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#### Are we there yet? The path toward more rigorous predictions of coordinated effects

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#### ABSTRACT

A series of recent academic papers aim to develop a framework and practical tools to rigorously quantify coordinated effects in timelines that are realistic for merger reviews. The tools allow mergers to enhance coordination through the specific mechanism of price leadership. These tools may be a good fit in some cases and industries, but may be most useful in cases where the more traditional and qualitative checklist approach can also be applied, pointing to the need for further research.

The views expressed in this article are solely those of the authors and do not necessarily represent the views of Cornerstone Research.

**1.** Before the 1992 Merger Guidelines introduced "unilateral effects," merger review and the guidelines had primarily focused on "coordinated effects." <sup>1</sup> In the decades since, nearly all government cases have focused on unilateral effects, delegating coordinated effects to a secondary theory of harm or omitting them entirely. <sup>2</sup> Modern cases with a greater emphasis on coordinated rather than unilateral effects have been the rare exception that justifies the rule. <sup>3</sup>

**2.** Agencies may have brought more unilateral than coordinated effects cases in part because economists have made relatively little progress in concretely predicting coordinated effects—the analysis has generally continued to focus on the so-called checklist of factors that evaluate whether an industry is susceptible to coordination, and whether a proposed merger is likely to increase the risk of such coordination. <sup>4</sup>

**3.** The checklist analysis, by its nature, is qualitative. It does not specifically predict that coordination will occur, the form it will take if it does occur, or the magnitude of prospective harm. <sup>5</sup> Theories of

- C. Shapiro, The 2010 Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years, *Antitrust Law Journal*, Vol. 77, No. 1, 2010, pp. 701–759, at 704–706, 712, https://www.law.berkeley.edu/wp-content/ uploads/2015/04/Shapiro-The-2010-Horizontal-Merger-Guidelines-From-Hedgehog-to-Fox-in-40-Years-2010.pdf.
- N. L. Rose and C. Shapiro, What Next for the Horizontal Merger Guidelines?, *Antitrust*, Vol. 36, No. 2, 2022, pp. 4–13 at 5, https://economics.mit.edu/sites/default/files/2022-09/ What%20Next%20for%20the%20Horizontal%20Merger%20Guidelines\_.pdf.
- 3. N. Hill, D. Vote and N. E. Wilson, Four Key Aspects of the *Tronox/Cristal* Litigation, *The Antitrust Source*, Oct. 2019, pp. 1–9, at 8–9, https://awards.concurrences.com/IMG/pdf/3\_four\_key\_aspects\_of\_the\_tronox\_cristal\_litigation.pdf.
- 4. 2023 Merger Guidelines, § 2.3; 2010 Horizontal Merger Guidelines, § 7.2; 1992 Merger Guidelines, § 2.1.
- 5. For example, in the T-Mobile/Sprint litigation, the plaintiffs' expert

coordinated effects therefore risk coming across to courts as theoretical and speculative. <sup>6</sup>

**4.** In practice, courts have been skeptical of coordinated effects arising in the absence of premerger evidence of coordination. <sup>7</sup> Even when evidence suggests the presence of prior coordination, courts have been skeptical when the evidence was out of date or when competitive conditions that allowed coordination had changed. <sup>8</sup>

**5.** This situation contrasts with unilateral effects, where economists have developed numerous empirical tools. <sup>9</sup> When properly applied, these tools offer compelling quantitative evidence for the likely magnitude of unilateral effects. <sup>10</sup> Combined with

estimated that "if the new T-Mobile, Verizon and AT&T together coordinate and simply avoid price declines, so if prices stabilize rather than decline for the next year (...) then annual consumer harm (...) would be \$8.7 billion." C. Shapiro, Expert Witness Testimony, State of New York, et al. v. Deutsche Telekom AG, et al., case No. 1:19-CV-05434-VM-RWL (S.D.N.Y. Dec. 11, 2019), Transcript of Proceedings at p. 616: 11–16. This quantification assumes that prices stabilize, but the checklist analysis provides no basis to assume that coordination, if it occurs, would lead to that specific outcome.

