Evaluating the Evidence on Vertical Mergers

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I. INTRODUCTION

The Agencies' issuance of draft Vertical Merger Guidelines for public comment is a welcome development.[1] Some commenters assert that vertical mergers are relatively harmless. They often rely heavily on surveys of the empirical economic literature as justification for a procompetitive presumption for vertical mergers.[2] For example, Wong-Ervin states: "The generally accepted belief underlying modern antitrust analysis of vertical mergers … has been that they are generally procompetitive or neutral. This belief is supported by a significant body of empirical evidence."[3] Similarly, Wright et al. conclude: "Thus, **the modern antitrust approach to vertical mergers, as reflected in the antitrust literature, should reflect the empirical reality that vertical relationships are generally procompetitive or neutral**."[4] O'Brien says: "With few exceptions, the literature does not support the view that these [resale

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[1] U.S. Dep't of Justice & Fed. Trade Comm'n, *Draft Vertical Merger Guidelines*, Released for Public Comment (Jan. 10, 2020), https://www.ftc.gov/system/files/documents/public_statements/1561715/p810034verticalmergerguidelinesdraft.pdf.

[2] *See, e.g.,* Koren W. Wong-Ervin, *Antitrust Analysis of Vertical Mergers: Recent Developments and Economic Teachings*, 18 ANTITRUST SOURCE 1 (2019); Tad Lipsky, Joshua Wright, Douglas Ginsburg, John Yun, *DOJ/FTC Draft 2020 Vertical Merger Guidelines Comment of the Global Antitrust Institute, Antonin Scalia Law School, George Mason University*, George Mason Law & Econ. Research Paper No. 20-03 (Feb. 7, 2020) [hereinafter GAI Comment], https://www.law.gmu.edu/pubs/papers/doj_ftc_draft_2020_vertical_merger_guidelines_comment_of_the_global_antitrust_institute.

[3] Wong-Ervin, *supra* note 2, at 1.

[4] Joshua D. Wright, Douglas H. Ginsburg, Tad Lipsky, & John M. Yun, *Connecting Vertical Merger Guidelines to Sound Economics*, Truth on the Market Blog (Feb. 6, 2020), https://truthonthemarket.com/2020/02/06/wright-vmg-symposium/ (emphasis in original).

price maintenance, exclusive territories, vertical integration and nonlinear contracting] practices are used for anticompetitive reasons."[5]

Our comment explains why, even if in practice we observe many benign and procompetitive vertical mergers, the claims of supporting empirical evidence in these quotations are simply incorrect.[6] We demonstrate below that the empirical evidence evaluated in these articles does *not* show that vertical mergers are generally procompetitive, or generally anticompetitive. We encourage the Agencies to design Vertical Merger Guidelines to reflect empirical reality. However, in our view the economic literature demonstrates a variety of effects of vertical integration, including foreclosure and efficiencies, that justify examining vertical transactions on their merits rather than making general assumptions about their competitive effects. This finding has direct implications for the Agencies' design of presumptions and safe harbors.

First, the assertion that vertical mergers are "generally" benign requires some notion of a population: which group of mergers do the authors consider and what proportion of that group is benign? There is substantial heterogeneity in structure and competitive effects across transactions and a lack of empirical information on the prevalence of each type. These issues are not addressed, as far as we know, by commenters who make the claim that vertical mergers are "generally procompetitive." We readily agree that *many* vertical mergers are harmless or procompetitive, but that is a far weaker statement than presuming *every* or even *most* vertical mergers benefit competition regardless of market structure. Second, the quotations above give the impression that there are many academic studies evaluating the welfare effects of vertical mergers and the vast majority find that mergers increase social welfare. This is not the case, as we discuss below.

In this comment, we review two frequently cited surveys of empirical evidence on vertical integration as of 2005–2007,[7] as well as more recent studies not included in those surveys, to determine the extent to which they find that the vertical integration they study was procompetitive or anticompetitive.[8] Upon careful inspection, the evidence they provide on the change in welfare due to vertical mergers is decidedly mixed. Perhaps more importantly, taken

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[5] Daniel O'Brien, *The Antitrust Treatment of Vertical Restraints: Beyond the Possibility Theorems*, in THE PROS AND CONS OF VERTICAL RESTRAINTS 40, 76 (2008).

[6] Professor Scott Morton has also provided more comprehensive comments on the draft guidelines in her joint submission with Jonathan B. Baker, Nancy L. Rose, and Steven C. Salop.

[7] James C. Cooper, Luke M. Froeb, Dan O'Brien, & Michael G. Vita, *Vertical Antitrust Policy as a Problem of Inference*, 23 INT'L J. INDUS. ORG. 639 (2005); Francine Lafontaine & Margaret Slade, *Vertical Integration and Firm Boundaries: The Evidence*, 45 J. ECON. LIT. 629 (2007).

[8] Some of these studies are referenced by the GAI Comment, some were referenced by Baker et al., and some were referenced by Salop. *See* GAI Comment, *supra* note 2, at 13; Jonathan B. Baker, Nancy L. Rose, Steven C. Salop, & Fiona Scott Morton, *Five Principles for Vertical Merger Enforcement Policy*, 33 ANTITRUST 12, n. 38, 45 (2019); Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1962, n. 103 (2018).

as a whole, these studies do not provide evidence for the proposition that all or most vertical mergers are good for consumers.

In our review of the literature, we find that, due to the questions posed by the authors or tools used to address the authors' hypotheses, many studies *cannot determine* the net effect of the vertical integration on welfare. Even setting aside any methodological issues and the fact that most studies do not attempt to conduct a full welfare analysis, the suggestive evidence is mixed. For example, of the 17 more recent studies that were not covered by the surveys published during 2005–2007, 11 find some evidence of harm to consumers or competition from vertical integration and 9 find some evidence of benefits from vertical integration. We do not view these results as providing any support for the proposition that vertical mergers are usually procompetitive, nor that they are usually anticompetitive. Rather, the effects of a vertical merger will depend on the specifics of the transaction and markets at issue, and are worth carefully investigating when the transaction and market characteristics indicate a potential for harms to outweigh benefits.

Before discussing the literature, it is important to make it clear that a survey of the empirical studies on vertical integration does not provide an unbiased assessment for determining, as a matter of policy, whether vertical mergers in general should be presumed to be procompetitive or anticompetitive. First, the ability to conduct an empirical study depends critically on the availability of data, so the literature tends to be concentrated on studying a few industries where good data are available. These industries are often ones that are relatively competitive (e.g., fast food), which may make findings hard to apply in more concentrated markets, or have complex structures and regulations that may make generalizations to other industries difficult (e.g., gasoline, cable television, healthcare). Second, each study attempts to test a particular hypothesis or factor of interest to its author(s), and often that hypothesis is not whether social welfare increased or decreased. So, while these studies may shed light on particular incentives or effects of vertical integration, and in fact do provide evidence of both harms and efficiencies occurring, they do not provide an unbiased sample of welfare effects to use in policy discussions.

Finally, the extent of vertical integration in particular industries and the mergers that have occurred, and are therefore available to be studied, are not exogenous. The transactions (or business forms) included in an empirical study are influenced by the enforcement policy at the time they were undertaken (or created). We would expect a different enforcement regime to generate a different set of vertical transactions. For example, suppose current antitrust policy deters the worst cases of anticompetitive conduct, so that consummated mergers are comprised of slightly anticompetitive as well as procompetitive transactions. An empirical study of actual mergers would tend to find benefits from vertical integration. But this finding would

significantly underestimate the harm that would occur if more lenient antitrust rules permitted the more anticompetitive transactions to be carried out.[9]

Retrospective studies without a model of the choice to merge cannot be used to justify a change in enforcement that would be expected to alter the number and type of vertical mergers. The general lack of attention to the endogeneity of transactions when applying the results of the empirical literature on vertical mergers to proposed policy is regrettable.[10] While the notion of equilibrium is sophisticated to be sure, it is a fundamental concept in the field of economics, and therefore should be incorporated into the analysis of economist authors contributing to policy in the antitrust area.

