Evidence of Efficiencies in Consummated Mergers

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Executive Summary

- Under the U.S. antitrust laws, enforcement agencies may block an M&A transaction only if they meet their burden to prove that the transaction's "effect [] may be substantially to lessen competition." 15 U.S.C. § 18. As courts have explained, this is a "totality-of-the-circumstances" inquiry, and they "weigh[] a variety of factors to determine the effects of particular transactions on competition" and "future competitiveness." *United States v. Baker Hughes Inc.*, 908 F.2d 981, 984 (D.C. Cir. 1990).
- In the modern era of antitrust law, one of these "variety of factors" has been the ability of a transaction to improve the performance of the combined entity, and thus to improve "future competitiveness" in the market. That is why the current Horizontal Merger Guidelines, as well as several prior iterations, explain: "a primary benefit of mergers to the economy is their potential to generate significant efficiencies and thus enhance the merged firm's ability and incentive to compete, which may result in lower prices, improved quality, enhanced service, or new products."
- Enforcers in the Biden Administration, however, have threatened to move away from this effects-based analysis, particularly when it comes to measuring whether efficiencies will improve the performance of a combined entity. Indeed, the Chair of the Federal Trade Commission, Lina Khan, and the Assistant Attorney General for Antitrust, Jonathan Kanter, have promised that a revision of the merger guidelines is coming soon, and they have signaled their plan to take a skeptical view of whether mergers can make a market more competitive.
- This Administration appears to prefer that companies, or at least established companies, avoid growth by M&A—and various Administration officials have cited for this position the belief that there is no good evidence for the ability of mergers to result in efficiencies.
- In anticipation of what we expect will be a significant overhaul of the merger guidelines to enshrine this skepticism, we think it is valuable to begin a conversation about the state of empirical research on merger efficiencies. We perform a literature review to collect the existing studies that have observed real-world mergers resulting in improved performance for the combined entity. We believe this collection of academic studies is an important first step in pressure-testing the current climate of merger skepticism.
- Here are the key takeaways from the literature review:
    - There is zero basis to doubt the once-settled wisdom underpinning the basic framework for merger review: mergers can and do advance procompetitive business objectives. Merger review is therefore correctly focused on finding particularized evidence that the unilateral, coordinated, or vertical effects of an individual merger will cause quality-adjusted prices to increase or innovation to decrease.
    - There is no robust evidence that certain types of mergers are especially *unlikely* to result in efficiencies. Rather, there is evidence of mergers leading to efficiencies in a wide range of industries, including for both goods and services, and for both highly commoditized products and highly differentiated products.
    - Merger skeptics are correct that theoretical treatments of merger efficiencies are more plentiful than papers that record real-world evidence and control for appropriate variables to prove causation. Though we found plenty of examples of this sort of empirical treatment, more research is still needed. Currently, there are limitations on researchers seeking to test the hypothesis of merger efficiencies: a relatively small number of industries record public data measuring the inputs and outputs of production. Collecting additional data along these lines would allow for more robust testing of the efficiencies hypotheses in more industries, and could possibly allow researchers to predict factors that make merger efficiencies likely (or unlikely) in a particular transaction.

I. Introduction: Wither Efficiencies?

The U.S. antitrust agencies have repeatedly acknowledged since at least 1984 that "a primary benefit of mergers to the economy is their potential to generate significant efficiencies and thus enhance the merged firm's ability and incentive to compete, which may result in lower prices, improved quality, enhanced service, or new products."[2] This approach has been embraced by courts, which recognize there is no basis to override the strategic rationale for an acquisition unless the plaintiff meets its burden to prove that the overall effect of a merger is anticompetitive.[3] What was once settled wisdom, however, has recently been re-opened for debate.

In July 2021, the White House issued an Executive Order "On Promoting Competition in the American Economy" which outlined its priorities on competition policy.[4] To "address the consolidation of industry," which it blames on "Federal Government inaction," the Executive Order encourages the Department of Justice (DOJ) and Federal Trade Commission (FTC) to review the merger guidelines. The announcement echoed an earlier report by the U.S. House Judiciary Committee's Subcommittee on Antitrust, which was written when the current Chair of the FTC, Lina Khan, was a staffer on the Subcommittee.[5] The Subcommittee report stated that the DOJ and FTC contributed to the forming of private monopolies in part by "issuing guidelines that are highly permissive of market power and its abuse."[6] Making good on that view as FTC Chair,

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[2] U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES 1 (2010), https://www.justice.gov/atr/file/810276/download; *See also* U.S. DEP'T OF JUSTICE, 1997 MERGER GUIDELINES (1997), https://www.justice.gov/sites/default/files/atr/legacy/2007/07/11/11251.pdf ("Mergers have the potential to generate significant efficiencies by permitting a better utilization of existing assets, enabling the combined firm to achieve lower costs in producing a given quantity and quality than either firm could have achieved without the proposed transaction. Indeed, the primary benefit of mergers to the economy is their potential to generate such efficiencies."); U.S. DEP'T OF JUSTICE, 1992 MERGER GUIDELINES (1992), https://www.justice.gov/sites/default/files/atr/legacy/2007/07/11/11250.pdf ("The primary benefit of mergers to the economy is their efficiency-enhancing potential, which can increase the competitiveness of firms and result in lower prices to consumers. Because the antitrust laws, and thus the standards of the Guidelines, are designed to proscribe only mergers that present a significant danger to competition, they do not present an obstacle to most mergers. As a consequence, in the majority of cases, the Guidelines will allow firms to achieve available efficiencies through mergers without interference from the Agency."); DEP'T OF JUSTICE, 1984 MERGER GUIDELINES (1984), https://www.justice.gov/sites/default/files/atr/legacy/2007/07/11/11249.pdf (substantially the same).

[3] *See, e.g.*, United States v. Baker Hughes Inc., 908 F.2d 981, 985 (D.C. Cir. 1990) (setting out burden shifting framework and calling efficiencies one of a "variety of factors" to rebut a prima facie merger case that have "become hornbook law"); New York v. Deutsche Telekom AG, 439 F. Supp. 3d 179, 215-16 (S.D.N.Y. 2020) (criticizing plaintiffs for "unduly discount[ing] the rate at which technological innovation, new products, and consumer applications develop to take advantage of enhanced capabilities, and the extent to which this merger might specifically help accelerate that process" and counting those longer-term efficiencies). *See also* Northern Pacific Railway Co. v. United States, 356 U.S. 1, 4 (1958) (the design of the antitrust laws is to "yield the best allocation of our economic resources, and lowest prices, the highest quality, and the greatest material progress").

[4] Exec. Order No. 14,036, 86 Fed. Reg. 36987 (July 14, 2021), https://www.whitehouse.gov/briefing-room/presidential-actions/2021/07/09/executive-order-on-promoting-competition-in-the-american-economy/.

[5] FED. TRADE COMM'N, *Lina M. Khan Biography* (2023), https://www.ftc.gov/about-ftc/commissioners-staff/lina-m-khan (last visited Mar. 24, 2023).

[6] SUBCOMM. ON ANTITRUST, COMMERCIAL, AND ADMIN. LAW OF THE H. COMM. ON THE JUDICIARY, 117TH CONG., INVESTIGATION OF COMPETITION IN DIGITAL MARKETS: MAJORITY STAFF REPORT AND RECOMMENDATIONS (July 2022), https://www.govinfo.gov/content/pkg/CPRT-117HPRT47832/pdf/CPRT-117HPRT47832.pdf.