- 6. Similarly, vertical concerns have received less traction with courts when they have come across as theoretical and speculative, without being sufficiently tied to pre-merger evidence. See G. Das Varma, Towards an Evidence-Based Framework for Enforcement of Vertical Mergers, Antitrust Source, Feb. 2023, https://www.americanbar.org/groups/antitrust\_law/resources/source/2023-february/towards-evidence-based-framework-enforcement-vertical-mergers/.
- 7. See, e.g., Decision and Order, New York, et al. v. Deutsche Telekom AG, et al., case No. 1:19-CV-05434-VM-RWL (S.D.N.Y. Feb. 11, 2020), § II.C.1.
- See, e.g., Memorandum Opinion, Federal Trade Commission v. RAG-Stiftung et al., case No. 1:19-CV-02337-TJK (D.D.C. Feb. 3, 2020), § III.B.1 (noting that price fixing occurred nearly 20 years ago and that the industry features that enabled price fixing were no longer present).
- N. H. Miller and G. Sheu, Quantitative Methods for Evaluating the Unilateral Effects of Mergers, *Review of Industrial Organization*, Vol. 58, No. 1, 2021, pp. 143–177, https://doi.org/10.1007/s11151-020-09805-8 ("Miller and Sheu (2021)").
- Merger simulation and other unilateral effects tools do not provide a precise prediction of post-merger prices. See Miller and Sheu (2021), supra

qualitative evidence and the fact that the mechanism of upward pricing pressure is intuitive and clear, unilateral effects analyses have helped agencies persuade several courts to enjoin proposed mergers.

**6.** A series of recent academic papers points the way forward for a similar quantification of coordinated effects. Using data on the U.S. beer market, Miller and Weinberg (2017), <sup>11</sup> Miller, Sheu, and Weinberg (2021), <sup>12</sup> and Mansley, Miller, Sheu, and Weinberg (2023) <sup>13</sup> develop a framework and increasingly practical tools to quantify how a merger could enhance coordination through price leadership. We discuss this work, how it can be applied in practice, and how it points to the need for further research.

#### I. A retrospective provides rigorous evidence of coordinated effects

**7.** In June 2008, the Department of Justice (DOJ) approved the MillerCoors joint venture (JV). The JV brought together the second- and third-largest U.S. brewers. The antitrust approval was in part driven by efficiencies—the JV would have a more dispersed geographic footprint than Miller and Coors, which was expected to reduce variable transportation costs by enough to offset any likely anticompetitive unilateral effects. <sup>14</sup>

**8.** A first retrospective study confirmed that while the JV led to price increases in local areas where

- N. H. Miller and M. C. Weinberg, Understanding the Price Effects of the MillerCoors Joint Venture, *Econometrica*, Vol. 85, No. 6, 2017, pp. 1763–1791 ("Miller and Weinberg (2017)").
- N. H. Miller, G. Sheu and M. C. Weinberg, Oligopolistic Price Leadership and Mergers: The United States Beer Industry, *American Economic Review*, Vol. 111, No. 10, 2021, pp. 3123–3159 ("Miller et al. (2021)").
- R. Mansley, N. H. Miller, G. Sheu and M. C. Weinberg, A Price Leadership Model for Merger Analysis, *International Journal of Industrial Organization*, Vol. 89, 2023, 102975 ("Mansley et al. (2023)").
- 14. K. Heyer, C. Shapiro and J. Wilder, The Year in Review: Economics at the Antitrust Division, 2008–2009, *Review of Industrial Organization*, Vol. 35, No. 4, 2009, pp. 349–367, https://doi.org/10.1007/s11151-009-9232-1.

concentration increased, these price increases were offset, on average, "by a nearly equal and opposite efficiency effect." <sup>15</sup> A limitation of this earlier research was that it did not explicitly model supply and demand. The study describes post-JV changes in prices and correlates them to changes in concentration and reductions in cost, but it does not directly speak to what drove the price increases or more finely balance them against efficiencies.

**9.** A later study took a closer look at what drove the net price changes experienced after the JV. The resulting paper, Miller and Weinberg (2017), offers some of the literature's most rigorous evidence of both efficiencies and coordinated effects in a merger context.<sup>16</sup>

**10.** At a high level, the Miller and Weinberg (2017) approach is straightforward. They first estimate a sophisticated but otherwise standard econometric model of demand. <sup>17</sup> They then estimate a supply-side model that takes into account merger-specific transport cost synergies and also allows for the possibility of post-merger coordination.

