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Abstract: In recent articles, I have advanced a number of criticisms of the market definition/redefinition paradigm, chief among them that market definition is impossible and counterproductive. First, there is no valid way to infer market power from market shares in redefined (non-homogeneous-goods) markets. Second, one cannot choose which market definition is superior without already having in hand one's best estimate of market power, rendering the exercise pointless. Worse, market power inferences in the chosen market are inferior to the best estimate with which one began. After elaborating these points, this Essay applies them to the three main settings in which the hypothetical monopolist test is employed in various jurisdictions' merger guidelines, showing this test to be counterproductive in every instance. Finally, it addresses reasons that some are nevertheless reluctant to abandon market definition altogether.

JEL Classification: D42, K21, L40

Keywords: Market definition, Mergers, Merger guidelines, Hypothetical monopolist test, Competition policy, Antitrust

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MARKET DEFINITION: IMPOSSIBLE AND COUNTERPRODUCTIVE

LOUIS KAPLOW*

Market definition is impossible. In light of this logical roadblock, it is fortunate that attempts at market definition are also counterproductive, for there is only gain, no loss, from abandoning this methodology. So why, then, is there so much nostalgia for market definition?

Part I of this Essay draws on my prior writing to elaborate two respects in which market definition is impossible.[1] First, there does not exist a valid means of inferring market power from market shares in redefined (non-homogeneous-goods) markets. That is, although market redefinition is literally possible (one can, after all, say anything), there is no legitimate way to function once the task is completed. Second, it is impossible to determine which market definition is superior without already formulating one's best estimate of market power, rendering the exercise pointless. Worse, the market power one would infer once the relevant market is chosen—even if done correctly—

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[1] These writings are: Louis Kaplow, *Why (Ever) Define Markets?*, 124 HARV. L. REV. 437 (2010) [hereinafter Kaplow, *Why (Ever) Define Markets?*], which offers a more extensive treatment of these and a significant number of other matters; Louis Kaplow, *Market Definition and the Merger Guidelines*, 39 REV. INDUS. ORG. 107 (2011), which applies the analysis in greater detail to the hypothetical monopolist test in the merger guidelines; Louis Kaplow, *Market Share Thresholds: On the Conflation of Empirical Assessments and Legal Policy Judgments*, 7 J. COMPETITION L. & ECON. 243 (2011), which expands on the concept of a standard reference market and uses it to illuminate problems with market share threshold tests; Louis Kaplow, *Market Definition*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL ANTITRUST ECONOMICS (Roger D. Blair & D. Daniel Sokol eds., forthcoming 2014), on all of these subjects; Louis Kaplow, *Market Definition Alchemy*, 57 ANTITRUST BULL. 915 (2012), which responds to critics, mainly those in a symposium on *Why (Ever) Define Markets?*; and Louis Kaplow, *The Accuracy of Traditional Market Power Analysis and a Direct Adjustment Alternative*, 95 HARV. L. REV. 1817 (1982) [hereinafter Kaplow, *Traditional Market Power Analysis*], for preliminary criticisms, many of which are superseded by my subsequent writing. This Essay omits most citations to these writings.

provides a less accurate indicator than the estimate one had to employ in order to choose the right market in the first place. Indeed, why ever define markets?

Part II further employs my prior work to illustrate the counterproductivity of the market definition process. For concreteness, it focuses on the hypothetical monopolist test (HMT) algorithm, as articulated in many jurisdictions' merger guidelines, in three basic settings. When assessing unilateral effects in homogeneous goods markets, the proper technique sticks with the initial, homogeneous goods market regardless of what the HMT tells us. When assessing unilateral effects in markets with differentiated products, one should focus on competition between the products in question without bothering to define a market. When assessing coordinated effects, the relevant group of firms consists of those that we are worried about engaging in coordinated price elevation, which ordinarily means that we should stick with the homogeneous goods market.

In sum, the HMT/SSNIP approach is wrong in each of the three standard settings it is supposed to handle. Another sign of the deep flaws in the method is that, even in the simplest setting in which it should work best, it fails to provide at least a crude, approximate ordering of the dangerousness of mergers. For example, it is demonstrated that it presumptively allows (safe harbors) a merger that generates more than thirty-five times the price elevation of one that is presumptively challenged.

Finally, Part III briefly examines market definition nostalgia, addressing why so many cling to a technique that is impossible and counterproductive.[2] Undoubtedly inertia and denial play prominent roles. In addition, practitioners—lawyers, experts, agencies, and courts—are concerned by the fact that direct estimation of market power and competitive effects is often quite difficult, to say the least. Although the challenge is surely great, it is no answer to attempt to substitute a method that is impossible and counterproductive: one that requires direct estimation as an input anyhow, and one that yields an unintelligible output that can only lead us astray. Practitioners are also concerned that the law, as a purely formal matter, commands market definition. Modern competition law, however, is not rigid and formalistic, and it cannot successfully command impossible feats in any event. Furthermore, it is well understood that such a demand can be satisfied by working backwards: one determines the economic effects as best one can and then simply chooses a relevant market that ratifies one's conclusion. Indeed, agencies and courts

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[2] Throughout, I refer mainly to lawyers, experts, and competition agency staff, some (but not all) of whom resist discarding market definition to varying degrees. I concentrate on more widely held views and what seem to me more substantial concerns, with significant additional attention to claims advanced in Gregory J. Werden, *Why (Ever) Define Markets? An Answer to Professor Kaplow*, 78 ANTITRUST L.J. 729 (2013).

have done just this from time to time, sometimes openly, and nothing prevents greater use of this practice in the future.

I. MARKET DEFINITION IMPOSSIBILITY

This Part explicates two basic reasons why the market definition/redefinition procedure should be regarded as impossible. It is important to keep in mind that these arguments are logical, not matters of pragmatic compromise or personal judgment. Hence, when reluctant skeptics insist on maintaining the status quo, we should ask ourselves what they could conceivably have in mind. When something is impossible, there is not much point in bickering about when and how it might sometimes remain a useful enterprise.