Lina Khan led the FTC to withdraw the 2020 Vertical Merger Guidelines in September 2021. The press release opined: "The guidelines adopted a particularly flawed economic theory regarding purported pro-competitive benefits of mergers, despite having no basis of support in the law or market reality."[7]

President Biden's top antitrust enforcers have been working on the promised revisions to the merger guidelines for over a year.[8] There is reason to believe that they will try achieve the foreshadowed aggressive stance by rejecting efficiencies arguments that the agencies once would have accepted.[9] The agencies' request for information in support of the revision asks, "Is the guidelines' approach to efficiencies consistent with the prevailing legal framework as enacted by Congress and interpreted by the courts?" and "For those mergers that appear to yield cognizable efficiencies, what degree of certainty should the guidelines require that they cannot be achieved in any other way?"[10] In a recent letter promising the new guidelines are coming soon, Chair Khan and Assistant Attorney General for Antitrust Jonathan Kanter criticized past versions of the guidelines for indicating that "the consideration of certain efficiencies could lead to a decision not to challenge a merger."[11] Signaling their intentions, they claim that Congress "has stated a preference for organic growth over growth through acquisition."[12]

This shift in position seems driven, at least in part, on generalized skepticism that mergers generate efficiencies or other improvements that help businesses compete more aggressively on the merits. Indeed, we see signs of this Administration's generalized skepticism all around. The agency heads proclaimed in the same recent letter that "Our experience has been that efficiencies are often claimed but rarely proved."[13] Chair Khan hired an economic advisor, Professor John Kwoka, who is a prominent skeptic of merger efficiencies. In a 2018 piece suggesting reforms to merger

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[7] Press Release, Fed. Trade Comm'n, Federal Trade Commission Withdraws Vertical Merger Guidelines and Commentary (Sept. 15, 2021), https://www.ftc.gov/news-events/news/press-releases/2021/09/federal-trade-commission-withdraws-vertical-merger-guidelines-commentary.

[8] Press Release, Fed. Trade Comm'n, Federal Trade Commission and Justice Department Seek to Strengthen Enforcement Against Illegal Mergers (Jan. 18, 2022), https://www.ftc.gov/news-events/news/press-releases/2022/01/federal-trade-commission-justice-department-seek-strengthen-enforcement-against-illegal-mergers.

[9] *See* MALCOLM B. COATE & ANDREW J. HEIMERT, MERGER EFFICIENCIES AT THE FEDERAL TRADE COMMISSION 1997-2007, https://www.ftc.gov/reports/merger-efficiencies-federal-trade-commission-1997-2007 (2009). Staff considered efficiencies in 147 of the 186 "second request" cases during the period studied by Coate & Heimert. Bureau of Competition (BC) staff discussed efficiencies in 115 of its recommendation memos, including 342 different efficiency claims. BC staff accepted 29 of the 342 claims (they rejected about a third of the claims, and did not come to a conclusion on the rest). The acceptances were correlated to a statistically significant degree with the outcomes of the investigations: BC accepted efficiency claims in 15.3% of the closed cases, compared to just 4.2% of cases where the Commission sought a settlement, and 6.9% of cases where the Commission challenged the merger.

[10] *See* FED. TRADE COMM'N & U.S. DEP'T OF JUSTICE, Request for Information on Merger Enforcement (2022), https://www.regulations.gov/docket/FTC-2022-0003/document.

[11] FED. TRADE COMM'N & U.S. DEP'T OF JUSTICE, Letter re Ministry's Public Consultation Paper on the Future of Competition Policy in Canada (Mar. 31, 2023), https://www.ftc.gov/news-events/news/speeches/letter-chair-lina-khan-assistant-attorney-general-jonathan-kanter-canadian-ministry-innovation.

[12] *Id.*

[13] *Id.*

control, he argued: "There is, in short, no good evidence that mergers generally result in substantial and verifiable cost savings, notwithstanding claims to the contrary."[14] Likewise, Professors Nancy Rose and Jonathan Sallet—both considered thought-leaders in the progressive antitrust movement—published a law review piece in 2020 arguing "the current methods used by the federal antitrust agencies to determine whether to investigate a horizontal merger likely rests on an overly-optimistic view of the existence of cognizable efficiencies, which we believe has the effect of justifying market-concentration thresholds that are likely too lax."[15] Like the Kwoka piece, the Sallet & Rose piece selectively cites some of the research that looks for and fails to find efficiencies and other competitive benefits after mergers, but it largely relies on papers investigating whether merger efficiencies outweighed changes in market power (for instance by looking at overall price effects). Those papers tend to start from the premise of looking at potentially problematic mergers, like those in concentrated industries. Rose and Sallet do not attempt to collect evidence of when mergers do result in productivity gains or other competitive benefits, which is our endeavor here.

The enforcers in charge of merger review have converted this research ambiguity into a policy prescription. In an interview in June 2022, Chair Khan responded to a question regarding the tradeoffs involved in enforcement by stating that "the word efficiency doesn't appear anywhere in the antitrust statutes" and that "it's really up to the FTC to be defining what is fair and what is unfair when it comes to competition."[16] Chair Khan went on to state that the agency's duty was not to determine whether a "business practice that increases welfare or increases efficiency is fine," but rather to define what constitutes an unfair method of competition.[17] This sentiment is reflected in the FTC's recent policy statement redefining what is an "unfair method of competition" (UMC),

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[14] *See* John Kwoka, *Reviving Merger Control: A Comprehensive Plan for Reforming Policy and Practice* (Oct. 9, 2018), https://www.antitrustinstitute.org/wp-content/uploads/2018/10/Kwoka-Reviving-Merger-Control-October-2018.pdf (describing a McKinsey study showing that merger buyers overpay based on an overly optimistic view of synergies, a Blonigen and Pierce study using a dataset that we discuss at some length below, and two retrospective studies that showed efficiency gains of less than 1% and about 1.5%, respectively, across large samples). It is worth noting that the studies Professor Kwoka cites for his grim view of merger efficiencies all observe that the studied mergers did in fact result in efficiencies. *See, e.g.*, Scott A. Christofferson, Robert S. McNish, and Diane L. Sias, *Where Mergers Go Wrong*, MCKINSEY ON FINANCE (2004), https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/where-mergers-go-wrong (finding 55 of 77 studied mergers achieved at least 50% of projected revenue synergies and 84 of 92 studied mergers achieved at least 50% of projected cost savings). The exception is the Blonigen & Pierce piece, which found no average, manufacturing industry-wide effect of mergers on plant-level productivity. *See* Bruce A. Blonigen & Justin R. Pierce, *Evidence for the Effects of Mergers on Market Power and Efficiency*, Nat. Bureau Econ. Rsch. Working Paper No. 22750 (Oct. 2016). Other researchers using plant-level productivity gains on an industry-wide basis have reached the opposite conclusion. *See, e.g.*, MERT DEMIRER & OMER KARADUMAN, *Do Mergers and Acquisitions Improve Efficiency: Evidence from Power Plants* (2022), https://www.ftc.gov/system/files/ftc_gov/pdf/demirerkaraduman.pdf.

[15] Nancy L. Rose & Jonathan Sallet, *The Dichotomous Treatment of Efficiencies in Horizontal Mergers: Too Much? Too Little? Getting it Right*, 168 U. PA. L. REV. 1941, 1941 (2020).

[16] Guy Rolnik, *Q&A With FTC Chair Lina Khan: "The Word 'Efficiency' Doesn't Appear Anywhere in the Antitrust Statutes"*, PROMARKET, https://www.promarket.org/2022/06/03/qa-with-ftc-chair-lina-khan-the-word-efficiency-doesnt-appear-anywhere-in-the-antitrust-statutes/ (June 3, 2022).

