UNCERTAINTY AND TWO THEORIES OF HARM IN NASCENT COMPETITOR ACQUISITIONS

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There are two principal theories of harm in nascent competitor acquisition cases: (1) loss of future competition between the acquirer and the target, and (2) loss of innovation. I argue that the loss of future competition theory is most applicable in cases where there is a high probability of significant future competition between the merging parties, that competition is relatively imminent, and market evolution is relatively predictable. Conversely, the innovation effects theory is more suitable for cases where the expected competition between the merging parties is relatively distant in time, market evolution is unpredictable, and innovation is an important part of the competitive process. The economic analysis of innovation effects requires a dynamic competition model. I discuss how economic tools based on dynamic competition models can be effectively applied in analyzing innovation effects of nascent competitor acquisitions.

I. INTRODUCTION

Antitrust policy regarding nascent competitor acquisitions is one of the most contentious issues in antitrust. A nascent competitor is a firm that is not yet a significant competitor in the relevant market but may become one over time.[2] Lawmakers, antitrust scholars, practitioners, and enforcement agencies around the world are engaged in a heated debate about the correct analytical approach for these transactions. This debate misses a key point about nascent competitor acquisitions. Although authors and commentators often speak about nascent competitor acquisitions as if they are a single generic type of transaction, in reality, there is a wide variety of cases.[3] Differences among cases require distinct antitrust prescriptions and analytical approaches.

A key point of differentiation is the likelihood of significant future competition between the merging parties.[4] Closely related to the likelihood of future competition is the temporal proximity of competition. A case where significant competition between the merging parties is imminent and almost certain to occur is very different from a case where there is a low probability of significant future competition between the merging parties and that competition would not occur until the distant future.[5]

Another source of differentiation is the theory of harm. The U.S. antitrust enforcement agencies have pursued two distinct theories of harm in nascent competitor acquisition cases. The first theory is the loss of future competition. The second theory is the loss of innovation. An acquisition may lead to diminished incentives to pursue innovation if, for example, the target's innovation poses a competitive threat to the acquirer's existing business. The two theories of harm require different analytical frameworks and may lead to different conclusions about effects. Whether one theory is more applicable than the other depends on the nature of the case.

The loss of future competition theory is most applicable in cases where there is a high probability of significant future competition between the merging parties and that competition is relatively imminent. This theory is also more applicable in cases where market evolution is relatively predictable. The innovation effects theory is more suitable for cases where the expected competition between the merging parties is relatively distant in time, market evolution is unpredictable, and innovation is an important part of the competitive process.

Substantiating competitive effects under the loss of future competition theory may be particularly difficult when the expected competition between merging parties is distant in time. These difficulties arise from the inherent uncertainty about future competition. When the level of uncertainty is sufficiently high, analyzing cases under the loss of future competition theory may be impractical.

The innovation effects analysis need not rely on predictions about future competition. Instead, the analysis may focus on how a nascent competitor acquisition affects the abilities and incentives of the merging firms to engage in innovation at the time of the acquisition. Thus, the innovation effects approach may be more practical when there is significant uncertainty about future competition.[6] The assessment of innovation effects should rely on rigorous economic analysis. Below, I discuss the application of economic tools in analyzing innovation effects.

II. TWO THEORIES OF HARM

The competitive effects under the loss of future competition theory may take several forms. Absent the merger, the nascent target may (by itself or in combination with another firm) develop into a significant competitor to the acquirer. In addition, each of the merging parties may be developing

2 Nascent competitors are a subcategory of potential competitors, which also include firms that are poised to enter the relevant market if market conditions warrant entry. Such potential competitors may have a current constraining effect on pricing. See U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES § 5.1 (2010), https://www.justice.gov/atr/horizontal-merger-guidelines-08192010 [hereafter Horizontal Merger Guidelines].

