

THE 2010 HORIZONTAL MERGER GUIDELINES: FROM HEDGEHOG TO FOX IN FORTY YEARS

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The U.S. Department of Justice and the Federal Trade Commission recently updated their Horizontal Merger Guidelines,¹ which build upon and replace the 1992 Guidelines.² The revised Guidelines are the product of an extensive team effort at the Agencies that took place over roughly a year, under the leadership of Assistant Attorney General Christine Varney and FTC Chairman Jon Leibowitz. The process for revising the Guidelines was lengthy, collaborative, and open: the Agencies posted a series of questions, inviting public comment on possible revisions; numerous useful public comments were received and reviewed; the Agencies sponsored five public workshops at which panelists discussed possible revisions to the Guidelines; subsequently, the FTC made public a draft of the proposed Guidelines, again inviting additional public comments; numerous thoughtful comments were again received and reviewed; and in response to those comments, the proposed Guidelines

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¹ U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (2010) [hereinafter 2010 Guidelines], *available at* <http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf>. *See* Press Release, U.S. Dep't of Justice, Federal Trade Commission and U.S. Department of Justice Issue Revised Horizontal Merger Guidelines (Aug. 19, 2010), *available at* http://www.justice.gov/atr/public/press_releases/2010/261642.pdf.

² U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (1992, rev. 1997) [hereinafter 1992 Guidelines], *available at* <http://www.justice.gov/atr/public/guidelines/hmg.pdf>.

were further clarified.³ Inevitably, however, many of the questions raised in the public comments submitted in response to the proposed Guidelines are not explicitly addressed in the final Guidelines. In this article, I respond to some of those questions, especially the questions pertaining to the economic principles underlying the revised Guidelines. I also elaborate in greater detail on some of the points made in the Guidelines themselves.⁴

I. HISTORICAL PERSPECTIVE: THE HEDGEHOG AND THE FOX

The 2010 Guidelines are best understood in historical context. They reflect the ongoing evolution of merger enforcement that has taken place since the DOJ first issued merger guidelines in 1968. The 2010 Guidelines rely heavily on earlier versions of the Guidelines, especially those released in 1982 and 1992, and on the 2006 Commentary on the Merger Guidelines. Many of the approaches in the 2010 Guidelines that some commentators have considered novel actually are contained in those earlier statements of merger enforcement policy.

Isaiah Berlin's famous allusion to the different ways in which the Hedgehog and the Fox view the world is a useful model for how to think about the evolution of the Merger Guidelines. The hedgehog knows one big thing.⁵ Likewise, the 1968 Guidelines were based on one big idea: horizontal mergers that increase market concentration inherently

³ Public Comments on the 2010 Guidelines are available at <http://www.ftc.gov/os/comments/hmgrevisedguides/index.shtm>. The Agencies are indebted to all of those who submitted comments or appeared at the workshops. The joint DOJ/FTC working group could not have done its job without extensive support and input from career staff at both agencies. Throughout the process, the working group consulted extensively with staff to ensure that the Guidelines accurately describe how staff conducts merger investigations, to enhance clarity, and to avoid errors. The Agencies also received very helpful comments from a number of international jurisdictions, including the European Commission, the UK Office of Fair Trading, the UK Competition Commission, and the Canadian Competition Bureau.

⁴ I focus here on the economic principles in the 2010 Guidelines, not on specific DOJ investigations or enforcement actions. For a wealth of examples, see U.S. Dep't of Justice & Fed. Trade Comm'n, *Commentary on the Horizontal Merger Guidelines (2006)* [hereinafter 2006 Commentary], available at <http://www.justice.gov/atr/public/guidelines/215247.pdf>.

⁵ See ISAIAH BERLIN, *THE HEDGEHOG AND THE FOX: AN ESSAY ON TOLSTOY'S VIEW OF HISTORY* (Phoenix 1999) (1953). Berlin's title is based on a line attributed to the ancient Greek poet Archilochus: "The fox knows many things, but the hedgehog knows one big thing." More recently, Philip Tetlock uses Berlin's prototypes to evaluate the accuracy of political predictions. See PHILIP TETLOCK, *EXPERT POLITICAL JUDGMENT: HOW GOOD IS IT? HOW CAN WE KNOW?* (2005).

are likely to lessen competition.⁶ By today's standards, the 1968 Guidelines are rather shocking. For example, in a market in which the combined share of the four largest firms is at least 75 percent, they state that the Department "will ordinarily challenge" a merger if the acquiring firm's share is at least 15 percent and the acquired firm's share is at least 1 percent.⁷ Few would advocate such an enforcement stance today.

However, this focus on market concentration reflected unambiguous Supreme Court precedent. In *Brown Shoe*, the Court stated: "The dominant theme pervading congressional consideration of the 1950 amendments [to § 7 of the Clayton Act] was a fear of what was considered to be a rising tide of economic concentration in the American economy."⁸ In *Philadelphia National Bank*, the court quoted this passage from *Brown Shoe* and then stated:

This intense congressional concern with the trend toward concentration warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects. Specifically, we think that a merger which produces a firm controlling an undue percentage share of the relevant market, and results in a significant increase in the concentration of firms in that market is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects.⁹

One cannot help but marvel at how far merger enforcement has moved over the past forty years, with no change in the substantive provisions of the Clayton Act and very little new guidance on horizontal mergers from the Supreme Court. But the Court has given a great deal of guidance in Sherman Act cases, moving away from simple rules and towards an approach emphasizing the practical reality of the market and the likely effects of the practice in question. As Justice Souter explained in *California Dental*, "What is required . . . is an enquiry meet for the case, looking to the circumstances, details, and logic of a restraint."¹⁰

Returning to Berlin's prototypes, the fox knows many things. Likewise, merger enforcement in recent years has become increasingly eclec-

⁶ U.S. Dep't of Justice, Merger Guidelines ¶ 5 (1968) [hereinafter 1968 Guidelines], available at <http://www.justice.gov/atr/hmerger/11247.pdf>. All references to earlier guidelines refer only to the portions of those guidelines dealing with horizontal mergers.

⁷ *Id.* See, e.g., *Stanley Works v. FTC*, 469 F.2d 498, 508 (2d Cir. 1972) (finding that the acquisition of a company with 1 percent of the market by a company with 22 percent of the market violated Section 7).

⁸ *Brown Shoe Co. v. United States*, 370 U.S. 294, 315 (1962).

⁹ *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321, 363 (1963).

¹⁰ *Cal. Dental Ass'n v. FTC*, 526 U.S. 756, 781 (1999).

tic, reflecting the enormous diversity of industries in which the Agencies review mergers and the improved economic toolkit available. The Agencies and the courts look at a wide variety of evidence and use a wide variety of methods to determine whether mergers may substantially lessen competition. Based on decades of experience examining mergers, the Agencies recognize that each industry has unique features and each merger presents unique circumstances.

The transition of merger enforcement from hedgehog to fox can be traced through the various merger guidelines published from 1968 to 2010. At times, most notably in 1982, new guidelines have spurred changes in Agency enforcement practice. At other times, including 2010, new guidelines have primarily been an exercise in transparency, reflecting ongoing changes in Agency enforcement practice and advances in economic learning.

The 1982 Guidelines were a revolution. Five innovations formed the foundation on which all subsequent Merger Guidelines have been built:

1. The 1982 Guidelines articulated a “unifying theme” for merger enforcement: “that mergers should not be permitted to create or enhance ‘market power’ or to facilitate its exercise.”¹¹ This was a dramatic departure from the 1968 Guidelines, which stated that “the primary role of Section 7 enforcement is to preserve and promote market structures conducive to competition.”¹² The unifying theme from the 1982 Guidelines is repeated in the introductory section of the 2010 Guidelines.

2. The 1982 Guidelines introduced the hypothetical monopolist test (HMT) for defining the relevant market.¹³ The HMT has been widely accepted by the courts and other jurisdictions. Section 4 of the 2010 Guidelines, “Market Definition,” retains the HMT and explains its correct implementation in greater detail.

3. The 1982 Guidelines introduced the Herfindahl-Hirschman Index (HHI) into merger analysis and established enforcement thresholds based on the post-merger HHI and the change in the HHI resulting from the merger. Section 5 of the 2010 Guidelines, “Market Participants, Market Shares, and Market Concentration,” retains the usage of HHI thresholds, adjusting them upwards.

¹¹ U.S. Dep’t of Justice, Merger Guidelines, § I (1982) [hereinafter 1982 Guidelines], available at <http://www.justice.gov/atr/hmerger/11248.pdf>.

¹² 1968 Guidelines, *supra* note 6, ¶ 2.

¹³ The basic idea behind the hypothetical monopolist test substantially pre-dates the 1982 Guidelines. See Gregory J. Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, 71 ANTITRUST L.J. 253, 254–57 (2003) [hereinafter *Hypothetical Monopolist Paradigm*].

4. The 1982 Guidelines expanded the discussion of competitive effects, somewhat downplaying the role of market concentration in comparison with the 1968 Guidelines. The 2010 Guidelines continue this trend.

5. The 1982 Guidelines provided a list of factors that affect the ease and profitability of collusion. Many of these same factors can be found in Section 7 of the 2010 Guidelines, “Coordinated Effects.”

While the 1982 Guidelines were a dramatic step forward in merger enforcement policy, they proved to be limited in some respects due to their heavy emphasis on what today we refer to as “coordinated effects,” and specifically the danger that the merger would increase the likelihood of collusion, either express or tacit.

The 1982 Guidelines were written with relatively homogeneous, industrial products in mind. Product differentiation was considered as a factor affecting the ease and profitability of collusion, that “will be taken into account only in relatively extreme cases.”¹⁴ This mindset reflected longstanding antitrust concerns about the performance of concentrated markets for basic industrial commodities. Antitrust attention was focused on markets of this type during the industrial age—the age of steel. The Sherman Act itself was motivated by concerns about collusion in markets for homogeneous products, which took the form of the 19th century trusts. The HHI thresholds were thus best suited to evaluate concerns about collusion in markets for homogeneous products. Indeed, in his classic 1964 article, George Stigler derived expressions involving the HHI from a model of collusion.¹⁵

The Guidelines were slightly revised in 1984, but the next major change arrived with the 1992 Guidelines, the first that were jointly issued by the DOJ and the FTC.¹⁶ The 1992 Guidelines increased the sophistication of the economic analysis and explained more fully how the Agencies evaluate various types of competitive effects. These changes reflected the accumulation of Agency experience and the advance of economic learning during the 1980s. Two innovations in the 1992 Guidelines stand out.

First, the most significant advance in the 1992 Guidelines was their introduction of “unilateral effects.” The earlier guidelines had focused

¹⁴ 1982 Guidelines, *supra* note 11, § III.C.1.a.

¹⁵ See George Stigler, *A Theory of Oligopoly*, 72 J. POL. ECON. 44 (1964). Stigler’s theory of oligopoly had considerable influence on William Baxter, under whose leadership as Assistant Attorney General for Antitrust the 1982 Guidelines were released.

¹⁶ U.S. Dep’t of Justice, Merger Guidelines (1984) [hereinafter 1984 Guidelines], *available at* <http://www.justice.gov/atr/hmerger/11249.pdf>; 1992 Guidelines, *supra* note 2.

almost exclusively on coordinated effects. They considered what we now call “unilateral effects” only via their “leading firm proviso,” which comprised a single paragraph in the 1984 Guidelines.¹⁷ In recent years, more DOJ investigations have involved unilateral effects than coordinated effects. The 2010 Guidelines build upon the treatment of unilateral effects in the 1992 Guidelines.

Second, the 1992 Guidelines introduced a more detailed and sophisticated analysis of entry. Entry analysis in the 1992 Guidelines is built upon the principle that entry must be “timely, likely, and sufficient” to deter or counteract the competitive effects of concern. The 2010 Guidelines retain this basic approach to the analysis of entry.¹⁸

The leading firm proviso in the 1984 Guidelines stated that “the Department is likely to challenge the merger of any firm with a market share of at least one percent with the leading firm in the market, provided the leading firm has a market share that is at least 35 percent.”¹⁹ The aim of the proviso was to prevent “mergers that may create or enhance the market power of a single dominant firm.”²⁰

The 1992 Guidelines expanded on the leading firm proviso, developing the idea of unilateral effects, i.e., that eliminating competition between the merging firms could itself constitute a substantial lessening of competition, even without post-merger coordination between the merged firm and its remaining rivals.²¹ Critically, the 1992 Guidelines explained how such unilateral effects could be diagnosed in markets with differentiated products, where the adverse competitive effects of concern typically are not uniform throughout the relevant market. The introduction of unilateral effects in the 1992 Guidelines reflected and anticipated a shift in merger enforcement away from relatively homogeneous industrial commodities and towards more differentiated products. While the Guidelines necessarily apply to all industries, the 1992 Guidelines were a major step in the evolution of antitrust enforcement from the industrial age to the information age.

The next change to the Guidelines was the substantial revision and expansion in 1997 of the treatment of merger efficiencies.²² The 1997

¹⁷ 1984 Guidelines, *supra* note 16, § 3.12.

¹⁸ 2010 Guidelines, *supra* note 1, § 9.

¹⁹ 1984 Guidelines, *supra* note 16, § 3.12.

²⁰ *Id.*

²¹ 1992 Guidelines, *supra* note 2, § 2.2.

²² 1992 Guidelines, *supra* note 2. The current versions of the 1992 Guidelines as revised in 1997 posted on both the DOJ and FTC Web sites include the following note immediately after the title page:

changes reflect an appreciation that mergers can promote competition by enabling efficiencies, and that such efficiencies can be great enough to reduce or reverse adverse competitive effects that might arise in their absence. The 2010 Guidelines make very few changes to the treatment of efficiencies articulated in 1997.

II. THE TRIUMPH OF THE FOX

The 2010 Guidelines reflect the ongoing trend in merger enforcement from hedgehog to fox that has continued since 1992.

These Guidelines should be read with the awareness that merger analysis does not consist of uniform application of a single methodology. Rather, it is a fact-specific process through which the Agencies, guided by their extensive experience, apply a range of analytical tools to the reasonably available and reliable evidence to evaluate competitive concerns in a limited period of time.²³

Many observers have noted specifically that the 2010 Guidelines place less weight on market shares and market concentration than did predecessors. This is a central example of the fox's eclectic approach, tailoring the methods used to the case at hand and to the available evidence.

The 2010 Guidelines also follow a more integrated and less mechanistic approach. Section 0.2 from the 1992 Guidelines described a step-by-step approach followed by the Agencies: (1) market definition and concentration; (2) competitive effects; (3) entry; (4) efficiencies; and (5) failing firm defense. Even in 1992 the Agencies did not rigidly follow these steps, and by 2009 many witnesses observed at the hearings that they gave an inaccurate impression of Agency practice. The 2006 Commentary acknowledged as much, stating that "the Agencies do not apply the Guidelines as a linear, step-by-step progression that invariably starts with market definition and ends with efficiencies or failing assets."²⁴ There was a consensus at the hearings that new guidelines should reflect the movement away from the step-by-step approach described in the

Section 4 of these Guidelines, relating to Efficiencies, appears as it was issued in revised form by the Department of Justice and the Federal Trade Commission on April 8, 1997; and the footnotes in Section 5 of the Guidelines have been renumbered accordingly. The remaining portions of the Guidelines were unchanged in 1997, and appear as they were issued on April 2, 1992.

²³ 2010 Guidelines, *supra* note 1, § 1.

²⁴ 2006 Commentary, *supra* note 4, at 2. The 2006 Commentary then states: "Three significant principles are generally applicable throughout." *Id.* These principles are (1) the Agencies' focus is on competitive effects; (2) investigations are fact-driven, intensive processes; and (3) the same evidence often is relevant to multiple elements of the analysis. *See id.* at 2-4. These principles are endorsed and embraced in the revised Guidelines. *See* 2010 Guidelines, *supra* note 1, §§ 1-2 (discussing principles one and two).

1992 Guidelines to a more integrated approach that does not necessarily start with market definition or base predictions of competitive effects primarily on market concentration.²⁵

The revised Guidelines emphasize that merger analysis ultimately is about competitive effects. The new Section 2, "Evidence of Adverse Competitive Effects," provides guidance about the types of evidence the Agencies normally seek, and the sources of evidence the Agencies normally use, to inform their analysis of competitive effects. The section is placed near the front of the Guidelines because investigations usually start with the formulation of candidate theories of harm to competition and the exploration of evidence to support or reject those theories. In most cases, especially where market boundaries are unclear, DOJ staff will analyze evidence of possible harm before it has determined the scope of the relevant market. Indeed, the same piece of evidence may be relevant to competitive effects and to market definition, as emphasized in the 2006 Commentary.²⁶ The 2010 Guidelines make a similar observation in Section 4: "Evidence of competitive effects can inform market definition, just as market definition can be informative regarding competitive effects."

