

# Recent Studies on Common Ownership, Firm Behavior, and Market Outcomes

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## Abstract

The literature on competitive effects of common ownership has grown at a fast rate in the past two years. Anticompetitive effects have been confirmed with alternative reduced-form and structural estimation methods, in different industries, geographies, and jurisdictions. Multiple independent studies have disproven early critiques of the literature. Other papers document the heterogeneity of common ownership effects on competition across markets and industries. Important advances were made on the study of the economic mechanisms and governance channels that implement anti-competitive incentives. New theory refines the interpretation of existing empirical work. Access to high-quality ownership and product-market data remains a bottleneck for meaningful research in the area.

## Keywords

ownership, control, industry concentration, antitrust, competition, managerial incentives, corporate governance

## Introduction

The documentation of likely anticompetitive effects of common ownership in specific U.S. airline markets<sup>1</sup> has triggered an explosion of research on the effects of common ownership on competition and corporate behavior. In this review, I seek to give some structure to the latest work in this area. I will selectively cover a few of the more prominent papers that have emerged since the publication of the last review.<sup>2</sup> I will also cover some important papers that had escaped my attention then. I focus on the papers in the economics and finance literatures, as Elhauge has recently covered developments in the legal literature.<sup>3</sup> By covering relatively few papers in depth, I will illustrate key issues for the literature's future development.

1. José Azar et al., *Anticompetitive Effects of Common Ownership*, 73 J. FIN. 1513 (2018) [hereinafter AST].
2. Martin C. Schmalz, *Common-Ownership Concentration and Corporate Conduct*, 10 ANN. REV. FIN. ECON. 413 (2018).
3. See Einer Elhauge, *How Horizontal Shareholding Harms Our Economy—And Why Antitrust Law Can Fix It*, 10 HBLR 207 (2020) [hereinafter Elhauge, *How Horizontal Shareholding Harms*]. Elhauge also offers a detailed review of various recent

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Key issues I flagged in my last review for consideration by future research, and that continue to be relevant, include:

- (1) documentation of observed and formal investigation of theoretically plausible governance mechanisms by which common ownership can cause changes in competitive outcomes,
- (2) investigations as to whether there are measurable common ownership effects on firm behavior and market outcomes in different industries and geographies,
- (3) development of alternative estimation techniques, including structural methods, alternative measures of common ownership, and identification strategies,
- (4) focus on firm behavior and product market outcomes rather than broad “industry” studies, and
- (5) a focus on (ownership) data quality and the need for regulators to make available high-quality ownership data to enable researchers to study this important topic.

The rationale was as follows: first, a better understanding of mechanism and theory as well as measurement and estimation techniques help increase confidence in the causal interpretation of empirical results, the extrapolation of existing results, quantitative measurement of effects, and help inform policy makers about the likely effects of implementing various policy proposals. Second, a formal study of mechanisms is necessary because the existing corporate governance literature does not take equilibrium effects from strategic interactions between firms into account, which has led to logically wrong conclusions in the literature. Third, testing the theory in different industries and on different outcomes would help inform policy makers whether targeted industry-specific interventions or broad-based structural reforms are more appropriate policy responses. Lastly, a focus on product market outcomes as opposed to broad industry studies and on high-quality ownership data is necessary to avoid false negatives that can arise from an attenuation bias due to mismeasured common ownership and less meaningful market definitions.<sup>4</sup>

This article reviews the many important papers that have pushed the boundaries of knowledge forward in each of these five areas. Whereas the vast majority of the review details such positive progress, I will also critically discuss some prominent papers that have not paid attention to data quality and theoretical foundations and thus have come to conclusions that lack substantiation. That part includes a discussion of withdrawals of earlier claims by two sets of authors that had criticized the literature on anticompetitive effects and that are often mentioned in the policy debate. I also discuss a new structural paper that proves that Azar, Schmalz, and Tecu’s (AST) results are not due to their use of reduced-form methods that may be affected by endogenous market shares. These earlier claims criticizing the literature had been widely distributed in the profession and have influenced the policy debate—but have turned out to be based on the selection of small subsamples of the data as well as data errors, which in two cases even involved replacing actual data with zeros.

This review is selective in that it does not cover significant new work in other parts of the literature and in particular important theoretical work on the macroeconomic consequences of common

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papers in the economics literature, which no interested reader should miss. *Id.* at 209–55; Einer Elhauge, *The Causal Mechanisms of Horizontal Shareholding*, 82 OHIO ST. L.J. (forthcoming 2021), <https://ssrn.com/abstract=3370675> or <http://dx.doi.org/10.2139/ssrn.3370675>. MATTHEW BACKUS ET AL., THE COMMON OWNERSHIP HYPOTHESIS: THEORY AND EVIDENCE, The Brookings Institution (2019), [https://www.brookings.edu/wp-content/uploads/2019/02/ES\\_20190205\\_Common-Ownership.pdf](https://www.brookings.edu/wp-content/uploads/2019/02/ES_20190205_Common-Ownership.pdf) also offer a review, which however takes the narrower perspective of the modern industrial organization (IO) literature with its valid, but selective, methodological preferences and concerns.