II. THE EARLIER STUDIES

A survey article by Cooper et al., published in 2005, and another survey by Lafontaine and Slade, published in 2007, are often cited for the claim that vertical mergers are generally procompetitive.[11] These surveys report benefits but little evidence of harms from vertical mergers. However, on closer inspection using the tools of modern economics, the evidence is both mixed and limited.[12]

These two surveys analyzed some studies of vertical integration or vertical mergers and other studies of vertical restraints implemented through contractual provisions (e.g., exclusive dealing or resale price maintenance) or conduct not related to merger activity. The vertical restraints and other non-merger conduct are not included in the Vertical Mergers Guidelines. For the purpose of this review, we focus on the thirty-one studies that assess the consequences of vertical

[9] *See* Jonathan B. Baker, *Taking the Error Out of "Error Cost" Analysis: What's Wrong with Antitrust's Right*, 80 ANTITRUST L.J. 1, 19–22 (2015).

[10] Many published evaluations of vertical mergers and vertical relationships conclude with statements summarizing past transactions and without making a direct link to a change in policy. Nonetheless, these results are often used in a policy context—on panels, or in speeches, or in footnotes as evidence—to justify a lessening of enforcement of vertical mergers.

[11] Cooper et al., *supra* note 7; Lafontaine & Slade, *supra* note 7. The authors of the second survey have another paper that is often cited as part of the discussion of benefits of vertical relationships. *See* Francine Lafontaine & Margaret Slade, *Exclusive Contracts and Vertical Restraints: Empirical Evidence and Public Policy*, in HANDBOOK OF ANTITRUST ECONOMICS 391 (Paolo Buccirossi ed., 2008). It focuses on non-merger-related vertical restraints—such as resale price maintenance, exclusive dealing, exclusive territories, quantity forcing and tying—for which the Vertical Merger Guidelines would not apply. *Id.* at 392.

[12] In fact, one of the authors of one survey, Margaret Slade, observed at the FTC Hearing that the results of the studies of vertical mergers were mixed and the set of industries studied was narrow. *See* FTC Hearing #5: Vertical Merger Analysis and the Role of the Consumer Welfare Standard in U.S. Antitrust Law, at 51 (Nov. 1, 2018), https://www.ftc.gov/system/files/documents/public_events/1415284/ftc_hearings_session_5_transcript_11-1-18_0.pdf (The transcript records the word "fixed" when the speaker actually said "mixed.").

integration on various economic outcomes, such as prices or profits.[13] While we do not discuss the studies of vertical restraints, a finding that vertical restraints adopted through contracts (rather than mergers) achieve efficiency benefits might suggest that those efficiencies are not merger specific.

It is important to appreciate the context of the underlying research before applying it to merger policy. In fact, Margaret Slade, one of the survey authors, has advocated caution in using these studies for antitrust policy. She explained that the industries studied are often competitive, the studied benefits cannot always be achieved through merger, and the empirical methods often test for only costs or benefits instead of examining the tradeoffs between the conflicting effects.[14]

In addition, research on vertical integration often faces significant empirical challenges. For example, vertical integration decisions are often endogenous and separating foreclosure from efficiencies may require a model of consumer demand. Looking at the methodologies used and settings evaluated in these earlier studies, we find limits to the conclusions that can be drawn from them for the purpose of making merger policy recommendations.

First, two of the studies surveyed in these articles were purely descriptive and do not contain any econometric analysis.[15] These studies do not quantify changes in welfare.

Second, six of the articles were stock market event studies or analyzed other measures related to the stock market, such as stock ratings or systematic risk.[16] Stock market outcomes cannot

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[13] Specifically, we start with the 30 (after removing duplicates) studies in Tables 15–17 of the survey by Lafontaine and Slade. *See* Lafontaine & Slade, *supra* note 7, at 672–676. This survey also reviews numerous other studies in Tables 1–14 concerned with explaining the incidence, rather than the consequences, of vertical integration. Those studies are excluded from the following discussion. *See* Lafontaine & Slade, *supra* note 7, at 671 ("The research reported in tables 1–14 is devoted to an assessment of the incidence of vertical integration. In other words, the variable that is explained in most studies is a measure of whether a transaction takes place (or has a tendency to take place in more aggregate studies) inside a firm or in a market. The research that is reported in tables 15–17, in contrast, assesses consequences."). We then consider Table 1 of the survey by Cooper et al., which covers all studies reviewed by those authors, including analyses of both vertical integration and vertical restraints. *See* Cooper et al., *supra* note 7, at 648 ("In Table 1 we summarize existing empirical studies of vertical integration and vertical restraints.") After removing studies that duplicate those in Lafontaine & Slade, *supra* note 7, Tables 15–17 or concern restraints other than full integration (e.g., partial ownership, exclusive dealing, resale price maintenance, exclusive territories, etc.), we arrive at 31 total studies.

[14] Margaret E. Slade, *Vertical Mergers: A Survey of Ex Post Evidence and Ex Ante Evaluation Methods*, Working Paper, at 4 (Jan. 2020), https://econ2017.sites.olt.ubc.ca/files/2020/02/pdf_paper_Slade-Margaret_Vertical_Mergers.pdf.

[15] Bruce T. Allen, *Vertical Integration and Market Foreclosure: The Case of Cement and Concrete*, 14 J.L. & ECON 251 (1971); David Reiffen & Andrew N. Kleit, Terminal Railroad Revisited: Foreclosure of an Essential Facility or Simple Horizontal Monopoly? 33 J.L. & ECON 419 (1990).

[16] Kenneth Edwards, John D. Jackson, & Henry L. Thompson, *A Note on Vertical Integration and Stock Ratings of Oil Companies in the U.S.*, 21 ENERGY J. 145 (2000); Constance E. Helfat & David J. Teece, *Vertical Integration and Risk Reduction*, 3 J.L. ECON. & ORG. 47 (1987); Joseph C. Mullin & Wallace R Mullin, *United States Steel's Acquisition of the Great Northern Ore Properties: Vertical Foreclosure or*

necessarily determine the competitive effects from a standard vertical merger because they may be the same for the hypotheses the researcher wishes to distinguish.[17] A merged firm with lower costs would cause the unintegrated rival's stock price to fall, as would a merged firm engaging in foreclosure. Stock market studies also do not account for investor expectations about, for example, potential future transactions and Agency enforcement decisions that could bias results.

Third, four of the articles involved markets where state laws prohibited vertical integration to benefit local retailers.[18] This fact limits their value in forming presumptions about markets where vertical mergers might be used to maintain or enhance market power.

Fourth, eight of the articles are cross-sectional studies that exploit differences in organizational structure across firms.[19] There are two inherent issues with cross-sectional studies. First, firms that are vertically integrated are not randomly selected, so there could be another, unobservable factor causing both the differences in firm structure and in the outcome variable.[20] Second, it can

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Efficient Contractual Governance? 13 J.L. ECON. & ORG. 74 (1997); Eric S. Rosengren & James W. Meehan, Jr., *Empirical Evidence on Vertical Foreclosure*, 32 ECON. INQUIRY 303 (1994); Christopher M. Snyder, *Vertical Integration for Efficiency or Market Power? Event Studies of the U.S. Oil Industry*, Working Paper (1996); Pablo T. Spiller, *On Vertical Mergers*, 1 J.L. ECON. & ORG. 285 (1985).

[17] The authors of one of the surveys, Lafontaine and Slade, also express concerns about the ability of event studies to distinguish between procompetitive and anticompetitive effects. *See* Lafontaine & Slade, *supra* note 7, at 670 ("Indeed, a vertical merger can harm downstream rivals either because it lowers the integrated firm's costs (an efficient merger) or because it raises unintegrated costs due to foreclosure (an anticompetitive merger). One remedy is to look at share-price effects for buyers of the downstream product …. However, in many contexts, this effect can be far removed and is apt to be quite weak.").

[18] John M. Barron & John R. Umbeck, *The Effects of Different Contractual Arrangements: The Case of Retail Gasoline Markets*, 27 J.L. & ECON 313 (1984); Asher A. Blass & Dennis W. Carlton, *The Choice of Organizational Form in Gasoline Retailing and the Cost of Laws That Limit That Choice*, 44 J.L. ECON. & ORG. 511 (2001); Margaret E. Slade, *Beer and the Tie: Did Divestiture of Brewer Owned Public Houses Lead to Higher Beer Prices?* 108 ECON. J. 565 (1998); Michael G. Vita, *Regulatory Restrictions on Vertical Integration and Control: The Competitive Impact of Gasoline Divorcement Policies*, 18 J. REGULATORY ECON. 217 (2000).