**11.** In particular, their supply-side model allows merging firms Miller and Coors to internalize the profits of non-merging firm Anheuser-Busch InBev ("ABI") when it sets its prices. This is a measure of coordinated effects—if MillerCoors benefits from higher ABI profits in response to increased prices, it has an incentive to increase prices further than it would otherwise. <sup>18</sup> Miller and Weinberg (2017)

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note 9, at 144 ("Perhaps ironically, one thing that quantitative modeling does not typically accomplish is a precise quantification of merger effects. Models by their nature are simplified representations of the world. Their purpose is to isolate the most important ways that mergers affect economic incentives, and they need not account for secondary and tertiary details").

O. C. Ashenfelter, D. S. Hosken and M. C. Weinberg, Efficiencies Brewed: Pricing and Consolidation in the US Beer Industry, *RAND Journal of Economics*, Vol. 46, No. 2, 2015, pp. 328–361, https://doi.org/10.1111/ 1756-2171.12092.

<sup>16.</sup> For a discussion of the available evidence on merger efficiencies, *see* J. Asker and V. Nocke, Collusion, Mergers, and Related Antitrust Issues, in *Handbook of Industrial Organization*, Vol. 5, K. Ho, A. Hortaçsu and A. Lizzeri (eds.), Elsevier, Amsterdam, 2021, pp. 177–279, https://doi.org/ 10.1016/bs.hesind.2021.11.012.

<sup>17.</sup> The authors model consumers as choosing among beer options as a function of price, brand preferences, and observable and unobservable product characteristics (including calories, package size, and whether the beer is imported). They allow consumer preferences to vary by demographics, namely, income. *See* Miller and Weinberg (2017), *supra* note 11, § 4.

<sup>18.</sup> This builds on earlier contributions in the economic literature that seek to understand whether firm behavior is more consistent with oligopolistic competition or a certain level of coordination. See, e.g., R. H. Porter, A Study of Cartel Stability: The Joint Executive Committee, 1880–1886, Bell Journal of Economics, Vol. 14, No. 2, 1983, pp. 301–314; T. F. Bresnahan, Departures from Marginal-Cost Pricing in the American Automobile Industry: Estimates for 1977–1978, Journal of Econometrics, Vol. 17, No. 2, 1981, pp. 201–227; and T. F. Bresnahan, Competition and Collusion in the American Automobile Industry: The 1955 Price War, Journal of

estimate that MillerCoors gave 25%-37% as much weight to ABI's profits in setting prices as it did to its own profits. If there had been no coordination and post-JV prices could be explained entirely by unilateral effects, this statistic should have been 0%. Conversely, a statistic of 100% would have been consistent with ABI and MillerCoors perfectly coordinating to maximize their joint profits, as if the two had merged.

**12.** The authors' ultimate conclusion is that post-JV prices were 6%-8% higher than they would have been absent coordination. Moreover, they find that coordinated effects can substantially negate the effect of cost efficiencies. They estimate that the combination of merger-specific marginal cost decreases and unilateral effects would have increased Coors prices by only 3%. With the addition of coordinated effects, the price increase was instead 10%.<sup>19</sup>

**13.** Overall, Miller and Weinberg (2017) offer rigorous, quantitative evidence that the MillerCoors JV led to meaningful coordinated effects. Their results, although limited to a particular industry, certainly contribute to an argument that merger review should more frequently consider coordinated effects. <sup>20</sup> However, the work in this paper does not on its own offer a prescription for analyzing coordinated effects in merger review. The analysis is backward-looking and cannot speak to the likely effects of a proposed future merger. The authors sought to address this shortcoming in later work, to which we turn now.

Industrial Economics, Vol. 35, No. 4, 1987, pp. 457–482, https://doi.org/ 10.2307/2098583.

#### II. Adapting the price leadership mechanism to prediction

**14.** Miller et al. (2021) expand on the ideas above. By more precisely modeling the mechanism of coordination, this second paper develops a merger simulation approach that uses pre-merger information on coordination to predict changes in coordinated effects for proposed future mergers.

**15.** Specifically, the authors consider the coordination that results from the so-called price leadership mechanism that documentary evidence suggests was in effect in the beer industry. <sup>21</sup> Under this coordination mechanism, ABI would announce price increases on a yearly basis. MillerCoors would then observe and largely follow these increases.

**16.** To understand how the price leadership mechanism works, and how it can be used to predict coordinated effects, we must first discuss pricing in the absence of coordination. Without coordination, the market reaches a competitive price equilibrium where each firm has no incentive to either raise or lower prices. Raising prices would not be profitable—too many customers would switch to competitors to justify higher profits on remaining customers. Reducing prices would also not be profitable—a reduction would not attract enough new customers to justify the reduction in profits on its existing customers.