Thus, like the fox, the 2010 Guidelines embrace multiple methods. But this certainly does *not* mean they reject the use of market concentration to predict competitive effects, as can be seen in Sections 2.1.3 and 5. The 2010 Guidelines recognize that levels and changes in market concentration are more probative in some cases than others. In particular, as the revised Guidelines explain, the Agencies place considerable weight on HHI measures in cases involving coordinated effects.²⁷ The statement that "merger analysis does not consist of uniform application of a single methodology" certainly also does *not* mean that the DOJ will dispense with identifying the relevant line of commerce and section of the country when going to court to challenge a merger.²⁸ Instead, it means that predictions about competitive effects may rely on evidence

²⁵ This consensus reflected not only Agency practice but the gradual decline of the structural presumption. In 1990, the influential *Baker Hughes* decision emphasized that the analysis was not confined to market concentration: "That the government can establish a prima facie case through evidence on only one factor, market concentration, does not negate the breadth of this analysis. Evidence of market concentration simply provides a convenient starting point for a broader inquiry into future competitiveness." *United States v. Baker Hughes, Inc.*, 908 F.2d 981, 984 (D.C. Cir. 1990).

²⁶ See 2006 Commentary, *supra* note 4, at 3.

²⁷ The DOJ places more weight on evidence of diversion ratios and margins in cases involving unilateral price effects. Market shares can be informative about diversion ratios. See 1992 Guidelines, *supra* note 2, § 2.21.

²⁸ 2010 Guidelines, *supra* note 1, § 4.

other than market shares and market concentration. For this reason, the revised Guidelines state in Section 4: “The measurement of market shares and market concentration is not an end in itself, but is useful to the extent it illuminates the merger’s likely competitive effects.”²⁹

Concern that the revised Guidelines, with their more flexible approach, provide less valuable guidance to the business community and increase the uncertainty faced by companies considering or undertaking horizontal mergers is unwarranted.

First, the revised Guidelines, by increasing transparency and providing more up-to-date guidance, should allow the business community to assess more accurately how the Agencies are likely to evaluate proposed horizontal mergers. The public hearings confirmed our internal assessment that actual practice had departed from the 1992 Guidelines. To a considerable degree, these departures were already reflected in the 2006 Commentary: “In some investigations, before having determined the relevant market boundaries, the Agencies may have evidence that more directly answers the ‘ultimate inquiry in merger analysis,’ i.e., ‘whether the merger is likely to create or enhance market power or facilitate its exercise.’”³⁰

To respond to this discrepancy between the 1992 Guidelines and actual practice, both Assistant Attorney General Varney and Chairman Leibowitz stated their goal was to provide transparency by updating the Guidelines themselves, while referencing the 2006 Commentary as a useful supplement to the 2010 Guidelines. For example, Assistant Attorney General Varney explained in a speech in January 2010 that a major goal of revising the Guidelines was to provide greater transparency:

A consistent theme running through the panels is that there are indeed gaps between the Guidelines and actual agency practice—gaps in

²⁹ *Id.* § 4. The European Commission uses market shares in a similar fashion. “Market shares and concentration levels provide useful first indications of the market structure and of the competitive importance of both the merging parties and their competitors.” See European Comm’n, Guidelines on the Assessment of Horizontal Mergers Under the Council Regulation on the Control of Concentration Between Undertakings, 2004 O.J. (C 31) 5, ¶ 14 [hereinafter EU Horizontal Merger Guidelines], available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2004:031:0005:0018:EN:PDF>. See also Steven C. Salop, *The First Principles Approach to Antitrust, Kodak, and Antitrust at the Millennium*, 68 ANTITRUST L.J. 187 (2000). Salop notes:

Although market power and market definition have a role in antitrust analysis, their proper roles are as parts of and in reference to the primary evaluation of the alleged anticompetitive conduct and its likely market effects. They are not valued for their own sake, but rather for the roles they play in an evaluation of market effects.

Id. at 188.

³⁰ 2006 Commentary, *supra* note 4, at 10 (quoting 1992 Guidelines, *supra* note 2, § 0.2).

the sense of both omissions of important factors that help predict the competitive effects of mergers and statements that are either misleading or inaccurate. Those gaps are something that we are aware of within the Division, and they have been reflected in several documents issued by the Agencies over the years, including for instance the 2006 Commentary on the Horizontal Merger Guidelines and the 2003 Merger Challenges Data. Our panelists and commentators have affirmed that many outside the Agencies recognize and appreciate these gaps as well.

Gaps between what the Agencies say we do and what we actually do are unfortunate for a number of reasons. Our Guidelines are meant to inform practitioners and the business community of the Agencies' standards for evaluating mergers. Gaps run counter to our goal of being transparent. That transparency helps businesses make accurate predictions about our likely enforcement intentions and adjust their behavior accordingly. Gaps increase uncertainty and thus can lead to unnecessary surprises. We want to avoid that.³¹

Second, the supposed simplicity and predictability based on market definition and market concentration was more apparent than real. Market definition is often disputed. In many merger investigations, such as the *Staples* or *Whole Foods* cases,³² the merging parties assert a broad market in which they argue that the post-merger HHI or the change in HHI is small, but the Agencies respond that the hypothetical monopolist test properly leads to a narrower market. Unfortunately, completely eliminating any uncertainty about the results of the hypothetical monopolist test is not possible. It is inherent in the need to measure "reasonable" interchangeability. Some of this uncertainty can be reduced, however, when one focuses on competitive effects rather than the line-drawing exercise of market definition.

Furthermore, placing greater weight on market concentration does not eliminate uncertainty. The 1992 Guidelines state: "Where the post-merger HHI exceeds 1800, it will be presumed that mergers producing an increase in the HHI of more than 100 points are likely to create or enhance market power or facilitate its exercise."³³ Merger enforcement data show that this presumption has frequently been overcome.³⁴ Few

³¹ Christine Varney, Ass't Att'y Gen., Antitrust Division, Dep't of Justice, An Update on the Review of the Merger Guidelines, Remarks as Prepared for the Horizontal Merger Guidelines Review Project's Final Workshop (Jan. 26, 2010) (footnotes omitted), *available at* <http://www.justice.gov/atr/public/speeches/254577.pdf>.

³² *FTC v. Staples, Inc.*, 970 F. Supp. 1066 (D.D.C. 1997); *FTC v. Whole Foods Mkt. Inc.*, 548 F.3d 1028 (D.C. Cir. 2008).

³³ 1992 Guidelines, *supra* note 2, § 1.51(c).

³⁴ *See* Fed. Trade Comm'n, Horizontal Merger Investigation Data, Fiscal Years 1996–2007, Table 3.1 (Dec. 2008), *available at* <http://www.ftc.gov/os/2008/12/081201hsrmergerdata.pdf>. Among the 912 investigations of mergers leading to a post-merger

would favor giving the business community greater certainty by making this presumption irrebuttable.

Third, the tradeoff between simple bright lines and accuracy is inherent in the antitrust review of proposed horizontal mergers. This fundamental tradeoff has been a consideration going back to *Philadelphia National Bank* and the 1968 Guidelines.³⁵ The 1968 Guidelines are anything but flexible, but I doubt the business community would welcome a return to those Guidelines. Accounting for the real-world business conditions in which a merger takes place is worthwhile, even if doing so means that some simplicity must be sacrificed to achieve greater accuracy in merger enforcement. The second paragraph in the 1982 Guidelines states:

Although the Guidelines should improve the predictability of the Department's merger enforcement policy, it is not possible to remove the exercise of judgment from the evaluation of mergers under the anti-trust laws. Difficult factual questions arise under the standards stated below, and the Department necessarily will base its decision on the data that are practicably available in each case. Moreover, the standards represent generalizations to which some exceptions are inevitable.³⁶

Lastly, of specific relevance to businesses considering mergers, the vast majority of mergers reported under the Hart-Scott-Rodino Act (HSR) do not trigger a second request for information from the Agencies. During the ten-year period from Fiscal Year 1999 through Fiscal Year 2008, the percentage of all HSR transactions involving a second request varied annually from a low of 2.1 percent to a high of 4.3 percent.³⁷ The detailed analysis of competitive effects described in the Guidelines is most relevant to transactions that join together two substantial competitors among a few; these are well less than 5 percent of HSR transactions. Among those mergers, where the Agencies conduct a thorough investigation, experienced practitioners already know that "investigations are intensively fact-driven iterative processes."³⁸

HHI greater than 1800 and an increase in the HHI of at least 100, 174, or 17.6 percent, were closed without an enforcement action. Of these 912, 156 involved a post-merger HHI of 1800–2399, and 57 of these, or 36 percent, were closed without an enforcement action. *See id.*

³⁵ *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321 (1963); 1968 Guidelines, *supra* note 6.

³⁶ 1982 Guidelines, *supra* note 11, § I.

³⁷ U.S. Dep't of Justice & Fed. Trade Comm'n, Hart-Scott-Rodino Annual Report to Congress, Fiscal Year 2008, Fig. 2, p.4, available at <http://www.ftc.gov/os/2009/07/hsrreport.pdf>.

³⁸ 2006 Commentary, *supra* note 4, at 3.

In practice, economic analyses of mergers often focus on certain quantitative measures, such as prices, costs, market shares, or demand elasticities. But that does not indicate any tendency for DOJ investigations to favor quantitative evidence over qualitative evidence. In practice, a great deal of investigative time and effort is expended to develop qualitative evidence, e.g. by reviewing documents and conducting interviews, and such evidence typically is central to our evaluation of likely competitive effects. The concepts described in the Guidelines inform the gathering and interpretation of this evidence.³⁹ The 2010 Guidelines, like all of their predecessors, provide a high-level economic framework within which investigative work takes place.

III. UNILATERAL EFFECTS

The biggest shift in merger enforcement between 1992 and 2010 has been the ascendancy of unilateral effects as the theory of adverse competitive effects most often pursued by the Agencies. Prior to 1992, merger enforcement focused primarily on coordinated effects. In recent years, a sizeable majority of DOJ merger investigations have focused on unilateral effects. Along with this pronounced shift in practice has come considerable new economic learning about unilateral effects. This shift in practice and advance in learning regarding unilateral effects was one of the chief reasons we at the DOJ felt that the time had come to update the Guidelines.⁴⁰

Section 6 in the 2010 Guidelines, “Unilateral Effects,” is broken into four parts. These parts describe the distinct modes of analysis that the Agencies use to investigate unilateral effects in different market settings. Sections 6.1 and 6.2 address pricing and bidding competition among suppliers of differentiated products; they are closely related descendants of Section 2.21 from the 1992 Guidelines. Section 6.3 addresses capacity and output for homogeneous products; this part descends from Section 2.22 from the 1992 Guidelines. Section 6.4 addresses innovation and product variety and is entirely new.

³⁹ For example, an investigation focusing on the extent of direct competition between the merging parties can be usefully structured around diversion ratios even if it is not possible to measure the diversion ratio with precision.

⁴⁰ This view was widely shared. In 2008, the Antitrust Section of the American Bar Association recommended that the Agencies consider revising the Guidelines (Recommendation 35) to “improve application and understanding of unilateral effects theories” (Recommendation 37), and to “clarify the role of market definition in unilateral effects cases.” (Recommendation 38). ABA SECTION OF ANTITRUST LAW, 2008 TRANSITION REPORT, available at <http://www.abanet.org/antitrust/at-comments/2008/11-08/comments-obamabiden.pdf>.

A. PRICING OF DIFFERENTIATED PRODUCTS

Section 2.21 in the 1992 Guidelines dealing with pricing of differentiated products was a major advance over the leading firm proviso in the 1984 Guidelines. This section introduced into the Guidelines two important strands of research from the field of industrial organization economics: (1) pricing competition among suppliers of differentiated products, including the workhorse Bertrand model; and (2) bidding competition in procurement settings. These two strands have been separated in the 2010 Guidelines.

The basic economic principles articulated in Section 2.21 of the 1992 Guidelines are fundamental and should not be controversial.⁴¹ The 2010 Guidelines rely heavily on these basic principles. This key passage from Section 2.21 of the 1992 Guidelines has been retained virtually unchanged:

A merger between firms selling differentiated products may diminish competition by enabling the merged firm to profit by unilaterally raising the price of one or both products above the pre-merger level. Some of the sales lost due to the price rise will merely be diverted to the product of the merger partner and, depending on relative margins, capturing such sales loss through merger may make the price increase profitable even though it would not have been profitable prior to the merger.⁴²

The central role of diversion between the products sold by the merging firms is then stressed:

The extent of direct competition between the products sold by the merging parties is central to the evaluation of unilateral price effects. Unilateral price effects are greater, the more the buyers of products sold by one merging firm consider products sold by the other merging firm to be their next choice.⁴³

Economists have long measured diversion from one product to another using the cross-elasticity of demand between the two products, and elasticities have been used in antitrust for decades to measure “reasonable interchangeability.”⁴⁴ By 1995, DOJ was using the term “diversion ratio,”

⁴¹ Appendix B to this article contains an extended hypothetical example, “Toxonomics,” designed to illustrate some key economic points relevant to three closely related issues arising in markets with differentiated products that triggered considerable commentary: unilateral effects, the role of price/cost margins, and market definition.

⁴² 2010 Guidelines, *supra* note 1, § 6.1.

⁴³ *Id.*

⁴⁴ The Supreme Court used cross-elasticities to define the relevant market in *Brown Shoe*. See *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962); see also Gregory J. Werden, *Demand Elasticities in Antitrust*, 66 ANTITRUST L. J. 363 (1998) [hereinafter *Demand Elasticities*].

to capture this same concept in a more intuitive way. The diversion ratio from Product 1 to Product 2 is defined as the percentage of unit sales lost by Product 1, when its price rises, that are captured by Product 2.⁴⁵

Section 6.1 in the 2010 Guidelines, like Section 2.21 in the 1992 Guidelines, explains how the Agencies assess the impact of the merger on pricing competition. But the very same concepts can be applied to non-price competition. For example, one can examine how improvements in the quality of a product sold by one merging firm capture sales from a product sold by the other merging firm. The “quality” diversion ratio need not equal the normal (price) diversion ratio.

The focus on diversion in the 1992 Guidelines was impeccable in terms of the underlying economics. But it presented a conundrum: how could this approach be reconciled with the emphasis on market shares found in the case law and perpetuated in the 1992 Guidelines? In a path-breaking article, Robert Willig, one of the primary authors of the 1992 Guidelines, showed the way.⁴⁶ First, Willig acknowledged the challenge: “On the face of it, this perspective appears to remove consideration of market shares from merger analysis since there are no obvious systematic relationships among market shares and cross-price derivatives of demand.”⁴⁷ But then Willig identified certain conditions under which “market shares can be accurate indicators of the competitive effect of a merger between producers of differentiated products.”⁴⁸ The required conditions were subsequently described in the 1992 Guidelines:

The market concentration measures provide a measure of this effect if each product’s market share is reflective of not only its relative appeal as a first choice to consumers of the merging firms’ products but also its relative appeal as a second choice, and hence as a competitive constraint to the first choice. Where this circumstance holds, market concentration data fall outside the safeharbor regions of Section 1.5, and the merging firms have a combined market share of at least thirty-five percent, the Agency will presume that a significant share of sales in the market are accounted for by consumers who regard the products of the merging firms as their first and second choices.⁴⁹

⁴⁵ See Carl Shapiro, Deputy Ass’t Att’y Gen., Antitrust Div., U.S. Dep’t of Justice, Mergers with Differentiated Products, Speech Before the American Bar Association and the International Bar Association (Nov. 9, 1995), available at <http://www.justice.gov/atr/public/speeches/227167.pdf>; see also Carl Shapiro, *Mergers with Differentiated Products*, ANTITRUST, Spring 1996, at 23 [hereinafter *Mergers with Differentiated Products (Antitrust article)*].

⁴⁶ Robert D. Willig, *Merger Analysis, Industrial Organization Theory, and Merger Guidelines*, 1991 BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECONOMICS 281 (1991).

⁴⁷ *Id.* at 300–01.

⁴⁸ *Id.* at 301. Willig develops the relevant conditions in the section entitled “Differentiated Product Bertrand Models.” See *id.* at 299–305.

⁴⁹ 1992 Guidelines, *supra* note 2, § 2.211 (footnote omitted).