[19] Erin Anderson, *Transaction Costs as Determinants of Opportunism in Integrated and Independent Sales Forces*, 9 J. ECON. BEHAVIOR & ORG. 247 (1988); Tasneem Chipty, *Vertical Integration, Market Foreclosure, and Consumer Welfare in the Cable Television Industry*, 91 AM. ECON. REV. 428 (2001); Kenneth S. Corts, *The Strategic Effects of Vertical Market Structure: Common Agency and Divisionalization in the US Motion Picture Industry*, 10 J. ECON. & MGMT. STRATEGY 509 (2001); George S. Ford & John D. Jackson, *Horizontal Concentration and Vertical Integration in the Cable Television Industry*, 12 REV. INDUS. ORG. 501 (1997); Ricard Gil, *Revenue Sharing Distortions and Vertical Integration in the Movie Industry*, 25 J.L. ECON. & ORG. 579 (2008); Kathryn Graddy, *Do Fast-Food Chains Price Discriminate on the Race and Income Characteristics of an Area?* 15 J. BUS. & ECON. STATISTICS 391 (1997); Andrea Shepard, *Contractual Form, Retail Price, and Asset Characteristics in Gasoline Retailing*, 24 RAND J. ECON. 58 (1993); David Waterman & Andrew A. Weiss, *The Effects of Vertical Integration Between Cable Television Systems and Pay Cable Networks*, 72 J. ECONOMETRICS 357 (1996).

[20] The authors of the survey also note endogeneity issues in these studies. *See* Lafontaine & Slade, *supra* note 7, at 668 ("Unfortunately, in many of the empirical contributions discussed below, researchers did

be difficult to distinguish foreclosure and efficiency effects. For example, a finding that the vertically integrated firms have lower prices compared to non-vertically integrated firms could be the result of either efficiencies that lower the vertically integrated firms' prices or foreclosure that raises unintegrated rivals' costs.

We note that two of these cross-sectional studies use instrumental variables in their regressions evaluating vertical integration by cable television distributors into content and find mixed evidence of both harms and benefits. Chipty has a cross-sectional study that finds evidence of both customer foreclosure and efficiencies.[21] She also estimates a demand system using an instrumental-variable specification to determine the net effect of vertical integration and finds a positive, but statistically insignificant, effect on consumer surplus. Ford and Jackson offer evidence that vertical integration decreases programming costs but increases subscriber fees.[22] Using a partial equilibrium analysis that assumes various restrictions on demand and costs, they derive a 60-cent annual reduction in social welfare per subscriber due to vertical integration.

Finally, the remaining eleven studies use panel regressions. While observing changes in vertical integration (e.g., due to a merger) can provide useful variation for identifying effects, in our opinion, the majority (seven) of the eleven panel-regression studies do not have clear welfare implications. According to Lafontaine and Slade, two have results that are statistically insignificant, at least under certain specifications.[23] Hortaçsu and Syverson find that, consistent with efficiencies, vertical integration is associated with lower prices and higher volumes in markets for ready-mixed concrete.[24] However, they also find that these efficiencies are not attributable to the vertical structures but rather to downstream size, as vertical integration was also associated with horizontal concentration in the downstream market. Mullainathan and Scharfstein find that capacity at vertically integrated chemical manufacturers is less sensitive to downstream consumption than that of non-integrated producers, but they do not translate

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not have access to panel data. They then … more times than not, … used a cross-sectional data set to exploit the variation in organizational form across firms. … [I]n purely cross-sectional data, the set of firms that are vertically integrated and those that are not are not random draws from an underlying population.").

[21] Chipty, *supra* note 19.

[22] Ford & Jackson, *supra* note 19.

[23] See Lafontaine & Slade, *supra* note 7, at 674 (noting that "the introduction of time trends in the regressions renders effects documented [by McBride] insignificant" and denoting that Shelton's results are insignificant at 5 percent using a two-tailed test); Mark E. McBride, *Spatial Competition and Vertical Integration: Cement and Concrete Revisited*, 73 AM. ECON. REV. 1011 (1983); John P. Shelton. *Allocative Efficiency vs. "XEfficiency": Comment*, 57 AM. ECON. REV. 1252 (1967).

[24] Ali Hortaçsu & Chad Syverson, *Cementing Relationships: Vertical Integration, Foreclosure, Productivity, and Prices*, 115 J. POL. ECON. 250 (2007).

differences in sensitivity to differences in welfare.[25] Levin finds no significant relationship between the degree of profitability and the degree of integration between crude oil production and refining; he finds "weak evidence" that vertical integration decreases the variability of profits.[26] Jin and Leslie report evidence that franchised restaurants free ride off the reputation of the chain; specifically, they find that company-owned locations have higher health scores than franchised locations, but this difference goes away in the presence of posted grade cards.[27] Hastings estimates that ARCO's acquisition of Thrifty Oil Company increased retail gasoline prices by five cents per gallon at competing stations.[28] However, she also finds no significant impact on competitor prices from whether a Thrifty station was converted to a company-owned or dealer-operated ARCO station, suggesting no incremental efficiencies or harms from the vertical integration.

Thus, out of thirty-one studies, we are left with four panel-regression studies, one of which offers evidence of harm and the other three of which offer evidence of benefits.[29] Hastings and Gilbert offer evidence consistent with vertical integration leading to higher wholesale prices charged to competitors.[30] Muris et al. report a decrease in Pepsi prices after Pepsi bottler acquisitions.[31] They also look at cross-sectional differences in bottler ownership and find that prices of competitor Pepsi (Coke) products are lower in markets with a company-owned Coke (Pepsi)

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[25] Sendhil Mullainathan & David Scharfstein, *Do Firm Boundaries Matter?* 91 AEA PAPERS & PROCEEDINGS 195 (2001).

[26] Richard C. Levin, *Vertical Integration and Profitability in the Oil Industry*, 2 J. ECON. BEHAVIOR & ORG. 215 (1981).

[27] Ginger Zhe Jin & Phillip Leslie, *Reputational Incentives for Restaurant Hygiene*, 1 AMER. ECON. J.: MICROECON. 237 (2009).

[28] Justine S. Hastings, *Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California*, 94 AM. ECON. REV. 317 (2004). As discussed in the next section, a later study by Taylor et al. found a price increase from the same transaction, but it was much smaller in magnitude. Christopher T. Taylor, Nicholas M. Kreisle, & Paul R. Zimmerman, *Vertical Relationships and Competition in Retail Gasoline Markets: Empirical Evidence from Contract Changes in Southern California: Comment*, 100 AM. ECON. REV. 1269 (2010).

[29] We note that the surveys missed one older study on vertical integration among railroads. Grimm, Winston and Evans tested the single monopoly profit theory—that a monopolist has no additional market power to gain from foreclosure through vertical merger—and found it did not hold for railroad markets. Curtis M. Grimm, Clifford Winston, & Carol A. Evans, *Foreclosure of Railroad Markets: A Test of Chicago Leverage Theory*, 35 J.L. & ECON. 295 (1992). When the single monopoly profit theory does not hold, a vertical merger may provide an incentive to foreclose unintegrated competitors.

[30] Justine S. Hastings & Richard J. Gilbert, *Market Power, Vertical Integration and the Wholesale Price of Gasoline*, 53 J. INDUS. ECON. 469 (2005).

[31] Timothy J. Muris, David T. Scheffman, & Pablo T. Spiller, *Strategy and Transaction Costs: The Organization of Distribution in the Carbonated Soft Drink Industry*, 1 J. ECON. & MGMT. STRATEGY 83 (1992).

bottler.[32] Ciliberto finds an increase in investment in healthcare services associated with hospital-physician integration,[33] and Kerkvliet offers evidence of increased allocative and technical efficiency at vertically integrated electric plants.[34] These latter two studies do not test for potential foreclosure.

