



The Economic Analysis of Mergers

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AND COMMERCIAL DIPLOMACY

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Preface

With the growing internationalization of markets, and the adoption of liberalization programs worldwide, nations in transition to a market economy have sought mechanisms intended to defend the process of competition. Antitrust policy or, as it is known beyond our borders — Competition Policy — contains the promise of consolidating the gains from liberalization. Few are unaware that the benefits and promise of markets can be sustained only to the extent that consumers and producers are assured that the rules of the game are transparent, responsibly enforced and impartial.

The *Center for Trade & Commercial Diplomacy*, a graduate education and research center, has gathered a number of international competition policy experts with significant experience on the competition problems of foreign countries. Early on, we understood the need for a flexible, thorough and time-tested tool-kit for competition policy practitioners. This current volume is our response. It encompasses an important element of competition policy, the evaluation of mergers. Written as a "how-to" digest, it is nonetheless a 'state of the art' effort on the practice of antitrust enforcement. Its objective is to facilitate the professional enforcement of antitrust laws.

Its authors, Dr. Malcolm Coate of the U.S. Federal Trade Commission and Professor A. E. Rodriguez of the Monterey Institute of International Studies bring years of experience in domestic and international competition policy to bear. Their research on the problems facing the new competition agencies of recently liberalized economies, identified the advantage of methodological unity and transparency in the enforcement of competition laws. Such a view benefits the analysis of competition issues both for domestic purposes and with a view towards clarifying the rules of the game for prospective international investors.

This volume is intended for the competition policy practitioner, whether a government official, a private sector attorney, or economist, and may be useful for scholars who would like an understanding of how theory meets practice. But the general approach should extend beyond antitrusters; specifically it should facilitate methodological consistency in the treatment and analysis of competition issues between the various areas of competition policy: antitrust, antidumping and countervailing duties, intellectual property, banking and other regulatory initiatives. And despite drawing on the US's experience of antitrust enforcement for its core message, it includes substantive aspects of the European Union's experience as well as lessons from countries who have only recently inaugurated competition policy efforts. While it was being written, the manuscript served to hone the skills of a number of Federal Trade Commission employees. It was also used to train a number of foreign competition policy officials at the FTC.

As we see the world trade arena evolving, the *Center for Trade & Commercial Diplomacy* will continue to engage the issues of importance to the international business community. We hope that this volume entices you to remain with us as we chart exciting and novel initiatives.

Geza Feketekuty

Director

Center for Trade & Commercial Diplomacy
Monterey Institute of International Studies

A Note from our Series Editor

Welcome to the first in our series of Occasional Studies in International Trade & Commercial Diplomacy. The present work by Dr. Malcolm B. Coate and Professor A. E. Rodriguez is our attempt to fulfill our charge to make a difference in current debates of interest to the international trade community. As trade continues to grow worldwide, competition policy promises to be an area of ongoing interest and controversy. The prospects of abuse and mismanagement of competition initiatives in developing as well as developed countries heightens the need for a professional approach to its enforcement. The current volume provides a solid approach to the analysis of competition issues based on sound economic theory combined with practical experience.

The *Center for Trade & Commercial Diplomacy* is an educational and research institution affiliated with the Monterey Institute of International Studies. Our educational mission is to train the coming generation of commercial diplomats. The CTCD's multidisciplinary program in the emerging field of Commercial Diplomacy is the vanguard in the training of government officials and business executives who are able to smoothly manage the increasingly complex relationship between global corporations and national governments.

Our research functions encompass numerous issues including the close examination of important developments in trade policy, their implications and the approaches for dealing with them. The CTCD is funded by the U.S. government and by the Monterey Institute of International Studies and is completely non-partisan.

Professor Chi Zhang
Series Editor
Center for Trade & Commercial Diplomacy
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Authors Preface

Over the years, as antitrust practitioners and as economists, we have noticed that antitrust policy often lags in incorporating economic learning. Fortunately, antitrust policy grows and evolves naturally, enriched by debate and input from a number of fronts. Thus, we were confident that our observations and suggestions would find a receptive audience, if only we would systematically put them on the table. The problem was that such projects, by their nature and our disposition, necessarily fall behind in the queue of the myriad other projects and obligations.

A natural avenue to gather our notes and thoughts on this matter emerged not long ago with a relatively new role for us. As foreign countries moved towards free markets, they adopted many of the institutions that are viewed as necessary to maintain and enhance confidence in the market system. One of these ancillary mechanisms was antitrust, known abroad as competition policy. Many of these foreign governments turned towards the Federal Trade Commission for training and expertise in competition policy. Thus, in addition to our normal antitrust caseload, we both found ourselves training and advising foreign antitrust practitioners who were to be soon enforcing the competition laws of their countries. At the time, and to our surprise, despite the US's long tradition in antitrust, we found few textbooks suitable for this purpose. We believed it was a good time as any to write out the analytical approach which we had been assembling over the years. The result is this monograph.

When viewed as a tool that will easily transfer to foreign settings, the applicability of our approach to the practice of antitrust policy is readily appreciated. Since institutional detail varies from country to country, it becomes clearer that the methodological unity which underscores the practice of antitrust must be provided by economic theory. This is, of course, our message.

In draft stage, portions of this monograph have been used by practitioners at the FTC, and several foreign competition agencies, including the Comisión Federal de Competencia in Mexico, ProCompetencia in Venezuela and Indecopi in Peru. We are happy to report that it has been well received and used extensively. Moreover, we have benefited from their comments, criticisms and enthusiasm.

The evaluation of the likely competitive effects of a proposed merger or acquisition is one of the more complicated tasks facing antitrust regulators, because almost all of the analysis is, by necessity, forward looking. The U. S. Merger Guidelines offer a structured approach to solve this merger enforcement problem. By gathering information on a market and using the construct of a hypothetical price increase, it is possible to predict the profitability (and hence the likelihood) of an anticompetitive effect. A final stage balances efficiencies with the expected anticompetitive effects to generate the appropriate regulatory response.

Although the Guidelines technique is relatively straightforward, misinterpretations are possible and could lead to incorrect policy decisions. Based on our experience, we have compiled a list of 10 common errors in the application of the Guidelines construct. We believe our detailed discussion of the Guidelines will minimize the occurrence of these and other application problems.

TEN PITFALLS TO AVOID IN MERGER ANALYSIS

1) High Herfindahls Cause Competitive Problems

Herfindahl statistics are really only useful in defining safe harbors where no enforcement is necessary. Anticompetitive effects may not occur even if the Herfindahl is very high.

2) Market Structure Often Generates Collusive Outcomes

While a merger could enhance the likelihood of collusion, mergers in many concentrated markets do not affect the probability of collusion. For a competitive concern to be valid, the merger must change an aspect of the market structure, facilitating an anticompetitive price rise.

3) Dismiss Efficiencies as Speculative

Although a reasonable case can be made for ignoring speculative efficiencies that could be captured without a merger, it is important to realize that anticompetitive effects are often equally speculative. All potential efficiencies should be measured and balanced against potential adverse effects to predict the likely net effect of a transaction.

4) Survey Responses of Inframarginal Firms

A number of the Guidelines' questions focus on the expected responses of market participants. Unless the investigation surveys all the affected firms, the analysis must focus on the responses of the marginal firms that may react to a change in market incentives, not the inframarginal firms that (by definition) do not respond to changes in incentives.

5) Focus on a Five Percent Test

In market definition, the price test determines if customers are likely to switch to firms outside the market. It would be naive to use a five percent standard to justify a narrow market definition, if the evidence suggests that an individual customer would not even change suppliers within the market for the five percent price increase.

6) Base a Unilateral Theory only on Market Share

Although the Guidelines advance a 35 percent post-merger share as establishing a presumption of an anticompetitive effect, evidence is really required to support a competitive concern. An understanding of the nature of competition must be obtained to ensure that the share statistic has some relevance.

7) Require Evidence on Actual Entry

The Guidelines describe a detailed analytical technique for inferring the likelihood of entry. This approach avoids the complications associated with attempting to induce firms to speculate on hypothetical entry decisions. While evidence of actual intentions to enter tends to imply entry is likely, information on the lack of those intentions is not relevant to the Guidelines' entry analysis.

8) Substitute Interviews for Analysis

The Guidelines rely on information gathered from numerous market participants and thus it is tempting to ask firms for their opinions on a merger. However, it is important to note that merger analysis is not a popularity contest. Customer and competitor complaints are primarily relevant for the explanations of why they are concerned, not the fact that they are concerned.

9) Consider Guidelines Issues Sequentially

Although the Guidelines are constructed as a series of questions, the bottom line conclusion of the Guidelines analysis depends on the expected profitability of a hypothetical price increase. Thus, all the Guideline responses must be considered in a simultaneous evaluation of likely competitive effect.

10) Naively Balance Efficiencies and Anticompetitive Effects

The Guidelines offer little guidance on how to trade off efficiencies and anticompetitive effects. Aside from the standard debate between the consumer surplus (price test) and social welfare (balance of savings with deadweight losses), an efficiency tradeoff must consider both the likelihood and long run nature of the two effects. Likely, long run efficiencies are probably going to outweigh speculative, two year price increases, regardless of the overall standard.

Acknowledgements

The analyses and conclusions set forth in this paper are ours and do not necessarily represent the views of the Federal Trade Commission, any individual Commissioner or the official position of any Commission Bureau. We would like to thank Mark Williams for assistance on competitive effects section of this project, Jeffrey Fischer for helpful comments on previous drafts of the manuscript and all our colleagues at the Bureau of Economics for sharing their insights on antitrust with us over the years. Sharona Wolkowicz carefully edited our work and did a superb job in catching bloopers and mistakes. Of course, any remaining errors — in form or substance — are ours. We would like to convey special thanks to Geza Feketekuty, the director of the *Center for Trade & Commercial Diplomacy* for his careful direction and interest in our work. Geza's vision and influence in international competition policy is well known in the international trade community. He does not necessarily share our views on merger enforcement and antitrust practice but his unqualified confidence in the healthy debate of ideas is certainly ours.

We would like to dedicate this monograph to Christina and Andrea, our daughters, our joy.

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I. INTRODUCTION

Merger analysis is a question of economics. Although policy makers may differ with respect to the standards for judging mergers, the principles of economics structure the analysis.¹ Competitive concerns associated with monopoly, oligopoly or market dominance all generate the same basic types of questions. Information on markets, concentration, competitive effects, entry conditions, and efficiencies are all required to evaluate a merger. Once these economic questions are answered, the merger analyst must evaluate the facts with the relevant policy standard to determine if the merger should be allowed to proceed without a challenge.

This monograph addresses the crucial questions that should be asked in all merger investigations. The structure largely follows that of the U. S. Merger Guidelines, although the analysis is presented in greater detail.² Section II focuses on market definition, addressing both product market and geographic market issues and commenting on the identification of the firms in the market. Given a market, the next section discusses how to define a Herfindahl-based concentration statistic. Assuming the concentration is

¹ The goals of antitrust policy range from maintaining competitive prices (preserving consumer surplus) to maximizing social welfare. Differences in policy goals can be addressed in a final analysis since all goals are concerned with both the expected magnitude of the anticompetitive price increase and the merger-related efficiencies. It is beyond the scope of this paper to advise liberalizing economies on the appropriate antitrust policy goals. Because the monopoly problem is analytically derived from neoclassical economics, the modeling of firm behavior adopts the profit maximization assumption underpinning neoclassical analysis. Advanced considerations such as transaction cost analysis and agency theory can be easily integrated into the evaluation if the available evidence suggests that these models should be applied.

² For alternative presentations, the interested reader could consult Salop (1984) or Blumenthal (1993). Of course, an overview of merger policy is limited in its comprehensiveness and an interested reader can obtain more detail and alternative techniques in the professional literature. General references for theory include Carlton and Perloff (1990) and Scherer and Ross (1990), while Gellhorn and Kovacic (1994) serves as a good reference on the law. Coate and Kleit (1996) represents a timely reference on policy. While some could argue that the U. S. Merger Guidelines have limited applicability for foreign antitrust policies, the basic economics underlying the Guidelines is universal. Policy makers can differ on antitrust exemptions (declining industries, failing firms or crisis cartels), burden of proof issues, relevance of market dominance or balancing efficiencies with anticompetitive effects and still apply the same general analytical structure.

relatively high, section IV describes an approach to investigate the likely competitive effect of the merger using both coordinated interaction and unilateral theories.³ Given the merger is likely to lead to some type of anticompetitive effect, section V explores the timeliness, likelihood and sufficiency of entry. Section VI evaluates the relevant efficiencies that could result from the merger to complete the step by step analysis. The final section aggregates the analyses and addresses the various policy decision rules. Although less structured approaches to antitrust are possible, the overall focus on the likely competitive effects of the transaction tends to ensure a similar policy conclusion.⁴

It is important to note that a merger is unlikely to adversely affect competition if the market is unconcentrated, the market conditions are incompatible with an anticompetitive effect or entry is easy. Therefore, merger analysis can be truncated after any of the analyses undertaken in sections III to V suggest that the merger is not likely to lead to a price increase. However, even if all the individual analyses point to an anticompetitive effect, the various factors must all be considered simultaneously before one concludes that the merger is likely to lead to a competitive problem. Moreover, if the analysis points to a likely anticompetitive effect, efficiency considerations may argue for allowing the merger.

Each analytical section follows the same basic format. After presenting initial background material describing the importance of the concept and noting how the issue was addressed in the past, the section presents a brief overview of the particular analytical

³ The unilateral effects theory incorporates the concept of market dominance in which one firm is able to affect competition in the marketplace

⁴ Antitrust laws often list a series of factors that affect the legality of a proposed transaction. In general, these issues address key economic considerations required by a competitive analysis or define specific exemptions to the standard enforcement policy

concept contained in the Merger Guidelines. More detail is then added through a list of questions that should generally be answered before completing the investigation. Each section concludes with a hypothetical application of the relevant standard.

It is important to note that merger analysis is interested in the behavior of marginal and not average firms, whereas a naive survey of likely behavior will generate data on average and not marginal firms.⁵ If this average information is to be of use in the analysis, the underlying causes of the data must be identified and then an explanation offered for why these factors apply to marginal firms. Alternatively, the marginal firms could be directly surveyed.

Every merger involves a unique set of circumstances. Obviously, space constraints preclude a detailed discussion of all the possible questions, so some customization of any investigational plan is required. Often only a few issues will require detailed attention, so a quick investigation may answer most of the questions and allow the analyst to focus the bulk of the analysis on the key concerns. For example, in some cases, the market may be defined with just a cursory review, while in others, barriers to entry can be easily established. On the other hand, the analysis of market definition or barriers may be quite difficult. It may prove useful to estimate statistical models to identify a market or create financial models to predict the profitability of entry. Of course, in any merger analysis, the analyst should never lose sight of the basic goal — to determine if the transaction in question is likely to lead to an anticompetitive price increase and whether this price

⁵ The responses of the marginal firm are important on both the buyers' and sellers' side of the market. Marginal buyers can switch purchases away from the monopolized product, while marginal sellers can undercut the monopoly price either by expanding their output if they are already in the market or entering the market if they do not have a product offering. Thus, all the information gathered during the investigation must address marginal firms who may respond to monopolistic pricing.

increase is likely to be balanced by other procompetitive effects.

Finally, the Guidelines allow the analyst to move beyond an evaluation of a transaction based on customer opinion and documents to one based on an understanding of the functioning of a market. Documents and expert opinion play a role in understanding how the market functions, but do not represent a substitute for analysis. If the Guideline analysis conflicts with the available expert opinion and/or internal documents of the merging parties, all the evidence needs to be reexamined. In some cases, the detailed analysis will suggest the experts are biased or the documents misleading, while in other cases, the reexamination of the Guideline analysis will lead to implications that match the exogenous evidence.

While this study focuses on merger analysis, many of the economic techniques discussed below can be applied in non-merger cases and other economic analysis. For example, market definition is useful for any antitrust investigation. Likewise, ease of entry impacts on the profitability of a predation scheme. Competitive effects analyses can be undertaken in horizontal agreement cases to conclude that the activity in question requires coordination among the market participants and therefore it is reasonable to infer an agreement from ambiguous evidence. Moreover, market analyses are also required in other policy analysis areas (international trade), as well as in business strategy and corporate planning.

II. MARKET DEFINITION

Market definition is generally considered the first stage in antitrust analysis.⁶ It sets the foundation for the competitive analysis of concentration, competitive effects, entry conditions and to a lesser extent, efficiencies. While it is possible to adjust the later analyses to compensate for oversights in market definition, the conclusions reached in the market definition section often have significant ramifications for the overall evaluation of competitive effects.

The market definition inquiry consists of three steps: first, defining the relevant product market; next, distinguishing the relevant geographic market; and finally, identifying all the firms that participate in the appropriate product and geographic market.⁷ Product market definition seeks to highlight all the products that can be considered meaningful substitutes for the product under study. Geographic market definition attempts to define the spatial scope of the market. The final analysis identifies all the firms that are able to offer products for sale in the relevant market in a reasonable time period.

The conventional concept of an economic market has been surprisingly difficult to utilize in antitrust analysis. The textbook market assumes competition between numerous

⁶ A per-se analysis could be undertaken without an analysis of market definition, because the investigation could focus on the prohibited behavior. However, activity is only per-se illegal in limited circumstances which may involve the definition of a market. For example, tying is considered per-se illegal. However, the products must compete in separate markets to be tied (i.e. left shoes are not tied with right shoes). Likewise, price fixing is often inferred from the available evidence, so economic analysis suggesting a price agreement would be unlikely to succeed could be relevant to the inference of an agreement.

⁷ Market definition can also be undertaken by defining the market on the demand side (primarily the Guidelines identification of product and geographic market) and then defining the market from the supply side (primarily the identification of the firms that compete in the market, regardless of their existing sales). However, supply-side substitutes could be included in the demand side market if competition with firms currently participating in the market precludes a price increase within the market (the analysis that leads to a world market in response to exports is an example of this principle). Thus, if an antitrust policy mandates definition of the market from both the demand and supply sides, the questions in section II-E become relevant to the initial market definition exercise.

buyers and sellers in addition to homogeneous products, perfect information and costless transactions. These factors force the product price to a uniform level. In reality, products reflect varying degrees of substitutability, with firms often operating in environments characterized by limited numbers of rivals, heterogeneity, imperfect information and high transaction costs. Thus, the observation of a uniform price cannot be used to rigorously define a market. As a consequence, a considerable body of literature discussing how product and geographic markets should be delineated for antitrust purposes has emerged (Elzinga and Rogowsky, 1984).

Establishing relationships between prices for products believed to be substitutes (i.e. estimating cross elasticities) is an intuitive approach to market definition. Indeed, although uncertainty and other market factors suggest that prices may not be identical at any point in time, some economists have argued that prices will tend to uniformity within a relatively homogeneous market (Stigler and Sherwin, 1984). Various statistical approaches, such as correlation or even cointegration, can identify general relationships among the prices of relevant products (Rodriguez and Williams, 1993). If the prices are not related, the conclusion that the products belong in different markets may be justified. However, the opposite is not necessarily true⁸. Moreover, even if advances in econometric techniques allow for the construction of a statistical market definition test, the merger analyst may not have sufficient data to apply the procedures due to the fast paced nature of the investigation and the heterogeneity of the products being considered. Thus, more

⁸ For example, a correlation between the prices of two goods does not always imply that the products are in the same market. If factors such as input costs affect the prices of both goods simultaneously, correlation may be found. Thus, a correlation between the prices of relevant products is a necessary but not a sufficient condition for establishing a product market.

qualitative approaches are generally required for market definition.

