

The Pros and Cons of Merger Control

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Swedish Competition Authority

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The Contributors

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Gregory Werden is Senior Economic Counsel in the Antitrust Division of the U.S. Department of Justice, where he has worked since 1977 on a wide range of competition policy issues. He was a principal author of the 1982 and 1984 Merger Guidelines, and he worked on four other sets of guidelines and numerous friend of the court briefs. He has authored or co-authored over eighty publications on antitrust policy and related issues, many focusing on market delineation or the quantitative analysis of likely effects from horizontal mergers. He and Luke Froeb organized in May 2002 a workshop on merger simulation sponsored by the Swedish Competition Authority. It was attended by professionals from competition authorities world-wide.

1. Introduction

The pros and cons of merger control are high on the agenda of policy makers, competition authorities, academics, representatives of industry and labour organizations, and others. The views and concerns on corporate concentrations also span a wide range, covering at one extreme scrapping merger control altogether, and at the other prohibiting all mergers, as well as even proposals for breaking up very large firms, which in some cases have attained economic strength and influence comparable to that of some nations. In Sweden, the existence and rationale for merger control has become widely known to the public in recent years after three proposed mergers were abandoned on the grounds of severe restrictions on competition. Two of the mergers were examined by the European Commission and one by the Swedish Competition Authority.

The need for merger control is widely supported – but the specific principles and tools by which it should be exercised are subject to discussion and debate, and also revision. The review of the Merger Regulation in the Green Paper by the European Commission has attracted public comments from more than a hundred different sources. The review process of the Green Paper carried out by the Swedish Competition Authority and the dialogue with our counterparts in Europe have provided a stimulating exchange of ideas. The pros and cons of changing the “substantive test” from the dominance standard to the SLC-test (“Substantial Lessening of Competition”) is an issue that needs careful scrutiny. The concept of collective dominance and other issues such as jurisdiction, efficiencies, and procedures are also of great importance.

This volume, commemorating the 10th Anniversary of the Swedish Competition Authority, is intended to serve as a contribution to the discussion. It consists of individual contributions from independent scholars and professionals with expertise in economics who have been invited to participate. The authors have themselves chosen the topics of their chapters, the only requirement being that their choice should have a strong bearing on the pros and cons of merger control. The purpose has been to stimulate discussion and test ideas – not to present a uniform view. Naturally, the opinions expressed are those of the authors alone. The book will be officially released on September 6, at a seminar in Stockholm concluding a meeting of the Director-Generals of European Competition Authorities.

All the chapters are relevant to policy. The contribution by Neven and Röller evaluates the precision of decisions made by the Commission in terms of identifying pro- and anti-competitive mergers over the last ten years based on stock market reactions. A main finding is that the Commission has done fairly well in clearing pro-competitive mergers, but not as well in prohibiting anti-competitive ones. The authors suspect that this discrepancy is associated with the scope of the concept of dominance, political influence, and the strength of efficiency arguments. In the authors' view, the latter necessitates changes in the treatment of efficiencies by the Commission. Procedural and institutional reforms are also needed. Since phase I discrepancies are more common, increasing the time limits, or, alternatively opening phase II investigations more frequently may well be justified.

Reforms in the analysis of collective dominance have also been suggested by some analysts following the judgment by the Court of First Instance on the *Airtours* case. Collective dominance may be simple in theory, but it is complex to verify in practice. Kai-Uwe Kühn raises in his chapter several criticisms against the implementation of the concept by the Commission in recent cases. A key weakness is a lack of solid economic analysis. The *Airtours* judgement, according to Kühn, may have effectively put a lid on "Pandora's box" of non-essential arguments previously advanced to support the creation of collective dominance in some cases. He concludes by proposing alternative instruments, based mainly on the tools of economic theory, for identifying such behaviour.

We may thus see greater focus on and the requirement for more rigorous economic analysis in the future. Concerning mergers, economic models may provide the analyst with quantitative tools for market delineation and estimating how prices, quantities, market shares and welfare change as a result of a specific merger. As with all economic models, they are subject to some degree of uncertainty given their dependence on statistical estimates of relevant economic parameters, and the specification of the underlying economic model. However, it can certainly be argued that the methodology of simulating mergers often offers better opportunities for understanding what happens when two companies become one, compared with that provided by traditional structural analysis. In particular, the technique is well suited for assessing the impact on competition resulting from mergers involving differentiated consumer products. Drawing on experiences mainly from the US, Gregory Werden and Luke Froeb describe in their chapter the functioning and the uses of the merger simulation tool. In May 2002, the

authors gave a merger simulation training workshop in Stockholm which was attended by economists from competition authorities world-wide.

More rigorous economics may also be warranted in the debate on whether firms in small countries are at a disadvantage because of EU merger control. The reason being that markets are often national, making it harder for firms in small countries to merge simply because they would very soon reach critical market shares, although they would still be relatively small in absolute size. Hence, the argument goes, it is beneficial for a small country to allow mergers that potentially hurt domestic consumers, since they have the advantage of making the companies large enough to be internationally competitive. A counter argument is that sacrificing consumer interests is not necessary since the companies can engage in cross-border mergers instead. However, such mergers may be less favourable for smaller countries, since from the merged entity's view, it is sometimes more rational to locate in a large rather than a small country. The economic logic of these arguments, and the need and appropriateness for the Commission to incorporate these aspects in its analyses, are dissected by Henrik Horn and Johan Stennek in the concluding chapter.

Together, these contributions highlight some of the key issues of merger control. It has been a source of satisfaction for the Swedish Competition Authority to organize this seminar, and take part in a lively debate both on and off stage. The debate will continue unabated, and I hope that this book will stimulate it still further. I would like to warmly thank all the authors who have contributed. My appreciation also goes to Karl Lundvall at the Swedish Competition Authority, who is the editor of the book and to Åsa Eriksson and Birgitta Snell, who have repeatedly proof-read the manuscript and put the pieces together.

Stockholm, August 2002

Ann-Christin Nykvist
Director-General

2. Discrepancies between markets and regulators: An analysis of the first ten years of EU merger control*

Damien J. Neven

Lars-Hendrik Röller

“...it boils down to whether you trust the agencies or the stock market. I’ll take the stock market any day...”¹

The purpose of this paper is to gather and interpret some evidence with respect to the first ten years of EU merger control’s implementation. In particular, we present some evidence on apparent discrepancies between EU decisions and stock market’s anticipations of the anti-competitive consequences of particular mergers. Finally, we explore some of the factors that may account for such discrepancies.

We identify, for a sample of mergers, whether the stock market anticipated that the operation would benefit consumers by considering the reaction to the stock price of the competitors. We consider this evidence in the light of the actual decisions taken by the EU. The comparison reveals both type I and type II “discrepancies”, i.e. instances where on the face of it, the Commission “should have” allowed a merger that it has prohibited and instances where the Commission has allowed a merger that it “should have” prohibited. We identify three factors, which may explain systematic discrepancies (beyond differences in assessment which would presumably introduce some random noise). First, the objective of the EC Merger Regulation (ECMR) may not be to prevent mergers which hurt consumers because of the incomplete overlap between dominance and significant increases in price. Significant price increases may indeed take place without leading to the creation or strengthening of a dominant position. Second, a discrepancy between the stock market’s anticipation of the anti-competitive consequences of a

*This paper partly draws on research that the authors currently undertake with T. Duso from Wissenschaftszentrum (WZB), Berlin.

¹ Bruce Kobayashi, former economist at the US Federal Trade Commission (FTC) and Department of Justice (Antitrust Division) quoted in Fortune Magazine, April 14th, 1997.

merger and actual decisions could be associated with a bias in the evaluation of efficiencies. Indeed, we observe that the ECMR necessarily makes an implicit assumption about a benchmark level of efficiencies. Excessive optimism by the Commission with respect to this benchmark could explain why some mergers are allowed when the market anticipates that the merger will be anti-competitive. Third, the discrepancies may be associated with the “political economy” of merger control, i.e. influence that is brought to bear on the Commission so that it may not have followed the objective that it has been assigned.

The last factor has been much emphasized in recent discussions and deserves a more detailed discussion. First, the Commission is sometimes criticized for giving excessive attention to the welfare of competing firms. According to some observers, the Commission’s attention to the concerns of competitors is associated with its apparent willingness to listen to them and the credence that it attaches to their point of view.² The Commission may rely excessively on the claims that they put forward and fail to realise to what extent the interests of consumers and those of competitors may diverge. However, there is a more benign interpretation behind the observation that the Commission tends to consider the fate of competitors. Its attention could be partly dictated by the substantive criteria under which the Commission operates and in particular the dominance criteria; arguably, a firm’s ability to act independently of its competitors might indeed depend heavily on the fate of these competitors.³

Second, the Merger Task Force (MTF) is sometimes criticised for relying on somewhat speculative claims; that is, it is sometimes asserted that the anti-competitive concerns identified by the Commission lack solid foundations, in particular in terms of economic analysis, or that there is insufficient empirical support behind these concerns (see for instance Muris, 2001). The recent decision by the Court of First Instance in the *Airtours* case supports this point of view. In its ruling, the Court criticizes the Commission for insufficient reasoning in its analysis of collective dominance, for having relied on insufficient evidence and for not having adequately considered the evidence submitted by the parties.

² For instance, C. James (Assistant Attorney General for Antitrust at the U.S. Department of Justice) pointed out that U.S. antitrust laws protect “competition and not competitors” and note a “significant point of divergence” with the EU on the issue (see James, 2001).

³ See Kovacic, 2001. He discusses why US and EC authorities had a divergent assessment in the *Boeing/McDonnell Douglas* case. He shows that the source of the divergence is the EU’s concern about the entrenchment of dominance, which arose even though the EU had recognised that McDonnell was no longer a real force.

In addition to collective dominance, the MTF's approach to geographic market definition and portfolio effects has been the subject of concern. However, it is inevitable that any anti-trust authority should have a margin of appreciation, and the burden of proof that the Commission should appropriately carry is a matter of degree.

Third, the Commission's approach is sometimes characterized as being biased against small countries. As discussed in the chapter by Horn and Stennek, the concern underlying this criticism seems to be that current EU policy prevents firms in small countries "from merging and obtain a leading global position". This critique can be interpreted in several ways, which are fully discussed by Horn and Stennek. At least one version of this critique suggests that large member states are in a position to exert more influence on the Commission's decisions. However, while there is some evidence that member states could influence Commissioners in the early years of merger control (see Neven et al, 1993), the current Commissioner is widely credited for his independence and for protecting his staff from political influence (see for instance, Burnside, 2001).

According to some commentators (see for instance Alhborn, 2002), the origin of these shortcomings can be traced back to the institutional framework in which EU merger control operates and in particular to the multiple roles played by the Commission, which essentially acts as investigator, judge and jury. According to this approach, EU merger control is not sufficiently accountable and its decision making process enjoys excessive discretion. In this context, individual civil servants, and more generally the hierarchy of the MTF, can pursue their own objectives at the expenses of those assigned by the regulation. These interests and objectives can in turn be manipulated by third parties, including competitors and member governments.⁴ In other words, according to this approach, bureaucratic capture is at the source of the shortcomings of EU merger control and those can thus only be addressed by making the Commission more directly accountable.⁵

⁴ See Neven, Nuttal and Seabright (1993) for a discussion of this and some evidence relating to the first five years of EU merger control. See Neven and Röller (2001) for a model where third parties can influence the decision of a competition agency which is subject to ex post monitoring by the government.

⁵ Public attention has also focused on a number of cases like *Volvo/Scania*, *Airtours*, *Worldcom/MCI*, *Schneider/Legrand*, *GE/Honeywell* or *Tetra Laval/Sidel*. Senior executives of the companies involved have openly expressed dissatisfaction with the outcome of the procedure (as one might have expected) but also with the procedure itself (see for instance, Financial Times, October 29th, 2001). They claim that the MTF has abused the power that it has been granted by the regulation and in all but one of the cases mentioned above, companies have appealed the Commission's decision to the Court of Justice. These decisions to appeal presumably give an indication both that the companies do not consider to have been granted a fair hearing and that they anticipate that a different

This paper considers some direct evidence on the issue of whether the Commission may have pursued different interests from those that is has been assigned, taking the anticipation of the financial market as a benchmark. The paper characterizes the pattern of discrepancies⁶ between decisions and market anticipations across various dimensions and tries to account for them. We discuss the respective role played by the concept of dominance, the lack of an explicit efficiency defence and the influence that third parties could be expected to exercise.

We find a low frequency of type I discrepancies, i.e. relatively few instances where the Commission has prohibited a merger that the market had anticipated as being pro-competitive. By contrast, we observe a high frequency of type II discrepancies, i.e. relatively numerous instances where the Commission has failed to block or to impose remedies on mergers that the market had anticipated to be anti-competitive. Considering the pattern of discrepancies (across countries, across incentives to lobby and over time), some very preliminary observations reveal that competitors play an important role in favour of anti-competitive deals but surprisingly not against pro-competitive mergers, that discrepancies are more frequent in phase I and possibly when large countries are involved.

2.1 A benchmark from the stock market

As indicated above, we consider a sample of merger cases reviewed by the EU and derive the stock market's implicit anticipation of the consequences of the proposed mergers for the consumers. We then compare actual decisions with what the stock market would have indicated if the objective of the EU were to prevent price increases. We discuss these discrepancies and identify the circumstances where, independently of any outside influence, the MTF could allow a price-increasing merger, or prohibit a merger that reduces price. This section first describes the method that we use in order to infer the stock market's implicit anticipation of mergers' consequences for the consumers. We subsequently outline our understanding of the objective function assigned by the ECMR and the constraints that it imposes, and finally describe our sample.

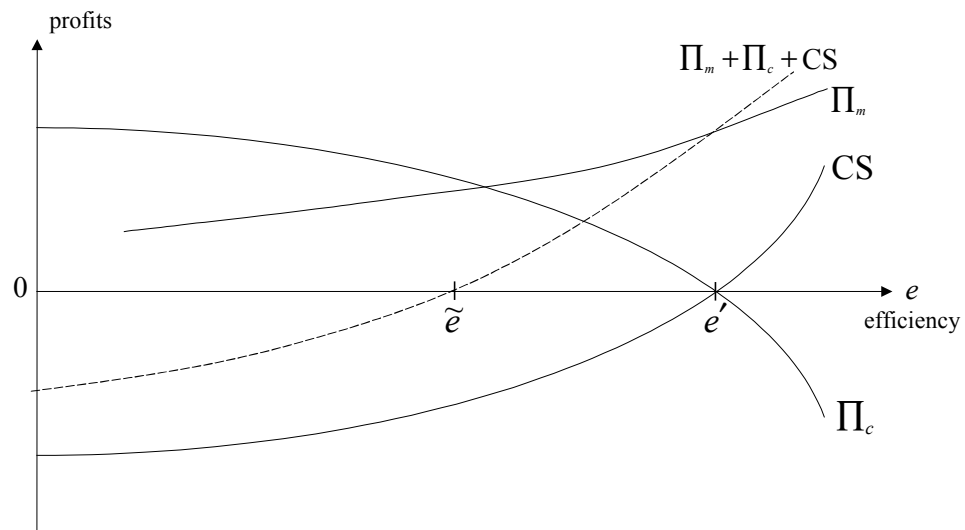
decision may be reached on appeal, thereby indicating possibly that, according to their perception, the Commission did not pursue in its decision the objectives that it had been assigned.

⁶ Discrepancies may be a more appropriate term than "errors", given that the rules imposed by the ECMR can explain the divergence between decisions and what the stock anticipation may have dictated and given that the assessment of the competitive consequences of potential mergers from stock market data suffers from its own shortcomings.

Identification of anti-competitive mergers from competitors' profits

The consequences of a merger for merging parties, competitors and consumers in the context of a prototype model are described in Figure 2.1. It is assumed that before the merger, N firms compete with the same marginal cost. The new entity, which results from the merger (involving M firms out of N) is assumed to operate with a lower marginal cost. The marginal cost saving achieved by the merger (relative to the common pre-merger level) is represented on the horizontal axis and dubbed e (for efficiency). The vertical axis represents the profits. The four curves in Figure 2.1 present respectively; the change in the profit of merging parties (that is, the level of profit of the merged entity less the sum of the individual profits of the merging parties before the merger, denoted Π_m); the change in the profit of competitors (all firms not involved in the merger, denoted Π_c); the change in the consumer surplus (denoted CS); and the change in welfare (defined as the sum of profits and consumer surplus, denoted $\Pi_m + \Pi_c + CS$).

Figure 2.1 Efficiency, Profits and Welfare



There are five striking features from this figure. First, it is immediately apparent that mergers will be not attractive (both privately and in terms of welfare) if they do not achieve at least some level of efficiency. Second, the change in consumer surplus increases as the level of efficiency achieved by the merger increases. This accords with intuition, as part of the efficiency achieved by the merged entity will be passed on to consumers. Third, when the efficiency is large enough, the reduction in the number of competitors entailed by the merger, which normally leads to higher prices, is more than compensated by the effect of higher efficiency, which leads to lower prices, other things being equal. As indicated by Figure 2.1, there is a critical level of efficiency (e') which ensures that the merger does not affect consumers. At this critical level, prices are unchanged. Fourth, the change in welfare is also increasing with the level of efficiency. Higher efficiency leads to higher aggregate profits (this is not shown) and higher consumer surplus, thereby increasing welfare. Figure 2.1 also indicates the level of efficiency, \tilde{e} , which is required in order to ensure that welfare increases as a consequence of the merger. This level is naturally less than the level, which is required to ensure that consumers are not hurt. Fifth, and most importantly for our purpose, we observe that the change in profits accruing to competitors mirrors the changes in consumer surplus: profits to competitors fall as the level of efficiency achieved by the merger increases and the level of efficiency which ensures that competitors do not gain is exactly the level which ensures that consumers are not hurt. In other words, in this framework, if a merger hurt competitors, it will benefit consumers and vice versa. That is also to say that if we can obtain a reliable measure of the extent to which competitors could be hurt by a merger, we will also have a measure of whether the merger is pro-competitive (i.e. benefits consumers).

The idea that mergers, which hurt competitors, will tend to be pro-competitive has long been recognized and has been first exploited by Eckbo (1983) and Stillman (1983). They propose to use the stock market reaction to the announcement of a merger (a so called "event study") to evaluate the impact of the merger on competitors' profits. A positive reaction will normally indicate that the merger is expected to enhance the profits of competitors and hence that it will be anti-competitive (and vice-versa). The change in the value of competitors' equity can also be taken as a measure of the (discounted) additional profits that is expected to accrue to them as a consequence of the merger. In what follows, we will adopt this methodology and accordingly identify mergers that were

expected to be anti-competitive from reactions in the equity of competitors.

Questions naturally arise with respect to the generality of the above framework in which competitor gains can be used to identify consumer losses, as well as with respect to the reliability of stock market returns as a proxy for the change in competitors' profits. We take each question in turn.

The consequences of a merger for competitors and consumers outlined in the framework above accord with intuition. Formally, this intuition holds for standard models like Cournot competition and homogenous products (with general demand functions⁷). The shape of the profit and consumer surplus functions also hold for some specifications with product differentiation and/or Bertrand competition.⁸ The exact correspondence between the sign of the change in competitors' profits and the change in consumer surplus depends on the assumption of Cournot competition. However, as long as the level of efficiency which guarantees that competitors' profits are unchanged remains in the neighbourhood of the efficiency level e' , our analysis should continue to yield empirically informative results.

Nevertheless, a number of limitations of the above framework need to be emphasised. First, it is assumed that competitors will not be weakened to the point that they will prefer to leave the industry.⁹ If this would arise, both competitors and consumers could be hurt. Second, our framework assumes that the efficiency of competitors is not affected by the merger. This may not be appropriate in the presence of technological spillover across firms so that part of the efficiency gains also accrue to competitors. In those circumstances, the correspondence between competitor gains and consumer losses may no longer hold. Competitors and consumers could gain at the same time. Third and most importantly, this framework focuses on unilateral effects in horizontal mergers. With respect to co-ordinated effects, the matter may not be very different, to the extent that competitors are expected to gain and consumers are expected to lose (whatever the efficiency gain). However, conglomerate mergers may lead to outcomes where the correspondence between the

⁷This property holds for the so called "smooth Cournot games", as defined by Vives (2000). A proof of this can be obtained upon request from the authors.

⁸For instance, these properties hold for a symmetric system of product differentiation à la Shubik and Levitan (1980). See Neven (2001) for a derivation of this result in a different context.

⁹However the concern that competitors may be led to leave the industry has not been prominently raised in the merger decisions that are included in our sample (our sample only includes decisions until the summer of 2000, whereas *GE/Honeywell* and *Tetra Laval/Sidel* have been prohibited in 2001).

change in consumer surplus and the change in competitor profits is lost. For instance, when merging firms sell complement goods as a bundle (as in *GE/Honeywell* with avionics and engines), competitors will typically loose even though consumers may gain or loose depending of particular features of demand. Similarly tied sales of substitute or independent goods will typically hurt consumers but may increase or decrease competitors' profits depending again on particular features of demand.¹⁰

Let us now turn to the measurement of competitors' expected profits. As indicated above, the change in the expected profit of competitors associated with a merger is typically measured by a so-called event study, which attributes "abnormal" changes in their stock price or equity value to the merger around the day of its announcement. Leaving technical issues aside for the moment (such as the identification of abnormal changes in stock prices), a number of issues of interpretation should be kept in mind; first, the announcement of a merger may have little effect on the stock price of competitors, in particular when the merger affects only a small part of the business of the firms being considered. Second, when participants in the stock market contemplate several possible mergers, the announcement of a particular merger will change the likelihood of many alternative configurations.¹¹ As a consequence, a change in the stock price of a firm not involved in the merger may reflect more the change in the likelihood of alternative mergers involving that firm (the "in play" effect) rather than the consequences of the announced merger for its profit (see Stennek and Fridolfsson, 2001). If one assumes that the market anticipated an increase in the value of the "competitor" in alternative merger configurations, a fall in its stock price may not be a reliable indicator that the merger is pro-competitive (but an increase in its stock price will remain a good indicator that the merger is anti-competitive). It is not clear however whether this "in play" effect is important empirically; Salinger and Shuman (1988) test for the presence of such effects and conclude that it may matter in some cases, but it does not matter on average across a sample of cases. Third, it is worth keeping

¹⁰ Our sample includes only a few cases where "conglomerate" concerns were raised (in particular, *Tetra Pak/Alfa Laval* and *Guinness/Grand Metropolitan*).

¹¹ More generally, it should be recognized that the stock market could anticipate clearance and prohibitions. At the time of the announcement, the market surely takes into account the antitrust procedure and attributes a probability to the merger being cleared. Hence, the change in the value of the stock at the time of the announcement is equal to the probability that the deal will be cleared times the value that will accrue if it is realised. In order to identify whether deals are perceived as anti-competitive or not, we only use the sign of the expected change in the stock price. The expected change is of the same sign as the conditional change (i.e. given that the merger takes place), the former being a proportion of the latter. Hence, the fact that the market may anticipate the outcome of the antitrust procedure does not introduce a bias in our procedure.

in mind that abnormal returns around the day of announcement may provide a fairly imprecise estimate of the change in profits. However, as confirmed by Schwert (1996), there is a lot of evidence in support of the semi-strong hypothesis of market efficiency with respect to mergers. Hence, the change in stock prices is likely to provide an unbiased estimate of the change in profit. Nevertheless, the variance around this estimate could be large.

Matching markets and regulators

As discussed in the previous section, the anticipation by the stock market of the anti-competitive consequences of a merger can be inferred from competitors' stock prices. In order to identify possible discrepancies between the anticipation of the market and the decision of the regulators, one should clarify what the regulator was meant to achieve.

The ECMR is concerned with the creation or reinforcement of a dominant position as a result of which effective competition would be significantly impeded (Article 2.3). The regulation also indicates that efficiencies can be taken into account in the analysis as long as consumers are not hurt (Article 2.1b). Altogether, the objective set by the ECMR would thus appear to involve the protection of consumer welfare. According to this approach, the Commission would be expected to consider potential price increases and evaluate whether efficiencies are sufficient to ensure that prices would fall (i.e. make sure, in terms of Figure 2.1 that the actual level of efficiency is above e'). According to this approach, it is straightforward to assess whether the Commission has pursued the objective that it was assigned; all it takes is to check the sign of the expected change in competitors' profit. If it is positive and the merger has been prohibited, then the Commission has taken the "right" decision, and vice versa. Of course, some difference in appreciation between markets and regulators could take place so that different outcomes will be observed. But there should be no systematic bias induced by differences in appreciation.