In modern parlance, these are the circumstances in which market shares yield good proxies for diversion ratios.⁵⁰ In particular, as Willig demonstrates, the diversion ratio from Product 1 to Product 2 is proportional to $S_2/(1 - S_1)$, where S_1 and S_2 are the market shares of Products 1 and 2.⁵¹ Connecting market shares and unilateral price effects in this way was a theoretical tour de force. But Willig was very careful to emphasize the limitations of this approach. “We shall see that the assumptions are unlikely to be valid in many areas of application where specific information can be developed about product characteristics and about consumer preferences for them. For such applications, merger analysis that focuses exclusively on market shares is likely to go awry.”⁵² Furthermore, even under those special circumstances in which market shares are informative, even Willig, for all his theoretical prowess, could not relate the level of the HHI to diversion ratios.⁵³

Consequently, the treatment in the 1992 Guidelines of unilateral price effects in markets with differentiated products suffered from a mismatch between the basic theory of differentiated product pricing competition, which emphasizes diversion, and the Guidelines’ historical reliance on market shares and HHIs. As one commenter expressed it at the Stanford Workshop, the 1992 Guidelines were like a centaur: the head of differentiated products pricing was grafted onto the body of market definition and market concentration.⁵⁴

This left the 1992 Guidelines in an uncomfortable state: the link they emphasized between market shares and unilateral price effects rested on a strong assumption about demand (i.e., market shares are good

⁵⁰ Even in these circumstances, the diversion ratio from Product 1 to Product 2 depends upon the fraction of lost sales of Product 1 that are recaptured by other products in the market, i.e., the market recapture percentage, as well as on the market shares of Products 1 and 2.

⁵¹ Willig, *supra* note 46, at 302.

⁵² *Id.* at 301.

⁵³ George Stigler had linked HHIs to the danger of collusion; this required making some rather strong assumptions. See Stigler, *supra* note 15. Later, the HHI was linked to the welfare effects of changes in outputs in a market for a single homogeneous good. See Keith Cowling & Michael Waterson, *Price-Cost Margins and Market Structure*, 43 *ECONOMICA* 267 (1976); Robert E. Dansby & Robert D. Willig, *Industry Performance Gradient Indexes*, 69 *AM. ECON. REV.* 249 (1979); Joseph Farrell & Carl Shapiro, *Asset Ownership and Market Structure in Oligopoly*, 21 *RAND J. ECON.* 275 (1990). But there is no good theoretical link between the level of the HHI and unilateral price effects with differentiated products.

⁵⁴ “To me the Unilateral Effects standards in the Guidelines are a kind of antitrust centaur in which you have the head of a unilateral effects analysis that has been grafted onto the body of a coordinated effects analysis.” Comment of Dan Wall, Horizontal Merger Guidelines Review Project, Fourth in a Series of Five FTC/DOJ Workshops, Stanford University, at 166 (Jan. 14, 2010), available at <http://www.ftc.gov/bc/workshops/hmg/transcripts/100114transcriptstanford.pdf>.

proxies for diversion ratios) that often cannot be justified. Willig anticipated this difficulty, writing: “The analysis here also points to the strong need to develop information beyond shares in markets with differentiated products, particularly the relative proximity of the products of the merging firms in the space of salient characteristics.”⁵⁵ Indeed, this is just how practice has evolved since 1992: the DOJ looks at a wide variety of evidence to assess whether the products offered by the merging firms are close substitutes and to measure diversion ratios when possible, sometimes but not always starting with shares in plausibly defined markets.

Spurred by the 1992 Guidelines, and in parallel with major advances in practice, the economic literature relating to unilateral price effects, including the estimation of demand and full merger simulation, developed over the past eighteen years. Many Ph.D. theses have been written about estimating demand systems with differentiated products, and considerable strides have been made in developing simpler approaches that are feasible when data are limited.⁵⁶ I cannot possibly do justice to that literature here; in any event, it has been well surveyed quite recently.⁵⁷ Suffice it to say that enormous strides have been made in theory and in practice.⁵⁸

As economic learning and practice evolved, the emphasis on market shares found in Section 2.21 of the 1992 Guidelines became less helpful to achieve transparent and accurate merger enforcement using a unilateral-effects theory. For example, in a recently litigated case, the court, citing the relevant passage from the Guidelines, rejected the FTC’s attempt to invoke the 35 percent presumption quoted above.⁵⁹ In that case at least, the court wanted more data to support the unilateral effects theory. DOJ economists routinely look for this type of evidence.

⁵⁵ Willig et al., *supra* note 46, at 304.

⁵⁶ See, e.g., Roy J. Epstein & Daniel L. Rubinfeld, *Merger Simulation: A Simplified Approach with New Applications*, 69 ANTITRUST L.J. 883 (2001).

⁵⁷ See Gregory J. Werden & Luke M. Froeb, *Unilateral Competitive Effects of Horizontal Mergers*, in HANDBOOK OF ANTITRUST ECONOMICS 43 (Paolo Buccirossi ed., 2008); Oliver Budzinski & Isabel Ruhmer, *Merger Simulation in Competition Policy: A Survey*, 6 J. COMPETITION L. & ECON. 277 (2010); Jonathan B. Baker & David Reitman, *Research Topics in Unilateral Effects Analysis*, in RESEARCH HANDBOOK ON THE ECONOMICS OF ANTITRUST (Einer Elhauge ed., forthcoming) (Baker & Reitman chapter available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1504863); PETER DAVIS & ELIANA GARCÉS, QUANTITATIVE TECHNIQUES FOR COMPETITION AND ANTITRUST ANALYSIS (2010).

⁵⁸ Recent advances build upon basic theories going back over one hundred years. “Although unilateral effects theories are based on ideas that are quite old as economic theory goes, explicit application of these ideas to merger policy was quite limited prior to the release of the *Horizontal Merger Guidelines* (1992).” Werden & Froeb, *supra* note 57, at 43.

⁵⁹ *FTC v. CCC Holdings Inc.*, 605 F. Supp. 2d 26, 67–72 (D.D.C. 2009).

The 2010 Guidelines modestly update the treatment of unilateral price effects to reflect the substantial changes in economic learning and Agency practice since 1992.⁶⁰ Two aspects of that updating are of special significance: (1) reduced emphasis on market shares, and (2) introduction of the “value of diverted sales” as an indicator of upward pricing pressure.

Before turning to those two topics, it is worth highlighting that *all* of this analysis involving diversion takes as given the set of products being offered and thus does not account for the supply-side responses of repositioning and entry.⁶¹ Although a number of comments criticized the revised Guidelines for purportedly establishing unjustified presumptions about unilateral price effects based on diversion ratios and margins, the Guidelines explicitly state:

A merger is unlikely to generate substantial unilateral price increases if non-merging parties offer very close substitutes for the products offered by the merging firms. In some cases, non-merging firms may be able to reposition their products to offer close substitutes for the products offered by the merging firms. Repositioning is a supply-side response that is evaluated much like entry, with consideration given to timeliness, likelihood, and sufficiency. See Section 9. The Agencies consider whether repositioning would be sufficient to deter or counteract what otherwise would be significant anticompetitive unilateral effects from a differentiated products merger.⁶²

This language, however, led to criticism that the revised Guidelines take an overly skeptical approach to repositioning by treating it like entry. Yet the same basic approach can be found in the 1992 Guidelines.⁶³ The 2006 Commentary observed that in practice repositioning has rarely been a significant factor:

Consideration of repositioning closely parallels the consideration of entry, discussed below, and also focuses on timeliness, likelihood, and sufficiency. The Agencies rarely find evidence that repositioning would

⁶⁰ Most of the new points made in Section 6.1 of the 2010 Guidelines can be found in the 2006 Commentary, *supra* note 4, at 27–28 (section titled “Unilateral Effects Relating to the Pricing of Differentiated Products”).

⁶¹ Again, Willig recognized and emphasized this point: “The above discussion proceeded on the implicit assumption that the pattern of demand relationships and products’ characteristics are not subject to endogenous change. Although this may be an accurate assumption in many contexts, in others firms may be readily and quickly able to reposition their products in response to market incentives.” Willig, *supra* note 46, at 304.

⁶² 2010 Guidelines, *supra* note 1, § 6.1.

⁶³ “The timeliness and likelihood of repositioning responses will be analyzed using the same methodology as used in analyzing uncommitted entry or committed entry (see Sections 1.3 and 3), depending on the significance of the sunk costs entailed in repositioning.” 1992 Guidelines, *supra* note 2, § 2.212 n.23.

be sufficient to prevent or reverse what otherwise would be significant anticompetitive unilateral effects from a differentiated products merger. Repositioning of a differentiated product entails altering consumers' perceptions instead of, or in addition to, altering its physical properties. The former can be difficult, especially with well-established brands, and expensive efforts at doing so typically pose a significant risk of failure and thus may not be undertaken.⁶⁴

The revised Guidelines recognize that the ease or difficulty of repositioning varies greatly across markets.⁶⁵

1. *Reduced Emphasis on Market Shares*

The 2010 Guidelines do not explicitly link diversion ratios to market shares. This reflects experience gained over the years: while market shares are often a useful starting point for assessing diversion ratios, and can indeed be used as proxies for diversion ratios, the DOJ will normally look as well for more direct evidence of diversion ratios. The new language states:

The Agencies consider any reasonably available and reliable information to evaluate the extent of direct competition between the products sold by the merging firms. This includes documentary and testimonial evidence, win/loss reports and evidence from discount approval processes, customer switching patterns, and customer surveys.⁶⁶

The revised Guidelines go on to state:

Substantial unilateral price elevation post-merger for a product formerly sold by one of the merging firms normally requires that a significant fraction of the customers purchasing that product view products formerly sold by the other merging firm as their next-best choice.⁶⁷

This differs somewhat from the 1992 Guidelines, which stated:

Substantial unilateral price elevation in a market for differentiated products requires that there be a significant share of sales in the mar-

⁶⁴ 2006 Commentary, *supra* note 4, at 31.

⁶⁵ 2010 Guidelines, *supra* note 1, § 6.1. Repositioning is analyzed very similarly in Section 6.2, which covers bargaining and auctions.

⁶⁶ 2010 Guidelines, *supra* note 1, § 6.1. These ideas were present but less well developed in the 1992 Guidelines. "Information about consumers' actual first and second product choices may be provided by marketing surveys, information from bidding structures, or normal course of business documents from industry participants." 1992 Guidelines, *supra* note 2, § 2.211, n.22. The European Commission follows a similar approach. "When data are available, the degree of substitutability may be evaluated through customers preference surveys, analysis of purchasing patterns, estimation of the cross-price elasticities of the products involved, or diversion ratios." EU Horizontal Merger Guidelines, *supra* note 29, ¶ 29 (footnotes omitted).

⁶⁷ 2010 Guidelines, *supra* note 1, § 6.1.

ket accounted for by consumers who regard the products of the merging firms as their first and second choices . . .⁶⁸

The revised Guidelines reflect Agency practice, which involves assessing whether the price of any product sold by the merging firms is likely to increase significantly due to the merger. That depends heavily on diversion to products sold by the merging partner, not on any market-wide measure.⁶⁹ The central role of diversion between the merging parties is explained this way:

Diversion ratios between products sold by one merging firm and products sold by the other merging firm can be very informative for assessing unilateral price effects, with higher diversion ratios indicating a greater likelihood of such effects. Diversion ratios between products sold by merging firms and those sold by non-merging firms have at most secondary predictive value.⁷⁰

Some comments criticized this passage for purportedly downplaying the importance of competition from products offered by non-merging firms. However, that criticism is inapt: if products offered by non-merging firms are close substitutes for a product sold by a merging firm, diversion to those products will normally be high, necessarily depressing the diversion ratio to products sold by the other merging firm.⁷¹ This same point was explicitly made in the 2006 Commentary:

A merger may produce significant unilateral effects even though a non-merging product is the “closest” substitute for every merging product in the sense that the largest diversion ratio for every product of the merged firm is to a non-merging firm’s product. The unilateral effects of a merger of differentiated consumer products are largely de-

⁶⁸ 1992 Guidelines, *supra* note 2, § 2.21.

⁶⁹ In some cases, the economic models used by the Agencies predict significant price increases only for products with relatively few sales. This is most likely to happen if a relatively unpopular product is merging with a popular product that has a larger margin. However, in such cases, the Agencies may conclude that the predicted harm to relatively few customers is not substantial enough to warrant an enforcement action, especially if the merger is expected to generate cognizable efficiencies that will benefit a larger set of customers so customers overall are likely to benefit from the merger. *See generally* Joshua D. Wright, Comment on the Proposed Update on the Horizontal Merger Guidelines: Accounting for Out-of-Market Efficiencies (May 31, 2010), *available at* <http://www.ftc.gov/os/comments/hmgrevisedguides/548050-00008.pdf>.

⁷⁰ 2010 Guidelines, *supra* note 1, § 6.1.

⁷¹ Alison Oldale, Chief Economist at the UK Competition Commission, made this point at the first workshop. “For example, the diversion ratio is a ratio. On the top, you may have just the diversion between the merging parties. But on the bottom, you’ve got the whole world. So, you’ve got the diversion to everything else that might be acting as a constraint. They don’t get lost in the analysis.” Fed. Trade Comm’n, Horizontal Guidelines Review Project Workshop, Dec. 3, 2009, at 191, *available at* <http://www.ftc.gov/bc/workshops/hmg/transcripts/091203transcript.pdf>.

terminated by the diversion ratios between pairs of products combined by the merger, and the diversion ratios between those products and the products of non-merging firms have at most a secondary effect.⁷²

In a merger joining Products 1 and 2, significant unilateral effects for Product 1 can occur even if Product 2 is not the “closest substitute” overall to Product 1. What these effects require is that a significant percentage of the customers purchasing Product 1 consider Product 2 to be their next second choice. That percentage is captured by the diversion ratio.

DOJ puts far more weight on diversion ratios and margins (see below) than on the HHI level when diagnosing unilateral price effects. This has been the case for many years, and again the 2006 Commentary made clear that HHI levels are of limited predictive value for this purpose:

Indeed, market concentration may be unimportant under a unilateral effects theory of competitive harm. As discussed in more detail in Chapter 2’s discussion of Unilateral Effects, the question in a unilateral effects analysis is whether the merged firm likely would exercise market power absent any coordinated response from rival market incumbents. The concentration of the remainder of the market often has little impact on the answer to that question.⁷³

As noted below, the market shares of the merging firms, and the *change* in the HHI, are more informative in this context than the *level* of the HHI.

These changes in practice had left many practitioners uncertain about whether and how the Agencies use HHIs in cases involving unilateral price effects for differentiated products. The revised Guidelines clarify the role of HHIs in such cases:

Diagnosing unilateral price effects based on the value of diverted sales need not rely on market definition or the calculation of market shares and concentration. The Agencies rely much more on the value of diverted sales than on the level of the HHI for diagnosing unilateral price effects in markets with differentiated products.⁷⁴

The express acknowledgement that HHI levels typically are not very helpful diagnostics in these cases has led to concerns that the valuable screening role played by the HHI thresholds since 1982 has been reduced or lost. In fact, the 2010 Guidelines recognize the importance of these HHI thresholds to help identify mergers that are “unlikely to have

⁷² 2006 Commentary, *supra* note 4, at 28.

⁷³ *Id.* at 16.

⁷⁴ 2010 Guidelines, *supra* note 1, § 6.1.

adverse competitive effects and ordinarily require no further analysis.⁷⁵ Indeed, the 2010 Guidelines not only retain HHI thresholds but raise them. DOJ continues to apply the HHI thresholds to all horizontal mergers.⁷⁶ Of course, HHIs can only be calculated after a relevant market has been defined, so uncertainty about the scope of the relevant market necessarily creates uncertainty about applicable levels and changes in the HHI. Below, I discuss market definition in cases involving differentiated products.

The combined shares of the merging firms, and the change in the HHI, can be useful and informative metrics in unilateral effects cases, and these measures are used by the Agencies. If diversion is proportionate to market share, the diversion from Product 1 to Product 2 is proportionate to $S_2/(1-S_1)$, which can be approximated as $S_2 \times (1+S_1)$ if S_1 is not too large.⁷⁷ Approximating the diversion ratio from Product 2 to Product 1 in the same way, and adding up the two diversion ratios, gives $S_1 + S_2 + 2 \times S_1 \times S_2$ which equals the combined share of the merging firms plus the change in the HHI. Unilateral price effects are unlikely if the change in the HHI is less than 100, which corresponds to a merger between firms with market shares of 5 percent and 10 percent.

Nonetheless, the revised Guidelines do not retain the presumption that the merging firms are significant direct competitors if their combined market share is at least 35 percent. This presumption was dropped, for four reasons. First, the 1992 Guidelines did not provide a specific basis for the 35 percent figure. Evidently, it was taken from the 35 percent figure used in the leading firm proviso since 1982. But that proviso was based on a very different model and theory: the dominant firm/competitive fringe model in a market for a homogeneous good. Second, as practice evolved, the 35 percent presumption was often invoked as a safe harbor, with merging parties frequently asserting that,

⁷⁵ *Id.* § 5.3.

⁷⁶ Merging parties generally emphasize HHIs when they are low and downplay HHIs when they are high. This perspective is reflected in the comments filed by the ABA Antitrust Section, which applauds the Agencies for expanding the HHI-based safe harbor zones while urging the Agencies to disavow any presumptions based on high HHIs. See ABA Section of Antitrust Law, HMG Revision Project—Comment, Project No. P092900, at 12 (June 4, 2010), available at <http://www.ftc.gov/os/comments/hmgrevisedguides/548050-00026.pdf>. The 2010 Guidelines, like their predecessors, are consistent in placing some weight on HHIs, be they low or high.