The Merger Guidelines have defined an approach to construct an antitrust market via a "small but significant and nontransitory" price test.⁹ In general, the Guidelines recommend a five-percent price increase lasting for the foreseeable future as the standard price increase measure, but note that other figures might be appropriate in some circumstances.¹⁰ Then the Guidelines define a sunk cost test to identify additional firms that may be able to sell in the marketplace.¹¹

The initial objective in a Guidelines' product market analysis is to determine if a specific product faces significant competition from rival products and hence a broad market is mandated. In particular, a product market is defined as a product or group of products such that a hypothetical profit-maximizing firm that was the only present and future seller of these products (a monopolist) could profitably impose a "small but significant and non-transitory" price increase (i.e. five-percent for the foreseeable future).¹² If a sufficient

⁹ For a general discussion, see Werden (1993).

¹⁰ The price increase is generally applied to the base price at the stage of the industry under examination. The significance of this base can be changed by considering a smaller price increase. Thus, if one feels a five percent price increase in wholesale gasoline would cause huge changes in market behavior, it is possible to reduce the price increase under study. In special cases, a predicted future price can be used as the base of the analysis. For example, if the available evidence suggests that a dramatic change in price is expected, the future price would be used in the analysis. The Guidelines also suggest that a lower competitive price should be used for market analysis if the market is not currently competitive.

¹¹ Sunk costs are investments in tangible or intangible assets that cannot be recovered through redeployment of the assets outside the market. To define sunk costs, one must estimate the cost of the assets required to participate in the market, compute the relevant depreciation rates and predict the residual or salvage value. To obtain "sunk cost" one simply subtracts depreciation and salvage value from the initial cost of the assets.

¹² The price increase is focused on the foreseeable future to ensure customers accept the implication of a change in structure for their profit-making calculus. In many industries, customers find it difficult to understand a price increase not related to demand and supply conditions because their market is so competitive. Prices may vary, but the changes are related to shocks in available supply, input cost fluctuations or other temporary events. This information should be integrated into the competitive effects analysis.

number of customers would be lost such that the price increase would not be profitable, the seller's products and the substitute products are said to be in the same market. The exercise starts with the products similar to those of the merging firms and continues until the group of products that would ensure that a five-percent price increase would be profitable is identified. The smallest group of products for which a hypothetical price increase would be profitable is defined as the relevant product market. Numerous other considerations could be used to support a particular market definition.¹³

Given a definition of the product market, the procedure is repeated to define a geographic market. The same basic question is asked, but the analysis focuses on consumers switching to products manufactured outside the geographic confines of the market instead of substituting to different products. Again, other factors can be used to substantiate a proposed geographic market definition.

Once a market is defined, the firms actually in the market are identified by listing all the firms that could produce (or actually do produce) the product within a short period of time at a minimal investment in sunk costs. The Merger Guidelines suggest one year as a short period of time and propose the sunk costs be considered minimal if they can be recouped within one year by a five-percent price premium.¹⁴

In sum, the process of market definition consists of three steps: (1) defining the relevant product, (2) isolating the geographic area of competition and (3) identifying the firms that produce or could easily produce the relevant product within the geographic

¹³ Harris and Simons (1989) present an interesting analytical approach to market definition. See also Morris and Mosteller (1991).

¹⁴ The Guidelines approach appears designed to identify contestable markets which allow for "hit and run" entry. For a discussion of contestability, see Baumol et al (1982).

market. The Guidelines also suggest that an additional analysis can be undertaken to define "price discrimination" markets in which a monopolist can impose a targeted price increase on a subset of consumers in the market without facing a significant loss in sales. This generally requires the monopolist to be able to identify the inelastic consumers and prevent resale of the monopolized product from the elastic to inelastic users.

A number of questions can aid in the determination of the market. They will be organized into questions associated with the five-percent test for product market, other product market questions, questions linked to the five-percent test for geographic market, other geographic market questions and issues associated with identifying competitors in the market.

II-A Product Market: Demand Substitution Under the Guidelines

The Guideline analysis of demand-side substitution depends crucially on the interview responses to the Guidelines hypothetical. In the outline below, we discuss a number of issues that must be addressed in gathering the relevant information, usually from customer interviews. Then in the next section, we discuss some additional evidence that can be gathered to support the market definition

II-A1 What is the smallest possible product market?

Any market analysis must start with a potential product market. For a horizontal merger, one would usually start with a product manufactured by both the merging firms and add all the products whose characteristics are difficult to physically distinguish from the overlap product. This information is relatively easy to obtain from the initial interviews with industry participants.

II-A2 How is the price test calibrated?

The hypothetical price increase test should be calibrated by asking industry participants if a sufficient number of each firm's customers would switch to the products of other firms (or would otherwise not purchase product) to render a five-percent price increase unprofitable.¹⁵ If the five-percent test suggests that every firm has a "monopoly" (i.e. a price increase would be profitable), then adjustments in the Guidelines test would have to be made to obtain meaningful information.¹⁶ For example, the hypothetical price increase could be raised until competitive responses are obtained from the interviewees. Alternatively, the hypothetical could be associated with the long-run and explicitly allow changes in the customer's product that mandate requalification of the input. If customers then report a willingness to switch, the analysis could continue with the generalized question. Third, it may be necessary to consider small, but significant changes in non-price variables. Again, if this adjusted question identifies competition among the firms in the narrowest possible market, a Guidelines analysis could be undertaken. Finally, if it is not possible to identify any competition between the products of the merging firms, no horizontal overlap exists.¹⁷

It is also possible for the calibration analysis to suggest that the smallest market will

¹⁵ The five-percent hypothetical is based on a real (inflation adjusted) price increase with the prices of related products held constant. In inflationary environments, the investigator must make a clear distinction between increases in real and nominal prices. Moreover, interviewees should understand that the hypothetical price increase is not the consequence of increased cost, a natural assumption for most businessmen, but rather an increase in price caused by market power.

¹⁶ The Guidelines hypothetical exploits information on switching costs faced by customers to define markets. If these switching costs are relevant to the decision to change suppliers within the market, they are not useful in isolating a product market.

¹⁷ At this point, the investigation could be terminated. Alternatively, the case could be refocused to a potential competition theory in the market served by one of the merging partners.

be unreasonably broad. In a few industries, many distant competitors would be predicted to undertake very significant procompetitive actions for a five-percent price increase. This result would raise the question of whether the price increase biases the size of the market.¹⁸ It is possible that the use of the naive five-percent test will generate large markets which tend to be very unconcentrated. However, a small anticompetitive price increase may be quite likely. Once aggregated over a large sales base, such a price increase may represent a significant deadweight loss to society. This scenario is more likely to be a problem when a five-percent price increase represents a significant portion of the firm's margin and switching costs are relatively low. If the calibration analysis suggests the five-percent price increase is too large, a smaller figure can be considered with no other changes in the analysis.

In general, the calibration question can be addressed by the initial interviews in an investigation. Both competitors and customers should have some idea on whether the hypothetical price increase is likely to cause no switching or total switching in the marketplace. If a problem is identified, it must be resolved before moving on to the standard analysis. Customers are probably best positioned to aid in the calibration of the price increase question.

II-A3 What are the potential customer alternatives?

To operationalize the Guidelines analysis, all the alternatives available to customers facing a price increase need to be identified. These alternatives can range from switching

¹⁸ Evidence that distant competitors have sold in the narrow market would suggest that the five-percent test is applicable. Alternatively, evidence that distant competitors never considered selling in the market under study suggests that the five-percent test should be adjusted.

the business to another firm to eliminating some purchases because the product would be priced out of its downstream market. Thus, the lost sales need not be replaced by another product to be relevant.

This information is generally acquired by asking customers about the alternatives to the product in question. As noted above, all alternatives should be explored and a solid understanding of why the customer would shift or not shift should be obtained. The merged firms and their competitors may also have some information on how customers have behaved in the past. This information, gathered from the merged parties or their competitors, should be checked with the customers to obtain a more complete understanding of how the market works.

II-A4 Are the various alternatives ranked?

The Guidelines attempt to define the smallest market which can be subject to an anticompetitive effect, so it may be necessary to consider the competitive alternatives in a sequential manner. Usually customers will face a nested choice of alternatives, with one type of product preferred by a number of customers and if that choice is not available, another alternative will prove acceptable to a smaller subset of the customer pool. In this situation, a sequential list of substitutes can be easily prepared. In other cases, various customers will have different initial responses to a price increase. Therefore, all alternatives must be considered simultaneously. Any attempt to address the alternatives in a sequential manner will bias the test in favor of a narrow market.

Again, customer interviews should facilitate answers to this question as customers report either one "best alternative" or a set of substitute products. Technical study of the industry may be able to supplement the interview responses, as the analyst becomes able

to rank (or not rank) the relative effectiveness of the substitute products.

II-A5 What percentage of sales would be lost to a price increase?

This question seeks to determine what percentage of the overall business would be lost to alternatives. If only a small fraction of consumers report any willingness to switch to other products (i.e. the five-percent price increase is profitable), it is not appropriate to consider the competing products in the same market. Consequently, the initial product market is accepted. Alternatively, if numerous customers claim to be able to switch a significant number of purchases, the Guidelines question must be asked once again, this time stipulating a broader hypothetical market.

In answering the profitability question, it is important to keep in mind that it is the marginal consumer rather than the average consumer which is likely to switch in response to a price increase. Thus, it is necessary to survey a *random* sample of marginal customers. Barring the availability of a representative sample, it is important to understand biases introduced into the analysis by an investigation limited to a subset of prospective marginal customers. The general information uncovered in customer interviews should be independently discussed with the merger partners and their competitors to ensure the responses are considered reasonable.

II-A6 How confident are the customers that they will not switch?

The Guidelines hypothetical requires a prediction of future behavior. Firms may be unable to provide an accurate answer. Instead, the firms may only be capable of estimating the probability of switching. For example, if all the firms in the market recognize that there is a 75 percent probability that they will not switch, it is possible to conclude that 25 percent of the firms will switch in response to a price increase (assuming each decision

is statistically independent). This result would likely defeat the anticompetitive price increase and lead to a broader market.

Interview techniques must be designed to probe for the confidence associated with a particular response. Some customers may feel 100 percent certain that they will not switch and offer a number of plausible reasons in support. On the other hand, other customers may have little justification for their response, and once asked, feel more comfortable with a probability estimate. Quantifying the probability of switching is likely to be difficult, but it is necessary to avoid a biased market definition.

II-A7 Can customers maintain output in the face of a price increase.

The Guidelines hypothetical should also collect information on the loss of sales associated with the price increase. It is possible that a customer cannot switch to another product, but may find its own downstream sales adversely affected by the higher price. Thus, the customer must reduce his purchases in response to a price increase. The likelihood of significant substitution away from the input depends on various factors including the elasticity of demand of the downstream product, the cost share of the input, the technical substitution parameters and the elasticity of supply of substitute inputs. For example, if the input cost share is large compared to the total cost, the customer is more sensitive to a given price increase. If the downstream demand is elastic, the price increase may not be passed on. Under this scenario the customer would tend to reduce purchases of the higher priced input.

This "downstream" effect should also be measured and the analysis adjusted as necessary. Both affected customers and producers of potential downstream substitutes may be able to contribute to the analysis. Some customers may report inelastic

downstream demands, small input cost shares and few substitutes, so the effect is likely to be small. Other customers may believe it is impossible to pass through the price increase and therefore they would be forced to reduce purchases. Manufacturers of substitute input products may be able to confirm these expectations. Finally, evidence on how a downstream firm's input purchases actually changed with respect to input prices would be particularly useful.

II-A8 Is price discrimination possible?

If some classes of customers have good substitutes available at market prices, the consumers in that class will alter their consumption pattern in response to a small price increase. Other consumers who do not have good substitutes will only switch in response to a large price increase. In general, the ability of one significant class of customer to switch mandates a broad product market, because it renders the overall price increase unprofitable.

Price discrimination may enable sellers to profitably increase price to a limited group of customers. Under a price discrimination scheme, sellers increase price to those customers least able to substitute. In such cases, the relevant market may be defined more narrowly to account for the ability to price discriminate. Price discrimination is feasible only if (1) a distinct class of inelastic customers can be economically identified¹⁹ and (2) resale (arbitrage) can be prevented.

Thus, the investigation must focus on isolating the types of information available to

¹⁹ An inelastic derived-demand for an intermediate good requires that the customer have limited potential to substitute away from the monopolized product and that the final consumer have limited potential to substitute away from the customer's product. Thus, even if the two merging firms could raise their price to a group (or even one) customer, price discrimination would not usually be a concern unless the evidence suggested that the price increase could be passed on to final consumers.

the hypothetical monopolist that would allow it to identify the inelastic groups. It must also identify the characteristics of the product that prevent its resale. For example, the various upstream firms may have good information on customer "type" from sales-call reports.²⁰ Moreover, the product may be sufficiently customized so as to make its resale impossible. If price discrimination is likely, a standard Guidelines analysis can be undertaken in the narrow niche "market".²¹

II-B Evidence useful to Support Guidelines Inferences

The Merger Guidelines' hypothetical price test will generate a specific market definition. However, other evidence discussed below should be integrated into the market definition analysis. If the evidence fails to support the Guidelines' conclusion, the analyst should revisit the hypothetical price exercise to eliminate the possibility of having overlooked an important component of the analysis; any conflicting evidence should be reviewed accordingly. As a bottom line, the merger analyst should be able to explain why various types of evidence were rejected in defining a market.

II-B1 Identify instances in the past in which switching has happened.

Evidence of significant switching from product A to product B serves to support the analyst's Guidelines conclusion that A and B should be incorporated in the same product market. For example, if products A and B use different inputs, it may be possible to isolate

²⁰ Firms typically record information gathered in meetings with actual and potential customers and recorded in "call-reports," which is industry jargon for sales-call records. This data may serve a number of purposes including product price monitoring, input price monitoring, market intelligence, R&D efforts undertaken by competitors, new entrants and other information highly relevant to the firms competitive position.

²¹ Given the difficulties associated with cartelizing such a market, the analysis may not be worth the trouble. In particular, if all the firms in the overall market sell or could sell into the niche, competition will undermine a cartelized niche price, so anticompetitive behavior is very unlikely.

a situation in which a temporary increase in costs forced the price of one product to rise relative to the other. Shifts in sales patterns would tend to support a single market. However, the lack of substitution could be explained by any number of factors and should not necessarily be interpreted to mean that A and B are in different product markets. For example, lack of substitution may imply that the market is characterized by non-price competition or that the input price effect was considered transitory.²² Firms in the industry may have sufficient data on historical sales to complete this analysis.

II-B2 Identify why customers will not switch.

A narrow market definition should be supported with evidence explaining why customers cannot switch. This may require going beyond the initial customer interviews required for the initial Guidelines evaluation. For example, if all the products in the market are based on the technical properties of a particular chemical, it may be possible to obtain scientific testimony on the lack of viable alternatives. On the other hand, reputational effects may preclude customers from using alternative products in response to a price increase. Overall, some clear and simple explanation for the inflexibility tends to ensure the Guidelines conclusion is not based on the self-serving speculation of market participants.

II-B3 Is the product used as an input?

As noted earlier, particular care must be used in defining markets for products that are used as inputs into a downstream production process, because the structure of the downstream market may have implications for the analysis. Thus, it is useful to do a

²² This lack of substitution may also reflect a "systems" competition approach that may not be captured by the standard 5-10% test

supplemental market analysis as a check on the Guidelines conclusions. Possibly, a competitive downstream market may prevent an upstream price increase. If cost conditions precluded the increase in the input price from being passed on, downstream manufacturers would reduce or even eliminate purchases of the input. Similarly, important downstream producers may be able to force input prices into line. For example, if the downstream purchaser accounts for a sizable portion of the upstream firm's output, the downstream firm may enjoy more power to negotiate prices than a customer with smaller purchases. Thus, anticompetitive pricing would be less likely.

II-B4 Do manufactures expect substitution?

A market definition may be supported by documentary evidence internal to the firm. For example, studies could have been done suggesting sales would be lost to a type of product if prices were to rise. Similarly, the firm may have constructed some type of planning model that addresses competition from a potential substitute. However, documents need to be read with caution, because they typically reflect marketing viewpoints, not necessarily shared by antitrust analysts. It seems unreasonable to suggest that a document listing a few firms with nearly identical products implies that more distant substitutes are not competitive. The documents may be more relevant to competitive effects, highlighting the closest competitors. If the firm believes a unilateral price increase is unprofitable, it has no reason to analyze the Guidelines hypothetical of an "industry-wide" price increase. Of course, some documents may purport to represent industry wide price increases. For example, the classic "smoking gun" document predicting a post-merger price increase seems to fit the Guidelines test and thus would be supportive of a particular market. Whether the price increase would stick requires competitive effect and

entry analyses.

II-B5 How have prices behaved over time

One traditional approach to market definition is to evaluate the behavior of prices over time. If prices tend to move together, a single market is inferred; if prices move independently, the products under study are in separate markets. If data are available, it is possible to estimate a number of statistical demand models to isolate a market, while controlling for parallel movements in the prices of inputs and other determinants of price. The most sophisticated models estimate demand systems and use the resulting parameters to infer the answer to the market definition hypothetical. However, the actual econometric results tend to depend on the exact specification, so the analysis may not be conclusive even when good data is available. Of course, the lack of data preclude statistical analysis of market definition issues.

II.C Geographic Market Definition Under the Guidelines

After identifying a given a group of firms that supply the product in question, the analyst repeats the procedure to define a geographic market. In general, the Guidelines' questions match those discussed in the product market section so only details specific to geographic market will be discussed. Section D addresses other forms of empirical data that would be useful for geographic market definition.

II-C1 What is the local area of competition?

The first step in determining the relevant geographic market is to identify a tentative relevant area. This can usually be based on the marketing area of the two merging firms. In general, adjustments can be made to expand or contract the provisional market to

correspond to institutional realities such as national boundaries or free trade zones.

II-C2 How is the price increase calibrated?

Again, the five-percent test must be calibrated to ensure that the firms in the local market area generally compete or that some distant firms can be adequately excluded from the market (i.e. the choice of five-percent does not guarantee the result). Of particular concern is the possibility that the five-percent test could draw overly broad geographic markets. For example, in petroleum wholesaling, five-percent of the price of the wholesale gasoline may lead to huge markets. Given the fact that transportation costs (the customers' effective switching costs) are small relative to the price differential, firms from numerous distant areas could sell in the region even though they would never consider competing in a real market. As discussed in product market definition section, the magnitude of the price increase should be adjusted in the rare cases in which the case threatens nonsensical results. The analyst can use different price increases for product and geographic market definition if required by practical realities.

II-C3 What are the customer's alternatives in response to a five-percent price increase?

Domestic consumers may have a wide range of foreign alternatives or choices may be limited to a few developed areas in the world. Again, some type of spatial ranking should be attempted, with free trade zones being considered as a first alternative to a national market. However, one may find that once international competition is considered, a world market is the only alternative. If domestic customers express a willingness to deal with any foreign firm, it is inappropriate to subdivide the world into regions for sequential geographic market testing.

II-C4 How would customers respond to a price increase?

The expected responses of domestic customers are crucial to determining the profitability of a price increase. As with product market, the probability of switching must be addressed and the potential for the reduction of purchases due to declines in downstream demand must be analyzed. The probability analysis can be gauged by careful review of the hypothetical responses or a detailed physical and economic study of import alternatives. Downstream substitution can be proxied by analyzing the current state of downstream imports. If transportation costs, tariff barriers or consumer preferences currently preclude imports of finished goods, issues associated with derived demand would be of less concern. Retailers or end users are best positioned to comment on the current import situation. Overall, if sufficient sales would be lost to a price increase, a broader geographic market must be entertained.

II-C5 Is price discrimination possible?