[17] *Id*.

including both mergers and non-merger conduct.[18] The statement claims the FTC's approach to labeling something UMC "would not be a net efficiencies test or a numerical cost-benefit analysis." Indeed, it suggests that the FTC may decline to consider any efficiency justification at all.[19]

In remarks rescinding the 2020 Vertical Merger Guidelines (VMGs), Chair Khan expressed skepticism that elimination of double marginalization tended to be realized in vertical mergers, and generally rejected the position that "efficiencies or 'procompetitive effects' may rescue an otherwise unlawful transaction."[20]

We see evidence of the same approach at the DOJ, too. Assistant Attorney General Jonathan Kanter criticized the VMGs for "overstat[ing] the potential efficiencies of vertical mergers."[21] In a recent speech, Principal Deputy Assistant Attorney General Doha Mekki announced that it is the policy of the Administration to "Be skeptical of efficiencies" because, among other reasons, "in the exceedingly rare instances when low[er] courts have considered them, they have explained that there is a high burden for demonstrating that efficiencies *increase* competition."[22] Indeed, the DOJ argued in its challenge to the U.S. Sugar/Imperial Sugar merger that courts "have expressed skepticism about efficiencies defenses" and asked the court in that case to reject the likelihood of a plant-level performance improvement, which is one of the most verified type of efficiencies in the empirical literature we collect below.[23]

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[18] Fed. Trade Comm'n, *Policy Statement Regarding the Scope of Unfair Methods of Competition Under Section 5 of the Federal Trade Commission Act, Comm'n File No. P221202* (2022), https://www.ftc.gov/system/files/ftc_gov/pdf/p221202sec5enforcementpolicystatement_002.pdf.

[19] *Id.* at 10 (claiming "courts have declined to consider justifications altogether" and citing Atlantic Refining Co. v. Fed. Trade Comm'n, 381 U.S. 357, 371 (1965), where the court upheld the FTC's condemnation of conduct that was "an economical method of assuring efficient product distribution among its dealers"); *See also* Fed. Trade Comm'n Off. of the Chair, *Remarks of Chair Khan for the Fordham Annual Conference on International Antitrust Law & Policy* (2022), https://www.ftc.gov/system/files/ftc_gov/pdf/KhanRemarksFordhamAntitrust20220916.pdf (describing the 2015 statement as a rejection of Section 5's "clear statutory mandate", and that the efficiencies defense in the 1982 guidelines was contradictory to existing precedent at the time).

[20] Fed. Trade Comm'n Office of the Chair, *Remarks of Lina M. Khan Regarding the Proposed Rescission of the FTC's Approval of the 2020 Vertical Merger Guidelines* (2021), https://www.ftc.gov/system/files/documents/public_statements/1596392/remarks_of_chair_lina_m_khan_regarding_the_proposed_rescission_of_the_ftcs_approval_of_the_2020_vmgs.pdf.

[21] U.S. Dep't of Justice Off. Of Public Affairs, *Assistant Attorney General Jonathan Kanter Delivers Remarks on Modernizing Merger Guidelines* (2022), https://www.justice.gov/opa/speech/assistant-attorney-general-jonathan-kanter-delivers-remarks-modernizing-merger-guidelines.

[22] U.S. Dep't of Justice Off. of Public Affairs, *Principal Deputy Assistant Attorney General Doha Mekki of the Antitrust Division Delivers Remarks at Mercatus Center Second Annual Antitrust Forum: Policy in Transition* (2023), https://www.justice.gov/opa/speech/principal-deputy-assistant-attorney-general-doha-mekki-antitrust-division-delivers.

[23] Plaintiff United States of America's Post-Trial Brief (Redacted Version), United States v. U.S. Sugar Corp., Case No. 21-cv-01644, Dkt. No. 218, 43-44 (D. Del. May 16, 2022). Notably, in its "findings of fact" the court ultimately credited that the acquiring firm would be able to "increase the capacity utilization of [the plant]" and entered judgment against the government. Redacted Memorandum Opinion, United States v. U.S. Sugar Corp., Case No. 21-cv-01644, Dkt. No. 256, 22 (D. Del. Sept. 23, 2022).

In addition to specific remarks questioning efficiencies, we see an increasing amount of rhetoric equating consolidation with bad outcomes for consumers.[24] This oversimplification fails to acknowledge gains from consolidation like economies of scope or scale, the assets of poorly managed firms coming under direction of well managed ones, and the research and design benefits that come from the integration of complementary functions. Of course, if the enforcers do not believe these benefits will be realized post-transaction, then it is no wonder they equate consolidation with a failure of public policy.[25]

But how well-founded is this sort of generalized skepticism that mergers create efficiencies? Is Professor Kwoka right that there is no evidence that mergers can create sustained benefits of the type that enable firms to compete more aggressively? Until now, there has not been a good compendium of resources to repudiate those claims. Most policy statements have relied on theoretical work, including modeling of cost savings, knowledge transfers, and improvements in asset management, but without marshalling the empirical or observational evidence looking at consummated mergers.[26] In this article, we aim to supplement the theoretical work by providing

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[24] *See, e.g.*, Open Markets et al., *The Federal Trade Commission and the Department of Justice Should Abandon the Proposed Vertical Merger Guidelines and Embrace the Framework of the 1968 Guidelines* (Feb. 2020), https://www.ftc.gov/system/files/attachments/798-draft-vertical-merger-guidelines/comment_to_ftc-doj_re_vertical_merger_guidelines.pdf (arguing for a return to the 1968 approach using strict market-share-based thresholds for horizontal and vertical mergers to "reflect the Clayton Act's purpose to preserve and promote *market structures* conducive to competition"); Fed. Trade Comm'n Off. of the Chair, *Prepared Statement of the Federal Trade Commission Before the United States Senate Committee on the Judiciary Subcommittee on Antitrust, Competition Policy and Consumer Rights* "Oversight of the Enforcement of the Antitrust Laws," (Sept. 20, 2022), https://www.ftc.gov/system/files/ftc_gov/pdf/P210100SenateAntitrustTestimony09202022.pdf (criticizing agency underenforcement for resulting in concentrated markets); Fed. Trade Comm'n Off. of the Chair, *Remarks of Chair Lina M. Khan Regarding the Request for Information on Merger Enforcement* (Jan. 18, 2022), https://www.ftc.gov/system/files/documents/public_statements/1599783/statement_of_chair_lina_m_khan_regarding_the_request_for_information_on_merger_enforcement_final.pdf ("This inquiry comes against the backdrop of a broader reassessment of the effects of mergers across the U.S. economy. Evidence suggests that decades of mergers have been a key driver of consolidation across industries, with this latest merger wave threatening to concentrate our markets further yet. As President Biden noted in his Executive Order on Promoting Competition, industry consolidation and weakened competition have 'den[ied] Americans the benefits of an open economy," with 'workers, farmers, small businesses, and consumers paying the price.'"). For a discussion of the history of the conduct-structure-performance paradigm and the research leading to reform of the 1968 approach, *see* Bruce H. Kobayashi & Timothy J. Muris, *Turning Back the Clock: Structural Presumptions in Merger Analyses and Revised Merger Guidelines*, COMPETITIVE ENTERPRISE INSTITUTE (Feb. 22, 2023), https://cei.org/wp-content/uploads/2023/02/KobayashiMuris-FINAL-Layout-RY-approved.pdf.

[25] Additionally note that economies of scale themselves might be subject to condemnation, judging by the concerns in the Request for Information on Merger Enforcement, which asks "Where a merger is expected to generate cost savings via the elimination of 'excess' or 'redundant' capacity or workers, should the guidelines treat these savings as cognizable 'efficiencies'? How should the guidelines address the potential for capacity reductions to reduce resilience of supply or otherwise lower product or service quality?" *See also* Fed. Trade Comm'n Office of the Chair, *Remarks of Chair Lina M. Khan Regarding the Request for Information on Merger Enforcement* (2022), https://www.ftc.gov/system/files/documents/public_statements/1599783/statement_of_chair_lina_m_khan_regarding_the_request_for_information_on_merger_enforcement_final.pdf ("And when a merger is expected to generate cost savings through layoffs or reduction of capacity, should the guidelines treat this elimination of jobs or capacity as cognizable 'efficiencies'?").