4. For a detailed explanation of the problems with two prominent studies that have tried to disprove anticompetitive effects from horizontal shareholding using industry definitions that are vastly larger than actual market definitions and thus treat shareholders as horizontal when they are not, see Elhauge, *How Horizontal Shareholding Harms*, *supra* note 3, at 244–54. See also the methodological critique in this issue by José Azar et al., *Research on the Competitive Consequences of Common Ownership: A Methodological Critique*, 66 ANTITRUST BULL. 113 (2021).

ownership. Regulatory reform in the United States appears to be headed toward a deterioration of ownership data quality on the side of the securities market regulator, whereas antitrust authorities appear to be considering steps to modify the extent to which they are informed about the extent of common ownership of related firms. The conclusion remains that progress in terms of data quality and scope would be the most welcome step regulators could take in order to improve transparency and quality of research on the competitive effects of common ownership.

## Mechanism and Theory

The first item dealt with in this review relates to the theory of governance mechanisms by which common ownership can cause variation in competitive outcomes, relative to the outcomes that result from ownership by dispersed, entirely passive shareholders, or—alternatively—relative to outcomes that result from large, active, but concentrated shareholders that do not at the same time own significant stakes in related firms.

### *Evidence on the Mechanisms of Common Ownership*

AST categorize possible corporate governance mechanisms that can implement the anticompetitive incentives from common ownership into four categories: (i) do nothing (or do less than what an undiversified, dedicated investor of similar size would), (ii) use voting (e.g., on directors), (iii) use direct engagement (or the use of “voice”), and (iv) use compensation.<sup>5</sup> The literature in the past two years has provided theory and evidence in support of all four categories and more.

**Engagement.** Whereas systematic evidence on direct engagement is perhaps most difficult to produce for academic research due to data limitations, it is also regarded by some as the most important to support a causal interpretation of a link between common ownership and reduced product market competition. Shekita<sup>6</sup> cumulates thirty incidents of common owners engaging with portfolio firms with the apparent objective or effect of changing product market structure or product market outcomes (whether in socially beneficial or detrimental ways). Among that set is a series of engagements documented by Condon,<sup>7</sup> who details how a set of large common owners successfully pressured oil companies, one by one, to adopt carbon emissions targets. Emissions targets are difficult to separate from output targets in that industry and therefore directly related to product market outcomes. It is difficult to reconcile a belief that institutional investors can play a role in mitigating climate change by imposing emissions targets on portfolio firms, with a simultaneous belief that they are unable to affect output and thus product market competition. Other evidence on direct engagement is collected by Elhauge.<sup>8</sup>

**Voting.** A quirk on the idea that common owners can influence corporate behavior through voting is proposed by Hsieh, Li, and Tang.<sup>9</sup> They provide evidence that passive funds, by comparison to their

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5. AST, *supra* note 1.

6. Nathan Shekita, *Interventions by Common Owners*, SSRN ELECTRONIC JOURNAL, July 22, 2020, <https://ssrn.com/abstract=3658726> or <http://dx.doi.org/10.2139/ssrn.3658726>.

7. Madison Condon, *Externalities and the Common Owner*, 95 WASH. L. REV. 1 (2020).

8. Einer Elhauge, *The Causal Mechanisms of Horizontal Shareholding*, 82 OHIO ST. L.J. 10–11, 14, 17–18, 60 (forthcoming 2021), <https://ssrn.com/abstract=3370675> or <http://dx.doi.org/10.2139/ssrn.3370675> [hereinafter Elhauge, *Causal Mechanisms*].

9. Shenje Hshieh et al., *How do Passive Funds Act as Active Owners? Evidence from Mutual Fund Voting Records*, J. CORP. FINANCE (forthcoming) <https://doi.org/10.1016/j.jcorpfin.2020.101692>. Similarly, Zhaoyang Gu & Chunqiu Zhang, *Living with the Frenemy: Common Ownership and Hedge Fund Activism*, WORK. PAP., 2019, document that hedge funds are less

active counterparts, “often exert corporate governance changes on portfolio firms not via how they vote for a given proxy ballot but rather by influencing what proxy items get included on the ballot in the first place” during behind-the-scenes intervention. Absent data collection efforts by regulators, more specific and reliable information about the precise content of such behind-the-scenes meetings will likely remain hidden from academic researchers.