Price discrimination can also lead to relatively narrow geographic markets. The basic approach is the same, with the analyst looking for evidence to suggest that the firm can identify inelastic consumers and prevent resale. Geographic price discrimination is particularly relevant when customers are spatially distributed in the market. Some customers will be relatively close to distant sources of supply and hence would switch in response to a price increase, while other customers would be close to the core area served by the merger partners. Transportation cost generally make resale relatively difficult. The investigation would then tend to focus on determining if isolated customers exist and if they

can be forced to pay higher prices.²³ This information should be relatively easy to obtain from the customers themselves.

II-D Evidence to Support a Guidelines Market

Geographic market is generally more amenable to analysis than product market, because the bright market lines facilitate empirical investigation. In addition to information on the issues discussed in section II-B, data is usually available for products crossing national boundaries. The basic investigation on the standard issues can follow the earlier presentation, while the shipments data raises issues discussed in detail below. Again if the geographic market generated by either approach does not match the Guidelines market, both analyses should be revisited until the analyst obtains satisfactory conclusions.

II-D1 What are the historic shipment patterns?

Shipment data has been advanced as a useful method for defining relevant geographic markets. While some would consider the approach superseded by the Guidelines' methodology, it can still offer a check on the hypothetical analysis. In their original article advocating the analysis of shipments data, Elzinga and Hogarty (1973)(E-H) discuss two different tests which should be used to determine the relevant geographic market: the "Little Out From Inside" (LOFI) test; and the "Little In From Outside" (LIFO) test. The LOFI test focuses on the smallest geographic region served by a given producing area, hence it computes the share of the production actually consumed in an area. The LIFO test addresses the sources of product for a specific area and is defined as the share

²³ If customers have numerous locations in the local market, it will be difficult to force them to pay higher prices. On the other hand, a set of customers located in a central region are at a higher risk for a price increase.

of consumption actually produced in the relevant area. Both figures are generally discussed as percentages and the difference between 100 percent and the LOFI is considered "exported" to outside and the difference between 100 percent and the LIFO is considered "imported" from outside the market. In general, LOFI and LIFO statistics should both be above 90 percent to support a strong geographic market, while a weak market would be supported if both indices exceed 75 percent (Elzinga and Hogarty, 1978).

Implementation of the Elzinga-Hogarty test involves a three step procedure. First, determine a geographic range around the larger of the merging firms which accounts for 90% of its sales.²⁴ This serves as the initial geographic market definition. The second step is to identify all the other firms in the initial area and obtain data on their shipment patterns. If the firms within the area sell at least 90 percent of their product within the area, the LOFI test is passed. If the share is less than 90 percent, then add to the area until firms within the revised area sell 90 percent of sales within the region. The third step involves determining if 90% of the consumer purchases in the region come from firms located in the region. If not, the area should be expanded until the LIFO test is passed.²⁵

It should be noted that the use of shipments data is not guaranteed to generate the appropriate answers for the market definition hypothetical. For example, if transportation costs are low, consumers may switch between regions in response to a five-percent price increase, even though historical switching had been low. Thus, the E-H test could

²⁴ The first test may be skipped and a geographic region including both merging firms tested if aggregate data is used. Moreover, the first two stages can be combined as long as the overall export figure is less than 10 percent.

²⁵ Alternatively, as discussed in the original E-H paper, the LIFO test could be satisfied first and then the LOFI test.

generate narrow markets. Alternatively, consumers could purchase significant product from outside the region, but remain unwilling to increase their purchases in response to a price increase. Thus, the E-H test could also generate inappropriately large markets. In general, Elzinga-Hogarty analysis must be used with caution.

II-D2 Do tariffs or non-tariff barriers prevent entry?

International markets are generally less likely if significant tariff or non-tariff barriers exist. Thus, information on these costs is important in analyzing the scope of the market. If tariff and non-tariff regulatory costs are high relative to the value of the product, imports are less likely to increase in response to a domestic price effect. Although competitive disadvantages due to tariff barriers are generally easy to quantify, non-tariff barriers are much more complicated. To estimate the non-tariff effect, information on the total costs of importing the product would have to be acquired and used to estimate the effects of the regulation.

II-D3 Do domestic producers export abroad?

In principle, foreign producers may affect the market power of domestic firms even where foreign producers make no sales in the host country. This may be true even when a foreign producer is unable to sell in the domestic market in response to a price increase. However, the following special case circumstances must hold.

1. Domestic country producers sell in foreign markets where they compete against foreign producers.
2. Foreign market sales are a significant percentage of total sales of domestic country producers.
3. Domestic country producers are unable to price discriminate between domestic

country and foreign sales.

4. The profitability of a domestic price increase is outweighed by the losses associated with reduced export sales.

Information on the first three questions is likely to be readily available from domestic firms. The final question may require the analyst to perform a profitability analysis which would depend on the relevant data and underlying cost structure. It is possible that historical experience may substitute for the analysis if the domestic firms faced a recent and isolated cost shock that could simulate a price increase.

II-D4 How do price differences affect the analysis?

In geographic market analysis, it is possible that the products under study will be differentiated primarily by distance.²⁶ If this is true, price data can be combined with information on transportation costs to simulate the Guidelines hypothetical. The analyst must first identify the price in the home and potential foreign market, usually from the merging partners and foreign competitors. Then the transportation costs associated with importing the product must be added to the price in the foreign market and this "landed" price compared to the domestic price. If imports are currently minimal, it is likely that the imported price is higher than the domestic price. The Guidelines analysis would add five-percent to the domestic price and then compare it to the import price. As long as the adjusted domestic price is lower than the import price, foreign competitors should be

²⁶ Of course, prices in individual markets will seldom differ exactly by the transportation costs between them for various reasons. First, transportation costs are not constant over time. Second given bounded rationality, demand and supply shocks may create divergent, temporary price movements even within the same market. Third, varying quality for a heterogenous product can cause price differences. Also, factors such as credit risks, volume discounts, inventory stocks, and seasonal variations can cause price differences and, hence, imperfect correlation of prices in even highly efficient markets.

excluded from the market. However, if the domestic price is now larger than the foreign price, a larger geographic market should be considered. Data on transportation costs is generally available from small importers or can be obtained from firms that specialize in transportation.

II.E Identification of Market Participants

The Guidelines product and geographic market analyses focus entirely on the demand side, while market definition generally addresses competition from both the demand and supply side. To fully incorporate supply-side considerations, the Guidelines add an analysis of the competitive impact of firms that could produce the product in question relatively easily.

II-E1 Identify the current producers or sellers

All firms that currently manufacture the relevant product within the geographic market are generally considered to participate in the market. This generalization includes vertically integrated firms unless the evidence clearly shows that these firms do not have an impact of competition.²⁷ In markets in which marketing is more significant than manufacturing, the analysis may focus on all firms that market a product. For example, in the food industry, co-packers are able to easily manufacture a wide range of processed foods, although retailers will not carry the product unless it is either branded or private label. In general, existing competitors can be easily identified from customer interviews.

II-E2 Do firms that sell used products compete?

For durable goods, some consumers may be able to switch to used units in

²⁷ For example, an upstream chemical plant which is physically linked to a downstream plant producing under long-term contracts for export, could be excluded from a domestic market.

response to a small price rise. To justify the inclusion of the used equipment dealers in the market, one should (1) determine if a used market exists and (2) decide if a used (reconditioned) product is a close substitute for a new product. The first question is easily addressed with customer interviews. Documents from the merging parties often sheds light on the second question with lost sales reports highlighting competition from used products. Alternatively, a significant number of customers may express a willingness to buy used equipment. Assuming used products are competitive, various industry trade publications can be reviewed to identify used equipment dealers.

II-E3 How should small importers be treated?

In many markets, foreign firms import small amounts of product into the geographic market, although the trade flows are insufficient to justify an international market. These firms should be identified so that their actual and potential impact on the market is measured. In some cases, customer interviews will identify a few major importers who have incurred significant marketing investments to sell in the domestic market. It is even possible that one of the large firms in the industry will depend on imports.²⁸ In general, these firms should be considered competitors, even though the source of their product is foreign. Other cases will involve a large number of small importers. It is often easier to ignore their identities and just attempt to capture the magnitude of the imports on the market universe.

²⁸ The geographic market analysis will have determined that other foreign firms cannot easily duplicate the success of the incumbent firm or the analyst must use an international market and count foreign competitors that make no domestic sales.

II-E4 Are any firms in the process of entering the market?

Firms that are in the process of entering the market should be viewed as competitors if their entry is likely to occur in the immediate future. One approach to this question is to consider entrants expected in the market within one year as current competitors. It is likely that customers will have information on planned entrants and then the actual entrants can be contacted directly to determine if they meet the time constraints. If the entrant is excluded from the market, it is likely that its competitive effect will be addressed later in the section on entry.

II-E5 Can entry into the relevant market occur within one year?

Firms can effectively participate in a market even if they have no current sales. The Guidelines attempt to evaluate this effect by identifying all firms that are able to profitably sell into a market within one year. In general, this implies that production equipment would be sufficiently flexible so that minimal re-tooling would allow the manufacturer to produce the product under study. Information on this issue would likely be available from industry incumbents who may be producing multiple products on their existing equipment. If these firms face competitors in other markets that can produce the relevant product within one year these firms may be considered existing competitors. In other markets, the manufacturing process may be so simple that a number of outside firm can enter the market within one year. For certain simple products, a near infinite list of potential rivals can be found. Of course, once a large number of firms are identified, it is not really important to identify the entire universe.

II-E6 What is the magnitude of sunk costs in the industry into which entry can occur within one year?

Sunk costs are acquisition costs of tangible or intangible assets that cannot be recovered through the redeployment of these assets outside the relevant market. In general, this information can be obtained from potential entrants by discussing a hypothetical entry. It should be relatively easy for the potential entrant to list the expenditures necessary to compete in the market and estimate the salvage value of the assets. Then the analyst subtracts the salvage value and the depreciation charge from the initial investment to compute the sunk cost.

II-E7 What firms should be considered to participate in the market through supply response?

The analyst must determine whether there are firms which do not presently offer the product or service but which would respond to a small but significant and non-transitory price increase by offering that product or service. These supply responses must be likely to occur within one year and entail relatively low sunk costs. This latter point implies a cost level such that the firm could recover its investment through a price premium of five-percent lasting one year. Overall, this Guidelines test is designed to separate firms that could reasonably expect a short term participation in the market to be profitable from those that would require a longer-term horizon to profit. In effect, this methodology establishes a "could profitably" standard for firms that could enter the market within one year. If entry takes longer than one year or is unlikely to be profitable for one year, it is addressed in the section on entry conditions.

II-F Case Study

A merger between two manufacturers of widgets each with a 30 percent share of

the widget market is brought to the attention of the Federal Trade Commission. In pursuing its inquiry, the FTC establishes that widgets are purchased by customers for final consumption. The ultimate consumer can choose between widgets and gadgets, the closest substitute to widgets. Clearly, the analyst must determine whether the "market" should also include gadgets.

Because widgets and gadgets are imperfect substitutes in consumption, they constrain but do not entirely restrain the other's price. If this relationship would be sufficient to defeat a 5 or 10 percent widget price increase, the products should be placed in the same antitrust product market. If it is not sufficient, widgets and gadgets are in different product markets.

Consider the following hypothetical situation of a widget monopolist entertaining a five-percent price increase. P_1 and Q_1 represent the widget price and output of the producer before the five-percent price increase; P_2 and Q_2 represent the widget price and output of the producer after the five-percent price increase; and C is the (constant) per-unit cost of production.

$$P_1 = 100 \quad Q_1 = 100 \quad \text{and} \quad C = 75$$

$$\begin{aligned} \text{PROFITS}_1 &= (P_1)(Q_1) - (C)(Q_1) = (100)(100) - (75)(100) \\ &= 10,000 - 7,500 = 2,500 \end{aligned}$$

After the hypothetical price increase, the scenario is as follows if the price increase causes one in ten widget customers to substitute to gadgets:²⁹

$$\text{PROFITS}_2 = (P_2)(Q_2) - (C)(Q_2) = (105)(90) - (75)(90)$$

²⁹ Alternatively, customers may report an 90 percent expectation that they will not switch, an estimate which implies one in ten will actually substitute away from widgets

$$= 9450 - 6750 = 2700$$

$$\text{PROFITS}_2 - \text{PROFITS}_1 = 2700 - 2500 = 200$$

Note that the price increase is profitable which suggests that the proposed market definition (widgets) is appropriate. Thus, we would not have to incorporate gadgets into our proposed product market and repeat the above exercise.

In a real case, the investigation would attempt to identify the reasons why customers would not switch from widgets to gadgets in response to the price increase. If the evidence suggested that approximately 16.5 percent of the customers would switch, the narrow market definition would be rejected. Evidence that other consumers would still not switch is of little value, because the market fails with 83 percent of the customers paying the higher price.

Given the product market, the procedure is repeated for geographic market definition. It is important to pick a reasonable starting point for the market so small foreign competitors are not automatically excluded.³⁰ Then the analysis should attempt to identify which domestic customers would switch to foreign suppliers. If sufficient customers would switch to some type of imported product, a broad market is required.³¹

Finally, once the bounds of the product and geographic markets are established,

³⁰ For example, the Guidelines methodology could be used to exclude Canadian firms from a US market because the firms could not produce enough output to defeat a US price increase. On the other hand, one would want to exclude Japanese or European producers from a North American market if these firms could not sell sufficient output in North America to defeat the price increase. The results differ because the incorrect Canadian exclusion is based on the inability to produce while the Japanese and European exclusion is based on the inability to profitably sell.

³¹ Both analyses should be undertaken simultaneously, because a provisional product and geographic market fails if overall substitution defeats the price increase. In practice, it is rare for both product and geographic market to require detailed analysis. However, the general approach discussed in Section VII will deal with this and any other simultaneity issues.

it is necessary to identify the competitors in the market. In general, the evidence will show either that firms not currently producing product cannot physically or profitably (i.e. cover sunk costs) sell into the market within one year or that a large number of firms can compete based on supply-side considerations. After an initial investigation has identified a group of firms that can physically market product within one year, the sunk cost analysis requires evidence on the profitability of selling product at a price five-percent above the competitive level for one year. In general, scale of the entrant and the competitive price of the product determine the profit premium associated with a five-percent price increase. This cash value is then compared to the estimate of the sunk costs associated with participating in the market. The sunk cost calculation starts with the value of the invested assets (i.e. equipment, marketing investments, etc.) and subtracts the liquidation value of the assets in uses outside the industry and the relevant depreciation charges associated with short term participation in the market. Overall, a financial analysis should identify a profitable opportunity (a profit premium greater than sunk costs) before a class of firms is considered participants in the market.

For example, assume a new firm must invest six million dollars to compete in the marketplace. Of this investment 20 percent depreciates in the current market period and 25 percent of the remaining investment can be salvaged upon exit. This leaves sunk cost of 3.6 million dollars to compare with a five-percent premium on the entrant's expected revenues. Assuming a market universe of one billion dollars and a share of five-percent, the revenue premium should be 2.5 million dollars to compare to the sunk costs of 3.6 million dollars. Given the revenue premium does not cover the sunk costs, supply-side entry would be rejected. This result would be reversed if the entrant could be expected to

obtain a 10 percent market share or if the initial investment was only 4 million dollars.

III. ANALYSIS OF MARKET CONCENTRATION

The second stage of merger analysis calculates a concentration statistic to serve as a quick measure of the competitive concerns generated by a merger. If the statistic takes on a low value, the investigation should be quickly closed because the merger is unlikely to substantially lessen competition. On the other hand, the transaction may not reduce competition if the statistic is relatively large. Instead, further analysis must be undertaken to integrate additional factors into the competitive evaluation.

Economists traditionally used the ratio of the sales of the leading firms in a market to total industry sales as the measure of concentration. U.S. antitrust enforcers historically relied on the sum of the market shares of the four and eight leading firms. While this C4 index (or C8 in the case of the eight largest firms) as it is known, is relatively easy to measure, it fails to consider the distribution of the market shares among the industry participants. Given a concentration ratio of 80 percent, competitive concerns would be larger if the market contained one 50 percent firm and five 10 percent firms than if the market included four 20 percent firms and four 5 percent firms.

More recently, the Hirschmann-Herfindahl Index ("HHI") has been advanced to solve the problem by weighing the market share of each firm in the industry. Mathematically, the HHI is calculated by summing the square of the market shares of all the firms in the market³². Thus, the contribution of relatively large firms are weighted more than small firms, small firms are still considered. For example, the industry with one 50 percent firm and five small firms each holding 10 percent would have a index of 3000, while an industry

³² Market shares are generally measured as percentages, not fractions, generating an index that ranges from almost zero to 10,000. However, instances where HHI's are calculated from fractions are still found in the literature. Some European competition authorities calculate HHI's based on fractions.

with 4 firms with 20 percent share and 4 firms with 5 percent share would have an index of 1700. Since small firms contribute very little to the Herfindahl, it is not necessary to have good data on their shares. As long as the aggregate size of the fringe can be measured and incorporated in the calculation of total industry size, the Herfindahl index can be estimated.³³

The effect of a merger on this index is easily calculated by multiplying the shares of the two merging firms by each other and then doubling the result. Thus, a merger between two firms each with a 10 percent share or a merger between one 20 percent share firm and one five-percent share firm would increase the index by 200 points.

Critical levels associated with limited competitive concerns can be defined for both the post-merger Herfindahl and the change in Herfindahl. The U.S. Merger Guidelines define various safe harbor Herfindahl levels at which further action is rarely, if ever warranted. First, if the Herfindahl is under 1000, the investigation is closed. Second, if the change in the Herfindahl is under 100 and the Herfindahl is under 1800, the investigation is closed. Third, if the change in the Herfindahl is under 50 points and the Herfindahl is over 1800, the investigation is closed. However, mergers with Herfindahl statistics marginally above these critical levels are rarely challenged.³⁴ If the Herfindahl index falls

³³ One common mistake in Herfindahl analysis is to square the share of the fringe firms. If fringe share data is not available, one could divide the fringe share by the number of fringe firms and use this number as the estimate of each firm's share.

³⁴ Evidence from the Federal Trade Commission suggests a safe harbor exists for any merger that raises concentration by less than 200 points (not 50) or leads to a post merger Herfindahl under 1800 (not 1000). Enforcement action is likely if the change in the Herfindahl exceeds 500 points or the post-merger Herfindahl exceeds 2400 (with a change of more than 200 points). Mergers with concentration between these levels are challenged about half the time. The enforcement evidence suggests that the Guidelines do not establish clear rules, with some relatively low Herfindahl cases brought and some high herfindahl cases closed. See Coate (1996).

outside the safe harbor, the investigation should examine competitive effects, entry and efficiencies before concluding the merger should be blocked. Of course, the cutoffs must be customized to the particular type of merger regulation under study. For example, if antitrust policy only addressed monopoly, one would want to set much higher safe harbors.³⁵

A number of questions can aid in the construction of the Herfindahl index.³⁶ The analysis depends on the nature of the product under study. As a first approximation, if the product is homogeneous (standardized), capacity is generally the preferred measure of competitive significance, while if the product is differentiated, sales are usually the better proxy of competitive significance. Given a measure of the competitive significance of market participants, the Herfindahl is easily calculated.

III-A Analysis for Homogenous Products

A product is considered homogeneous if most of the products in the market tend to be close substitutes for other products in the market. This could occur if the products were physically identical or if the products were part of a product line and were available for purchase from many, if not all, of the firms in the market. In general, all firms will charge identical prices for homogeneous goods, but the actual transaction prices may be difficult to observe. Artificial differences in price could be caused by quantity discounts, special handling and delivery or case by case negotiation. Examples of homogeneous products

³⁵ A monopoly policy would tend to focus on the post-merger market share, because antitrust would be concerned with transactions that create or strengthen monopolists.