[26] *See* Oliver E. Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs*, 58 AM. ECON. REV. 18 (1968); Joseph Farrell & Carl Shapiro, *Horizontal Mergers: An Equilibrium Analysis* 80 AM. ECON. REV. 107

the compendium of research that has observed mergers, or industry consolidation generally, creating "efficiencies."[27] We show that plenty of real world evidence supports what used to be common wisdom: "a primary benefit of mergers to the economy is their potential to generate significant efficiencies."

II. Summary of Merger Efficiency Evidence

The below table collects all the papers we could find, using a keyword search methodology, wherein the author(s) measured the real-world effects of mergers, corporate consolidation, or vertical integration, and where at least one of the observed results was an increase in productivity or other improvement in performance (which we are, together, calling "efficiencies" throughout this paper). We performed a keyword search of legal and social science journals and platforms, like SSRN, and manually reviewed all papers that hit on synonyms for "merger" and "efficiency" appearing in the same paper.

We did not exclude papers if they found that the observed efficiencies were predominated by price effects from increased market power or other anticompetitive effects. Although the question of which effect predominates is obviously at the crux of individualized merger review, we are interested here only in a broader policy point about the potential gains from a merger. That is, is there evidence that mergers regularly result in the sort of procompetitive performance improvements that an acquirer might offer as a deal rationale, and which policymakers might properly think of as a "legitimate" reason for decisionmakers choosing M&A rather than some other growth strategy? If so—as we find is the case—then there is continued reason to engage in case-by-case merger review to stop only those mergers where (any such) gains are predominated by the anticompetitive effects that enforcers, courts, and researchers have observed in many individual instances.

We did not include in our table theoretical works modeling hypothetical gains from mergers. Nor did we include meta-analyses of other empirical work. We did, however, review (as a form of cross-reference) several meta-analyses and included in our table the original research cited therein when it met our criteria. As a result, our table reflects and builds upon prior work done by, for instance, LaFontaine and Slade, who collected papers showing the effects from vertical integration, and also by Professor Kwoka, who collected papers showing effects from certain horizontal combinations.[28] We are not here attempting to perform any meta-analysis ourselves (that is, we do not make overarching conclusions about the likelihood that one set of merger effects predominates over another, or identify when certain merger effects are likely to occur). Our goal

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(1990) (The seminal theoretical works modeling merger effects, and the potential for consumer surplus increases derived from reductions in the combined firm's marginal cost).

[27] We will use "efficiencies" as a shorthand term throughout the rest of this piece to mean all types of operating benefits that can make a firm more competitive.

[28] Francine LaFontaine & Margaret Slade, *Vertical Integration and Firm Boundaries: The Evidence*, 45 J. ECON. LIT. 629 (Sept. 2007); John Kwoka, MERGERS, MERGER CONTROL, AND REMEDIES: A RETROSPECTIVE ANALYSIS OF U.S. POLICY (2015). *But see* Michael Vita & F. David Osinski, *John Kwoka's Mergers, Merger Control, and Remedies: A Critical Review*, 82 ANTITRUST L.J. 361, 377-81 (2018) (criticizing Kwoka's methodology).

is to collect the findings of efficiencies such as they exist, and to point out areas where additional data could help supplement the existing work showing that M&A is an important strategic tool for improving competitive performance in many markets.

One common theme of the literature is how difficult it is to measure accurately the effects of a merger.[29] As is often the case in antitrust, one difficulty is isolating the effect from the combination of assets and controlling for all the other changes that affect firm performance after the merger. Another difficulty is even more fundamental: what constitutes improved performance post-combination?[30] For instance, we are not interested in empirical evidence of outsized gains in stock price or revenue as such, which could be attributable to gains in market power.[31] The studies that find improvements attributable to mergers answer these questions using different methodologies, which can be loosely categorized into seven buckets. We describe these seven categories below and record the category of the study in our table. We also track in our table: the industry in which the study was conducted; whether the type of combination studied was horizontal or vertical; a brief description of the finding regarding efficiencies (including any conclusion about whether efficiencies tend to occur under certain circumstances); and any other observed effect from the merger (for instance, price effects).

a. Difference-in-Differences Measures of Plant-Level Production After Acquisition

One group of studies finds efficiencies using rich datasets of plant-level manufacturing outputs and the changes in ownership of those plants. These studies look at a time series of data from

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[29] *See, e.g.*, MERT DEMIRER & OMER KARADUMAN, *Do Mergers and Acquisitions Improve Efficiency: Evidence from Power Plants* (2022), https://www.ftc.gov/system/files/ftc_gov/pdf/demirerkaraduman.pdf ("A major challenge in analyzing the efficiency effects of mergers is distinguishing true efficiency gains from other factors, such as changes in market power, buyer power, and product quality."); David R. King et al., *Meta-Analyses of Post-Acquisition Performance: Indicators of Unidentified Moderators*, 25 STRAT. MGMT. J. 187 (2004) ("First, most post-acquisition performance research has only employed stock market event studies, thus ignoring M&A effects on other potentially relevant dimensions of firm performance. The short-term nature of most event studies may not fully capture anticipated benefits from an acquisition due to information asymmetries."); Orly C. Ashenfelter et al., *Efficiencies Brewed: Pricing and consolidation in the U.S. Beer Industry*, 46 RAND J. ECON. 328, 328-29 (2015) ("[T]here is very little direct empirical evidence that efficiencies can offset the incentive to raise prices. This lack of direct evidence is likely due to the inherent difficulties in measuring if (and by how much) mergers lower firms' marginal costs.").

[30] *See* DEMIRER & KARADUMAN *supra* note 27, at 2 ("A major challenge when studying the efficiency effects of mergers is the lack of suitable data because most industries do not have reliable measures of cost and physical productivity.").

[31] There is a large literature in the study of finance that attempts to measure "performance" improvements resulting from acquisitions, by which the researchers almost exclusively mean to forecast returns on investment. While there may be some results from this literature that shed light on the topic of efficiencies or other operational improvements, we do not attempt to catalogue this field of research. For a fairly comprehensive (if somewhat outdated) treatment of this sort of retrospective analysis of mergers and acquisitions, *see* Maruizio Zollo & Harbir Singh, *Deliberate Learning in Corporate Acquisitions: Post-Acquisition Strategies and Integration Capability in U.S. Bank Mergers*, 25 STRAT. MGMT. J. 1233 (2004); *see also* Paul M. Healy, Krishna G. Palepu, & Richard S. Ruback, *Does Corporate Performance Improve After Mergers?*, 31 J. FIN. ECON. 135 (1992).

entire industries (e.g., power generation[32] or ready-mix concrete[33]) where some of the plants were acquired across the period tracked. They measure the productivity of any given plant—that is, the amount of finished product produced from a given amount of inputs.[34] They compare the productivity of acquired plants in a given moment to the productivity of plants that were not acquired. (A variation on this method is to measure productivity under different concentration levels, rather than after specific merger events.) This difference-in-differences methodology allows the researchers to draw conclusions about what gains in productivity were due to acquisition, rather than exogenous effects on the industry as a whole.

b. Difference-in-Differences Measures of a Single Firm's Accounting Data

There is a wide variety of studies using a firm's accounting data to measure its improved performance after a merger by comparing it to an appropriate "but for" alternative, as measured by the performance of the rest of the industry, or a particular sample of the rest of the industry that has similar characteristics to the merged firm. Researchers measure this improved performance in many different ways. Some look at quality-adjusted prices—that is they choose a measurable variable that serves as a proxy for the quality of a product or service (e.g., wait times) and measure changes in price, controlling for the variable. Price is only informative as a measure of reduced costs (i.e., efficiency) if the researcher is able to control for the price effects from any loss of competition (i.e., increases in market power or tacit coordination). Others look directly at measures of cost to produce goods or services. Still others compare output quantities to determine whether a combined firm is able to produce more from the same pre-merger assets.

c. Data Envelopment Analysis

Some researchers find performance improvements after mergers or during periods of industry concentration by using a measure of productivity called data envelopment analysis. Data envelopment analysis (DEA) is a statistical method that uses data measuring inputs and outputs in an industry to try to estimate the highest limits of possible production (i.e., "the production possibility frontier") and then measures a specific producer's performance against that potential performance to come up with a measure of efficiency. The method is only available where there is firm-level data available on the inputs used and outputs produced over time. When researchers also have a dataset tracking mergers in the industry, or concentration levels generally, they show how the DEA measure of efficiency improves with the M&A, or how the measure improves when the industry becomes more concentrated. Many of the DEA studies showing efficiency gains were focused on the banking industry, where the inputs and outputs seem to be more regularly measured by regulators.