**17.** For a coordinated equilibrium to arise that sustains prices above the competitive level—whether tacitly or explicitly—firms must expect that, as long as they behave in a certain way that supports above-equilibrium prices, their competitors (or enough of their competitors) will do the same.

18. Under price leadership, <sup>22</sup> a price leader

<sup>19.</sup> In addition to its econometric modeling, the paper presents in Figure 1 a comparison of prices for five large beer brands. Two brands that are not considered to be coordinating—Corona Extra and Heineken—continue a downward trend in prices after the formation of the JV. Three brands that are considered to be coordinating—Miller Lite, Bud Light, and Coors Light—have the same pre-JV downward trend that breaks shortly after the formation of the JV. Prices instead rise and stay roughly constant. See Miller and Weinberg (2017), supra note 11, at 1769. Figure 1.

See, e.g., M. C. Levenstein and V. Y. Suslow, The 2023 Merger Guidelines and Coordinated Effects: Recommendations for Robust Protection of Competition, *George Mason Law Review*, Vol. 31, No. 4, 2024, pp. 999–1018, https://lawreview.gmu.edu/wp-content/uploads/2024/11/ 31-Geo.-Mason-L.-Rev.-999-2024.pdf.

<sup>21.</sup> Miller et al. (2021), supra note 12, cite several documents, including a DOJ complaint in United States v. Anheuser-Busch InBev SA/NV and Grupo Modelo S.A.B. de C.V., two industry studies, and DOJ statements in ABI's acquisition of the Craft Brewer's Alliance. See pp. 3128–3129.

<sup>22.</sup> The following discussion simplifies certain aspects of the methodology and incentives for ease of building intuition. For example, in the paper, the price leader need not charge the price that it announces, while to simplify

announces a price above the competitive level only if it expects that enough competitors would similarly set supracompetitive prices. <sup>23</sup> For this to happen, each follower firm must expect that others will go along and the coordination will continue, sustaining higher prices in the long run. If they instead expected someone to "cheat" and set a more competitive price to steal market share and profits, they would expect coordination to unravel—then they would also be better off setting a competitive price.

**19.** The price leader thus needs to determine what the coordinated price will be, taking the followers' incentives into account. A follower's incentives to cheat increase as the coordinated price increases—if prices are just slightly above the competitive price, there are not many gains to cheating, and the price leader can increase the price further. Eventually, though, the gains to cheating become too large and the price leader can no longer increase prices without causing a follower to cheat.

**20.** The price leader therefore chooses a price premium that is as high as it can be to maximize coordinating profits while still being "incentive compatible"—that is, not so high that it tempts one or more coordinating firms to cheat and unravel coordination.  $^{24}$ 

**21.** The key to turning all of this into a forward-looking tool that evaluates coordinated effects for proposed mergers is that the authors have outlined the precise logic by which coordination appears to operate pre-merger, as well as how this might be impacted by a proposed merger. Under price leadership, there is always a particular competitor that ultimately restrains the price leader from offering an even higher coordinated price—the competitor that would have the incentive to cheat at a lower coordinated price than every other firm.<sup>25</sup> The merger

may well change that firm's incentives in a way that facilitates a higher coordinated price.

22. Note that this goes beyond identifying a "maverick" firm. First, even if the maverick is not itself a party to the merger, its incentives might well change given the many potential effects of the merger-beyond unilateral effects, the merger might lead to efficiencies, quality changes, or product repositioning, among others. Second, predicting whether the merger makes it more or less likely for the firm to cheat is not straightforward without more analysis. If the profits of cooperating increase by more than the profits of deviating, the price leader can sustain a higher coordinated price, meaning the merger leads to increased coordinated effects. The methodology in Miller et al. (2021) lends itself well to quantitatively estimating these changes through merger simulation, potentially incorporating a variety of relevant merger effects.

**23.** For the MillerCoors JV, the authors calculate that the transaction has two effects. First, it increases the profits associated with cheating, since overall competition is softened and the competitive price once coordination unravels is higher. Second, it changes the incentive compatibility constraint of Coors, which used to be the firm that most constrained ABI's ability to raise price. On net, the second factor dominates and so the JV results in a higher incentive-compatible price and higher coordination profits.