3 See, for example, C. Scott Hemphill & Tim Wu *Nascent Competitors*, 168 U. Pa. L. Rev. 1879 (2020), https://scholarship.law.upenn.edu/penn_law_review/vol168/iss7/1; *Competition in Digital Technology Markets: Examining Acquisitions of Nascent or Potential Competitors by Digital Platforms*: Hearing Before the Comm. on the Judiciary Subcomm. on Antitrust, Competition Policy, & Consumer Rights (Sept. 24, 2019) (Written Testimony of Bruce Hoffman), https://www.judiciary.senate.gov/imo/media/doc/Hoffman%20Testimony2.pdf; and Carl Shapiro, *Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets*, 33 J. Econ. Perspetc. 69 (2019), https://www.aeaweb.org/articles/pdf/doi/10.1257/jep.33.3.69.

4 Most of the discussion in this Article is in the context of horizontal effects of nascent competitor acquisitions. The arguments apply analogously to vertical effects of nascent competitor acquisitions.

5 In this Article I do not distinguish between mergers and acquisitions and use these terms interchangeably.

6 David Pérez de Lamo likewise argues that antitrust enforcers should adopt the "innovation competition approach" in analyzing alleged "killer acquisitions" in the digital sector. (David Pérez de Lamo, *Assessing "Killer Acquisitions": An Assets and Capabilities-Based View of the Start-Up*, CPI ANTITRUST CHRON. (May 2020).)

products or services that would compete against each other in a future relevant market.[7] The nascent target may also be developing a product that would enable other firms to compete against the acquirer in the future. The acquisition may prevent other firms from gaining access to this product.[8] Alternatively, the acquisition may foreclose access to the acquirer's product that other firms would need to compete against the nascent target's product in development.[9]

The competitive effects under the loss of future competition theory are substantially similar to the standard effects of eliminating current competition. The two differences are that there is more uncertainty about future competition than about current competition and that the loss of future competition effects are delayed.

Mergers may weaken innovation incentives if successful innovation by one of the merging firms threatens to take business away from the other merging firm. Thus, a nascent competitor acquisition may lead to a loss of innovation if the acquirer reduces or delays the investment in the nascent target's innovation to avoid cannibalizing the acquirer's existing business. The merged firm may also withhold products or services that other firms use for innovation if their innovations threaten the merged firm.[10] However, nascent competitor acquisitions may also spur innovation through synergies that enhance innovation capabilities and other effects.[11]

"Killer acquisitions" are an example of cases with potentially harmful innovation effects. In these cases, the acquirer terminates the target's innovation because that innovation threatens the acquirer's existing business. A recent study found that many acquisitions in the pharmaceutical industry are killer acquisitions.[12]

III. COMPETITIVE EFFECTS UNCERTAINTY

Uncertainty about future competition has different implications for the two theories of harm.

Under the loss of future competition theory, the competitive effect is a function of the likelihood of significant future competition between the merging firms, the timing of that competition, and the effect of eliminating that competition. The likelihood, timing, and effect depend on numerous other factors, including the scope of the relevant market, market structure, merger efficiencies, supply and demand conditions, margins, diversion ratios, cross-market substitution, the regulatory environment, technology, capacity constraints, supply contracts, licensing agreements, and ownership of assets such as production capacity, trademarks, and patents. What complicates the analysis of competitive effects under the loss of future competition theory is that these factors evolve over time. Moreover, the evolution of these factors depends on whether the merger has occurred and whether the nascent firm has developed into a significant competitor in the market.

The assessment of competitive effects under the loss of future competition theory requires the analyst to predict how markets would evolve over time, with and without the merger. In some industries, such as pharmaceuticals and electric utilities, market evolution may be relatively predictable, at least over the near term. But other industries may be less predictable. In such industries, accurately predicting the market's progression over a multi-year period may be impossible. More generally, given the overall unpredictability of markets, when future competition between the merging parties is relatively distant in time, the loss of future competition theory may be an impractical approach for analyzing nascent competitor acquisitions.[13]

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7 This is the mechanism of harm that the FTC alleged in the *Nielsen/Arbitron* matter. See FTC PUTS CONDITIONS ON NIELSEN'S PROPOSED $1.26 BILLION ACQUISITION OF ARBITRON (Sep. 20, 2013), https://www.ftc.gov/news-events/press-releases/2013/09/ftc-puts-conditions-nielsens-proposed-126-billion-acquisition.