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[32] *See* DEMIRER & KARADUMAN *supra* note 27

[33] Robert B. Kulick, *Ready-to-Mix: Horizontal Mergers, Prices, and Productivity* (US Census Bureau Center for Economic Studies Paper No. CES-WP-17-38, 2017).

[34] Some studies we catalogue measure output by using revenue as a proxy. We recognize a debate in the literature about whether revenue is an inappropriate measure because it would reflect price effects from increases in market power. We do not attempt to resolve this debate here, but record in our table which type of measure was used.

d. Before-and-After Measures of a Single Firm's Performance

Some studies look only at operations of a firm before and after a merger, and directly measure improvements in the firm's costs of production (e.g., distances that goods must be shipped) after the combination. Unlike the difference-in-differences methodology, the before-and-after methodology cannot control for exogenous changes over time that would have lowered the cost of production, or other direct measures of performance, of the whole industry. As a result, many of these studies also show price decreases at the merged firm relative to the rest of the industry, and in doing so attempt to control for market-wide variables that also affect prices.

e. Industry-Wide Regression Analysis Using Accounting Data

Some studies measure the effects not of individual mergers, but of industry concentration or vertical integration generally on measures of price or performance. These studies include variables in the regressions that control for other explanations of movements in price or performance. These studies' findings of lower prices or higher-quality outputs in periods of greater consolidation or vertical integration may be explained by economies of scale and vertical efficiencies.

f. Before-and-After Measures of Market Share

One study is not like the others: it makes a case for classifying mergers as "efficiency enhancing" if the post-merger market share (measured by quantity of a good produced) is greater than the sum of each firm's pre-merger market share.[35] Conversely, a merger is "market power enhancing" if the combined firm reduced output and their market share (after contracting aggregate output to internalize the infra-marginal losses that they impart to each other). The study uses a rich dataset from DRAM chip production to make the case that a group of "efficiency enhancing" mergers tended to cause less efficient firms to exit, and "market power enhancing" mergers tended to attract entry. The response of market participants, which is in line with theoretical expectation, tends to confirm the methodology for classifying a merger as "efficiency enhancing."

g. Case Studies

A final methodology does not purport to *quantify* efficiency effects in any way, rather it uses interviews, historical commentaries, or regulatory hearings to collect information on subjective understandings by managers or other informed observers to determine that mergers resulted in improved operations or created cost savings.

[35] Ralph B. Siebert, *Estimating Differential Dynamic Merger Effects on Market Structure and Entry in Related Markets*, 55 REV. OF INDUS. ORG. 431 (2019).

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
1	Do Mergers and Acquisitions Improve Efficiency: Evidence from Power Plants	Mert Demirer and Omer Karaduman	2022	a	U.S. Power Plants	n/a	Acquired power plants experience a 4% efficiency increase 5-8 months after acquisition.	High productivity firms buy underperforming assets from low productivity firms and make the acquired assets more productive after acquisition.	Evidence suggests that most of the gains are explained by increase in productive efficiency, but there is also observable gains in dynamic efficiency and allocative efficiency.
2	Barbarians at the Store? Private Equity, Products, and Consumers	Cesare Fracassi, Alessandro Previtero, and Albert Sheen	2022	b	Consumer Goods / Manufacturing	n/a	In the years following private equity buyouts, consumer goods manufacturers increase retail sales of their products by 50% on average compared to matched control firms. The launch of new products and geographic expansion explain this growth, not price increases.	The data suggest that PE firms achieve growth by easing financial constraints and providing managerial expertise.	It appears that PE firms with expertise in growth capital deals drive the results, whereas nongrowth-oriented firms more often raise prices on existing products.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
3	The (Heterogenous) Economic Effects of Private Equity Buyouts	Steven J. Davis, John Haltiwanger, Kyle Handley, Ben Lipsius, Josh Lerner, and Javier Miranda	2021	b	Private Equity Buyouts (All Industry Sectors)	n/a	Labor productivity rises by 7.5 percentage points at firms bought out by private equity relative to controls.	Productivity gains are larger amidst tight credit conditions, and for older and larger targets.	
4	Measuring the effects of M&As on Eurozone bank efficiency: an innovative approach on concentration and credibility impacts	Emilios Galariotis, Kyriaki Kosmidou, Dimitrios Kousenidis, Eirini Lazaridou, and Trifon Papapanagio-tou	2021	c	European Banking	H	Banks experienced positive increases in their efficiency scores post-merger.	These post-merger efficiency increases took place only when the market was within a certain threshold of market concentration. These efficiency increases were not seen in markets with particularly high levels of concentration.	
5	Evaluating Mergers and Divestitures: A Casino Case Study	F. David Osinki and Jeremy Sandford	2020	b	U.S. Casinos	H	In the 2013 merger of Pinnacle and Ameristar casinos, the merged firm benefited from efficiencies, resulting in		Divested casino performed worse than it did before the merger.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							lower prices and higher quantity.		
6	Productivity, Prices and Productivity in Manufacturing: a Demsetzian Perspective	Sam Peltzman	2020	e	U.S. Manufacturing	H	High and rising concentration is on average associated with better productivity growth.		Rising concentration is associated with widening price-cost margins, which are mainly driven by productivity gains, not price increases.
7	The success or failure of mergers in Japan's paper industry	Masahiro Ueda	2020	c	Japanese Paper Industry	H	Most paper mergers since the 1990s improved the merged firms' technical efficiency as compared to the target companies' technical efficiency before the merger.	Citing additional empirical studies showing that some of the individual mergers achieved economies of scale and economies of scope.	Prices did not rise in the industry despite a wave of consolidation.
8	Effect of Merger on Market Price and Product Quality	Somnath Das	2019	b	U.S. Airlines	H	Merger between American and U.S. Airways had a significant downward effect on price and that effect is larger for bigger markets; prices		No significant impact on frequency of flights or the number of seats; but there was a significant increase in departure and