*Intensity of Corporate Governance Interventions More Broadly.* Whether common owners (that are often equated without substantiation with asset management firms which predominantly sponsor “passive” funds) are more active and engaged or effective owners than less diversified ones remains disputed in the empirical literature. Theoretical advances in the literature, however, explain why that question might not be well-defined. Moreover, the empirical counterfactual often does not clearly distinguish between equally large, but undiversified owners, or very small, entirely passive investors. This ambiguity perhaps explains the lack of clarity of empirical results.

Antón, Ederer, Giné, and Schmalz<sup>10</sup> (AEGS) document empirically that common ownership robustly correlates with less performance-sensitive top management pay. They also show that additions of a competitor to the S&P 500 index is followed by weaker top management incentives of industry peers that were already in the index and that experienced a shock to common ownership as a result of the addition of a competitor to the index. Such weaker incentives are the endogenously optimal incentive structure from the perspective of common owners.

In apparent contrast to the view that big asset managers tend to behave in relatively management-friendly ways, but consistent with the view that they actively assert influence, He, Huang, and Zhao “find that high aggregate cross-ownership [common ownership]<sup>11</sup> positively predicts management losing a vote” on shareholder proposals.<sup>12</sup> This result, taken at face value, is more consistent with a rather active view of common owners’ involvement in governance than the traditional view that regards common owners as particularly “lazy.”

Kang, Luo, and Na<sup>13</sup> report that the number of blocks that a firm’s large institutions hold is positively associated with forced chief executive officer (CEO) turnover-performance sensitivity, abnormal returns around forced CEO turnover announcements and 13D filings, and changes in firm value. These results are particularly evident when institutions have multiple blockholdings in the same industry, when they have activism experience, or when they have long-term blockholdings in their portfolio firms. These results are in line with theories along the lines of Edmans, Levit, and Reilly,<sup>14</sup> who predict that under certain conditions, common ownership can strengthen governance through

likely to target firms with commonly owned peers, especially in more concentrated industries (in which strategic interactions between firms are more pronounced, and common ownership effects are greater).

10. Miguel Antón et al., *Common Ownership, Competition, and Top Management Incentives*, SSRN working paper, <http://www.ssrn.com/abstract=2802332>, henceforth AEGS. Similar in spirit but different in implementation, Davidson Heath, Daniele Macciocchi, Roni Michaely, and Matthew C. Ringgenberg, *Do Index Funds Monitor?*, ECGI Working Paper No. 638/2019, show that index-fund ownership leads to less performance-sensitive annual pay, and more management-friendly voting patterns – in sum, an apparent worsening of agency problems.
11. These authors follow a labeling convention used in some earlier papers in the finance literature that has stirred much confusion. In the literature on IO as well as the bulk of the common ownership literature in general, “cross-ownership” refers to direct stakes in industry rivals, whereas “common ownership” refers to shareholdings in related firms by otherwise unrelated agents.
12. Jie (Jack) He et al., *Internalizing Governance Externalities: The Role of Institutional Cross-Ownership*, 134 J. FIN. ECON. 400 (2019).
13. Jun-Koo Kang et al., *Are Institutional Investors with Multiple Blockholdings Effective Monitors?*, 128 J. FIN. ECON. 576 (2018).
14. Alex Edmans et al., *Governance Under Common Ownership*, 32 REV. FIN. STUD. 2673 (2019). Zohar Goshen & Doron Levit, *Irrelevance of Governance Structure* (Working paper 2020), show conditions under which common ownership can strengthen governance and thus cause underinvestment, leading to a higher profitability of each investment.

voice and exit. The results are also consistent with the idea that institutional investors often have quite strong incentives to monitor, as estimated by Lewellen and Lewellen.<sup>15</sup> Moreover, these latter results emphasize the important message that common ownership is by no means solely driven by “passive” diversification by textbook index funds across industry rivals as in Rotemberg,<sup>16</sup> but is in many cases the results of active portfolio choice, perhaps with the deliberate aim to reduce competition as in Rubinstein and Yaari.<sup>17</sup> Indeed, the empirical literature shows that the rise in common shareholding is driven not only by the growth of the Big Three index fund families but rather by the increased diversification of all institutional investors, including active funds.<sup>18</sup>

The empirical results are perhaps more difficult to reconcile with the alternative theory by Gilje, Gormley, and Levit,<sup>19</sup> which holds that investors with stakes in more firms have weaker incentives and/or capacity to govern them, as well as the spirit of law and economics papers such as Bebchuk and Hirst<sup>20</sup> arguing that what they regard as the typical common owner—an asset management firm—has weak incentives to govern.<sup>21</sup>