³⁶ These questions are also relevant to the calculation of a concentration ratio, because they explain how to define market shares.

include foodstuffs, commodity chemicals and cement. The following general questions aid in the calculation of market share figures.

III-A1 Is it possible to assign measurable capacities to the firms or is capacity a meaningless figure, with each firm able to supply the entire market?

To answer this question, we must look at the manufacturing ability of the firms in the market. In some cases, the factories will have engineering capabilities so output is strictly limited. In other cases, the potential output of a firm will exceed the demand in the market so no capacities can be defined. Likewise, contract production may be relatively common, again making potential output greater than industry demand. For example, output in the oil industry is limited by the physical capacity of the refinery, while in some drug industries, firms can produce as much output as they can sell, once they obtain government approval to make the product.

III-A2 Assuming measurable capacity, what is the capacity of each firm?

This question requires some type of survey of the industry (e.g. each firm could be mailed questionnaires or the contacts can be made directly). Capacity should be measured consistently, using the most meaningful approach for the industry. For example, some industries may operate their plants 24 hours a day, seven days a week, 52 weeks a year, while other industries choose to operate 2 shifts a week, five days a year for 50 weeks.³⁷ While the actual operation of the various plants is likely to differ, the responses would need to be standardized for the survey. Thus, some interpretation of the information

³⁷ If factories are underutilized for demand reasons, the excess capacity is relevant to the competitive analysis. On the other hand, some factories limit their operations to allow for maintenance and product shifts so no surge capacity exists.

is required.³⁸

III-A3 Assuming no ability to measure capacity, how does one define market shares?

In general, one would want to consider all firms equal and define market share as one divided by the number of firms in the market (e.g. in this numbers-equivalent approach, each market participant has a share of: $1/N$, where N is the number of firms in the market). In certain cases, the firms could be divided into significant and fringe competitors. All significant rivals would be considered equal, with some fixed share set aside for the fringe firms. Other schemes could be considered to construct a concentration index to proxy the competitive realities of the market.

III-A4 Should shares be adjusted for future conditions?

Once market shares have been defined, it is always possible to argue that they do not reflect future competitive conditions. For example, a firm may have a new plant under construction or another firm may have a plant scheduled to close. Alternatively, the competitive viability of foreign competitors could be affected by fluctuations in exchange rates. Overall, shares can be adjusted if it is possible to find a better proxy for the future competitive structure of the market.

III-B Analysis for Differentiated Products

A product is considered differentiated if the offerings of most firms tend to differ along important dimensions of the product. Differentiation could also be generated by

³⁸ Some believe that capacity committed to profitable uses outside a relevant market should be excluded from the Herfindahl. This commitment should exceed a year, because firms may participate through supply responses even if it takes a year to enter the market.

differences in the spatial location of firms when transportation costs are significant. In effect, the product of any one firm is not considered a perfect substitute for the products of most of the other firms in the market. Thus, the various product and geographic differences allow each firm to set a price for their product without losing all their sales to competitors. Of course, the market is defined to insure that rivals have some constraining effect on price. Examples of differentiated products include both consumer goods (clothes, cars and books) and producer goods (various specialty chemicals, unique machine tools and cable networks). The computation of market share statistics are aided by the following questions.

III-B1 Are annual sales the best measure of competitive significance or is a more complex measure needed?

Although annual sales are often the best proxy for share, conditions exist in which sales fail to capture the competitive significance of the firms in the market. For example, in industries with lumpy demand, high annual sales may only represent success in recent competition. Likewise, in certain bidding markets, all firms able to manufacture the product may have an equal chance to win. In other situations, the evidence could suggest that a particular firm has a weak product offering and therefore historical data overstates its competitive position. In general, sales will be appropriate for most consumer goods, while goods customized for the particular purchaser may require a more sophisticated technique with which to define share.

III-B2 Assuming sales are the best proxy of competitive significance, what are the sales of each business?

Although it would appear easy to measure sales by surveying all the industry participants, one should make some attempt to ensure the figures are all from the same

time period. Also, it may be necessary to use some government or trade association data to define the market universe, if a large number of small fringe firms exists. In some cases, it may be better to use quantity data instead of revenue data. For example, in the hospital industry, patient-days may be a better proxy than revenues, because revenues may depend on the mix of cases; such a mix could quickly change.

III-B3 Assuming annual sales are not an appropriate proxy for competitive significance, how are market shares measured?

To proxy shares, one needs to first attempt to gather additional information. For example, if shares changed from year-to-year, the merger analyst would require share data over a number of years. Then adjusted share data could be calculated. If one of the firms is a new entrant, their share would have to be imputed for years before their entry. Of course, if no systematic approach seems reasonable, all firms could be assumed to have equal shares.

III-B4 Should Shares be adjusted for future conditions?

It is also possible to adjust shares in differentiated product markets for expected future conditions. One firm may be planning to introduce an innovative product and expect a large jump in share, while another firm may be suffering from a downward spiral in sales. In any event, if good evidence can be gathered to support an adjustment in the market shares, adjustments should be made to better reflect competitive realities.

III-C An Application of the Analysis

Assume the two merging widget manufacturers (each with a 30 percent share) face competition from eight small firms (each with a five-percent share). The two large firm

could increase capacity by fifty percent, while each of the fringe firms could double their production. The Herfindahl index and the subsequent competitive effects analysis clearly depends on whether the product is determined to be homogeneous or differentiated.

If the product is deemed to be a differentiated one, the Herfindahl could be based on sales. This implies that the merged firm has a 60 percent share and its eight fringe competitors accounts for a 5 percent share each. The pre-merger Herfindahl would be 2000 and rise to 3800. On the other hand, if the products were homogeneous, the merged firm would account for 50 percent of industry capacity and each fringe firm would have a 6.25 percent share. The pre-merger Herfindahl would be 1562 and rise to 2812. Based on the U. S. Guidelines, both mergers would raise serious concerns, but the differentiated market example would be more problematic.

It is important to note that the difference in the Herfindahls is due to the assumption that the dominant firm had a more limited ability to expand capacity than the fringe. If this was not true, the difference in the Herfindahls would disappear. For example if the dominant firm could also expand its output by a factor of two, the capacity shares would equal the sales shares and the Herfindahl statistics would be identical. Thus, in a number of cases, the use of capacity-based Herfindahls will not reflect the lower competitive concerns

Of course, it is crucial to move the analysis beyond market share statistics and look at the likely competitive effects of a merger. One aspect of such analysis would focus on the homogeneous nature of the product and on the fringe elasticity of supply to determine

whether the merger is likely to lessen competition.³⁹ Alternatively, an exploration of the differentiated nature of the market might conclude that cartel behavior is unlikely, but unilateral effects remain a possibility. These options are explored in more detail in the next section on competitive effects.

³⁹ However, the Herfindahl index is designed to proxy the likely competitive effect and avoid the need for full scale merger analyses when anticompetitive effects are unlikely. Thus, one might want to design a more meaningful way to integrate excess capacity into the analysis at an early stage. For example, one could switch to number-equivalent shares once a number of firms hold capacity sufficient to supply $1/n$ of the market where n is the sum of the large firms and the fringe with significant capacity. In our example, each fringe firm had capacity to serve 10 percent of the market which is equal to the 10 percent share implicit for 10 firms. The adjusted Herfindahl would therefore be defined as 1000 and rise to 1111. This would suggest that the merger would be unlikely to have an anticompetitive effect.

IV. ANALYSIS OF COMPETITIVE EFFECTS

The third stage of a merger analysis attempts to explain how the merger in question could lead to an anticompetitive price increase in a concentrated market. Adverse competitive effects can stem from either collusive or unilateral behavior on the part of the merging firms. If the analyses suggest that both collusive and unilateral theories of market performance point to continued competition, the investigation should be closed.⁴⁰ However, if one theory generates competitive concerns, additional analysis is required to fully evaluate the merger.⁴¹

Until quite recently, merger policy in the U. S. focused on estimating the increase in the probability of oligopolistic collusion caused by the merger. In particular, the likelihood of collusion was considered to depend on (1) the probability that a cartel would agree on a set of prices and/or an associated scheme for distributing sales among its members, (2) the likelihood that the cartel would detect deviations from such an agreement, and (3) the ability of the cartel to punish any firm found to be violating the agreement. Analysts evaluated long laundry lists of structural and behavioral factors linked to these questions and attempted to predict the likely competitive effect of a merger (Posner, 1976, Bork, 1978). However, experience has shown that detailed competitive analyses of concentrated industries generally supported the hypothesis that the markets

⁴⁰ Analysis of actual market performance can supplement the structural methodology. For example, if the market appeared to be performing in a less than competitive manner, collusive or unilateral effects theories would be more likely to be accepted. However, in many if not most markets, pre-merger competition is the norm and thus evidence of adverse performance is unavailable.

⁴¹ The unilateral model precludes consideration of a collusive outcome, so both theories cannot be brought to bear in a given case. Either the firms may collusively raise price or the merger partners may unilaterally raise price. Of course, both theories are relevant in the early stages of an investigation with the relevant one discarded once falsified by the available evidence.

were competitive, especially when the products were differentiated. Unless the analyst could show how the merger changed an important attribute of the competitive market, the merger would be unlikely to affect competition. In effect, economists have learned that the traditional concern with collusion was misplaced. Of course, if one firm dominated a market, collusion might not be necessary to raise price. Instead, a monopoly analysis would be undertaken to determine if prices were likely to rise.

The 1992 Merger Guidelines addressed the concerns associated with the general collusion theory by presenting an enhanced structure for evaluating coordinated interaction (i.e. collusion)⁴² and defining an additional analysis focused on unilateral effects.⁴³ The collusion analysis highlights a limited number of factors that could have a significant effect on the questions of reaching a collusive agreement, detecting deviations from that agreement and punishing competitive behavior. While the analysis remains qualitative, the structure focuses the evaluation on a more limited list of important factors. The "new" unilateral effects analysis is designed to evaluate the possibilities that a merger might allow a firm to raise price, regardless of the actions of its competitors.⁴⁴ This technique

⁴² The Guidelines are confusing as to whether the evidence necessary to support an inference of likely collusion is related to the level of the Herfindahl (i.e. the sliding scale). The confusion stems from a misunderstanding of how the various competitive factors, including concentration, are integrated into the collusion analysis. All else equal, collusion is more likely when the industry is highly concentrated, hence there appears to be sliding scale. However, the significance of the concentration statistic depends crucially on various competitive factors. It is possible a Herfindahl of 2000 in one industry will raise competitive concerns, while a Herfindahl of 5000 in another industry will imply continued competition. Thus, no real sliding scale exists. Overall, while high concentration raises concerns, these concerns may disappear once other factors are evaluated. Since collusion analysis takes place on a case by case basis, no real generalizations are possible.

⁴³ For a general discussion of the issues see, Rule and Meyer (1990), Willig (1991), Denis (1993) and Coate (1997).

⁴⁴ If unilateral action on the part of both firms involved in the merger would lead to a profitable five-percent price increase in the market, then the market definition is overly broad and the merged firm should be considered a monopolist in a narrow market. However, if the merger allows the new entity to raise price by

subsumes the standard monopoly and dominant firm theories and addresses new theories associated with product differentiation.⁴⁵ Succinctly, if two merging firms currently sell the closest substitute products and other firms cannot quickly position a substitute product in the affected market niche, prices could rise.

The competitive effects analyses differ depending on whether the product in question is relatively homogeneous or differentiated. This implies that the relevant analysis (and questions) must be customized to both the type of theory under investigation and the type of product. Thus, instead of starting the section with theoretical analyses of collusion and unilateral effects, we discuss the broad outlines of the theory and the relevant questions in the following four subsections. This section concludes with a brief example applying both a coordinated interaction and unilateral effects analysis.

IV-A. Collusion Analysis for Homogenous Products

Collusion in a simple homogeneous product market generally requires firms to agree on a price and a means to adjust the price in response to market changes.⁴⁶ The agreement mechanism may also have to include some form of market division, customer allocation or fixed territories to allocate market share to the cartel participants.⁴⁷ More

five-percent on one of its products, holding the price(s) of the other(s) fixed at the pre-merger level, a unilateral effect would be said to occur. Alternatively, the unilateral price increase could be less than five-percent, thus compatible with the initial market definition.

⁴⁵ These unilateral theories are particularly helpful in offering theoretical support for the legal concept of market dominance. As applied in many European countries (and in countries that pattern their laws on the European Union), a merger that creates or enhances market dominance is illegal.

⁴⁶ Collusion does not require the participation of very small firms, because a change in their output would usually have a minimal effect on price.

⁴⁷ If the collusive agreement completely allocates customers, it may be possible to avoid setting price, because each supplier obtains a monopoly on its customers. However, it would then be necessary to agree on some mechanism to adjust the customer allocation in response to changes in the market.

complicated schemes such as price differentials may be required for collusion in customized markets.⁴⁸ While a cartel can function with a small number of fringe (competitive) firms, the size of the fringe is inversely related to the probability of a successful collusion.⁴⁹

To maintain the collusion, the firms must establish a mechanism for detecting and punishing deviations (sometimes referred to as cheating or chiseling) from the collusive agreement. For homogeneous goods, it may be possible to rely on statistical analysis of sales patterns, because the fact that all firms offer the same product implies that if one firm wins significantly more than its expected share of sales, it is likely to have cheated on the agreement. Evidence that is useful in an analysis of collusion in homogeneous goods industries is presented below.

IV-A1 How Does the Market Function?

To structure the analysis of competition in a market, it is necessary to understand how suppliers actually serve their customers. For example, the competitive implications are dramatically different for a market which is comprised of a large number of small sales through independent wholesalers than for one which uses a few large auctions. As Stigler(1964) notes, if a market is characterized by a large number of small sales, it may be possible to police a cartel with statistical analyses. Alternatively, it is generally considered very difficult to collude in a market dominated by a few large auctions, because the loss (or gain) of any one sale can have important ramifications for the viability of a firm.

⁴⁸ In a customized market, each product is designed to meet the needs of a specific type of customer. As long as all the firms in the market can produce identical customized products, the homogeneous model appears applicable. Of course, if each firm offers a unique customization, then the products are differentiated.

⁴⁹ By definition, fringe firms do not consider the effect of their actions on any collusive scheme.

Thus, the benefits to "cheating" on a collusive agreement are high, while punishment is difficult.

Data on the basics of the market should be readily available from market participants. For example, if competition occurs through bids, the merging parties should have numerous documents responding to requests for bids. In other cases, both bid and direct sales may exist, so it is necessary to estimate the relevant shares. Moreover, wholesalers and distributors may be able to explain how the market functions.

IV-A2 What information is available in the market?

Once the basic structure of the market is understood, it is possible to evaluate how a group of firms would establish and maintain a collusive agreement. First, good data on transactions prices seems likely to facilitate cartelization. If the industry price level is reasonably well understood, suppliers are more likely to be able to raise price and then detect discounting. Information on who supplies whom is also important and can serve as a partial substitute for price data. For example, in customer allocation agreements, price is less important, because suppliers are committed not to serve their rival's customers.

It is possible to ask the various industry suppliers questions concerning how they consider competitors in their day-to-day business decisions.⁵⁰ In some industries, firms will

⁵⁰ Often, customer interviews suggest that a particular firm acts as a price leader. However, price leadership stories are consistent with arguments related to facilitation of tacit collusion and theories of competition. The tacit collusion story is well known. The large firm raises prices, "signaling" the small competitors to follow. If they do not, the large firm can cut price below the competitive level and impose losses on the industry. Other more sophisticated versions of the basic story also exist. Competitive stories are also easy to construct. For example, if input prices rise, to maintain a zero economic profit level, competitive industries must raise prices. In an industry with only a few competitors, the largest firm generally has an incentive to raise prices first. Consider an industry where the amount of excess capacity is proportional to the market share of each firm. If a small firm were the first to raise prices, it risks being removed from the market if the other players do not match its price. On the other hand, if the large firm raises prices first, it only risks losing some of its share to the limited excess capacity held by small firms.

have a very good understanding about the market, know the prices charged by rivals, and have detailed information on potential customers.⁵¹ Thus, good information would appear to be available. In other industries, firms know little more than their own price and output levels. The firm may even have no record of their final customers if they use wholesalers to market their product. This scenario would support the conclusion that little information is available.⁵²

Another technique useful in understanding information flows in the market is to review the internal documents of the merging parties. For example, firms often have consulting reports, strategic plans or marketing documents that discuss their competitive situation including the available information on their rivals. Other firms have numerous sales call reports that contain data on prices and sales of their rivals to specific customers. When all the evidence is reviewed, it is possible to make an informed judgement about the quality of information in the market.

IV-A3 Do sophisticated buyers exist?

The standard collusion model posits a limited number of suppliers facing a large number of atomistic buyers.⁵³ However, this assumption is rarely valid, except in some

⁵¹ The situation would be complicated if the customers use numerous suppliers. It would be difficult to determine if a customer's change in historical purchase patterns was due to some exogenous effect of interpersonal interaction or a price cut.

⁵² Vertically integrated firms in intermediate markets have large incentives to cheat on a collusive agreement. If these vertically integrated firms were a party to a tacit agreement which raises the price of the intermediate good, they would have incentives to increase their captive supply of intermediates in producing the final good. In this manner, they can cheat on the agreement and gain profits through the sales of additional, lower cost, final goods. Competing intermediate goods companies could not easily determine whether this was cheating or whether the vertically integrated firms faced reduced costs of complementary inputs for the final product.

⁵³ These atomistic buyers are represented by the industry demand curve. That is, for any market price, a given amount of product will be sold to customers. For a detailed discussion of the applicability of this assumption see Scheffman (1996).

final consumer markets.⁵⁴ Buyers are often sophisticated and are able to implement strategies designed to defeat collusion. The idea is easiest to understand when the buyers are large in absolute size.⁵⁵ For example, large buyers can make collusion less likely by 1) increasing the profitability of cheating and 2) making it less likely that a cheater will be punished. Smaller buyers can also affect price. For example, if the buyers face members of the cartel in other markets they can threaten the loss of business if prices are not reduced. Alternatively, customers can randomly switch suppliers to create the impression of price discounting.

Large buyers with significant market shares can offer cartel members the incentive to cheat by guaranteeing a large amount of business at a price below the collusive level. Furthermore, if there are buyers that could purchase a cheater's entire production, a cheater would be insulated from any punishment the remainder of the cartel could exact. Similarly, large global or national customers have the ability both to punish multinational or national cartel members and to guarantee volume to cheaters outside the geographic market in question.

Information on buyer power is relatively easy to obtain, given data on total industry sales has already been collected for the market share analysis. For example, a list of large customers should be available from the merging parties and those firms could be contacted directly to obtain estimates of their purchase requirements. Also, customers

⁵⁴ Even in final consumer markets, intermediaries exist to aggregate the buying power of atomistic consumers. For example, in health care, employers are dealing with managed care businesses to aggregate the buying power of their employees to obtain discounts.

⁵⁵ The power buyer need not be a monopsonist to affect market prices. For a more detailed discussion of monopsony see Blair et al. (1989) or Jacobson and Dorman (1991).

may know the identities of other large rivals, so the search can be expanded. Once the identities of large buyers are known, it is useful to know how these buyers would react to an anticompetitive price increase. These strategies may be obtainable through conversations with customers and other suppliers.

IV-A4 Do the existing firms hold substantial excess capacity?

Cartels are generally considered unlikely if the existing firms (either the cartel members or the competitive fringe) maintain significant excess capacity. In theory, excess capacity reduces the likelihood of collusion because 1) profit-maximizing firms with excess capacity are unlikely to enter into output-reducing cartels; 2) excess capacity increases a firm's incentive to cheat on a collusive agreement and 3) excess capacity held by fringe firms allows them to expand and undermine the cartel price.