Two difficulties arise, however, with this interpretation. The first difficulty arises from the concept of dominance, which is not closely associated with the prospect for price increases that hurt consumers. That is, the Commission may have found that a merger does not create or strengthen dominance even if a price increase can be expected or the other way round. If anything, it would appear that significant price increases could take place even if dominance is not created or strengthened. There has been increasing recognition of this in the context of the debate surrounding the Green Paper on the reform of the ECMR (see

Vickers, 2002, for a succinct view on this). This arises because firms with moderate market share may still be able to achieve significant price increases if they sell close substitutes.¹² Hence, a finding that the Commission has not prohibited a merger that is expected to increase price may be due to the fact that the firms involved fell short of being dominant – and not the fact that the Commission has not pursued the objective that it was assigned. By contrast, a finding that the Commission has prohibited a merger, which was not expected to increase price, could not be explained by the scope of the concept of dominance.

The second difficulty arises from the observation that efficiency considerations are very seldom considered explicitly in actual decisions. As pointed out by Röller et al (2001), the objective of protecting consumer welfare and the Commission's apparent neglect of efficiency considerations would be hard to square with the fact that most mergers are allowed. Indeed, if no efficiency is ever taken into account, all horizontal mergers should be prohibited. Hence, the Commission's objective is probably best described as the protection of consumer welfare, while assuming a certain level of efficiency. According to this approach, it is only where competitive concerns are serious that the Commission may explicitly explore whether efficiency gains much exceed the benchmark level, which is assumed for all cases.¹³ To the best of our knowledge, the Commission has never found such a situation or at least has never publicly said so.

Hence, the absence of a systematic evaluation of efficiencies in each case could involve a bias in Commission decisions; if the benchmark level of efficiency which is assumed by the Commission exceeds average efficiency gains, mergers which hurt consumers could be allowed by the Commission. The opposite, however, is not true because the Commission's approach is asymmetric,¹⁴ if the Commission finds that there is

¹² Or to put it differently because a firm typically needs to be the largest in the market in order to be considered dominant. The absence of a clear doctrine on collective dominance in the early years may also be a significant factor – such that mergers that lead to collusion could not be considered to give rise to a dominant position.

¹³ This interpretation is consistent with the wording of the regulation and with some of the rare references to efficiency that one finds in actual decisions. For instance, in *Aérospatiale-Alenia/De Havilland* (a prohibition), the Commission acknowledged that it had considered efficiencies but that efficiencies were not sufficient to overturn the presumption that the merger was anti-competitive. Some observers however doubt that the Commission pays more than lip service to efficiency claims put forward by the parties (see Röller et al, 2001 for instance). The fact that the Commission may have turned efficiency into an offence in some cases should also induce some reluctance on the part of merging parties in claiming efficiencies. This may further contribute to an effective neglect of efficiency considerations.

¹⁴ If one assumes (see previous footnote) that the Commission hardly ever considers efficiencies, then both types of discrepancies could arise. Mergers which benefit consumers could be prohibited.

a competitive concern and that the benchmark level of efficiency is insufficient to ensure that prices will not increase, it will investigate actual efficiencies. Assuming that its evaluation is not biased, it will normally estimate the actual level of efficiency and hence will not prevent mergers which exhibit sufficient efficiency to ensure that prices do not increase.

In sum, mergers which hurt consumers could be allowed for three distinct reasons. First, mergers could lead to a price increase, but not create or strengthen dominance. Second, the benchmark level of efficiency, which is assumed by the Commission, could be biased upwards. Finally, it could be that mergers have been allowed because the Commission did not pursue the objective that it has been assigned, possibly under the influence of the merging entity and its competitors. By contrast, there is only one systematic reason¹⁵ which may explain why mergers which benefit consumers are prohibited, namely that the Commission did not follow the objective that it had been assigned, possibly under the influence of competitors.¹⁶

One should however note that the Commission does not consider that the scope of the dominance concept has been a constraint and hence that it could account for possible discrepancies. The Green Paper (EU, 2001) on the reform on the ECMR, while discussing the wisdom of changing the substantive test, acknowledges that some mergers which increase price may not be covered by the concept of dominance. However, the Green Paper dismisses this as an “interesting hypothetical discussion” and notes that the Commission has never experienced a case where this has been an issue (see para 166, page 40).

Data and Results

Our sample includes all phase II mergers reviewed by the EU during the first ten years of implementation of the ECMR (until mid-2000), and a matching sample of phase I cases (that were selected randomly). For each case, we have identified merging firms and competitors from the decision and the date of the announcement from the financial press. For

¹⁵ Different discount factors could be another source of discrepancy, in particular if the regulator gives more weight to the immediate future and if efficiencies only accrue after a lag (so that a pro-competitive merger first appears to be anti-competitive).

¹⁶ If the influence that different parties can exercise on the Commission is proportional to the resources that they devote, such an outcome should not be observed as the merging parties should always be in a position to trump the competitors, at least in the context of the prototype model considered above (see Neven and Röller, 2001, for a formal analysis of this in a common agency framework).

each firm (merging firm or competitor), we have computed the abnormal return¹⁷ on the day of announcement as well as the abnormal change in the value of equity. We add the change in the value of equity across merging partners to obtain an aggregate measure of the value of merging firms. When several competitors are identified in the decision (as is often the case, in particular when several relevant markets are considered), we have added the change in the value of equity across firms to obtain the aggregate effects on competitors. Because of difficulties in identifying competitors or their stock, we end up with 48 phase II cases (out of 64 phase II cases during the period under review) for which we have complete information. We encountered more difficulty in identifying competitors in phase I cases, which are typically less detailed and had to draw additional cases.¹⁸ We end up with a sample of 57 phase I cases. The list of cases included in the final sample is provided in the Appendix.

Table 2.1 reports the number of cases in our sample according to the decisions taken by the Commission and according to the stock market evaluation of their competitive consequences.

¹⁷ Several methods can be used to compute abnormal returns. Some authors estimate a Capital Asset Pricing Model (CAPM) equation which regresses the stock return on a constant and the market return (or an industry index) over a sample which immediately precedes a window of about 100 days around the announcement. Abnormal returns before the announcement are then computed as the difference between actual returns and the predicted returns obtained from the estimated equation. For the part of the window which follows the announcement, a symmetric procedure is used (such that a second CAPM equation is estimated on a sample which immediately follows the windows and use to compute normal returns during the second part of the window). Abnormal returns are then cumulated over the span of the window to obtain a cumulated abnormal return.

A much simpler approach can be followed, in which the abnormal return is simply computed at the difference between the return on the stock and the return on an appropriate index on the day of announcement. Given the difficulty in obtaining unbiased parameter estimates in CAPM equations (in particular when the stock accounts for a significant proportion of the index), we have adopted this simpler approach. We have obtained all stock prices, equity values and indices from Datastream.

¹⁸ Our sample includes approximately the same number of phase I cases that have been allowed with remedies and phase I cases that have been allowed without remedies. This partly reflects the more detailed information which is provided in decisions for which remedies have been imposed. Relative to the actual population of phase I decisions, our sample thus over-represents cases where competitive concern has been found (during the sample period, there are 45 phase I decisions with remedies and 982 decisions without remedies). Overall our sample thus includes all phase II cases and about 2/3 of phase I cases in which remedies have been imposed.

Table 2.1 A sample of decisions taken by the Commission during 1990–2000

	PHASE I		PHASE II			Total
	Art. 6.1.b (Clearance)	Art. 6.1.b (Clearance with remedies)	Art. 8.2 (Clearance)	Art. 8.2 (Clearance with remedies)	Art. 8.3 (Prohibition)	
Negative gains (pro-competitive)	14	18	7	17	2	58
Positive gains (anti-competitive)	15	10	3	13	6	47
Total	29	28	10	30	8	105

First, we observe across all decisions that 55% were considered to be pro-competitive. That is also to say that the distribution of efficiency gains across mergers has a median which is only slightly above the level of efficiency which would ensure that consumers are not hurt (e' in Figure 2.1). This observation should be contrasted with the usual finding of event studies such that a majority of mergers fail to generate value for the shareholders of acquirers (even though the variance is large and some mergers generate very high returns), such that target shareholders obtain handsome premia and such that acquirers and target shareholders combined earn small but positive returns on average (see Bruner, 2002, for a survey). Leaving aside the issue of the allocation of the value being generated across merging firms (acquirer and target) and the puzzle that many mergers are not expected to generate value ex ante for acquirers, these observations suggest, in terms of Figure 2.1, that the average level of efficiency associated with potential mergers is fairly low (close to the point where the sum of profits would cross the horizontal axis). Hence, it would appear that the average¹⁹ level of efficiency, as inferred from the stock market reaction of competitors is significantly *larger* than the average level of efficiency which can be inferred from the stock market reaction of merging firms.²⁰ This observation is a bit of a puzzle. One possible interpretation is that mergers *do* generate significant efficiencies

¹⁹ Assuming that the average is close to the median.

²⁰ The usual finding with respect to the creation of value for merging firms is broadly confirmed in our sample. We find 51 cases (out of 105) in which the merger creates value for the merging firms.

which affect competitors but that the shareholders of the merging firms do not manage to obtain the rents associated with these efficiencies (possibly in part because of ineffective corporate control).²¹ If this interpretation is correct, it would suggest that the common presumption that efficiencies associated with mergers tend to be small, which relies on evidence of gains to merging firms, could be misplaced. Gains may have been underestimated.

Table 2.1 distinguishes between different types of decisions depending on the article of the Merger Regulation that was applied. In phase I, matters are clear with respect to Article 6.1.b decisions which refer to clearance without conditions. Similarly in phase II, Article 8.1 and 8.3 refer respectively to clearance without conditions and prohibition. The issue then arises of how to interpret Article 6.1b and 8.2 decisions which include undertakings (respectively in phase I and phase II). Whether a decision with undertaking can be seen as giving rise to a discrepancy with the assessment of the stock market depends crucially on what the stock market could anticipate. That is, if the stock market could not anticipate the imposition of remedies, any instance where the stock market anticipated that the merger would be anti-competitive does not give rise to discrepancy if one assumes that remedies do indeed meet the competitive concerns. Similarly, any instance where the stock market anticipated that the merger would be pro-competitive does not give rise to a discrepancy – except to the extent that the remedies may not have been necessary. Hence, if the market does not anticipate the remedies, neither 6.1.b nor 8.2 decisions should be considered as potential discrepancies.

The matter is different if one assumes that the stock market could anticipate the remedies. In this case, any instance where the market anticipates that the merger would be anti-competitive would be associated with a type II discrepancy. But of course, any instance where the market anticipates that the merger would be pro-competitive would not be associated with a discrepancy. Hence, the frequency of type II discrepancies depends crucially on what we assume about the anticipation of the stock market. In what follows and in the absence of any clear presumption in favour of either, we will consider both assumptions, even if we tend to favour the assumption that the market could not anticipate the remedies.²²

²¹ This interpretation would also be consistent with the observation from ex post studies that most mergers do not generate additional profits relative a control group, as long as the rents appropriated by management are recorded as additional costs and hence reduce reported profits.

²² Purely on the grounds that remedies are the outcome of a negotiation between the Commission and the parties over which it is difficult to form a prior.

Table 2.1 indicates that the frequency of type I discrepancies, such that the Commission has prohibited seemingly pro-competitive mergers, at 25%, is relatively low, even if one should not possibly attach too much weight to this observation given the low overall number of prohibitions in the sample²³ (only 8 out of 13 prohibitions effectively imposed by mid-2000). As indicated above, type I discrepancies can only be explained by outside influence that may have led the Commission to pursue an objective which is different from the one that it has been assigned (assuming that the efficiency defense is asymmetric). Of course, competitors, which are hurt by pro-competitive mergers, would have an incentive to lobby against these mergers. This hypothesis will be further investigated below.

The frequency of type II discrepancies, i.e. situations where the Commission has allowed seemingly anti-competitive mergers, is larger (see Table 2.1); the frequency of discrepancy among those cases which do not involve remedies is 46%. If one includes cases involving remedies and assumes that the market did not anticipate remedies, the frequency is 19%. If one assumes that the market did anticipate remedies, the frequency is 42%. Frequencies in the range of 40% seems rather large, being close to what one would obtain if decisions and the anti-competitive consequences were independent discrete random variables.

As discussed above, at least three reasons can explain type II discrepancies, namely the scope of the dominance concept, the lack of an explicit efficiency defence and the influence that third parties can bring to bear on the Commission. If one follows the Commission and dismisses the limited scope of dominance as being unimportant, it would seem that only excessive optimism with respect to efficiencies and outside influence could explain type II discrepancies. Given the importance of such discrepancies, it would seem likely that both should play a role. However, additional information is required in order to disentangle the two. The last section of the paper uses the variance in the discrepancies across countries, time and incentive to influence in order to explore the issue.

2.2 The pattern of discrepancies

In order to further investigate the role of efficiencies and outside influence on the probability of observing discrepancies, we compute the cor-

²³ Interestingly, one of the two cases identified as a type I discrepancy is *Airtours/First Choice*. Some comfort can presumably be found from the fact that the discrepancy has been redressed by the Court of First Instance, at least in law, if not in terms of business opportunity.

relation between discrepancies and a number of variables which represent different sources of outside influence. Various sources have been discussed above. First, competitors and merging firms can be expected to influence the agency; merging firms will do so in order to enhance the probability that the deal will be accepted and we will represent this incentive by the expected profit that firms accruing to the merging firms (at the time of announcement). This variable is denoted MGAINS. The incentive of competitors depends on the effect of the merger on their profit; if the merger is expected to increase their profit, they will influence the agency in the same direction as the merging firms. We denote as PCGAINS the expected profit accruing to competitors at the time of announcement, when positive. At the opposite, when the merger is expected to decrease their profit (and hence is pro-competitive), competitors can be expected to influence the agency against the merger. We denote as NCGAINS the absolute value of the expected loss of profits to competitors.

Second, as discussed above, some observers suggest that there is a bias against small countries and in particular that there is a bias against mergers involving firms from the same country. We represent this by a dummy variable (CSPEC) which take the value 1 if the merging firms come from the same country. Another version of the “small country” argument is that large countries are in a better position to influence the Commission. We represent this by a dummy variable (BIG) which takes the value 1 if one of the merging company has its headquarter and main operation in one of the large EU countries (France, Germany, Italy, Spain or the UK).

In addition, in order to investigate whether discrepancies may become more frequent over time, we consider a variable (N), which is the chronological order of the case. We also introduce a dummy (PHASE1) to identify decisions taken in phase I.

Table 2.3 presents the correlation²⁴ between our preferred measure of discrepancy and these variables.²⁵ The discrepancy variable (MISTAKE) is a dummy variable, which identifies all cases of discrepancies (both type I and type II) and assumes that remedies could not be anticipated.

²⁴ Given that our measure of discrepancies is a dummy, we use Kendall correlation coefficients. The probability that the coefficient is equal to zero is reported together with (below) the coefficients.

²⁵ Alternative empirical investigations could of course be undertaken. In particular, one could estimate a probit model where the probability of observing a discrepancy is a function of the variables listed above. However, the estimation of such a model involves several econometric issues including endogeneity (in particular between the dependent variables and the expected profits of firms and competitors) that we have solved satisfactorily at the moment. This will be undertaken in further work.

Looking at Table 2.3 a few interesting findings can be identified. First, it appears that the probability of observing a discrepancy is higher in Phase I. Second, when competitors gain from the merger, their incentive to influence the agency is positively correlated with the occurrence of discrepancies. By contrast, when competitors lose, their incentive to influence the agency against the merger is negatively correlated with the occurrence of discrepancies. However, one should not attach too much significance to this finding, which is based on very few observations. Third, the occurrence of mistakes seems to be more frequent when companies from large countries are involved (but the level of significance of this variable is low). Finally, the preliminary data exploration in Table 2.3 suggests that there is no apparent bias against mergers which involve firms from the same country and no evidence that discrepancies are more frequent over time.

Overall, the analysis confirms that the influence that competitors can bring to bear on the Commission may be associated with type II discrepancies. That is, competitors may be successful in influencing the Commission to allow mergers that it should not allow according to the objective that it has been assigned. Interestingly, if this finding confirms the importance of competitors in the political economy of EU merger control, it is not consistent with the claim (for instance in *GE/Honeywell*), namely that competitors can influence the Commission to prohibit cases that it should allow.

The analysis also suggests that increasing the period of time during which the Commission has to undertake the analysis might significantly reduce the occurrence of discrepancies.

2.3 Conclusion

Evaluating merger decisions ex post is a notoriously difficult exercise, because it requires a comparison between the actual market developments induced by the decision with the developments that would have taken place otherwise. The construction of this counterfactual is fraught with difficulties and cannot be realistically undertaken for a large sample of decisions. Rather than considering ex post developments, this paper considers an alternative ex ante benchmark, namely the anticipation by stock market of the anti-competitive consequences of particular mergers. The reliability of this benchmark should not be overemphasised and our results should be seen as indicative. However, the sheer importance of the type II discrepancies that we observed can presumably not be explained solely by the shortcomings of the methodology.

If our results support the presumption that the political economy of merger control matters, they do not support the common claim (in particular among US practitioners) that the role of competitors is important towards the discrepancies that arguably matters most, namely the type I discrepancies such that pro-competitive mergers are prohibited. In addition, our results emphasize the importance of the reforms that the Commission is considering at the moment, as presented in the Green Paper. In particular, to the extent that type I discrepancies are less frequent than type II discrepancies, and to the extent that the former cannot be explained by the lack of an explicit efficiency defence, our results are consistent with the view that the lack of an explicit efficiency defence is a significant source of discrepancy. Reform in this area may thus be welcome.

Our results also indicate that reform may be useful in areas that are not considered by the Green Paper and in particular in the area of procedures and institutional reforms. Regarding procedures, the Green Paper envisages an increase in the effective length of phase II, to allow for a proper consideration of remedies. Our results suggest that more time may also help in phase I, or alternatively that a phase II should be opened more frequently. Regarding institutional reforms, it is beyond the scope of this paper to suggest how reforms could be undertaken but it would seem that the proper role of competitors in merger proceedings needs to be addressed.

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Appendix

Table 2.2 Summary statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
MISTAKE	105	0.19	0.39	0	0	1
N	105	53	30.45	53	1	105
PHASE1	105	0.54	0.50	1.00	0	1.00
PCGAINS	105	5.88	40.49	0	0	408.92
NCGAINS	105	2.27	13.25	0.0012	0	124.52
MGAINS	105	0.64	15.69	0	-82.85	78.91
BIG	105	0.73	0.44	1	0	1
CSPEC	105	0.30	0.46	0	0	1

Table 2.3 Correlations

Kendall Tau b Correlation Coefficients, N = 105
Prob > |r| under H0: $\rho = 0$

	MISTAKE	N	PHASE1	PCGAINS	NCGAINS	MGAINS	BIG	CSPEC
MISTAKE	1.0000 0.1917	-0.1050 0.1917	0.2017 0.0397	0.3640 <.0001	-0.3735 <.0001	0.0575 0.4752	0.1280 0.1919	-0.0481 0.6237
N	-0.1050 0.1917	1.0000	-0.7079 <.0001	0.0393 0.5863	-0.0331 0.6399	0.0268 0.6860	-0.0635 0.4296	0.1577 0.0500
PHASE1	0.2017 0.0397	-0.7079 <.0001	1.0000	0.0130 0.8822	0.0245 0.7756	-0.0562 0.4852	0.0086 0.9297	-0.2443 0.0127
PCGAINS	0.3640 <.0001	0.0393 0.5863	0.0130 0.8822	1.0000	-0.6517 <.0001	-0.0641 0.3747	-0.0286 0.7446	0.0237 0.7874
NCGAINS	-0.3735 <.0001	-0.0331 0.6399	0.0245 0.7756	-0.6517 <.0001	1.0000	0.0561 0.4281	-0.0652 0.4491	0.0038 0.9645
MGAINS	0.0575 0.4752	0.0268 0.6860	-0.0562 0.4852	-0.0641 0.3747	0.0561 0.4281	1.0000	0.0146 0.8562	-0.0266 0.7413
BIG	0.1280 0.1919	-0.0635 0.4296	0.0086 0.9297	-0.0286 0.7446	-0.0652 0.4491	0.0146 0.8562	1.0000	-0.2235 0.0227
CSPEC	-0.0481 0.6237	0.1577 0.0500	-0.2443 0.0127	0.0237 0.7874	0.0038 0.9645	-0.0266 0.7413	-0.2235 0.0227	1.0000

List of EU merger cases (1990–1999)

Case	Acquiring Firm	Target Firm(s)	Phase	Date
M.0004	Renault	Volvo	1	07.11.90
M.0012	Varta	Bosch ¹	2	12.04.91
M.0024	Mitsubishi Corp.	Union Carbide Corp.	1	04.01.91
M.0042	Alcatel	Fiat	2	21.01.91
M.0043	Fiat	Alcatel	2	21.01.91
M.0050	At&T	Ncr Corporation	1	18.01.91
M.0053	Boeing	Alenia	2	04.06.91
M.0057	Digital Equipment Int.	Mannesmann	1	22.02.91
M.0068	Tetrapak ¹	Alfa-Laval	2	19.03.91
M.0081	Viag	Continental Can	1	06.06.91
M.0121	Ingersoll Rand Co.	Dresser Inc.	1	18.12.91
M.0126	Accor	Wagons-Lits	2	16.12.91
M.0129	Digital Equipment Corp.	Philips Electronics	1	26.08.91
M.0141	Uap	Transatlantic HDG.	1	11.11.91
M.0165	Alcatel Cable S.A.	Aeg Kabel	1	18.12.91
M.0184	Gran Metropolitan	Cinzano S.A.	1	07.02.92
M.0190	Nestle'	Eaux Vittel	2	25.03.92
M.0214	Du Pont	Imperial Chemical Industries	2	03.06.92
M.0221	Asea Brown Boveri Limited	Trafalgar Hse	1	26.05.92
M.0222	Mannesmann	Hoesch	2	14.07.92
M.0236	Ericsson	Ascom	1	08.07.92
M.0253	Btr	Pirelli	1	17.08.92
M.0259	British Airways	.	1	27.11.92
M.0269	Shell	Montedison	2	07.02.94
M.0286	Zuerich Insurance Company	Municipal Mutual Insurance	1	02.04.93
M.0308	Kali	Mdk ²	2	16.09.93
M.0315	Mannesmann	Vlourec Dalmine	2	20.09.93
M.0331	Fletcher Challenge	Methanex	1	31.03.93
M.0354	Cyanamid	Shell	1	01.10.93
M.0358	Pilkington	Societa' Italiana Vetro ²	2	02.09.93
M.0361	Neste	Statoil	1	17.02.94

List of EU merger cases (1990–1999) (cont.)

Case	Acquiring Firm	Target Firm(s)	Phase	Date
M.0430	Procter & Gamble	Vp Schickedanz ¹	2	17.02.94
M.0437	Matra Marconi Space N.V.	British Aerospace Space Systems Ltd.	1	23.08.94
M.0447	Schneider Electric S.A.	AEG A.G.	1	01.08.94
M.0458	Electrolux	AEG A.G.	1	21.06.94
M.0468	Siemens	Italtel (Stet) ²	2	14.10.94
M.0469	Bertelsmann	Deutsche Bundespost Telekom ²	2	18.07.94
M.0477	Daimler Benz	Kässbohrer ¹	2	14.10.94
M.0479	Ingersoll Rand	Man	1	28.07.94
M.0484	Thyssen Stahl	Acciai Speciali Asti , Afl Falck ¹	2	21.10.94
M.0498	Commercial Union	Suez	1	12.09.94
M.0508	Credit Commercial De France (CCF)	Berliner Handels Und Frankfurter Bank (BHF)	1	28.10.94
M.0527	Thomson CSF	Daimler Benz AG	1	12.02.94
M.0550	Union Carbide Corporation	Enichem S.P.A.	1	13.03.95
M.0580	Daimler Benz	Asea Brown Boveri	2	23.06.95
M.0582	Orkla As	Volvo	2	23.05.95
M.0585	VA Technologie	Trafalgar House	1	07.07.95
M.0603	Crown Cork & Seal Company	Carnaudmetalbox Sa	2	25.07.95
M.0619	Gencor	Lonmin	2	20.12.95
M.0623	Kimberly-Clark	Scott Paper	2	12.09.95
M.0632	Rhône Poulenc Rorer Inc.	Fisons Plc.)	1	21.09.95
M.0685	Siemens	Lagardere	1	08.02.96
M.0689	Singapore Telecom	Belgacom	1	29.02.96
M.0706	Alcatel	Aeg	1	03.09.96
M.0731	Kvaerner A.S.	Trafalgar House Plc	1	15.04.96
M.0737	Ciba-Geigy	Sandoz	2	02.05.96
M.0754	Anglo American Corp.	Lonmin	2	16.12.96
M.0774	Saint Gobain	Hoechst Wacker	2	31.07.96
M.0794	Coca-Cola Enterprises	Cadbury Schweppes	2	13.09.96
M.0798	General Electric	Compunet Computer A.G.	1	19.08.96
M.0818	Cardo	Thyssen	1	02.12.96

List of EU merger cases (1990–1999) (cont.)