To make progress on the question whether common owners are good or bad for governance, the literature will have to make progress in both empirical and theoretical dimensions. First, the empirical literature will have to more clearly define its counterfactuals. In particular, the size of the stakes is not always held constant. It is therefore not always clear whether a result is a common ownership effect or a blockholder effect. To illustrate, consider an example. It would be less surprising to find or predict that institutions holding blocks greater than 5% in multiple firms are more active in governance, compared to institutions holding blocks of 5% or less, simply because of the fixed-cost component of governance activities. Therefore, if common ownership is defined using only blockholders, the finding will mix a blockholder and a common ownership effect. Also, the treatment of noninstitutional and small, truly passive shareholders (who are so passive as to not even vote their shares), who do not appear in databases of institutional ownership, is not always clear. A less often explored but perhaps more sensible counterfactual to deal with those fringes is whether, given the size of a stake in a firm or given the total assets under management (AuM) of an asset manager, concentrated ownership or common ownership leads to “better” governance outcomes.<sup>22</sup> However, there are conceptual limitations to this road forward as well. The following section on theoretical advances shows that what constitutes “good” governance outcomes is no longer well-defined when firms strategically interact because then the optimal governance choices differ for investors with different portfolios.

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15. Jonathan W. Lewellen & Katharina Lewellen, *Institutional Investors and Corporate Governance: The Incentive to Be Engaged* (Tuck School of Business Working Paper No. 3265761, Sept. 1, 2018), <https://ssrn.com/abstract=3265761>. See also Elhauge, *Causal Mechanisms*, *supra* note 8, at 49–51, 54 (arguing that Lewellen & Lewellen’s empirical results imply strong incentives to monitor).
  16. Julio J. Rotemberg, *Financial Transaction Costs and Industrial Performance* (Sloan School of Management Working Paper, Apr. 1984), <http://hdl.handle.net/1721.1/47993>.
  17. Ariel Rubinstein & Menahem E. Yaari, *The Competitive Stock Market as Cartel Maker: Some Examples*, Working Paper, 1983.
  18. Elhauge, *Causal Mechanisms*, *supra* note 8, at 5 (citing Matthew Backus et al., *Common Ownership in America 1980–2017*, at 3, 17, 22–23, 28 (NBER Working Paper No. 25454, 2019), <http://www.nber.org/papers/w25454>).
  19. Erik P. Gilje et al., *Who’s Paying Attention? Measuring Common Ownership and its Impact on Managerial Incentives*, 137 J. FIN. ECON. 152 (2020).
  20. Lucian Bebchuk & Scott Hirst, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, 119 COLUM. L. REV. 2029 (2019).
  21. Cf. Elhauge, *Causal Mechanisms*, *supra* note 8, at 41–62 (arguing that Bebchuk & Hirst, *supra* note 20, fail to show weak incentives because (a) the costs of lessening competition are generally zero or negative and certainly lower than anticompetitive gains and (b) even if the incentives of institutional investors are weaker than optimal, other investors have even less incentives to exert influence).
  22. Cf. Elhauge, *Causal Mechanisms*, *supra* note 8, at 62 nn.289-90, 292 (collecting empirical literature on the effect of greater index fund ownership on corporate governance outcomes and rates of returns).

Theoretical research on governance under common ownership in the finance literature has until recently ignored strategic interactions between the firms; sometimes explicitly so (including Gilje et al.).<sup>23</sup> Future empirical work should consider this point in its choice of measure of common ownership: a measure of common ownership whose theoretical basis rules out strategic interactions of firms, such as Gilje et al.'s, is not suitable to study the competitive effects of common ownership in industries in which firms strategically interact.

It remains unclear whether, from the perspective of competition policy, it is an important question to debate whether common owners have stronger or weaker incentives than noncommon owners to engage with portfolio firms. If common owners do have incentives to engage and act accordingly, they will engage to the effect of maximizing portfolio performance, not individual firm performance. If they do not have incentives to engage, then they also do not push firms to maximize their own performance. Either way, commonly owned firms lack owners that have strong incentives to push firms to maximize their own individual value and compete aggressively. Perhaps this consideration can serve as a benchmark for future work on this question.

**Common Directors.** Barone, Schivardi, and Sette show that a regulatory reform that disallowed common directorships between Italian banks reduced loan interest rates charged to customers by ten to thirty basis points.<sup>24</sup> Getting rid of interlocks also increased the dispersion of these prices, which the authors interpret as being consistent with interlocking directors facilitating collusion. Nili documents interlocking directorates across U.S. industries, which he interprets as a violation of Clayton Act Section 8.<sup>25</sup> Common ownership correlates with a higher likelihood of overlapping directors.<sup>26</sup> Common directors are present not only in publicly traded firms but also in venture capitalist (VC)-backed start-ups in the United States.<sup>27</sup> This serves as a reminder that, while most attention in the common ownership has been on publicly traded firms, one should not assume that private firms are necessarily independently owned, controlled, and influenced.