By definition, excess capacity implies that a firm can easily increase production at competitive prices. This implies that the firm has little incentive to reduce output and further idle productive capacity, especially in concert with other firms not facing capacity underutilization. Chronic excess capacity raises the firm's incentives to cheat on a collusive agreement. For example, significant excess capacity in capital intensive industries give rise to high price/cost margins. This greatly encourages cheating since gains in sales lead to much higher profits, while punishment for a cheater could be quite severe as the competitors lower prices to the average variable costs. Of course, the retaliation would not be credible if the cheater could tie up business with long term contracts. Finally, excess capacity held by fringe firms serves to undermine an agreement. By definition, fringe firms have relatively low levels of sales, so their participation is not crucial to the success of the cartel. However, if these firms can dramatically expand sales,

without incurring significant sunk costs, they can render a collusive price increase unprofitable.

Information on sales and capacity will generally be available from the Herfindahl analysis, so the calculation of excess capacity requires little additional work. Customers can be approached to determine if they are willing and able to guarantee a market in the long run. Likewise, fringe firms should be interviewed to identify any impediments to expansion.

IV-A5 Are firms following similar strategies?

In general, collusion is more likely if the various firms in the market are following similar strategies. Strategy is driven by the basic circumstances of the firms and the specific long range goals of each competitor. Analysis of the basic circumstances (i.e. technology, supplier relationships, levels of capacity, and marketing focuses) is relatively straight-forward, especially in a homogeneous goods industry in which all firms produce the same product. It is possible that one firm has a scale advantage or economies of scope, with either factor complicating a collusive agreement. On the other hand, all the firms may be in the same situation, which would simplify coordination. Corporate goals tend to be more complicated, because firms can set a wide range of strategies for their business units. In general, collusion is difficult if one or more firms is attempting to grow their market shares. Alternatively, if firms are all interested in a harvest strategy, collusion should be relatively easy. The Guidelines note that the acquisition of a "maverick" firm is particularly troublesome, because the acquiring firm might abandon the competitive strategy in favor of a more collusive alternative.

A review of the internal documents of the merging parties can often aid in

establishing the strategies of industry participants. Strategic and marketing plans, as well as consulting reports often provide the parties' perceptions of the strategies of their rivals. As always, it is necessary to determine the amount of pure conjecture, poor information or mere "puffery" in any such documentation. A general idea of the strategies followed by the various firms in the industry can also be obtained by reviewing the temporal patterns of market share and capacity. In general, dramatic changes in relative position suggest strategic asymmetry. Finally, interviews with customers and rivals will determine if some firms can be characterized as "mavericks."

IV-A6 Are market conditions relatively stable?

The dynamics of the marketplace represent a final issue that should be addressed in a collusion analysis. Any type of change (i.e. market demand, cost structure, technology) tends to disrupt a collusive agreement and hence makes one less likely to evolve. In effect, a new agreement must be established, while at the same time, the existing agreement must be policed. Thus, it is extremely difficult to differentiate between actions designed to signal a new collusive equilibrium and those designed to undermine an existing agreement (i.e. exploit the uncertainty associated with change to build market position)

Information on expected change is generally available from industry participants and sometimes from market consultants. A number of different analyses must be performed, one for each key variable (i.e. demand, input costs, technology) which is expected to change. As a rough approximation, the product's life cycle position is a proxy for change with growth and decline phases associated with dynamic market conditions, while mature

products are generally more stable.⁵⁶

IV-B. Collusion Analysis for Differentiated Products

Collusion in differentiated products markets is significantly more complicated than collusion in homogeneous products markets.⁵⁷ Since each firm offers a unique product, price agreements are likely to become overly complex and thus extremely unlikely to occur.⁵⁸ Territorial or random customer allocations are probably impossible due to consumer preferences for differentiated products offered by specific firms. This only leaves the cartel with the possibility of customer or at least market share allocation schemes. Thus, the cartel must 1) establish to a system to identify customers (or market shares) allocated to each cartel member, 2) monitor *ex post* whether the appropriate firm in fact obtained the business and 3) punish any firm that "steals" customers from its rivals. While customer allocations or market share quotas may be feasible in the short run, both could be undermined by market changes. For example, even if customers preferred a particular product at any point in time, customer allocations would become unstable as product needs change. Likewise, market shares are likely to rise and fall with market

⁵⁶ While the life cycle model has some attractive descriptive properties, its forecasting abilities are limited, because life cycle position can change in response to exogenous factors. For example, technical change elsewhere in the economy can switch a product from a mature phase to a growth phase. Alternatively, exogenous change can shift a life cycle from growth to decline without going through a mature stage.

⁵⁷ As with cartels in homogeneous goods markets, collusion is often possible without the participation of small "fringe" firms.

⁵⁸ Each firm has an incentive to underestimate the appropriate correction factor for its differentiation, because the firm with the best value for consumers is likely to gain share once the price is raised to the noncompetitive level. Likewise, a firm that negotiates poorly and is saddled with an overestimated correction factor is likely to lose sales after price is raised. These firms would then face additional pressure to defect from the agreement. Given the incentives to misrepresent information in the tacit negotiations and the endogenous incentives to cheat on an agreement once it evolved, price collusion is unlikely.

preferences for particular differentiated products and these swings may be impossible to distinguish from deviations from an agreement. Overall, collusion in differentiated product markets appears very unlikely to evolve and even less likely to be sustained.⁵⁹ However, if concentration levels rise high enough, firms may find techniques to address the relevant concerns. Thus, a set of key questions are addressed below, with the understanding that they are only relevant in extremely concentrated markets. In general, the questions focus on slightly different subtopics than those for homogeneous products, although that information is also useful in the analysis.

IV-B1 How does the market function?

In a differentiated product market, competition is likely to involve market interactions between suppliers and customers. For example, competition would be affected if each supplier established long-run relationships with specific customers. These arrangements could make it easier to establish a collusive agreement, but the ability to establish long term relationships with new customers would create a large incentive to cheat on the cartel. Likewise, if the contracting is relatively infrequent, cheating is more profitable and difficult to punish. For example, customers may send out relatively few requests for quotations. At that time, if a cheater would cut quality-adjusted price from the collusive level, it might reap increased profits by "buying" a customer's business at a price effectively below the collusive level. Competitors may not be able to tell whether this is, in fact, cheating on the agreement or whether the firm possessed a technology that fit the needs of the customer

⁵⁹ This observation could be described as the major result of antitrust enforcement under the HSR reporting system. Numerous highly concentrated industries were studied and complaints about collusive behavior were rare in differentiated products markets (Scheffman, 1996)

particularly well. Even if the cartel could identify cheating, punishment would be delayed until another major order is available.

As with homogeneous products, information of the type of market is generally available from the merger partners, their competitors, the downstream customers and industry experts. For example, it should be relatively easy to determine if suppliers have established long term partnership relationships with customers and if market transactions are infrequent. In general, the analyst needs to assemble a picture of how competition occurs in the marketplace.

IV-B2 What information is available in the market?

Information requirements for a successful cartel in a differentiated product market are likely to be much larger than that required for a cartel in a homogeneous market. Firms are likely to need a great deal of information on each competitor and customer to be able to judge whether a lost sale is related to cheating on the agreement. In the basic cartel model, each supplier reserves a set of customers for their product. However, customers will still shop the market and could easily switch to a new firm if various non-price variables were considered superior. Thus, each firm needs information on an entire set of price and non-price attributes of their rivals' products and their customers' needs. Then for any lost sale, the firm must determine whether the sale was lost to a random event in the market or to endogenous competitive activity on the part of a rival.

The firms in the industry should be best able to identify their sources of information. In general, these firms will have minimal knowledge on their rivals, although they may have a good understanding of their customer needs. On occasion, evidence in the parties' documents suggesting that the firms "know" their rivals' pricing structures to various

customers will be found. This information is supplied by the customers by saying, for instance, "your bid is X percent too high" or "to be competitive, you need a price of Y dollars." This data is, by its nature, unreliable. If a cartel of suppliers were raising prices anticompetitively, customers are unlikely to provide accurate information to rival suppliers. The customer would be expected to misrepresent the facts and attempt to induce a price discount. Similarly, if rivals know who they are competing with for individual sales, this may indicate that they can monitor a collusive customer allocation scheme. On the other hand, a customer could very well say that "Company A" is offering a good bid, regardless of the quality of the bid. Thus, customer information must be interpreted with care.

IV-B3 Do sophisticated buyers exist?

A competitive analysis must address the potential for buyer sophistication before concluding that suppliers can raise price above the competitive level. While product differentiation makes reaching a collusive agreement more difficult, it also makes cheating on that agreement more difficult. A sophisticated buyer might be able to enhance the probability of cheating on a cartel by undertaking actions to allow it to use any of the differentiated products. For example, a customer could adjust its production process to compensate for the physical differences in the various differentiated inputs available on the market. This adjustment could even be targeted at the firm considered most likely to cheat on an agreement. Alternatively, a large buyer could force a price discount by threatening retaliation in other markets.

Information on buyer sophistication may come from the buyers themselves. In general, buyers already have programs in place to defend against price increases. Thus, the analyst only needs to uncover the appropriate person in the firm and obtain an

understanding of the relevant strategies. Suppliers may also have some ideas of how buyers could behave. The various strategies may have been used before and the outcome memorialized in internal documents.

IV-B4 Do the fringe firms have competitive products?

In differentiated products markets, excess capacity is not necessarily related to the ability to expand output, thus the capacity levels of the cartel participants are not really relevant. However, the competitive effect of fringe firms still needs to be evaluated. Of course, it is possible that the fringe will have little effect on competition. Their small share may be evidence that their products are not desirable to most customers and hence they would have a minimal constraining effect on any cartel. On the other hand, fringe firms may be relatively late entrants into the market or offer innovative features that are not really valued at current prices. However, they may represent attractive alternatives for customers were prices to rise.

Information on the competitive significance of the fringe can come from customers or the fringe firms themselves. Evidence that customers do not even know (or have reviewed and rejected) the products of the fringe firms suggests minimal competitive impact. On the other hand, successful product trials implies fringe competition which could impact the market. Likewise, internal expansion plans on the part of the fringe (especially if currently on track) suggest a competitive impact.

IV-B5 Do firms have similar incentives to compete?

Differentiation is likely to lead to firms facing diverse opportunities and require firms to pursue a number of different strategies, both of which complicate any possible collusion. Differences in circumstances can vary, with unique technologies, specialized customer

bases, different capitalization levels, and customized input suppliers all affecting the firms optimal choices. Moreover, strategies can differ, with some firms following a cost minimization strategy (that requires high output levels to capture experience curve cost reductions), other firms attempting a niche strategy (that mandates investment to further differentiate their product) and still other firms engaging in a harvest strategy (that minimizes investment to maximize cash flow). It goes without saying that diverse firms would have a difficult time agreeing on a single strategy to reduce competition and raise price. Likewise, non-price competition opens up numerous avenues for firms to cheat on any tacit agreement.

Information on circumstances and strategies can be acquired from various industry participants. The merging parties' documents are likely to describe strategies and the competitive circumstances that justify their strategic choices. Customers may have some understanding of the strategies followed by other suppliers. Of course, one could attempt to obtain this information directly from third parties, but these may be unwilling to reveal the normally secret strategic discussions and conclusions.

IV-B6 Are market conditions relatively stable?

As with homogeneous products, changes in market conditions make collusion less likely. However, the differentiated products cartel may be more troubled with changes within the market and less troubled with general market changes.⁶⁰ Since the product is differentiated, it is likely that new products are always being introduced into the market. This creates an initial problem with pricing the products comparably to the existing product

⁶⁰ In effect, a new product introduction can be considered a form of non-price competition

line of the cartel. Moreover, firms with successful products tend to gain share, while firms with unsuccessful products tend to lose share. This dynamic change is likely to have an impact on the likelihood of cheating, because a firm facing a product failure has a strong incentive to try to salvage the situation with a competitive price cut. On the other hand, simple growth in the market may be addressed by each firm increasing its efforts to serve its customer base. Prices would not be directly relevant to the cartel based on customer or share allocations.

The merger partners and their competitors can probably provide the best information on new product introductions. Then suppliers can be interviewed to determine their likely responses to the new products. Evidence suggesting customers are attracted to new products suggests collusion is less likely, while information that implies new products will have a minimal impact tend to raise concerns.

IV-C. Unilateral Analysis for Homogenous Products

The unilateral effects analysis in a homogeneous goods industry is basically an application of the dominant firm model.⁶¹ If a merger results in the creation (or strengthening) of a single large firm, the elimination of the acquired firm may allow the post-merger entity to raise price. In particular, the dominant firm calculates a residual demand curve by subtracting an estimate of the fringe output from the overall market demand. Then the dominant firm restricts output until it forces price up to a monopoly

⁶¹ A case can be made for applying a Cournot model to predict an anticompetitive price effect from a merger in a homogenous products industry. While the mathematics would work out, the assumption of Cournot behavior is probably invalid rendering predictions unreliable. Firms would likely need to collude on Cournot expectations to behave as a Cournot model predicts.

level.⁶² Fringe firms cannot defeat the price increase, because they are capacity constrained at various price levels (either by physical constraints or cost disadvantages). As discussed below, these issues are relatively easy to address.

IV-C1 How profitable is the dominant firm?

The Merger Guidelines set 35 percent as the minimum share that could lead to a unilateral effect. While the number appears reasonable as a lower bound, a share of 35 percent does not establish an anticompetitive presumption.⁶³ Instead, a dominant firm will only increase price if the additional margin associated with the sales retained by the firm exceeds the foregone margin on existing sales lost to competitive actions by the fringe firms.

The basic information on margins is a key variable in the analysis and should be readily available from the merging parties. In general, a firm should have a good idea of the margin associated with its output, even if it just divides variable costs by total output. Once supplemented with information on lost sales, the margin data would allow the calculation of the profitability of a price increase.

IV-C2 What is the excess capacity held by the fringe firms?

For the price increase to be viable, the fringe competitors must not be able to expand output dramatically in response to a unilateral price increase. Thus, information on excess capacity held by the fringe is important in the analysis.

The basic concentration analysis should have surveyed the fringe firms to obtain

⁶² The dominant firm price is below the industry monopoly price, because the fringe firms do not restrict output

⁶³ In general, a dominant firm with a 35 percent market share would not possess unilateral market power, unless the aggregate fringe firm supply was extremely inelastic.

estimates of their available excess capacity. At this stage, it would be useful to check the analysis to be sure that the excess capacity is functional and reasonably cost efficient. For example, if the excess capacity is comprised of obsolete machines kept in the factory to provide surge output in response to large price increases or to meet the demand of important customers, it might not be appropriate to expect the capacity to come back on line in response to a noncompetitive price increase. Likewise, a fringe firm may have a union contract that makes it very unprofitable to use the excess capacity. Overall, the investigation should attempt to determine if the excess capacity can be easily used in the market. Opinions of the fringe competitors are useful, although without clear justifications, should not be considered dispositive.

IV-C3 Are the fringe firms at a cost disadvantage?

Even if the fringe firms have excess capacity, output expansion will not defeat a dominant firm price increase unless the product can be competitively priced. Thus, an analysis of the fringe firms' cost structure is crucial. If the fringe firms face a significant cost disadvantage (e.g. the dominant firm is able to exploit economies of scale), then the output expansion, although positive, is less likely to render a dominant firm price increase unprofitable. On the other hand, if the fringe has the same basic technology and cost structure as the leading firm, a dominant firm price increase will be defeated by fringe expansion if sufficient excess capacity can be brought into the market.

Evidence on the fringe cost structure may be available from the small competitors, although it may be difficult to detect subtle cost disadvantages. For example, information on the size of machines could be obtained and the analyst could evaluate the technical effects on cost. However, if cost is driven by technology, it may be more difficult to obtain

the information directly. Customers may be of assistance, since they have observed how the dominant firm and fringe have interacted in the past. Evidence of competitive bids would be suggestive of technical parity, while evidence the fringe only wins those bids ignored by the dominant firm could suggest cost differences.⁶⁴

IV-C4 Can fringe firms easily add efficient capacity?

The final question addresses the issue of whether the fringe firms could expand capacity in response to a price increase. In general, the same standards associated with identifying competitors in a market could be used, with the investment considered likely if the sunk costs could be completed in one year and recouped by a price five-percent above the competitive level for one year. As with the identification of competitors, if expansion plans fail the test the issue is revisited in the later entry analysis.

The questions follow the basic approach described in the market definition section. However, instead of just focusing on whether the firm could produce output, any analysis must focus on the magnitude of entry. Unless the new capacity is sufficient to defeat the dominant firm price, fringe expansion is insufficient to maintain competition.

IV-D. Unilateral Analysis for Differentiated Products

In the unilateral effects analysis for differentiated products, the two merging parties should be shown to be head-to-head competitors for at least a significant number of

⁶⁴ The evidence would have to show that both merging parties have a cost advantage for the transaction to raise a competitive concern. If the dominant firm acquired one of a number of fringe firms, the transaction would be unlikely to lead to higher prices (unless all fringe firms had relatively inelastic marginal cost curves).

customers, with no other rivals able to constrain price.⁶⁵ Thus, after a merger, price will increase on one or both products.⁶⁶ Questions relevant to this analysis are discussed below.

IV-D1 Does one of the merging partners constrain the price of the other?

The simplest unilateral theory involves a situation in which the price of one of the products offered by the merged entity is constrained by competition from the products of the merger partner.⁶⁷ After the merger, the firm can raise price on one product and hold the price fixed on the other product. Thus, the firm recaptures the margins on sales from a number of customers who substitute away from the affected product. Given the merged firm retains the margins for a number of customers who substitute away, the price increase could be profitable. This is simple model, depending, at first, only on the value of the price increase, the magnitude of the lost margins and the share and magnitude of the recaptured margins. If the price increase is profitable, the repositioning issue would have to be addressed.

To evaluate the potential profitability of this strategy, a merger analyst should obtain an understanding of the various attributes of the merged entity's products and their relation to the products of other firms. Products can be "close" in terms of geography or product attributes. By asking customers and competitors about the characteristics of the products,

⁶⁵ Using the European concept of dominance, a merger of two significant competitors could create market dominance, while the merger of a large firm with a fringe rival could entrench market dominance.

⁶⁶ It is possible to assume that firms in a differentiated products market follow Bertrand behavior and price in a less than competitive manner. However, the magnitude of the effect depends on the structure of the market.

⁶⁷ This theory may involve a logit model in which the high-share firm buys a much smaller low-share firm or a spatial model in which one of the merger partners is constrained by other rivals, but represents the key competitive constraint on the other partner.

it can be determined if the merging parties' products are similar. In some industries, customers and firms have knowledge of the attributes of their alternatives and rivals. In other industries, however, this information may be limited.

Often the internal documents of the merging parties provide information as to the "closeness" of products. If one firm's product (B) is disproportionately mentioned as direct competition in sales call reports and marketing documents to product A, this tends to identify B as a close competitor to A. However, the documents associated with product B may identify a number of substitute products in addition to A. This would imply that B alone constrains A, while A in combination with other products constraints the price of B. Given the evidence on closeness, the analyst would then have to collect standard information on the firm elasticity of demand and various cost structures to compute the potential profitability.

IV-D2 Do the two merger partners constrain the price of each other?

The unilateral theory will also apply if the products offered by the two merger partners are similar to each other, but not similar to products offered by other competitors (similar generally implies a closeness in terms of market characteristics).⁶⁸ In this case, the merged entity could raise the price of both products, although the increase would be less than 5 percent.