A. THE IMPOSSIBILITY OF MAKING VALID MARKET POWER INFERENCES FROM SHARES IN REDEFINED MARKETS

Starting from a homogeneous goods market, the standard initial question in the market definition paradigm is whether we should expand (that is, redefine) it to include various substitutes. To contemplate doing so necessarily presumes that, once we have thus redefined the market, there is something useful we can do with it. And that thing, as we all know, is to make market power inferences from market shares in this redefined market.[3] The trouble is:

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[3] I am skeptical that market definition is useful for other purposes (but, in any event, they are not the focus of my prior writings or this Essay). Some suggest that market definition can guide interim decisions about data collection or other matters that might serve as inputs to making market power inferences. *See, e.g.*, *id*. at 737–38 (discussing mergers of differentiated consumer products); *id*. at 738 (discussing auction models). However, as Part I.B explains, since one must already have one's best estimate of market power in order to choose the proper market definition in the first place, this reasoning would be circular if market definition was meant in the sense criticized in this Essay. As a prerequisite to advancing this or any other use of market definition, one should state precisely what the purpose is and then indicate, in light of that purpose, just what is the criterion by which one deems some market definition to be superior to another. Writers fail to take even these preliminary steps. For example, Gregory Werden argues that, as an alternative to using market definition to infer market power, "[c]orrect market delineation is essential for entry analysis." *Id*. at 731–32. But he does not explain what, then, is the criterion for market definition (does he mean that we do not want the definition that yields the best inference of market power?) or how one overcomes the two logical roadblocks advanced in my writing: First, if we are not using the shares in the redefined market, what are we using, and how do we infer what, about what, from that? Second, how do we overcome the impossibility of defining the market in the first place? (For the interested reader, the correct way to think about entry regarding a substitute for a dominant firm's product is analogous to the manner in which one should analyze exclusionary conduct directed at a substitute, which is related in spirit to aspects of the analysis of differentiated product mergers, discussed in Part II.B. *See* Louis Kaplow & Carl Shapiro, *Antitrust*, *in* 2 HANDBOOK OF LAW AND ECONOMICS 1073, 1185–86 (A. Mitchell Polinsky & Steven Shavell eds., 2007). This method, for the record, does not involve market definition.) Even more mysteriously, Werden claims that, aside from using market definition to infer market power, "the relevant market remains essential" because it is "the metaphoric arena in which the competition at issue occurs." Werden, *supra* note 2, at 732. Similarly, in a full Part of his critique, Werden endorses the traditional market definition paradigm because it provides a useful "narrative" for presenting or defending an antitrust case. *Id*. at 740–43. I confess an inabil-

there is not—and never was—any valid way to do so. At least to industrial organization economists, this conclusion should not come as a surprise, for the notion of a relevant market does not exist in the field.[4]

At this point, the first argument is complete: since it is impossible to make a valid market power inference from shares in redefined markets, it cannot ever make sense to engage in market redefinition. It is helpful, nevertheless, to back up a bit and unpack this argument.

To begin the analysis, let us ask: Is it ever possible to use a market share to make a market power inference? After all, isn't it true that, all else equal, a higher market share implies greater market power? The answers are both affirmative, but in markets for homogeneous goods. (The latter is also true in a redefined market, all else equal, but we nevertheless have no way of determining how much market power is implied by any given share.)

Market power and related questions of competitive effects are quantitative matters. In principle, there should exist some sort of formula that takes various quantitative market measures as inputs—including market share—and provides some market power measure as its output. Over the years, economists have developed two such formulas: one for the market power of a dominant firm with competitive fringe firms (that act as price takers) and another for the price elevation caused by firms engaged in quantity competition (on which, more in Part II.A). The absolutely critical point about these formulas—for all their other simplifications—is that they are meaningful *only in a homogeneous goods market*. That is, the derivations for these formulas assume—critically, not just incidentally—that the market in question is one involving homogeneous goods.

Although they involve various specific assumptions, the formulas sometimes are useful. For the dominant firm model, the pertinent formula indicates how much the firm profitably elevates price above marginal cost.[5] The key inputs are: the elasticity of industry demand, the elasticity of supply expansion by the competitive fringe, and—happily for present purposes—the dominant firm's market share. A higher share does imply greater market power, and the

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ity to appreciate why we should devote substantial resources to hire experts (ultimately to testify) solely so that, at the conclusion of adjudication, the tribunal can announce which lawyer's rhetorical framing—whether best understood as a metaphor or a narrative—was more apt.

[4] *See, e.g.*, Franklin M. Fisher, *Economic Analysis and "Bright-Line" Tests*, 4 J. COMPETITION L. & ECON. 129, 132 (2008); Franklin M. Fisher, *Horizontal Mergers: Triage and Treatment*, J. ECON. PERSP., Fall 1987, at 23, 27; Kaplow & Shapiro, *supra* note 3, at 1091; Adriaan ten Kate & Gunnar Niels, *The Relevant Market: A Concept Still in Search of a Definition*, 5 J. COMPETITION L. & ECON. 297, 298 (2009).

[5] *See* George J. Stigler, *Notes on the Theory of Duopoly*, 48 J. POL. ECON. 521, 523–24 (1940); William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 944–47 (1981); Kaplow & Shapiro, *supra* note 3, at 1080–81.

formula tells us how much, once we know the two stated elasticities. The explanation for the relevance of market share is familiar: a greater share means that the dominant firm captures more of the industry-wide profit of a price increase and hence is willing to sacrifice more output in order to raise price, and a greater share for the dominant firm means a smaller share for the competitive fringe and hence less competitive restraint is implied by a given supply elasticity for those firms.

So far, so good. But, remember, for the market definition/redefinition method to work, we also need to know what to do with market shares in *redefined* markets. Naturally, we seek a formula for doing that. Problem is, there isn't one—which raises the interesting question of what we think we have been doing for the last half century when we have examined shares in redefined markets.