**Disclosure.** An emerging literature in accounting debates whether investor pressure for greater disclosure may serve as a mechanism facilitating weakening competition between commonly owned firms.<sup>28</sup> One basic logic underlying these papers is that disclosure can hurt an individual firm because it reveals proprietary information, but it benefits competitors and can facilitate product market coordination and therefore benefit the industry overall. Common owners therefore like greater disclosure more than concentrated owners.

Coffee views common owners' pressure on portfolio firms to offer greater disclosure of Environmental, Social, and Governance—and particular climate—risks as a natural consequence of their

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23. Gilje et al., *supra* note 19.

24. Guglielmo Barone et al., *Interlocking Directorates and Competition in Banking* (CEPR Discussion Paper No. DP14654, 2020), <https://ssrn.com/abstract=3594285>.

25. Yaron Nili, *Horizontal Directors*, 114 Nw. U. L. REV. 1179 (2020).

26. See José Azar, *A New Look at Oligopoly: Implicit Collusion Through Portfolio Diversification* (Dissertation, Doctor of Philosophy, Princeton University, 2012), <https://pqdtopen.proquest.com/pubnum/3545676.html>.

27. Ofer Eldar et al., *Common Ownership and Startup Growth* (Duke Law School Public Law & Legal Theory Series No. 2019-42; Georgetown McDonough School of Business Research Paper No. 3406205, June 2019), <https://ssrn.com/abstract=3406205> or <http://dx.doi.org/10.2139/ssrn.3406205>.

28. See Andrea Pawliczek et al., *Facilitating Tacit Collusion: A New Perspective on Common Ownership and Voluntary Disclosure*, SSRN ELECTRONIC JOURNAL, May 3, 2019, <https://ssrn.com/abstract=3382324> or <https://dx.doi.org/10.2139/ssrn.3382324>; Santhosh Ramalingegowda et al., *Common Institutional Ownership and Earnings Management*, CONTEMP. ACCOUNT. RES. (forthcoming 2020), <https://ssrn.com/abstract=3652349> or <https://doi.org/10.1111/1911-3846.12628>. By contrast, Jihwon Park et al., *Disclosure Incentives When Competing Firms Have Common Ownership*, 67 J. ACCOUNT. ECON. 387 (2019) consider a reduction in proprietary costs as a primary mechanism of interest.

greater concern about systematic risks rather than idiosyncratic risks, given their diversified portfolios in line with equilibrium asset pricing models.<sup>29</sup>

### *Theory and Causal Interpretation of Empirical Results*

A common feature of the policy discussion of common ownership are demands for more “causal evidence” of the corporate governance mechanism, over and above the evidence the literature has already accumulated. To an economist, this demand can seem puzzling, because in economics, incentives cause behavior. As such, the causal interpretation of an empirical relationship always comes from theory, but not from “direct evidence.” That said, empirical evidence can of course be refined, so as to eliminate alternative theories. In the end, the causal interpretation comes from the interplay between theories and empirical evidence.

In the literature on common ownership, a tighter connection between empirical findings and theoretical underpinnings would also be desirable because some empirical results were interpreted in ways that were unsubstantiated, given where the theory stands. In other cases, new theory challenges the arrived interpretation of some empirical facts.

For example, AEGS show that a standard model of firm-level corporate governance, embedded in a standard model of strategic competition from the industrial organization (IO) literature, can generate variation in market-level prices, output, and market structure consistent with empirical evidence in the literature.<sup>30</sup> It is the first model that explicitly predicts variation not only across markets but also *within firms* in product market behavior rather than broad effects emphasized in earlier theories. At the same time, it challenges the interpretation of some of the empirical work in this area because it endogenizes firm output and market shares, as detailed below.

Specifically, their model assumes that a manager faces costs of effort, whereas greater effort leads to a reduction in the firm’s cost of production. (Incentives to induce “effort” is a metaphor in the literature to more generally mean the tightness of corporate governance. The model is indeed isomorphic to one in which the manager does not choose effort, but perquisites and the role of shareholders it to limit these, to some extent.)

If the firm were a price taker in the product market as in traditional models of corporate finance and personnel economics, higher managerial effort would increase firm value and shareholder value, up to the point that the compensation cost necessary to induce such effort provision equalizes the gains in terms of an increase in profit margins.