⁷⁷ The ratio of the approximation to the precise value is $(1 + S_1) \times (1 - S_1)$ which equals $(1 - S_1^2)$, so the approximation is less than the actual value. If Firm 1's market share is 10 percent, $S_1 = 0.1$ and the approximation is 99 percent of the actual value. If Firm 1's market share is 20 percent, $S_1 = 0.2$ and the approximation is 96 percent of the actual value. If Firm 1's market share is 30 percent, $S_1 = 0.3$ and the approximation is 91 percent of the actual value.

according to the Guidelines, there could be no substantial unilateral price effects if their combined share of the relevant market was less than 35 percent. In fact, the 1992 Guidelines contain no such safe harbor.⁷⁸ Nor would one be justified: a merger combining two products that are close substitutes can lead to substantial unilateral price increases for those products even if their combined market share is less than 35 percent. Third, the presumption could only properly be invoked if market shares are a reasonable proxy for diversion ratios. As discussed above, DOJ often uses market shares to assess diversion, and higher shares in a properly defined relevant market do generally go along with elevated concern about unilateral price effects. But we also look for more direct evidence of diversion. Fourth, as emphasized in this article, economic theory relates unilateral price effects with differentiated products more directly to diversion ratios and margins than to the combined market share of the merging firms.

2. *The Value of Diverted Sales*

The 2010 Guidelines introduce the “value of diverted sales” into the analysis of unilateral price effects with differentiated products:

Adverse unilateral price effects can arise when the merger gives the merged entity an incentive to raise the price of a product previously sold by one merging firm and thereby divert sales to products previously sold by the other merging firm, boosting the profits on the latter products. Taking as given other prices and product offerings, that boost to profits is equal to the value to the merged firm of the sales diverted to those products. The value of sales diverted to a product is equal to the number of units diverted to that product multiplied by the margin between price and incremental cost on that product.⁷⁹

The basic economics underlying the “value of diverted sales” concept are not new. Suppose that the merger brings under common ownership Product 1, formerly owned by Firm 1, and Product 2, formerly owned by Firm 2. One key question is whether the merger is likely to lead to a significant price elevation for Product 1?⁸⁰ As stressed above, repositioning and entry are not considered at this point in the analysis, which takes as given the set of competing products offered by non-merging firms. One can also take as given the prices charged by non-merging

⁷⁸ “Section 2.2 of the Guidelines does not establish a special safe harbor applicable to the Agencies’ consideration of possible unilateral effects.” 2006 Commentary, *supra* note 4, at 26.

⁷⁹ 2010 Guidelines, *supra* note 1, § 6.1.

⁸⁰ This question can then be repeated for Product 2 and other products owned by the merging firms.

rivals for their products. Holding these prices fixed typically will lead to an under-estimate of the magnitude of the post-merger price change.⁸¹

With these simplifications, the central question can be posed very specifically: “Taking as given all other products and their prices, is the profit-maximizing price for Product 1 significantly higher for a firm that owns both Product 1 and Product 2 than it was for Firm 1, which owns just Product 1?” The answer to this question depends entirely on (a) how the demand for these two products varies as their prices rise above pre-merger levels, and (b) their pre-merger margins.⁸²

As discussed in more detail below, this is *precisely* the same question posed by the hypothetical monopolist test to see if Products 1 and 2 form a relevant market. This very tight connection between unilateral price effects with differentiated products and market definition was not clear in earlier Guidelines. The Guidelines now clarify this relationship by explaining in more detail how the hypothetical monopolist test works with differentiated products.⁸³

As a first step to answering this question, it is instructive to simplify even further by holding fixed the price of Product 2 and asking how common ownership of Product 2 changes the pricing *incentives* for Product 1, starting at pre-merger prices. Studying these incentives requires far less information than estimating the profit-maximizing price increase for Product 1.

To see how common ownership changes incentives, it is a bit easier to think in terms of the incentives to sell more units of Product 1 (the reverse of raising the price of Product 1). Owning Product 2 creates a disincentive to sell more units of Product 1. Suppose that for every four extra units sold of Product 1 by lowering its price, one fewer unit of

⁸¹ Rivals usually have an incentive to raise the prices of their products in response to the higher demand they face when the merged firm raises the prices for its products. As Willig puts it: “rival nonparties have incentives to raise their prices in response.” Willig, *supra* note 46, at 299 (citing Raymond Deneckere & Carl Davidson, *Incentives to Form Coalitions with Bertrand Competition*, 16 RAND J. ECON. 473 (1985)). Therefore, accounting for rival pricing responses *magnifies* the predicted price increases (or decreases). Merger simulation models typically account for such responses. “These models often include independent price responses by non-merging firms.” 2010 Guidelines, *supra* note 1, § 6.1.

⁸² Strictly speaking, one needs to measure the marginal cost of Products 1 and 2 at output levels in the vicinity of pre-merger levels. If marginal cost is constant within this range of output, knowing pre-merger marginal cost is sufficient. The assumption of constant marginal cost is commonly made, and I make it here. Modifying the analysis to account for non-constant marginal cost is not difficult in principle and can be important in practice.

⁸³ One way the revised Guidelines do this is by linking together Example 5 on market definition with Example 19 on unilateral price effects. Market definition with differentiated products is addressed below.

Product 2 is sold. This corresponds to a diversion ratio of 25 percent. The higher the diversion ratio, the greater the disincentive to sell units of Product 1 created by the merger. So far so good, as per the 1992 Guidelines. The logical—and unavoidable—next step is to ask how cannibalizing sales of Product 2 affects the merged firm's *profits* from selling more units of Product 1. Lost unit sales of Product 2 only affect the merged firm's profits to the extent that those sales were contributing to profits, i.e., to the extent that price exceeds marginal cost for Product 2. This directs our attention to the gap between price and marginal cost for Product 2. This is just arithmetic.⁸⁴

Suppose that Products 1 and 2 each sell for \$100,000, and the marginal cost of each is \$60,000, so each unit sold contributes \$40,000 towards covering fixed costs and earning profits. For every four extra units sold of Product 1, one unit of Product 2 is cannibalized, leading to a lost contribution of \$40,000. Thus, every extra unit sold of Product 1 reduces Product 2's contribution by \$10,000. Combining the ownership of Products 1 and 2 thus creates a \$10,000 per-unit disincentive to sell units of Product 1. In economic terms, the merged entity bears a \$10,000 per-unit *opportunity cost* not borne by Firm 1.⁸⁵

Moving beyond this specific numerical example, the per-unit opportunity cost of selling Product 1 that is borne (internalized) by the merged firm but not Firm 1 is equal to $D_{12}(P_2 - C_2)$, where D_{12} is the diversion rate from Product 1 to Product 2, P_2 is the price of Product 2, and C_2 is the marginal cost of Product 2. The opportunity cost is equal to the multiplicative product of the diversion ratio and the margin.⁸⁶ *Neither the*

⁸⁴ See Willig, *supra* note 46, at 299; Daniel P. O'Brien & Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, 67 ANTITRUST L.J. 559 (2000) (developing these ideas for partial acquisitions as well as full mergers); see also Jerry Hausman, Gregory Leonard & J. Douglas Zona, *Competitive Analysis with Differentiated Products*, 34 ANNALES D'ÉCONOMIE ET DE STATISTIQUE 159, 173–76 (1994) (noting the key role played by margins in the analysis of unilateral price effects).

⁸⁵ This example is taken from Joseph Farrell & Carl Shapiro, *Recapture, Pass-Through, and Market Definition*, 76 ANTITRUST L.J. 585, 588–90 (2010) [hereinafter *Recapture, Pass-Through, and Market Definition*]. The opportunity cost approach stressed here is developed in that article and in: Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10 B.E. J. THEORETICAL ECON.: POLICIES & PERSP., Vol. 10, No. 1, Art. 9 (2010), <http://www.bepress.com/bejte/vol10/iss1/art9> [hereinafter *Antitrust Evaluation of Horizontal Mergers*].

⁸⁶ Nearly twenty years ago, Willig showed that the multiplicative product of the diversion ratio and the margin was the key driver of unilateral effects:

Thus, to the first order, the incentive to raise the price of good 1 following a merger with the seller of good 2 is greater the larger the product of the markup on 2 and the derivative of the demand for 2 with respect to the price of 1. This cross-price derivative is meaningfully scaled in relation to the absolute value of

diversion ratio nor the margin operates alone to generate upward pricing pressure.

These ideas are at least twenty years old, as the Willig reference shows, and are not new at DOJ. When I served as Deputy Assistant Attorney General for Economics in 1995 I wrote:

Roughly speaking, a valuable index of the potential anticompetitive unilateral effects is obtained by multiplying the Diversion Ratio by the Gross Margin. Any danger of a unilateral price increase may be alleviated by product repositioning, entry, or efficiencies. Nonetheless, the Diversion Ratio and the Gross Margin are the key variables in the demand-side portion of the analysis.⁸⁷

For example, the DOJ's 1997 challenge to the proposed merger between Vail Resorts and Ralston Resorts noted the central role of diversion ratios and margins in unilateral price effects:

This unilateral effect will be larger as the recapture rate (which is sometimes called the "diversion ratio," see *infra* note 4) is larger, as the margin earned on recaptured customers is higher, and as the customers who leave the merging firms in response to a price increase are fewer (in technical terms, the lower the "own price elasticity").⁸⁸

The 2010 Guidelines move beyond diversion ratios, directing attention to the "value of diverted sales." The "value of diverted sales" incentive measure is constructed from the multiplicative product of a diversion ratio and a margin.

Consider a small price increase on Product 1, which we denote by ΔP_1 . Holding fixed all prices other than P_1 , this will cause the unit sales of Product 1 to fall by some amount, call it ΔX_1 . Some of those lost sales will be diverted to Product 2, call them ΔX_2 . The revised Guidelines define the value of sales diverted to Product 2 by the price increase for Product 1 as "the number of units diverted to that product multiplied by the margin between price and incremental cost on that product."⁸⁹ The value of diverted sales associated with the postulated price increase for Product 1 thus is given by $V \equiv \Delta X_2 (P_2 - C_2)$.

the (own-price) derivative of the demand for 1 with respect to the price of 1, to indicate the share of the marginal sales of 1 that would divert to 2.

Willig, *supra* note 46, at 299.

⁸⁷ Shapiro, *Mergers with Differentiated Products (Antitrust article)*, *supra* note 45, at 23.

⁸⁸ Competitive Impact Statement at 10–11, *United States v. Vail Resorts, Inc.*, No. 97-B-10 (D. Colo. Feb. 3, 1997), available at <http://www.justice.gov/atr/cases/f1000/1014.pdf>.

⁸⁹ 2010 Guidelines, *supra* note 1, § 6.1. The relevant cost concept here, C_2 , is the average incremental cost associated with the extra units of Product 2.

The value of diverted sales is usefully measured in proportion to the reduction in unit sales of Product 1 resulting from the price increase, i.e., ΔX_1 . On this per-unit basis, the value of diverted sales is equal to

$$\frac{\Delta X_2}{\Delta X_1} (P_2 - C_2).$$

This equals the opportunity cost term, $D_{12}(P_2 - C_2)$ that emerged inexorably out of the basic logic of unilateral price effects.

The next and final step in this line of reasoning is to scale this opportunity cost in proportion to the price of Product 1. This gives $D_{12}(P_2 - C_2) / P_1$, which is a *gross upward pricing pressure index* for Product 1.⁹⁰ We label this very useful index as

$$GUPPI_1 = D_{12} \frac{P_2 - C_2}{P_1}.$$

The Guidelines now provide a condition under which unilateral price effects are unlikely:

If the value of diverted sales is proportionately small, significant unilateral price effects are unlikely. . . . For this purpose, the value of diverted sales is measured in proportion to the lost revenues attributable to the reduction in unit sales resulting from the price increase. Those lost revenues equal the reduction in the number of units sold of that product multiplied by that product's price.⁹¹

This condition corresponds to a low value of the GUPPI. As noted above, the value of diverted sales is equal to $V \equiv \Delta X_2 (P_2 - C_2)$. The lost revenues attributable to the reduction in unit sales of Product 1 are given by $L \equiv \Delta X_1 \times P_1$. Measuring the value of diverted sales in proportion to the lost revenues gives

$$\frac{V}{L} = \frac{\Delta X_2 (P_2 - C_2)}{\Delta X_1 \times P_1} = D_{12} \frac{P_2 - C_2}{P_1}$$

which equals $GUPPI_1$. Denoting the relative margin on Product 2 as $M_2 = (P_2 - C_2) / P_2$, the gross upward pricing pressure index on Product 1 can be expressed as

⁹⁰ See O'Brien & Salop, *supra* note 84, at 599; see also Steven C. Salop & Serge Moresi, Updating the Merger Guidelines: Comments (Nov. 9, 2009), available at <http://www.ftc.gov/os/comments/horizontalmergerguides/545095-00032.pdf>; Serge Moresi, *The Use of Upward Pricing Pressure Indices in Merger Analysis*, ANTITRUST SOURCE, Feb. 2010, <http://www.abanet.org/antitrust/at-source/10/02/Feb10-Moresi2-25f.pdf>; DAVIS & GARCÉS, *supra* note 57, at 216–17.

⁹¹ 2010 Guidelines, *supra* note 1, § 6.1, § 6.1 n.11.

$$GUPPI_1 = D_{12} M_2 \frac{P_2}{P_1}.$$

If the two products have equal prices, this index becomes simply $GUPPI_1 = D_{12} M_2$.

Summarizing, the revised Guidelines direct attention to the disincentive created by the merger to sell additional units of Product 1 if these cannibalize unit sales of Product 2. This disincentive is measured as an opportunity cost borne by the merged firm for selling Product 1. That opportunity cost, scaled in comparison to the price of Product 1, is equal to the multiplicative product of the diversion ratio to Product 2 and the margin on Product 2. Unilateral price effects for Product 1 are unlikely if this measure is small.

Focusing in this way on how the merger changes pricing incentives achieves two important goals. First, the treatment of unilateral price effects in the Guidelines now rests on a rock solid economic foundation.⁹² The economic principles used are extremely basic and robust: (a) firms account for opportunity costs (cannibalization) when pricing and promoting product lines containing substitute products, and (b) higher costs tend to lead to higher prices.⁹³ Second, the Guidelines now identify circumstances under which unilateral price effects for a given product are unlikely: when the opportunity cost term for that product is small as a fraction of that product's price. Because the gross upward pricing pressure index is so well grounded in basic economics, a quasi-safe-harbor based on this index does not suffer from the mismatch between the economic logic of unilateral price effects and a quasi-safe-harbor based on the HHI level.⁹⁴

This approach also indicates how to incorporate efficiencies into the analysis. For example, merger-specific reductions in the marginal cost of Product 1 create an incentive to lower the price of Product 1. In particular, efficiencies create *downward* price pressure that can reduce or reverse the incentive to raise price just discussed. One of the attractive

⁹² In his comment, Robert Willig writes: "First, the value-of-diverted-sales is a potentially powerful new tool with a distinguished pedigree in the economics literature and solid support in professional economic logic." Robert Willig, Public Comments on the 2010 Draft Horizontal Merger Guidelines 3 (June 4, 2010), available at <http://www.ftc.gov/os/comments/hmgrevisedguides/548050-00015.pdf>.

⁹³ Some comments mistakenly believe that the appearance of the margin on Product 2 in the value of diverted sales measure reflects an assumption about the relationship between the margin on Product 2 and the elasticity of demand for Product 2. No such assumption is required for the arithmetic to operate as described above.

⁹⁴ Additionally, the quasi-safe-harbor based on GUPPI is far better grounded in economics than was the 35 percent presumption in the 1992 Guidelines.

features of the revised Guidelines is that efficiencies can easily and naturally be integrated into the analysis. One can directly compare any merger-specific reduction in marginal cost for Product 1 with the opportunity cost due to cannibalization.⁹⁵ A merger thus generates *net* upward pricing pressure for Product 1 if the opportunity cost exceeds the efficiencies for that product.⁹⁶ The value of diverted sales measure used in the Guidelines, scaled as GUPPI, indicates how large the marginal cost savings must be on Product 1, measured as fraction of the price of Product 1, for there to be no net upward pricing pressure on Product 1, given the price of Product 2.

The value of diverted sales, taken alone, does not purport to quantify the magnitude of any post-merger price increase. Rather, as the Guidelines state, it “can serve as an indicator of the upward pricing pressure on the first product resulting from the merger.”⁹⁷ This is an important distinction not appreciated in some comments. In Appendix A, I elaborate on this point. The value of diverted sales is a measure of the extra (opportunity) cost the merged firm bears in selling units of Product 1. Higher costs give the merged firm an incentive to raise the price of Product 1. But further analysis is needed to determine how that cost increase translates into a price increase. That depends upon the rate at which costs are passed-through to prices, which in turn depends upon the curvature of the demand curve.⁹⁸ Pass-through rates are important

⁹⁵ This comparison depends upon the pre-merger mode of behavior. The analysis in the remainder of this paragraph is clearest if the firms set prices independently pre-merger, as in the Bertrand model of differentiated product oligopoly. If a different mode of behavior prevails pre-merger, a modified version of the diversion ratio applies. If there is substantial pre-merger coordination between the merging firms, which can involve nothing more than parallel accommodating conduct, unilateral effects will tend to be smaller, because there is less competition between the two firms to be lost due to the merger. In that situation, the Agencies may instead pursue a theory of coordinated effects.