Worse, it is not possible to come up with a valid formula in any meaningful sense.[6] I attempted to do so when working on my 2010 article and ultimately concluded that the uniquely valid formula for making inferences about market power from market shares in a redefined market was a jerry-rigged one that, upon examination, required that we *entirely undo the market redefinition* in order to make it function. This news was not at all bad, for implicit in the preceding discussion of the formula for the original, homogeneous goods market was that *it worked*. That is, no matter how many or few are the substitutes, and no matter how strong or weak each one is, the formula for market power in the homogeneous goods market already yields the correct market power measure (within the confines of that model, of course). In other words, there never was any point to redefining the market. The key conclusion, however, for present purposes, is this: if we insist on doing so, there exists no valid way to make market power inferences from the shares in the redefined market.[7]

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[6] It had long been supposed that one could apply an analogue to the formula that works in the homogeneous goods market in the broadened, non-homogeneous-goods market, making suitable interpretations of the elasticities. This strategy is pursued in Landes & Posner, *supra* note 5, with early criticisms advanced in Richard Schmalensee, *Another Look at Market Power*, 95 HARV. L. REV. 1789 (1982), and Kaplow, *Traditional Market Power Analysis*, *supra* note 1.

[7] Werden purports to respond directly to this logical challenge in his Part I. *See* Werden, *supra* note 2, at 730–32. He suggests that that the inability to infer market power from shares in redefined markets does not concern him because "the relevant market remains essential for assessing market power even if the assessment makes no use of market shares." *Id.* at 731; *see also supra* note 3 (discussing his other proffered uses). Yet he never hints as to how one could ever do this: if power is not inferred from shares, what *is* it inferred from? Furthermore, his introduction asserts that "when the standard test for market delineation is used, market shares are given significant meaning," Werden, *supra* at 730, and he acts as if shares are meaningful—never having explained how the impossible somehow became possible—at various points in the remainder of his essay. *See, e.g.*, *id.* at 742, 745.

B. The Impossibility of Choosing the Best Market Without Already Having Formulated a Best Estimate of Market Power

For purposes of examining the second logical infirmity of the market definition/redefinition process, let us set aside the difficulty raised in Part I.A.[8] Specifically, suppose that we somehow are able to make some sort of inference from market shares in redefined markets. Consider now the crux of the market definition process: Which market should we choose? Well, presumably the best one.

Remarkably, virtually nothing in the prior literature—including agency and court pronouncements—states with clarity what we even mean by the "best" market definition. Nevertheless, it seems fairly clear what is intended. Presumably, it is something like: the best market is that in which our market power inference is most reliable, which is to say, closest to whatever is the truth of the matter about market power. To make our discussion more concrete, suppose that in a particular case we have limited the field of contenders to two market definitions: Narrow and Broad. And, assuming that the process of refinement was well done, let us suppose that the truth lies somewhere in between.

To choose between Narrow and Broad, we first must contemplate what market power inference we would make from the pertinent shares in each of these markets. (Since at least one and perhaps both of these markets is not a homogeneous goods market, this is impossible, but we are ignoring that obstacle here.) Presumably, we will infer more market power from the relatively high shares in Narrow than we will infer from the relatively low shares in Broad. Fixing these inferences—whatever they are—in our minds, let us proceed to the next step.

In order to know which market definition is better, our criterion asks which of these two market power inferences, the larger one in Narrow or the smaller one in Broad, is closer to the truth, as best we can tell. In other words, we should choose that market in which the resulting inference produces the smaller error. (Error is generally inevitable, for we understand the truth to lie somewhere in between.) What is "error" in this context? It is the difference

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[8] Werden mistakenly associates the analysis of the dominant firm model (which was used merely to illustrate the first argument) with the present argument, to which it is entirely unrelated. *See id.* at 732–35. This misreading is puzzling since my original article presents the two ideas in separate (nonconsecutive) parts; it begins the latter (what is here Part I.B) by explicitly setting the former (I.A) aside (*see* Kaplow, *Why (Ever) Define Markets?*, *supra* note 1, at 469); and it does not at any point make use of the dominant firm formula or anything like it. It will be obvious that the logic in this Part (I.B) is independent of the specifics of the preceding one (indeed, one must set the preceding problem aside for the market definition approach even to have meaning for present purposes).

between the market power we would infer conditional on choosing a particular market (Narrow or Broad, as the case may be) and our best estimate of the truth about market power.

Therefore, to choose the market in which our market power inference is most reliable, a logically necessary input is our best estimate of the truth about market power in the case at hand.[9] That best estimate—depending on the particulars of the case, the stage of the proceedings (preliminary screening, initial agency decision, final adjudication)—might be derived from all manner of sources (internal documents, industry experts, buyers' understanding of the marketplace, econometric analysis) and will have widely varying degrees of reliability. Regardless, our best estimate will be our best estimate: it is the best we can do, given the information we have available and our capacity to analyze it. (Note, by the way, that market definition *cannot* be something we rely on at this point because we have not yet chosen the market; because we need first to estimate the error associated with each choice, we need this best estimate as an *input* to our market definition decision.)

The foregoing brief exposition is entirely straightforward, but it yields a momentous conclusion: it is impossible to choose the best market without already having in hand one's best estimate of market power. The basic logic is inescapable: The best market is that which produces the most reliable inference of market power. Which of the two inferences is closer to the truth about market power, in turn, requires that one have already estimated the truth of the matter about market power.

In light of this fundamental point, choosing the best market definition is always—necessarily—a pointless exercise. It is impossible to implement the market definition/redefinition paradigm without first having determined one's best estimate of the bottom line, that is, the answer to the very question that the market definition process is designed to illuminate.[10]

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[9] Werden offers an example that purports to define a market without explaining how this problem is avoided. Werden, *supra* note 2, at 734–35. He chooses the narrow market when the elasticity is "low" but not when it is "high." But this is an evasion. How low is "low," and how high is "high"? By what criterion is this determined? Obviously if "low" means "low enough that choosing the narrow market is *better* than choosing the broad market, in that it leads to a better market power inference," and if "high" means "high enough that . . . ," then his examples run directly into the core problem I raise. So "low" and "high" must mean something else. But what could that be? And why would we care about it? No hint is offered.