Overall, we find that the earlier literature suffers multiple limitations that make it difficult to draw clear conclusions on the expected welfare implications of vertical mergers.

III. MORE RECENT STUDIES

Additional literature taking advantage of more modern techniques has been produced since the surveys discussed above were published in 2005 and 2007. For example, the GAI Comment briefly surveys 12 studies of vertical integration published since 2009.[35] The authors summarize their findings as follows: "While vertical integration can certainly foreclose rivals in theory, there is only limited empirical evidence supporting that finding in real markets. The results continue to suggest that the modern antitrust approach to vertical mergers should reflect the empirical reality that vertical relationships are generally procompetitive or neutral."[36]

We have reviewed these articles, as well as five additional studies referenced by Baker et al. and Salop,[37] and reach different conclusions. Like the older studies, many of these articles suffer from issues of endogeneity or do not attempt to measure both the potential harms and the potential benefits, so they cannot balance these competing effects. Those articles that do consider both the costs and benefits of vertical integration tend to find effects in both directions.

In particular, the claim that the "empirical reality" in these more recent articles shows limited evidence of foreclosure *relative to* efficiencies in "real markets" is unfounded. The recent

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[32] The first result is consistent with the findings of a later study by Luco and Marshall, discussed in the next section. However, Luco and Marshall also find that acquired bottlers increase prices of rival soft drinks (not manufactured by the acquiring firm) that they bottle. *See* Fernando Luco & Guillermo Marshall, *The Competitive Impact of Vertical Integration by Multiproduct Firms*, Working Paper (Dec. 31, 2019), https://drive.google.com/file/d/1xUlZuBwpjHe2fw7JXdJ7bBNzik8EN5xL/view.

[33] Federico Ciliberto, *Does Organizational Form Affect Investment Decisions?* 54 J. INDUS. ECON. 63 (2006). As discussed in the next section, later studies have found integration between hospitals and physicians to be correlated with increased prices and spending. *See* Laurence C. Baker, M. Kate Bundorf, & Daniel P. Kessler, *Vertical Integration: Hospital Ownership of Physician Practices is Associated with Higher Prices and Spending*, 33 HEALTH AFF. 756 (2014); Thomas G. Koch, Brett W. Wendling, & Nathan E. Wilson, *How Vertical Integration Affects the Quantity and Cost of Care for Medicare Beneficiaries*, 52 J. HEALTH ECON. 19 (2017).

[34] Joe Kerkvliet, *Efficiency and Vertical Integration: The Case of Mine-Mouth Electric Generating Plants*, 39 J. INDUS. ECON. 467 (1991).

[35] GAI Comment, *supra* note 2.

[36] GAI Comment, *supra* note 2, at 14.

[37] Baker et al., *supra* note 8; Salop, *supra* note 8.

studies frequently find evidence of anticompetitive effects as well as procompetitive effects. In our judgment, there is not a pattern of one effect dominating the other, at least in this sample of transactions analyzed in the economics literature, which as we noted above is also not an unbiased sample and could be skewed in either direction. Instead, we believe the empirical evidence evaluated in these articles does *not* show that vertical mergers are generally procompetitive or generally anticompetitive. Rather, the relative magnitudes of harms and benefits from a vertical transaction will depend on the market structure and incentives.

In what follows, we describe the results of each of these 17 articles,[38] organized by the industries they study.

A. Gasoline

1. Taylor, Kreisle, & Zimmerman

Taylor, Kreisle and Zimmerman comment on the Hastings article in the earlier surveys that studied the acquisition of Thrifty Oil Company, an independent gasoline retailer in Southern California, by ARCO, a vertically integrated retailer and refiner.[39] As described above, Hastings found that the acquisition increased retail gasoline prices by five cents per gallon at competing stations (those within one mile of an acquired station), but that there was no significant impact on competitor prices from whether a Thrifty station was converted to a company-owned or dealer-operated ARCO station.

Taylor, Kreisle and Zimmerman attempt to replicate Hastings' first result using a different data set, from OPIS. The OPIS data also cover station-level gas prices, but the distribution of stations sampled differs from that used by Hastings. Neither data set is representative of the true underlying distribution (according the California Energy Commission), but Hastings' sample comes closer.[40] Following Hastings' difference-in-differences specification, Taylor, Kreisle and Zimmerman find a price increase of only 0.4 cents per gallon at competing stations, much lower than Hastings' estimate of 5 cents per gallon. They also try exploiting the higher frequency of data from OPIS and find a price increase of 0.5 to 0.7 cents per gallon.

[38] This sample of studies is not intended to be an exhaustive list of every relevant article written since the earlier surveys were published in 2005–2007. Nonetheless, the number of articles that find evidence of harm and benefits from vertical mergers suggests it would not be correct to interpret the economic literature as supporting a viewpoint that vertical mergers are predominantly procompetitive or anticompetitive.

[39] Taylor et al., *supra* note 28; Hastings, *supra* note 28.

[40] *See* Taylor et al., *supra* note 28, at Table 1.

The authors characterize these price increases as having "little economic significance."[41] The GAI Comment changes the conclusion to "no economic significance,"[42] which seems inconsistent with the way the GAI Comment classifies other articles by taking them at their face value (in this case, a negative). While Taylor, Kreisle and Zimmerman's results were weaker than Hasting's, they should be read in conjunction with Hastings' original results. However, we note that Taylor, Kreisle and Zimmerman did not attempt to replicate Hasting's results on conversions to company-owned versus dealer-operated ARCO stations or distinguish the effects of changes in gasoline brand, which consumers might view as a somewhat different product, from changes in the vertical structure.[43]

2. Austin

Austin studies vertical integration between retail gasoline stations and oil companies.[44] This paper employs two empirical strategies to measure the effect of vertical integration on retail gasoline prices. First, it uses cross-sectional variation in daily prices in a "large regional U.S. market" from 1999 to 2006, while controlling for number of competitors within a quarter mile, local population, and fraction of the local population commuting less than one-half hour to work.[45] Second, it uses a station-fixed-effect regression to exploit variation in pricing at stations that switched to being vertically integrated. Both regressions find that vertical integration decreases prices.

However, the paper does not consider typical incentives to raise rivals' costs. Instead, the paper hypothesizes that incentives for vertically integrated stations to raise price come from a reduction in competition among same-brand stations. In other words, the primary mechanism of harm explored by this study is *horizontal* in nature, not vertical: the fact that oil companies own multiple retail gasoline stations might soften horizontal price competition among those commonly owned stations.[46] In addition, the author only has data on vertical integration for a

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[41] *Id.* at 1269.

[42] GAI Comment, *supra* note 2, at 13.

[43] The authors note: "Our results also cast doubt on the underlying model of consumer preferences (differentiated products with consumer brand loyalty) for which Hastings finds support in her data. Even if this model accurately depicts consumer behavior, we note that its welfare effects are ambiguous because the introduction of a new brand increases gross consumer utility. Hastings describes how rebranding can soften price competition but makes no claims as to welfare effects.") Taylor et al., *supra* note 28, at 1269.

[44] Joshua Karl Austin, *Vertical Integration and Pricing Outcomes in Retail Gasoline Markets*, 35 ECON. BULL. 1 (2015).

[45] *Id.* at 2061.