Case	Acquiring Firm	Target Firm(s)	Phase	Date
M.0833	Coca Cola Company	Carslberg A/S	2	02.05.97
M.0850	Fortis	Abn-Amro Bank	1	06.02.97
M.0856	British Telecom	Mci (Ii)	2	20.01.97
M.0877	Boeing	Mcdonnell Douglas	2	19.03.97
M.0913	Siemens	Elektrowatt	2	28.07.97
M.0938	Guinness	Grand Metropolitan	2	20.06.97
M.0942	Veba	Degusta	2	02.09.97
M.0950	Roche	(Boehringer Mannheim)	2	02.10.97
M.0954	Bain Capital Inc.	Hoechst Ag	1	02.09.97
M.0967	Klm	.	1	22.09.97
M.0970	Thyssen Krupp Stahl	Itw Signode	2	22.12.97
M.0984	Dupont De Nemours & Co.	Imperial Chemical Industries Plc.	1	02.10.97
M.0986	Bayer Group	Du Pont I De Nemours	2	09.10.97
M.0993	Bertelsmann	Taurus Entertainment Canal Plus	2	22.01.98
M.1027	Deutsche Telekom	Bertelsmann	2	29.01.98
M.1042	Eastman Kodak Company	Dainippon Ink & Chamics	1	15.01.98
M.1069	Worldcom	Mci	2	03.03.98
M.1081	Dow Jones	General Electric	1	22.01.98
M.1094	Caterpillar	Lucas Varity	1	23.02.98
M.1142	Commercial Union Plc	General Accident Plc	1	06.05.98
M.1225	Enso Oyj	St. Kopparbergs Bergslags Ab	2	31.07.98
M.1232	Ingram	Tech Data	1	17.07.98
M.1252	At&T	Tele-Communications Inc.	1	04.12.98
M.1258	General Electric	Finmeccanica	1	28.08.98
M.1265	Chs Electronics Inc.	Metro Ag	1	21.08.98
M.1332	Thomson-CSF	Lucas Varity Plc	1	21.12.98
M.1363	Du Pont De Nemours & Co.	Hoechst AG	1	05.02.99
M.1383	Exxon Corporation	Mobil Corporation	2	09.06.99
M.1405	Tnt Post Group N.V.	Jet Services Sa	1	15.02.99
M.1439	Telia ²	Telenor ²	2	15.06.99
M.1466	Eaton Corporation	Aeroquip Vickers	1	31.03.99
M.1476	Adecco S.A.	Delphi	1	26.03.99
M.1524	Airtours	First Choice	2	03.06.99

List of EU merger cases (1990–1999) (cont.)

Case	Acquiring Firm	Target Firm(s)	Phase	Date
M.1532	Bp Amoco Plc.	Atlantic Richfield Company	2	10.06.99
M.1561	Getronics N.V.	Wang Laboratories Inc.	1	15.06.99
M.1578	Sanitec	Konink. Sphinx	2	03.08.99
M.1650	ACEA S.P.A.	Telefonica	1	01.12.99
M.1671	Dow Chemical	Union Carbide	2	22.12.99
M.1672	Ab Volvo	Scania Ab	2	25.10.99
M.1673	Veba Ag	Viag Ag	2	04.02.00
M.1687	Adecco SA	Olsten ²	1	29.10.99
M.1760	Mannesmann AG	Orange Plc	1	20.12.99
M.1797	Bae Systems+ Investor AB	Celsius AB	1	04.02.00
M.1871	Arrow Electronics Inc.	Tekelec	1	13.04.00

¹ On the basis of the information on market shares obtained from the EU Commission's report and about the stock prices of the other merging firms, we calculate a price reaction also for those firms that were not quoted in any stock market.

² These are public owned firms. We assume that their lobbying efforts are not through money but rather through political channels.

In the table are reported (almost) all Phase II and a selection of Phase I merger cases analysed by the EU Commission during the period 1990-1999. Some Phase II cases could not be considered because of the lack of information about firms' stock prices.

3. Closing Pandora's Box? Joint dominance after the Airtours judgment

*Kai-Uwe Kühn**

The use of joint dominance arguments in merger cases has proliferated over the past few years starting with the *Kali and Salz* and *Nestle-Perrier* cases.¹ Emboldened by the *Gencor/Lonrho* judgment of the Court of First Instance (CFI), the Merger Task Force (MTF) at the European Commission has aggressively expanded on the use of joint dominance as a means to raise objections to mergers in cases in which traditional market share benchmarks would have prevented objections in the past. As a result there have been a number of prominent cases (among them *Price/Waterhouse-Coopers*, *Airtours*, and the abandoned *EMI-Warner*) in which the discussion of joint dominance has had a central role. But many more cases have been affected by this policy. It is fair to say that a number of merger transactions have been abandoned due to the perception of an increased regulatory risk.

While the concept as such makes sense from the economic point of view, the implementation by the Commission has been very unsatisfactory. Academic economists, echoing many practitioners, have lamented an unreasonably low standard of proof for joint dominance relative to the enhanced rigor we have achieved in single firm dominance cases.² Part of the problem appears to be a lack of established theory and empirical method that could be used by practitioners. Instead of treading carefully in such a complicated area of economic analysis, the MTF has created a set of ad hoc tests for joint dominance (including the famous joint dominance checklist). Policy practice effectively opened a Pandora's box of

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¹ I will be using the terms "joint dominance" and "collective dominance" interchangeably in this paper.

² It should be noted that similar concerns have grown about single firm dominance assessment when arguments about foreclosure effects of mergers and product line effects became an important part of Commission decisions as in *GE/Honeywell* and *Tetra Laval-Sidel*.

valid, invalid, and hard to evaluate arguments, some of which left merging parties no possibilities to disprove the Commission's claims. The recent CFI judgment on Airtours has the potential of putting things back in order.

In this paper I will discuss the major issues surrounding the application of the collective dominance concept and suggest a first step toward a more rigorous approach in merger cases. In section 3.1, I discuss the concepts of unilateral and coordinated effects and argue that they fully capture any anti-competitive effects of mergers. I then (in section 3.2) show how these two effects neatly map into the concepts of dominance and collective dominance as used in European merger policy and explain why any claims to the contrary make little sense. In section 3.3, I explain the extent to which the CFI has settled the issues concerning collective dominance in the direction we argue for in this paper. I also discuss that the judgment raises difficult questions concerning the appropriate empirical (or evidentiary) standards for a finding of joint dominance. In section 3.4, I attempt to take up this challenge by making suggestions for a systematic system of negative and positive tests. Section 3.5 concludes.

3.1 Unilateral and coordinated effects of mergers

Mergers can generally have two effects. First, they can increase the incentives to raise prices (everything else being equal): market power can be enhanced. Secondly, the recombination of the assets of the merging firms can lead to efficiency increases through the merger. They can facilitate the reorganization and reallocation of assets and therefore have a positive role to play in the economy. They may even lead to lower prices as a result of marginal cost reductions. The efficiency effects of mergers are precisely the reason why mergers are not generally prohibited.

The question of whether a dominant (or jointly dominant) position is created or strengthened through a merger requires an economic analysis to what extent the scope for the exercise of market power is increased. However, there are two logically distinct ways in which market power can be increased. These are best referred to as the unilateral and the coordinated effects of mergers.

Unilateral effects analysis

Consider unilateral effects first. In a merger the two merging firms combine their product lines, production capacities and other assets. Typically the incentives for pricing the products will be different before the merger

than after the merger. If there are no effects on the cost side, the prices that the joint entity should optimally charge for each of its products to maximize short run profits will always be above the prices the separate entities would charge for any given set of prices of competitors. To what extent prices would be increased depends on how much of a competitive constraint other producers are imposing on the merging firms. Most of the time this can be reduced to the question of how closely substitutable the products of other competitors are.³

Note that the basic incentives of the non-merging firms are not directly affected by a merger. Given any prices that are set for the products of the merging firms, the best short run profit maximizing prices for the remaining firms will remain the same. In other words, when we speak about price setting incentives of a firm we mean the relationship between the prices of other firms and the firm's own optimal short run pricing decisions.

In the technical language of economics the list of a firm's optimal prices for any possible prices competitors might set in the market is called a "best response function". While a merger changes the best response function of the merging firms, the best response functions of the non-merging firms are left unchanged. This is the reason why we speak about "unilateral effects". In the sense just described only the pricing incentives of the merging firms are affected by a merger.

This does not mean that the prices of non-merging firms do not change as a result of the merger. These firms will anticipate that the merger will lead to higher prices set by the merging firms and will set higher prices in response to the anticipated higher prices set by the merged firm. In other words, the unilateral incentives to raise prices on the side of the merging firms lead to price increases for *all* firms that are in the same market.

Many years of experience with empirical data and with mathematical models of oligopoly have convinced us that such unilateral effects of mergers will have an important impact on equilibrium prices only when the market is sufficiently concentrated. This has led to informal rules of thumb relating a presumption of significant price increasing effects of mergers to some benchmark market concentration measure. Depending on the jurisdiction significant effects of a merger are anticipated only if some minimal market share criterion is passed for merging firms or if

³ The discussion in this section is primarily based on markets with differentiated products absent capacity constraints. However, almost all of the arguments can be made (in a slightly more tedious way) for homogeneous goods market with capacity constraints. I suppress this to simplify exposition.

there is a significant change in the Herfindahl index. Such guidelines are extremely rough because the typical market share figures will not tell us very much about the actual degree of substitutability between the products of the remaining firms. There is a wide range of market shares for which it will not be obvious whether unilateral effects of mergers would lead to large or small equilibrium price changes.

Fortunately, there is an expanding body of literature that has developed empirical methods to estimate elasticities and cross-elasticities of demand systems (see among others Baker and Bresnahan, 1985, Hausman, Leonard, and Zona, 1994; Nevo, 2001). Possible unilateral price effects from a merger can then be calculated from these estimates. In principle, these methods therefore allow a full estimation of the price effects due to unilateral effects of mergers.

In many merger cases data on all the firms in the market are not available for use in some of these available methods. However, using price and quantity data only of the merging firms can be sufficient to estimate the effects of a merger on the general price level. Baker and Bresnahan (1985) have, for example, shown how to estimate the equilibrium price changes of the merging firms from such data.

But shouldn't we care about the likely price changes of other firms as well? Some reflection shows that, to the extent that it really matters for a merger decision by a competition authority, this information is contained in the estimates of the equilibrium price changes of the merging parties. To see this, first note, that in any setting the prices of competitors never rise as much as the prices of the merging firms.⁴ Hence, the predicted equilibrium price changes of the merging firms will bound the expected price changes of the non-merging firms from above. But this is not all. Suppose that the price change of competitors is almost one to one. This can happen only in a situation in which the competitors are producing almost perfect substitutes to the products of the merging firms. But then the initial estimated price change for the merging firms will be small in the first place and the price reaction of competitors will not matter. Now consider decreasing the degree of substitutability between the products of the merging firms and their competitors. This will increase the incentive to raise prices for the merging firm, but will decrease the price response of non-merging firms to the merger. As the market power that

⁴ To gain some intuition for this: the price increases of merging firms give non-merging firms a profit opportunity. The greatest profits can typically be had by responding to this by getting a higher price, but also by increasing market share. A one to one match in the price would not increase market share. Hence, an economic model would predict that the prices of rivals will always rise less than those of the merging firms.

is generated through the merger grows, the merging firms' products will be less and less substitutable with the products of competitors and the price reaction of competitors will become smaller. Significant estimated price increases will therefore only be associated with relatively modest price responses by the non-merging firms in the market. Hence, no important information is lost when we do not estimate the price responses of competitors.⁵

To summarize, unilateral effects are very well defined. They are the equilibrium price changes that can be expected to arise from the changed incentives for short run profit maximization by the merging firms. The price effects of mergers from unilateral effects are driven by the impact of the merger on the short run best responses of firms. There are well-established empirical methods to assess the order of magnitude of such effects.

Coordinated effects of mergers

Unilateral effects analysis essentially assumes that firms are best responding in every period to prices that are expected to be set by their rivals. This is a situation economists would characterize as "competitive" in the context of merger and anti-trust policy, because each firm tries to maximize its short run profits. But we know from economic theory and from many cartel cases that this is not always the case. We have to accept the fact that firms often do collude in the economic sense, which means that there is either an explicit agreement to raise prices or such outcomes are achieved implicitly through "parallel conduct". In such situations firms will charge prices above their best responses. They will not maximize their short run profits.

But why should they do that? What keeps them from obtaining the highest short run profits available? Raising prices above short run best responses in a collusive manner (or as parallel conduct) requires a set of implicit threats and promises about behavior in the future. In principle, there must be the following type of understanding: if everyone keeps their prices at some level above best response prices, everyone promises

⁵ There are serious arguments that would suggest that the methods used would somewhat underestimate the equilibrium price effect of a merger and capture only the price increase the merging firms would make if others left their prices unchanged. I would argue that all we can ever expect is an estimate of the order of magnitude of the effect in any case and this would be sufficient to make a satisfactory decision. Furthermore, under such circumstances there would not be enough data available to give a reasonable estimate on the price reactions of rivals to the merger. Any attempts to do so would then amount to unfounded speculation and could not improve on the estimate in any case. See also Kühn (2001a) on this point.

to do so in the future as well. Should any deviation from the expected behavior be detected (or look likely) then everybody expects a switch to future behavior that involves significantly lower profits. Such behavior is generally called “punishment”. Whether such mechanism can work depends on the credibility of the promises and punishments considered. Consider first the credibility of the promise to collude in the future. A firm can only promise a price significantly above a best response price if it is sufficiently deterred. In other words, the short run profit gain from best responding must be outweighed by the loss in future profits that is induced by a switch from collusive behavior to something worse (i.e. the punishment). But equally important is the credibility of the punishment itself. If a firm can easily escape the punishment by not complying with it, or if firms can make more money by refusing to punish a deviator, everyone will know that the punishments cannot be carried out effectively. The size of the punishments can therefore be quite limited. This in turn will limit the degree to which firms can raise prices above the level generated from short run profit maximization.⁶

The analysis of the range of behaviors that can be *credibly* sustained is the essence of collusion theory in economics. What limits behavior are the incentives to deviate from the price above the best response price on one hand and the incentives to deviate from pricing behavior required under punishments on the other hand. These two constraints determine the feasible range of outcomes in the industry. Collusion theory is simply the study of how these constraints on behavior are tightened or relaxed by changes in the competitive environment. One of the changes in the environment that can be considered is that of a merger between two parties in the industry. The “coordinated effects” of mergers are nothing else but the impact of the merger on the tightness of the two constraints that determine the range of possible behaviors in a particular market. In other words: has the merger made it more or less credible to make the implicit promises of future collusion and threats of punishments that sustain collusive (or parallel) behavior? This theoretical analysis allows one to determine whether higher prices can be sustained through collusion after a merger or whether collusion becomes feasible in a wider range of circumstances.

At first sight this analysis might be considered trivial. If we eliminate one firm from competition in standard collusion models, collusion (or

⁶ The reader should note that there is not a simple alternative between competition and collusion. The question will always be how much collusion can be achieved. In other words, the analysis of coordinated effects determines how much prices can be raised above the level achieved under short-term profit maximization.

parallel conduct) must be facilitated in the sense discussed above. However, such straightforward application of collusion theory would be in error because it incorrectly interprets mergers as the elimination of a given firm from the industry. In reality, mergers involve the combination of the product lines, capacities and other assets of the merging firms. A merger will therefore replace two smaller firms (in terms of their physical assets) by a significantly larger firm (that holds all of these assets). A recent literature on the comparative static effects of mergers on collusion (see Compte, Jenny, and Rey, 2002; Kühn and Motta, 2002) has shown that such a change in the market is entirely different from the disappearance of a firm.

To understand the difference it is easiest to consider the Kühn and Motta (2002) framework in which the assets are lines of differentiated products (where every product is slightly different from the other). First suppose a situation where one firm and its products simply disappear from the market through exit. Exit of such products will mean that the remaining firms in the market will be winning some demand at given prices from customers who cannot purchase their most preferred products anymore. It follows from this that a deviation from a given collusive price will not win over as many customers as before the exit, because some have already switched due to exit. Hence, the exit of a firm leads to a relaxation of the constraint to stick to collusive prices for all remaining firms in the market.

Contrast this with a situation in which the firm does not exit, but merges with another firm, combining the two product lines. All products will now still be in the market (typically a realistic assumption for many mergers). Consider the old collusive prices. Given these prices non-merging firms still have the same incentive to deviate. They still win over business from the same number of products as before the merger. A merger, in contrast to exit, does not affect the incentives to deviate for the non-merging firms. The whole logic that a firm disappears and therefore collusion gets easier is therefore basically flawed and can lead to very misleading predictions about the likely coordinated effects of mergers.⁷

⁷ It is, of course, possible that the reduction in the number of firms has more indirect facilitating effects on collusion, by reducing the number of firms, whose actions have to be coordinated. While such an argument might sound plausible, it is unclear that the complexity or informational requirements for collusion are significantly changed, when (implicit) agreements on the same number of product prices is necessary. Furthermore, and most importantly for policy purposes, such arguments are inherently impossible to quantify and are therefore not very useful for rigorous merger analysis.

The recent theoretical work on the effects of asset transfers between firms (including mergers) by Compte, Jenny, and Rey (2002) as well as Kühn and Motta (2002) has demonstrated that a central question for coordinated effects is whether the merger increases or decreases the asymmetry in the asset distribution between the largest and smallest potentially colluding firms. They have demonstrated that mergers can in many circumstances decrease the scope for collusion and in those cases will often reduce the highest sustainable collusive prices in the industry.⁸ Mergers can therefore *reduce* the scope for coordination in an industry. Intuitively, the reason is that asymmetric asset structures will generate divergence in the interests of different firms in the industry and lead to conflicting incentives for collusion. Such incentive conflicts will undermine the scope for collusion or parallel behavior in an industry.

This literature has pointed out that standard remedies may have surprisingly counterproductive effects when collusion drives the pricing decisions. When firms are setting best response prices, the price level in the industry will always increase when the largest firm is made larger. This is different when coordination drives the pricing decision. Making large firms larger will create more heterogeneity, undermining the scope for collusion. This observation has a profound impact on the analysis of coordinated effects of mergers. For example, the Herfindahl index should never be used to rank mergers when coordinated effects are feared. The Herfindahl index will count an increase in asymmetry of market shares as an increase in market power, something that is incorrect when applied to coordinated effects. Kühn (2001a) discusses a number of other consequences that follow from this theoretical observation for the assessment of coordinated effects.

To conclude this discussion of coordinated effects of mergers, it is important to stress that the analysis must always focus on the *change* in collusive incentives that might result from a merger. The fact that collusion or parallel conduct were likely before the merger can never be an argument to block a merger. Only when the situation is worsened in the sense that collusion gets further facilitated would such a finding be relevant. Unfortunately, there has been little work beyond that of the cited authors so far that has focused on the change in the incentives to collude induced by a merger. Instead, most discussions of coordinated effects in mergers have centered around the question whether collusion is generally easy or not in the industry. Given the theoretical results I have reported, this could only be used to exclude the possibility of coordi-

⁸ These may be considerably below monopoly prices.

nated effects of a merger, but never positively establish that a merger leads to increased prices through the joint exercise of market power.

3.2 Mapping unilateral and coordinated effects to dominance concepts

The European Merger Regulation does not use the language of unilateral and coordinated effects but refers to mergers creating or strengthening a dominant position. However, the concept of a dominant position is only an empty verbal shell until filled with economic meaning. In the context of an abuse of dominance case the European Court of Justice has defined “dominance” as a “position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers, and ultimately of its consumers.” (cited according to Whish 1989, pp. 290-291).

This definition is neither economically very sensible (What does it mean to act independently of customers?) nor did it bring anyone closer to an operational definition. However, a clear consensus has formed that one would inevitably have to interpret this judgment as referring to what economists call “market power”. A dominant position has therefore been widely referred to as a position of substantial market power enjoyed by a firm (see Whish 1989, p. 219). Analogously, the “creation or strengthening of a dominant position” through a merger would be translated into the “creation or strengthening of substantial market power through the merger”. Given this, the association of dominance concepts in mergers and the concepts of unilateral and coordinated effects appears straightforward. Unilateral effects refer to the change in market power by the merging firms and the impact of that change on equilibrium prices. This is then obviously what we have to associate with “creation or strengthening of a single firm dominant position”. Coordinated effects refer to changes in multi-firm market power in the sense that firms are more likely to exercise market power through a collusive mechanism. That obviously corresponds to joint dominance. What else could we interpret as the joint exercise of market power? In a sign of how much economic and legal thinking on competition policy issues has converged between lawyers and economists in Europe over the last 20 years, this view is widely shared across economic and legal practitioners of merger cases. For example, Ysewin (2002) writes:

One cannot get away from the simple truth: the underlying test in merger control is one of single-firm and multi-firm market power. In Europe this led to a test based on

”dominance”. In the US the same test was baptized as reviewing the ”substantial lessening of competition.”

It is therefore hard to comprehend why there has been some insistence on the side of the Commission that both coordinated effects and unilateral effects should be covered under the joint dominance concept. Indeed, we are sometimes warned that a “serious gap” would be created in the Merger Regulation if joint dominance analysis would only refer to coordinated effects of mergers. The reasons for such, in my view misguided, arguments appear to range from a naïve textual interpretation of the word “dominance” to a possible attempt to lower the standard of proof for finding anti-competitive effects of mergers.

The pure semantic arguments about the “meaning” of the word “dominance” are hardly worth discussing. A naïve textual interpretation of the word “dominance” might lead someone unfamiliar with policy implementation in Europe to ask the question: “How can a firm that is not the largest in the market be dominant?” Given that everybody, including the CFI, understands nowadays that dominance is a placeholder for the economic concept of market power, this causes no serious issue for merger policy. It is, clearly, possible that a firm that is not the largest in a market can gain significant market power by merging – even when it does not become the largest firm. To my knowledge this has never been an issue in real merger cases.

A more subtle argument, defended by some commentators (see Klosterhuis, 2001, Motta, 2000), contends that somehow the current single dominance test requires such overwhelming market power by the dominant firm, that many mergers that should be blocked on the basis of unilateral effects cannot be blocked under the current criterion of single firm dominance. Hence, the argument goes, either these have to be dealt with under joint dominance or under a new dominance concept that would have to be created.

It is hard to see what this claim could be based on, except for simple assertion. It clearly does not follow from any explicit definition of single firm dominance in the legal literature nor does it appear to follow from case practice. Either there is a significant effect on single firm market power from a merger or there is not. If single firm dominance is at all meaningful in mergers, changes in the degree of dominance will logically have to be equated with unilateral effects.

Having unilateral effects dealt with under both single firm dominance and joint dominance would lead to absurdities in practical merger analysis. Suppose single firm dominance would be considered to require more market power than a unilateral effects benchmark under joint dominance.

The question in both cases is how much firms would like to raise their prices as a result of the merger. The empirical economic test that would have to be applied in both cases would have to be the same. The only difference is that the critical cutoff for a finding of single firm dominance would be at a higher expected price increase. Clearly, the single firm dominance criterion would simply be redundant, because the new dominance criterion to cover unilateral effects below the single firm dominance standard would become the effective standard.

This observation probably moves us closer to the true origin of the debate, namely that the extended use of the joint dominance concept appears to be in response to a conviction at the MTF that the single firm dominance threshold traditionally applied was too high. There seemed to be an implicit intention to use joint dominance as a device to lower the marketshare threshold at which mergers could be blocked without further direct proof of market power. This may have less to do with the interpretation of the word “dominance” than with the implicit decision rule that has become the standard to find a presumption for single firm dominance.