[10] Werden never responds to this fundamental point. His introduction announces that he will "demonstrate that market delineation does not require a prior market power assessment," *id*. at 729, but there is no section that even purports to show this. The closest he comes is a single paragraph asserting that it is sufficient to prove a narrow market to show a low elasticity of demand. *See id*. at 734. But how about proving a broad market? And do we ever *compare* markets to ask *which is better*? And, as I ask (and elaborate) in note 9 above, how low is "low"? The point is simple: the demand elasticity is indeed helpful in assessing market power, but how can it be that it is sufficient to answer which market definition is best—giving us the better

Unfortunately, we are not so lucky. Not only is market definition useless, but it is counterproductive. Reflection on the foregoing indicates that the market power inference we make once we have chosen the best market is *inferior* to our input, which, after all, is our best estimate of market power. Now, some will object that this claim is a tautology, which, of course, it is. This means, however, that it must be true.

To elaborate, recall that we are choosing between Narrow and Broad. If we pick Narrow, we will make some (relatively high) inference of market power; if we pick Broad, some (relatively low) inference. The truth—as best we can tell given available information—is somewhere in between. So, rather than simply sticking with our best (intermediate) estimate of market power, the market definition approach demands that we pick Narrow or Broad. To be sure, if we choose well, we are choosing the lesser of two evils. But why do that? Why choose a market definition that leads to error—which we just measured in the process of determining which market definition was best—even if it is the smaller of the two errors? Why not instead stick with our best estimate, avoiding this needless error? We should quit while we are ahead.

Nor is this further defect in market definition merely an academic curiosity. On one hand, we can readily imagine cases (say, horizontal mergers) where our best estimate indicates that the merger should go forward. But if Narrow (which overestimates market power) is a better market definition than Broad (which underestimates market power, but by more), then the standard method chooses Narrow, which overestimates market power, and if this error is sufficiently large, we are led to prohibit a merger that should have been allowed. Likewise, we can imagine mergers that are over the line, where our best estimate indicates prohibition. But if Broad is the better market definition, then we will needlessly understate market power, allowing some of these mergers.[11]

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indication of market power—above and beyond its ability to indicate how much market power there is in the first place? (In the passage, he suggests that market power also depends on market share and rivals' supply elasticity, so as best I can tell, he is implicitly arguing that, in cases where these factors matter, one should nevertheless choose the best market by simply ignoring them, and that the resulting market definition is then somehow useful in inferring market power, the difference between the two being precisely what he just said market definition omits.) At a later point in his essay, he refers to the need for "something *akin* to the relevant market." *Id.* at 738 (emphasis added). He does not, however, articulate what that is, how it would be chosen, or how it could possibly be done in light of my critique. To be sure, Werden subsequently supposes at many points that one can (somehow) define a market. *See, e.g.*, *id.* at 739 ("Less sophisticated analysis, therefore, is sometimes necessary, and such analysis normally employs the relevant market."); *id.* (referring to evaluations that "use[ ] the relevant market" and talking of "delineating the relevant market"); *id.* at 745 (referring to the use of the "market share in a properly defined relevant market"). But he never says how.

[11] It is often noted that our inferences of market power from given market shares can be adjusted upward or downward, as appropriate, in order to reduce such error. First, as discussed further in the sources in note 1, it is rather mysterious how this is done. In a redefined market,

II. MARKET DEFINITION COUNTERPRODUCTIVITY

Part I.B highlights a fundamental respect in which insistence on market definition is counterproductive: it generates needless error, relative to the best estimate of market power with which we begin. This Part explores the sense in which market definition is useless and, worse, counterproductive in a number of specific applications. For concreteness, the discussion will focus on the three basic settings that are featured in many jurisdictions' merger guidelines: unilateral effects with homogeneous goods, unilateral effects with differentiated products, and coordinated effects.[12]

To begin, readers are familiar with the hypothetical monopolist test (HMT).[13] The procedure starts with the narrow, homogeneous goods market and asks whether a hypothetical monopolist in that market could profitably impose a "small but significant and non-transitory increase in price ('SSNIP')," say 5 percent.[14] If so, that is the relevant market. If not, we add the next layer of substitutes and repeat the test, continuing until it is passed. Then, merger guidelines make various inferences from the market shares in the resulting market. For example, the 2010 U.S. Merger Guidelines state: "Mergers resulting in highly concentrated markets [with an HHI above 2500]

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where we have no valid way to make market power inferences from market shares in the first place, how do we know where to begin, in which direction to adjust our inference, or by how much? Second, if this corrective process were feasible and, let us further suppose, perfect, the best we could hope for would be that the errors are eliminated entirely. But think about what this means: the error in choosing Narrow is zero, so the inference in Narrow must be identical to our best estimate of market power, and the error in choosing Broad is also zero, so the inference in Broad must also be identical to our best estimate of market power. This means that we make the identical inference of market power *regardless of which market we select*. Hence, in this idealized setting, where we imagine that there is no error, it is even more transparent that the choice between Narrow and Broad is pointless.

[12] Werden asserts that I wrongly "presume[ ] that two simple models reflect the full range of competitive settings in which unilateral effects arise." Werden, *supra* note 2, at 739. That is incorrect. What I do is refer to the two core unilateral effects settings that are the focus of the U.S. Merger Guidelines and discuss the methodologies employed in the vast majority of writing on the subject. Then, in those cases, I show that the favored approach fails. These demonstrations are offered as concrete illustrations of my more general critique that the market definition paradigm is always useless as a matter of logic for two reasons. None of my analysis implies that there are not mixed cases or other variants of interest; of course there are. But if a technique utterly fails and is in fact counterproductive in the core cases for which it was devised, it takes powerful wishful thinking to believe that, when complexities are added, it will resurrect itself, overcoming its inherent logical defects.

[13] *See, e.g.*, U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (2010) [hereinafter U.S. Merger Guidelines]; Guidelines on the Assessment of Horizontal Mergers Under the Council Regulation on the Control of Concentrations Between Undertakings, 2004 O.J. (C 31) 5; Commission Notice on the Definition of Relevant Market for Purposes of Community Competition Law, 1997 O.J. (C 372); *DG Competition Discussion Paper on the Application of Article 82 of the Treaty to Exclusionary Abuses* (Dec. 2005).