**24.** This specificity about the incentives around price leadership allows Miller et al. (2021) to be used as a forward-looking tool. The price leader is trying to raise price as much as possible without causing anyone to cheat. The model predicts how incentives change for each firm and so offers a prediction of how the price leader will adjust the solution to its pricing problem.

**25.** A key limitation in applying this methodology to actual mergers is its complexity. The Miller et al. (2021) approach to estimating demand is standard in cutting-edge academic research but, with few exceptions, is one the government infrequently uses

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exposition we assume that it does.

<sup>23.</sup> Otherwise, as explained above, the price leader's optimal response to competitors charging their competitive equilibrium prices is to also charge its competitive equilibrium price—that is the very definition of equilibrium. Note that firms in industries with differentiated products do not need to set the same price under price leadership. Prices may vary across products, as they would in a competitive equilibrium—price leadership models may instead assume that every coordinating firm sets the same supracompetitive premium above its competitive equilibrium price.

<sup>24.</sup> This is a well-established principle in the economics of coordination. See, e.g., R. H. Porter, Mergers and Coordinated Effects, International Journal of Industrial Organization, Vol. 73, 2020, 102583, https://doi.org/10.1016/ j.ijindorg.2020.102583 ("Porter (2020)").

<sup>25.</sup> The literature would say that this competitor is the one whose incentive

compatibility constraint is the lowest. The incentive compatibility constraint says that, for coordination to be stable, each participating firm must prefer the net present value of getting its coordination profits forever rather than getting a higher profit from cheating for one period and then its lower competitive equilibrium profit forever. *See* Porter (2020), *supra* note 24, § 2.1.

in merger investigations or even litigation. <sup>26</sup> **26.** While the government does routinely conduct merger simulation in both investigations and litigation, it tends to use more practical calibration methods. <sup>27</sup>

**27.** Two differences between academic research and merger reviews largely explain this methodological difference. First, through discovery, the government tends to have information that academic researchers typically do not, namely on margins and diversion ratios. These additional data give the government incremental modeling choices. Second, the government tends to have less time than academic researchers, especially in the early investigation phase of a merger review. The authors address these issues in their next article, which we discuss now.

#### III. Streamlining the methodology to fit merger review timelines

**28.** Mansley et al. (2023) shows how a simplified version of the Miller et al. (2021) model can be implemented using information on prices, margins, market shares, and diversion ratios. These data are frequently available to antitrust agencies but typically not to academic researchers.<sup>28</sup>

**29.** Along with specific assumptions on demand, the authors use these data to calibrate a demand model,

a process that is more straightforward and less timeconsuming than the estimation in Miller et al. (2021). They then use this calibrated demand model and simplifying assumptions on the supply side to repeat the exercise in Miller et al. (2021) and conduct a merger simulation for the MillerCoors JV. The results are similar to the more complex approach in the earlier paper. This is a useful result for merger review practitioners. In situations where the assumptions hold, this finding suggests that a simplified and timeefficient methodology can provide similarly informative results and conclusions as more complex approaches. This is not unlike, for example, how simple calculations of upward pricing pressure (UPP) can yield similar results to more complex merger simulation methods. 29

**30.** The authors go on to discuss the model's implications for mergers in the presence of price leadership. First, the model implies that coordination can, in some cases, mean that a merger increases prices by more than under unilateral effects alone. However, if pre-existing price leadership means premerger prices are already at supracompetitive levels and markets are sufficiently concentrated, then a merger might lead to a lower price increase than unilateral effects would predict.

**31.** The authors argue that a second implication is that efficiencies can have an ambiguous impact on merger price effects in the presence of price leadership. In the MillerCoors JV, Mansley et al. (2023) find that the presence of cost efficiencies increased rather than decreased the magnitude of coordinated effects. The mechanism is nuanced and arises through changes in the incentives of the firm most likely to cheat. If a firm merges with another and reduces their costs through efficiencies, then it can be the case that their incentive to cheat decreases, meaning the price leader can increase the coordination price. They argue that a similar consideration applies to divestitures, which this model implies can have an ambiguous impact on the incentives for firms to engage in coordination.

29. See, e.g., Miller and Sheu (2021), supra note 9.

<sup>26.</sup> The single instance we are aware of where the government used similarly detailed demand estimation methods in litigation was the DOJ's successful challenge to the proposed *Aetna/Humana* merger. *See* Memorandum Opinion, *United States of America*, et al. v. Aetna Inc., et al., case No. 1:16-CV-01494-JDB, (D.D.C. Jan. 23, 2017).