The investigation requires the same type of information discussed above. However, one would now try to show that the two products constrain the price of each other with little outside assistance. While the products of the merging firms may be "closer" than other

⁶⁸ This situation would occur in a logit model where two equal sized firms merge and in a spatial model when two relatively similar (but otherwise unique) firms merge.

firms in the relevant market, only de minimis price effects would occur if the other products were sufficiently close. To assess this rivalry, customers must be asked about the magnitude of the price increase required to induce switching. The parties' internal documents may also indicate how many competing products customers actively considered. If a large number of products are considered, the merging parties may not be able to raise price. A formal analysis could be undertaken to show the relatively small price increase would be profitable. Again, the analysis abstracts from the potential for rivals to reposition their product line.

IV-D3 Can the other firms in the industry reposition their product offering?

A unilateral price increase creates profitable opportunities for competitive firms to adjust or expand their product lines. In effect, by offering new products "close to" the product(s) imposing the unilateral price increase, competitors can, if successful, gain share and defeat the unilateral effect. Evidence should be gathered on the ability of competitors to either re-position their existing products or introduce new products and the sunk costs required for such an effort.⁶⁹ The discussion in the section on entry should be particularly helpful

IV-D4 Can the downstream buyers undertake any strategies to disrupt the unilateral effect?

In many differentiated products industries, buyers will invest in transaction-specific capital in forming relationships with suppliers. Given suppliers could opportunistically exploit these investments to demand a premium price, buyers will only invest in the capital

⁶⁹ If repositioning does not require an investment in sunk costs, price premiums cannot be maintained by unilateral actions

when sufficient institutional mechanisms exist to ensure competitive prices. These same institutional relationships may be able to guarantee competitive prices after a merger.

Evidence on contractual mechanisms is likely to be most available from the buyers. After first identifying the transaction-specific investments, the analyst needs to explore why the buyer felt comfortable with the investment. Answers range from sophisticated contracts to reputation effects. For example, if a buyer does other business with a supplier, the threat of retaliation in that market may ensure competitive prices. Alternatively, future quasi-rents from the business relationship may be lost if the supplier behaves opportunistically (raises price to an anticompetitive level). Thus, suppliers may credibly commit to competitive behavior before the merger and the commitment may be unaffected by the transaction.

IV-E Undertaking the Competitive Analysis

A competitive analysis of the widget merger would have to determine if an anticompetitive effect was likely or unlikely based on theories of cartel or unilateral behavior. As noted earlier, these two theories are mutually exclusive (either firms collude or act independently) and the evidence needed to support either theory depends on the characteristics of the product. In the two examples discussed below, we focus on a cartel theory applicable to a homogeneous widget industry and a unilateral theory applicable to a differentiated widget theory. Analysis could also be undertaken for a cartel theory in a differentiated market and a unilateral theory in a homogeneous market.

IV-E1 Cartel Behavior

Any cartel must be able to establish a collusive agreement, monitor its members'

actions and punish deviations from the agreement. If the product is relatively homogeneous, the widget manufacturers need only agree on a single noncompetitive price to establish an agreement. The agreement could be as simple as the post-merger firm posting a new higher price and the remaining firms raising their price to this level.⁷⁰ Evidence suggesting sufficient public information on business relationships is available to allow the large firm to determine if its rivals are cheating on the agreement would make policing the agreement easier. Likewise, an ability to target price discounts to the customers of any particular firm would aid in punishing discount pricing. However, if buyers can protect their suppliers with long term contracts, competitive pricing may be profitable and therefore collusive behavior is less likely. Another issue involves excess capacity. In particular, if all the small firms can double their sales, the attractiveness of competitive pricing would tend to undermine the cartel. If the small firms believed at least a few of their rivals were likely to expand output to offset the post-merger collusive reduction in output, the cartel would appear unprofitable and be unlikely to evolve.

IV-E2 Unilateral Behavior

The basic goal of a unilateral analysis is to determine if a targeted price increase is profitable, assuming the firm's rivals act to maximize their profits. In a differentiated products model, a price increase on the part of the merged firm is likely to trigger some switching to substitute products, but may still be profitable to the merged firm.

Of particular interest is the post-merger elasticity of demand facing the large 60

⁷⁰ In our hypothetical example, one firm with a 60 percent share competes with eight firms each with a five-percent share. If the small firms can expand their output to defeat a unilateral price increase, collusion is necessary for noncompetitive performance. In theory, the merger could transform the industry from one in which two 30 percent firms actively compete, to one in which a 60 percent firm serves as a price leader.

percent firm. If the demand is relatively inelastic, a price increase would cause a relatively small reduction in sales and tend to be profitable, while if demand is sufficiently elastic, a price increase would lead to a significant reduction in sales and tend to be unprofitable. In the differentiated products model, the interaction of the elasticity and cost structure gives rise to a potential price increase (possibly zero). However, competitors are able to reposition existing (or position new) product offerings to compete for sales. If this effect can be quantified, an additional analysis should be performed to supplement the elasticity profitability calculation. Alternatively, some downward adjustment can be made to the profitability calculation so marginally profitable actions would then fail the profit test.

Various quantitative models of unilateral competition can be readily estimated, although the structure of the models seems to guarantee a price increase.⁷¹ In the real world, customers and fringe competitors are unlikely to behave as naively as the models assume. Thus, an actual analysis will need to account for buyer counter-strategies and fringe firm competition aimed at the unilateral effect.

⁷¹ For example, a logit analysis always predicts a higher post merger price, although the effect may be diminished or offset by efficiencies. Werden and Froeb (1994). Econometric analysis can also generate elasticities which would allow the analyst to calculate the expected price increase. See Baker and Bresnahan (1985) and Hausman et al (1994).

V. ENTRY IN MERGER ANALYSIS

The fourth stage of merger analysis focuses on the ease of entry into the market. In general, the analyst attempts to predict whether the threat of entry will prevent or deter a particular type of anticompetitive price increase. If entry is sufficiently easy such that established firms cannot impose or maintain a price above the competitive level for a significant period of time, the merger investigation should be closed. Alternatively, if entry is insufficient to discipline a price increase, then transactions which are likely to lead to an unilateral or collusive price increase raise serious competitive concerns.

The traditional approach to entry involved a search for barriers to entry that make it unlikely that new firms will choose to construct capacity. If barriers were found, entry was considered impeded, while if no barriers existed, entry was considered to be easy. Various definitions of barriers to entry have been offered. Bain (1956), for example, defined barriers as advantages of established sellers over entrants, while Stigler (1968) considered barriers to be costs of producing at various output levels incurred by entrants but not incurred by existing firms. Thus, product differentiation could serve as a barrier under Bain's definition, but would generally not be a barrier under Stigler's definition. Overall, the existence of barriers often turned on the definition of barriers used in the analysis. Finally, the traditional approach to entry ignored the time required for entry to occur.⁷² Thus, it would be possible for a merger to lead to an intermediate term price increase, with entry returning the market to competition in the long run.

The 1992 Merger Guidelines advanced a the three part test of timeliness, likelihood

⁷² Note that Posner (1976 at 39) did advance time as a barrier to entry.

and sufficiency to determine if entry was likely to deter or defeat a price increase.⁷³ If carefully applied, this technique will identify those cases in which entry eliminates competitive concerns.⁷⁴ In general, the timeliness consideration ensures that entry can relatively quickly offset the anticompetitive effect and the likelihood consideration ensures that entry is profitable.⁷⁵ The sufficiency concern is necessary to guarantee that the entry can actually defeat the anticompetitive price increase. Of these three conditions, only timeliness requires a policy standard to determine how quickly entry should affect the market. The Guidelines advance a two year standard, although either shorter or longer periods could also be considered.⁷⁶

To determine if entry is timely, information needs to be gathered on the entry process from the initial planning stage until the impact on competition. The analysis should generally be undertaken from the perspective of a motivated, well positioned entrant. The U. S. Merger Guidelines suggests two years as the critical level, with entry considered timely if it could affect competition within the relevant time frame. Two approaches exist, the first using historical experience (assuming recent entry has occurred) and the second based on expert opinion. The historical experience approach risks generating lengthy

⁷³ For a general overview, see Coate and Langenfeld (1993). Gilbert (1989) and Stiglitz (1987) raise theoretical issues, while Salop (1986) and Schmalensee (1987) offer more applied considerations.

⁷⁴ The Guidelines standard represents an attempt to combine a time horizon for entry with a "could profitably" standard. Although the time horizon is debatable, the comparison of minimum viable scale with sales opportunities ensures the entry, if undertaken, would be profitable. Analysis that focuses on whether potential entrants "would" enter is clearly inappropriate, because the threat of entry is sufficient to maintain competitive prices.

⁷⁵ The analysis of likelihood would be most relevant to an antitrust policy based on barriers to entry. If entry was not likely, the reasons for the lack of profitability could be considered barriers to entry.

⁷⁶ The Guidelines suggest that entry into a durable goods market need only assist in constraining price within a two year period to be considered timely (Section 3.2). A similar argument would suggest the threat of entry (potential competition) should be timely if the threat of entry constrains price.

estimates of the entry process, because actual entrants are usually responding to competitive conditions, while the expert opinion approach may only amount to speculation. Since both approaches suffer from drawbacks, careful analysis should be undertaken to minimize the problems. To be more thorough, if possible, both approaches should be explored.

The likelihood of entry is basically a profitability test. To justify a significant sunk investment in a market, an entrant must feel comfortable that it can profit in the post-entry environment.⁷⁷ Thus, pre-entry prices may be illusionary. The Guidelines suggest that the analyst study the minimum viable scale and then determine if this output can be absorbed by the market without depressing price.⁷⁸ First, the methodology assumes that the market can absorb a five-percent output expansion without depressing price.⁷⁹ Then additional adjustments are made for growth, buyer power and possible accommodation of the entrant and the resulting share figure is compared to the estimate of minimum scale. If the share available to the entrant is greater than minimum viable scale, entry is presumed to be

⁷⁷ This approach has been criticized as creating the "low profits" barrier to entry. While the concern is relevant in instances when the analysis is improperly applied, correct application of the methodology should be able to avoid the problem. First, sunk costs are a necessary condition for entry to be unlikely. If no sunk costs exist, the possibility of hit and run entry serves to maintain competition. Second, the comparison of scale to sales opportunities avoids a direct focus on price. Thus, entry could be considered likely even if the current market is unprofitable (as long as future conditions suggest a return to profitability). Third, even if the industry is expected to decline, an entrant with a new technology could be accommodated by the incumbents.

⁷⁸ Minimum viable scale equals minimum efficient scale if the market is competitive.

⁷⁹ If the market had a unit elasticity, a five-percent price increase would require a five-percent restriction in output. Assuming the entrant expands output by 5 percent, the market price is returned to the competitive level. An alternative explanation is that five-percent of the market is on the margin, considering alternative suppliers, and searches for entrants in response to an actual or threatened price increase.

profitable.⁸⁰

The final concern involves the sufficiency of entry to deter or defeat a price increase. For example, even if entry is timely and likely, the scale of the entry must be sufficient to defeat the price increase. Although in many situations, entry can be replicated, other cases exist in which multiple entry would lead to higher input prices and therefore prevent sufficient entry from occurring. Situations also exist in which entry into the broad market would be possible, but the entry would be unable to defeat a price increase in a market niche within two years.

It is important to note that entry analysis overlaps with the supply-side substitution analysis in market definition. As discussed above, firms that can enter the market within one year with a minimal investment in sunk costs are considered to be competitors in the market and assigned a market share. The competitive impact of entry by firms that require more than one year to enter a market or must invest in significant sunk costs to compete in the market are not considered in the market definition analysis. Thus, entry analysis requires consideration of two types of firms; the uncommitted entrants, firms able to compete in more than one year and committed entrants, firms able to compete after investing in sunk costs. Time is the relevant issue for uncommitted entry, while analysis of committed entry requires an evaluation of both the time and profitability of entry.⁸¹ For both types of entrants, a brief sufficiency analysis would also be required.

⁸⁰ The Guidelines analysis focuses on "me-too" entry in which the new firm offers a product similar to those of the incumbents

⁸¹ Again, an argument can be made that the exact time required for entry is not relevant for uncommitted entry. Instead, the evidence would need to show the potential for competition would constrain pricing within two years

To structure the entry analysis, questions to elicit the key information on ease of entry are organized into timeliness, likelihood and sufficiency. Once this information is collected, standard entry analysis can be undertaken.

V-A. Timeliness of Entry

The analysis of timeliness is designed to determine how long entry takes to affect competition in the market. Some questions which are particularly useful in this analysis are listed below.

V-A1 Have any new firms entered the market in last 5-10 years?

Investigations which uncover a number of recent entrants are more likely to obtain good answers to the relevant entry questions. Of course, it is possible to conclude entry is not going to occur even in the face of actual entrants and it is possible to conclude entry is timely and likely without recent entrants.

It should be relatively easy to determine if any new producers or importers have entered the market through interviews with industry participants. Then the exact dates of the entry can be confirmed by the particular entrants.

V-A2 Given actual entry has occurred, how long did it take?

Recent entrants can offer the best evidence on timeliness of entry, although the information must be adjusted by the analyst. The responses should trace out the time frame for entry, starting with the planning stage and ending with the product roll-out into the market. Then the entrant should be asked if it would be possible to speed up the entry process at minimal cost. For example, it might be possible to curtail the initial planning process, because the entrant had to determine whether to enter a competitive market,

while the merger analyst is interested in entry into a noncompetitive market. Likewise, it may be possible to undertake various tasks simultaneously. Finally, the times should be adjusted downward to reflect the situation of the firms best situated to enter the market with a product comparable to those already sold in the market. In high technology markets, this final step may require significant investigation, because entrants may be most knowledgeable on innovative entry, not the me-too entry of the merger analyst. Thus, the information obtained from the entrants will have to be adjusted and integrated into a hypothetical me-too entry evaluation. In other cases, the information will have to be adjusted to the perspective of a customer. Since customers use the product internally, they may not need time to survey the market requirements.

V-A3 How long do industry experts expect entry to take?

Evidence on the time required for entry should also be gathered from competitors and potential entrants. In general, firms in the market or potential entrants should be asked how long it would take to expand capacity. Additional information would be gathered for the time required to develop a product to proxy the situation of the entrant. Again, adjustments would have to be made for the ability to conduct the various tasks simultaneously, the possibility that the entry impacts on the market either before or after the plant was completed and to ensure the information is appropriate for the best positioned class of entrants. On occasion, information can be gathered from firms that are neither competitors nor potential entrants.

V-A4 When is the market expected to respond to the entry?

A market response is generally shown by the entrant winning a significant amount

of business, or by a competitive response from the incumbents.⁸² In some cases, the entrant could affect competition before the manufacturing plant or distribution center was opened. Incumbents, for example, may often react to the inevitable influence of the new entrant by renegotiating current contract terms with their customers. Under these circumstances the expected time required for entry would have to be adjusted downwards in the final analysis. On the other hand, entry could require product qualification, which takes time as new products are tested to confirm that they are suitable to the user. In this case, the testing period must be added to the entry time-calculus.

Expected entrants should be asked the following: when do they believe that the market will respond to their entry? Likewise, similar information could be gathered from incumbents. Of course, the best information could be obtained from reviewing instances of recent entry.

V-A5 Does the threat of entry affect market behavior?

It is possible that the threat of entry will preclude supracompetitive prices. For example, firms may refrain from raising price to avoid a chance that another rival will enter the market. To evaluate this issue, competitors need to be questioned about how they make pricing decisions. Evidence that firms currently respond to potential entrants would suggest that entry affects prices instantaneously.

V-A6 Does product durability argue for a longer time frame?

In general, product durability allows customers to delay purchasing new equipment

⁸² The term "significant" is not defined in the Guidelines. Reasonable interpretations include five-percent of the business open to competition, contracts with a number of small customers, or the creation of a business relationship with a major customer.

by either utilizing the existing stock of equipment more intensely or by investing in additional maintenance.⁸³ In either case, entry need only occur before customers have to purchase significant amounts of new equipment to defeat a price increase. Thus, questions should proceed along two lines. First, customers need to be asked if they can delay purchasing new equipment by using up their existing stock of assets (or purchasing used equipment). If this is the case, information on how long the higher utilization rates could be maintained would have to be obtained. Second, maintenance schedules need to be examined to determine if existing equipment can retain its productivity through additional internal upkeep. Again, one would want to know how long the equipment could be maintained. The answers to these questions would give an idea of what time-frame should be used for entry in durable goods markets. For example, the time-frame for entry could be lengthened to three or even five years, if the evidence suggested customers could significantly delay purchasing new products.

V-B. Likelihood of Entry

Analysis of the likelihood of entry attempts to determine if entry would be profitable and hence could be inferred to occur in response to a price increase. A number of questions are listed below to evaluate the profitability of entry in response to a price increase

V-B1 What is the minimum viable scale in the market?

Under the standard Guideline theory, scale economies interact with sunk costs to

⁸³ For a theoretical model on this point, see Froeb (1989).

render entry unprofitable. The basic theory suggests the need for large scale entry is likely to depress price below the competitive level, such that incumbents cannot earn a sufficient return on their sunk costs.

To obtain information on the relevance of scale economies, the size of the various firms in the market and the cost advantages generated by the large scale needs to be examined. Economies of scale may be plant specific and generally understood in the industry. Alternatively, a distribution of plant sizes may exist in the market, with no clear agreement on the efficient scale. In this case, the survivor principle can be applied to define the minimum efficient scale as the size of the smallest firm that is successfully competing in the broad market. Obviously, failing or niche firms should be excluded from the analysis.

V-B2 Are scale advantages significant?

Once the efficient scale is identified, it is necessary to determine the magnitude of the advantage. In general, the efficiencies will preclude firms from operating at a small scale. However, if the advantage is deminimis, small scale entry is likely to occur. In effect, the estimate of minimum viable scale needs to be adjusted downward until a significant cost advantage is found. While it is impossible to identify a significant advantage for every investigation, a cost disadvantage of more than five-percent would be likely to deter inefficient entry.

V-B3 Are sunk costs large in the industry?

Sunk costs are capital investments in an industry that cannot be recovered after exiting. Various firms can supply information on the assets required to compete in the market. The analyst must exercise her judgement in assessing the salvage value of the

asset after an unsuccessful entry as well as the depreciation of the asset during the entry period. For example, many types of equipment tend to depreciate slowly and may be easy to sell if a used equipment market exists. Thus, the sunk costs would be limited to the physical costs associated with transferring the equipment. Other equipment is specialized to a particular industry. If no buyer is available, industry-specific assets would be considered sunk. Investment in intangible assets, which are usually not marketable, may not be considered sunk if it tends to depreciate quickly. Research and development expenditures, for instance, are considered sunk if they tend to generate benefits for years. Advertising assets, on the other hand, would not be considered sunk if the established name recognition depreciates quickly.

V-B4 What is the market growth rate?

The relevance of economies of scale to an entry analysis depends in part on the market growth rate. If the industry is growing quickly, the market can more easily accommodate a relatively large entrant. If the industry is growing slowly, a large entrant would be obliged to take significant share away from its rivals.

In general, firms in the industry would have estimates of the expected growth rate in the market. These estimates can be readily averaged to generate a figure to use. Alternatively, various experts and trade periodicals may track an industry and have reliable growth estimates.

Business cycle considerations complicate the analysis. Industry growth rate is often above the historical level during a boom period and below during a recession. The use of a cyclical growth rate would lead one to conclude that entry is relatively easier in boom periods than it is during recessions. Thus, all else equal, antitrust policy would be more

lenient under robust macroeconomic conditions. Given more mergers may be proposed in recessions to avoid bankruptcy during recessions, policy makers should consider whether some adjustment in the analysis is in order. For example, an analysis could focus on long run growth rates to net cyclical considerations out of the analysis.