By contrast, AEGS show that when the firm strategically interacts with product market competitors, cost reductions caused by managerial effort also increase the firm’s chosen output. Higher output reduces product prices due to downward-sloping demand curves. Thus, better governance and higher effort induce a negative externality on rival firms. A common owner will therefore optimally choose less performance-sensitive incentives than a customarily assumed-to-be undiversified owner (or the owner of a firm that does not interact with product market rivals). Notwithstanding that, a common owner may choose more performance-sensitive pay than the manager would like, and thus, more performance-sensitivity than would be implemented in firms whose shareholder base is entirely composed of small, purely passive, distributed shareholders that leave control to managers.

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29. John C. Coffee, *The Future of Disclosure: ESG, Common Ownership, and Systematic Risk* (European Corporate Governance Institute—Law Working Paper 541/2020, Sept. 2020), <https://ssrn.com/abstract=3678197> or <http://dx.doi.org/10.2139/ssrn.3678197>. There is now also an emerging literature on common-ownership effects on corporate social responsibility, *see, e.g.,* Xin Dai & Yue Qiu, *Common Ownership and Corporate Social Responsibility*, *REV. CORP. FIN. STUD.*, (forthcoming 2020). Methodological concerns discussed through this review also apply here.

30. Antón et al., *supra* note 10.

Perhaps surprisingly, such *firm*-level corporate governance choices can induce *market*-level variation in price and quantity outcomes. The reason is that commonly owned firms end up being less efficient than firms controlled by undiversified owners. Therefore, in markets in which there is common ownership and inefficient, high-cost firms compete, prices are high. In markets in which there is no common ownership between rivals, one of the high-cost firms owned by common owners might compete with a low-cost firm that has no common ownership at all, which thus offers lower prices, and takes a greater market share. By this token, the model generates positive market-level correlations between common ownership and prices and negative correlations with output, but also a negative correlation between market concentration and common ownership. Those are empirical facts documented in previous literature that thus far lacked a unified explanation.

More speculatively, the AEGS model might even contain the explanation for the result in AST that the anticompetitive effects of common ownership are only present in markets with greater concentration: the AEGS mechanism requires that firms interact strategically. That is in contrast to earlier theories of governance under common ownership which do not depend on strategic interactions between firms (even explicitly ruling them out) but have the number of firms in an investor's portfolio as the key parameter.<sup>31</sup>

*Conceptual Learnings and Trade-Offs.* Aside from the more applied results in AEGS, several conceptual learnings arise as well: First, the view that common owners are relatively “lazy” or low-cost principals that underinvest in stewardship and are “excessively deferential” to managers (such as Bebchuk and Hirst)<sup>32</sup> is not incompatible with anticompetitive effects of common ownership. On the contrary, in the AEGS model, common ownership is the reason why, endogenously, the owners choose to underinvest in stewardship. Understanding this new rationale is important for policy makers: it is not clear that discouraging institutions from engaging in corporate governance activities will improve competition between portfolio firms. Indeed, it might harm both the quality of corporate governance and lead to a further lessening of competition through less efficient firms and hence reduced output. Breaking up asset managers without reducing the extent to which they hold competitors—rather than reducing the extent of within-industry diversification—might have a similarly adverse effect on both governance and competition. Also, the model proves that it may not be possible to distinguish between common ownership versus agency problems as ultimate causes of changes in firms' product market strategy: the two explanations are endogenously related and therefore not exclusive, as assumed in much of the literature on the topic to date.

Second, firm managers need not know who their largest shareholders are in order to act in their interest. The informational and computational burden for managers to act in common owners' interest is no greater than in standard, existing, and accepted, theories of corporate governance. In the AEGS model, the manager simply takes her incentive contract as given and acts accordingly. Market-level pricing is performed by an agent that takes firms' cost as given and simply maximizes profits market by market, as in standard IO models. The informal theory that, in order for common ownership to have market-level effects, an elaborate corporate governance mechanism is required does not hold up to the scrutiny of mathematical logic.

Third, endogeneity of market shares is not a bug in common ownership research, but a feature. In Antón et al.'s model, variations in common ownership affect firm output, market shares, and product prices.<sup>33</sup> As a result, in a regression of price on ownership-adjusted concentration, the coefficient on measures of common ownership that incorporate market shares such as the often-used Modified

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31. Gilje et al., *supra* note 19; Edmans et al., *supra* note 14.