8 This is a vertical loss of future competition effect.

9 The FTC's recent challenge of the proposed *Illumina/Grail* transaction alleged this type of vertical loss of future competition effect. See FTC CHALLENGES ILLUMINA'S PROPOSED ACQUISITION OF CANCER DETECTION TEST MAKER GRAIL (March 30, 2021), https://www.ftc.gov/news-events/press-releases/2021/03/ftc-challenges-illuminas-proposed-acquisition-cancer-detection (hereafter "FTC *Illumina/Grail* Press Release").

10 This is a vertical innovation effect. The FTC's recent complaints in the *Nvidia/Arm* and *Illumina/Grail* matters alleged harm under the vertical innovation effect theory. See FTC SUES TO BLOCK $40 BILLION SEMICONDUCTOR CHIP MERGER (Dec. 2, 2021), https://www.ftc.gov/news-events/press-releases/2021/12/ftc-sues-block-40-billion-semiconductor-chip-merger and FTC *Illumina/Grail* Press Release, *supra* note 9. In this Article, I focus on horizontal innovation effects.

11 Carl Shapiro, "Competition and Innovation: Did Arrow Hit the Bull's Eye?" in *The Rate and Direction of Inventive Activity Revisited*, eds. Josh Lerner and Scott Stern (Chicago: University of Chicago Press, 2012), 361-404, and Jay Ezrielev, *An Economic Framework for Assessment of Innovation Effects of Nascent Competitor Acquisitions* (March 22, 2021), https://ssrn.com/abstract=3810486.

12 Colleen Cunningham, Florian Ederer, & Song Ma, *Killer Acquisitions*, 129 J. Political Econ. 649 (2021).

13 See discussion in John M. Yun, *Potential Competition, Nascent Competitors, and Killer Acquisitions*. The Global Antitrust Institute Report on the Digital Economy 652 (2020), https://gaidigitalreport.com/2020/08/25/killer-acquisitions-and-nascent-competition/.

The assessment of innovation effects need not rely on predictions about future competition. Instead, factfinders may consider how the merger would affect the merging firms' incentives and abilities to engage in innovation, based on currently available information. What ultimately matters for innovation effects is whether the acquirer intends to reduce the investment in innovation because of any loss of dynamic competition. Factfinders may obtain evidence on plans for further investment in innovation through documents and testimony, although this type of evidence has some limitations. It is important to corroborate this evidence with the economic analysis of innovation effects, which I discuss below.

IV. ECONOMIC ANALYSIS: LOSS OF FUTURE COMPETITION EFFECTS

To gauge the competitive effects under the loss of future competition theory, analysts may apply standard static (one period) competition models, such as the differentiated Bertrand and Cournot models.[14] In these models, the relevant competitive interactions occur within a single period. The main challenge for the economic analysis of loss of future competition effects is how to analyze effects when future competition is uncertain.

The uncertainty about future competition may be represented by multiple future states of the world. Assume that there is some future state of the world where the merging parties compete against each other without the merger. In that future state of the world, the competitive effect under the loss of future competition theory is the static (single period) unilateral effect of eliminating competition between the merging parties, potentially leading to higher prices or lower quality.[15] The effect may include upward pricing pressure that arises from the elimination of mutual pricing constraint between the merging parties.[16] However, the merger may also lower prices or increase quality in that future state because of marginal cost efficiencies.