[46] *Id.* at 2060 ("When multiple retailers in the same market are owned by the same price setter (such as an integrated oil company), the stations can be considered different products of a multi-product firm and they would have higher prices than they would otherwise in order to reduce cannibalization between the substitutable products, potentially resulting in a price increasing effect of vertical integration.").

single gasoline brand, so the control group for this study consists of lessee-operated gas stations of the same brand as the vertically integrated stations. The regression does not directly test for foreclosure at off-brand stations (or the wholesalers supplying off-brand stations).[47]

B. Cable Television

3. Crawford, Lee, Whinston, & Yurukoglu

Crawford et al. study vertical integration of regional sports networks (RSNs) with programming distributors in the U.S.[48] They estimate a structural model of household viewership, subscriptions choices, distributor pricing, carriage, and affiliate fee bargaining. They then use the structural model to evaluate the impact of 26 simulated vertical mergers. The GAI Comment characterizes this study as showing decreased cable prices and a "mixed to positive" effect on welfare from vertical integration,[49] which aligns with the way that the authors characterize the average effects across all simulated mergers. However, the authors themselves come to two conclusions: "(i) foreclosure is a real phenomenon that could lead to welfare losses; and (ii) the 'jury is still out' on the likelihood of pro vs. anticompetitive effects being the dominant force in the types of markets where vertical mergers are likely to be challenged."[50]

The model predicts that, after the simulated vertical mergers, rival distributors would be denied access to 4 of the 26 RSNs and would pay 18% higher prices for access to the other 22. For the 22 mergers without complete foreclosure, efficiency effects dominate and lead to net increases in consumer and total welfare. For the 4 mergers in which rival distributors would be denied access, changes in consumer and total welfare are small and are not statistically significant. However, the authors' methodology for evaluating the magnitude of the price increases calculates only "lower bound" estimates of rival foreclosure.[51] The authors also note that they do not evaluate how profit reductions experienced by rival distributors might affect entry and investment decisions, so their welfare analysis "is only partial."[52] Thus, we consider this study

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[47] This paper mentions a test of prices at competitor gas stations, but it does not provide details about the regression specification or show a table of results. It simply states that the test shows competitors of vertically-integrated stations priced 1.9 cents per gallon lower than competitors of non-integrated stations. However, the paper notes that "many of the competitors' stations are likely to themselves be lessee operated," which would imply they were unlikely to buy gasoline from the vertically integrated competitor and therefore unlikely to be targets of input foreclosure incentives. *Id.* at 2063.

[48] Gregory S. Crawford, Robin S. Lee, Michael D. Whinston, & Ali Yurukoglu, *The Welfare Effects of Vertical Integration in Multichannel Television Markets*, 86 ECONOMETRICA 891 (2018).

[49] GAI Comment, *supra* note 2, at 13.

[50] Gregory S. Crawford, Robin S. Lee, Michael D. Whinston, & Ali Yurukoglu, AT&T/Time Warner and Antitrust Policy Toward Vertical Mergers, 1 CPI ANTITRUST CHRONICLE 1 (2019) (discussing Crawford et al., *supra* note 48, and the authors' reading of the literature).

[51] Crawford et al., *supra* note 48, at 920.

[52] Crawford et al., *supra* note 50, at 4.

to show "mixed" results because it identifies settings where vertical integration results in foreclosure and those where it results in efficiencies.

4. Suzuki

Suzuki tests for customer foreclosure effects in the U.S. cable industry from the acquisition of the Turner Broadcasting networks by Time Warner.[53] The article uses time series variation in ownership resulting from the acquisition and finds that Time Warner carried more Turner Broadcasting channels post-merger while its bundle size did not change significantly, suggesting that Time Warner shifted channels in its bundle to Turner Broadcasting at the expense of rival channels. The article also finds that Time Warner's price per channel decreased after the acquisition, but its subscribership rates did not change significantly.

The GAI Comment characterizes the welfare effects of this vertical merger as "mixed." We would characterize this study as failing to provide useful information for two important reasons. First, this type of study cannot separate efficiency from foreclosure incentives, nor provide estimates of overall welfare effects. The reduced carriage of rival non-integrated channels could reflect either foreclosure effects or the impact of efficient increases in carriage of integrated channels. Likewise, lower prices could reflect benefits from efficiencies or decreased demand because consumers preferred the pre-merger channel bundles. Second, this merger was subject to an extensive FTC consent decree designed to *prevent* customer foreclosure.[54] For example, Time Warner was required to carry a rival cable news channel and was barred from foreclosing rival programmers from access to its distribution systems. Thus, a lack of anticompetitive customer foreclosure could be due to the remedy, not the underlying foreclosure incentives of Time Warner. It is not clear what can be learned about other mergers from this special setting.

5. Baker, Bykowsky, DeGraba, LaFontaine, Ralph, & Sharkey

Another article on vertical mergers in the U.S. cable industry that was not reviewed in the GAI Comment is Baker et al. That article discusses the FCC's evaluation of the impact of vertical integration in 2004 between News Corp., the owner of Fox programming, and the DIRECTV video distribution system.[55] Using a difference-in-differences regression framework, the FCC compared changes in affiliate fees paid for News Corp. networks before and after the transaction

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[53] Ayako Suzuki, *Market Foreclosure and Vertical Merger: A Case Study of the Vertical Merger Between Turner Broadcasting and Time Warner*, 27 INT'L J. INDUS. ORG. 532 (2009).

[54] Fed. Trade Comm'n, *FTC Requires Restructuring of Time Warner/Turner Deal: Settlement Resolves Charges that Deal Would Reduce Cable Industry Competition*, Press Release, FTC File No. 961-0004 (Sept. 12, 1996) https://www.ftc.gov/news-events/press-releases/1996/09/ftc-requires-restructuring-time-warnerturner-deal-settlement.

[55] Jonathan B. Baker, Mark Bykowsky, Patrick DeGraba, Paul LaFontaine, Eric Ralph, & William Sharkey, *The Year in Economics at the FCC, 2010-11: Protecting Competition Online*, 39 REV. INDUS. ORG. 297 (2011).

to differences in affiliate fees for other national networks not experiencing any change in vertical integration. The FCC found anticompetitive effects from input foreclosure. The results indicated that both the average monthly affiliate fees for News Corp programming and the percentage increase in those fees from the previous year were higher after the vertical integration, providing evidence of raising rivals' costs. However, these results do not address the overall change in welfare because this study did not test for potential effects of customer foreclosure or efficiencies.

Overall, the economic literature on vertical integration by cable television distributors into content finds evidence of both foreclosure and efficiencies. The average effect of this type of vertical integration in an economy would, in general, depend on the mix of settings where it was undertaken.

C. Healthcare

6. Baker, Bundorf, & Kessler (2014)

Baker, Bundorf and Kessler examine county-level correlations between (i) measures of hospital-physician vertical integration and (ii) indices of hospital prices (measured as allowed amounts) per admission, hospital admissions per health-plan member, and hospital spending per health-plan member for a group of nonelderly people enrolled in a private health plan during 2001–2007.[56] They find that an increase in the market share of hospitals that own physician practices, while controlling for the hospital market's HHI, is associated with higher prices and spending but does not have a statistically significant impact on admissions. The authors also analyzed the impact of less restrictive vertical contracts between hospitals and physician groups and found that they were generally not correlated with prices and spending.[57]

The GAI Comment characterizes the results of this article as "mixed to negative."[58] This seems out of line with the comment's other welfare conclusions because, all else equal, higher prices and higher spending would tend to harm consumers and therefore should count as a negative.[59] However, as noted above, it is important to keep in mind that cross-sectional studies suffer from issues such as endogeneity (the fully integrated hospitals chose to integrate with physician practices for reasons that may also be related to prices and spending). In addition, the authors control for the age and sex of patients within each county, but not for the mix of conditions being

[56] Baker et al., *supra* note 33.

[57] Vertical contracts tended decrease hospital admissions, but the relationship was only statistically significant for "open physician-hospital organizations," which are defined as contracting relationships (not ownership) that are generally open to all members of the medical staff who wish to participate. The impact on spending for these hospitals is not significantly different than zero despite the decrease in admissions.

[58] GAI Comment, *supra* note 2, at 13.

[59] If the "mixed" assessment is based on admissions, that coefficient is not statistically significant.

treated, which likely impacts prices, admissions, and spending. If hospitals that employ their own physicians are also the ones that provide the most complex care to the sickest patients, then that would create a correlation between spending and vertical integration.

7. Baker, Bundorf, & Kessler (2017)

Baker, Bundorf, and Kessler examine the impact of multispecialty physician practices that integrate of generalist and specialty physicians.[60] While generalist and specialty physicians do not have a supplier-customer relationship, they are complements to patients seeking healthcare services. Mergers that combine complementary products involve similar economic incentives as those combining an input supplier with its customer.