⁹⁶ The details are worked out in Farrell & Shapiro, *Antitrust Evaluation of Horizontal Mergers*, *supra* note 85 (building upon O'Brien & Salop, *supra* note 84, and Gregory J. Werden, *A Robust Test for Consumer Welfare Enhancing Mergers Among Sellers of Differentiated Products*, 44 J. INDUS. ECON. 409 (1996) [hereinafter *A Robust Test*]).

⁹⁷ 2010 Guidelines, *supra* note 1, § 6.1.

⁹⁸ The basic relationship between the pass-through rate and the curvature of demand is derived in Jeremy I. Bulow & Paul Pfleiderer, *A Note on the Effect of Cost Changes on Prices*, 91 J. POL. ECON. 182 (1983). The pass-through rate is lower, the more sharply demand falls off as price goes up. For a recent, deep analysis of pass-through rates in oligopoly, see E. Glen Weyl & Michal Fabinger, *Pass-Through as an Economic Tool* (Oct. 2009) (unpublished manuscript), available at http://www.people.fas.harvard.edu/~weyl/Pass-through_10_09.pdf. In his public comment, Dennis Carlton notes that the relationship between upward pricing pressure and the equilibrium post-merger price increase for a given product depends upon the pass-through rate for that product as well as feedback effects arising due to changes in the prices and costs of other products. Dennis W. Carlton, Comment on Department of Justice and Federal Trade Commission's Proposed Horizon-

but can be difficult to estimate empirically. If the elasticity of demand is constant for small price changes, the pass-through rate is greater than one. If unit sales are equally sensitive to small price increases and decreases, demand is linear and the pass-through rate is one-half. In the extreme, if demand were sharply kinked at pre-merger prices, meaning buyers are far more sensitive to price increases than price decreases, the pass-through rate would be low, and even a large incentive to raise price would not translate into a significant price increase. Kinks are implausible when demand comes from multiple diverse buyers; kinks also generally lack empirical support.⁹⁹

The value of diverted sales is an excellent simple measure for *diagnosing or scoring* unilateral price effects, but it cannot capture the full richness of competition in real-world industries. Indeed, as stressed above, all of the quantitative methods discussed here must be used in conjunction with the broader set of qualitative evidence that the Agencies assemble during a merger investigation.

A thorough analysis often must do more than just quantifying how the merger changes pricing incentives. Further information about demand is needed, and additional analysis is required, to translate these incen-

tal Merger Guidelines 17–24 (June 4, 2010), available at <http://www.ftc.gov/os/comments/hmgrevisedguides/548050-00034.pdf>.

⁹⁹ The theoretical point was made nicely by Hotelling:

[A] discontinuity, like a vacuum, is abhorred by nature. More typical of real situations is the case in which the quantity sold by each merchant is a continuous function of two variables, his own price and his competitor's. Quite commonly a tiny increase in price by one seller will send only a few customers to the other.

Harold Hotelling, *Stability in Competition*, 39 *ECON. J.* 41, 44 (1929).

Kinked demand would imply that small changes in costs are not passed through at all to prices, but this is inconsistent with the extensive empirical literature on pass-through rates. See Weyl & Fabinger, *supra* note 98, at 13–14. For example, Besanko, Dubé, and Gupta study retail pass-through rates, finding that “[o]wn-brand pass-through rates are, on average, more than 60% for 9 of 11 categories.” David Besanko, Jean-Pierre Dubé & Sachin Gupta, *Own-Brand and Cross-Brand Retail Pass-Through*, 24 *MKTG. SCI.* 123, 123 (abstract) (2005). Scheffman and Simons assert that kinks in demand are common for consumer products, but Werden explains theoretically why kinks are implausible and reviews the empirical literature, which does not find kinks. See David Scheffman & Joseph Simons, *Unilateral Effects for Differentiated Products: Theory, Assumptions and Research*, ANTITRUST SOURCE, Apr. 2010, <http://www.abanet.org/antitrust/at-source/10/04/Apr10-Scheffman-4-14f.pdf>; Gregory Werden, *Unilateral Effects with Differentiated Products: A Response to Scheffman and Simons*, ANTITRUST SOURCE, June 2010, <http://www.abanet.org/antitrust/at-source/10/06/Jun10-Werden6-24f.pdf>; see also Kevin M. Murphy & Robert H. Topel, *Critical Loss Analysis in the Whole Foods Case*, GLOBAL COMPETITION POL'Y, Mar. 2008, at 5 (“It is true that this *ad hoc* pattern of consumer responses would reconcile things, but what is the evidence?”). Even if there were a kink just at the pre-merger prices, there is unlikely to be a kink at other price levels, and those prices may well become the “but-for” prices in the future, e.g., if costs change.

tives into predictions of post-merger price increases. To accomplish this, DOJ economists and economists working for merging parties often undertake merger simulation exercises. The revised Guidelines, for the first time, identify merger simulation as a methodology used by the Agencies. In some cases, the DOJ uses merger simulation methods to diagnose unilateral price effects.¹⁰⁰ Before using the output of any merger simulation model to actually predict the magnitude of the post-merger price increase, DOJ economists check the model's output for robustness and consistency with other evidence. We also consider repositioning, entry, and efficiencies.

The competition authorities in the United Kingdom have been using very closely related techniques for the past five years to diagnose unilateral price effects. In its analysis of the proposed acquisition by Somerfield of 115 stores from William Morrison Supermarkets, the UK Competition Commission (CC) computed "illustrative post-merger price rises" based on diversion ratios and margins.

As set out in Appendix D, illustrative 'post-merger price rises' can be calculated on the basis of the diversion ratio and the margin. We did not seek to use the formulae directly to predict post-merger price rises, because our concerns are more widely with a deterioration in PQRS [price, quality, and range of service] over time, as a result of reduced competitive constraints, rather than just an increase in price. However, we did regard that approach as providing important guidance on how to combine margin and diversion ratio data to evaluate the relative lessening of competitive constraints in different stores.

Neither high diversion ratios nor high margins in isolation need indicate that a merger has potential anticompetitive effects. Rather, it is the combination of a high diversion ratio and high margins (with other qualitative factors relevant to a highly complex market—see paragraph 7.16) that can indicate a loss of competition: where margins are high, firms face little competitive constraint; and where diversion ratios are high, an acquiring firm may be removing what little competitive constraint it faces. The value in the illustrative price rise is in combining diversion ratios and margins in one measure.¹⁰¹

The UK Office of Fair Trading (OFT) now applies a rebuttable presumption based on combining diversion ratios and margins:

¹⁰⁰ Appendix A discusses how some highly simplified merger simulation methods relate to diversion ratios, margins, and the value of diverted sales.

¹⁰¹ See UK Competition Comm'n, *Somerfield plc & Wm Morrison Supermarkets plc* ¶¶ 7.5–7.6 (Sept. 2005) [hereinafter *Somerfield & Morrison Report 2005*], available at http://www.competition-commission.org.uk/rep_pub/reports/2005/fulltext/501.pdf. The formulas used to compute the illustrative price rise are taken from Shapiro, *Mergers with Differentiated Products* (Antitrust article), *supra* note 45.

Accordingly, the combination of gross margin data and diversion ratios is a valuable measure of the change in incentives brought about by a merger. Due to the general probative value of this combination of evidence, the OFT applies a rebuttable presumption that a merger between firms with (i) high margins and (ii) significant diversion ratios between them raises a realistic prospect of a substantial lessening of competition through unilateral effects.¹⁰²

Consistent with these cases, the September 2010 UK Merger Assessment Guidelines emphasize diversion ratios and margins and refers to the illustrative price rise methodology.¹⁰³ Likewise, the European Commission's Guidelines on the Assessment of Horizontal Mergers state: "High pre-merger margins may also make significant price increases more likely."¹⁰⁴

Some observers have questioned whether these techniques are practical, given the need to measure diversion ratios and margins, suggesting that they are far more complex than simply measuring HHIs.¹⁰⁵ These concerns are easily answered.

First and foremost, DOJ economists and economists working for the merging parties have been measuring diversion and margins for many years. Margins are used in critical loss analysis and are an essential element of market definition under the hypothetical monopolist test, as discussed in more detail below. Diversion ratios have been central to unilateral effects cases since 1992. Yes, there are well-known pitfalls in measuring margins using accounting data, but DOJ economists are well aware of these pitfalls and skilled at overcoming them when the data

¹⁰² UK Office of Fair Trading, *Anticipated Acquisition of the Online DVD Rental Subscription Business of Amazon Inc. by LOVEFiLM International Limited* ¶ 30, No. ME/3534/08 (2008), available at <http://www.offt.gov.uk/OFTwork/mergers/decisions/2008/LOVEFiLM>. The OFT has subsequently applied this presumption in the Home Retail Group/Focus merger, the Co-operative Group/Somerfield merger, and in the William Morrison Supermarkets/Co-operative Group merger. UK Office of Fair Trading, *Completed Acquisition by Home Retail Group plc of 27 Leasehold Properties from Focus (DIY) Ltd* ¶ 62, ME/3427/07 (2008); UK Office of Fair Trading, *Anticipated Acquisition by Co-operative Group Limited of Somerfield Limited* ¶¶ A.11–A.13, ME/3777/08 (2008); UK Office of Fair Trading, *Completed Acquisition by Wm Morrison Supermarkets plc of 30 Stores from Co-operative Group Limited* ¶ 23, CR/34/09 (2009).

¹⁰³ UK Competition Comm'n & Office of Fair Trading, Merger Assessment Guidelines, ¶¶ 5.4.6–5.4.12 (Sept. 2010), available at http://www.offt.gov.uk/shared_offt/mergers/642749/OFT1254.pdf.

¹⁰⁴ EU Horizontal Merger Guidelines, *supra* note 29, ¶ 28.

¹⁰⁵ When the 1982 Guidelines were first released, critics questioned whether the hypothetical monopolist test was practical. Techniques soon developed for implementing the test, which has since been embraced by the courts. Werden characterizes the criticism as "dead wrong." See Werden, *Hypothetical Monopolist Paradigm*, *supra* note 13, at 253, 266.

permit.¹⁰⁶ Second, as noted above, in addition to U.S. agency experience, the UK competition authorities have been using these techniques for the past five years.¹⁰⁷ Third, the documents of merging parties can be informative regarding diversion ratios and margins. Firms often are keenly interested in identifying the rivals to which they lose business, or from which they can gain business. Businesses are far more likely to ask *these* questions in their day-to-day operations than they are to ask how customers would respond to a price increase by a hypothetical monopolist. Margins are also central to business decisions. Margins are an essential element of pricing decisions, and the return on a marketing campaign that attracts new customers depends directly on the price/cost margins that will be earned on those customers. Indeed, in suitable cases, where reasonably reliable measurement of diversion ratios and margins is possible, these techniques can offer a lot. But they are not meant to displace other methods in situations where diversion ratios and margins cannot be measured with reasonable reliability.

This is a good point to address another common criticism of unilateral effects theory: the claim that unilateral effects models “always predict a price increase” and thus are unsuitable for merger enforcement. This assertion is incorrect. First, the criticism ignores efficiencies, repositioning and entry. Efficiencies generate downward pricing pressure that may outweigh the upward pricing pressure, particularly when repositioning and entry mitigate the upward pricing pressure. Second, the criticism erroneously assumes that the Agencies mechanically run a merger simulation model without examining other evidence or exercising judgment. In fact, the Agencies put real weight on these models only when they are reliable and consistent with other evidence. The Guidelines emphasize that the Agencies use qualitative and quantitative evidence together. If a merger simulation model “predicts” a tiny price increase, that may alleviate DOJ concerns—precisely because DOJ understands that these models typically generate at least some post-merger price increase in the absence of any efficiencies. The Guidelines reflect this by stating that unilateral price effects are unlikely if the value of diverted sales is proportionately small. The UK Competition Commission made this same point very nicely:

¹⁰⁶ Academic researchers are often unable to obtain good estimates of marginal cost using publicly available accounting data. DOJ economists and economists working for merging firms often can estimate marginal costs using detailed, proprietary information that is available through the HSR discovery process but unavailable to academic researchers.

¹⁰⁷ See Oldale, *supra* note 71, at 191–94.

We note that the analytical process described above will always produce a positive predicted price rise, for any merger in which the diversion ratio exceeds zero and firms are making positive margins. In practice, some mergers clearly do not result in an SLC [substantial lessening of competition]. It seems to us likely that, in this inquiry, where the diversion ratio is low and the illustrative price increase is low (because margins are low), there is no SLC: that any lessening of competition is non-existent or insubstantial. We would expect no (or at least no substantial) price rises or reductions in PQRS where this is so. It should not be assumed that the 'predicted price rises', below 5 per cent, in these cases represent real price rises that are in some way 'acceptable' to the [UK Competition Commission].¹⁰⁸

Although this criticism often is coupled with an apparent preference for HHI analysis, the same criticism could be made about economic models involving the HHI.

For all of these reasons, DOJ investigations mainly use the GUPPI and merger simulation models to provide an indication—not a precise prediction—of whether a merger is likely to cause significant unilateral price effects. Both methods are used in conjunction with other evidence.

B. BARGAINING AND AUCTIONS

The substantial majority of merger investigations at the DOJ involve firms that sell intermediate goods: the customers of the merging firms are themselves businesses, not final consumers. Indeed, in many cases the buyers are themselves large firms; below, I discuss powerful buyers. In the majority of cases I have worked on as Economics Deputy, the merging firms negotiate prices (and other terms and conditions) with their customers. As Section 2.2.2 points out, testimony from well-informed customers can be especially important in these cases.

Section 6.2 in the revised Guidelines, "Bargaining and Auctions," addresses these very common situations. This section draws heavily from the 2006 Commentary, which contains separate sections on "Unilateral Effects Relating to Auctions"¹⁰⁹ and "Unilateral Effects Relating to Bargaining,"¹¹⁰ including numerous examples.

Price discrimination is quite common in these settings. Suppliers often have considerable information about individual customers, including information about customers' needs or options, customers' switch-

¹⁰⁸ UK Competition Comm'n, *Somerfield & Morrison Report 2005*, *supra* note 101, ¶ 7.12 n.33.

¹⁰⁹ 2006 Commentary, *supra* note 4, at 31–34.

¹¹⁰ *Id.* at 34–36.

ing costs, and the costs of serving different customers. DOJ often investigates to determine whether certain types of customers, or certain individual customers, are likely to be harmed by a merger. Section 3 in the revised Guidelines, “Targeted Customers and Price Discrimination,” has been added to reflect the importance of these situations in practice.

The Agencies analyze unilateral effects in bargaining and auction situations using similar approaches to those just discussed for differentiated products.¹¹¹ To see the connection, consider a situation in which suppliers submit sealed bids to win a particular piece of business. The customer picks the most attractive bid, accounting for price, other terms and conditions, and differences among the suppliers in the products and services they offer, their reputation, etc. As a matter of formal economics, this is very similar to the situation just discussed, where suppliers set prices and each of many customers each picks his or her preferred product. In the bidding setting, each supplier tries to judge the relationship between its bid and the probability it will win the business. In the consumer products setting, each supplier tries to judge the relationship between its price and the number of consumers who pick its product. Either way, the supplier sees a negative relationship between its price and the number of units it expects to sell.

The details of unilateral effects analysis depend on the auction format. For example, in the classic English (open-outcry) procurement auction to provide specified goods or services, bidders publicly offer lower and lower prices to provide the required goods or services until the bidding stops. The equilibrium outcome for such an auction is for the bidder with the lowest cost to win at a price equal to the cost of the next most efficient bidder. In this setting, a merger between the two lowest-cost bidders will lead to a price increase, with the size of the price increase equaling the difference in cost between the less efficient merging firm and the next most efficient bidder. This opens up the distinct possibility that a merger will harm some customers—those for whom the merging firms are the two lowest cost suppliers—but not others.