In some other future state of the world, there is no competition between the merging parties with or without the merger. In that future state, there is no competitive harm under the (horizontal) loss of future competition theory. In yet another future state of the world, there is competition between the merging parties without the merger, but there is also entry by other firms. In this future state of the world, entry by other firms mitigates the competitive harm. The competitive effects in future states depend on a myriad of other factors (with and without the merger), including the diversion ratios, market structure, margins, demand conditions, supply functions, and merger efficiencies. The competitive effect in any given future state of the world corresponds to the specific set of factors that describe competition in that state. There are countless future states of the world, each producing a different competitive effect. To assess the overall competitive effect under the loss of future competition theory, the analyst must assign weights to each future state of the world.[17]

In some cases, courts and enforcement agencies may use documents and testimony to predict future competition. This may be a feasible strategy when the expected entry or expansion by the nascent competitor is relatively soon and where the focus of the effects analysis is the near term. Factual evidence may provide some indication of the nascent competitor's plans for entering the market. In some industries, it may be possible to predict with reasonable accuracy significant changes in markets over the near term. Consider, for example, an acquisition of a drug in late stages of development. In this case, analysts may be able to predict what competition in the market will look like in the next few years by examining the market participants' drug development plans. Analysts may also apply econometric analysis to estimate the likelihood that a drug will eventually by approved, based on the drug's current stage of development.[18] However, in cases where the expected entry by the nascent competitor is relatively distant in time and in markets that are relatively unpredictable, determining what the future state of competition will look like at the time of entry by the nascent competitor may be exceedingly difficult.

V. ECONOMIC ANALYSIS: INNOVATION EFFECTS

The economic analysis of innovation effects requires a dynamic (multi-period) model of competition because innovation competition spans mul-

14 In cases where the loss of future competition effects involve vertical foreclosure, analysts may apply vertical competition models to analyze the effects. See, for example, Michael A. Salinger, *Vertical Mergers and Market Foreclosure*, 103 Q. J. Econ. 345 (1988).

15 These effects correspond to the discussion in the Horizontal Merger Guidelines §§ 6.1-6.3.

16 Carl Shapiro, The 2010 *Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years*, 77 ANTITRUST L.J. 49 (2010).

17 The assignment of the weights may be implicit. For example, if the analyst focuses on a specific future scenario, the analyst is implicitly assigning a weight of zero to all other future scenarios. A number of commentators argue that nascent competitor acquisitions should be assessed based on the expected value of the acquisition's competitive effect. See Hemphill & Wu, supra note 3 and A. Douglas Melamed, *Mergers Involving Nascent Competition* (January 14, 2022), https://ssrn.com/abstract=4009229. Under this approach, the weights assigned to future states of the world would be the states' probabilities.

18 In some cases, analysts may be able to predict the likely structure of future competition in a market based on which firms own critical assets such as patents or mining rights.

tiple periods. Firms invest today to create new or improved products and services in the future. Successful innovations benefit consumers but they also take business away from competing firms. Innovation investment may require many years to develop into a viable product or service. For example, it takes 10 years on average to develop a successful new drug.[19]

There are many different types of dynamic competition models in industrial organization economics.[20] Applying these models to study innovation may be complicated because the answers that the models provide are highly sensitive to the models' specific assumptions. Moreover, calibrating models to analyze innovation effects in specific cases may require information that is generally unavailable. Then there are the administrative challenges of having courts and enforcement agencies actually apply dynamic competition models in antitrust cases.[21]

What matters for antitrust policy is understanding how mergers affect firms' incentives and abilities to pursue innovation. Kenneth Arrow's innovation model provided early insight into how mergers may affect innovation incentives. Under Arrow's model, a monopolist may have diminished incentives to invest in innovation compared to an entrant because the innovation cannibalizes or replaces the monopolist's existing products.[22] In this case, the monopolist's acquisition of the entrant may reduce innovation. The Arrow model effect (sometimes also called the replacement effect) is just one of many ways that mergers may affect innovation.[23] The U.S. Horizontal Merger Guidelines discuss several alternative mechanisms through which mergers may either reduce or increase innovation.[24]