The appropriate economic estimation of whether a merger creates incentives for the merging firms to significantly increase the price is often not possible on the basis of available data. For this reason merger control practice at the European level has created an informal standard that any merger that leads to a market share above 40% creates the presumption that single firm dominance is obtained. Having such a benchmark is quite reasonable from an economic point of view. It allocates the burden of proof between the competition authority and the merging firms. If the reached concentration is very high it may be reasonable to create such a presumption, so that the burden would fall on the firms to prove that no significant price increases should be expected. However, when the market shares are smaller, the a priori plausibility of strong price effects is much reduced. In these cases merger rules should be designed to force the competition authority to prove its case. The most plausible interpretation of what has happened in the joint dominance discussion is that at some point in the past MTF officials have gained the conviction that the 40% market share level for a presumption of competition reducing mergers was too high. After all, the cutoff level for such a presumption is much lower in German competition law. In addition, the rigorous proof of price effects through empirical documentation appears as generally too difficult to block mergers below 40% – even when the case handlers are firmly convinced that the merger is anti-competitive.

The extended use of joint dominance has been a way to address these concerns in the Commission without formally changing the standards of single firm dominance analysis. For joint dominance, the economically appropriate standards of proof have essentially not been established. The concept thus gave the promise of allowing a wide range of arguments why a merger increased market power without any systematic obligation as to the quantification of effects. Pandora's box was opened. For firms labeled as "jointly dominant" there was often no escape. If they argued that the market was not likely to make a collusive mechanism work because significant punishments were not credible, you could answer that punishment mechanisms were not necessary for joint dominance. It then became incumbent on the firms to prove that their merger did not cause significant unilateral effects, even if they fell below the traditional 40% benchmark. At the same time coordinated effects were systematically found based on unquantifiable checklist criteria. For example, "multi-market contact" has become a criterion for joint dominance against which it is impossible to defend a firm. Even if firms compete in a number of parallel markets, multi-market effects can range theoretically from the totally irrelevant to the moderate (Bernheim and Whinston, 1990). Quantification in a particular case is virtually impossible due to the data required for such a test. Hence, firms faced with a claim that multi-market contact facilitates collusion in their market are faced with the burden of proof to show that the effect is small. But there is no possible way to ever prove their case.

The main consistency in the application of joint dominance appears to have been that the Commission has pushed down the effective presumption for price increasing mergers, threatening even transactions leading to a total marketshare well below 30% (as in EMI/Warner). This has the advantage from the point of view of a competition authority that it obtains wide discretion to block virtually any merger that creates suspicion, even if hard data cannot confirm this view. This move towards more discretion has the undesirable effect of an associated creeping reversal of the burden of proof in merger cases.

From an economic point of view such a lowering of the presumption for anti-competitive effects and the associated reversal of the burden of proof have to be resisted. First, there is no good economic argument based on current merger experience that would justify the reduction of the level at which mergers are presumed to raise prices without further empirical proof. At a market share of around 40% economists would generally feel relatively comfortable with the idea that market power could be a considerable problem. At levels around 30% both consider-

able market power and fairly competitive behavior are conceivable. There is no cross-sectional data available that would suggest that at mergers to above 30% price effects should be expected to be large. Nor is there any evidence that such price effects would be large if the remainder of the market was already fairly concentrated. There is therefore no justification for per-se intervention at such concentration levels. The only way for a reasonable policy to proceed at this level of concentration is to resort to a rigorous empirical analysis.⁹ There is no reason whatsoever to put the burden of proof for such an analysis on the firms given that there are considerable efficiency gains possible through the asset reallocations induced by a merger.

Lowering the standard for automatic intervention will also reduce the pressure on the MTF for rigorous analysis of cases. Less cases will then be subject to substantial review by the courts and the MTF will be subject to even less scrutiny and consequently face even less frequently sanctions for bad decision making.

The attempts to lower the intervention threshold through the joint dominance channel also undermine the credibility and usefulness of the joint dominance concept itself. The effects of mergers on the incentives for coordinated conduct (be it undetected collusion or parallel conduct) are a matter that policy should worry about. But in order to retain credibility and make the concept work in the long run, rigorous empirical standards for coordinated effects have to be developed. It is therefore not helpful to lump vague allusions to unilateral effects together with arguments on coordinated effects into the same joint dominance concept.

There is therefore no good reason not to equate single firm dominance analysis in mergers with unilateral effects and joint dominance analysis with coordinated effects of mergers. These are the two issues related to market power that have to be analyzed in a merger and, ultimately, it does not matter what we call them. What matters is the standard of proof we require for finding significant unilateral and coordinated effects!

⁹ This statement is, of course, subject to the availability of empirical data. However, much more quantification is typically possible than has been used in the past.

3.3 The Airtours judgment: Closing Pandora's box?

The recent Airtours decision is remarkable because it fully embraces the economic concepts underlying the interpretation of joint dominance as capturing coordinated effects. For the first time the Court of First Instance has defined joint dominance with reference to the essential ingredients for collusion in the economic sense (or tacit coordination in the language of the court).

The CFI expressly makes it a condition for collective dominance that it must be credibly possible to maintain a common policy of elevated prices and that for such a policy it is central to show that in the market environment credible punishments are plausible. This effectively puts the standard economic analysis of collusion at the heart of the definition of collective dominance. Similarly consistently with economic theory, a dominant position requires that coordinated action can significantly raise prices, i.e. the MTF has to show that the presence of other competitors or entry do not limit the possibility to jointly raise prices. Thirdly, it has been included in the definition of collective dominance that the market must be sufficiently transparent in the sense that competitors can monitor each other's actions for joint dominance to be an issue. (See para 62 of the Airtours judgment.)

What is so significant in the judgment is that these points are generally accepted, not just as benchmarks for the Airtours case. It should therefore be considered as settled that joint dominance analysis and coordinated effects analysis have to be regarded as the same. This means considerable progress for applying rigorous economic reasoning to joint dominance problems.¹⁰

But the CFI has gone even further. It has explicitly required that the Commission must show the impact of the merger on the *change* in market conduct. Some commentators on the Airtours decision (see Kühn 2001) have pointed out that the original decision at no point ever refers to the *change* in the incentives for collusion. Instead the Commission applied a fairly mechanical checklist of conditions believed to be conducive to collective dominance. What the Commission manifestly failed to

¹⁰ Apparently it has been disputed by some officials at the MTF that the CFI judgment identifies the creation or strengthening of a jointly dominant position as equivalent to finding coordinated effects. They maintain that unilateral effects can still be considered in future cases. It is, however, hard to see how that conclusion could be drawn from the judgment. Para 62, (T-349/99, *Airtours*), *explicitly* states that the three conditions describing collusion are “*necessary* for a finding of collective dominance” [my emphasis].

do (see Kühn 2001a for a discussion) and what the CFI has criticized repeatedly in its decision is to show how the merger would have created incentives for coordinated conduct that did not exist (or were smaller) prior to the merger.

Again the insistence of the CFI on this point amounts to enormous progress in light of recent decisions (and statements of objections) in European merger cases. An actual assessment of the likely change of conduct has virtually *never* been done. In most cases the analysis amounted to no more than an argument that characteristics facilitating collusion were present in the market. The MTF appeared to think that all it needed to prove the creation or strengthening of a collective dominant position was some argument that characteristics facilitating collusion were present in the market.

The third remarkable point about the CFI decision is its severe criticism of the failure to properly substantiate claims of collective dominance with market data. As an example, consider the claim that the market is very transparent in the Commission decision on Airtours. This claim is backed up by the speculative assertion of the Commission that information about competitors would be disseminated because tour operators negotiated with the same hotels for reserving beds. But how much information would be released by this? Would this really be sufficient for monitoring? How would the merger affect transparency? The CFI observed on this particular issue that "...it cannot be ascertained from the Decision how much information an integrated tour operator may obtain by virtue of the fact that several such operators may be in contact with the same hotels ...".¹¹ And the CFI goes on to point out that there is significant evidence that there are generally very tight limits to such information spillovers. This is an example of how general claims are made from an observation that is not systematically empirically validated. One of the great deficiencies of the Commission's Airtours decision is that almost every claim made has a similarly weak empirical basis. The fact that the CFI has so severely censored such lax treatment of economic evidence will have profound effects on future collective dominance cases. For example, the EMI/Warner merger was abandoned in the face of Commission opposition based on joint dominance arguments. However, the empirical basis for such claims was no stronger than in the Airtours case.¹²

¹¹ Judgment of the CFI in case T-349/99, Airtours, para 173.

¹²The lack of systematic economic evidence relevant to the theories proposed by the Commission has been an important issue in many recent disputed merger decisions of the Commission, including the much-debated *GE/Honeywell* case.

With this decision, the CFI has set high standards for the presentation of economic evidence to support joint dominance cases. Under the regime of the current Merger Regulation this can considerably stem the slide towards an implicit reversal of the burden of proof from the Commission to the parties in future merger cases involving joint dominance. We might just have observed Pandora's box closing.

However, the court decision also presents a considerable challenge to develop standards for the evaluation of joint dominance that are firmly rooted in economic theory and can predict with a minimum degree of confidence increases (or decreases) in the likelihood of coordinated behavior as a result of mergers. Unless we have such methods available the joint dominance instrument will be of little use. Unfortunately, empirical tests for joint dominance are very difficult to develop because they involve – to a larger extent than unilateral effects analysis – an assessment of future behavior that cannot simply be inferred from current data. There are no ready, off-the-shelf answers from economic research to deal with joint dominance. The recent work nevertheless suggests some factors we should be looking for and others we should not consider for a systematic assessment of joint dominance empirically. I will discuss these as well as the perspectives for empirical tests of joint dominance based on these insights in the next section.

3.4 Towards a reasonable implementation of the joint dominance concept

The challenge to merger policy after the CFI judgment on Airtours is to design empirical tests for the creation and strengthening of a jointly dominant position (or in other words for coordinated effects of mergers) that withstand careful scrutiny. Such an approach will require a drastic change in the practice of the MTF away from speculative theorizing and towards an attempt at quantification of effects.

As in many contexts it is useful for policy towards joint dominance to develop both negative tests (i.e. safe haven tests) and positive tests. A first step in a negative test would be features of the market that would make collusion so unlikely, even after a merger, that there should be a presumption that joint dominance cannot arise after the merger. In a second step one can look at the impact on the change in market structure and identify types of mergers that are unlikely to have substantial impact on the possibility of collusion.

Positive tests are much harder to establish. Appropriate empirical methods have not really been developed for a positive test. For this

reason any positive test would have to rely on benchmarks that would establish a presumption that tacit coordination will be possible after the merger and would require that the change induced by the merger should theoretically have significant impact on the ability to collude. Given that such a test will be of a somewhat speculative nature, only very conservative benchmarks for joint dominance appear warranted.

Potential negative tests

A negative test can be developed quite nicely along the lines of the definition of collective dominance advanced in the CFI judgment. I structure this test to start with criteria that are least demanding on the data needed to verify the test.

First, there can be features of the market, which make the operation of a collusive mechanism highly unlikely. One of such features are tight capacity constraints. Then punishment mechanisms that would raise prices above the competitive level (given the capacities) will simply not be feasible. Similarly, Kühn (2001b) has shown that, with irreversible capacity decisions, collusion in reducing capacity investments will not be feasible at all in an important class of models. Again, this is the type of economic results that make collusion qualitatively so unlikely that findings of this nature should lead to an automatic conclusion that collective dominance cannot be present in the industry.

It is, however, important to note that not all results on the likelihood of collusion in the literature can be considered of large enough order of magnitude a priori to make them useful in merger proceedings. For example, there are often discussions whether demand is growing or declining. In economic theory collusion under growing demand is easier, in competition practice the opposite is asserted. But whatever the claim, there is no clear idea of how strongly demand has to grow or to fall to make a real difference. There is no way to quantify the impact of demand growth on the likelihood of collusion in any specific case. Such market characteristics are therefore not useful for conclusions about joint dominance in merger proceedings.

Secondly, there is the issue of how easy it is to monitor the actions of rivals in the market. Again this is something difficult to quantify. However, it appears possible to carefully document when many of the decisions are essentially unobservable to rivals and when there is significant uncertainty in the market that limits inferences about behavior. Theory does state that such market conditions very significantly reduce the scope for collusion. But an analysis clearly has to go way beyond the pure assertions of transparency that have been made in most collective

dominance cases. Indeed, as discussed earlier, the CFI very carefully tracked how often rivals might see each others interactions with hotels, showing that a careful analysis of market data can lead to a fairly convincing *rejection* of market transparency.

Thirdly, there is the question whether the potentially collusive group can at all significantly increase prices. Here one should analyze by how much this potentially collusive group would raise prices if they could perfectly collude. In the joint dominance test you would, however, want a somewhat higher safe haven benchmark. The reason is that there exists no precise test to show how high a degree of collusion can be reached in a particular market setting. However, the incentive constraints on collusion will always make collusion to the joint optimum less likely than if the firms were a single entity. Furthermore, the incentive constraints will tend to restrict optimal collusion to levels below full collusion. We should, therefore, never expect a collusive group to fully raise prices to the joint profit maximum. A safe haven benchmark would therefore have to be set above the one that we would use in single firm market power tests. As in other safe haven tests it will be a judgment call where to set this benchmark. At a minimum this would establish a test that has some qualitative justification and can be anticipated by the parties in a merger.

Our discussion of the last point begs the question what should be considered the potential collusive group. For those purposes the recent theoretical literature (Compte et al, 2002; Kühn and Motta, 2002) is helpful. It has established that firms that are fairly similar have similar incentives to collude while firms that are different in terms of their assets will have a harder time to coordinate behavior. A potential collusive group should therefore have members that have sufficiently similar asset structure within the group but have fairly different asset structure from firms outside the group. As explained in Kühn (2001a), it appears most appropriate to proxy the asset distributions between firms with their market share distributions. Then we would think of firms that are within 10 or 20% of each other sizes as “similar”, while they are “dissimilar” if one firm is, say, at least 50% larger than the other. One can then define groups of firms as potentially collectively dominant if their market shares are similar enough within the group and sufficiently larger in size than firms outside that group. Kühn (2001a) discusses in detail why this procedure would best capture the qualitative results derived from the theory. Intuitively, the justification comes from a striking difference in the effects of asset transactions between similar and different firms under collusion theory (see Kühn and Motta, 2002). When firms are sufficiently similar, the effects of asset transactions are best described by the predictions

based on collusion theory. For sufficient heterogeneity, the analysis predicts that all feasible behaviors will be close to short run best response behavior.

Following the same line of argument, the creation or strengthening of a dominant position can also be rejected directly on the basis of an analysis of the change in asset distributions induced by the merger. If a merger makes the asymmetry between the largest and smallest firm in the candidate collectively dominant group of firms larger, the work of Kühn and Motta demonstrates that profits for the colluding firms would go down and even prices may fall. This means that mergers that increase such asymmetries do not create significant additional market power and are generally not profitable. This makes it very likely that such mergers are motivated by other factors than anti-competitive effects. It is then not appropriate to intervene in such a merger. The increased asymmetry argument should therefore always be accepted as a defense against the claim of creating or strengthening a collective dominant position.

Potential positive tests

While it is relatively easy to develop a battery of safe haven tests that reject the assumption of collective dominance, it is much harder to develop reliable positive tests that provide economically reasonable evidence to conclude that collective dominance is strengthened or created.

First of all, there are no market characteristics that we can check off to guarantee that collusion in the market will occur. While we can exclude collusion for theoretical reasons there is no way to assert that only collusion is possible under certain circumstances. This makes valid negative and positive tests very asymmetric in structure.

What we could do, combining existing empirical approaches to market power and recent theoretical work on joint dominance, is a combination of tests that assess the price increasing potential of the merger from collusion and the likelihood that these can be realized given the actual asset transactions involved in the merger.

First, we can use the same analysis as suggested for one of the negative tests: measure the degree to which the firms in the jointly collusive group would increase their prices if they could fully collude. This gives the maximal potential for anti-competitive effects. Mergers should be blocked more readily the larger that potential is. Currently there is no such evaluation at all.

Secondly, we need some test for the likelihood of collusion in the group post merger. This is difficult to achieve because this is a counterfactual that cannot be directly inferred from pre-merger market behavior.

Currently, there is probably no other choice but to resort to some market share distribution benchmark for which we regard the achievement of collusion highly plausible. Given the speculative nature of such a benchmark this would necessarily have to be conservative to avoid that private beliefs about market power have undue effects on merger decisions. It has been suggested that for two-firm dominance such a benchmark should not be below 60% market share and a fairly symmetric distribution of market shares between the two firms. For larger potentially collectively dominant groups such market share tests should be considerably tighter.

Finally, a systematic procedure could apply the basic theoretical findings to assess the change in incentives to collude. To increase the incentives to collude one would have to find a significant accretion of market share to the collectively collusive group and/or an increase in the symmetry of the market positions of the largest and smallest firm in the collusive group after the merger.

This seems to be a way of constructing a positive test based on the empirical and theoretical work that currently exists. It is clearly not an entirely satisfactory test, and we would hope that economic research would refine such a testing procedure over time. However, the proposed positive test would impose a significant degree of discipline on the analysis of joint dominance.

It is probably also the case that currently any dominance test for more than two firms will have to rely on fairly speculative assertions about the effects of the merger. On the other hand, there is much more consensus that in markets with two similarly sized large firms, collusive (or parallel) conduct should be considered fairly likely. For this reason it is probably prudent at the current state of research to stick to two firm dominance analysis in collective dominance cases. Indeed, in most of the cases in which the Commission has tried to expand the dominance concept to more firms than two, its case would have been a little more convincing had it attempted to establish two-firm dominance. Most cases that have come under the scrutiny of the Commission would still require a joint dominance analysis – although in most of them joint dominance would be dismissed based on the negative tests.

The confusion of positive and negative tests in current MTF practice

Current policy towards collective dominance by the MTF has basically failed to establish a positive test for joint dominance. A core element of the MTF analysis is the so-called collective dominance checklist, which

is largely a restatement of factors facilitating collusion in the classic textbook by Scherer and Ross (1990). There are many problems with the checklist and its application. First, the checklist contains some claims that are not well founded in economic analysis or at least depend on conditions that are never checked in practice. Recent economic theory contradicts several checklist claims ranging from the effects of product differentiation, the impact of growing demand, and of the elasticity of market demand, to the role of cross-ownership between firms. Secondly, the Commission does not test very carefully whether the conditions described in the checklist are actually applicable to the case. In its *Airtours* judgment the CFI reversed the Commission on virtually every factual claim supporting the checklist analysis.

But the problem of the checklist is a more fundamental one. It can never form the basis of a positive test for collusion. Some of the checklist points allow concluding with high confidence that collusion is not possible. However, collusion theory does not permit the conclusion that collusion is the necessary result of certain market circumstances. All one can potentially assess is how much the potential for collusion is enhanced by certain features of the market. However, there is virtually no point on the checklist for which this impact is quantifiable. Take again multi-market contact. The presence of multi-market contact as such does not give any indication about its impact on collusion. It can be zero or somewhat substantial, but we have no way of testing the impact in a specific market. The same holds for many other criteria that are routinely used.

A positive test therefore cannot get around some explicit measurement of the potential harm to consumers if perfect collusion would be established in some potential collusive group. More importantly it has to rely on establishing the impact on collusion of the *change* in the industry. None of this has been systematically done and the Commission has been severely reprimanded for this failure by the CFI. Part of the problem, I believe, is a lack of recognition of the strong asymmetry between valid positive and negative tests for collective dominance.

3.5 Conclusions

In the last few years we have experienced a dramatically increased use of the collective dominance instrument in European merger policy. Given the lack of established standards almost any argument was possible. Even in specific cases it was often ambiguous whether the Commission went after coordinated or unilateral effects. Pandora's box was opened

for all kinds of speculative arguments about the potential effects of a merger – most of the time with little solid grounding either in economic theory or (more importantly) in solid market evidence.

The CFI judgment on Airtours has put the lid back on Pandora's box. It has settled the question that collective dominance only concerns coordinated effects. It has also raised the level of economic evidence required to a point economists should feel comfortable with. However, this now poses the challenge of developing sound instruments for the analysis of joint dominance that meet this standard. This is a difficult enough task. It will require of the Commission to radically review its use of the joint dominance concept. The current use has greatly diminished the credibility of the joint dominance concept as a useful policy tool. The only way to retain this instrument as part of merger policy's toolbox will be to use it with extreme rigor and very conservatively.

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4. Calibrated economic models add focus, accuracy, and persuasiveness to merger analysis

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The traditional competitive analysis of mergers was developed mainly by judges in the United States, with training in neither economics nor anti-trust, who had to decide whether particular mergers substantially lessened competition. Economists participated in that process mainly as expert witnesses, typically offering little more than ultimate conclusions. Economic models (for example, models of oligopoly) and empirical studies (for example, of the relationship between market concentration and price) were at most a basis for crude intuition about the effects of increased market concentration.

Traditional merger analysis has been giving way to a more scientific inquiry that applies the full panoply of tools provided by modern economics. The competitive analysis of mergers increasingly employs formal micro-economic models and econometrics – statistical analysis designed for, and applied to, economic data.¹ Of particular significance in merger cases is the use of “calibrated economic models,” i.e., quantitative analysis using formal economic models in which the values of the key parameters are based on the observable facts of the merger under review. The calibration of models to the facts of the case may be based on econometric studies or direct measurements of relevant quantities. And calibrated economic models may be used to inform the traditional structural analysis of mergers, based on market delineation and market shares, or used instead of structural analysis.

Calibrated economic models offer three advantages in merger analysis. First, they bring key issues into sharper focus by making assumptions explicit and identifying which factors are critical and precisely how they matter. Second, they add accuracy to the analysis by quantifying issues

*The views expressed herein are not purported to reflect those of the U.S. Department of Justice.

¹ Baker and Rubinfeld (1999) survey uses of econometrics in antitrust litigation.

of importance and relying on calculations rather than intuition. Third, they make the analysis more persuasive in a judicial proceeding by making it more concrete and better grounded in both the facts of case and economic theory.² These advantages are illustrated below first in market delineation and second in directly assessing the competitive effects of mergers.

4.1 Calibrated economic models for market delineation

In traditional structural analysis, market delineation is central to horizontal merger cases, and it often has proved decisive in court. It is not surprising, therefore, that calibrated economic models are most commonly used, and have been most influential, in market delineation. The hypothetical monopolist paradigm for market delineation, which has become a standard tool for merger analysis around the world,³ holds that a collection of products and an area constitute a market only if a hypothetical monopolist over them would maximize its profits by raising price at least some specific threshold amount, such as 5%. This paradigm is now commonly implemented using calibrated economic models.

The formal economic model of monopoly is both very simple and relatively straightforward to apply to market delineation using the hypothetical monopolist paradigm. The model teaches that the monopolist sets its price to equate its price-cost margin (price minus marginal cost, all divided by price) with the reciprocal of its elasticity of demand.⁴ The main difficulty in applying this lesson is that the monopolist's elasticity of demand depends on its price. Demand generally is more elastic at higher prices, and the monopoly price normally exceeds the pre-merger price at which the elasticity of demand is assessed in market delineation. To make direct use of the monopoly model, it is therefore necessary to

² This third advantage may be more important in the United States than in some other places. In the United States, only the courts have the power to enjoin the consummation of a merger. In the European Union, and some countries, competition authorities can prevent consummation of a merger, although their decisions can be overruled by courts.

³ Werden (2002b). Werden (2002a; 1998, pp. 387–96; 1993; 1983) details the application of the paradigm.