Section 6.2 identifies the key factors that the Agencies consider in bidding and auction settings:

Anticompetitive unilateral effects in these settings are likely in proportion to the frequency or probability with which, prior to the merger, one of the merging sellers had been the runner-up when the other

¹¹¹ For an outstanding discussion of competition in bidding markets, emphasizing that the same principles apply to these markets as to “ordinary markets,” see Paul Klemperer, UK Competition Comm’n, Bidding Markets (June 2005), *available at* http://www.competition-commission.org.uk/our_role/analysis/bidding_markets.pdf.

won the business. These effects also are likely to be greater, the greater advantage the runner-up merging firm has over other suppliers in meeting customers' needs. These effects also tend to be greater, the more profitable were the pre-merger winning bids. All of these factors are likely to be small if there are many equally placed bidders.¹¹²

The first of these elements is the bidding analog of the diversion ratio. DOJ economists, and economists for merging parties, have long been working with win/loss data and other bidding and auction data to assess how often one merging firm is the runner-up when the other merging firm wins the business. We also routinely try to assess the second element—the magnitude of the advantage the runner-up merging firm has over rival suppliers. This advantage is likely to be larger, the more highly differentiated are the goods and services offered by the various suppliers. High margins tend to go along with such differentiation.

Customers sometimes structure their procurements in multiple rounds, down-selecting to just two or three suppliers for the final round. This is especially common when the procurement process itself is costly, e.g., because the suppliers must work closely with the customer to understand its needs and to prepare customized bids. In these circumstances, the frequency with which the merging firms met each other as finalists tends to be quite important to our analysis. Normally, when the merging firms are finalists, the customer benefits from competition between them. In that circumstance, we typically seek to determine whether replacing one of the merging firms with another supplier as a finalist would leave that customer in a less favorable negotiating position. Merging firms often claim that certain non-merging firms can and will offer an equally good alternative to customers. Customer evidence can be especially valuable in assessing this claim. There can be some tension between this claim and the presence of significant supplier differentiation. We may test this claim with evidence from procurement events in which the merging firms competed as finalists against these non-merging firms. If they really do offer very close substitutes, one would expect to see relatively low margins in those bidding situations.

C. INNOVATION AND PRODUCT VARIETY

The 1992 Guidelines have been widely criticized for putting an undue focus on pricing competition and giving short shrift to innovation. While this is not an entirely fair characterization, arguably the 1992 Guidelines gave the impression that the Agencies did not pay sufficient

¹¹² 2010 Guidelines, *supra* note 1, § 6.2. See also EU Horizontal Merger Guidelines, *supra* note 29, ¶ 29.

attention to competition in product quality, service, or innovation. There was a consensus that new Guidelines should do more to acknowledge the importance of non-price competition, especially innovation competition, and to explain how the Agencies incorporate non-price competition into their merger analysis.

The revised Guidelines place far greater emphasis on non-price competition. For expositional reasons, this was done “globally” in the introduction:

Enhancement of market power by sellers often elevates the prices charged to customers. For simplicity of exposition, these Guidelines generally discuss the analysis in terms of such price effects. Enhanced market power can also be manifested in non-price terms and conditions that adversely affect customers, including reduced product quality, reduced product variety, reduced service, or diminished innovation. Such non-price effects may coexist with price effects, or can arise in their absence. When the Agencies investigate whether a merger may lead to a substantial lessening of non-price competition, they employ an approach analogous to that used to evaluate price competition.¹¹³

The Agencies are well aware of the importance of non-price competition, and especially the enormous importance over the long run of innovation competition in generating consumer benefits. At DOJ, we routinely consider non-price aspects of competition, including service, product quality, and innovation. In some cases, such as over-the-air radio and various Internet-based services and content, the product is free to consumers so competition to attract consumers takes place entirely on non-price dimensions.

Section 6.4, “Innovation and Product Variety,” explains in general terms how the Agencies evaluate whether a merger is likely to significantly harm customers by retarding innovation or reducing product variety. The analysis of innovation comes in two parts.

The first part looks at the shorter-term impact of the merger on the introduction of new products. This part focuses on whether new products being developed by one merging firm will cannibalize significant profits from products sold by the other merging firm. This analysis is much like that in Sections 6.1 and 6.2, in that it focuses on diversion and cannibalization of profits, but the business decisions here involve product introduction, not pricing.

¹¹³ *Id.* § 1. The European Commission also considers non-price competition, including whether a merger will lead to a unilateral reduction in innovation. See EU Horizontal Merger Guidelines, *supra* note 29, ¶ 38.

The second part considers the longer-term impact of the merger on innovation. This usually involves looking beyond the products currently being offered, and perhaps even those being developed. This part of the analysis focuses more on the firms' R&D plans and capabilities. Longer-term effects on innovation can be hard to assess, because of the inherent uncertainty associated with R&D, because of the difficulty of evaluating an organization's innovation capabilities, and because these effects are more distant in the future. However, they can be very important, due to the critical role of innovation in generating long-term consumer benefits.

The revised Guidelines also add language in Section 10, "Efficiencies," to clarify that the Agencies recognize and account for the possibility that a merger may generate innovation efficiencies.

When evaluating the effects of a merger on innovation, the Agencies consider the ability of the merged firm to conduct research or development more effectively. Such efficiencies may spur innovation but not affect short-term pricing. The Agencies also consider the ability of the merged firm to appropriate a greater fraction of the benefits resulting from its innovations.¹¹⁴

Section 6.4 also addresses product variety. The analysis of product variety is very similar to the treatment of shorter-term innovation effects just described. The focus here, however, is on the withdrawal of existing products rather than the cancellation or delay of new products. A very similar approach, focusing on diversion and cannibalization of profits, is applied: "An anticompetitive incentive to eliminate a product as a result of the merger is greater and more likely, the larger is the share of profits from that product coming at the expense of profits from products sold by the merger partner."¹¹⁵ This passage explains how one can distinguish between reductions of product variety that are "largely due to a loss of competitive incentives attributable to the merger"¹¹⁶ and those that are not anticompetitive. Anticompetitive reductions in product variety may well be accompanied by a price increase on the remaining product.

IV. MARKET DEFINITION AND THE HYPOTHETICAL MONOPOLIST TEST

Market definition plays two roles in the Guidelines. First, market definition specifies the line of commerce and section of the country in

¹¹⁴ *Id.* § 10.

¹¹⁵ *Id.* § 6.4.

¹¹⁶ *Id.*

which the competitive concern arises. Second, market definition allows the Agencies to identify market participants and measure market shares, which can be informative regarding the merger's likely competitive effects. The Guidelines retain the basic hypothetical monopolist test used since 1982 to define relevant markets.

The 2010 Guidelines explain more fully (a) how the exercise of defining markets and measuring concentration relates to the ultimate question of whether the merger may substantially lessen competition; (b) why using market concentration measures based on broader groups of substitutes than required by the HMT can be misleading; (c) how the Agencies evaluate and perform critical loss analysis; and (d) how the Agencies define price discrimination markets, including geographic markets based on the locations of customers.

A. THE ROLE OF THE HYPOTHETICAL MONOPOLIST TEST

The HMT provides a well-defined and coherent method for delineating the relevant market. The test can be employed even in situations where there is no clear break in the chain of substitutes and where customers differ greatly in their willingness to substitute more distant products in response to a price increase. As Section 4.1.1 of the Guidelines states: "The Agencies use the hypothetical monopolist test to identify a set of products that are reasonably interchangeable with a product sold by one of the merging firms."¹¹⁷ The HMT plays a very specific role in the Guidelines, Section 4:

However, a group of products is too narrow to constitute a relevant market if competition from products outside that group is so ample that even the complete elimination of competition within the group would not significantly harm either direct customers or downstream consumers. The hypothetical monopolist test (see Section 4.1.1) is designed to ensure that candidate markets are not overly narrow in this respect.¹¹⁸

A group of products can form a relevant market under the HMT even if there is significant substitution between that group of products and other products: "As a result, properly defined antitrust markets often exclude some substitutes to which some customers might turn in the face of a price increase even if such substitutes provide alternatives for those customers."¹¹⁹ "Groups of products may satisfy the hypothetical

¹¹⁷ *Id.* § 4.1.1.

¹¹⁸ *Id.* § 4.

¹¹⁹ *Id.*

monopolist test without including the full range of substitutes from which customers choose.”¹²⁰

These statements follow from the economic logic of the HMT. They do not reflect any change in how the Agencies define relevant markets. For example, the 2006 Commentary states:

Defining markets under the Guidelines’ method does not necessarily result in markets that include the full range of functional substitutes from which customers choose. . . . The Agencies frequently conclude that a relatively narrow range of products or geographic space within a larger group describes the competitive arena within which significant anticompetitive effects are possible. . . .¹²¹

The description of an “antitrust market” sometimes requires several qualifying words and as such does not reflect common business usage of the word “market.” Antitrust markets are entirely appropriate to the extent that they realistically describe the range of products and geographic areas within which a hypothetical monopolist would raise price significantly and in which a merger’s likely competitive effects would be felt. . . .¹²²

Even when no readily apparent gap exists in the chain of substitutes, drawing a market boundary within the chain may be entirely appropriate when a hypothetical monopolist over just a segment of the chain of substitutes would raise prices significantly.¹²³

Some comments have suggested that the Guidelines now point to narrower markets than did the 1992 Guidelines. This is incorrect: the basic HMT remains unchanged. If anything, the opposite is true, since the “smallest market principle” has been relaxed, as I explain next.

B. IMPLEMENTING THE HYPOTHETICAL MONOPOLIST TEST

The basic HMT dates back to the 1982 Guidelines. The implementation of the test has been slightly modified over the intervening twenty-eight years, during which time we have learned a great deal about the operation of the test, both in theory and in practice. That process continues in 2010.

As noted above, the Guidelines were updated in 1992 to better handle markets with differentiated products. As part of that updating, the 1992 Guidelines explicitly directed attention to the profit-maximizing price increases on the various products controlled by the hypothetical monop-

¹²⁰ *Id.* § 4.1.1.

¹²¹ 2006 Commentary, *supra* note 4, at 6.

¹²² *Id.* at 12.

¹²³ *Id.* at 15.

olist, recognizing that these price increases typically will not be uniform.¹²⁴

The 1992 Guidelines implement the HMT using a specific, iterative algorithm.¹²⁵ Products are added to the candidate market in the order of “next best substitutes” and the exercise is halted once the test is satisfied. “The Agency generally will consider the relevant product market to be the smallest group of products that satisfies this test.”¹²⁶ The algorithm has much to commend it, but it suffers from a theoretical problem and a practical problem. The theoretical problem is that the “smallest market principle,” can fail to detect a merger as horizontal in some cases where the merging firms sell substitute products and their merger would likely lead to a substantial lessening of competition.¹²⁷ The practical problem is that one may not be able to identify the “next best substitute” at each stage of the algorithm, yet the outcome of the iterative algorithm can be sensitive to this determination.¹²⁸ As a result, while the iterative test in the 1992 Guidelines provides a very useful conceptual framework, in practice the Agencies often are unable to implement the test as stated.

Recognizing these difficulties, the revised Guidelines retain the HMT but take a more flexible approach to its implementation. The iterative procedure no longer appears. The smallest market principle is softened, and the scope of its use is explained in Section 4.1.1:

The Agencies may evaluate a merger in any relevant market satisfying the test, guided by the overarching principle that the purpose of defin-

¹²⁴ In markets involving differentiated products, prices typically differ among various products in the market, and the price effects of a merger need not be uniform. Accordingly, the 1992 Guidelines state that “the hypothetical monopolist will be assumed to pursue maximum profits in deciding whether to raise the prices of *any or all* of the additional products under its control.” 1992 Guidelines, *supra* note 2, § 1.11 (emphasis added). They then state that a group of products satisfies the test if a hypothetical monopolist over that group of products would profitably impose at least a small but significant and nontransitory increase in price (SSNIP) “including the price of a product of one of the merging firms.” *Id.* These points are discussed at greater length by two of the principal authors of the 1992 Guidelines. See Janusz A. Ordover & Robert D. Willig, *Economics and the 1992 Merger Guidelines: A Brief Survey*, 8 REV. INDUS. ORG. 139, 140 (1993).

¹²⁵ See 1992 Guidelines, *supra* note 2, § 1.11.

¹²⁶ *Id.*

¹²⁷ See Carl Shapiro, Deputy Ass’t Att’y Gen., Antitrust Div., U.S. Dep’t of Justice, Updating the Merger Guidelines: Issues for the Upcoming Workshops, Speech Before the Fall Forum, ABA Antitrust Section (Nov. 12, 2009), available at <http://www.justice.gov/atr/public/speeches/251858.pdf>; Salop & Moresi, *supra* note 90. This problem was recognized back in 1992 and can be dealt with in a somewhat ad hoc manner by increasing the SSNIP size.

¹²⁸ Furthermore, if one is able to determine the profit-maximizing prices for a series of hypothetical monopolists, one likely can also determine the profit-maximizing prices for the merged firm (taking as given the products offered by non-merging firms and their prices), which provides a more direct way of evaluating unilateral price effects.

ing the market and measuring market shares is to illuminate the evaluation of competitive effects. Because the relative competitive significance of more distant substitutes is apt to be overstated by their share of sales, when the Agencies rely on market shares and concentration, they usually do so in the smallest relevant market satisfying the hypothetical monopolist test.¹²⁹

C. THE ROLE OF PRICE/COST MARGINS IN THE HYPOTHETICAL MONOPOLIST TEST

The 2010 Guidelines are more explicit than their predecessors about the role played by price/cost margins in the HMT. Section 4.1.3, “Implementing the Hypothetical Monopolist Test,” begins:

The hypothetical monopolist’s incentive to raise prices depends both on the extent to which customers would likely substitute away from the products in the candidate market in response to such a price increase and on the profit margins earned on those products. The profit margin on incremental units is the difference between price and incremental cost on those units.¹³⁰

The revised Guidelines have not changed the role of profit margins in the HMT. The central role played by these margins follows from the economic logic inherent in the test. The 2010 Guidelines *explain* the role of profit margins in a way that reflects Agency experience and practice since 1992 along with advances in economic learning during that time.

The HMT asks a very specific economic question: would a profit-maximizing monopolist controlling a group of products raise the price of at least one of those products by at least a SSNIP? As noted above, the answer to this question depends entirely on (a) how the demand for these products varies as their prices rise above pre-merger levels; and (b) pre-merger price/cost margins.¹³¹ Example 5 in the Guidelines illustrates how the test works using this information.

In principle, one can perform the HMT by estimating the demand for the products in the candidate market, measuring pre-merger margins, and then computing the profit-maximizing prices.¹³² DOJ economists and the economists consulting for the merging parties routinely devote

¹²⁹ 2010 Guidelines, *supra* note 1, § 4.1.1.

¹³⁰ *Id.* § 4.1.3.

¹³¹ See *supra* note 82 for further explanation. See also Werden, *Demand Elasticities*, *supra* note 44, at 387–91 (providing the underlying calculations in the case of a candidate market containing a single homogeneous product).

¹³² If one can accurately estimate the underlying demand system, one can use merger simulation methods to estimate the unilateral post-merger price increases, making the

considerable effort to estimating demand, using whatever reliable and relevant data are available. However, we often lack sufficient data to reliably and robustly estimate the demand system, making it necessary to follow approaches that are less stringent in terms of their data or modeling requirements. Furthermore, since we are often trying, at least initially, to screen mergers based on market concentration, it is highly desirable to have relatively simple methods of defining the relevant market that do not require the econometric estimation of an entire demand system. Fortunately, we have learned a great deal over the past twenty years about how to exploit the information contained in pre-merger prices, costs, and diversion ratios to perform the HMT without full estimation of the demand system.¹³³

By focusing on how the pricing incentives facing the hypothetical monopolist differ from the pricing incentives of firms independently owning and controlling the relevant products prior to the merger, the HMT can be grounded in reality. Focusing on the *change* in incentives is a major and very sensible and practical simplification. The Clayton Act standard—whether the merger may substantially lessen competition—is explicitly focused on the *change* resulting from the merger. The unifying theme of the Guidelines since 1982 has also been about the change: whether the merger will *enhance* market power. And the HMT itself asks about whether the hypothetical monopolist will *raise* prices by at least a SSNIP, which again looks at a change from pre-merger conditions.

The hypothetical monopolist's pricing incentives differ from those of the pre-merger firms because the hypothetical monopolist owns a larger group of substitute products. The hypothetical monopolist does not lose sales when the price of one product is elevated and customers shift away from that product to other products it owns. Therefore, in considering how the hypothetical monopolist's incentive to raise the price of one product differs from the pre-merger incentives of the firm controlling that product, a key question is what percentage of the unit sales lost, when that product's price rises, are recaptured by other products controlled by the hypothetical monopolist. This percentage is defined in Section 4.1.3 of the Guidelines as the *recapture percentage*, "with a higher

separate measurement of market shares superfluous for the purpose of predicting post-merger unilateral price increases.