V-B5 Do big buyers exist in the market?

Large buyers are important to the entry analysis, because of their ability to facilitate entrants.⁸⁴ In particular, the need for large scale entry is not a deterrent if the entrant can obtain large contracts before investing in sunk costs. Likewise, the existence of large buyers raises the possibility that these firms would integrate backwards in response to anticompetitive pricing.

Firms will usually have information on the identity of their customers. Thus, it should be relatively easy to identify the large buyers and their share of the buyers' side of the market. Note that a large buyer need not have a dominant share in absolute terms; rather, it need only have a sufficiently significant demand for the product such that an entrant which wins that account can load a plant efficiently.

V-B6 Are large buyers willing to switch suppliers?

In some markets, buyers develop long term relationships with suppliers and may be reluctant to deal with entrants. This reluctance can be quantified as switching costs, which are the additional costs the customer must incur to change suppliers. Detailed investigation is necessary to fully understand these costs. For example, the costs may involve product testing that must be undertaken to assure the entrant's product will perform

⁸⁴ For a theoretical model of the importance of large buyers, see Sexton and Sexton (1987), Scheffman and Spiller (1992), and Kleit and Coate (1993)

in the customer's formulation. While these costs tend to prevent switching in the short run, they may facilitate switching in the long run. When the customer decides to reformulate its product, all inputs are usually requalified, so an entrant competes on equal terms with the incumbent. If some large buyers are considering reformulation, qualification costs are not relevant. Alternatively, the incumbent may be concerned with a reputation for quality. As long as the entrant has a quality reputation in its other businesses, this concern can be minimized since reputation is transferable.

In other markets, large buyers regularly solicit additional suppliers. Thus, it is reasonable to infer that they would deal with entrants. While quality concerns always exist, it may be relatively easy to test the input so the customer can quickly satisfy itself that the entrant meets its standards. Even if quick testing is impossible, an entrant may be able to offer warranties. In any particular industry, it is important to determine what arrangements have evolved to maintain quality and then explore how an entrant could certify the quality of its product.

V-B7 What share of output is available from large buyers?

Given an anticompetitive price increase, large buyers may be willing to switch at least some of their output to a qualified new entrant. In some cases, the buyers may be willing to offer all their business, while other buyers may prefer multiple sources. Basically, the aggregate share of large buyers that could switch to an entrant needs to be determined.

V-B8 How are the incumbent firms expected to respond to entry?

When faced with an entrant, incumbent firms have three choices: they can maintain price above the competitive level, drop price to the competitive level or drop price below

the competitive level - all through their choice of output levels. The Guidelines assume that the incumbents will drop price to the competitive level in the face of a five-percent output expansion from an entrant. If the entry is larger than five-percent, the Guidelines suggest price will be depressed below the competitive level. While a number of factors discussed above interact to affect the profitability of entry in this environment, it is useful to look for special industry characteristics which could lead to a different response by incumbents. For example, if industry capital stock is largely obsolete, incumbents may be forced to reduce output to accommodate an efficient entrant. On the other hand, if significant output expansions are already underway, incumbents may maintain output, thus depressing price in the face of any entry.⁸⁵

V-C. Sufficiency of Entry

Analysis of sufficiency of entry is often an afterthought, because timely and likely entry are generally sufficient to restrain anticompetitive pricing. However, a few special case situations exist in which timely and likely entry are not sufficient conditions for continued competition. These issues are explored below.

V-C1 Can the entry be replicated?

In general, entry can be replicated until the additional output depresses price back to the competitive level. However, it is necessary to determine if any special conditions exist to preclude the expansion. For example, the process of entry may force-up the price

⁸⁵ Incumbents may be more willing to accommodate entry if supranormal pricing is generally viewed as a competitive signal to increase output in the market. Thus, firms would respond to anticompetitive pricing by entering and expanding output. Given entrants, the incumbents may find additional output restriction to maintain the competitive price to be their the most profitable strategy.

of a key input to the point where entry becomes unprofitable.

V-C2 Can entry affect the competitive effect of concern?

In general, if an anticompetitive effect is broadly felt across the entire market, entry would be able to defeat the associated price increase. However, for some unilateral effects, the price increase may only impact on a niche in the market. If these adversely affected customers are unable to use the entrant's product in the short run, one could argue that the entry does not defeat the price increase. In general, this situation is very rare, because an ability to profitably raise price for a class of customers suggests a narrow market. An argument that the price increase cannot be profitably maintained in the long-run (justifying the broad market) and is immune to entry in the short-run (explaining why entry does not deter or defeat the increase) would appear to require a special set of transactions cost assumptions.

V-D. Application of Entry Analysis

An analysis of entry into the widget industry involves two major issues: timeliness and likelihood, and one relatively minor issue: sufficiency. The timeliness analysis is relatively simple, given the information obtained from the questions listed above. Basically, the time required for the sequential entry tasks needs to be added up and compared to a benchmark such as the two year period suggested in the U. S. Merger Guidelines.⁸⁶ If entry into widgets appears to be timely, a second analysis must be undertaken for likelihood

⁸⁶ The period could be longer for a durable good.

The likelihood analysis is more complicated.⁸⁷ It involves comparing the estimate of minimum scale of widget entry to the output available to the new entrant at the competitive price.⁸⁸ A study of the widget industry could suggest efficient scale was 20 percent. As noted above, the U.S. Merger Guidelines suggest a benchmark of five-percent of industry output as the baseline critical level.⁸⁹ As the scale estimate is well above five-percent, a new firm would probably depress price below the competitive level. However, it is possible that a more detailed analysis could show how entry would be profitable.

The benchmark share of five-percent should be customized for market conditions. If the industry is growing, sales opportunities are created for the entrant. Given the entry is timely two years in the future, one could add two years of growth to the initial five-percent share. Moreover, if the firm can load its plant over a few years, additional growth should be integrated into the available share. An example should clarify the analysis. Assume a growth rate of 4 percent a year for the widget market, a two year time horizon for entry and a two year period to load a plant, the market would generate a compound growth of 17 percent. If half of this growth was available to the entrant, entry would be profitable if the minimum scale was 13 percent. Alternatively, if the price increase of the incumbents allowed the entrant to capture all the growth, a firm could profitably enter as long as scale was not above 22 percent. Thus, entry would appear likely in most growth industries.

⁸⁷ One can shorten this analysis if the investigation uncovers an actual barrier to entry, because the entrant would be forced to compete at a higher cost level and hence the entry would not be likely

⁸⁸ If gadget production offered economies of scope with widget production, it would be reasonable to reduce the minimum viable scale required for entry to reflect these savings

⁸⁹ In the widget example, if the collusion model was accepted, it would be reasonable to conclude that the minimum viable scale was no more than five-percent. Hence the likelihood standard would be passed without sophisticated analysis

A second adjustment should be undertaken for large buyers willing to deal with entrants. For example, if the evidence suggested that two customers, each with 10 percent share, were willing to switch to a new widget producer at a competitive price, the entrant could profitably compete even if the minimum efficient scale was 25 percent. The market price would likely be depressed below the competitive level for the short-run, generating losses for incumbents, while the entrant would benefit from long-run contracts with big buyers. Given the differential effect of entry, anticompetitive prices are less likely.

A third adjustment is necessary for special case situations in which the incumbents restrict output in the face of entry. For example, if timely entry would occur with a new efficient technology, incumbents could further restrict output. Thus, innovative entry could be profitable even at higher minimum efficient scales.

Overall, these adjustments allow the analyst to evaluate the likelihood of entry. If entry is both timely and likely, a final analysis is necessary to look for special circumstances that would suggest the entry is not sufficient to defeat a price increase. As the questions mentioned above suggest, this would only occur in rare circumstances.

A few final observations are necessary. The minimum scale/share analysis is only necessary if significant sunk costs exist. If sunk costs are minimal, but entry takes between one and two years, entry would be presumed profitable if price rose above the competitive level. Second, if significant entry has recently occurred at competitive prices, it may be difficult to argue that entry is not likely. Moreover, the output expansion from the entry should play an important role in the competitive effects analysis. It is unlikely that incumbents will be able to restrict output sufficiently to raise price given that the output expansion from entry placed significant downward pressure on price. Third, it is always a

good idea to evaluate Stiglerian barriers to entry before concluding entry is profitable. If industry characteristics suggest that entrants must compete at significantly higher costs, then entry should not be considered likely.

VI. EFFICIENCY DEFENSE

The fifth stage of a merger analysis evaluates the relevant efficiencies associated with the merger. For antitrust purposes, recognizable efficiencies represent cost reductions that (1) allow a firm to produce a product with fewer resources, or produce a superior product with the same resources;⁹⁰ (2) can be efficiently obtained only by the proposed transaction.⁹¹ If efficiencies exist, a firm can reduce its costs and offer lower prices to consumers. However, if anticompetitive effects are considered likely, some type of balancing analysis is needed to trade-off the beneficial effects of efficiencies against the anticompetitive impact of the proposed transaction.⁹²

Traditional merger analysis has not generally considered efficiencies important if a merger is likely to have an anticompetitive effect. This position was challenged by Williamson (1968), who showed that even small efficiencies could offset significant anticompetitive effects. This insight did not have much effect on policy, probably because antitrust enforcement in the United States tends to focus on maintaining competitive prices, instead of enhancing industry efficiency. However, it did create a need to evaluate efficiencies to provide the relevant decision makers with information on the effects of their various policy options.

* Standard efficiency analysis focuses on what can be described as "static" efficiencies. Also of interest, although more difficult to judge are "dynamic" efficiencies. For example, if a particular merger enhances the ability of a firm to introduce a new product or production process, the implicit cost savings should be considered. These dynamic efficiencies are best considered on a case-by-case basis and used to supplement the standard analysis. Pecuniary efficiencies (i.e. those related to the ability to negotiate lower prices for inputs independent of resource savings) are not considered in efficiency analysis. This is appropriate for a consumer welfare standard, but not for a price test. A price analysis should focus on all efficiencies that affect a firm's cost curves and its optimal price. Pecuniary efficiencies, like real efficiencies present the firm with lower costs and hence create incentives to lower price.

⁹¹ If alternative transactions raised similar competitive concerns, the efficiencies would not be invalidated.

⁹² For a discussion of relevant issues, see Fisher and Lande (1983), Kwoka and Warren-Boulton (1986), Pitofsky (1992), Stockum (1993), Kattan (1994) and Yde and Vita (1996).

The Merger Guidelines list efficiencies as a factor to be evaluated in a merger review. After requiring the analysis to show that the efficiencies represent merger specific, real cost reductions, the Guidelines suggest that efficiencies should be considered in the analysis with greater efficiencies required to offset more serious competitive concerns.

An efficiency analysis generally requires information on two issues. First, it is important to identify the relevant cost savings and quantify their magnitude.⁹³ Second, an additional analysis must evaluate and reject alternative mechanisms for obtaining the cost savings. Of course, if only some of the savings can be obtained through alternative actions, then only a part of the valid efficiency need be rejected.

VI-A Questions to Identify Efficiencies

Mergers can give rise to a broad spectrum of efficiencies. One approach to efficiency analysis is to first identify the relevant efficiencies and then attempt to measure their magnitude. Moreover, each efficiency analysis may also need to estimate the probability that the savings will actually occur. The questions addressed below will aid in this analysis.⁹⁴

VI-A1 Will the merger allow the firms to achieve economies of scale?

Economies of scale exist if costs decline with the level of output. It is often alleged that a merger will allow a firm to exploit economies of scale. Although it is obvious that a horizontal merger will increase the total scale of an operation, some analysis is needed to

⁹³ In certain cases it may be necessary to reduce the efficiency by the transactions costs associated with the move to a more efficient technology. Often these expenses will be one-shot occurrences, while the efficiencies will exist in each year.

⁹⁴ In general, the efficiency examples focus on manufacturing, because the ideas are easier to understand. However, many efficiencies can apply to research and development, marketing, distribution or any other undertaking of the firm.

conclude that economies will be realized. First, one must identify changes in the production process that allow for longer production runs and then obtain evidence to support the hypothesis that costs will be lowered. For example, a merged firm may close a factory and increase the output at the remaining factory. On the other hand, if both factories are operating near capacity, cost savings would be delayed until the two factories are replaced with one larger more efficient plant.

The actual measurement of the efficiencies may be even more complicated than identification. Abstracting from industries in which costs are generally based on engineering rules of thumb, specialized studies may be required to quantify the efficiencies. For example, longer production runs often economize on start-up costs and the savings imply lower per-unit cost. While the merging parties may have internal estimates of the cost savings, a detailed analysis is still necessary to organize and evaluate the information.

VI-A2 Will the merger lead to any adjustment in plant specialization?

In principle, a firm can lower costs if it manufactures its product line in the most efficient way. After a merger, a firm may have the opportunity to shift products among its plants to optimize production runs. The analyst should identify the proposed changes along with evidence to support the hypothesis that the changes will be implemented. For example, each firm in an industry may manufacture all their products in a single factory. After a merger, the two factories could each produce a specialized product line, presumably at lower cost. Even when this efficiency only affects part of the product line, it does represent a cost savings.

Measurement should proceed in much the same manner as for economies of scale.

Actual cost savings from improved production techniques needs to be quantified for each proposed change in the loading of each plant.⁹⁵ Of course, any additional costs associated with the change in the organization of production should be netted out.

VI-A3 Will the merger create opportunities for superior integration of production facilities ?

Firms often vertically integrate upstream from the final product to capture various efficiencies associated with using a centralized governance structure instead of the market. It is possible that a merger of two downstream horizontal competitors will create opportunities for vertical efficiencies. For example, one firm may control the most efficient upstream manufacturing technology and another the most efficient downstream technology. After a merger, a single firm could transfer the efficient technologies to all the plants.

These efficiencies may be difficult to measure, because the advantages are largely qualitative. Possibly evidence on costs will exist to show one firm is efficient at one operation and the other firm efficient at another operation. If a plan can be devised to transfer the technology after the merger, the relevant savings could be computed. Alternatively, only one firm may be integrated, but produce more product than it needs. The merger may eliminate the need for merchant-market sales and economize on marketing expenses.⁹⁶

⁹⁵ This efficiency is very similar to economies of scale, because it exploits economies associated with producing the particular products offered for sale in the market instead of economies associated with aggregate output

⁹⁶ In some cases, the need to work closely with a downstream customer/competitor to develop products may prevent an integrated firm from participating in the merchant market. In that case, the integration efficiencies will be more significant, because the integrated firm can expand upstream output after the merger increases its downstream demand

VI-A4 Will the acquisition reduce freight costs due to improved logistics of supply?

Transportation logistics may create genuine efficiencies, because a merger involving firms with multiple plants may allow a reduction in the freight costs of serving a given base of customers. This scenario is most plausible when the geographic dispersion of the supplier's (pre-merger) plants does not match that of its demand. For example, if two firms have plants in different regions of the country, these economies are likely, while if the plants are in the same areas, the efficiencies are unlikely to occur. Again, the savings will occur on only the share of the firm's output that is shipped more efficiently.

This efficiency should be relatively easy to measure if good information on transportation costs and sales patterns is available. It should be possible to compute freight in both the pre and post merger environment and then measure the efficiency as the savings in transaction costs.

VI-A5 Will the merger enable the firm to capture greater volume discounts in the purchase of inputs?

Although some purchasing economies are pecuniary and therefore not real resource savings, it is possible that combined volume of two firms will generate additional volume discounts from some suppliers. Increased volume may enable a supplier to reduce its production and transactions costs. This would allow the supplier to reduce the price for the input. Given the inputs are produced with fewer resources, the efficiencies are valid for social welfare analysis. On the other hand, if the merger partners are only able to negotiate a lower price (without any real cost savings), the lower prices do not represent real efficiencies, because they are only a transfer of resources from suppliers to the merger

partners. Thus, they would not be considered in a social welfare analysis.⁹⁷

Measurement of these efficiencies are likely to be particularly difficult, because their characterization depends on resource savings of a supplier. In general, it will be necessary to interview the supplier and attempt to obtain the relevant information. Of course, the general magnitude of the overall cost saving is likely to be easily estimated from information on volume discount policies.

VI-A6 Will the merger enable the firm to reduce sales, administrative, R&D and other fixed costs?

Expenditures that represent fixed costs, such as sales, administration and R&D do not directly affect the firm's short run pricing behavior, however, they should still be considered if actual resources are saved due to their long run impact. These savings are generally estimated by the merging parties with plans suggesting rationalization of the combined business. For example, the merged firm can reduce the costs of sales calls, because customers no longer have to be visited twice.

Actual measurement of fixed cost savings is often difficult, because a listing of eliminated activities may not consider additions to cost. For example, it is relatively easy to claim a marketing department can be eliminated. However, sales calls are likely to be longer as the salesman must discuss more products. Similar arguments exist for other overhead costs such as research and development.⁹⁸ Detailed knowledge of jobs of often

⁹⁷ However, these pecuniary efficiencies should count in a price test because all cost savings induce firms to lower price

⁹⁸ Another efficiency often claimed is the elimination of management. While mergers often lead to the elimination of one headquarters office, the other office probably expands. Many management tasks are more complicated and hence require more staff. Before accepting a management efficiency, it is important to understand what tasks no longer need to be performed. For example, in a declining industry, it may be possible to argue that management resources are underutilized and can manage a large operation without

necessary to estimate the magnitude of the savings. Some research projects can build on a set of core findings while other research projects must independently explore outcomes. If some of the research findings can be shared, an efficiency exists, otherwise, both research programs must be kept to maintain output.

VI-A7 Do efficiencies exist in other markets?

It is possible for a conglomerate merger to generate efficiencies in other markets. Standard U.S. procedure is to reject these efficiencies, a reasonable position when the savings can be accomplished without the anticompetitive aspect of the overall transaction. However, some efficiencies associated with other markets may depend on the transaction under review and are relevant to the analysis. For example, cost saving associated with redeploying assets out of the market of concern would appear to be relevant.

Analysis of this efficiency should focus on the specific plan to obtain out-of-market efficiencies. A firm may have plans to increase investment in another market, and the proposed merger may offer a cheaper investment technique. These savings would appear to represent a one-time savings. In other cases, a technology may have uses outside the market, and the merger could efficiently transfer the information. This efficiency would result in lower long run costs in the outside market.

VI-A8 Can long-run costs be reduced?

Standard efficiency analysis focuses on static savings associated with current costs. However, dynamic efficiencies may be more important to the firm, because these savings enhance the viability of the firm in the long run. Examples include the integration of firms

with different competencies (marketing, development) or resource basis (capital, technology).

The evaluation of these efficiencies is likely to be difficult, because they are relatively vague. Company documents would be particularly useful, as would testimony from managers describing the relevant plans. Competitor complaints of a strong rival could even be credited as supporting these efficiencies.

VI-B Alternative Approaches to Efficiencies

In general, efficiencies are not relevant to merger analysis if the firm can accomplish the cost savings in a less anticompetitive manner. Thus, alternative techniques for accomplishing each relevant efficiency must be evaluated. The consideration given to the efficiency is reduced or eliminated if an alternative technique is available to accomplish some or all of the efficiency. However, it is necessary to ensure that the alternative technique is likely to occur for it to merit analysis.⁹⁹ A number of relevant questions are discussed below.

VI-B1 Will the perceived efficiencies be captured if the target was being acquired by a different firm?