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							increased in smaller markets.		arrival delays and a significant reduction in cancellations.
9	Estimating Differential Dynamic Merger Effects on Market Structure and Entry in Related Markets	Ralph B. Siebert	2019	f	Dynamic Random Access Memory (DRAM) Market	H	Efficiency and market-power mergers do not exert instant impact on market structure; after 2 years, efficiency-dominated mergers cause an additional two firms to exit; market-power mergers attract entrants 2 years after the merger.		
10	What Makes a Good Merger? An Analysis of Merger Efficiencies in the U.S. Bottled Water Industry	Jun Zhang	2018	b	Bottled Water	H	A bottled water merger reduced prices, increased product varieties and advertising, and increased market shares of certain products. Compared to a "no merger" baseline in year 2009, the merger reduced the prices of		The merger raised consumer surplus by about 22%.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							Glaceau products by 3.5%-5.2% and increased product varieties by 18.8%-35.8%; it increased advertising of Vitaminwater by 53.9%.		
11	The Welfare Effects of Vertical Integration in Multichannel Television Markets	Gregory S. Crawford, Robin S. Lee, Michael D. Whinston, and Ali Yurukoglu	2018	e	U.S. Television	V	Vertical integration between television distributors and regional sports networks (RSNs) results in efficiency gains.	Integrated distributors can carry their own RSNs at lower cost (consistent with the elimination of double marginalization); with effective program access rules in place, the integration would reduce television subscription prices to the consumer by an average of 1.2%	There is evidence of raising rivals costs, so without program access rules, the overall welfare effects depend on the market share of the integrated distributor in the particular region.
12	Ready-to-Mix: Horizontal Mergers, Prices, and Productivity	Robert Kulick	2018	a	U.S. Ready-Mixed Concrete	H	Over 400 horizontal mergers over 15 years in the ready-mix concrete	Acquiring firms target low-productivity plants and brought	When nearby plants were acquired, there was evidence of price increases and

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							industry raised productivity at acquired plants.	productivity levels up.	decreases in output (a loss in consumer welfare). Increased productivity reduced price, but at a modest rate, and the effects of increased market power were not offset.
13	Dynamic efficiencies of the 1997 Boeing-McDonnell Douglas merger	Yonghong An and Wei Zhao	2017	b	Medium-sized Wide Body Aircrafts	H	Evaluating the welfare effects of the 1997 merger between Boeing and McDonnell Douglas, there were significant gains from the transfer of experience.		Preliminary investigation of price changes: from 1991 to 2002, there was a significant drop in prices for up to the first five years after the merger. Annual decrease in prices was $2.36 million larger in the post-merger period than in the pre-merger period. The prices for medium-sized aircrafts dropped $4.46 million more

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
									each year than the prices for other aircrafts. Other wide body aircraft prices declined only slightly and narrow body prices rose.
14	Does Vertical Integration Decrease Prices? Evidence from the Paramount Antitrust Case of 1948	Ricard Gil	2015	b	U.S. Movie Theaters	V	Ticket prices at vertically integrated movie theaters increased at slower rates than at theaters affected by the Supreme Court's order in U.S. v. Paramount requiring vertical divestiture.	The results are consistent with the elimination of double marginalization.	
15	Vertical Integration, Exclusivity, and Game Sales Performance in the US Video Game Industry	Ricard Gil and Frederic Warzynski	2015	e	Video Games	V	Vertical integration between video game developers and video game publishers results in higher demand for the games.	Results suggest that most of the difference in performance is due to selection of better video games into integrated publishers and value added from better game	The research did not explore alternative explanations for the improved performance on vertically integrated firms including network effects (when the

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
								release strategies.	developers and publishers are integrated with the hardware manufacturers), lower production costs, and improvements in R&D from keeping talent consistently employees.
16	Private Equity, Jobs, and Productivity	Steven J. Davis, John Haltiwanger, Kyle Handley, Ron Jarmin, Josh Lerner, and Javier Miranda	2014	a	U.S. Manufacturing	n/a	Compared to control firms, target firms bought out by private equity experienced improvements in total factor productivity. On average, over the first two years post buyout, total factor productivity grows by 2.1 log points.	Three quarters of the post-buyout gains in TFP were attributable to private equity buyer's propensity to close low productivity plants and to open new, high productivity plants. In other words, PE buyers reallocated assets efficiently within target firms.	
17	Airline Networks, Mergers, and	Kai Hüschelrath and Kathrin Müller	2014	b	U.S. Airlines	H	Airline mergers resulted in price decreases for		When merging parties are not competing on same routes the

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
	Consumer Welfare						non-overlapping routes.		result is an increase in consumer welfare. However, where parties competed, prices often rose. This was especially acute where one firm was a failing firm so prices were lower than the market and the acquisition resulted in a large price increase.
18	Efficiencies brewed: pricing and consolidation in the US beer industry	Orley C. Ashenfelder, Daniel Hosken, and Matthew C. Weinberg	2013	d	Beer	H	Efficiencies led to downward pressure on prices that resulted in overall price decreases of 1.8%.		Price increases occurred in regions where the merger increased concentration; average price increase was just under 2%. Efficiencies offset these initial price effects in the long run.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
19	How Do Stock Markets in the US and Europe Price Efficiency Gains from Bank M&As?	Dimitris K. Chronopoulos, Claudia Girardone, and John C. Nankervis	2013	c	Banks in the U.S. and Europe	H	Not all of the studied mergers brought about gains, but the paper found that bank managers were more likely to pay a higher premium for M&A transactions that did bring about efficiency gains.		
20	Pairwise X-efficiency combinations of mergering banks: analysis of the fifth merger wave	Jamal Ali Al-Khasawneh	2013	c	U.S. Banks	H	Banks that merged from 1992-2003 experienced an increase in profit efficiency.	Value-maximizing mergers are mostly large and match banks with clear chances of increasing their future efficiency rankings.	Smaller banks experienced significant loss in efficiencies following mergers.
21	Can Industry Consolidation Lead to Greater Efficiencies? Evidence from the U.S. Defense Industry	Nayantara Hensel	2010	d	Defense Contracting	H	Although market concentration levels in certain sectors increased because of the wave of defense mergers, DoD's costs across weapons systems tended to be lower in the post-merger period.		

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
22	Oil Industry Consolidation and Refined Product Prices: Evidence from US Wholesale Gasoline Terminals	Michael Kendix and WD Walls	2010	e	Refined Petroleum Products	H	Increasing concentration in the industry from 2000-2008 is associated with lower prices of wholesale gasoline.	Less concentrated markets are associated with lower price levels.	Some mergers resulted in an increase in prices when the markets were highly concentrated.
23	Post-merger Bank Efficiency and Stock Market Reaction: the Case of the US versus Europe	Dimitris K. Chronopoulos, Claudia Girardone, and John Nankervis	2010	c	Banks in the U.S. and Europe	H	Looking at 100 bank mergers between 1997 and 2003, and measuring changes one year prior and three years following the merger, there is a positive relationship between stock market reaction and post-merger performance in profit efficiency.		European bank mergers tend to provide a greater return than American ones.
24	Welfare Tradeoffs in U.S. Rail Mergers	Marc Ivaldi and Gerard McCullough	2010	d	Class I Freight Railroads in the U.S.	H	There have been large gains in intermodal and bulk markets offset by losses of surplus in general freight. Primary effect of mergers has	These changes in the composition of surplus can be attributed to deregulation which granted rail managers commercial freedom to shift	Real shipper surplus declined in the early 1980s immediately following deregulation but has recovered since

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							been a reduction in unit costs which has enabled railroads to remain revenue adequate.	their strategic emphasis from general freight to bulk and intermodal services.	despite a significant amount of consolidation in the industry.
25	The Effect of Non-Rural Hospital Mergers and Acquisitions: An Examination of Cost and Price Outcomes	HR Spang and Richard Arnould	2009	d	U.S. Hospitals	H	Hospital consolidation generated efficiency gains in some circumstances.	Efficiency gains were very sensitive to hospital ownership and governance.	Some of these gains may be passed on to consumers, but the result is sensitive to the structure of the market following the consolidation.
26	Measuring Efficiency Gains from Hospital Mergers	James E. Groff, Donald Lie, and Jiwei Su	2007	c	U.S. Hospitals	H	In the data for one year after merger, 20% of non-merged hospitals and 37% of merged hospitals were classified as efficient. In the data for two years after merger, 17% of non-merged hospitals and over 64% of merged hospitals were classified as efficient.	The authors theorize the technical efficiency gains stemmed from elimination of duplicate services. This would allow hospitals to realize savings on personnel and capital expenses.	