¹³³ For an entrée to that literature, see Werden, *Demand Elasticities*, *supra* note 44; Epstein & Rubinfeld, *supra* 56; Farrell & Shapiro, *Recapture, Pass-Through, and Market Definition*, *supra* note 85; Joseph Farrell & Carl Shapiro, *Improving Critical Loss Analysis*, ANTITRUST SOURCE, Feb. 2008, <http://www.abanet.org/antitrust/at-source/08/02/Feb08-Farrell-Shapiro.pdf>; DAVIS & GARCÉS, *supra* note 57. Also see the references cited in these articles.

recapture percentage making a price increase more profitable for the hypothetical monopolist.” In some cases, the Agencies can glean information about the recapture percentage even if they lack sufficient data to estimate the entire demand system. For example, if the price of one product was raised in the past (or if supplies of that product were disrupted or limited), one may be able to track how customers of that product shifted to other products. The recapture percentage is closely related to the cross-elasticity of demand that has been central to market definition for decades.¹³⁴

The hypothetical monopolist’s incentive to raise the price on any one product under its control depends on the recapture percentage associated with that product and on the margins it receives on the sales recaptured by the other products it owns.¹³⁵ Kevin Murphy and Bob Topel put it this way: “A larger fraction of sales diverted to other firms in the market or a larger profit margin on these sales will make the incentive to increase price greater for the hypothetical monopolist.”¹³⁶ Applying this fundamental economic logic, the Guidelines state: “The higher the pre-merger margin, the smaller the recapture percentage necessary for the candidate market to satisfy the hypothetical monopolist test.”¹³⁷ This is the same basic economic logic we saw above in the evaluation of unilateral price effects.

With linear demand, if each firm selling one of a symmetric group of differentiated products is setting its pre-merger price independently, that group of products forms a relevant market if the recapture percentage for any one product is at least as large as $2S/(M + 2S)$, where S is the size of the SSNIP and M is the pre-merger margin.¹³⁸ In this special case, Appendix A shows that a symmetric pair of products satisfies the HMT if GUPPI is at least 10 percent. This highlights the tight connection between unilateral effects and market definition.

D. CRITICAL LOSS ANALYSIS

Merging parties sometimes conduct a “critical loss analysis,” typically to support their claim that a certain candidate market in which they

¹³⁴ See, e.g., *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962).

¹³⁵ The relevant cost concept here is the average incremental cost on these recaptured sales.

¹³⁶ Murphy & Topel, *supra* note 99, at 8–9.

¹³⁷ 2010 Guidelines, *supra* note 1, § 4.1.3.

¹³⁸ See Michael Katz & Carl Shapiro, *Critical Loss: Let’s Tell the Whole Story*, ANTITRUST, Spring 2003, at 49. In this case, profit maximization implies a uniform price increase for all of the products, and that uniform price increase exceeds the profit-maximizing price increase on a single product alone.

have large shares is too narrow to satisfy the HMT. Critical loss analysis relies heavily on price/cost margins. The Guidelines now explain how the Agencies evaluate and properly conduct critical loss analysis. Since critical loss analyses have long been presented to the Agencies by merging parties, this explanation is overdue.

Most critical loss analyses presented to the Agencies use the “breakeven” approach.¹³⁹ The Guidelines note that “this ‘breakeven’ analysis differs from the profit-maximizing analysis called for by the hypothetical monopolist test” since 1984.¹⁴⁰ Breakeven analysis compares the “critical loss” with the “predicted loss.” The Agencies and others have been aware for some time of a fundamental flaw appearing in a number of breakeven critical loss analyses they receive. The flaw arises when the predicted loss is not reconciled with the pre-merger margins. Michael Katz, writing when he was Economics Deputy at the DOJ in 2002, described this flaw in some detail in his discussion of the *Sungard* case.¹⁴¹ FTC economists were equally aware of the flaw; additional cases are described by Daniel O’Brien and Abraham Wickelgren.¹⁴² The UK Competition Commission is also aware of this flaw:

The “fallacy” in this analysis is to treat the elasticity and the margin as if they were independent from each other. In fact, according to the benchmark model, margins tell us about the own-elasticity before the price increase. If margins are high, it implies a low price elasticity and that in turn suggests perhaps even strongly there will be low actual losses due to a price increase.¹⁴³

The same flaw appeared more recently in the *Whole Foods* case.¹⁴⁴ The revised Guidelines alert practitioners to this flaw and explain how the

¹³⁹ This approach was pioneered by Barry Harris and Joseph Simons, who introduced the term “critical loss.” See Barry C. Harris & Joseph J. Simons, *Focusing Market Definition: How Much Substitution Is Necessary?*, 12 RES. L. & ECON. 207 (1989).

¹⁴⁰ 2010 Guidelines, *supra* note 1, § 4.1.3.

¹⁴¹ Michael Katz, *Recent Antitrust Enforcement Actions by the U.S. Department of Justice: A Selective Survey of Economic Issues*, 21 REV. INDUS. ORG. 373, 375–79 (2002) (referring to *United States v. SunGard Data Systems, Inc.*, 172 F. Supp. 2d 172 (2001)). My article with Michael Katz was motivated in part because he saw studies with this flaw presented at the DOJ when he was Economics Deputy during 2001–2002. See Katz & Shapiro, *supra* note 138.

¹⁴² Daniel P. O’Brien & Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST L.J. 161 (2003). Both authors were economists at the FTC when they wrote this article.

¹⁴³ DAVIS & GARCÉS, *supra* note 57, at 212. Davis is currently a Deputy Chairman of the UK Competition Commission.

¹⁴⁴ See *FTC v. Whole Foods Mkt. Inc.*, 548 F. 3d 1028, 1048 (D.C. Cir. 2008) (discussing Kevin M. Murphy’s testimony regarding the flaw in critical loss). Murphy and Topel write:

Our point in this comment is not to criticize the application of critical loss analysis to market definition in [the *Whole Foods* merger] case. Rather, we illustrate why the [critical loss] analysis used by Whole Foods’ economist is not useful as a

Agencies evaluate breakeven critical loss analysis: “Higher pre-merger margins thus indicate a smaller predicted loss as well as a smaller critical loss.”¹⁴⁵ See Appendix A for further details.

V. TARGETED CUSTOMERS AND PRICE DISCRIMINATION

The revised Guidelines add a separate section on targeted customers and price discrimination. This section sets forth the two basic conditions necessary for price discrimination to be feasible: differential pricing and limited arbitrage.¹⁴⁶ The basic principles explained here have been well understood by economists for roughly one hundred years. They can be found in the Guidelines going back to 1982 and are not controversial.

Price discrimination is frequently an important factor in DOJ merger investigations. The majority of our mergers involve intermediate goods and services. In these markets, prices typically are negotiated and price discrimination is common. For example, manufacturers may negotiate lower prices with larger customers than with smaller customers, and these price differences may constitute price discrimination, i.e., they may not merely reflect lower costs of supplying the larger customers. In other settings, established customers with high costs of switching away from their incumbent supplier may pay higher prices than new customers. In yet other settings, prices vary across customers based on their locations in a manner not merely reflecting transportation costs. This is relevant for geographic markets based on customer location.¹⁴⁷

This new section was placed relatively early in the Guidelines because the basic principles of price discrimination articulated here are used throughout the Guidelines. They are relevant to market definition. For that purpose, we usually are asking whether the hypothetical monopolist can engage in price discrimination. They are also relevant to competitive effects. When considering unilateral effects, we often ask whether the merged firm can engage in price discrimination. In some cases, we ask whether the merged firm can raise prices to certain customers by ending discrimination that had been in their favor. When considering

general matter. In our view, the type of analysis he presented is so fundamentally flawed that it cannot be used as a tool of market definition.

Murphy & Topel, *supra* note 99, at 2. Murphy served as the FTC’s economic expert witness in *Whole Foods* case.

¹⁴⁵ 2010 Guidelines, *supra* note 1, § 4.1.3.

¹⁴⁶ In keeping with the general style of the Guidelines, the discussion in Section 3 addresses price discrimination, as distinct from discrimination on other dimensions, such as quality or service. This is purely for simplicity of exposition. The same basic principles described in this section also apply to non-price forms of discrimination.

¹⁴⁷ See 2010 Guidelines, *supra* note 1, § 4.2.2.

coordinated effects, we may ask whether a group of coordinating firms could engage in price discrimination.

In fact, DOJ investigations often *begin* by asking whether there are particular types of customers who are most likely to be harmed by the merger. We often find that some types of customers are more vulnerable than others to adverse competitive effects. We look for pre-existing price discrimination and we consider the possibility of post-merger price discrimination.

The Guidelines address the danger that mergers may harm some customers more than others, or some customers but not others, usually by making a discriminatory price increase profitable. But this observation should not be taken to imply any hostility to price discrimination as a stand-alone form of business conduct.¹⁴⁸ For many years, economists have studied the effects of price discrimination, usually by comparing price discrimination with uniform pricing. These studies are directly relevant to the evaluation of regulations that limit or prohibit price discrimination.¹⁴⁹ But the comparison of uniform pricing and price discrimination is not directly relevant for the analysis of horizontal mergers, and the Guidelines do not undertake any such comparison. Nor do the Guidelines address the issue of whether or when price discrimination by a firm indicates that the firm has significant market power under the antitrust laws. The Guidelines are focused on whether the merger is likely to *enhance* market power. Price discrimination is highly relevant to this question if the merger may enhance market power over some customers but not others.

VI. POWERFUL BUYERS

The revised Guidelines add a discussion of “Powerful Buyers” in Section 8. In this respect, they follow the lead of the European Commission’s 2004 Horizontal Merger Guidelines, which include a discussion of “Countervailing Buyer Power.”¹⁵⁰

Many DOJ merger investigations involve intermediate goods markets, where the customers of the merging firms are themselves sizeable enterprises. Merging parties often argue that their customers are large and powerful and will not be vulnerable to adverse competitive effects. This

¹⁴⁸ Similarly, the Guidelines focus on whether a merger will lead to higher prices, but of course this does not mean that high prices alone constitute an antitrust violation.

¹⁴⁹ See, e.g., ANTITRUST MODERNIZATION COMM’N, REPORT AND RECOMMENDATIONS 311–26 (2007), available at http://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf.

¹⁵⁰ EU Horizontal Merger Guidelines, *supra* note 104, ¶¶ 64–67.

section explains how the Agencies evaluate “power buyer” arguments and how merger analysis is influenced by the presence of large or powerful buyers.

Three basic economic themes underlie this section. First, whatever leverage buyers have in negotiations must ultimately rest on the alternatives available to them. In some cases, larger buyers are better placed than small buyers to vertically integrate upstream or sponsor entry, or to shift a greater portion of their business to price cutters. Options such as these can give larger buyers additional bargaining leverage.¹⁵¹ In contrast, mere size alone, without options, does not normally create bargaining leverage, although it can imply large gains from trade.

Second, the Agencies are interested in the impact of the merger on all buyers, not just powerful buyers. The Guidelines state: “Furthermore, even if some powerful buyers could protect themselves, the Agencies also consider whether market power can be exercised against other buyers.”¹⁵² The 2006 Commentary sounded a similar message:

Large buyers rarely can negate the likelihood that an otherwise anticompetitive merger between sellers would harm at least some buyers. Most markets with large buyers also have other buyers against which market power can be exercised even if some large buyers could protect themselves. Moreover, even very large buyers may be unable to thwart the exercise of market power.¹⁵³

In some cases, the actions of powerful buyers can protect more vulnerable customers, e.g., when the lumpy sales of the large buyers disrupt coordination and engender price wars. However, this is not always the case, particularly when the concerns involve unilateral effects. If powerful buyers are protected and other buyers are not, there may be a price discrimination market in which those other buyers are the targeted customers.

Third, the Agencies focus on how the merger will *change* bargaining leverage. “The Agencies examine the choices available to powerful buyers and how those choices likely would change due to the merger. Normally, a merger that eliminates a supplier whose presence contributed significantly to a buyer’s negotiating leverage will harm that buyer.”¹⁵⁴

¹⁵¹ However, in some situations, larger buyers have more demanding requirements than smaller buyers, giving them *fewer* options.

¹⁵² 2010 Guidelines, *supra* note 1, § 8.

¹⁵³ 2006 Commentary, *supra* note 4, at 17–18.

¹⁵⁴ 2010 Guidelines, *supra* note 1, § 8.

These principles can be applied to situations in which a large buyer purchases other products from the merging firms in addition to the products over which they compete. Merging parties sometimes assert that the merged firm would be foolish to try to raise price to such a powerful buyer, because that buyer would retaliate by shifting its purchases of these *other* products away from the merged firm. While buyers of this type do have an extra tool at their disposal, and may indeed be able as a consequence to negotiate lower prices than other buyers, such buyers will normally still be harmed if the merger eliminates a supplier whose presence contributed significantly to their negotiating leverage.

VII. CONCLUSION

The 2010 Guidelines provide updated and more accurate guidance regarding merger enforcement at the DOJ and the FTC than did the 1992 Guidelines, which they replace.

APPENDIX A
UNILATERAL PRICE EFFECTS:
THE ROLE OF DIVERSION RATIOS AND MARGINS

The Guidelines identify diversion ratios, margins, and the value of diverted sales as objects that the Agencies seek to measure to diagnose unilateral price effects in markets with differentiated products. The Guidelines also, for the first time, list merger simulation as one of the tools used by the Agencies to “quantify the unilateral price effect resulting from a merger.”

Merger simulation, in its full-blown form, involves estimating the demand system for a set of differentiated products, backing out or directly measuring marginal costs, computing the post-merger equilibrium, and then comparing pre-merger and post-merger prices. In principle, this is the “gold standard,” since it involves predicting post-merger price increases based on detailed demand and cost information, under some maintained assumption about oligopolistic behavior, usually independent (Bertrand) pricing behavior. However, the data required for full merger simulation are often not available, the predictions of merger simulation models may not be robust, and merger simulation techniques can be opaque to non-specialists. Therefore, less demanding and less sophisticated methods are often needed.

One way to achieve substantial simplification and increased transparency is to focus just on the demand for the products sold by the merging firms, holding fixed the prices of competing products sold by non-merging parties. As noted in the text, doing so will normally generate smaller price effects than the full model; but the simplification is considerable and the price effects coming out of the full model often differ very little from those of the simplified model.

With this major simplification, we rephrase the key question posed in the text: “Taking as given all other products and their prices, how much higher are the merged firm’s profit-maximizing prices for Products 1 and 2 than the pre-merger prices of those products?” If we can answer this question, we can derive a useful diagnostic measure of tendency of the merger to raise the price of these products. Technically, this diagnostic consists of the post-merger price increases for Products 1 and 2, holding other prices constant, and assuming that there is no repositioning or entry and no efficiencies. This diagnostic measure is not a “prediction” of the post-merger price increases. The diagnostic measure provides a relatively simple way of ranking or scoring mergers by their

tendency to raise price.¹⁵⁵ Predicting post-merger price increases requires further analysis.

One good diagnostic measure relies on the fact that one can treat $GUPPI_1$ as a post-merger opportunity cost for Product 1, and then apply a default pass-through rate to those costs, holding fixed the price of Product 2.¹⁵⁶ Basing the default pass-through rate on linear demand gives a pass-through rate of 50 percent; this figure is within the general range of pass-through rates that are estimated empirically. With a default pass-through rate of 50 percent, the indicated price increase, measured as a fraction of the price of Product 1, is

$$\frac{1}{2} GUPPI_1$$

which equals

$$\frac{1}{2} D_{12} M_2 \frac{P_2}{P_1}.$$

With equal prices, this becomes

$$\frac{1}{2} D_{12} \times M_2.$$

Using this method, a 10 percent value of $GUPPI_1$ translates into an indicated price increase of 5 percent.

This approach has been criticized for holding fixed the price of Product 2 when calculating the indicated price increase for Product 1.¹⁵⁷ Instead, one can specify the demand system at prices just above pre-merger levels and calculate the indicated post-merger prices for that demand system. A larger indicated price increase, with a somewhat different ranking, is obtained by simultaneously considering a price increase for Product 2. Yet again, Willig led the way, working with a linear demand system for Products 1 and 2. He writes:

¹⁵⁵ More specifically, a diagnostic measure is most useful if it is informative in ranking mergers that are likely to lead to small or moderate price increases. Those are the mergers where such diagnostics can help inform the Agency's enforcement decision. The ability of the diagnostic to rank mergers likely to lead to large price increases is less important.

¹⁵⁶ If we are only concerned about ranking mergers using this measure of the gross upward pricing pressure, the choice of the default pass-through rate does not matter.

¹⁵⁷ See Richard Schmalensee, *Should New Merger Guidelines Give UPP Market Definition?*, GCP ANTITRUST CHRONICLE, Dec. 2009. As Schmalensee points out, accounting for an increase in the price of Product 2 leads to a larger price increase without efficiencies and increases the efficiencies required to prevent the merger from generating net upward pricing pressure.

[T]he merger will elevate the price of good 1 according to two effects. One focuses on the initial price-cost margin of good 2, multiplied by the absolute value of the ratio of the cross-price and own-price derivatives of demand for goods 2 and 1. The second effect adds further price elevation to good 1, depending on the elevation in the price of good 2 and the same ratio of demand derivatives.¹⁵⁸

A few years later, I extended Willig's work by expressing the post-merger price increase in the linear model solely in terms of the pre-merger diversion ratios and margins.¹⁵⁹ In the symmetric case, where the two products face equal demand and have equal marginal costs, profits are maximized by raising the prices of the Products 1 and 2 the same amount. The indicated (uniform) price increase in this model is equal to

$$\frac{D \times M}{2(1-D)}.$$

This ranking puts more weight on the diversion ratio than on the margin.