⁴ Demand elasticity is the responsiveness of the quantity consumers demand to a change in price. Responsiveness of a product's quantity to its own price is an "own elasticity of demand," and responsiveness to the price of another product is a "cross elasticity of demand." Both are expressed as a quotient; the numerator being the percentage change in quantity, and the denominator being the percentage change in price inducing that quantity change. The greater the own elasticity of demand, the more "elastic" demand is said to be. Demand is also said to be "elastic" ("inelastic") when the own elasticity of demand is less than 1, meaning that a 1% change in a product's price induces more (less) than a 1% reduction in its quantity demanded.

make an assumption about how the elasticity of demand changes with price, or equivalently, about the curvature of demand. A common and relatively conservative assumption is that demand is linear.⁵

Assuming linear demand, it is straightforward to operationalize the hypothetical monopolist test in terms of a “critical elasticity of demand” or “critical sales loss.”⁶ The former is the highest pre-merger elasticity of demand the hypothetical monopolist could face and still want to raise price at least the threshold amount. The latter is the maximum loss in unit sales the hypothetical monopolist would be willing to suffer and still raise price at least the threshold amount.⁷ The critical elasticity of demand and the critical sales loss are entirely determined by the price-increase threshold (typically specified to be 5%) and the pre-merger price-cost margin.⁸

The hypothetical monopolist test is routinely calibrated from accounting data reflecting the industry price-cost margin.⁹ Having measured that margin, it is immediately clear when the demand faced by the hypothetical monopolist is so elastic that it would not raise price at least the threshold amount. If the margin is quite high (80–100%), the critical elasticity of demand is close to 1, meaning that a loss in sales of only about 5% would be sufficient to dissuade the hypothetical monopolist from increasing price by 5%. If the margin is quite low (less than 25%), the critical elasticity of demand is greater than 3, meaning that a loss in sales of more than 15% would be necessary to dissuade the hypothetical monopolist from increasing price by 5%. Typical margins (50–60%) yield critical demand elasticities of roughly 1.5.

⁵ Only linear demand and constant elasticity demand yield simple formulas as in footnote 8. From the perspective of a plaintiff challenging a merger, linear demand normally is the more conservative assumption, as it makes it more difficult to pass the hypothetical monopolist test.

⁶ There is an extensive literature on these tools: Baumann and Godek (1995), Danger and Frech (2001), Harris and Simons (1989), Johnson (1989); Langenfeld and Li (2001), and Werden (1998, pp. 410–11; 1992).

⁷ Described in the text is the “profit-maximization critical loss,” which is consistent with the profit-maximization assumption in the hypothetical monopolist paradigm. More commonly used is the “breakeven critical loss” – the greatest reduction in quantity the hypothetical monopolist could experience and still not suffer a net loss in profit from the threshold price increase. The attractive feature of breakeven critical loss is that it does not depend on the functional form (curvature) of demand. And if the price-increase-significance threshold is small, like 5%, and the margin high, the breakeven critical loss is quite close to the profit-maximization critical loss.

⁸ Denoting the price-increase threshold as t and the price-cost margin as m (both expressed as proportions), Werden (1998, pp. 388–91, 410–12) shows that the critical demand elasticity and critical loss with linear demand are $1/(m + 2t)$ and $t/(m + 2t)$, and the breakeven critical loss for any demand curve is $t/(m + t)$.

⁹ Calibration can be subtle: There may be significant conceptual issues in reckoning the relevant marginal cost, and the larger the reduction in output and the longer the period of time allowed to adjust to the post-merger environment, the greater the associated reduction in cost and the lower the relevant price-cost margin.

Critical elasticity and critical loss analysis bring market delineation into much sharper focus. It has long been understood that market delineation is about demand elasticity, but critical elasticity and critical loss analysis make it exquisitely clear that the only relevant demand elasticity is the own elasticity of demand faced by the hypothetical monopolist. Most importantly, critical elasticity and critical loss analysis indicate exactly when the hypothetical monopolist's demand would be sufficiently inelastic to induce the hypothetical monopolist to raise price significantly. Finally, critical elasticity and critical loss analysis highlight the importance of pre-merger price-cost margins as a determinant of the relevant market.

Because formal economic models are built on explicit assumptions, they also focus the analysis by facilitating an inquiry into how well they "fit" the facts of a case.¹⁰ The proper use of calibrated economic models involves careful consideration of the facts and constructs models consistent with them. Standard critical elasticity and critical loss calculations assume, for example, that the hypothetical monopolist has constant marginal costs. When this assumption is unrealistic, the standard calculations should not be used; rather, a more realistic cost model can be calibrated. If investigation reveals that different units of productive capacity have differing marginal costs, the hypothetical monopolist can be modeled accordingly.¹¹ The additional information required to calibrate the hypothetical monopolist's cost function is not difficult to obtain in many cases.

Most often, a calculated critical elasticity or critical loss is used as a yardstick to evaluate the significance of non-quantitative evidence on likely consumer switching in the event of a price increase. In such cases, critical elasticity and critical loss analysis enhance the accuracy of merger analysis by providing a concrete basis for evaluating qualitative evidence on substitution, indicating, for example, whether a little sub-

¹⁰ In the United States, expert testimony may be excluded for lack of "fit" with the facts of the case. *General Electric Co. v. Joiner*, 522 U.S. 136, 146 (1997) ("A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered."); *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 242 (1993) ("When expert testimony is not supported by sufficient facts to validate it in the eyes of the law, or when indisputable record facts contradict or otherwise render the opinion unreasonable, it cannot support a jury's verdict. Expert testimony is useful as a guide to interpreting market facts, but it is not a substitute for them.") (citation omitted).

¹¹ Similarly, it is easy to model the scenario in which quasi-fixed costs are avoided as output is decreased because some productive capacity is shut down. And it is straightforward to model more complex demand scenarios, for example, a product with several distinct uses and significantly different elasticities of demand in the different uses.

stitution is enough to defeat a price increase.¹² Significantly greater accuracy is achieved by combining such analyses with econometric estimation of the relevant demand elasticity. While not a recent development, the use of estimated demand elasticities in market delineation has now become fairly common, in part because the development of critical elasticity analysis has provided a useful guide to their interpretation.¹³

Econometric evidence on demand elasticities is most needed, most helpful, and most often used with differentiated consumer products. With such products, documents and interviews tend to leave critical questions of degree unanswered. Unlike producer goods for which substitution issues are apt to turn on objective cost issues, with differentiated consumer goods, such issues inherently are matters of taste. Econometric evidence often is the most accurate, reliable, and objective basis for evaluating critical questions of degree involving consumer tastes, because they tend to be too idiosyncratic to be reckoned with sufficient accuracy without data on actual choices or survey responses. Critical elasticity analysis greatly enhances the accuracy of econometrics-based market delineation by providing a specific value with which to compare the estimated elasticity for a candidate market.¹⁴

Critical elasticity and critical loss analysis enhance the persuasiveness of a market delineation argument to a court, and in the United States, that is especially important for the government, which has the burden of proof. The burden is significant because district court judges have tended to be skeptical of the anticompetitive effects of challenged mergers.¹⁵ Especially over the last decade, judges have been inclined to find that a little substitutability is sufficient to place products in a relevant market. The problems the government confronts, and the potential of calibrated

¹² Critical loss analysis was used in this way and was highly significant in several litigated merger cases in the United States. *FTC v. Tenet Health Care Corp.*, 186 F.3d 1045, 1050–51, 1053 (8th Cir. 1999); *United States v. Mercy Health Services*, 902 F. Supp. 968, 980–81 (N.D. Iowa 1995), *vacated as moot*, 107 F.3d 632 (8th Cir. 1997); *California v. Sutter Health System*, 84 F. Supp. 2d 1057, 1076–80 (N.D. Cal. 2000), *aff'd*, 217 F.3d 846 (9th Cir. 2000), *opinion amended by* 130 F. Supp. 2d 1109, 1128–32 (N.D. Cal. 2001).

¹³ A quarter century ago, the government's expert estimated the elasticity of demand for frozen dessert pies in an effort to show that they constituted a relevant market. The court found his "testimony completely useless, primarily because we have no basis for evaluating what a particular elasticity coefficient means." *United States v. Mrs. Smith's Pie Co.*, 440 F. Supp. 220, 227–28 (E.D. Pa. 1976). Werden (1997a, p. 371) provides further discussion.

¹⁴ A United States court was first presented with (but did not rely on) a critical elasticity of demand analysis supported by econometric demand estimates in *FTC v. Swedish Match Co.*, 131 F. Supp. 2d 151, 160–161 (D.D.C. 2000).

¹⁵ In the 1960s, the United States Supreme Court did not share this skepticism and ruled in the government's favor in many merger cases. The Supreme Court would not have had the opportunity to do so had the government not lost so frequently in district court. At that time, the Justice Department appealed directly to the Supreme Court.

economic models to solve them, are illustrated by two Department of Justice merger cases.

The merger case most recently tried by the Department concerned “disaster recovery” services for computer systems.¹⁶ The facts were complicated because different businesses have different “recovery time objectives” and different computer facilities. The combination of a complex factual setting and the extraordinary pace of litigation¹⁷ made it difficult for the Department to carry its burden on market delineation, and the court found the Department failed to do so.¹⁸

The Department alleged that the relevant market was “shared hot-site services” (for certain types of computer equipment), which provide a relatively rapid recovery time, at a relatively low cost, by serving multiple clients with the same computer facilities. The central issue in the case was whether alternatives, especially internally provided hot-sites, potentially providing even more rapid recovery, were in the relevant market. The court found that the government had shown that *some* customers would *not* switch away from shared hot-site services in response to a 5% price increase, but failed to show that the number of such consumers was “substantial enough that a hypothetical monopolist would find it profitable to impose such an increase in price.”¹⁹

The defendants presented the court with a critical loss analysis purporting to show that the critical loss was only 5% because margins were extremely high.²⁰ Because the Department offered no contrary critical loss analysis,²¹ the defendants’ analysis stood uncontested, and we suspect that the defendants’ analysis substantially influenced the way the court viewed the substitutability evidence. That analysis indicated that very little substitution was enough to defeat a price increase, and it was impossible for the Department to show that even such little substitution would not occur. Had the court been presented with an analysis indicating that a great deal of substitution was required to prevent a price

¹⁶ United States v. SunGard Data Systems, Inc., 172 F. Supp. 2d 172 (D.D.C. 2001).

¹⁷ The court rendered its decision just 24 days after the complaint in the case was filed. This extraordinary pace resulted from pending bankruptcy proceedings.

¹⁸ 172 F. Supp. 2d at 182, 186–92.

¹⁹ *Id.* at 191–192.

²⁰ *Id.* at 190 n.21.

²¹ The defendants treated all costs associated with computer hardware and software as fixed, resulting in a marginal cost that was a tiny fraction of price. This would make perfect sense if the hardware and software were long lived assets while the service was sold on a short-term basis. In this industry, however, hardware and software were replaced fairly frequently and services were sold through long-term contracts. Thus, it might have been argued that the relevant price-cost margin actually was quite low.

increase, the showing made by the Department might have been viewed as sufficient to establish the alleged relevant market.

Also illustrative is the 1995 challenge to the merger of leading bakers of branded white bread.²² Like the vast majority of government merger cases in the United States, it was settled by a consent decree providing for the divestiture of assets (in this case, principally brands). Had the case gone to trial, the defendants most likely would have argued that other types of bread, perhaps all sources of carbohydrates, were in the relevant market. There is no doubt that these other products are substitutes for white bread, and the court likely would have been skeptical about a relevant market limited to white bread. In support of its relevant market, the Department's expert calculated critical demand elasticities (for different local markets) and compared them to demand elasticities estimated from supermarket scanner data. This evidence indicated, with very high statistical confidence, that demand was less elastic than the critical value.²³ The government's presentation surely would have been more persuasive to a skeptical judge because it used quantitative evidence in a concrete manner to shed light on the difficult questions of degree presented by market delineation.

Critical elasticity and critical loss analysis is routinely used, and it is highly influential. It has been said in litigation that "some number beats no number." The reason is that the introduction of any respectable quantitative analysis is apt to control the debate, and thereby likely win it. The use of calibrated economic models also means that expert testimony is no longer a black box to the court. Properly chosen and carefully calibrated economic models provide direct, scientific connections between the facts of a case and the ultimate conclusions reached.²⁴

²² *United States v. Interstate Bakeries Corp.*, No. 95C-4194 (N.D. Ill., filed July 20, 1995); 60 Fed. Reg. 40,195 (Aug. 7, 1995) (hold separate stipulation and competitive impact statement).

²³ The Department's expert was an author of this paper. Werden (2000, pp. 141–43) offers a highly condensed version of his expert report in the case, which was not filed at the time, but was subsequently made public.

²⁴ This connection is essential in the United States, because expert conclusions lacking a scientific foundation are entitled to no weight. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999) (an expert must "employ[] in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field"); *SMS Systems Maintenance Services, Inc. v. Digital Equipment Corp.*, 188 F.3d 11, 25 (1st Cir. 1999) ("Expert testimony that offers only a bare conclusion is insufficient to prove the expert's point."); *Mid-State Fertilizer Co. v. Exchange National Bank of Chicago*, 877 F.2d 1333, 1339 (7th Cir. 1989) ("An expert who supplies nothing but a bottom line supplies nothing of value to the judicial process.").

4.2 Calibrated economic models for predicting competitive effects

Economics offers a variety of models that may be employed in a variety of ways to assess the competitive effects of mergers. Just as the monopoly model can be used to analyze the price or quantity set by a hypothetical monopolist, oligopoly models can be used to analyze how a merger affects the prices or quantities set by merging firms and their rivals. But no oligopoly model capturing the complexities of a real-world competitive process also is simple enough to permit calibration based on observable data or simple enough to yield useful predictions. The art of modeling is simplifying reality in a manner that captures what is important for the purposes of the analysis to be undertaken. An appropriate model in any particular case reflects both the significance of individual competitors and the essence of the competitive process in the industry.²⁵

For a merger involving highly differentiated consumer products, the model must account for brand preferences in a reasonably realistic manner. If firms compete primarily on the basis of price, at least in the relatively short-term, price should be the strategic decision variable for competitors. For a merger involving a homogeneous product and competitors distinguished by their costs and production capacities, the model must account for costs and capacities in a reasonably realistic manner. If a single market price is determined by aggregate quantity competitors make available, quantity should be the strategic decision variable for competitors.

Oligopoly models are “equilibrium” models, i.e, they determine a set of competitive strategies (usually prices or quantities) at which no competitor has an incentive to change its strategy, given the strategies of rivals.²⁶ Calibrating such a model involves setting its parameters so that it exactly predicts the pre-merger equilibrium. For example, plugging the pre-merger prices into the model must yield the pre-merger shares.²⁷

²⁵ For example, the competitive interaction in many industries closely resembles an auction, and formal auction models have been used by Brannman and Froeb (2000), Dalkir, Logan, and Masson (2000), Froeb and Tschantz (2002), and Tschantz, Crooke, and Froeb (2000) to predict the competitive effects of mergers in such industries.

²⁶ This is Nash, non-cooperative equilibrium, formalized by mathematician John F. Nash, who shared the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel in 1994 for this work.

²⁷ Calibration requires that a set of prices and shares be deemed the pre-merger equilibrium. Prices and shares averaged over a recent period generally are used; however, the prices and shares used may never have been observed but rather are thought to be likely in the near future if the merger does not occur. While we refer to the benchmark model as “pre-merger,” it is meant to reflect the world that will prevail but for the merger. Failing to calibrate in this manner is a common error that

The simplest oligopoly model for predicting the competitive effects of mergers probably is the “dominant firm model.”²⁸ It posits that all firms but one in an industry act as a “competitive fringe,” producing up to the point at which their marginal costs of production equal the market price, as all firms do in a competitive industry. The remaining firm is the dominant firm, and it acts as a monopolist with respect to its “residual demand curve,” i.e., the portion of total industry demand that the competitive fringe does not supply. This model may be appropriate in an industry with a homogeneous product if the merged firm would be substantially larger than its rivals. The model can be calibrated from information on the elasticity of market demand and the pre-merger margins and productive capacities of the relevant competitors.²⁹

The use of calibrated economic models for predicting the competitive effects of mergers is referred to as “merger simulation,” and we have found it especially well suited to the analysis of the competitive effects of mergers involving differentiated consumer products.³⁰ The standard oligopoly model applied to such products is the Bertrand model,³¹ which assumes that price is the only short-term strategic variable through which competition occurs. A Bertrand equilibrium is a set of prices such that each competitor is happy with its price given those of rivals.

One reason we find the Bertrand model well suited to predicting the effects of differentiated products mergers is that it accurately reflects what a merger does in such an industry. A merger mainly internalizes the competition between formerly separately owned brands, and that is precisely what occurs in the model. And to the extent that merger synergies

renders meaningless the comparison between the predicted prices post merger and the actual prices pre merger.

²⁸ This model is credited to Forchheimer (1908) and is the model used by Landes and Posner (1981).

²⁹ Such an analysis was employed by the Department of Justice in its analysis of Georgia Pacific Corp.’s acquisition of Fort James Corp., which was challenged on the basis of likely anticompetitive effects on away-from-home tissue products. *United States v. Georgia Pacific Corp.*, No. 00-2824 (D.D.C., filed Nov. 21, 2000); 66 Fed. Reg. 9,096 (Feb. 6, 2001) (complaint and competitive impact statement).

³⁰ To date, there has been very little courtroom use of merger simulation in the United States. One reason for this is that the two federal enforcement agencies each have only about one merger trial per year. We know little of the details but understand that an analysis similar to that we advocate was unsuccessfully used by the plaintiffs in *New York v. Kraft General Foods, Inc.*, 926 F. Supp. 321 (S.D.N.Y. 1995), a merger case involving ready-to-eat breakfast cereals. Nevo (2000b) provides an academic analysis prompted largely by the case. Analyses prepared for use in litigation are provided by Hausman and Leonard (1997) (analyzing a tissue merger) and Werden (2000, pp. 144–46) (analyzing a bread merger).

³¹ The Bertrand model is named for Joseph Louis François Bertrand and stems from a book review he published in 1883. Daugherty (1988, pp. 73–81) supplies a modern translation by James W. Friedman. Deneckere and Davidson (1985) show that mergers without efficiencies raise prices in Bertrand models of differentiated products.

reduce production cost, that is easily incorporated. While price is never the only strategic variable in the real world, we have often concluded that little violence to reality is done by considering only price competition.³² We have also generally found that the intensity of competition in the Bertrand model matches well with that observed pre merger.³³

A differentiated products merger simulation is calibrated with readily observable information on the prices and “shares” of brands in the simulation, and with potentially observable information on the elasticities of demand (own and cross) of those brands.³⁴ A simulation may be more or less inclusive than the relevant market, and these “shares” are merely the relative quantities for the included brands.

The prices of brands included in a simulation are determined by the competition among them and their prices may change as the merger alters competition. The prices of brands excluded from a simulation are assumed to be unaffected by the merger. Narrowing the list of included brands merely narrows the list of brands for which prices may increase, and because the prices of excluded products generally would be affected very little by a merger, excluding them just imparts a very slight downward bias to the price increase predictions. The critical implication of the foregoing is that market delineation is irrelevant to merger analysis based on merger simulation.³⁵

³² Various sorts of promotions, such as sales, are important marketing strategies for many highly differentiated consumer products. The simulation model omits this sort of marketing, for example, summarizing a complicated schedule of prices by a single average price, but we generally do not view this simplification as problematic. Similarly, consumers often choose among a large number of configurations of a particular product, while the model generally reflects them as a single brand aggregate, but we do not believe this is a serious problem.

³³ To predict the competitive effects of mergers, it is necessary to “recover” the marginal costs for each product in the model. This normally is *not* done by directly measuring costs. Rather, the equilibrium conditions of the model are solved for the marginal costs implied by the observed prices and shares. The implied marginal costs then can be compared with cost information that may be available. We generally have found that the implied marginal costs correspond closely to what is known about actual marginal costs, at least for major products. What that means is that the markup of price over cost in the model, and hence the intensity of competition, is at least roughly the same as the intensity of actual competition.

³⁴ Werden (1997b) offers a concise statement of the process of Bertrand merger simulation with differentiated consumer products. More complete statements of the analysis are provided by Crooke, Froeb, Tschantz, and Werden (1999) and Werden (1997a, 1997c); Werden and Froeb (1996).

³⁵ In the United States, case law precedent mandates market delineation, but we believe it is only a matter of time before courts embrace direct methods for predicting the competitive effects of mergers, since they already embrace direct evidence of market power. We also believe that delineating a relevant market actually may undermine a challenge to a merger. With highly differentiated consumer products, the relevant market delineated by the hypothetical monopolist paradigm may be as narrow as the two merging brands (if they are next-best substitutes and the merger would increase their prices at least 5%), yet such narrow markets are not alleged in merger complaints because of a well-founded belief that judges would reject them out of hand. And when a broad relevant market is alleged, some judges take this to be a concession that all products in the market are very close substitutes for each other.

Ideally, the demand elasticities used to calibrate the model would be estimated from a rich data source that makes it possible to reliably measure all of the relevant own and cross elasticities of demand. Precisely estimated demand elasticities significantly enhance the fit between the model and the facts of the case and hence significantly increase the accuracy of the predictions as well as the persuasiveness of the analysis in court. The data available in the real world, however, are never ideal and generally present a trade-off between variance and bias.³⁶

The number of elasticities that must be estimated increases with the square of the number of brands included in a simulation. Unless some structure is imposed on substitution patterns, their number easily may be so large that the data are inadequate to the task. Econometricians then say that the estimator has a high “variance.”³⁷ Variance can be reduced by asking less of the data, which is done by imposing structure on substitution patterns, but that may mean imposing unrealistic substitution patterns. Econometricians then say that the estimator is “biased.”

At one extreme in the variance-bias trade-off is the logit model, in which just two parameters determine all of the own and cross elasticities of demand for the included brands.³⁸ One of these parameters is the aggregate elasticity of demand for all brands in the simulation, and it plays basically the same role in merger simulation that market delineation plays in traditional structural analysis. If the demand for the included brands is sufficiently elastic, excluded brands are sufficiently close substitutes for the included brands that mergers of included brands cannot increase prices significantly. The greater the value of the second demand parameter, the greater the substitutability among included brands. If this parameter is very low, the included brands are such distant substitutes for each other that each is essentially a monopoly unto itself, so the merger of two included brands has little effect on their prices. If this parameter is very high, the included brands are such close substitutes for each other that only a merger to monopoly among the included brands could have much effect on their prices.

³⁶ Estimating demand elasticities with real-world data presents a host of complex issues beyond the scope of this paper.

³⁷ A common symptom of high variance is negative estimated cross elasticities, indicating brands are complements, even though they are known to be substitutes.

³⁸ We refer mainly to the Antitrust Logit Model (ALM), a reformulation of the conventional logit model designed to make it more user friendly to practitioners of merger analysis. Details of the model are provided by Werden and Froeb (1996, 1994) and Werden, Froeb, and Tardiff (1996).

The logit model forces substitution patterns to exhibit the Independence of Irrelevant Alternatives (IIA) property.³⁹ In practical terms, this means that substitution from any brand to all others is proportionate to their relative shares. If brands *A*, *B*, and *C* have shares of 60%, 30%, and 10%, and the price of brand *C* is increased, the IIA property says that the substitution from brand *C* to brand *A* must be twice that from *C* to *B*, because the share of *A* is twice that of *B*.

Absent contrary evidence, substitution in proportion is often viewed as the most natural default assumption.⁴⁰ We share that view because we think the IIA property most usefully defines what it means for a group of brands to be equally close substitutes for each other. One justification for this definition is that the IIA property implies that the all cross elasticities of demand, with respect to any one price, are exactly the same. The equality of cross elasticities follows directly from substitution being proportionate to relative shares.

Economists have long noted that the IIA property is not likely to hold in the real world. It is basically always true that a model not imposing the IIA property fits a real-world industry better than the logit model.⁴¹ Nevertheless, we find the logit model very useful, at least as a starting point for the analysis of differentiated products mergers. Until reliable contrary evidence is uncovered, it is sensible to presume that the products of the merging firms are neither especially close nor especially distant substitutes, which means that the IIA property holds approximately. And merger simulation using the logit model provides a highly useful initial indication of the potential consumer injury from a differentiated products merger.

³⁹ Formally, the IIA property is that the ratio of the probabilities of any two choices is independent of the presence or absence of other alternative choices.

⁴⁰ Willig (1991, pp. 299–305) argued that the logit model, with its IIA property, provides an appropriate benchmark and used the logit model to motivate reliance on market shares in the analysis of differentiated products mergers. Willig's view appears to be reflected in U.S. Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines § 2.211 (1992, rev. ed. 1997):

The market concentration measures articulated in Section 1 [of the Guidelines] may help assess the extent of the likely competitive effect from a unilateral price elevation by the merged firm notwithstanding the fact that the affected products are differentiated. The market concentration measures provide a measure of this effect if each product's market share is reflective of not only its relative appeal as a first choice to consumers of the merging firms products but also its relative appeal as a second choice, and hence as a competitive constraint to the first choice. Where this circumstance holds, market concentration data fall outside the safeharbor regions of Section 1.5, and the merging firms have a combined market share of at least thirty-five percent, the Agency will presume that a significant share of sales in the market are accounted for by consumers who regard the products of the merging firms as their first and second choices.