<sup>27.</sup> For example, Miller and Sheu (2021), supra note 9, at 149, explain that "antitrust agencies often rely on simple demand functional forms (...) rather than the more sophisticated random-coefficients logit demand system (...) that is popular in academic research. This difference reflects the resources that are available. In merger review, the time and data necessary for sophisticated demand estimation often are unavailable, but margins and diversion may be obtained from confidential documents."

<sup>28.</sup> As the authors put it, "[o]ur focus reflects that what is possible in merger review can differ from what is possible for academic research. Specifically, in merger review, the time and data necessary for sophisticated demand estimation may be unavailable whereas, subject to the usual caveats, data on equilibrium objects such as margins and diversion may be possible to obtain from proprietary data or confidential business documents." Mansley et al. (2023), supra note 13, at 3.

## IV. Applying the price leadership model in practice

**32.** Miller et al. (2021) and Mansley et al. (2023) both provide tools that allow for a quantitative analysis of coordinated effects, bringing the toolkit closer in line with that used in predicting unilateral effects. While potentially impactful, the framework of these models has limitations that could make it harder to apply in a broad set of cases.

**33.** First, the framework contemplates a specific price leadership mechanism. While the model does not require the exact announcement mechanism that is discussed in the beer industry, it does require that one firm set a price that coordinating firms follow. This mechanism may not be a good fit for other industries.

**34.** Second, the framework requires that coordination already exists pre-merger. Just like the checklist approach, it does not predict whether coordination may arise if it does not already exist. The model works through first assessing what constrains pre-merger coordination and then evaluating whether and how much the proposed merger would strengthen or weaken those constraints. The logic by which the model predicts coordinated effects does not apply if there was no pre-merger coordination.

**35.** Third, the framework requires a particular fact pattern where some firms coordinate, others do not, and where it is possible to establish which is which. This is because the model uses the differences between the prices and margins of coordinating and non-coordinating firms to determine what constrains pre-merger coordination. Depending on the industry, established facts, and available documentary information, identifying these firms accurately may not be possible or may become the subject of considerable debate.

**36.** Fourth, the econometric work in Miller et al. (2021) is complex and time-consuming. While such models have been previously deployed in mergers, <sup>30</sup> it may not be feasible to do so in most mergers because of timing or cost concerns. By contrast, the

Mansley et al. (2023) model is calibrated and so simpler to apply by comparison. Doing so requires data on market shares, diversion ratios, prices, and the margins (or marginal costs) of one firm in the coordinating group and one outside the group.

**37.** Overall, the framework's most novel contribution is that it brings quantification and rigor to the prediction of coordinated effects. For plaintiffs, certain courts may find the price leadership framework to offer more compelling evidence of likely coordinated effects than the checklist approach. Conversely, merging parties faced with checklist-based claims might want to implement the approach to test the magnitude of coordinated effects and whether it would actually be substantial.

### V. Conclusion

**38.** The papers discussed here are the first to extend merger simulation methods to effectively estimate coordinated effects for prospective mergers. On the one hand, their framework is most applicable in situations where the checklist approach might also be compelling, i.e., situations where coordination preexists any merger and is well understood. On the other hand, when and where it is practical to apply it, this framework provides precision and rigor that is equivalent to unilateral effects methods and that has been missing from many prior applications of theories of coordinated effects.

**39.** Development of similar frameworks in coordination settings other than price leadership could substantially broaden the applicability of rigorous coordinated effects modeling. Equally, if not more important, would be research that allows agencies to better assess when coordination can likely arise absent pre-merger evidence of coordination.

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<sup>30.</sup> See, e.g., J. Asker and M. L. Katz, The Sprint/T-Mobile Merger, Oct. 15, 2022, http://www.johnasker.com/STMO.pdf; J. Asker, T. Bresnahan and K. Hatzitaskos, Economic Analysis of the Proposed T-Mobile/Sprint Merger, Nov. 6, 2018, https://www.fcc.gov/ecfs/document/ 11060648404338/1; D. Bayot, K. Hatzitaskos, B. Howells and A. Nevo, The Aetna-Humana Proposed Merger, Oct. 13, 2017, https://ssrn.com/ab-stract=4304424.