[14] U.S. Merger Guidelines, *supra* note 13, § 4.1.1.

that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power."[15]

Unfortunately, in each of the aforementioned settings—ones that the HMT/SSNIP approach aims to address—the stated market redefinition procedure is always a bad idea. The various merger guidelines that articulate this procedure never even attempt to explain why it makes sense in any of these core contexts.[16]

A. Unilateral Effects with Homogeneous Goods

Part I.A mentions two formulas that economists had developed in which market shares can be related to market power and discusses the one involving a dominant firm. The other, relevant here, derives from the Cournot quantity-competition model with homogeneous goods. This formula indicates that the industry-wide average, output-weighted margin equals HHI/$|\varepsilon_d|$ (where the HHI is represented in ten-thousandths, so that its range is from 0 to 1, and ε_d is the elasticity of demand for the homogeneous good).[17] Now, if we really have Cournot quantity competition,[18] this formula tells us that we can compute the price elevation as a function of the market shares (the HHI). However, as emphasized in Part I.A, this formula is applicable *only in the initial, homogeneous goods market*.

Sticking with our homogeneous goods market, we can use this formula to compute the price elevation due to a merger by comparing the elevations implied by the pre- and post-merger HHIs. If we abstain from market redefinition, we will be fine. Our task may still be difficult—in this instance, we need an estimate of the industry demand elasticity—but the formula works, and an estimate (or guesstimate, if necessary) is the best we can do.

Now, suppose instead that we follow standard merger guidelines, which under the prescribed HMT may require us to redefine (broaden) the market. In any instance in which that must be done, our formula becomes void and there

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[15] *Id.* § 5.3.

[16] Although Werden devotes the longest Part of his essay to merger analysis and cites the HMT as a solution to many problems, he makes little mention of most of the critiques, general and specific, from my prior writings that are reviewed here, including the numerical example presented below (which has appeared previously and Werden has seen and heard in person while a co-panelist). *See* Werden, *supra* note 2, at 735–40.

[17] *See, e.g.*, Janusz A. Ordover, Alan O. Sykes & Robert D. Willig, *Herfindahl Concentration, Rivalry, and Mergers*, 95 HARV. L. REV. 1857, 1865 (1982); Kaplow & Shapiro, *supra* note 3, at 1085. I will ignore the important qualifications in Joseph Farrell & Carl Shapiro, *Horizontal Mergers: An Equilibrium Analysis*, 80 AM. ECON. REV. 107 (1990), because they are not central to the argument developed here.

[18] Of course, we may not, in which event we would have to adjust the analysis to take account of further complications, but such would not resurrect a ground for using the HMT that never existed in the first place.

is no other formula to replace it. This is a surprising situation: we begin in a setting in which we have a formula that works—and this is so regardless of the demand elasticity and thus regardless of whether the homogeneous goods market is proper under the HMT—but we are then told to move to a different, redefined market in which we are totally at sea. We have willed our way into market redefinition, but this leap renders it impossible to derive meaningful results. Market redefinition is entirely counterproductive, not merely unnecessary.

Although the main argument here is now complete, it is worth reflecting on just what the HMT/SSNIP procedure is really about. We might suppose it was somehow calibrated to choose a best market. (This is what I had long supposed.) But, actually, it is not. One way to see this is to consider what it does *not* do: specifically, it in no way *compares* the narrower and broader market *to determine which market definition is better*. As one reads the description of the mechanism and accompanying explanation, it is apparent that nothing like this is contemplated.[19]

Another way to see this failure is via numerical examples. In previous writings and presentations,[20] I have juxtaposed two examples, as follows. First, consider a merger in which the 5% HMT is barely satisfied for the homogeneous goods market, and the merger raises the HHI from 2300 to 2501, in which case it is deemed presumptively to pose a threat under the U.S. Merger Guidelines, as quoted above. Performing some mathematical manipulations that make use of the above formula (taking a setting in which it is applicable), one can determine that the market demand elasticity that just meets the 5% HMT in this example is approximately 15, the pre-merger price elevation is about 1.49%, and the post-merger elevation is approximately 1.62%. Therefore, the merger-induced elevation is about 0.13%, that is, under two tenths of one percent.

Second, consider a different case, a merger to monopoly, where this time the hypothetical monopolist in the homogeneous goods market can only raise price 4.9%. We are commanded by the HMT/SSNIP approach to expand the market. Suppose that, when we do this, the included substitutes involve far more revenue than does the original market, so much so that the share of the post-merger monopoly yields a post-merger HHI (and an increase in the HHI) sufficiently low to be in what is essentially the safe harbor range. Yet we

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[19] This startling lacuna explains why the process does not require a best estimate of market power as an input: since it is not even trying to choose the best market, it is irrelevant which of the two markets produces inferences that are closer to the truth.

[20] *See* sources cited *supra* note 1; *supra* note 16 (discussing Werden's prior exposure to these examples).

know that the hypothetical monopolist can raise price 4.9%, and this is, after all, a merger to monopoly.

Finally, let us juxtapose these two examples. The Guidelines method permits the second merger, which raises price 4.9%, but presumptively condemns the first, which raises price 0.13%. That is, the freely permitted merger raises price more than *thirty-five times as much* as the one that is presumptively disallowed.

What have we learned? That the Guidelines and the HMT/SSNIP are a miserable failure even in ordering some simple mergers by their approximate dangerousness. In a sense, this should not surprise us because we have already learned that the HMT/SSNIP mechanism does not actually purport to choose a best market and that the market redefinition process is counterproductive. What may be a surprise, however, is just how badly the procedure can perform. And this failure was in a plain vanilla pair of examples, with no complications due to entry, efficiencies, or other matters. That is, the HMT/SSNIP method crashes and burns in some of the most basic cases for which it was designed. But we need not fear: as long as we eschew market redefinition in all such cases, we are on a track that works in principle and points us toward what information we need in order to reach sensible conclusions.

B. Unilateral Effects with Differentiated Products

In mergers of firms producing differentiated products, the concern about the incentive of the merged firm to raise price is more focused. To illustrate, suppose that each merging firm produces a single differentiated product. Before the merger, the firm selling the first product, when contemplating a further increase in price, was deterred by the prospect of losing sales to other firms' products, including that of the merger partner. After the merger, that same price increase has become more attractive: some lost sales are now to oneself, and to the extent that price exceeds marginal cost for that other product, this contribution to profits partly reduces the overall profit loss from the price increase. (The gain—from the higher price on retained sales of the first product—is the same.) Note that we can perform similar analysis with respect to the incentive to raise the price on the second firm's product before versus after the merger.