This entire analysis is very closely related to the market definition exercise. Indeed, the question we have been asking—what are the profit-maximizing prices of Product 1 and 2 given the prices of all other products—is precisely the question posed by the HMT when evaluating these two products as a candidate market. The HMT asks whether this price increase is at least as large as the SSNIP, S . With symmetry and linear demand, profits are maximized by raising the prices of both products equally, so the results of the HMT are the same whether one is considering the profit-maximizing price increase on one product (with the price on the other product also adjusting to maximize profits) or the profit-maximizing (uniform) price increase on both products. With linear demand, the profit-maximizing post-merger (uniform) price increase is at least a SSNIP if

$$\frac{D \times M}{2(1-D)} \geq S.$$

Rearranging, this becomes

¹⁵⁸ Willig, *supra* note 46, at 300 n.43.

¹⁵⁹ See Shapiro, *Mergers with Differentiated Products (Antitrust article)*, *supra* note 45, at 27. For a full set of calculations, allowing for asymmetry and for efficiencies, see Carl Shapiro, *Unilateral Effects Calculations* (unpublished manuscript), available at <http://faculty.haas.berkeley.edu/shapiro/unilateral.pdf>. See also Jerry Hausman, Serge Moresi & Mark Rainey, *Unilateral Effects with General Linear Demand*, *ECON. LETTERS* (forthcoming) (pre-publication version available at <http://crai.com/uploadedFiles/Publications/Unilateral%20Effects-of-Mergers-with-General-Linear-Demand-Hausman-Moresi-Rainey.pdf>).

$$D \geq \frac{2S}{M+2S}.$$

This is the same formula reported in the text for the minimum group recapture ratio necessary for a group of products to form a relevant market with linear demand (with the diversion ratio here replacing the group recapture ratio in the text, since here the candidate market contains just two products).

With linear demand, the HMT is directly related to GUPPI. We just noted that the two products form a relevant market if $D \times M \geq 2(1 - D)S$. In the symmetric case, $GUPPI = D \times M$, so this becomes $GUPPI \geq 2(1 - D)S$. A sufficient condition for the two products to form a relevant market is $GUPPI \geq 2S$. Using the standard 5 percent SSNIP, the two products form a relevant market if GUPPI is at least 10 percent.¹⁶⁰ The HMT is satisfied with a somewhat smaller GUPPI; the precise level required is $0.1 \times (1 - D)$. If the diversion ratio is 25 percent, a GUPPI of 7.5 percent is sufficient to satisfy the HMT.

One can easily integrate efficiencies into this type of analysis. Suppose the merger causes the marginal cost of Products 1 and 2 to fall from C to $C(1 - E)$. Then the indicated price increase in the linear symmetric model is equal to¹⁶¹

$$\frac{D \times M}{2(1 - D)} - \frac{E(1 - M)}{2}.$$

Prices rise if, and only if, this expression is positive. The minimum efficiencies necessary to prevent prices from rising, measured in percentage of pre-merger marginal cost, are given by

$$E = \frac{D \times M}{(1 - D) \times (1 - M)}.$$

In a very important article, Werden showed that this condition applies *regardless* of the shape of the demand system.¹⁶² Equally generally, he showed that the minimum efficiencies necessary to prevent prices from rising, measured as a percentage of the price, are given by

¹⁶⁰ Similar but more complex calculations can be done in the asymmetric case. These calculations require information on the relative price of the two products, the two diversion ratios, and the two margins.

¹⁶¹ See Schmalensee, *supra* note 157; Shapiro, *Mergers with Differentiated Products (Antitrust article)*, *supra* note 45. For the asymmetric case, see Shapiro, *Unilateral Effects Calculations*, *supra* note 159.

¹⁶² See Werden, *A Robust Test*, *supra* note 96. Werden also worked out the asymmetric case.

$$\frac{DM}{1-D}.$$

This formula may be more applicable if the efficiencies involve improvements in product quality or service, which may be more closely related to the value (price) of the product than its marginal cost. With linear demand, the indicated price increase is just half as large as this measure.

APPENDIX B
DIFFERENTIATED OLIGOPOLY: TOXONOMICS,
A HYPOTHETICAL

In the land of Tox, all households and businesses unavoidably and steadily generate a highly toxic substance, Toxon. Toxon must be treated at dedicated facilities, which require highly specialized and expensive equipment. A long and expensive permitting process is needed to establish a Toxon treatment facility. Transporting Toxon is hazardous and very costly.

Tox has a free-enterprise economy. Private, for-profit firms compete to handle the critical job of Toxon treatment. These firms build Toxon treatment sites where they expect them to be profitable, and close them when and if they become unprofitable to operate. These firms set their Toxon treatment fees independently. The marginal cost of disposing of one unit of Toxon is \$60. Toxon treatment facilities are differentiated based on their locations and based on other attributes, such as service quality and reputation.

Each Toxon treatment site faces competition from neighboring sites, but also has some control over its own price. Any given site will lose some customers, mostly to adjacent sites, if it raises its price slightly. But a site that slightly raises its prices is unlikely to lose its nearest customers, who have the farthest to travel to other sites. Suppose that each site maximizes its profits by setting a price of \$100 per unit of Toxon. This is a markup of \$40 over the marginal cost. Measured as percentage of the price, the markup is 40 percent. These markups contribute to covering the substantial fixed costs of establishing a site and to profits. Without the prospect of earning such markups, no firm would ever build a site.

Before we consider a proposed merger between two adjacent Toxon treatment sites, it is instructive to make some observations about the Toxon treatment industry.

First, this type of market structure, which economists call a *differentiated oligopoly*, has been well understood by economists going back at least to the 1920s and 1930s.¹⁶³ In a differentiated oligopoly, each supplier faces competition yet has some ability to control price.

¹⁶³ There is a huge economic literature on differentiated oligopolies. The classic reference for a one-dimensional version of spatial competition is Hotelling, *supra* note 99. See also EDWARD H. CHAMBERLIN, *THE THEORY OF MONOPOLISTIC COMPETITION* (1933); JOAN ROBINSON, *THE ECONOMICS OF IMPERFECT COMPETITION* (1933). If there are no barriers to entry, this market structure is called "monopolistic competition."

Second, the Toxon treatment prices obey the textbook rule relating margins to the elasticity of demand. This relationship is sometimes presented in introductory economics classes as the rule that marginal revenue equals marginal cost, $MR = MC$. Equivalently, it can be presented as the fundamental markup rule, which states that the a firm's margin is inversely related to the firm's own elasticity of demand,

$$\frac{P-C}{P} = \frac{1}{E},$$

where P is price, C is marginal cost, and E is the elasticity of demand facing the firm. This latter form of the rule is sometimes referred to as the Lerner Equation.¹⁶⁴ So long as this basic rule applies, a high margin is evidence that a firm believes that its customers are not highly sensitive to the price it sets.¹⁶⁵ As Kevin Murphy and Robert Topel state: "A well-known result of basic economics is that a profit-maximizing seller sets price so that the actual percentage reduction in quantity sold from a small percentage increase in price is equal to $1/m$."¹⁶⁶

A variant of this last statement appears in the revised Guidelines in Section 2.2.1. While the statement is uncontroversial among industrial organization economists, it sparked a number of comments. For example, the ABA Antitrust Section questioned this basic rule relating margins to the elasticity of demand, calling it "unjustified."¹⁶⁷ However, the rule follows directly from the standard working assumption that firms set prices to maximize profits. Of course, like any simple rule in economics, complications arise in practice so it must be used with care. A distinguished group of economists put it this way:

In conclusion, the inverse relationship between the price/cost margin and the firm's own-price elasticity follows from the fundamental working assumption of profit-maximization, has a long history in economics and remains relevant for careful and reliable merger analysis, along

¹⁶⁴ See A.P. Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157 (1934).

¹⁶⁵ If the firm sets its price independently of its rivals, as in the Toxon example, this lack of sensitivity typically reflects either that the firm's product is significantly differentiated or that its rivals face increasing marginal cost (capacity constraints). Alternatively, high margins can result from coordinated interaction. "Coordinated interaction includes conduct not otherwise condemned by the antitrust laws." 2010 Guidelines, *supra* note 1, § 7.

¹⁶⁶ Murphy & Topel, *supra* note 99, at 4.

¹⁶⁷ ABA Section of Antitrust Law, *supra* note 76, at 17. The comment correctly observes that the long-run competitive price can greatly exceed short-run marginal cost. The comment does not appear to appreciate that this observation is perfectly consistent with the textbook $M = 1/E$ rule. That is the essence of the work on monopolistic competition going back to the 1930s. See CHAMBERLIN, *supra* note 163; ROBINSON, *supra* note 163.

with econometric estimates and other facts learned during a full merger analysis.¹⁶⁸

Third, nothing in this description of the Toxon treatment industry necessarily requires that any of the treatment sites earn more than a competitive rate of return or possess substantial market power as that term is used in antitrust law. To the contrary: if permits are freely available and there are no other barriers to entry, in a long-run equilibrium each facility will earn no more than a normal, risk-adjusted rate of return on the investment required to establish a treatment site. In such a long-run equilibrium, there is nothing inherently worrisome about the resulting margins for Toxon treatment. Over the long run they are necessary to induce firms to build treatment sites. In the long run with freely available permits, the density of treatment sites balances two forces. The high fixed costs of establishing a treatment site push for relatively few sites, spaced far apart. But the very high costs of transporting Toxon push for a large number of sites, spaced close together. If there are no entry barriers, given enough time for new sites to be established where they are profitable and closed where they are not, some balance between these two forces can be expected.

Some readers of the proposed Guidelines mistakenly read them to indicate that the Agencies regard high margins, standing alone, as worrisome. We do not. High margins are not in themselves of antitrust concern. A footnote was added to put such concerns to rest:

High margins commonly arise for products that are significantly differentiated. Products involving substantial fixed costs typically will be developed only if suppliers expect there to be enough differentiation to support margins sufficient to cover those fixed costs. High margins can be consistent with incumbent firms earning competitive returns.¹⁶⁹

As emphasized in the text, unilateral price effects require a *combination* of diversion ratios and margins. Margins do not operate alone to generate unilateral price effects. If there is little or no diversion between products sold by the merging firms, the merger cannot cause significant unilateral price effects, regardless of the margins on those products.

Fourth, it is instructive to consider how the Toxon treatment industry would be jolted if the cost of transporting Toxon were suddenly re-

¹⁶⁸ Michael R. Baye et al., Proposed Horizontal Merger Guidelines: Economists' Comment 6 (June 4, 2010), available at <http://www.ftc.gov/os/comments/hmgrevisedguides/548050-00017.pdf> (jointly submitted by Michael R. Baye, Aaron S. Edlin, Richard J. Gilbert, Jerry A. Hausman, Daniel L. Rubinfeld, Steven C. Salop, Richard L. Schmalensee, Lawrence J. White, and Joshua D. Wright).

¹⁶⁹ 2010 Guidelines, *supra* note 1, § 2.2.1 n.3.

duced. Suppose a new technology is invented that sharply reduces these costs by enabling each household and business to place its Toxon in a secure container, a ToxBox, which can safely and cheaply be transported to a treatment site. For simplicity, suppose also that the existing treatment sites are able to treat additional Toxon at the marginal cost of \$60 per unit.

The invention of the ToxBox is most unwelcome to owners of Toxon treatment sites. The ToxBox greatly diminishes their chief source of differentiation—location. Each site suddenly faces a more elastic demand, since customers are more willing to travel to a neighboring site rather than pay a premium. The predictable result will be intensified pricing competition among Toxon treatment sites. This will cause prices, and thus margins, to fall.¹⁷⁰

Notice the relationship between margins and transportation costs: the invention of the ToxBox reduced transportation costs, and thus raised the elasticity of demand facing each treatment site, leading those sites to reduce their prices and thus their margins. As a general principle, higher margins reflect greater differentiation among the various products. Businesses know this well: they are forever looking for ways to differentiate their products so they are not forced to compete on price alone. Such non-price competition also can generate enormous consumer benefits.

We are now ready to consider a proposed merger of two Toxon treatment sites. We focus on unilateral price effects. The 1992 Guidelines directed our attention to the diversion ratios between the two merging sites. The 2010 Guidelines do the same, but they also direct our attention to the “value of diverted sales,” which effectively (see above) is the multiplicative product of the diversion ratio and the margin. A merger between Site A and Site B creates incentives to raise the price at Site A that are proportional to the number of sales diverted to Site B multiplied by the margin earned on sales at Site B.

If the merging Toxon treatment sites are not adjacent, there is little diversion between them. With a very low diversion ratio, the value of diverted sales is very low as well, regardless of the size of the margin. So, the merger of non-adjacent Toxon sites does not create any significant

¹⁷⁰ In the short run, the returns earned by owners of Toxon treatment sites will fall. In the long run, with lower margins, each site must process more Toxon to cover its fixed costs. Eventually, some treatment sites will exit if these lower margins are not sufficient to cover their recurrent fixed costs. The invention of the ToxBox, by reducing the Toxon transportation costs, makes it efficient to space Toxon sites farther apart to save on their fixed costs.

unilateral incentive to raise the Toxon treatment price, regardless of the margins.

If the merger involves two adjacent Toxon treatment sites, we measure their proximity using the diversion ratio between the two sites. Nothing new there. Diversion can be significant between Site A and a number of neighboring sites; competitive concerns can arise for a merger between Site A and any such site, not just between Site A and the nearest competing site. But even a high diversion ratio would not raise serious concerns if transportation costs were very low: any attempt by the merged firm to raise prices at one or both of these two adjacent treatment sites would be defeated as customers easily shift to more distant sites. Concerns arise only if the two treatment sites are significant direct competitors—as captured using the diversion ratio—and if customers cannot easily shift to other more distant sites due to significant transportation costs.

All of this tells us that concerns about the merger between two adjacent Toxon treatment sites are far greater in the world without the ToxBox than in the world with the ToxBox. This should not be a controversial point. Indeed, many readers will recognize that we are straying into the question of the relevant geographic market for the treatment of Toxon. The invention of the ToxBox tends to expand this geographic market.

In evaluating the merger of two adjacent Toxon treatment sites, we certainly are interested in measuring Toxon transportation costs. If we can accurately measure these costs, we can ask directly how many customers would respond to an increase in the price of Toxon treatment imposed unilaterally by the merging firm by taking their Toxon to a more distant site owned by a non-merging firm. If the evidence convincingly shows that enough customers would do this to defeat any significant unilateral price increase, we can be confident that the merger will not lead to significant unilateral price effects.

What can we do if we are unable to measure Toxon transportation costs accurately? We can make some inferences about transportation costs using the price/cost margins for Toxon treatment: as explained above, higher transportation costs go along with relatively inelastic demand for any one treatment site and thus with higher margins. If transportation costs were low, any individual site would find it profitable to lower its price to attract more customers. Margins can thus tell us a lot about transportation costs, either as a consistency check if we can separately measure transportation costs, or as an alternative if we cannot.

The bottom line: concerns about the merger of two adjacent Toxon treatment sites are greater, the larger are the price/cost margins at these sites. This conclusion could also be expressed in terms of geographic market definition. Higher margins are indicative of higher transportation costs, which go along with a narrower geographic market.

Before leaving the land of Tox, it is worth stressing that this entire analysis, which focuses on diversion ratios and margins, is directed at the *demand* for Toxon treatment. A full merger analysis must also consider the supply side: repositioning, entry, and efficiencies. Since a long and expensive permitting process is required to establish a new Toxon treatment facility, repositioning and entry are, by assumption, very difficult in the Toxon treatment industry. Greater efficiencies are required to prevent prices from rising, the larger is the multiplicative product of the diversion ratio and the margin.

What does all this imply about mergers between suppliers of differentiated products? Transportation costs in the land of Tox are analogous to customer preferences for differentiated products in the real world. Higher transportation costs are analogous to stronger customer preferences among brands. If we have sufficient data to see how customers have responded to shifts in the relative prices of the various products, we may be able to directly estimate demand elasticities and cross-elasticities. However, if we lack such data, or as a consistency check on such estimates, margins can tell us what the firms themselves believe about how demand varies with price. This approach has the great virtue of taking advantage of what the true experts—the firms themselves—believe about demand for their products. Using margins in this way does require assuming that the firms set prices to maximize profits, but that working assumption has long been fundamental to merger analysis.

We can apply this same logic to a merger between two nearby retailers. Diversion might be low because many customers will shift to other stores in response to a price rise at one. Margins might be low, especially if these other stores are nearby. Even if diversion ratios and margins are both high, ease of repositioning and entry might protect customers from harm.