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
27	The Impact of Mergers and Acquisitions on the Efficiency of the U.S. Banking Industry: Further Evidence	Adel A. Al-Sharkas, M. Kabir Hassan, and Shari Lawrence	2007	c	U.S. Banks	H	Bank mergers in general result in increased cost and profit efficiency.	Mergers seem to allow efficiency banks to gain control of weaker banks and increase input efficiency. Mergers may allow the banking industry to take advantage of opportunities created by improved technology.	
28	Cementing Relationships : Vertical Integration, Foreclosure, Productivity, and Prices	Ali Hortacsu and Chad Syverson	2007	a	U.S. Ready-Mixed Concrete	V	Vertical integration between cement and ready-mix concrete producers is predictive of lower prices and higher output, consistent with the theory that higher productivity firms are more likely to vertically integrate and are also larger and more likely to	Integrated producers' productivity advantage is tied to improved logistics coordination from large local concrete operations (i.e., from scale economies and the associated managerial talent/processes).	Larger scale operations also demonstrated higher productivity levels independent of vertical integration (i.e., horizontal consolidation was an exogenous variable that explained the efficiency of both vertically integrated firms and non-vertically

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							charge lower prices.		integrated firms).
29	Do Mergers Improve Hospital Productivity?	G.D. Ferrier and V.G. Valdmanis	2004	c	U.S. Hospitals	H	Merged hospitals performed better in simulated efficiency measures as compared to non-merged hospitals.		
30	The Union Pacific/Southern Pacific Rail Merger: A Retrospective on Merger Benefits	Denis A. Breen	2004	g	U.S. Railroads	H	Oversight hearings by the Surface Transportation Board revealed that the merger of Union Pacific and Southern Pacific resulted in expanded single-line services and improved routings, as well as increased capacity and capital investment by Union Pacific.		
31	Hospital Consolidation and Costs: Another Look at the Evidence	David Dranove and Richard Lindrooth	2003	d	U.S. Hospitals	H	The authors found significant, robust, and persistent cost savings for		

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							mergers 2-4 years after consolidation.		
32	The Effect of the Big Eight Accounting Firm Mergers on the Market for Audit Services	Mary W. Sullivan	2002	d	External Audit Services	H	The author found that "the big eight" auditing firm mergers led to cost reductions that benefitted relatively large audit buyers.	The mergers enabled constituent merging firms to combine their staffs and complementary locations. This allowed merged firms to compete more effectively for large audit buyers.	
33	An Empirical Investigation of the Competitive Effects of Domestic Airline Alliances	Gustavo Bamberger	2001	b	U.S. Airline Code-Sharing Alliances	H	Airline alliances benefited consumers—average fares fell by about 5–7 percent.		
34	Hospital Merger and Savings for Consumers: Exploring New Evidence	HR Spang, GJ Bazzoli, RJ Arnould	2001	b	U.S. Hospitals	H	Non-merged hospitals had faster growth in costs and prices compared to merged hospitals.		The extent of cost savings varied based on market and hospital conditions.
35	Vertical Integration, Market Foreclosure, and	Tasneem Chipty	2001	e	U.S. Television	V	Vertical integration between cable system operators and program	Integrated operators can carry their own programming at lower cost; they	There is evidence of foreclosure, but efficiency gains tend to

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
	Consumer Welfare in the Cable Television Industry						services results in efficiency gains.	are better at promoting their services and offer more of their integrated services at lower prices (consistent with the elimination of double marginalization).	offset the welfare effects from foreclosure.
36	The Market for Corporate Assets: Who Engages in Mergers and Asset Sales and Are There Efficiency Gains?	Vojislav Maksimovic and Gordon Phillips	2001	a	U.S. Manufacturing	n/a	Full-firm sales and mergers result in significant "total factor productivity" gains when buyers add capacity to their main divisions. Partial-firm asset sales result in significant productivity gains when the seller sells from its peripheral divisions (rather than their main divisions).	Assets increase in productivity when the productivity of the buying firm is higher than the productivity of the assets purchased. The results are consistent with more skilled firms buying less skilled firms and being able to transfer skill to improve use of the assets they purchase.	Gains in productivity are positively related to the seller's size. Otherwise, firm characteristics are not predictive of gains in productivity.
37	Consolidation in the Medical Care Marketplace, A Case Study	Jason Barro and David M. Cutler	2000	d	Massachusetts Hospitals	H	Two of the five mergers studied show some positive effect on cost.		

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
	from Massachusetts								
38	Paths to Creating Value in Pharmaceutical Mergers	David J. Ravenscraft and William F. Long	2000	g	Pharma-ceuticals	H	Glaxo's 1995 hostile acquisition of Burroghs Welcomme reduced costs and resulted in product improvements.	Cost savings stem from economies of scale or scope, reduction of excess capacity, and elimination of inefficiencies. Revenue enhancement resulted from expanded global reach, broader product lines, expanded application of current and future technology, and sharing skill, information, and best practices.	
39	The Effects of Market Concentration and Horizontal Mergers on Hospital Costs and Prices	Robert A. Connor, Roger D. Feldman, and Bryan E. Dowd	1998	b & e	U.S. Hospitals	H	Measuring the operating costs per admission at over 3,500 U.S. short-term general hospitals from 1986-1994 shows that horizontal mergers produced an	Cost savings were generally greater for mergers of similar-size hospitals, with a higher degree of duplicative services, and with lower pre-	

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							average cost savings of approximately 5%.	merger occupancy rates.	
40	The Effects of Megamergers on Efficiency and Prices: Evidence from a Bank Profit Function	Jalal D. Akhavein, Allen N. Berger, and David B. Humphrey	1997	c	U.S. Banks	H	Merged banks experience an average increase of profit efficiency of 16%	Most of the improvement is from increasing revenues, including a shift in outputs from securities to loans.	
41	United States Steel's Acquisition of the Great Northern Ore Properties: Vertical Foreclosure or Efficient Contractual Governance?	Joseph C. Mullin and Wallace P. Mullin	1997	g	U.S. Steel	V	Applying the Eckbo-Stillman stock price event-study methodology and directly observing historical indicators of performance after a steel manufacturer's acquisition of iron ore properties in 1906, evidence suggests that vertical integration generated a net efficiency gain.	The vertical acquisition promoted relationship-specific investment in the exploitation of the iron ore properties.	Customers (the railroads) have a significant positive excess stock return, suggestive of welfare gains to consumers.
42	The Short-Term Effect of Merger on	JA Alexander,	1996	d	U.S. Hospitals	H	Preexisting trends towards inefficiency	Pre-existing trends in the decline of	

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
	Hospital Operations	MT Halpern, and SY Lee					were halted after mergers.	occupancy rates were curtailed after mergers.	
43	On Productivity and Plant Ownership Change: New Evidence from the Longitudinal Research Database	Robert H. McGuckin and Sang V. Nguyen	1995	a	U.S. Manufacturing	n/a	Manufacturing plants that transferred ownership during the 1977-1982 period experienced improvement in productivity performance.	Plants with high productivity were the most likely to experience ownership change, suggesting that gains from synergies between the buying and selling firms are the most important motive for ownership change.	The managerial-discipline theory on low-performing assets was not observable for most ownership changes, though it could explain the fate of large plants that have low productivity, which tended to be purchased rather than closed.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
44	Case Studies of the Price Effects of Horizontal Mergers	Laurence Schumann, Robert P. Rogers, and James D. Reitzes	1992	g	1. Corrugating Medium Paperboard	V	Once FTC imposed hold-separate order expired, vertical efficiencies resulted in decrease in prices for medium cardboard boxes.		
					2. Cement Production in Hawaii	H	Price of cement in Hawaii declined following merger.		
45	Productivity and Changes in Ownership of Manufacturing Plants	Frank R. Lichtenberg and Donald Siegel	1987	a	U.S. Manufacturing	n/a	About 21% of over 18,000 relatively large plants changed owners at least once during a ten-year period. Plants involved in one or more changes of ownership experienced 0.56% higher "total factor productivity" growth than their industry counterparts who remained with the same	Supports the "matching" theory of ownership change: a firm lacking a comparative advantage with respect to a given plant will sell it to another corporation, leading on average to an improvement in the plant's economic performance.	Low levels of efficiency increase the likelihood of ownership change. It appears to take several years for a new parent to have a significant influence on performance.