From this standard explanation, it is fairly clear what we need to know to predict the extent to which the merger will generate greater incentives to raise price. Taking the perspective of firm one and its product, for example, we need to know what portion of its lost sales, as it increases its price, are to the product of the second firm (the diversion ratio). In addition, we need to know the pre-merger mark-ups (price-cost margins), which allows us to measure how large is the profit offset when some of the lost sales to product two are

now internal to the merged firm. At that point, the analysis is largely complete.[21]

The most important point about this analysis for present purposes is that it *does not involve defining any market*. Market definition is wholly unnecessary in this context (a point that has increasingly been noted in the literature on critical loss analysis and upward pricing pressure).[22] Moreover, suppose that one did, as per the HMT/SSNIP approach of many jurisdictions' merger guidelines, define some market. In that heterogeneous goods market, there does not exist a formula indicating, as a function of firms' market shares therein, how much price will be elevated before the merger or after—and thus, how much prices rise as a consequence of the merger.

There is, however, a trivial manner in which one could define a market in such a case: simply deem the relevant market to be that which includes the two merging firms' products and nothing else.[23] At that point, one could perform the first step (only!) of the HMT, asking how much a hypothetical mo-

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[21] To be more precise, we will have determined the unilateral incentive to raise price, taking other (nonmerging) firms' prices and the second product's price as given. A complete analysis takes into account that, in response, they will have an incentive to increase price somewhat, which in turn augments the merging firm's incentive to raise price, and so forth. Hence, the resulting equilibrium involves a greater price increase than the analysis in the text indicates, and determining these ripple effects requires information on the interactions among additional firms' products. For further elaboration, see the sources cited in note 22 below.

[22] *See, e.g.*, Jonathan B. Baker & Timothy F. Bresnahan, *The Gains from Merger or Collusion in Product-Differentiated Industries*, 33 J. INDUS. ECON. 427 (1985); Barry C. Harris & Joseph J. Simons, *Focusing Market Definition: How Much Substitution Is Necessary?*, 12 RES. L. & ECON. 207 (1989); Daniel P. O'Brien & Abraham L. Wickelgren, *A Critical Analysis of Critical Loss Analysis*, 71 ANTITRUST L.J. 161 (2003); Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, B.E. J. THEORETICAL ECON., Jan. 2010, art. 9, 1. The most recent version of the U.S. Merger Guidelines, *supra* note 13, § 6.1, embraces an approach along the lines sketched in the text; however, it is unclear the extent to which this methodology is used alongside the HMT/SSNIP method or supplants it. Differentiated products mergers is the one setting in which Werden believes that market definition may not as often be helpful. *See* Werden, *supra* note 2, at 736–38. Yet he reverts to the common refrain, *see infra* Part III.A, that data limitations often render modern tools inadequate, resurrecting the need for market definition. This relapse, however, is a non sequitur. Aside from the logical barriers to defining the market and making inferences from shares in non-homogeneous-goods markets (which these will necessarily be), he simply fails to explain the nexus between data limitations and market definition. Simply put, if it is hard to reliably measure, say, the diversion ratio, and that is what determines the price effect of the merger, how will picking some market definition give us a better estimate? (More precisely, if what we need to know is something about the degree of substitution between products *A* and *B*, but that is hard to measure, how does making judgments about some other products, *X*, *Y*, and *Z*, help matters?) In addition, if the core idea of substitution between products, which is presumably Werden's basis for choosing a market definition, is the same as that behind the diversion ratio, how does he propose to do this since he begins by assuming that the pertinent data is inadequate?

[23] For ease of exposition, I assume that each merging firm produces only a single product and abstract from other considerations. Werden (who routinely uses such simplifications himself) attempts to avoid some of my arguments by raising further complications, such as the existence of multiple products. *See, e.g.*, Werden, *supra* note 2, at 744–45. It is as if, in response to the fact

nopolist in that market—that is a firm that produced both products rather than just one or the other—could profitably increase price. That question is just a way of restating: how much will the merged firm increase price? The restatement does not do anything to help us *answer* the question. Much as in Part I.B, we need to have our best estimate before we can proceed.

Note, however, that it is critical that we stop, immediately, once we have the answer. That is, once we know how much the hypothetical monopolist *in this two-product market* would raise price—which is our answer—we are finished. We don't ask whether it is 5% or greater and then, if it is, look up the two firms shares on some table (the post-merger share in *this* market is 100%). And we don't ask, if it is under 5%, what products to bring in and how much a hypothetical monopolist of *that* market could increase price, which is wholly beside the point. Nor would we want to compute shares in that market and look up the pre- and post-merger HHIs and changes in HHI on some guidelines' table. Market redefinition is pointless and counterproductive in this setting as well.

C. COORDINATED EFFECTS

In addition to raising the unilateral incentives of merged firms to increase price, mergers might also facilitate coordinated price elevation.[24] This might arise on account of smaller numbers, greater symmetry, elimination of a pricing maverick, or other factors. Assessment of the extent to which a given merger might ease coordination is largely a separate matter for present purposes. The question here is, supposing that coordination becomes more likely, just how much can the coordinating firms elevate price if they are successful? The answer involves a market power assessment, but again the market definition/redefinition approach is counterproductive.

Take the typical case, in which we are concerned about coordination in the homogeneous goods industry because, in principle, coordination tends to be simpler in such settings and, in fact, a substantial portion of successful cartel prosecutions involve homogeneous goods.[25] If the merger, say, makes perfect

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that jumping out of a high-flying airplane without a parachute is fatal, one objected: But what if two people jump?

[24] For a comprehensive analysis of the law and policy toward coordinated oligopolistic price elevation outside the merger context, see LOUIS KAPLOW, COMPETITION POLICY AND PRICE FIXING (2013), and Louis Kaplow, *An Economic Approach to Price Fixing*, 77 ANTITRUST L.J. 343 (2011).