Due to data limitations that prevent matching vertical integration (from physician billing data) and claims by practice, the authors estimate the impact of the fraction of practices (weighted by office visits) that are multispecialty in a particular zip code on a price index of physician services provided to commercially insured patients within that zip code during 2008–2012. The price index includes controls for factors such as patient characteristics, procedure codes, and cost of care. Estimating separate regressions for generalist and specialist physicians, the authors find that generalist [specialist] physicians charge higher prices when they are integrated with specialist [generalist] physicians, controlling for the degree of competition within their own practice area.[61] The authors also find similar evidence for the impact on prices of cardiology and orthopedics when those physicians are integrated with any other specialist physicians.

The authors note that higher prices at multispecialty practices could also be the result of unobserved differences in quality. To rule out this explanation for price differences, they include an interaction between integration and the degree of competition within the integrated partners' practice areas in their empirical model. The idea is that the quality of a generalist office visit, for example, would be unlikely to vary with the market concentration of specialist services after controlling for the market concentration of generalist services. However, they find that the effects of integration are larger when the integrated partners operate in less competitive practice areas. Therefore, the authors characterize their results as showing anticompetitive effects of multispecialty physician practices.[62]

This article was not reviewed in the GAI Comment. On its face, an increase in price not related to quality suggests evidence of consumer harm. Of course, these empirical tests cannot directly

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[60] Laurence C. Baker, M. Kate Bundorf, & Daniel P. Kessler, *Does Multispecialty Practice Enhance Physician Market Power?* Nat'l Bureau of Econ. Research Working Paper No. 23871 (Sept. 2017), https://www.nber.org/papers/w23871.pdf.

[61] The degree of competition is measured as the weighted average of zip-code specific HHIs (based on concentrations of physician practices serving patients in the zip code) for zip codes that are near the physician's practice and account for a majority of the practice's patient billings.

[62] *Id.* at 23.

control for all unobservable factors that might influence both price and the prevalence of multispecialty practices, such as consumer preferences for integrated care.

8. Koch, Wendling, & Wilson

Koch, Wendling and Wilson study the impact of hospital acquisitions of physician groups on spending by the Centers for Medicare and Medicaid Services ("CMS").[63] This article uses claim-level CMS data and a difference-in-differences empirical strategy to estimate the effect of a set of 27 acquisitions during 2005–2010 on number of claims and spending. Specifically, the article investigates whether vertically integrated physician groups take advantage of CMS rules in which CMS paid more for a physician service provided at a hospital than for that same service provided in a physician's office. Medicare rules allowed hospital-employed physicians to bill as though working in a hospital even for services provided in their offices. The article finds evidence that acquired physicians significantly shift (or shift reporting of) care from in-office visits to visits at the acquiring hospital. Looking at all hospital claims, including for visits provided by physicians whose ownership did not change, the article finds that physician-group acquisitions do not have a statistically significant impact on CMS spending at acquiring hospitals.

The GAI Comment concludes that the results on spending are "mixed" and the effect on welfare is "not addressed." In our view, this characterization of spending is incorrect. "Mixed" would better describe a study for which there is evidence of spending increases in some cases and spending decreases in others, whereas this article does not find a statistically significant effect on spending. We agree that welfare is not addressed. This article does not specifically evaluate efficiencies. Moreover, the CMS payment rules are specific to this industry, so the results may not be applicable more broadly. We would classify this paper as not providing relevant information on competitive effects of vertical mergers.

9. Dafny, Ho, & Lee

Dafny, Ho and Lee address hospital mergers where the geographic locations of the hospitals at issue preclude substitution from a patient's standpoint, but where an insurance company might regard the merging hospitals as complements.[64] Specifically, insurance companies sell health plans to large employers that demand coverage in multiple geographic markets. The authors hypothesize that a merger of hospitals operating in distinct geographic markets might increase the bargaining power of the merged entity with complementary hospitals in negotiations with insurance companies. Again, although these merging hospitals do not have a supplier-customer

[63] Koch et al., *supra* note 33.

[64] Leemore Dafny, Kate Ho, & Robin S. Lee, *The Price Effects of Cross-Market Mergers: Theory and Evidence from the Hospital Industry*, 50 RAND J. ECON. 286 (2019).

relationship, their complementarity to insurance companies may lead to similar incentives as in a more traditional supplier-customer merger.

This article uses panel data on hospital prices to study acute-care hospital mergers during 1996–2012. It estimates price increases at hospitals acquiring "adjacent" hospitals in the same state but not in the same local geographic market and at those acquiring "non-adjacent" hospitals in other states, relative to control hospitals that were not party to any adjacent or non-adjacent mergers. Using a difference-in-differences specification, the article estimates that mergers of adjacent hospitals led to 7% to 10% higher prices. By contrast, there were no statistically significant price increases associated with mergers of non-adjacent hospitals. The authors argue that the price increases related to adjacent hospital mergers are unlikely to be driven by quality improvements because the measured price increases are for the hospitals making the acquisitions, not the targets. They also find suggestive evidence of larger price effects when the acquiring and target systems share common insurers.

Thus, this study, which was not reviewed in the GAI Comment, provides evidence of a mechanism through which mergers of complementary products might lead to price increases.

10. Malik

Malik studies the relationship between licensing, joint ventures, and full vertical integration and clinical trial activity in the pharmaceutical industry.[65] This paper constructs counts of licensing agreements, joint ventures, acquisitions, and the number of new technologies that entered at least one phase in the clinical trial process during 1994–2005, based on public announcements. It then runs a firm-level OLS regression of the logarithm of its clinical trial count on the counts of licensing agreements, joint ventures, acquisitions, and controls (e.g., firm size and number of patents). The regression yields positive, statistically significant coefficients on the joint venture and acquisition count variables, which the author interprets as joint ventures and acquisitions as having positive effects on new product development.

The GAI Comment characterizes the results of this study as showing a positive effect on welfare from vertical integration.[66] However, there are several ways in which the firm-level OLS regression used in this paper falls short of being able to quantify the effect of vertical integration on total welfare. First, there is likely to be a relationship between a firm's innovation strategy and its organizational or contracting strategy that is unobserved, so the correlations may not be causal. Second, the aggregation to the firm level does not account for therapeutic areas or the timing of the vertical relationships relative to clinical trials (i.e., it counts them whether or not they were in place before the clinical trial). Finally, the regression does not measure whether total innovation in the industry increases or decreases in response to vertical integration (i.e.,

[65] Tariq Malik, *Vertical Alliance and Vertical Integration for the Inflow of Technology and New Product Development in the Pharmaceutical Industry*, 23 TECH. ANALYSIS & STRATEGIC MGMT. 851 (2011).

[66] GAI Comment, *supra* note 2, at 13.

vertical integration may generate new innovations or simply move innovations from one firm to another).

D. Cross Section of Industries

11. Atalay, Hortaçsu, & Syverson

Atalay, Hortaçsu and Syverson use data on commodity flows in the U.S. manufacturing, wholesale, and retail sectors to study the relationship between vertical integration and transfers of physical goods.[67] The authors find that vertical integration is not primarily about facilitating the transfers of physical goods along the production chain. Almost half of upstream establishments do not report making any internal shipments (defined based on matching ownership data to commodity flow destinations). Thus, elimination of double marginalization ("EDM") benefits would not occur for the majority of these vertically integrated firms.

Faced with this somewhat negative efficiency result, the authors then suggest an alternative efficiency benefit. They hypothesize that vertical integration facilitates the flow of intangible assets, such as managerial oversight, marketing expertise, or intellectual property. They find that vertical ownership is associated with systematic differences in establishment "type" (measured as output per worker-hour, total factor productivity, revenue, and capital to labor ratio). However, firm size (measured as employment, number of establishments, or number of industries) accounts for most, but not all, of these systematic differences in type.[68] Moreover, focusing only on the firms that had a change in vertical ownership indicates much smaller, albeit still significant, differences in type. Thus, the authors interpret their results as "primarily reflect[ing] 'selection' on preexisting differences rather than 'treatment' effects of becoming part of a vertical ownership structure."[69]

Finally, the authors find some evidence that acquired establishments experience a decrease in non-production workers, and a shift in sales towards products and locations (a proxy for the customer) previously served only by the acquiring establishment and away from products/locations previously served by both or served only by the acquired firm.