My recent working paper proposes an economic framework for analyzing innovation effects of nascent competitor acquisitions using a dynamic competition model.[25] The economic framework identifies nine factors that determine how mergers affect innovation. One of the factors is the replacement effect (or the so-called Arrow model effect), which tends to reduce innovation.[26] Another factor is the realization of the merger's synergies, which can enhance innovation capabilities and spur innovation.[27] Yet another factor is nascent market competition, which is the effect on innovation of competition from other firms innovating in the same space as the acquisition target. The nascent market competition factor mitigates any loss of innovation from a nascent competitor acquisition.[28]

Analysts may apply the economic framework by determining which of the nine factors are present in a transaction. The analysts may also gauge the effect of each factor based on the data from the merging parties. The analysis of innovation effects based on the economic framework may corroborate findings from documents and testimony. The combination of factual evidence and economic analysis can improve the overall reliability of innovation effects analysis.

VI. U.S. ENFORCEMENT

Enforcement of nascent competitor acquisition cases typically includes both the loss of future competition and loss of innovation theories of harm. For example, the U.S. Federal Trade Commission's recent complaint in the *Illumina/Pacific Biosciences* ("*PacBio*") matter alleged that Illumina's proposed acquisition of PacBio would "eliminate significant current and future competition between Illumina and PacBio, substantially harming

19 BIOPHARMACEUTICAL RESEARCH & DEVELOPMENT: THE PROCESS BEHIND NEW MEDICINES (2015), http://phrma-docs.phrma.org/sites/default/files/pdf/rd_brochure_022307.pdf.

20 See, for example, Richard Ericson & Ariel Pakes, *Markov-Perfect Industry Dynamics: A Framework for Empirical Work*, 62 Rev. Econ. Stud. 53 (1995); Gautam Gowrisankaran, *A Dynamic Model of Endogenous Horizontal Mergers*, 30 RAND J. ECON. 56 (1999); Ariel Pakes & Paul G. McGuire, *Stochastic Approximation for Dynamic Analysis: Markov Perfect Equilibrium and the 'Curse' of Dimensionality*, 69 ECONOMETRICA 1261 (2001); Gautam Gowrisankaran & Robert J. Town, *Dynamic Equilibrium in the Hospital Industry*, 6 J. Econ. Manag. Strategy 45 (1997); and Patrick Bajari, C. Lanier Benkard, & Jonathan Levin, *Estimating Dynamic Models of Imperfect Competition*, 75 ECONOMETRICA 1331 (2007).

21 Douglas H. Ginsburg & Joshua D. Wright, *Dynamic Analysis and the Limits of Antitrust Institutions*, 78 ANTITRUST L.J. 1 (2012).

22 Kenneth Arrow, "Economic Welfare and the Allocation of Resources for Invention," in *The Rate and Direction of Inventive Activity: Economic and Social Factors*, eds. Universities-National Bureau Committee for Economic Research, Committee on Economic Growth of the Social Science Research Council (Princeton, NJ: Princeton University Press, 1962), 609–626.

23 Shapiro, *supra* note 11.

24 Horizontal Merger Guidelines §6.4.

25 Ezrielev, *supra* note 11.

26 *Id.*

27 *Id.*

28 See *Id.* for a full discussion of the nine factors that determine innovation effects in nascent competitor acquisitions.

consumers."[29] The complaint also alleged that the proposed merger would "harm consumers, in part, by hampering competition, particularly innovation competition."[30]

Similarly, the U.S. Department of Justice's complaint in the recent *Visa/Plaid* matter alleged that "Plaid's entry into online debit services as a pay-by-bank debit service would erode Visa's monopoly power by giving merchants and consumers a cheaper, more innovative alternative to Visa's online debit services," resulting in "lower prices for online debit transactions and a higher volume of online debit transactions."[31] The complaint further alleged that Visa's proposed acquisition of Plaid would reduce innovation.[32] The complaint argued that "[i]f the acquisition were enjoined, Plaid – on its own or in combination with a company other than Visa – would continue to act as a disruptive competitor, developing and launching new, innovative solutions in competition with Visa," but "[i]n the hands of Visa, this would change dramatically."[33]