32. Bebchuk & Hirst, *supra* note 20.

33. Antón et al., *supra* note 10.

Herfindahl-Hirschman-Index's increment of the over the traditional Herfindahl-Hirschman Index (HHI), MHHI delta, is not equivalent to the effect of common ownership on prices. One reason is that MHHI delta contains endogenous market shares. But another reason is that all other controls in the regression, including HHI, are ultimately driven by variation in ownership and their effects on price should therefore be correctly interpreted as a common ownership effects as well. As such, the model challenges the interpretation by AST of AST's result—but also the interpretation of Dennis et al.,<sup>34</sup> who believe that if variation in market shares drives the correlation between prices and common ownership,<sup>35</sup> then there is no effect of common ownership on prices. Even if that claim was factually correct, that conclusion is not warranted. If common ownership affects costs, strategic capacity decisions, and therefore prices, the effect would be reflected in the data precisely in a correlation between market shares (as well as its corollary, market concentration) and prices. Such endogeneity might even indicate that AST underestimate the effect.<sup>36</sup>

One limitation of the new theory by Antón et al.<sup>37</sup> is that it presumes the existence of a manager and set of competitors. Two papers neatly complement that theory for a fuller picture. One is a novel contribution by Ruiz-Pérez,<sup>38</sup> discussed in more detail below, which models and estimates that entry negatively relates to common ownership in the U.S. airlines industry; in contrast, in Antón et al., market presence is taken as given, but quantity choice is affected by common ownership. The other complement is by Azar, who shows that a noncontractual approach—namely, voting—can also yield incentives for managers to take into account common shareholders' interests, by virtue of the market for corporate directors and director elections rather than explicit incentives.<sup>39</sup> In other words, Antón et al. study explicit incentives, whereas Azar shows that implicit incentives can lead to anticompetitive behavior as well.

## Broader Effects on Firm Behavior and Product Market Outcomes

The second set of new papers this review discusses concerns studies documenting common ownership effects in a variety of markets and industries, as well as common ownership effects on other aspects of firm behavior.

### Product Market Effects in Other Industries

My last review of the literature covered studies of effects of common ownership on prices and output in U.S. airline and banking markets, as well as entry into drug markets.<sup>40</sup> Since then, studies from many other sectors have been produced by a variety of researchers. These studies suggest that common ownership effects on competition may exist also in other industries.

Specifically, one of the articles in this issue, Jennifer Clapp and Mohammad Torshizi,<sup>41</sup> studies prices of agricultural seeds. Notably, this article shows that using a variant of MHHI delta as a measure

34. Patrick J. Dennis et al., *Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry*, SSRN ELECTRONIC JOURNAL, June 25, 2020, <https://ssrn.com/abstract=3063465> or <http://dx.doi.org/10.2139/ssrn.3063465>.

35. This is a hypothetical that is not factually correct; see discussion of Pauline Kennedy et al., *The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence*, SSRN ELECTRONIC JOURNAL, July 24, 2017, <https://ssrn.com/abstract=3008331> or <https://dx.doi.org/10.2139/ssrn.3008331> by José Azar et al., *Research on the Competitive Consequences of Common Ownership: A Methodological Critique*, 66 ANTITRUST BULL. 113 (2021) in this volume.

36. See Elhauge, *How Horizontal Shareholding Harms*, *supra* note 3, at 223–24.

37. Antón et al., *supra* note 10.

38. Alexandro Ruiz-Pérez, *Market Structure and Common Ownership: Evidence from the U.S. Airline Industry* (2019), [https://www.cemfi.es/~Ruiz-Perez/alexandro\\_ruiz\\_perez\\_JMP\\_nov2019.pdf](https://www.cemfi.es/~Ruiz-Perez/alexandro_ruiz_perez_JMP_nov2019.pdf).

39. José Azar, *The Common Ownership Trilemma*, 87 U. CHI. L. REV. 263 (2020).

40. Schmalz, *supra* note 2.

41. Mohammad Torshizi & Jennifer Clapp, *Price Effects of Common Ownership in the Seed Sector*, 66 ANTITRUST BULL. 39 (2021).

of common ownership, which is not subject to the same endogeneity critiques of the measure as used by AST,<sup>42</sup> still predicts product prices. Aslan shows that common ownership predicts variation in prices of hundreds of consumer goods, using instruments for ownership and market shares.<sup>43</sup> Switching industries, using panel regressions, Liu finds a positive relationship between common ownership concentration and hospital prices, as proxied by the bill by patient.<sup>44</sup> The results may have a causal interpretation, given that panel regressions with lags and a difference-in-differences analysis confirm that positive relation. Hospital service prices for more concentrated regions (at the investor level) increased by 12% compared to the control regions with lesser increases of common ownership.<sup>45</sup> In a study commissioned by the European Commission, Rosati, Bompreszi, Ferraresi, Frigo, and Nardo (2020)<sup>46</sup> find that the BlackRock-BGI merger (used, as in AST, as a shock that changed common ownership levels) increased market power in European beverage markets.<sup>47</sup>

### Common Ownership Effects on Corporate Behavior

A newly emergent stream of work evaluates the effect of common ownership on facets of corporate behavior beyond consumer prices. A new study by Asai and Charoenwong<sup>48</sup> advances the literature not only on methodological grounds but also shows a different market outcome from previous studies: they show that identical bidding in public procurement options is correlated with common ownership, as is the winning bid. The conceptual import of this finding is that whereas much of the common ownership literature bases its investigations on various unilateral-effects frameworks, identical bidding does seem to have a coordinated component.