[25] *See, e.g.*, John M. Connor, *Price-Fixing Overcharges: Legal and Economic Evidence*, 22 RES. L. & ECON. 59, 136–53 (2007); Joseph E. Harrington, Jr., *How Do Cartels Operate?*, 2 FOUND. & TRENDS IN MICROECONOMICS 1, 98–102 (2006); George A. Hay & Daniel Kelley, *An Empirical Survey of Price-Fixing Conspiracies*, 17 J.L. & ECON. 13, 29–39 (1974). Werden inaccurately represents my prior treatments in two respects. *See* Werden, *supra* note 2, at 739–40. First, I clearly stated that, as a practical matter, coordinated effects typically arise in

coordination possible, how much will price increase? This quantity is determined by our standard formula for market power in homogeneous goods industries, which depends importantly on the market elasticity of demand.[26]

Note that our answer is, again, essentially that given in the first step of the HMT. A perfectly coordinating group of firms is, in essence, acting as a hypothetical monopolist *in that initial, homogeneous goods market*. Perhaps that hypothetical monopolist can raise price 3%. Perhaps 6%. Or 16%. Or 66%. Whatever the answer is, we are done. That is the answer to our question. If it so happens that the answer is below 5% (say, 3%, as just mentioned), there is no point to expanding the market by adding substitutes, as the HMT commands. We do not care how much a hypothetical monopolist of *that* market can raise price. Nor do we care what is the collective market share of our group of firms in *that* market or how this figure matches up in some table. Yet again, we have no need for market redefinition, and redefining the market is worse than pointless: it is counterproductive.

In sum, this Part has examined the three main sorts of anticompetitive effects attributable to horizontal mergers and featured in modern merger guidelines. In all three cases, market redefinition in general and the HMT/SSNIP mechanism in particular are entirely unnecessary to perform the proper analysis and, when employed, are counterproductive in that they entail extra effort and land us in a setting in which there does not exist a way to address the question at hand. Neither of these conclusions should be surprising after Part I because they are merely the concrete manifestations of the two central arguments advanced there. Both of those arguments are logical: they are inescapable and are entirely independent of pragmatic factors or the particular

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homogeneous goods markets, and in one of the two articles in question, I cited the aforementioned sources to document that this has usually been so in prosecuted cartel cases. Werden, without mentioning this evidence, asserts that my claim is wrong, as suggested by a handful of exceptions, as if that were a response to a general, empirically validated tendency. Second, he explicitly states that I "assess the risk of coordinated effects *only* for a single homogeneous good." *Id*. at 740 (emphasis added). Yet in *both* of the prior pieces he cites, *see id*. at 740 & n.49, the single-paragraph discussions have footnotes that explicitly address what he asserts I ignore. In any event, as a matter of substance, both of those articles explain that, when one does consider the case of a merger that might facilitate collusion outside a homogeneous goods market, the standard market definition/redefinition approach is again inappropriate. Instead, we should start by identifying what firms we might imagine are more likely to coordinate to raise price as a consequence of the merger and then ask how much *that group of firms*, if successful, could profitably elevate price. It is neither here nor there whether that group constitutes the "relevant market" in the conventional sense or whether it corresponds to the market that is selected by the HMT/SSNIP procedure. Werden misses this key point.

[26] As explained briefly in Part I.A, if we imagine that there will be a competitive fringe that does not participate in the coordination, we also need to know its supply elasticity and the market share of the hypothesized coordinating group of firms—that is, their collective share in the homogeneous goods market.

context. Hence, they naturally encompass all relevant scenarios, including those to which merger guidelines are addressed.

III. MARKET DEFINITION NOSTALGIA

The criticisms of the market definition/redefinition paradigm contained in Parts I and II—and others[27]—have now been in circulation for a few years. Many practitioners and commentators had long been wary of market definition, viewing it as a highly imperfect but necessary tool. My suspicion and experience is that some in the competition law and policy community have been moved to a degree by these new and more focused arguments and illustrations concerning the bankruptcy of the paradigm. But my sense is that few are fully convinced, and some remain fairly resistant.[28] In the introduction, I mentioned inertia and denial as partial explanations. In this Part, I focus on two concrete concerns.

A. BUT ISN'T DIRECT ASSESSMENT OF MARKET POWER AND OF COMPETITIVE EFFECTS DIFFICULT?

Yes. But repealing the laws of logic offers no way out.[29]

When faced with challenging cost-benefit analysis that requires predicting future, highly uncertain risks, we do not consult astrologers. Or, as I suggested in a previous essay responding to critics, when we desire more gold and it is very difficult to obtain, we do not call in the alchemists.

Proper economic analysis of a dominant firm's market power or the likely price effects of a horizontal merger is a daunting task. This challenge is especially great when lawyers seek to offer guidance to clients about prospective behavior or when agencies wish to screen the myriad possible cases to assess which ones merit greater scrutiny. But even much further along—well into merger review, or at the completion of adjudication with battles of experts—much uncertainty often remains. There are many sources of evidence: internal documents, views of buyers and competitors, various types of expert opinion, and econometric analysis. Depending on the stage of the proceeding and the particular industry setting, different mixes will be available, and the reliability of one's best estimate will vary (and will frequently be disappointingly low).

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[27] *See* sources cited *supra* note 1.

[28] Even in this group, my perception is that the displayed vigor with which market definition is defended has declined substantially in recent years and that the scope of the defense becomes ever narrower over time.

[29] The implicit logic that underlies this concern is as follows: Having been faced with a valid proposition "*A* is a necessary condition for *B*," and then confronted by the unfortunate reality "*A* is difficult in this case," one answers, "Let us, then, just skip *A* and go straight to *B*."

We can develop better techniques, as we have over time,[30] but at any given moment and even in a brighter future there are substantial limitations. This is the nature of competition law and policy reality, and no amount of wishful thinking can change it.