⁴¹ The logit model restricts substitution patterns only for the brands included in a simulation. Thus, the narrower the range of included brands, the less restrictive the logit model is. And since excluding brands typically is of little consequence to the price-increase predictions, the range of included brands may be quite narrow.

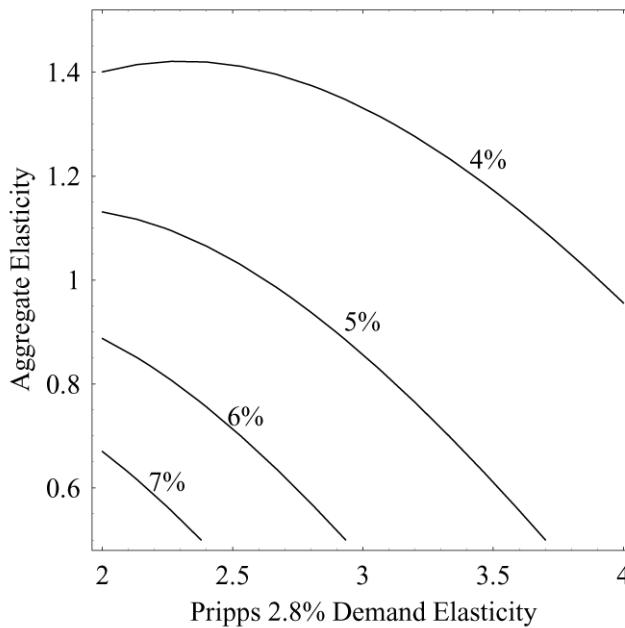
To illustrate how logit merger simulations can enhance the focus and accuracy of a merger investigation, we consider the acquisition of Pripps Ringnes by Carlsberg, which already owned Falcon. The Swedish Competition Authority allowed the acquisition to proceed with divestitures.⁴² We understand that a focus of the Authority's competitive concerns was Class II beer (folköl) sold in retail food stores, including beer with alcohol contents of 2.8% and 3.5%. We surmise that the Authority quickly began to pursue the possibility that a relevant market was Class II beer and quickly learned the average retail prices and shares for Class II beer.⁴³

The logit model has two demand parameters, and with knowledge of neither, we consider a range of values. If Class II beer is a relevant market, the aggregate elasticity of demand for it must be less than the critical elasticity of demand, and for price-cost margins typical of U.S. manufacturing, the critical elasticity would be roughly 1.5. Thus, we consider values of 0.5 to 1.5. Given prices, shares, and an aggregate elasticity, completing the model requires selecting a value for the one remaining demand parameter, and that may be done by fixing the value for any of the brand-level elasticities of demand. We fix the elasticity of demand for Pripps 2.8% alcohol beer,⁴⁴ and consider elasticity values from 2.0 to 4.0. The figure below presents the results of the simulations in the form of a contour plot of the weighted average price increase for all Class II beer.

⁴² Our discussion is based on information contained in the Authority's December 12, 2000 decision on the merger, as translated for us by Karl Lundvall, and in an on-line description of the beer industry in Sweden: <http://www.xs4all.nl/~pattro1ro/swedintr.htm>.

⁴³ As is typical with differentiated consumer products, the readily available price and share data are those for the retail level. To simulate competition among brewers, therefore, requires a model relating the retail and wholesale levels. The need for that model is acute in this case because of the differential tax treatment of 2.8% and 3.5% beer. We assume the simplest model: Let w_i be the wholesale price of brand i in SEK/liter and r_i its retail price. Assume retailers set prices by marking up the wholesale price by a fixed proportion s , then add any alcohol taxes. With a VAT of 12%, $r_i = (.12 + s)w_i$ for 2.8% beer, and for 3.5% beer, which has an added alcohol tax of 5.145 SEK/liter, $r_i = (.12 + s)w_i + 5.145$. Lacking any direct information, we assume $s = 1.3$, which is roughly consistent with margins for supermarkets in the United States.

⁴⁴ We aggregate all brands with the same brewer and alcohol content. Hence, the Pripps 2.8% demand elasticity is that for an aggregate of all Pripps 2.8% brands.

Figure 4.1

Merger simulation would have enhanced the accuracy of the evaluation of the acquisition by indicating a range of likely price increases: 4–7% for the weighted average of Class II beer prices at the wholesale level. This is a relatively narrow range, considering the wide range of demand parameters, and further analysis could have narrowed the range of price increases by narrowing the ranges of the demand parameters. Merger simulation also would have enhanced the accuracy of the evaluation of the acquisition by indicating not merely that the substitutability of other classes of beer was important, but also the likely impact on price increases of varying degrees of substitutability, as reflected in the aggregate elasticity. Of course, the price-increase predictions from merger simulations never should be taken as definitive, but rather only as a useful guide to the magnitude of the likely anticompetitive effects of a merger.

The simulations also would have added focus to the investigation by indicating what it would have had to reveal to alleviate competitive concerns. Findings that could have significantly alleviated concerns are: (1) that all Class II beers were viewed by consumers as essentially fungible, (2) that the Pripps and Carlsberg brands of Class II beer were

relatively distant substitutes in the minds of consumers, or (3) that the acquisition would have produced large enough reductions in marginal cost to offset the price increases.

The merger simulation also would have focused the investigation on whether the basic assumptions of the model are appropriate. Evidence could have been amassed on the relevance of the differentiated product Bertrand model by assessing the importance of brands, determining whether price was the key strategic variable for competition, and indicating whether the intensity of existing competition, as reflected in price-cost margins, was consistent with the Bertrand model. If the investigation provided strong support for the model, that would have greatly enhanced the persuasiveness of the simulation analysis in court.

As the investigation proceeded, it may also have been possible to estimate the relevant demand elasticities. If so, the simulation analysis could have been refined significantly, and a model of demand other than simple logit might have been used.⁴⁵ Among the options are generalizations of the logit model.⁴⁶ Econometrics-based merger simulation substantially increases the accuracy and persuasiveness of merger analysis by basing price-increase predictions directly on the underlying data from which the relevant demand elasticities are estimated.

Merger simulation also increases the focus and accuracy of the analysis of differentiated products merger in other ways. It provides a mechanism for explicitly trading off a reduction in competition against cost reductions from merger synergies. And it provides a mechanism for evaluating possible remedies, most notably the divestiture of particular brands. If brands are not all equally good substitutes for each other, or if there are synergies from the combination of just some of the merging firms' brands, simulation can enhance the accuracy of merger analysis by indicating the best remedy.⁴⁷

An important limitation of merger simulation with differentiated products is that price-increase predictions are sensitive to the functional form for demand. Conventional functional forms all impose both particular rates at which each product's demand becomes more elastic as its price

⁴⁵ Pinkse and Slade (2002) analyze two U.K. beer mergers using econometrics-based simulation.

⁴⁶ Ben-Akiva and Lerman (1985, ch. 10) and Dubin (1998, ch. 6–7) consider the nested logit model, in which “nests” are placed around brands that are especially close substitutes. Generalizations popular in academic research (e.g., Berry, Levinsohn, and Pakes (1995); Bresnahan, Stern, and Trajtenberg (1997); Nevo (2000a)) focus on brand characteristics.

⁴⁷ Jayaratne and Shapiro (2000). It is also possible to incorporate any effects of remedies on costs. For example, it is possible to model royalty payments from one competitor to another that could result from a licensing arrangement. While probably never an appropriate remedy, it is easy to incorporate pricing limitations in a simulation.

is increased, and idiosyncratic responses of cross elasticities to price changes.⁴⁸ A direct consequence is that the functional form of demand substantially determines the magnitude of price increases from a merger. Of the demand forms in common use, linear and logit demand yield the smallest price increases. Two other commonly used functional forms, constant elasticity and AIDS demand,⁴⁹ typically yield price increases that are *at least* several times those with linear or logit demand.⁵⁰ The same properties that cause different demand forms to yield very different price increase also cause them to yield very different pass-through rates for marginal-cost reductions.⁵¹

The dependence of merger simulation on the functional form of demand suggests the desirability of using calibrated economic models in a manner that makes them insensitive to the functional form of demand. This is done by computing the compensating marginal cost reductions (CMCRs), i.e., those that exactly offset the price-increasing effects of a merger. CMCRs do not depend on the functional form of demand for the simple reason that the equilibrium prices and quantities post merger are precisely the same as those pre merger. Using the same inputs as merger simulation – prices, shares, and demand elasticities – it is relatively simple to compute the CMCRs for a differentiated products merger.⁵² If merger synergies appear likely to reduce the merging firms' cost as much as the CMCRs, it follows that the merger is unlikely to harm consumers. And if merger synergies clearly fall well short of those necessary to prevent price increase, it follows that significant price increases are likely.⁵³

⁴⁸ Most conspicuously, with constant elasticity demand, all own and cross elasticities are invariant to prices.

⁴⁹ Deaton and Muellbauer (1980) present the AIDS model. Crooke, Froeb, Tschantz, and Werden (1999), Epstein and Rubinfeld (2002), and Hausman and Leonard (1997) discuss merger simulation using AIDS demand.

⁵⁰ Crooke, Froeb, Tschantz, and Werden (1999).

⁵¹ Werden, Froeb, and Tschantz (2001).

⁵² Werden (1996).

⁵³ Werden and Froeb (1998) offer a similar, but simpler, analysis for mergers in homogeneous goods industries.

Conclusions

Calibrated economic models provide concrete, quantitative analyses of market delineation and the competitive effects of mergers. These analyses are firmly grounded in the facts of the case and based on well-accepted models of monopoly and oligopoly. Their use significantly enhances the focus, accuracy, and persuasiveness of merger analysis in many ways.

Nevertheless, some lawyers are reluctant to rely on calibrated economic models, especially in court. The main reason appears to be a belief that such analyses cannot be adequately understood by judges and thus appear as a black box. Our view is almost precisely the opposite. Expert analysis based on calibrated economic models is a black box only if presented in a highly summary, and clearly inappropriate, fashion. When calibrated economic models are properly used and presented, they make clear how an expert's conclusions follow from the facts of the case. Economic models are built on assumptions, which should be stated explicitly. Once explicitly stated, assumptions can be attacked and defended largely on the basis of the factual record in the case. The use of calibrated economic models therefore makes the battle of the experts into what it should be – a debate over links in a chain of economic logic connecting established facts to ultimate conclusions. Useful economic analysis identifies the links that really matter and explains them in terms judges can comprehend.

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5. EU merger control and small member state interests

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The European Commission has recently intervened against a number of mergers and acquisitions in Sweden, as well as in other smaller countries. For instance, in March 2000 the Commission prohibited Volvo's acquisition of Scania, arguing that Volvo/Scania would get a dominant position in a number of nationally defined markets within the Union, such as Sweden and Finland.

These interventions have triggered a debate about EU merger control both in Sweden and abroad. Representatives of smaller countries have declared that, in effect, EU merger policy makes it impossible for companies in small countries to merge and obtain a leading global position. In Sweden, there was almost complete consensus among the political parties on this view, with only the Liberal party expressing support for the Commission's decision.

These claims have been rebutted by EU officials, who argue that companies in smaller countries can expand by merging with companies operating in other countries. According to this line of reasoning, the Volvo/Renault operation and the strategic partnership concluded by Scania/Volkswagen, following the prohibition of the Volvo/Scania merger, clearly showed that there were alternative ways for these companies to merge.¹

There are several possible interpretations of this critique against EU merger control. It could be seen as a "national champion"-type argument, based on the notion that competition authorities should allow mergers that hurt domestic consumers if domestic firms gain a sufficient

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¹ It is also maintained that several other alternatives are open to firms from small member states in addition to international mergers, for example internal growth and the possibility of adequate remedies (e.g. selling off parts of the assets to reduce concerns for competition). Although these possibilities are important strategies for the firms, these issues are not addressed in the present analysis.

competitive advantage over foreign firms in foreign markets through the merger. The argument against this from EU officials would be that the purpose of merger control is only to protect European consumers. And, while there may be efficiency gains related to firm size and therefore to mergers, those gains can be achieved with less impediments to competition, for example through international mergers. Moreover, they might say, experience shows that companies that are successful abroad are, in most cases, those facing a competitive environment back home.

But the critique has also taken other forms. It has been acknowledged that international mergers may indeed constitute alternatives to domestic mergers. The problem is instead that international mergers may be less advantageous from the point of view of smaller countries. These worries seem to be at least partly based on the possible effect of international mergers on employment and the location of R&D (Research and development) units and head quarters. In response to these worries, EU officials only concede that EU merger control does not take into account a possible move of firms abroad.

It is evident from this discussion that the issues involved are highly complex. Therefore, it is natural to seek guidance in the economic literature on the merits of the arguments put forth. To the best of our knowledge, there does unfortunately not exist any research that can be directly applied to this end. Nevertheless, this literature has provided us with a number of useful analytical tools. The purpose of this paper is to employ such tools, in order to discuss the validity of some of the main claims put forth in this debate on EU merger control rules.

The structure of the paper is as follows. In the next two sections, we demonstrate why and how EU merger control treats companies from small and large states differently and discuss whether the whole idea of merger control is well founded: Do we really need to control mergers? The rest of the paper discusses various proposals suggested to reduce this asymmetry. The first idea is to introduce a so-called efficiency defense, which would at least mitigate the asymmetry (Proposal 1). Other ideas include fighting market segmentation (Proposal 2), or that the Commission should change its principles for geographical market delineations (Proposal 3). Still others argue that the root of the problem is the “skewed” goals of competition policy, i.e. that only consumer welfare is considered (Proposal 4). The appropriate goal for competition policy, whether efficiency defenses should be allowed, etc. is of course issues that have been intensively discussed before. The distinguishing feature of the discussion here is that we reexamine these questions from the

point of view of the debate about the alleged asymmetry in EU merger control.

We will spend more time on two other related claims, which we feel to be more central to the policy discussion, referred to as Proposals 5 and 6. One is a refutation of the argument that firms in smaller countries are at a disadvantage, even if treated asymmetrically, since they can instead choose to merge internationally. Implicitly, this thus suggests that the Commission should take into account the possibility for alternative mergers. The second claim, which is a counter argument to the first, is that international mergers may be worse than domestic mergers for member states, due to adverse implications for the location of production following international mergers, and that the Commission should take these effects into account in its assessment. The chapter ends with a section summarizing the main findings.

5.1 The asymmetric treatment of small and large countries

This section will explain the sense in which EU merger control can be said to treat mergers in small and large member states asymmetrically. To this end, it starts by very briefly laying out core features of EU merger control.

Salient features of EU merger control

EU merger policy is enshrined in the so-called Merger Regulation of 1990.² The main purpose of EU merger control is usually seen as the protection of competition. The latter goal is, in turn, often motivated by consumer protection (Monti, 2001).³ The Merger Regulation prohibits a merger if, and only if, it “...creates or strengthens a dominant position as a result of which effective competition would be significantly impeded in the common market or in a substantial part of it”.⁴

A key concept in EU merger control is thus *dominance*,⁵ which is defined in the case law under Article 82 as “...a position of economic

² Council Regulation No 4064/89.

³ Sometimes other goals are also mentioned. For instance, the Commission (1980) refers to economic integration of member states, as well as “fairness”, as such objectives. It is unclear to us whether and to what extent these goals actually influence merger policy. More elaborate discussions of the goals of EU merger control may be found in Martin (1994) and Fridolfsson (2002).

⁴ *United Brands v Commission*, Case 27/76 [1978] ECR 207, [1978] 1 CMLR 429.

⁵ The Merger Regulation may be interpreted as containing either one or two tests. It refers to both the creation and strengthening of a dominant position and the resulting impediment of effective

strength enjoyed by an undertaking ... affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers". Market shares play important roles in the assessment of dominance. But many other factors believed to indicate dominance are also considered, such as legal protection, superior technology, strong financial status, and economies of scale, extensive vertical integration, and a high degree of product differentiation.

In economic terminology, dominance can be interpreted as a very high degree of market power. Market power, in turn, is usually defined as the ability to charge a price above the marginal cost without losing all customers. According to this interpretation, assessing dominance is an attempt to measure market power and, in particular, the price to cost margin. It is unclear, however, how well the methods employed to assess dominance really capture the economic notion of market power.

Firms' market shares obviously depend on the definition of the extent of the market, and the delineation of the "relevant market" is consequently a key aspect of merger control. The definition of the relevant market consists of two parts, namely the relevant product market and the relevant geographical market. Interestingly, adjudicating bodies have applied rather different approaches to the determination of these two aspects of market delineation.

The key criterion for judging if two goods are competing on the same product market is if they are *interchangeable*. The primary aspect is if customers consider the goods to be substitutable. Demand side substitutability may be measured by the cross-price elasticity of demand, or assessed using the physical characteristics of the products, or their prices or intended use. Supply side substitution plays a less important role. A certain firm is considered to be part of the relevant market, even if it is not active on that market at present, but can quickly start to supply the market if prices are slightly increased. If this were to take longer, the firm will not be considered to be in the market. (Still, it may influence the dominance assessments by being considered as a potential entrant.)

The relevant geographical market is defined as a geographical area where the product is marketed and "...where the conditions are sufficiently homogenous for the effect of the economic power of the undertaking concerned to be able to be evaluated".⁶ Our interpretation of this

competition. It could be that the second notion is merely a description of the consequences of the first. An alternative view is that the Commission must demonstrate that both parts are satisfied in order to block a merger. See Whish (2001) for a more extensive discussion.

⁶ *United Brands v Commission*, Case 27/76 [1978] ECR 207, [1978] 1 CMLR 429 at paras 10 and 11.

definition is that customers in different locations are considered to be in the same geographical market if the merger affects them in a very similar way. To define the geographical market, the Commission may, for example, consider whether products are expensive to transport in relation to their value or whether two areas are separated due to market-sharing agreements.

Finally, for a merger to be blocked, it does not suffice that it is found to create or strengthen dominance in a particular geographical market. It must also be the case that this market constitutes a *substantial part of the common market*. Thus, it is important to note that determining the relevant market is of a different nature from determining the limits of what constitutes a substantial part of the common market. The former is basically an analytical aid in the positive assessment of the consequences of the merger. The normative criterion largely lies in determining how geographically widespread negative dominance effects must be to be deemed undesirable. Further, the requirement that dominance is achieved in a substantial part of the common market prevents mergers of minor importance from being considered. It seems clear that large member state may be considered as substantial parts of the common market. In some cases, it has even been established that parts of member states can be substantial parts. However, the lower bound on the size of a substantial part is as yet unclear.

The asymmetry identified

It is clear that if the whole common market were found to be the relevant market, it would be immaterial to the assessment of a notified merger whether it took place in a small or large member state. However, as will be argued more fully below, it is likely that the boundaries of relevant markets sometimes coincide with national borders. In that situation, an asymmetry arises between larger and smaller member states in the sense that the relevant markets are smaller in the smaller states.

First, for most products, the servicing of a market is associated with fixed costs. Smaller markets are therefore likely to support fewer firms, and the competitive pressure is consequently likely to be weaker in such markets. Second, there is a strong tendency for firms to serve primarily the markets in which they are located – there is typically a “home market bias”. A merger between firms of a given magnitude in terms of turnover is thus more likely to lead to a dominance finding in a smaller than in a larger member state (still assuming that relevant market delineation and national boundaries coincide). An inescapable consequence of this is that *large companies active in small countries are treated differently from*

equally large companies in large countries, in the sense that their possibilities to merge domestically (that is, with other firms in the same market) are more limited.

It is not clear to us to what extent this asymmetry actually constitutes a problem, even for small member states. Nevertheless, some observers perceive it as such and have made a number of proposals in the policy debate for how this asymmetry can be removed. The rest of the paper will seek to shed some light on situations where the asymmetry may cause problems, and discuss the pros and cons of the different proposals for reform that have a bearing on the asymmetry.

5.2 Proposal 1: Allow efficiency defenses

If the anti-competitive effects were the whole story concerning mergers, there would of course be no reason for allowing them. But a frequent underlying assumption in the policy debate is the notion that mergers do generate efficiency gains for firms and that those gains will increase the merging firms' competitiveness. One possibility of reducing the asymmetry between small and large member states might be to allow an efficiency defense. In order to evaluate the validity of this claim, we will start by considering the extent to which such efficiency gains are likely to exist.

Efficiency gains from mergers

There are two issues of interest to the discussion concerning the efficiency gains from mergers. First, do mergers reduce costs? And secondly, if so, are these savings passed on to consumers? We will here deal briefly with each of these two issues.

Do mergers reduce costs?

One can distinguish between several types of efficiencies.⁷

(i) *Rationalization* of production refers to the cost savings that may be realized by shifting output from one plant to another, without changing the firms' joint production possibilities. As the term indicates, rationalization refers to an optimal allocation of the production levels across the different plants of a firm. Differences in costs between plants

⁷ We here focus on cost reductions although quality improvements may be analyzed in a similar fashion. For a richer exposition, see Röller, Stennek and Verboven (2002).

may be due to differences in capital or knowledge or, in the presence of capacity constraints, different production levels.

(ii) *Economies of scale and scope* can be realized if the merger enables firms to avoid the duplication of fixed costs that is unavoidable with separately operated firms, for instance by using the same administrative and support tasks. In the long run, additional scale economies can be realized by integrating future investment decisions (building one large plant instead of two small ones).

(iii) A merger may also contribute to *technological progress* by enhancing the diffusion of know-how between the formerly separately owned plants. In the longer run, mergers may change the incentives for R&D. In particular, too much competition may destroy incentives for research if, for example, the results are highly non-proprietary due to imitation or information spillover. Mergers may help internalize such benefits.

(iv) Mergers may also reduce costs due to the existence of *purchasing economies*. It is important, however, to distinguish between real efficiencies (e.g. discounts because it is less costly for the supplier to trade with one rather than two customers) and so-called pecuniary gains arising from the fact that the merger increases the firms' bargaining power against suppliers. The latter effect may be very similar to anti-competitive effects on the product market and, thus, not an efficiency gain from a social point of view.⁸

(v) Finally, an acquisition may be a way of targeting a firm with a poor profit record due to *slack* (also called internal inefficiency or x-inefficiency) in a company. However, it is not clear that mergers actually reduce the slack. On the contrary, many would argue that the resulting reduction in competition reduces the incentives to keep costs low.

The most direct way of empirically assessing the efficiency gains from mergers is to measure productivity increases and scale economy effects following mergers. Some studies use statistical techniques based on the concept of the production function and some of these allow a decomposition of the total effect of changes in x-efficiency and scale economy. Other studies confine the attention to particular merger cases.

There is also some relevant indirect evidence, such as estimates of the importance of returns to scale in different industries. In some studies, econometric techniques are used; in others, engineers employed to

⁸ If suppliers have more bargaining power before the merger, some people argue that increasing the customers' bargaining power may improve social efficiency (Galbraith, 1952). Due to an almost complete lack of research, it is not clear how important such countervailing power effects actually are.

design new production plants are asked to assess the gains of changing the scale of operation. Other, even more indirect, evidence of interest comes from studies of merger profitability and the effect of mergers on share prices as well as studies of consumer prices. The latter types of studies are difficult to interpret, however, since changes in profits, for example, may also arise from market-power effects.

On the whole, our interpretation of the empirical evidence is that it suggests that mergers do *not*, on average, create important cost synergies. Still, there are examples of industries with important economies of scale, and there are also examples showing that mergers may in fact lead to important cost savings.⁹

Do mergers reduce prices?

Lower production costs are obviously a good thing in themselves, since fewer resources are consumed in the production of a given quantity of goods. But there are also additional favorable effects. When firms' marginal costs are reduced, they have an incentive to produce more and reduce their prices, which is an important point since EU merger control primarily aims at protecting consumer interests.