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[67] Enghin Atalay, Ali Hortaçsu, & Chad Syverson, *Vertical Integration and Input Flows*, 104 AM. ECON. REV. 1120 (2014).

[68] The authors conclude: "much of what makes establishments in vertical ownership structures different isn't really related to vertical ownership itself. Instead, the largest establishments tend to be in the largest firms, and the largest firms tend to own vertically linked establishments." *Id.* at 1140.

[69] *Id.* at 1136. However, they note that "gaps not accounted for by preexisting differences in type are closed due to the faster growth in experience by existing establishments when they become integrated. Thus, we cannot ignore the possibility that integration has some direct effects on establishment types." *Id.* at 1139.

The GAI Comment characterizes this study as showing a positive effect on welfare through the higher productivity of vertically integrated firms.[70] While we agree that the study presents some evidence of higher productivity, it is also inconsistent with the view that EDM is ubiquitous because vertical integration often does not involve any input transfers. Moreover, it is not clear that vertical relationships drove differences in productivity. These results could also indicate more traditional horizontal-merger efficiencies, like economies of scale in management or distribution, and so it is not clear that this part of the study sheds light on the effects of the vertical structure.[71]

12. Boehm & Sonntag

Boehm and Sonntag use data on suppliers, customers, and competitors of large U.S. and foreign firms to test for input foreclosure resulting from vertical integration.[72] They match this data with information on mergers and acquisitions to compare the survival of vertical relationships after a supplier integrates with a competitor relative to that when a supplier integrates with an unrelated firm. They estimate a linear probability model, finding that vertical relationships are more likely to break when the supplier integrates with a competitor instead of a non-competitor and that such foreclosure is more likely when there are fewer upstream suppliers.

As the authors note, this regression specification cannot establish causality. A broken relationship could prompt integration with a remaining customer, or an unobserved factor could cause both the integration and the broken relationship. For example, if there are large efficiency gains from vertical integration, a competitor might experience a significant decrease in sales leading it to reduce its number of suppliers. The authors conduct several robustness checks aimed at addressing these concerns. For example, they instrument for vertical mergers with a measure of downward pressure on stock prices from hypothetical mutual fund outflows, they replace actual mergers with rumored mergers that were not consummated, and they test the impact of vertical integration with a competitor on a firm's sales. These robustness checks are consistent with foreclosure from vertical integration.

The GAI Comment does not review this article. We would classify it as providing evidence of input foreclosure, but we also note that the authors do not have access to data on prices, quality or other measures to assess the impact on consumers.

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[70] GAI Comment, *supra* note 2, at 13.

[71] The authors conclude that "there may not be anything particular about vertical structure within firms; intangible inputs can flow in any direction across a firm's production units. Vertical firm structures and expansions may not be fundamentally different from horizontal structures and expansions. Instead, a more generalized view of firm organization, like the firm as an outcome of an assignment mechanism that matches heterogeneous tangible and intangible inputs, may be warranted, and is consistent with some of the other patterns we document in the data." *Id.* at 1146.

[72] Johannes Boehm & Jan Sonntag, *Vertical Integration and Foreclosure: Evidence from Production Network Data*, Working Paper (Jul. 30, 2019), https://jmboehm.github.io/foreclosure.pdf.

E. Other Industries

13. Hanssen

Hanssen explores potential efficiencies from vertical integration in the motion picture industry.[73] The article hypothesizes that vertical integration between cinema owners and film producers/distributors created efficiency gains by allowing *ex post* adjustments to the length of film runs in the 1930s. For example, a cinema owner might be uncertain about the demand for a particular film at the time that it contracts for the run length; *ex post*, it may prefer to shorten the run if the film turns out to be less popular than expected. However, contracts typically contained large penalties for such "abbreviations."

The article also hypothesizes that cinema ownership allowed coordinated *ex post* adjustments in the length of film runs among the five firms that were vertically integrated (the "Big Five"). However, Hanssen does not directly test for coordination. Hanssen instead states: "Because the precise nature—or even existence—of any [explicit or implicit collusive] arrangement cannot be observed (being, by definition, extracontractual), I proceed by indirection. Was vertical integration associated with a greater probability of ex post run-length renegotiation, ceteris paribus?"[74]

Hanssen uses data from 1937–1938 on 23 cinemas in Wisconsin owned by Warner Brothers ("WB"), one of the Big Five. He finds that Big Five films were three times more likely to be abbreviated than independent films and that abbreviation was less likely for films about which cinemas would tend to have more information *ex ante* (e.g., longer, more expensive "blockbusters" that may have done pre-screenings). However, the fact that WB cinemas abbreviated runs for films of the other Big Five companies, and not just WB films, does not demonstrate a unilateral gain from vertical integration. It would only be considered an efficiency associated with vertical integration if the Big Five firms were able to coordinate and waive each other's contractual penalties for abbreviation, a claim which Hanssen assumes rather than proves. Moreover, Hanssen does not directly control for any differences in film quality or variance. He checks a different sample of independent theaters and finds similar abbreviations rates for Big Five and independent films.

The GAI Comment characterizes the results of this study as evidence that vertical integration has positive welfare effects. However, we note that Hanssen's model does not directly evaluate net welfare because it does not test for any foreclosure effects. It does not consider, for example, whether vertical integration raised rival cinemas' costs of showing films produced by vertically integrated cinemas.

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[73] F. Andrew Hanssen, *Vertical Integration During the Hollywood Studio Era*, 53 J.L. & ECON. 519 (2010).

[74] *Id.* at 521.

14. Gil & Warzynski

Gil and Warzynski study vertical integration between video game developers, publishers, and platforms (a three-level supply chain).[75] This article uses data on monthly video game sales during 2000–2007, together with information gathered on vertical relationships. It exploits a mix of cross-sectional variation across games and some instances where acquisitions happened in the middle of a game's lifecycle.

Using the cross-sectional variation in vertical relationships among the three levels of the supply chain, the authors find that vertical integration at all levels is correlated with higher game prices, higher game sales volumes, and higher game revenue. Such a regression cannot determine whether the higher prices and volumes indicate consumer harm (e.g., because vertical integration raises rivals' costs and causes consumers to switch away from those games) or consumer benefit (e.g., because vertical integration leads to higher quality games that increase demand).

The authors consider three channels that might explain the correlations they observe: vertically integrated firms may (i) produce higher quality games, (ii) release games further apart in time to "soften" competition, or (iii) promote games more successfully after their release. To investigate these channels, the authors use a back-of-the-envelope calculation combining multiple regressions that attempt to estimate demand as a function of indicators for vertical relationships and price.[76] First, the authors estimate the cross-sectional relationship between vertical integration and demand. Next, they add fixed effects to the regression to turn off various channels and then calculate changes in the coefficient on vertical integration across the different regressions to back out the contribution of each channel. Specifically, they add platform-month-year-genre-age fixed effects to turn off channel (ii), even though this does not directly measure competition at the time of a game's release. This regression decreases the coefficient on vertical integration by almost half. They separately add game-platform fixed effects to turn off channels (i) and (ii) because game quality and release date are fixed within a game. They find that post-release marketing does not have a statistically significant impact on demand, but nonetheless they subtract the coefficient from that in the previous regression to determine the residual effect, which they attribute to the quality (i) channel. Overall, the authors find that the effect of staggering release dates to "soften" competition is the slightly larger than the residual "quality" effect.

The GAI Comment characterizes this study as evidence of vertical integration increasing welfare,[77] but this conclusion does not seem appropriate. It appears to be based on the finding

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[75] Ricard Gil & Frederic Warzynski, *Vertical Integration, Exclusivity, and Game Sales Performance in the US Video Game Industry*, 31 J.L. ECON. & ORG. i143 (2015).

[76] Demand is measured as the share of platform owners without the game that purchase it during the current period. Price is often instrumented for using the average time it takes the price of other games within the same genre and platform to drop 60% from their level at release.

[77] GAI Comment, *supra* note 2, at 13.

that quality was higher. However, "quality" is measured as the residual impact of vertical integration that cannot be explained by differences in marketing or release dates, so it could also be driven by other omitted variables. Furthermore, the authors also find evidence of publishers altering release dates so as to soften competition for integrated games relative to independent games, which represents a decrease in competition, not an efficiency benefit, unless consumers have an intrinsic preference for such a release pattern. Therefore, without a model to determine the net effects of quality and release strategies, it is difficult to assess the welfare impacts of the vertical integration examined in this study. A more accurate description might be that it is "mixed."