The common view that market definition, no matter how imperfect a tool, is nevertheless a helpful one in this environment seems appealing on the surface but reflects a fundamental misconception. As explained—and at this point repeated ad nauseam—the two core arguments of Part I are matters of logic. Market definition is impossible in any meaningful sense: if one insists on market redefinition, there is no valid way to make market power inferences from the shares in the redefined market, and there is no valid way to choose which market is best in the first place, without already having in hand one's best estimate of market power. Moreover, that Part and the whole of Part II further demonstrate that, in numerous respects, market definition is counterproductive: it leaves those attempting to determine market power and competitive effects in worse shape—sometimes totally at sea and, in other instances, merely with inferior estimates.

If valid use of the market definition/redefinition procedure is logically impossible and if the procedure is counterproductive whenever it is nonetheless undertaken, it truly makes no sense to use it as a central tool or even, on occasion, as a supplemental one. When we find something in our toolbox that can never work and always causes damage, we should throw it away. To understand the true nature of market definition is to abandon it.

B. BUT DOESN'T THE LAW REQUIRE MARKET DEFINITION?

I addressed this question in *Why (Ever) Define Markets?*[31] and accordingly will confine myself here to a few brief observations. First, as a practical mat-

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[30] In addition to making more direct and effective use of firms' internal records and the views of important market players, work by economists in recent decades has made progress developing econometric techniques. *See, e.g.*, Jonathan B. Baker & Timothy F. Bresnahan, *Empirical Methods of Identifying and Measuring Market Power*, 61 ANTITRUST L.J. 3 (1992); Jonathan B. Baker & Timothy F. Bresnahan, *Estimating the Residual Demand Curve Facing a Single Firm*, 6 INT'L J. INDUS. ORG. 283 (1988); Gregory J. Werden & Luke M. Froeb, *Unilateral Competitive Effects of Horizontal Mergers*, *in* HANDBOOK OF ANTITRUST ECONOMICS 43 (Paolo Buccirossi ed., 2008); MICHAEL D. WHINSTON, LECTURES ON ANTITRUST ECONOMICS 100–14 (2006).

[31] *See* Kaplow, *Why (Ever) Define Markets?*, *supra* note 1, § VI.E. In addition to the points mentioned in the text and some others, this article explains that the common counterargument drawing on the language of Section 7, as interpreted in *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962), is largely a red herring. The natural interpretation of "in any line of commerce or in any activity affecting commerce in any section of the country" is "any anticompetitive effect, wherever it may lie." Moreover, the article suggests that other aspects of the legislative history of the 1950 Amendments to Section 7, which do not even suggest that conventional economic effects like higher prices were a central concern, have long since been abandoned by the courts.

ter, any such legal requirement is not hard to circumnavigate, and courts and agencies have sometimes taken this route. The basic method is to start by doing the correct analysis, then come to whatever legal conclusion follows, and finally to choose a market definition that ratifies this conclusion. For example, it appears that the judge in the *Staples* merger case began by examining evidence bearing on whether the proposed merger would significantly raise price, and then, concluding that it would, adopted a narrow market definition (making it a three-to-two merger), in which the post-merger HHI and the contribution of the merger to that HHI were both large.[32]

Second, confining attention to U.S. law, with which I am most familiar, the notion that existing doctrine really requires market definition seems overstated in a number of respects. There are important pronouncements, including by the Supreme Court, that market definition is a means to an end and that, when the end can be reached directly, that is sufficient. Additionally, from the beginning it has been appreciated that market share figures can be misleading and therefore that any inferences drawn from them should be adjusted in light of economic reality in the case at hand—which the present analysis indicates, if done properly, is tantamount to rendering any implications of market definition moot. (This point is consonant with the sort of ends-based approach sketched just above.)

Furthermore, competition law generally and U.S. antitrust law in particular has for decades eschewed formalism and focused on actual economic effects, so the present analysis is entirely in the spirit of this longstanding approach of competition law.[33] In this regard, even if the law once commanded market definition, it is difficult to believe that modern courts would insist on an approach that makes no economic sense and is, as explained, actually impossible. By the way, if courts do demand the impossible, just how are we to achieve it?[34]

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[32] *See* FTC v. Staples, Inc., 970 F. Supp. 1066 (D.D.C. 1997).

[33] In this regard, it is notable that, over time, the lower courts have come to adopt methods embraced by the U.S. Merger Guidelines, as they have evolved over time. This might be seen as the law's embrace of market definition. Nevertheless, it seems that, in the absence of Supreme Court precedent in the area for decades and given the wide general endorsement of the agencies' approaches, we can anticipate a continuing evolution. Just as previous Guidelines have been more economically focused than those coming before and than the older Supreme Court merger decisions, so the current (2010) Guidelines move ever further in the direction of embracing economic substance and, more particularly, downgrading market definition.

[34] Relatedly, it is interesting to contemplate how a lawyer might cross-examine an opponent's expert witness on market definition, or how one might prepare such an expert to respond, in light of the fact that the concept does not really exist in the field of expertise (as mentioned above) and that there is no logically valid way to implement it. Challenges based on *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), can also be imagined. Of course, if both sides proffer experts on market definition, such attacks would not be launched.

IV. CONCLUSION

Conventional wisdom is difficult to abandon. It is familiar and comforting.[35] Moreover, the alternative—in this case, a more direct inquiry into market power and competitive effects—appears daunting. As already explained, however, this can be no excuse for ignoring logic and indulging wishful thinking.

The next time one hears a defense of the market definition/redefinition approach, it would be appropriate, in light of the foregoing analysis, to pose to the defender some basic queries:

1. For any setting in which market redefinition is advocated as a possibility, state and justify the formula that translates market shares in the redefined market to market power inferences or competitive effects.
2. State the proper criterion for what market definition is best.
3. Explain how one can say that some market definition is superior to another without knowing what market power inference follows from either choice.
4. Explain how one can say that some market definition is superior to another without knowing which yields conclusions closer to the truth about market power.
5. Explain how one can determine how close a market power inference is to the truth about market power without first proffering a best estimate of market power.

I have presented these challenges and others—in writing, presentations, and one-on-one exchanges—many times to date, but have not heard coherent answers.

[35] There is an obvious, more cynical point that may play some role, consciously or unconsciously: all of us in the competition law community—lawyers, experts, and academics alike—have invested substantial human capital in the market definition/redefinition paradigm and, on that account, have something to lose as the paradigm recedes in importance or becomes obsolete.