If marginal cost synergies are large enough, a merger may even reduce consumer prices, despite the reduction in competition. For this reason, one may talk about the "pro-competitive" effects of mergers. For prices to be reduced, it is necessary that marginal costs and not fixed costs are reduced. It is also necessary that the cost saving is substantial for the cost effect to dominate the market power effect.¹⁰

The degree to which a cost saving is transformed into a price reduction is called pass-on. The pass-on rate measures the percentage change in price resulting from a reduction in the marginal cost by one percent. Both theoretical and empirical studies show that the pass-on rate varies a great deal between different markets, depending on a host of different factors. For industry wide cost savings, pass-on is determined by factors such as the price elasticity of demand, the presence of capacity constraints and the intensity of competition. Mergers primarily affect the cost of the merging parties, however. The pass-on of such firm-specific

⁹ For a review of these studies, see Röller, Stennek and Verboven (2002) and Stennek and Verboven (2002).

¹⁰ It may, for example, be shown that, under certain circumstances, pure reallocations of production between different plants (so-called rationalization) are not sufficient. Some form of synergies, for example in the form of sharing knowledge, is necessary for prices to fall (Farrell and Shapiro, 1990).

cost savings is typically lower, and also determined by the merging firms' market share, for example.¹¹

In any case, if a merger creates important marginal cost synergies and the pass-on rate is high, the merger will reduce prices and both the merging firms and their customers are better off as a result of the merger.

There is surprisingly little direct empirical evidence of the effect of mergers on product prices. The reason for the lack of such studies is, at least in part, a methodological problem. To identify the effect of a merger, one should properly take into account other conditions that may have changed after the merger, such as changes in factor prices. This problem has been tackled by studying how the prices of the merged firms' products have changed in comparison to other prices. The existing few studies primarily concern the US airline market during the 1980s and indicate that prices do tend to rise as a result of a merger.¹² Similar evidence is obtained from a few studies of market shares (anti-competitive mergers reduce the merging firms' market shares while pro-competitive mergers increase their shares).

Since the number of empirical studies of the effects of mergers on prices is so small, it is vital to also consider the indirect but complementary evidence obtained in studies comparing prices between geographically separated markets with different concentration levels. Surveys of these cross-sectional studies (Schmalensee, 1989; Breshnahan, 1989) typically conclude that they confirm the existence of a relationship between price and concentration.

Finally, we should mention yet another methodology for studying the effect of mergers on price. Mergers motivated by market power increase consumer prices and also competitors' profits. In contrast, mergers generating substantial efficiencies reduce consumer prices and the competitors' profits. Thus, relying on the so-called efficient market hypothesis, stating that a firm's share prices reflect its profitability, one may indirectly study the effect of mergers on price by measuring the effect of merger on competitors' share prices.¹³ These studies indicate that mergers either have little effect on price, or that the price is actually reduced. The methodology of these studies is, however, associated with both theo-

¹¹ For a review of both the theoretical and empirical research on pass-on, see Stennek and Verboven (2002).

¹² Barton and Sherman (1984) estimate the price effects of mergers in the microfilm market. Kim and Singal (1984), Borenstein (1990) and Werden, Joskow and Johnson (1991) study airline mergers.

¹³ The first study using this methodology was Eckbo (1983).

retical and empirical problems, making it difficult to interpret the results.¹⁴

Although not overwhelming, the empirical evidence supports the idea that horizontal mergers reduce competition and lead to increased prices. Some evidence also suggests that the negative effects of mergers appear in concentrated markets.

Efficiencies as a defense

It has been suggested that the Commission should allow mergers leading to or enhancing dominance, as long as these could be verified to yield such efficiency gains. Intuitively, it does indeed seem quite natural that mergers should not be blocked allegedly to protect consumers, if they can be shown to yield enough variable cost synergies to actually benefit consumers. But allowing for an efficiency defense might also reduce the asymmetry between small and large member states. Mergers of a given absolute magnitude might because of the home market bias be challenged in smaller states since they lead to dominance, but would be allowed if occurring in larger states. If an efficiency defense is allowed, some of these mergers might be cleared also in the smaller countries.

The question is, how should an efficiency defense be designed? There are at least two different approaches.

Two approaches

The basic stipulation of the EU Merger Regulation is that mergers giving the merged firm high market power (dominance) should be forbidden. It is not clear exactly how much market power is needed. Monopoly is obviously included, but it may also be substantially less, especially in markets with cartel problems. It is important to note that not all mergers and acquisitions are banned, but only those leading to very high degrees of market power. Other mergers are presumed to create positive net effects, for example in the form of cost savings, which means that EU merger control at least indirectly takes into account efficiency gains. Heuristically, all mergers are assumed to produce an “average” amount of efficiency, and only if competition is found to be very weak, will the merger be banned.¹⁵

¹⁴ See McAfee and Williams (1988) and Fridolfsson and Stennek (2002).

¹⁵ There exists some support for this procedure to condition the approval of a merger on the size of the firms and the market concentration. Without investigating the issue in all its complexity, let us just make a few remarks. The anti-competitive effects of a merger can be expected to be worse if competition is already weak in the market. (i) If concentration is high, a merger between two firms

Competition authorities in the US and Canada actually go one step further. Even in the case where a merger will substantially reduce competition – and one would expect the net effects to be negative – the authorities may investigate if the efficiency gains in the particular case are large enough to dominate the harm to competition. This is usually referred to as an *efficiency defense*.

Is such an efficiency defense also allowed in Europe? The Merger Regulation is unclear on this point, and it has been interpreted both ways. Some people interpret it to allow an efficiency defense, while the Commission has made certain policy statements in the other direction. The Commission's own decisions also give a rather unclear picture. In some decisions, the Commission explicitly analyzes efficiency gains, but conclude that they were not important enough to change the decision in the particular cases, thereby indicating that, in principle, it considers efficiencies. In other decisions, the Commission states that efficiencies are irrelevant. To further blur the picture, some lawyers have argued that in some cases, efficiency gains have changed a decision, but that the Commission has hidden this behind more favourable dominance assessments – since the Merger Regulation does not allow an efficiency defense. Thus, a simple but important conclusion is that the rules need to be clarified.

An important question is whether Europe should have an efficiency defense similar to the US system. In our view, the answer is yes. There are strong reasons to believe that the positive effects of mergers vary substantially between cases. If the Commission only makes standard, rather than individual, assessments of efficiency gains, it will inevitably systematically make mistakes.

There are also objections to such a reform, however. The most common one is that the Commission would have to collect and process much more information, which would both require more resources and take

with a given amount of capital will lead to a larger reduction in the quantity produced and consumed. (ii) Reducing quantity by one unit also leads to a larger dead-weight loss if firms already charge high markups, since the change in dead-weight loss from reducing production by one unit is measured by the difference between price and marginal cost. (iii) In a given market, it is particularly bad if large firms merge, in case size is determined by cost-advantage. The reason is that low-cost merging parties can be expected to reduce their production while high-cost outsiders can be expected to increase their production. Thus, a merger between large firms may imply a reallocation of production from efficient to inefficient firms.

Not only are there reasons to believe that the anti-competitive effects are larger if concentration is already high; one may also expect the positive effects of mergers to be smaller if the merging firms are large and if competition in the market is weak. Economies of scale are often present at low levels of production. At high levels of production, there may even be diseconomies of scale. In such industries, a merger will lead to more important cost savings if the merging parties are small than if they are already large. The pass-on rate is smaller, the less competition there is. Some people also argue that the incentives to actually reduce costs may be lower if the competitive pressure is low.

more time. This is obviously correct. But, in our view, the firms should have the burden of proving the existence of efficiency gains. Another objection is that an efficiency defense is unnecessary, since mergers generally do not lead to efficiency gains. As already discussed above, while this might be true on average, it is still possible and likely that there are specific instances when the gains for consumers are substantial.

The main objection might be that the system runs the risk of becoming less transparent if the decision is based on more factors. This is not necessarily true, however. It is often claimed that already today, the Commission considers efficiencies in some cases, but that it does not openly account for how that is done. A formal introduction of an efficiency defense may then improve transparency.

Implementation of an efficiency defense

Efficiencies are considered in various ways in the merger control systems around the world. The federal control system in the US is the natural reference point, for several reasons: it has long experience; the procedures are relatively well documented in the so-called Merger Guidelines issued jointly by the Federal Trade Commission (FTC) and the Department of Justice; and academic research and discussions have often focused on the US experience. We will therefore briefly describe the main features of the efficiency defense as practiced in the US.

The Merger Guidelines acknowledge that mergers may generate efficiencies of different types, including cost savings, improved quality, and enhanced service and new products. For such efficiencies to influence the anti-trust authorities' evaluation of a merger, several criteria must be satisfied. First of all, the efficiencies must be merger specific, which means that they must be likely to be accomplished by the proposed merger and unlikely to be accomplished in the absence of either the proposed merger, or another means with comparable anti-competitive effects. The second important aspect is the magnitude of efficiencies and pass-on. The agencies do not challenge a merger if efficiencies are of such a character and magnitude that the merger is not likely to be anti-competitive (anti-competitive is here not taken to mean an increase in market power). In particular, the efficiencies must be sufficient to reverse the merger's potential to harm consumers, for example by preventing price increases. The third requirement is that the firms can substantiate their claims so that the agencies can verify the likelihood and magnitude of each asserted efficiency, how and when each would be achieved, how they would enhance the merged firm's ability to compete and why the efficiencies are merger specific.

Already at this level of abstraction, it should be clear that the implementation of an efficiency defense is rather complex. The guidelines themselves point out that certain types of efficiencies are not likely to be considered due to problems of verification. The potential role of efficiencies to actually “save” otherwise anti-competitive mergers is also limited due to the requirement that efficiencies should be merger specific.

It was less clear in earlier versions of the Merger Guidelines whether an efficiency defense was legitimate. Coate and McChesney (1992) statistically analyze 70 merger investigations (including all important horizontal mergers) at the FTC from 1982 to 1987. They find that efficiency considerations did not affect the agency’s decisions whether to challenge mergers. Today the picture may be different, however. According to the former FTC Chairman Pitofsky (1998), claims of efficiencies do influence the FTC prosecutorial discretion, for example in some hospital mergers, and in the case of Chrysler/Daimler Benz. Lower courts have begun to examine efficiencies in merger cases and, in some cases, these have been acknowledged as a potential defense. According to Kinne (1998), the courts’ analysis is inspired by the Merger Guidelines. However, as late as in 1998 no federal court had upheld an otherwise anti-competitive merger on the basis of efficiencies.

The US experience thus indicates that the practical importance of an efficiency defense may be limited, for example due to problems of verification, and since efficiencies may not often be merger specific.

Conclusions

Mergers may produce efficiency gains such as cost savings. Since cost savings lead to reduced prices, mergers may actually benefit consumers even if competition is reduced. Since the positive effects of mergers vary substantially between cases, it seems reasonable that the Commission should also evaluate them case by case. That is to say, the Merger Regulation should allow for an efficiency defense, similar to the US control system.

While making merger control more sophisticated and accurate, and probably at least reducing the asymmetry between small and large member states, allowing for an efficiency defense is not likely to be a cure-all for merger control. The US experience suggests that the efficiency defense will have limited applicability due to the practical problem of verifying future efficiency gains for notified mergers. As a consequence, there is also a need to find additional means of reducing the asymmetry between small and large member states, if the latter is seen as desirable.

5.3 Proposal 2: Reduce market segmentation

The notion of geographical “market segmentation” is central for the discussion of EU merger control and smaller country interests. Roughly speaking, it refers to barriers to the transportation of goods and services. The essential consequence of such barriers is that they provide shelter from outside competition for firms inside the barriers.

Segmentation is what makes it necessary for the Commission to delineate relevant geographical markets smaller than the Common Market. It is also due to segmentation that the anti-competitive effects of mergers of a given size are worse in small than in large countries. Therefore, it seems reasonable to believe that reducing market segmentation is the best way of reducing the asymmetric treatment of companies from small and large member states, in addition to other more direct benefits such policies may have.

Sources of segmentation

There are a couple of distinctions that need to be made. First, one should distinguish between segmentation on the consumer and the producer side of the market. Consumers typically face much higher costs of importing products from other markets than do firms, so that markets are often more strictly segmented on the consumer than on the producer side. Hence, from a competition point of view, the hope often rests with the ability of firms and middlemen to reduce price divergences between different markets.

Another distinction is between *variable trade costs* barriers and *sunk cost* barriers as sources of partial or complete segmentation on the side of the firms. The most obvious example of the former is the cost of physically moving a good from one location to another. For instance, if the value to weight ratio is high, it is not economically viable to transport the product far, and there is a tendency that local producers do not face any external competition. If, in addition, there are pronounced economies of scale, there is a strong tendency for local monopolies to arise.

But there are also other costs affecting the transportation of products in a common market. These often arise when passing national borders, and stem from differences across countries in terms of legislation, culture, language, etc. Much of the EC 1992 Internal Market program was directed at the removal of government-induced barriers of this type, such as differences in product standards, customs red tape, etc. These barriers are referred to as “variable trade costs”, since they depend directly on traded volume.

Sunk cost barriers are of a different nature. They may arise in situations where certain firms have already incurred costs from investments, e.g. in distribution networks, while others have not. These investments are “sunk” in the sense that they cannot be recovered should the incumbent firms decide to leave the market. In situations where incumbent firms have already made sunk cost investments, it may not be profitable for outside firms to enter, if entry requires a significant investment in building up distribution and maintenance networks, and they would face intense competition from incumbent firms after the entry. The asymmetry between the firms thus shelters the incumbent firms from competition from outside.

It is clear that market segmentation is still important in the EU, despite the attempts to reduce it. This is evidenced by the significant price differences that still exist across countries for a large number of products. In particular, it seems as if the Nordic member states are segmented from the other member states. Such geographical segmentation may have important implications for the effects of mergers, as can be illustrated by a few simple examples.

Implications of segmentation for merger control

A central aspect of a common market is that, normally, it does not comprise one homogenous market, but rather a set of markets partly segmented from each other. The assessment of pro- and anti-competitive effects of mergers becomes much more complicated when performed at the level of the common rather than at a national, more homogenous market.

The consequences of a merger in a common market partly depend on the extent to which the markets involved are segmented, and partly whether a merger is domestic or international. Large trade barriers between different countries imply that the anti-competitive effects of a domestic merger are worse than when these barriers are low, since foreign firms are less able to discipline the merged entity when barriers are high. The anti-competitive effect of an international merger, on the other hand, may even be smaller when barriers are high compared to when they are low, the reason being that in the former case, the firms were not engaged in very intense competition before the merger in any event. This argument is especially important for small countries, where the markets sustain fewer active firms. In particular, international mergers may be preferred to domestic mergers in small markets from a competition point of view for this reason.

Can segmentation be reduced?

Some barriers are the result of public policies, and may be changed, while some are the result of the firms' own activities, such as exclusive dealing arrangements, and can be battled using other areas of competition policy. Yet other barriers are the result of factors outside the reach of political influence, for example the costs of transporting goods, or barriers created by linguistic or cultural differences. Furthermore, some barriers are unavoidable negative side-consequences of policies with positive net effects and should not be changed for that reason.

Conclusions

Market segmentation is the root of the problem of asymmetric treatment of companies from small and large member states. The most obvious strategy for curbing the problem would therefore be to hit against the barriers to competition between different countries within Europe, as well as between Europe and the rest of the world. But while there may still be scope for reforms to reduce intra-EU market segmentation, segmentation is likely to remain in the foreseeable future. Reduced market segmentation is thus not likely to be a manageable way of eliminating all the asymmetric treatment in EU merger control in large and small countries.

5.4 Proposal 3: Change geographical market delineations

In the Swedish debate, it has been argued that the method of geographical market delineation is the cause of the asymmetry between small and large member states. Thus, it has been suggested that the Commission should define the geographical market to be union-wide rather than national. We are not convinced by this idea, however. As already argued, geographical market delineations should only be viewed as an administrative technique used to assess the pattern of market segmentation. The Commission defines markets as narrowly as is appropriate to estimate the effect on price in all possible locations. This procedure is necessary in order to correctly assess the effects of a merger on competition and consumer welfare.

It is important to point out that it does not necessarily follow that a merger should be prohibited if dominance is achieved in one or more of these geographical markets. The regulation requires that dominance is achieved in a substantial part of the common market and, depending on the degree of segmentation of the markets, the latter may be a more

encompassing concept than the individual relevant geographical market. In principle, one could thus imagine that a merger is allowed even if it hurts consumers in a certain relevant market, if other consumers gain (which is presumed if there is no dominance). Hence, if anything, it must be the conclusions for merger policy drawn from the information obtained through the relevant market definitions that should be changed, rather than the method of obtaining the information itself.

5.5 Proposal 4: Change the objective of EU merger control

Many economists would argue that mergers should be permitted even if directly harming consumers, if they result in cost savings that more than compensate the direct loss to consumers, from an aggregate point of view. Such a change in the *goals* of merger control, away from consumer protection to the protection of some notion of national welfare, would also tend to reduce the asymmetric treatment of domestic mergers in countries of different size.

Fridolfsson (2002) discusses these matters much more fully, and we will therefore just very briefly mention some of the basic arguments in favour of changing the goals of merger control.

The consumer surplus standard – a means of affecting distribution?

The most obvious reason why competition policy would focus more on consumer welfare than on firms' profits is that the policymaker cares for the distribution of wealth between different individuals in the economy, combined with the idea that firm owners are typically wealthier than consumers. The facts are more complicated, however.

Many "ordinary" consumers are also shareholders, at least indirectly through pension funds. Likewise, owners of firms are also consumers (if they are big on shares they are probably also big in consumption). It is therefore not obvious that a consumer welfare approach will have substantial positive effects on distribution. If that is the case, one may question the idea of forbidding mergers that would increase national income by generating substantial fixed cost savings (which are typically not passed to consumers).

Yet another reason why including the implications for profits in the assessment of mergers might be reasonable is that a significant proportion of the profits made by firms goes to employees. While these types of estimates should be viewed with considerable skepticism, it can still be

noted that a main textbook on Industrial Organization estimates that about 2/3 of oligopoly profits actually end up with employees.

One may also add that there probably exist more efficient policy tools to affect distribution, in particular progressive taxation, public financing of different services and transfers.

We should emphasize, however, that all these arguments are “common sense” arguments and that there exists no research measuring the relative efficiency of competition policy in affecting distribution.

The national champions argument

A somewhat stronger version of the same type of argument builds on variable cost synergies reaped through mergers. According to this “national champion” argument, a merger should be permitted even if it is detrimental to domestic consumer interests through its market power implications, if it reduces the variable costs sufficiently for the increase in profits reaped abroad to be large enough to increase national income. From a national income point of view, there may thus arise a conflict between the increased profits the domestic firms can earn on international markets and the loss for domestic consumers. This type of argument, even though not put as bluntly as done here, has been important in Sweden in most of the post-World War II period, when many Swedish firms were allowed to dominate the domestic market, while successfully competing in export markets. It is not clear to what extent it underlies the current criticism of the EU merger control, even though it appears to lurk in the background.

In principle, there is nothing wrong with the notion that profits in foreign markets may more than compensate for consumer surplus losses in domestic markets. However, for this reasoning to be an argument in favour of allowing such mergers, it must be verified why the same cost reducing effects cannot be obtained through international mergers, or if they can, why the share of the profits from these mergers accruing to domestic firms does not suffice to make them a better alternative.

The consumer surplus standard – a solution to information problems?

The focus on consumer welfare does not seem to be well motivated by distributional concerns. One may therefore conclude that a total surplus standard would be more appropriate – that is, to take into account both the effects on consumers and those on the firms’ stakeholders. However, recent work on informational problems (Besanko and Spulber, 1993; Fridolfsson, 2002) and lobbying (Röller and Neven, 2002) in merger control suggests that there may be good reasons for competition authori-

ties to use consumer surplus as a “tactical goal”, even though the true objective is a more encompassing measure of social welfare. These issues are discussed in more detail in Fridolfsson (2002).

The substantiality criterion and the “give-and-take” problem

Many EU markets are geographically segmented, and mergers in such markets may affect consumers in different countries differently. There may thus be a need for some trade-offs between different consumers. In Europe, the solution to this problem is rather extreme, however. A merger is prohibited if it hurts consumers in *any* significant part of the common market, independent of the effects of the merger in other parts of Europe.

At first sight, it appears that the main beneficiaries of the Volvo/Scania decision, for example, were the customers in Sweden and other small countries where the two companies have large market shares. However, to evaluate this claim, it is necessary to remember that one should evaluate the merger control system as a whole and not only single decisions.

For simplicity, assume that the competition authority must evaluate two mergers and that each merger affects consumers in different markets differently. Merger A reduces consumer welfare in region 1 and increases consumer welfare in region 2. Merger B reduces consumer welfare in region 2 and increases consumer welfare in region 1. Assuming that both regions constitute a substantial part of the common market, the Commission would have to prohibit both mergers. It is entirely possible, however, that consumers in both regions would be better off if both mergers were allowed, that is, it may pay for all consumers to “give” in some markets if simultaneously allowed to “take” in others.

Conclusions

Standard arguments suggest that competition policy should not be used as a tool for redistribution, but to enhance efficient allocations. This would suggest a change in the goals of merger control away from a consumer surplus standard toward a total surplus standard. However, an inherent problem facing merger regulation is lack of information, and there are arguments to suggest that one should give the competition authorities more consumer oriented goals, even if the ultimate objective is total surplus. The state of the art of research on this issue is not yet sufficiently well developed to allow for more definite conclusions. For this reason, and due to the fact that EU merger control is unlikely to be changed in any dramatic fashion, we believe that a solution to the alleged asymmetry problem must be sought elsewhere than through changes in

the current objectives of EU merger control. We do believe, however, that consumer interests in different geographical markets should be aggregated.

5.6 Proposals 5-6: Take alternative mergers and location into account

We will now turn to the core of the policy debate, which can be seen as consisting of two separate ideas/proposals. One is based on the notion that the asymmetry in EU merger control is really not to the disadvantage of firms from smaller countries, if the fact that they can instead merge with competitors from larger countries is taken into account, thus achieving the necessary size for competing in the global markets.¹⁶ More generally, this argument suggests that the Commission should *take alternative mergers into account* when assessing a notified merger. The other argument is based on the notion that the interests of smaller countries may be systematically disadvantaged in certain merger structures, since they may lead to a relocation of production from smaller to larger markets. The argument is thus that the Commission should *take locational implications of mergers into account*.

In this section, we will discuss these proposals within a common framework, since the pros and cons of one of them may depend on whether the other is adopted. Further, discussing these proposals jointly we capture the idea that the Commission should take both alternative merger structures and their different locational consequences into consideration in its assessments. This would be a unique European element of merger policy, possibly motivated by the fact that Europe consists of several segmented markets to a much larger extent than the US.

There are many reasons why the location of firms' headquarters and production may be of concern to countries. For instance, this may have beneficial effects on employment, and may yield spillovers of various forms of know-how. However, these aspects are of little relevance for merger control, as long as its goal is consumer protection. It may thus be considered that the idea to take locational implications of mergers into account in merger assessments is completely unfounded. One of the main purposes of this section is to show how that the relevance of loca-

¹⁶ There are actually two possible interpretations of this suggestion. One is that international mergers are favoured since they reduce competition and hurt consumers less. Another is that international mergers are favoured since they lead to increased economic integration of the member states.

tional effects for merger policy can be expected to depend on the *type* of frictions to trade that exists between different markets.

The analysis is meant to capture salient features of mature or declining markets where there exists a fixed initial distribution of plants and the choice of location is essentially a choice of plant closure. This focus is motivated by the fact that mergers often occur in declining markets, sometimes even as a response to reductions in demand. It may also be suspected that the anti-competitive effects of mergers are more problematic in declining than in expanding markets where new investments and new entry are important and locational choice is more related to greenfield investment decisions.

The analysis is complicated by the fact that, to the best of our knowledge, the relationship between mergers and choice of location has not received any attention in the literature. The discussion must therefore be based on preliminary research (see Horn and Stennek, 2002). Note that the intention is *not* to provide a full-fledged analysis of this question – which would require a much more solid basis in research than currently exists.¹⁷ The idea is rather to point to some issues that would arise in case the Commission were to take possible alternative merger structures into account, and the resulting locational choices, in its decision-making, or conversely, some of the problems that might result if it does not.

In the next section, we will discuss possible outcomes of the interaction between mergers and locational decisions. Policy implications are dealt with in the ensuing subsection.