Once efficiencies are identified, it is necessary to determine if they can be obtained through a merger involving a less anticompetitive purchaser. If this is possible only in part, then one must deduct whatever portion of the efficiencies that could be gained through an alternative legal transaction. Unfortunately, specifying an alternative transaction is often

⁹⁹ The analysis of purely hypothetical alternatives to merger-related efficiencies generates little of value, because the fact that the alternatives have not been implemented strongly suggests some type of transaction cost negates their value

a highly speculative exercise. Thus, it seems reasonable to focus only on mergers that were actually proposed before the transaction under study or at least limit the search to parties actually interested in acquiring the target firm.

VI-B2 Could the efficiencies have been obtained via another mechanism, such as a contractual arrangement?

A number of hypothetical arrangements can be postulated to accomplish almost any type of efficiency. For example, if chemical company A merges with company B to obtain sufficient sales to justify an efficient chemical reactor, alternative mechanisms for achieving the efficiency could be postulated. Company A and B could contract with an independent reactor firm to produce the chemical product. Alternatively, the two firms could form a production joint venture and remain independent resellers. Both alternatives may not be realistic choices. When a highly specialized investment, such as a chemical reactor, must be incurred to participate in a market, contractual problems are likely to arise. Separate contracts would have to be negotiated and written for each possible market outcome. Achieving the flexibility necessary to support the specific investment would be difficult in the absence of a merger. The necessary monitoring and pricing of intermediate flows of product which are not regularly traded entail possibly unsurmountable difficulties for a contractual alternative. In sum, it would appear reasonable to insist on evidence that the alternative is used in the market before rejecting the efficiency as not merger-specific.

VI-B3 Can the efficiencies be obtained through internal restructuring or growth?

Internal reorganization represents the remaining alternative to obtain the relevant efficiencies. It is possible that the firm can improve its own performance without the need for a merger. Likewise, various economies of scale and scope could be achieved by

growth. In general, these alternatives must be carefully scrutinized before they support the rejection of the efficiency. For example, internal growth is not a credible alternative if the industry is stagnant. Moreover, reliance on growth may be inappropriate in a mature industry, especially for a small firm. On the other hand, internal reorganization plans to economize on overhead cast doubt on at least some of the relevant overhead efficiencies. In particular, in a declining industry, a firm is likely to have a plan to reduce overhead, which if not already implemented, should be used to scale back the relevant overhead savings from a merger.

VI-C An Example of Efficiency Analysis

Efficiencies can be quantified by careful analysis. In general, any efficiency analysis requires the prediction of both pre-merger and post-merger costs. Some of these costs are likely to be the same, while others will differ. For example, the widget production process may involve four stages, only one of which offers efficiencies. Thus, the scale economy would be applied to only a fraction of production costs. In particular, if manufacturing costs total 600 million dollars, savings at a rate of seven-percent on a 100 million dollar process would yield seven million dollars in savings. Likewise, if a merger may allow a firm to lower its transportation costs by 4 cents a unit on one-fourth of its output of 100 million units, the firm would save one million dollars. Alternatively, if a firm could improve the productivity of its plants by optimizing its plant-usage pattern, it should be possible to determine the per-unit savings on each unit reallocated. If 10 percent of a 100 million unit production run were shifted among plants and the savings were 1 dollar a unit, the efficiencies would total 10 million dollars. Other efficiencies should be measur-

by collecting the relevant data and computing the overall savings.

A second analysis must be performed to exclude all efficiencies not specifically-related to the merger. For example, transportation economies could be scaled back in an industry in which product exchanges are common. Likewise, specialization efficiencies would not be relevant if other firms obtain similar savings by contract. However, in many, if not most situations, these alternative techniques will not be viable and the efficiencies merit attention in the final analysis.

Once the aggregate savings are computed, it is possible to calculate a average unit savings. For example, if the savings totaled 18 million dollars on 100 million units of production, the cost savings would amount to 18 cents on each unit. Then the average or aggregate savings could be compared to the appropriate measure of the anticompetitive effect for a final evaluation of the merger.

VII. FINAL CONSIDERATIONS FOR MERGER ANALYSIS

Even if the sequential merger analysis points to an anticompetitive effect stemming from a merger, two final points must be addressed. First, it is necessary to establish whether a price increase is profitable taking into consideration sales lost to the following: to other products, to manufacturers from outside the geographic market, to competitive output expansion within the market and to de novo entry or expansion that requires expenditures of sunk costs. If sufficient additional output renders the price increase unprofitable, the merger is not likely to substantially lessen competition.

This analysis is an attempt to ensure that the merger review does not degenerate into a sequential series of questions, with the analyst only attempting to obtain information sufficient to satisfy each question and then move on to the next issue. A competitive problem can only be inferred if the overall evaluation of all the information points to a likely anticompetitive effect.¹⁰⁰

The issue can be addressed by a return to the initial hypothetical question of whether a small, but significant and nontransitory price increase would be profitable. Based on the initial market definition analysis, an estimate of the sales lost by an anticompetitive price increase to substitute products and firms located outside the geographic market is available. Next the level of sales lost to fringe expansion and competition from firms in the market is identified. The fringe expansion analysis should be relatively straight-forward since the investigation should have acquired information on their competitive strengths. Competition from significant market participants can come in the form of either cheating on a cartel (collusion theory) or repositioning a product line

¹⁰⁰ Landes and Posner (1981) address a general evaluation of market power in their pre-guidelines paper. For a discussion of the topic in light of the Guidelines, see Brogan (1992).

(unilateral theory). In either case, it should be possible to provide a rough estimate of the potential to increase output. Finally, the level of new entry expected in the two year horizon can be predicted. While it is obvious that a conclusion of timely and likely entry would usually defeat a price increase, it is possible that small entrants could defeat a price increase in combination with all the other factors. If reasonable estimates of these effects can be made, the profitability of a five-to-ten percent price increase can be quickly determined. Then it is possible to experiment with smaller price increases, because competitive concerns exist even if the price increase is held below five-percent or applies only to a niche in the market.¹⁰¹

Second, even if the merger appears anticompetitive, the transaction may still be required to capture merger-specific efficiencies. While the various aspects of competitive analysis all impact on the likelihood of a price increase, efficiency analysis proceeds relatively independently. As discussed above, the relevant merger-specific efficiencies are measured first and then balanced against the anticompetitive effect. The final decision on the merger may very well depend on the goal of merger policy, with a rule designed to maximize social welfare allowing numerous mergers,¹⁰² while a rule based on maintaining competitive prices suggesting most anticompetitive transactions should be blocked. As shown by Roberts and Salop (1993), the two goals of maximizing welfare and protecting

¹⁰¹ Mathematically, one could explore the profitability of price increases greater than five-to-ten percent. However, if a five-percent price increase is unprofitable, it is difficult to argue that the firms could coordinate a higher price effect.

¹⁰² A social welfare analysis compares the deadweight loss associated with the anticompetitive price increase (a triangle measuring the net value of product not produced because of the anticompetitive price) with the efficiency gain associated with the transaction (a rectangle defined by the cost savings on each unit of output produced by the efficient firm(s)). Since the efficiency generally applies to much more output than the anticompetitive effect, even small efficiencies can outweigh large anticompetitive effects. See Williamson (1968).

competitive prices can be combined and used to create a compromise standard.

An alternative approach would focus on the probability of efficiency and anticompetitive effects. By recognizing the analysis is only designed to predict an outcome, it becomes possible to evaluate the probabilities of various actual outcomes. Assuming the efficiency and anticompetitive effects are statistically independent, the probability of four outcomes: efficiencies, no anticompetitive effects (which implies a price decline), no efficiencies, anticompetitive effects (which implies a price increase), efficiencies and anticompetitive effects (indeterminant, but likely to lead to price effects) and no efficiencies or anticompetitive effects (no price effect) can be computed. Given any balancing rule, it is possible to complete the analysis.

A final technique would recognize that dynamic efficiencies are likely to out-last the anticompetitive effects.¹⁰³ Thus, some discounted cash flow analysis could be used to balance the potentially adverse effects in the next couple of periods with the full efficiencies over the long run. This approach would be particularly important when the efficiencies offer long run benefits. While the quantification of the long run savings is likely to be difficult, the efficiencies may represent the reason for the merger and should be considered in the final analysis.

¹⁰³ This consideration may be particularly relevant to declining industries in which the less competitive market structure would evolve with time. For a more detailed discussion of antitrust issues in declining industries, see Coate and Kleit (1991).

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Appendix

Glossary Of Terms

Barrier to Entry

Although definitions vary, a barrier to entry can be defined as any set of market characteristics that preclude a new entrant from competing on equal footing with an incumbent firm. Under this definition, the combination of sunk costs and economies of scale could be a barrier to entry.

Bertrand Expectations

An industry follows Bertrand expectations if all the firms in the market assume their rivals will hold price constant when they choose price. If the product is homogeneous, Bertrand expectations generate a competitive outcome even if there are only two competitors. If the product is differentiated, Bertrand expectations allow firms to raise price above cost. Entry occurs to create a zero profit equilibrium. Since competition occurs in both the price and product dimension, price equal to marginal cost is not an equilibrium characteristic of the market.

Buyer Power

Buyer power implies an ability on the part of the customer to influence price. For example, the buyer can use long run commitments to secure competitive prices. Alternatively, a large diversified buyer can use threats of retaliation in other markets to induce price reductions in the market of concern. Overall, buyer power is more than simple monopsony power.

Concentration Index

A concentration index is a statistic developed to provide a summary measure of market structure. A widely used measure of concentration is the percentage of total value of shipments supplied by the top four firms. Another measure is the Hirschmann-Herfindahl Index ("HHI"), which is a weighted average of the shares of all the firms in an industry.

Consumer Surplus

Consumer surplus is the aggregate value of the market to consumers. It is defined by the difference between the price a consumer is willing to pay for a particular unit of output and the market price summed for all units of output purchased in the market (this concept is graphically illustrated as the area under the demand curve, but above the market price).

Contestable Market

A market is contestable if entry can occur without facing costs of exit.

Coordinated Interaction (Collusion)

The concept of coordinated interaction involves cartel behavior in which each firm in the cartel explicitly or implicitly agrees on a course of action to restrict output and raise price. The behavior may involve pricing above the competitive level or allocating customers among the various firms in the market. It is distinguished from situations of tacit collusion by the fact that certain actions must be taken to form the cartel in contrast to the simple recognition of mutual dependence which could generate less than competitive Cournot outcomes. The reader should understand that this distinction may be artificial if firms could not maintain Cournot reactions (or any other less than competitive reactions) without an initial agreement on behavior. That is, in oligopoly, behavior may be endogenous and therefore any noncompetitive behavior is the result of coordination. This distinction is primarily relevant to legal decision rules evaluating the level of evidence needed to find liability under shared monopolization theories.

Cournot Expectations

An industry follows Cournot expectations if all the firms in a market assume their rivals will hold output constant when unilaterally choosing an output level. If the product is homogeneous, Cournot expectations will lead to prices above the competitive level, with the magnitude of the price premium related to the number of firms in the market. A similar result can be derived for differentiated markets. As noted above under coordinated interaction, the unilateral nature of this model is only relevant, if the expectations are actually exogenous.

Cross Elasticity

A cross elasticity is defined as the ratio of the percentage change in quantity to the percentage change in another price. When this ratio is positive, the products in question are considered substitutes. A substitute competes in the same market as the product in question when the ratio is relatively high. No empirical guidance is available to define "high".

Deadweight Loss

Deadweight loss is a pure loss in consumer surplus caused by an increase in price not related to cost. It is defined by the loss in surplus suffered by consumers willing to purchase a product at competitive prices, but unwilling to purchase at higher prices (it is illustrated by the area of the triangle defined by the change in price and related change in quantity). Deadweight losses are imposed by sales taxes, monopolization and tariffs.

Differentiated Product

A differentiated product offers consumers different sets of characteristics from its close competitors. The differentiation can be caused by variation in the underlying quality of the product or variation in the collection of attributes that comprise the product.

Dominance (Abuse of Dominant Market Position)

Dominance is a term used to describe anticompetitive business practices employed by large firms in order to preserve or extend their existing positions. The presence of dominant firms in transition economies is often due to government largesse combined with protectionist measures, or a result of previous development paradigms which emphasized government participation in the economy or central planning.

Dominant Firm

A firm selling a homogeneous product is considered to be a dominant firm if it can set price above the competitive level. This implies the dominant firm's rivals (fringe firms) sell all the output they can profitably produce at the specified price. In effect, a dominant firm picks a monopoly price on a residual demand curve, with this residual demand curve defined by the difference between the market demand curve and the fringe supply curve (a curve that defines the desired output level of the fringe firms in the market.)

Efficiency

A market is said to be allocatively efficient if the price a consumer is willing to pay for the last unit sold equals the extra cost to society of producing that last unit (the marginal cost of production).

A market is said to be productively efficient if total costs are minimized for any given level of output. Productive efficiency indicates that a firm is operating on its lowest possible average-cost curve.

Elasticity

Elasticity is defined as the percentage change in quantity divided by the percentage change in price. A given point on a demand curve is price inelastic if the elasticity is less than one, unit elastic if the elasticity is exactly one and elastic if the elasticity is greater than one.

Exemptions

Exemptions are specific antitrust regulations that place sectors or practices beyond the reach of the antitrust laws.

Fringe Firm

A fringe firm is a small firm in a market with a limited supply elasticity, such that the larger firm or firms can set price a market.

Hirschmann-Herfindahl Index ("Herfindahl")

See concentration index above. The Herfindahl is defined as follows:

$$HHI = \sum_{i=1}^n S_i^2$$

where S_i is the market share of the i th firm in the industry and n is the total number of firms in the industry. The HHI increases if either the number of firms in the industry declines or the degree of market share inequality increases. Therefore, the HHI is generally considered a better measure of market power than the four-firm concentration ratio.

Homogenous Product

A homogenous product is one which is basically indistinguishable from its close substitutes.

LIFO (little in from outside)

The LIFO index measures the share of consumption that is actually produced in the geographic market under study. It can also be calculated by subtracting the percentage of imports from 100.

LOFI (little out from inside)

The LOFI index measures the share of production that is actually consumed in the geographic market under study. It can also be calculated by subtracting the percentage of exports from 100.

Liberalization

At its core, liberalization, (also known as deregulation) reflects the return of property rights from the government to the individual. For example, elimination of currency controls is a reinstatement of the right to alienate one's property.

Market

A market is any exchange between buyers and sellers in which price can be determined by a competitive equilibrium at the intersection of the buyers' demand curve and the sellers' supply curve. Marginal changes in this equilibrium are not attractive to either buyers or sellers. It is important to note that the competitive equilibrium may not be achieved if the assumptions of the competitive model do not hold.

Market Power

The ability to raise and sustain price above marginal cost defines market power.

Market Structure

Market structure is a general term for the configuration of industry. Topics often considered are concentration measures, scale economies and scope of production.

Maverick Firm

A maverick firm is one with a greater economic incentive to deviate from the terms of coordination than do most of the rivals (Merger Guidelines, section 2.12). Maverick firms can assist in maintaining a competitive equilibrium in oligopolistic industries by refusing to follow output restricting strategies.

Minimum Efficient Scale (MES)

MES is the smallest scale at which costs are minimized. It often serves to define the size of the smallest firm in a market.

Minimum Viable Scale (MVS)

MVS is the smallest scale at which average cost equals the market price. It proxies the level of output required to compete in the market. The term is used in the Merger Guidelines to define the required size of a potential entrant.

Monopoly

A monopoly is a situation in which only one seller exists in a market. In a simple model, the firm maximizes profits by restricting output and raising price above the competitive level.

Monopsony

A monopsony is a situation in which only one buyer exists in the market. In a simple model, the firm can minimize costs by restricting its willingness to purchase and depressing price below the competitive level.

Neoclassical Economics

Neoclassical economics refers to the standard theory of the firm and consumer based on the maximization hypothesis. As such, neoclassical economics allows for easy mathematical modeling.

Oligopoly

An oligopoly is a situation in which a few sellers exist in a market. If these firms can coordinate their actions, they can raise price above the competitive level.

Pecuniary Efficiencies

Efficiencies are pecuniary to the firm in question if the savings are related to the position (e.g. size) of the firm and not related to real resource savings.

Per-se

Methodological standard of analyzing particular practices that explicitly proscribes specific types of behavior based on the assumption that the actions are so likely to be anticompetitive that detailed analysis of actual effects is not worth the required enforcement costs.

Predation

Predation is a competitive strategy whereby a firm initially lowers its price below its marginal cost of production to drive rivals out of business or scare off potential entrants. When rivals exit, the firm raises its price. Predation is rarely profitable, because the predator (as the largest firm) suffers huge losses in the predatory period and can only price above the competitive level until entry occurs to return the market to equilibrium.

Price-Discrimination

Price discrimination is a strategy in which a firm offers different prices to different customers. To price discriminate, a firm must possess market power, be able to differentiate customers based on their elasticity of demand and prevent resale.

Price-Fixing

Price fixing is defined by an agreement among rivals to set the market price of a product. It is possible to consider market allocations to be a form of price fixing, because the market allocation allows each firm to fix the price to its customer base without fear of competition.

Privatization

Privatization is a transfer of rights for which the recipient pays some transaction price.

Residual Demand

A residual demand curve nets out the effect of a firm's rivals from the overall demand curve. The concept is most easily illustrated in the dominant firm model in which the residual demand curve is computed by subtracting the fringe supply from the market demand. Residual demand analysis is also useful in differentiated products industries in which the residual demand curve of the firm is defined for a given set of competitor prices.

Rule-of-Reason

Rule-of-Reason is a methodological standard of analyzing proscribed practices whereby countervailing efficiencies are balanced against potential welfare reducing effects.

Small, but Significant and Nontransitory

This is the "term of art" used in the U.S. Merger Guidelines to define the change in

price used to define a market. The standard level is five-to-ten percent, although other price changes can be used to obtain meaningful results.

Social Welfare

Social welfare attempts to measure the aggregate well-being of society, usually without any explicit weights on the welfare of specific individuals. As such, it assumes that marginal welfare is the same for all individuals at all welfare levels. This concept is particularly useful for measuring small changes in an equilibrium where changes can be directly linked to monetary values.

Statistical Independence

Two events are statistically independent if their probabilities are not related. Therefore knowledge of one probability or occurrence would not aid in predicting the outcome of another event. For example, rolling two "fair" dice is a statistically independent event.

Survivor Principle

The survivor principle is a technique for estimating minimum efficient scale that studies the existing market structure and uses the smallest successful firm to predict scale.

Sunk Costs

Costs which cannot be recovered on exit from a market are sunk. The aggregate sunk cost involved in participating in an industry can be computed by subtracting salvage value and depreciation from the initial cost of an investment.

Systems Competition

A systems competition occurs when a set of products are simultaneously used to produce output. Markets for the individual products are of little value, because the prices are all driven by the aggregate competition of the system.

Transactions Costs

Transactions costs are the costs associated with using the market system for exchange. Opportunism, bounded rationality, small numbers issues, and uncertainty give rise to transaction costs.

Unilateral Effect

A unilateral effect occurs when a single firm holds market power. A merger can

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increase the potential for unilateral effects if the transaction significantly reduces the competition facing a particular firm.

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Although the US Merger Guidelines offer a relatively straightforward approach to the analysis of mergers, misinterpretations can occur and may lead to incorrect policy decisions. The state-of-the-art antitrust analysis presented here highlights a number of common errors in merger analysis. Relying on theoretical precepts, this volume offers a thorough grounding for economic reports, legal briefs, and research. The authors bring numerous years of enforcement experience to this novel and useful handbook of antitrust analysis. This volume is a must for any serious practitioner, scholar or student of antitrust law and economics.

An outstanding practical step-by-step guide for evaluating the competitive effects of mergers.

Robert Lande
University of Baltimore
School of Law

This state-of-the-art analysis will quickly become a central reference for all those interested in the economic and legal aspects of mergers and acquisitions.

Moises Naim
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