Study Number	Title	Authors	Year Published	Method Category	Market/ Industry	Horizontal or Vertical?	Description of Efficiency Gains	Explanation for the realization of gains?	Description of Other Findings
							parent corporation.		

III. Takeaways from the Merger Efficiency Evidence

A wide and varied range of empirical work observes the realization of efficiencies from mergers. The most important takeaway from this compendium of sources, therefore, is that there is no reason to doubt the once-settled wisdom underpinning the basic framework for merger review: mergers are considered a legitimate means to advance procompetitive business objectives unless there is evidence that the unilateral, coordinated, or vertical effects of the merger will cause quality-adjusted prices to increase or innovation to decrease.

Many of the studies here attempt to explain *when* or *why* mergers result in performance improvements. In some sense, that result would be the panacea because it would tell business managers when they should buy, rather than borrow or build, certain assets to advance their strategic growth plans. Unfortunately, the research is largely inconclusive.[36] However, several studies have results consistent with the explanation that better managed firms can acquire assets from underperforming firms and bring those assets up to the acquiring firm's level of performance. For a detailed discussion of this effect and the evidence corroborating it, we recommend Boyan Jovanovic and Peter L. Rousseau's paper from the American Economic Review in May 2002.[37] These results may give enforcers particular comfort when reviewing the acquisitions of firms with low levels of productivity.

We did not observe any robust evidence that certain types of mergers are especially *unlikely* to result in efficiencies.[38] Rather, we saw evidence of mergers leading to efficiencies in a wide range of industries, including for both goods and services, and for both highly commoditized products and highly differentiated products. For this reason, there is no empirically supported reason to alter our enforcers' case-by-case approach to analyzing efficiencies that decision-makers predict in any given merger. Moreover, there is no reason for courts to change their assumption that business managers, who are closest to the industry in question, are best placed to judge which strategy—build, borrow, or buy—will best improve firm performance.[39] As the Supreme Court

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[36] Equally inconclusive is the body of research trying to forecast the determinants of financial success for firms subject to M&A. *See supra* note 29.

[37] *See* Boyan Jovanovic & Peter L. Rousseau, *The Q Theory of Mergers*, 92 Am. Econ. Rev. 198 (2002).

[38] Although there is a large body of research on price effects, and stock price effects from mergers, most are extremely methodologically flawed and, in any event, do not even attempt to disprove efficiencies. Rather, findings of price increases after a merger usually claim to prove only that anticompetitive effects pre-dominated, and that enforcers should have acted to stop the particular merger in question. There is more to learn here from identifying predictors of the plaintiff's prima facie case than there is to learn about the possibility of achieving efficiencies. One notable exception is the case study approach in DAVID J. RAVENSCRAFT & F.M. SCHERER, MERGERS, SELL-OFFS, & ECONOMIC EFFICIENCY (1987). The authors conclude that the mergers they observed did not tend to lead to performance improvements, though they found performance improvements in some cases. Commentators have viewed this study, performed on a large dataset collected by the FTC and supplemented with interviews, as reaching conclusions that are idiosyncratic to the wave of conglomerate mergers completed in the 1960s. It nevertheless provides a model for the type of 6(b) study that could be useful for specific industries undergoing consolidation in the future.

[39] For a strategy-focused discussion on factors that might support buying rather than building or buying, *see* LAURENCE CAPRON & WILL MITCHELL, BUILD, BORROW, OR BUY: SOLVING THE GROWTH DILEMMA (2012) (explaining that buying may be the strategically optimal choice if existing internal resource have low relevance, the

explained in *NCAA v. Alston*, "antitrust law does not require businesses to use anything like the least restrictive means of achieving legitimate business purposes. To the contrary, courts should not second-guess 'degrees of reasonable necessity' so that 'the lawfulness of conduct turn[s] upon judgments of degrees of efficiency."[40]

IV. Limitations of the Merger Efficiency Evidence

One obvious limitation in the literature is the relatively small number of industries where data are available to measure the costs and quantity of inputs and outputs . The best data of this kind tend to come from the most highly regulated industries, like banking, healthcare, and rail, where those data are recorded for purposes of regulatory functions. We worry this could lead to a sense that regulation is a necessary pre-condition for efficiency-enhancing M&A, or that claims of likely performance improvements in non-regulated industries are not verifiable. One notable exception is the Census of Manufactures, which collects high quality data that have allowed researchers to calculate performance improvements in the use of assets to make more output when plants changed owners.

We think one critical learning from our effort to catalogue merger efficiency evidence is that the FTC has a unique power to collect data that would significantly improve the state of the research. Privately held data are necessary to test specific hypotheses about when mergers tend to lead to productive efficiencies, so the FTC's Section 6(b) power makes it uniquely qualified to clarify the empirical record in ways that private researchers have struggled to do. If the FTC has a specific hypothesis about how theorized merger efficiencies are likely to play out in the real world, it can test that hypothesis by collecting a time series of data on inputs and outputs in an industry and doing a difference-in-differences analysis after firms, in the ordinary course, decide to merge. Until that time, the obvious difficulties in measuring performance controlling for all relevant variables explain the relative dearth of evidence in this field, and should not be used as a policy argument to assume away the existence of efficiencies.

V. Conclusion

The research we have collected here tends to undermine the basis for generalized skepticism of merger efficiencies. Additionally, Neo-Brandeisian claims that more industries are more concentrated now than they were 40 years ago, even if accurate on their own terms, are not a sufficient basis to condemn the performance of antitrust enforcers.[41] Rather, as the research shows, increased concentration can mean better firm performance and better outcomes for consumers. Indeed, the destruction of inefficient firms (sometimes accompanied by the acquisition of their

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needed resource is difficult to trade or has principal-agent problems, and the resource must be closely integrated with other aspects of the business to achieve the growth strategy).

[40] NCAA v. Alston, No. 20-512, slip op. at 26 (S. Ct. Jun. 21, 2021) (quoting Rothery Storage & Van Co. v. Atlas Van Lines, Inc., 792 F.2d 210, 227 (D.C. Cir. 1986); Continental T.V., Inc. v. GTE Sylvania Inc., 433 U. S. 36, 58, n. 29 (1977)).

[41] *See* Kobayashi & Muris, *supra* note 22.

assets) is a fundamental part of the process of competition, which necessarily leads to consolidation as those who compete most strongly on the merits win out.

Though high-quality empirical evidence of mergers leading to improved performance is limited (relative to the huge number of mergers in the past 40 years), it exists for many industries where the necessary data were available to researchers. For industries or specific mergers with more limited data tracking, researchers have at least provided useful proxies for efficiency gains, again confirming the theoretical work modeling how consolidation can lead to welfare gains.

We should therefore reject the policy prescription that merger review be drastically altered to assume no gains from mergers, or to place the initial burden of proof on the parties to justify their merger strategy. The agencies should, as they have in the past, make enforcement decisions taking into account the likelihood of efficiencies in any particular case.[42] Moreover, as empirical evidence of explanatory factors for merger efficiencies improves, so will the ability of business leaders to select and pursue the most efficient mergers.

APPENDIX

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