U.S. courts view the probability of future competition between merging parties as a critical gating factor in determining whether transactions violate antitrust law. The courts have analyzed nascent competitor acquisitions under the "actual potential entry" or "actual potential competition" theory of harm, which is essentially the loss of future competition theory.[34] In applying the actual potential competition theory, U.S. courts have required plaintiffs to demonstrate that the acquisition target would have "probably" entered the relevant market, but for the transaction, in order to establish antitrust liability.[35]

A number of commentators have argued that the requirement of demonstrating that the nascent competitor would have "probably" entered the relevant market, but for the transaction, results in an overly permissive antitrust policy.[36] The commentators argue that low probability of harm is still harm.[37] When aggregated over a large number of nascent competitor acquisitions, the low probability of harm can turn into significant overall harm to the economy. As I discuss above, there are major practical challenges in determining antitrust liability based on the loss of future competition theory when future competition between the merging parties is unlikely and distant in time. However, the innovation effects approach may provide a workable solution for deterring some transactions that result in significant but low probability competitive harm.

For example, in killer acquisition cases, the acquirer takes out a competitive threat posed by the target's innovation by purchasing the target and discontinuing the innovation. Ending the development of the target's innovation may be harmful even if there is only a low probability that the innovation will be successful. Challenging such killer acquisitions under the innovation effects theory may deter some acquisitions that lead to significant but low probability harm.

VII. CONCLUSION

In this Article, I argue that there are practical reasons for analyzing nascent competitor acquisitions under the innovation effects theory rather than the loss of future competition theory in cases where there is a low probability of significant future competition between the merging parties and that competition would be distant in time.

However, there are other important differences between the two theories of harm. The innovation loss theory represents dynamic competition effects, whereas the loss of future competition theory represents static competition effects. Innovation effects are not limited to nascent competitor acquisitions. These effects may also be present in mergers between current competitors. The two theories of harm offer very different

29 Complaint (Dec. 17, 2021) at 10, *In the Matter of Illumina, Incorporated, a corporation, and Pacific Biosciences of California (PacBio), Incorporated, a corporation*, (Federal Trade Commission) (Dkt. No. 9387), https://www.ftc.gov/system/files/documents/cases/d9387_illumina_pacbio_administrative_part_3_complaint_public.pdf.

30 *Id.* at 11.

31 Complaint (Nov. 5, 2020) at 17, *United States v. Visa Inc. and Plaid Inc.*, (N.D. Cal.) (No. 3:20-cv-07810), https://www.justice.gov/atr/case-document/file/1334736/download.

32 *Id.* at 18.

33 *Id.* at 18.

34 *United States v. Marine Bancorp., Inc.*, 418 U.S. 602 (1974); *United States v. Falstaff Brewing Corp.*, 410 U.S. 526 (1973).

35 *Yamaha Motor Co. v. FTC*, 657 F2d 971, 977 (8th Cir. 1981).

36 See, for example, Hemphill & Wu, *supra* note 3 and DIGITAL COMPETITION EXPERT PANEL, UNLOCKING DIGITAL COMPETITION (2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlocking_digital_competition_furman_review_web.pdf.

37 The commentators argue that the assessment of nascent competitor acquisitions should be based on the expected value of the competitive effect of the acquisition. This approach may consider the effects of low-probability outcomes. See Hemphill & Wu, *supra* note 3 and Melamed, *supra* note 17.

perspectives on antitrust priorities. Should antitrust policy strive to avoid future price increases resulting from the elimination of competition between the merging parties in some future states of the world? Alternatively, should antitrust policy strive to avoid innovation losses resulting from the elimination of dynamic competition between the merging parties? Apart from any practical considerations in analyzing nascent competitor acquisitions, it is important that policymakers strive to achieve the right balance between these two perspectives on antitrust. It is also important to continue developing more economic tools for analyzing the innovation effects of transactions.

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