15. Cohen

Cohen uses retail scanner data to study store-brand milk purchases at major supermarkets in Boston during 1996–2000.[78] This region contained three supermarket chains that bought their store-brand milk from a brand manufacturer and one chain that manufactured its own store-brand milk product. This article constructs a structural model of demand, supply and pricing decisions, which it uses to estimate the best-fitting pricing model. It finds that the industry is best described by unintegrated producers setting linear prices for the vertically integrated retail chain, but non-linear prices (two-part tariffs) for both their branded and store-brand products sold to the non-integrated retail chains. Cohen then estimates the effects of a counterfactual divesture that changes all pricing to two-part tariffs and finds that it leads to decreased prices and a net increase in consumer surplus.

Consistent with this finding, the GAI Comment characterizes this article as showing that vertical integration has a negative impact on welfare.[79] Taking the study at face value, we would tend to agree. The discovery that the producers used two-part tariffs when selling to unintegrated supermarkets would also suggest that any EDM benefits from vertical integration might not be merger-specific. However, the finding that the producers simultaneously used linear prices when selling to the integrated supermarkets is surprising and requires additional explanation.

16. Forman & Gron

Forman and Gron examine whether vertical integration affected the speed at which insurance companies adopted new information technology ("IT") solutions during 1996–2002.[80] The insurance companies did not differ by full vertical integration. Instead, some companies had exclusive agents and some did not. The study finds that insurance companies that had exclusive agents were faster to adopt consumer-facing IT applications, but no different in their adoption

[78] Michael A. Cohen, *A Study of Vertical Integration and Vertical Divestiture: The Case of Store Brand Milk Sourcing in Boston*, 22 J. ECON. & MGMT. STRATEGY 101 (2013).

[79] GAI Comment, *supra* note 2, at 13.

[80] Chris Forman & Anne Gron, *Vertical Integration and Information Technology Investment in the Insurance Industry*, 27 J.L. ECON. & ORG. 180 (2011).

speed of technologies related to insurer-agent communication or basic Internet access.[81] Based on other studies finding a link between IT investment and productivity, the authors conclude that "[i]nsurers that delayed Internet investments as a result of frictions arising from independent agents were at a competitive disadvantage relative to those that reacted to the availability of Internet applications more quickly."[82]

As the GAI Comment found, this article is not informative about overall changes in welfare. It does not attempt to measure potential foreclosure from the exclusive agency relationships. In addition, the benefits of the increased adoption speed were achieved by exclusive contracts, not ownership. Thus, it supports the Coasian idea that contracts may substitute for vertical ownership.

17. Luco & Marshall

Luco and Marshall study the impact of EDM on bottlers that purchase concentrate from soft drink manufacturers, add carbonated water, and produce the soft drink products sold to retailers.[83] In this setting where the soft drink bottlers sell multiple products and merge with the upstream supplier of only a subset of those products, there are opposing incentives. First, the integration creates an incentive to (in effect) charge competing soft drink manufacturers a higher fee for bottling services by raising the wholesale prices for these brands. Second, the integration can create EDM, which puts downward pricing pressure on integrated products because they become cheaper to purchase. At the same time, the EDM increases the profitability of integrated products, which further incentivizes the firm to increase the price of non-integrated products in order to divert customer demand to the more profitable, integrated products.

This article uses a series of acquisitions by Coca-Cola and PepsiCo of their bottlers during 2009–2010, which created geographical variation in both the existence of vertical integration and whether the integrated bottler sold soft drinks from the unintegrated Dr. Pepper Snapple Group. It estimates a difference-in-differences regression exploiting cross-sectional variation and a within-store specification identified using changes in bottlers' integration status. The two regression strategies yield similar results, finding that the mergers caused the prices of integrated products to decrease by 0.8 to 1.2 percent (although these measures were not always statistically significant) while causing the prices of non-integrated products sold by integrated multi-product

[81] The study measured IT adoption based on the Harte Hanks Market Intelligence survey. The authors define business electronic commerce and extranet as IT related to "insurer-agent communication" and commerce, home electronic commerce, customer service, education, and publishing applications as IT related to "consumer applications." It is unclear how well these categories align with the hypothesis that frictions—namely independent agents acting in their own interest rather than in the insurer's interest (affecting consumer applications) and transaction costs associated with serving multiple insurers (affecting insurer-agent communication)—slow IT adoption for non-vertically-integrated firms.

[82] *Id.* at 182.

[83] Luco & Marshall, *supra* note 32.

firms to increase 1.2 to 1.5 percent. The authors observe: "our estimates of the anticompetitive effects are as large or larger in absolute value than the efficiency effects of vertical integration. This suggests that the EDM cannot be presumed to be procompetitive when examining vertical integration by multiproduct firms."[84]

We note that the impact on overall consumer welfare depends on the relative magnitudes of the effects weighted by the purchase patterns and preferences of consumers for the different products. This paper does not measure consumer welfare directly. It estimates a price index across all products and finds that vertical integration does not have a statistically significant effect on this index. Thus, we would characterize the evidence on welfare effects as mixed. The GAI Comment does not review this article.

IV. CONCLUSION

In conclusion, a careful examination of the literature evaluating the impact of vertical integration reveals limitations to its applicability for making broad policy recommendations, due to the endogeneity of the sample and the fact that most studies do not conduct a full welfare analysis. Even setting aside these methodological issues, the literature finds both procompetitive and anticompetitive effects. We discern no pattern in the results. The table below replicates the results in the GAI Comment and adds two columns showing our count of evidence of harms and benefits, taking each study at face value (i.e., ignoring any empirical challenges).[85] Our count shows 6 articles with evidence of harm and 8 articles with evidence of benefits, which we would not classify as reflecting an "empirical reality that vertical relationships are generally procompetitive or neutral."[86]

[84] *Id.* at 4.

[85] GAI Comment, *supra* note 2, at 13.

[86] GAI Comment, *supra* note 2, at 14.

GAI Review							Our Review	
Author	Year	Industry	Data/ Technique	Variable Examined (x)	Effect on x	Effect on Welfare	Potential Evidence of Harm?	Potential Evidence of Benefits?
Suzuki	2009	Multichannel Television	Panel; Difference-in-Differences	Cost Foreclosure	- +	mixed	Y	Y
Hanssen	2010	Motion Pictures	Cross-Sectional	Film Run Adjustments Foreclosure	+ no effect	+	N	Y
Taylor *et al.*	2010	Retail Gasoline	Panel; Difference-in-Differences	Price	+ (close to zero)	no economic significance	Y	N
Forman & Gron	2011	Insurance	Panel	Adoption of Information Technology	+ (at one level) & no effect (at another level)	not addressed	N	Y
Malik	2011	Pharmaceutical	Panel	New Product Development	+	+	N	Y
Cohen	2013	Retail Milk	Panel	Simulated Effects on Price from Vertical Divestiture	-	-	Y	N
Atalay *et al.*	2014	Various	Panel	Productivity	+	+	N	Y
Baker *et al.*	2014	Hospitals	Panel	Price-Spending Hospital Admissions	+ -	mixed to negative	Y	N
Austin	2015	Retail Gasoline	Panel	Price	-	+	N	Y
Gil & Warzynski	2015	Video Games	Panel	Price Quantity Quality	+ + +	+	Y	Y
Koch *et al.*	2017	Hospitals	Panel; Difference-in-Differences	Physician Hospital Utilization Spending	+ mixed	not addressed	N	N
Crawford *et al.*	2018	Multichannel Television	Panel	Price	-	mixed to positive	Y	Y
					Total Number of Studies:		**6**	**8**

Including the other recent studies discussed above would bring the count to 11 articles with evidence of harm and 9 articles with evidence of benefits. This balance of results constitutes a significant finding in an environment where the literature has been presented as supporting the proposition that almost all vertical mergers are benign. In our view, this is an inaccurate reading of the evidence.