Location and mergers: An analytical framework

As an analytical aid, we will employ a simple economic model of an oligopolistic industry. To allow for a role for the location of production, we assume that the output of this industry is sold in two markets, “Small” and “Large”. These markets differ in size, as measured by the number of buyers in the respective market, and possibly also in the degree of competition, but they are identical in all other respects. The two markets are completely segmented from each other on the buyers’ side – buyers’ trade costs are thus such that they will never find it profitable to buy abroad. With regard to producers, we will consider two alternative scenarios. In one, there are variable trade costs: when a firm located in one market exports to the other market, it incurs a cost for

¹⁷ One important issue that we abstract from in our analysis is the fact that mergers may trigger new entry, which reduces the anticompetitive effects of mergers, a factor acknowledged in merger control.

each unit delivered. These costs include those of transportation, but should be considered as including all variable costs associated with servicing a market from a foreign location, including difficulties due to different languages and tastes. The increase in delivery time may also be a disadvantage in the era of just-in-time production. The alternative scenario is where fixed cost investments in distribution and service networks are required in order to sell in a market and when some, but not all, firms have undertaken this expenditure. There is thus an asymmetry between firms having already incurred this cost and those that have not. We start with the variable cost scenario, and return to the other scenario later.

It should be stressed that we are not arguing that variable trade costs, or fixed cost of entry, are important in each industry in practice, or even that they are important in some average sense. But it is quite clear that such costs are important determinants of location of production in some industries. Basically, we have drawn on the fields of International Economics/Industrial Organization to construct a simple analytical framework that is rich enough to rationalize the argument that the asymmetry in merger control may have undesirable effects for consumer interests in smaller member states. But theory also suggests other determinants of location. For instance, as highlighted in the literature on economic geography, location may be determined by the balance between various forms of positive externalities in production (i.e., Silicon Valley-type phenomena) that make location in certain areas attractive (including knowledge spill-over and skilled subcontractors) and, on the other hand, high costs of land, labour, etc., in these locations. The choice of which model to apply should obviously depend on the particulars of the market to be analyzed.

In order to capture possible differences between domestic and international mergers in as simple a fashion as possible, let there be four main firms in this market, two in each region, and each operating one production plant. This will allow us to discuss the implications of both a structure where firms merge with domestic counterparts, and where they undertake international mergers. There is also a group of “outside” firms in Large. These firms compete with the other firms in delivering to Large, but as outsiders face sufficiently large trade costs to make it unprofitable for them to serve Small. The reason for including these firms is to allow for the possibility that competition is fiercer in Large. In order to substantially simplify the analysis of the incentives for mergers, the outside firms are not allowed to merge.

The firms first decide whether to merge into two international firms – in this case each firm has a plant in each region – or into two domestic firms, where each firm owns two plants in the same region. The incentive to merge is partly to enhance market power, but it is also to achieve marginal cost synergies (that is, to lower marginal production costs), or reduce duplication in fixed plant costs through the closing of one of the plants in the merged entity.

Choice of location

The advantage of closing a plant is that it saves on fixed costs. Following *domestic* mergers, there is no disadvantage for a firm of reducing the number of plants in the same region since they have enough production capacity, and domestic merger will hence definitely induce firms to shut down one plant each.

After an *international* merger, the decision is more complex, however. When closing the plant in one region, this region must be served from the other market, which has the disadvantage of forcing the firm to bear trade costs that would be avoided if producing locally. Whether a firm finds it profitable to close the plant in Large or in Small, or in neither region, thus depends on the balance between fixed cost savings and increases in trade costs, as well as on market power considerations – being alone in a market sheltered by large trade costs has a significant value to a firm.

The locational decision after international mergers is substantially complicated by the fact that the balance between cost savings, market power effects, etc., depends on the competitor's actions. However, it can be shown that *under certain circumstances, including a sufficiently weak competitive pressure from the outside firms in Large, both international firms will shut down the plant in the small market, regardless of the locational choice of the other firm.*¹⁸ On the other hand, *when the outside firms are sufficiently competitive, both firms will locate in the small region.* This pattern is summarized in Table 5.1.

¹⁸ For both firms to locate in the large region, independent of the other firm's choice, it is necessary that the size difference between the regions is large and that the variable trade cost is relatively small so that the location in the small market does not provide too much shelter from competition.

Table 5.1 Locational implications of domestic and international mergers

	WEAK OUTSIDE COMPETITION IN LARGE	INTENSE OUTSIDE COMPETITION IN LARGE
Domestic mergers	Each firm has one plant only, located in its home country	
International mergers	Each firm has one plant only, located in Large	Each firm has one plant only, located in Small

Domestic or international mergers?

The process of merger formation is likely to differ from that of choosing location in the sense that when choosing location, firms can be expected to act rather independently. Indeed, overt coordination among firms on decisions about location is likely to violate the prohibition of agreements between firms that restrict competition.¹⁹ The merger process, on the other hand, is characterized by (legal) communication between firms, in the form of negotiations, and the possibility of transferring wealth between the parties. In such a negotiation, the participating firms must take into account how their future production structure would be affected by a merger, and how other firms would act with regard to mergers and location. But they must also consider in what *other* mergers they might instead engage, as well as the outside opportunities of their counterparts. It is thus a rather complicated strategic interaction that leads to a pattern of mergers in a concentrated industry, such as the one we are portraying here.

The obvious question is then: which firms are likely to merge in the example we have in mind? A fair amount of research has gone into this question over the years, employing a large variety of different analytical tools. Due to the complexity of the strategic interaction in such situations, the literature has not come up with any clear-cut predictions.

¹⁹ Naturally, this does not imply that such collusion does not occur. Still, one may suspect it to be relatively inefficient (from the firms' point of view) since the firms must enforce the agreements themselves without the help of the legal system and since there is always a risk of being caught and fined. As this is the first attempt to analyze the issue of location and merger, we abstract from these issues for the sake of simplicity.

BOX 1. The Theory of Endogenous Mergers

The emerging theory of endogenous merger aims at predicting which merger will occur when there are many alternatives, using different economic models of bargaining and/or stock market interaction, but it is still in its infancy. Nevertheless, the available results indicate the existence of strong forces directing the firms in highly concentrated markets to maximize industry surplus, despite the fact that there typically exist conflicting interests (see, for example, Horn and Persson, 2001a, b). One may view this as an instance of the much more general Coase theorem.²⁰ Endogenous merger theory also shows, however, that there exist important “frictions” in the process of merger formation. For instance, some mergers that are both profitable to the participants (compared to the pre-merger situation) and the industry as a whole may not occur, or occur only after a delay, if it is even more profitable for the individual firm to unilaterally stand outside the merger. This free-riding problem was first noted by Stigler (1950) and later formalized by Kamien and Zang (1990, 1991, 1993) and Fridolfsson and Stennek (2000b). As a mirror image, some mergers that are unprofitable to the participants and the industry as a whole may nevertheless occur. If it is better to be an insider than an outsider in a merger, a firm may buy a target to preempt a competitor from acquiring those assets (see Fridolfsson and Stennek, 2000a). Since neither the free-riding problem nor the preemption problem appear to be a core aspect of the “small country asymmetry,” we abstract from these frictions for simplicity (this approach is validated in Horn and Stennek, 2002). Finally, we should emphasize that although some of this research provides possible explanations for already existing, and sometimes puzzling, stylized facts about mergers, endogenous merger theory has, so far, been exposed to almost no empirical tests (an exception is Lindqvist and Stennek, 2002).

²⁰ According to the Coase Theorem, independent of the initial allocation of certain assets within a group of agents, and despite the externalities inflicted by one agent’s use of the assets on other agents in the group, the final allocation of the assets between agents is efficient (from the point of view of the group), if there are no transaction costs in transferring ownership between members of the group.

However, some recent research on merger formation suggests that if mergers to duopoly are permitted, the merger pattern will be such as to maximize *industry* profits. This new line of research is called endogenous merger theory and is outlined in Box 1 above. Intuitively, whenever a market structure is about to be realized through mergers that would not maximize industry profits, firms have incentives to rearrange the merger pattern, and will be able to do so, since they are free to communicate with whomever they wish in the industry. We find this prediction sufficiently intuitively appealing for applying this reasoning to the discussion here. Hence, we will assume that as long as both a pattern of domestic and a pattern of international mergers are allowed, absent any policy intervention, the resulting duopoly structure will maximize the industry profits.²¹

Then, what is the implication of this assumption for the predicted merger structure? Generally speaking, the firms' choices between domestic and international mergers depend on the balance between the magnitude of trade costs, and market characteristics such as the intensity of competition in Large, and the relative magnitude of the two regions. When trade costs are very substantial, it becomes very difficult to compete effectively from a foreign location. Under such circumstances, there is a tendency toward domestic mergers, since the merged firm in Small will essentially be a local monopoly. Each of the merged firms will then close one of its local plants to save on fixed costs, as explained above. In this case, when trade costs are high, the merger pattern is essentially driven by *market power* aspirations.

On the other hand, when the variable trade costs are relatively small, there will be international mergers. Firms then know that the future pattern of location will be determined by the degree of competition in Large. When there is little competition from outside firms, locating production to Large will be attractive for both firms, since this will limit the trade cost expenditures. But, when competition is quite intense, it is very hard to make any profit at all in this market, and it is then better to locate in Small, since this minimizes trade costs. Hence, in these cases, *reduced trade cost expenditures* is the main factor driving mergers.²² The above outcomes are summarized in Table 5.2.

²¹ In our example, we assume that a merger to monopoly would not be allowed by the "Commission".

²² Note the dual role of trade costs. On the one hand, trade costs provide shelter from competition. On the other hand, they must be incurred by the firms. When trade costs are high, the former effect is more important for the firms' merger decisions, while the latter effect dominates in markets with low variable trade costs.

Table 5.2 Merger and location patterns

	WEAK OUTSIDE COMPETITION IN LARGE	INTENSE OUTSIDE COMPETITION IN LARGE
Large variable trade costs	Domestic mergers; production in both countries	
Small variable trade costs	International mergers; production in Large only	International mergers; production in Small only

Distribution networks

The Volvo/Scania case suggests that in some markets, the segmentation of different regional markets may rather be connected to differences in sales and maintenance networks, and differing technical standards, than to variable trade costs. To capture this, let us assume that the variable trade costs are small, but that investments of a certain magnitude are instead necessary in order to serve a region. The two local firms in Small have already made such investments both in Small and in Large, but the two main firms in Large have only invested in such infrastructure in their domestic market. Hence, in order to serve the Small region, it is necessary to have access to one of the two firms in this region, whereas all firms can serve the Large region.

Following *domestic* mergers, each firm closes one plant if the fixed cost saving is large enough. The merged entity in Large only serves its home market, if (which is assumed here) the investment cost required to serve Small is too large relative to the limited size of this market. The firm in the small region will thus have a local monopoly in this market, but it will also sell in Large, where there may be more intense competition. Following *international* mergers, on the other hand, both firms have access to distribution networks for both markets. Absent variable trade costs, the firms are indifferent between the two locations, independent of the other firm's choice. But, presuming that there are some smaller variable trade costs and that competition in Large is not too intense, both firms will locate in Large. In the merger negotiations, the firms foresee the different choices of locations resulting from domestic and international mergers. As a result, the firms will always choose domestic over international mergers, due to their anti-competitive effects in the small region.

Thus, in the case where segmentation is partly supported by distribution networks, and where firms from the smaller region have invested in

networks for this region, there is a presumption that market power driven mergers will be proposed in the smaller region.

Implications for merger control

So far, we have highlighted some determinants behind mergers and location patterns. Against this background, we will now discuss some aspects of EU merger control.

EU merger control prohibits a merger if it “creates or strengthens a dominant position”. The basic idea behind this test is to protect consumer interests. If the merger leads to dominance, the anti-competitive effects are presumed to dominate any efficiency gains or other beneficial effects of the merger. If the merger does not lead to dominance, the positive effects are presumed to dominate. In practice, these legal criteria fall short of a full cost-benefit analysis. Thus, even if the dominance test may be a useful tool, perhaps even producing accurate information in some average sense, it is still probably an imperfect predictor of the effect of a merger on consumer welfare in individual cases. As a starter, however, we give the Commission the benefit of the doubt and simply assume that the legal criteria correctly assess the effect of mergers on consumer welfare.

We assume that the two regions are both sufficiently segmented to be considered as separate geographical markets and sufficiently large to be considered as substantial parts of the common market.

Should location be of importance?

In the above framework, there is a special case of interest for the Swedish policy debate, which arises when competition in the large market is not too intense, and the trade cost is of an intermediate magnitude. We may then have a situation where firms will seek to undertake domestic mergers entailing local production but where, at the same time, they will both choose to locate in Large if domestic mergers are prevented. This case roughly reflects the notion put forth in the debate that the Commission’s blocking of domestic mergers in small countries will induce international mergers that will eventually lead firms to concentrate their production to large regions only, to the detriment of small member states.

In our view, this possibility is less obvious than it might first appear. After all, if firms seek to merge domestically, which is when the asymmetry is mainly of importance, they seem to prefer to be located in their respective home countries, yielding a geographically dispersed pattern of

production. One may then reasonably believe that the firms would also choose to locate in separate countries following international mergers. If so, the asymmetry in the merger control would not be of great importance for the actual outcome.

The reason for this somewhat counter-intuitive result is the difference in the nature of the merger game and the location game. Following an international merger, the firms will find themselves engaged in a non-cooperative location game where the outcome is inefficient from the point of view of the firms. Both firms may locate in the large region, since they do not take into account the negative externality (a business-stealing effect) their choice of location will imply for the competitor. In the merger game, however, the possibility for firms to negotiate with each other and transfer wealth, actually makes them internalize these externalities. Thus, they merge domestically to ensure location in different regions, which maximizes the aggregate profit.

There are many reasons why loss of production hurts the small country. It reduces the demand for the types of labour used in the affected industry, which will cause lower wages, increased unemployment, or both. From a regional perspective, the reduction in demand may be large, even if only one or a few firms in the small country are affected. The negative effects of the relocation of production may also be multiplied by the negative repercussions for other firms in the economy, such as subcontractors. At the same time, the loss of production hurts the public finances in the small country by reducing the tax base. Our interpretation of the debate in Sweden is that it is primarily the fear of such negative effects on the factor markets that is the cause of the critique of EU merger policy. Our analysis shows, however, that blocking domestic mergers in favour of international mergers may also hurt consumers in the small country.

Suppose that the competition authority effectively chooses whether to accept international or domestic mergers *without* taking plant closures into account. Firms do not relocate after domestic mergers, and the resulting prices are thus those predicted by the Commission. With international mergers, however, the evaluation of the anti-competitive effects is erroneously based on the assumption that the two merged entities will maintain their production in both markets. In practice, however, firms will locate in Large, serving Small from a foreign base and with higher variable costs than they would have had, had they maintained the local plants. Hence, in this example, *by disregarding locational implications, the competition authority underestimates the negative impact of the international merger on competition in Small*. It may thus prohibit

domestic mergers, believing that international mergers better serve small country consumer interests, thereby hurting the very same consumers. More generally, not taking locational consequences into account tends to bias the assessment against the country that does not attract investment.

This example highlights conditions under which the above-mentioned critique of the Commission's policy may be valid. But it can be noted that the conditions identified by this example are rather special: on the one hand, there must be substantial segmentation, otherwise the firms' first choice would be to merge internationally to save on transportation costs. A negative attitude toward domestic mergers has no consequences. On the other hand, the regions must not be too segmented; otherwise firms would choose different locations following international mergers in order to benefit from local monopoly power.

Our analysis also shows that the "Nordic critique" also crucially hinges on the intensity of competition in the two markets. If there is much more competition in the large than in the small market, more and not less production may be located in the small country following international mergers than following domestic ones. In this case, the Commission's skepticism against domestic mergers may be beneficial for the small region.

It is also important to emphasize that the negative effect on consumers builds on variable trade costs being a source of trade friction, and does not work with investment in distribution and service networks as barriers between markets. Since many trade costs are fixed rather than variable, and since many of the variable trade costs have been reduced in Europe as a result of the creation of the common market, it is questionable whether this effect is actually quantitatively important.

Should alternative mergers be of importance?

When regional markets are sufficiently segmented, they are treated as different relevant geographical markets, and the effect of a merger is assessed separately in each region. As we have seen, it is possible that international mergers may give rise to the same cost savings as domestic mergers, but with less distortion of competition. It thus seems reasonable that the Commission takes into consideration alternative merger structures that might arise as a consequence of blocking a proposed merger.

Attractive as it seems, such a merger policy may face serious problems. First, as we saw in the example above, consumers may be affected differently by different merger structures because of relocation of production in certain structures. A merger policy that considers these latter structures as alternatives to other proposed structures, but does not take

into account locational implications, will be based on erroneous premises, and would tend to be biased against the countries losing the production.

A second, and potentially serious, problem stems from the fact that each “substantial part of the common market” has “veto power”, in the sense that it suffices to find negative effects in one of these substantial parts for a merger to be blocked. This decision criterion may work well as long as a merger affects consumers in different substantial parts of the common market either in the same direction, or not at all. But it might run into problems when consumers are affected differently, which is possible when mergers have locational implications,²³ as we have seen above.

To highlight the potential severity of these problems, consider what may appear to be the “ideal” merger policy, a policy that (i) compares notified mergers with their relevant alternatives, (ii) requires that consumers must be made better off (compared to the relevant alternative) in all regions, and (iii) that takes the implications of location into account. By requiring that consumers in *each* substantial part of the common market prefer a proposed merger *to the outset*, the “veto power” criterion is a rather stringent condition generally speaking. However, with this type of policy, which compares *more than one merger structure*, the criterion becomes even more conservative. To see why, consider a proposed domestic merger. When international mergers are taken into account, not only must the proposed merger be better for consumers in each substantial part of the market as compared to the outset, *in addition, there must not be any such group of consumers who would prefer the international structure*. The inclusion of alternative merger structures in the assessment may thus make it very unlikely that a merger is accepted, even if it were to improve the situation for *all* consumers relative to the outset.

For instance, in our framework above, suppose that an international merger would lead to a relocation of production to Large, and that consumers in Small would therefore prefer domestic mergers to international mergers, while consumers in Large would prefer international mergers to domestic mergers. However, both groups would prefer any of the mergers to the outset. The Commission would now conclude that a proposed domestic merger could not be accepted, since when ranking the proposed

²³ Another example is that a merger which both reduces competition and reduces marginal costs may benefit consumers in regions where competition is intense while harming consumers in regions with little competition.

merger against an international structure, consumers in one substantial part of the common market – Large – would prefer the latter. On the other hand, if an international merger were proposed, consumers in Small would object, and the merger would thus be blocked. Consequently, *neither merger structure would be accepted, despite the fact that both are preferred to the outset by both groups of consumers.*

Then, what is the source of this problem, and how generic is it? The problem arises due to a combination of two factors. First, the Commission in our example takes into account more than one alternative to the proposed merger structure, and second, the locational implications of mergers, which tend to make consumer interest diverge in the two regions. Hence, in any situation where there is such a divergence and alternative structures are taken into account, this problem is likely to arise.

A third serious set of obstacles facing a merger policy seeking to take alternative merger structures into account, is the practical problems it would face. A first problem is to correctly predict the alternative mergers that will be proposed if the one under scrutiny is rejected. Here, the Commission would largely have to rely on *fingerspitzengefühl*, since economic theory gives very little guidance. A second problem is how to evaluate the implications of the alternative mergers. The Commission can obtain information about a notified merger from participating firms, but this is not possible for mergers that are not yet notified.

The conclusion is hence, that while taking alternative mergers into account seems intuitively attractive, this is likely to be associated with serious problems.

5.6 Summary and concluding discussion

The chapter has discussed a number of issues that arise when evaluating the criticism of EU merger control from the point of view of smaller member states. The main conclusions can be summarized as follows:

1. *Are there systematic differences in the treatment of mergers in small and large member states?*

Yes, in a certain sense. The combination of the fact that smaller EU member states are interpreted to constitute “substantial parts of the common market”, and the requirement that a merger must not create or enhance dominance in any such part, gives rise to an asymmetry when markets are segmented along national borders.

2. *Does the asymmetry in merger control have implications for firms' choices of location?*

The answer to this question is less obvious than it might appear. After all, if firms seek to merge domestically, which is when the asymmetry is of main importance, they seem to prefer to be located in their respective home countries, yielding a geographically dispersed pattern of production. One may then reasonably believe that the firms would also choose to locate in different countries following international mergers. If so, the asymmetry in the merger control would not be of great importance for the actual outcome.

In order to identify circumstances, under which firms would actually locate in the larger region following international mergers, we investigated a simple framework. In the model, three forces determine locational choice following an international merger. First, firms tend to prefer to locate in the large region in order to avoid trade costs in servicing the large market. Second, they tend to prefer to locate in the small region since competition may be more intense in the larger region. Finally, there is also an advantage from locating in different regions (as they would following domestic mergers), by limiting competition.

In this framework, firms locate in the larger region following international mergers under certain circumstances, but prefer domestic mergers entailing local production to international mergers. The reason is that the firms in the location game do not take into account the externalities of their choices on their opponents. They may well locate in the same region (e.g. the large one) despite the fact that this entails a reduction in aggregate profits, due to a "business stealing" effect. In the merger game, however, the firms may transfer wealth between themselves, thereby enabling them to better internalize such effects.

Hence, scenarios can be constructed where the claim that the asymmetry is important for firms' choice of location is validated. However, the conditions under which this occurs are rather restrictive, at least in this framework.

3. *Are smaller member states adversely affected by the asymmetry?*

Yes, this is possible, at least in theory. Much of the policy discussion has focused on the effects of mergers on factor markets. In particular, there is a widespread fear that relocation of production to larger regions may reduce employment in smaller regions. EU merger control, on the other hand, is mainly concerned with consumer welfare, and in this sense, the critique may at the same time appear relevant to smaller country governments and irrelevant from the point of view of the Commission. But

as we have shown, location may also be of importance for consumers. In particular, if competition authorities block domestic mergers (entailing local production), hereby promoting international mergers (entailing concentration of production to the large region), consumers in the small region may be hurt, since they must pay the higher prices associated with the higher variable trading costs.

More generally, if the assessment of the effects of mergers does not take locational consequences into account, the procedure tends to underestimate the negative impact on competition in the regions from which the firms relocate.

4. *Should the Commission take alternative mergers into account when assessing notified mergers?*

We made several observations concerning the role of alternative mergers in merger control:

- Taking alternative mergers into account has positive consequences under certain conditions.
- Taking alternative mergers into account without also considering location may harm consumers in small countries.²⁴
- Taking alternative mergers into account may lead to an overly restrictive merger policy when markets are segmented, as long as mergers are blocked if they create dominance in any significant part of the common market.
- It would be exceedingly difficult in practice to take alternative mergers into account in a systematic fashion.

We thus believe that at the current state of affairs in economic research, the Commission should not take into account alternative mergers, and in particular not if the current interpretation of the “substantial part of the common market”-criterion is employed. Intellectually unsatisfactory as it might seem, the Commission should evaluate each notified merger as if the alternative to accepting the merger is no merger at all.

²⁴ Not taking location into account may lead to problems also if the Commission does not consider alternative mergers. However, if the Commission considers alternative mergers, the problems can be expected to be worse, since this will tend to favour international mergers over domestic mergers in segmented markets.

5. *Should the Commission take location into account when assessing mergers?*

Our findings with regard to location are the following:

- The claim that international mergers may lead to different patterns of location than domestic mergers can be supported by theory in a plausible fashion.
- International mergers *may* be detrimental to consumer interests in smaller member states. However, it is unclear how likely this is. In the analytical framework we have relied on, this claim is only true for a limited set of parameters, and it relies on the existence of significant variable trade costs.
- As far as we can see, it would not involve any fundamental problem if the Commission were to take locational implications of mergers into account, only practical (and possibly legal) difficulties. We can thus not see any reason why the Commission should not do this, provided – and this is likely to be a severe constraint in practice – it can reliably predict the implications for location.

Where does this leave us then; should we accept the asymmetry? It should first be noted that the empirical magnitude of this problem is unclear. We would therefore be reluctant to propose any changes in current practices solely to solve this alleged problem, before it has convincingly been shown that the problem is real. But, in our view, if one nevertheless were to seek to remove the asymmetry, several of the remedies suggested in the debate should be avoided, including changes in relevant market definitions. The most natural change to current procedure would be to introduce an efficiency defense and explicitly weigh consumer interests in different substantial parts of the market, and make a judgment on the aggregate effects. It may also be natural to take locational implications of mergers into account. It is not clear, however, that such a reform would be quantitatively important, due to the difficulties in predicting location and since it is questionable to what extent location actually affects consumer prices. In the longer run, the problem will hopefully be resolved by reduced market segmentation.

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