42. AST, *supra* note 1.

43. Hadiye Aslan, *Common Ownership, Creative Destruction, and Inequality: Evidence from U.S. Consumers* (Working Paper, Sept. 12, 2019), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3452765](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3452765).

44. Mengde Liu, *Players behind the Scenes: Common Ownership in the Hospital Industry* (Working Paper, Oct. 31, 2019), <https://pdfs.semanticscholar.org/8dae/3f4c62c1eab3cf0412666f490f337149d223.pdf>.

45. As is so often the case, market-level studies of price effects of common ownership are limited by data, in particular of prices, to which only firms (and potentially regulators) have privileged access. In the case of the hospital study, for example, Zack Cooper et al., *The Price Ain't Right? Hospital Prices and Health Spending on the Privately Insured*, Q. J. ECON. 134.1 (2019) at 51, find that the correlation between charges (as used by Liu) and transaction prices ranges from 0.243 to 0.471—that is, significantly below 1. As such, better price data would likely reduce measurement error and thus attenuation bias and make it easier for researchers to detect price effects but also justify greater confidence in the findings.

46. Nicoletta Rosati et al., *Common Shareholding in Europe* (EUR 30312 EN, Publications Office of the European Union, JRC121476, Luxembourg, 2020), doi:10.2760/734264. Rosati et al. also dedicate an appendix to derive a unified framework for a series of common ownership measures; many indicators used in the literature fall within that framework. They also analyze the impact of varying thresholds for blockholdings on the measures, plus an empirical analysis on European data. The report also discusses the extent of common ownership in Europe, as documented by Monopolies Commission, *Common ownership*, Excerpt from Chapter II of the XXII Biennial Report of the Monopolies Commission (“Competition 2018”) in accordance with Section 44 Paragraph 1 Sentence 1 of the German Act against Restraints of Competition, available at [https://www.monopolkommission.de/images/HG22/Main\\_Report\\_XXII\\_Common\\_Ownership.pdf](https://www.monopolkommission.de/images/HG22/Main_Report_XXII_Common_Ownership.pdf) and by Frazzani et al., *Barriers to Competition through Common Ownership by Institutional Investors*, Study for the Committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2020, available at [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652708/IPOL\\_STU\(2020\)652708\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/652708/IPOL_STU(2020)652708_EN.pdf).

47. These authors also study common ownership levels in Europe. Documentations of the extent of common ownership in other industries also include Jocelyn D. Evans et al., *When Passive Index Investors Engage in Activist Corporate Governance: The Existence of Correlated Institutional Block Ownership within REIT Capital Markets*, 16 J. ACC. FIN. (2016) who claim to document that “Vanguard has approximately a 20% stake in almost 80% of all publicly traded REITs. Other institutions, many of which are index mutual funds and ETFs, also consistently own blocs in the same firms.”

48. Kentaro Asai & Ben Charoenwong, *Ownership Networks May Facilitate Bid-Rigging*, SSRN ELECTRONIC JOURNAL, Apr. 8, 2020, <https://ssrn.com/abstract=3298152> or <https://dx.doi.org/10.2139/ssrn.3298152>.

Along a similar vein, Xie<sup>49</sup> in this volume refines earlier results by Gerakos and Xie,<sup>50</sup> who showed that common ownership predicts pay-for-delay settlements between branded and generic drugs. Xie shows that the anticompetitive effect of horizontal shareholding on pay-for-delay settlements is driven by horizontal shareholding between the branded incumbent and the first-filing generic, which by statute gets a period of generic exclusivity that in turn delays the entry of other generics.<sup>51</sup>

Evidence that common ownership is a driver of mergers, and, by that token, of increasing market concentration also keeps mounting. Antón, Azar, Giné, and Lin show common ownership increases the profitability of horizontal mergers for diversified shareholders not only due to their ownership stakes in the target but also due to their stakes in nonmerging rival firms.<sup>52</sup> Cumulative abnormal returns for acquirer shareholders are not negative when taking into account the effects of nonmerging rivals in their portfolio. These results may explain why value-destroying mergers get approved and how a high-common ownership environment is correlated with higher M&A frequency, as documented by Brooks et al.<sup>53</sup> and covered in the previous review.<sup>54</sup> Irani, Yang, and Zhang show that common ownership between the acquirer and potential competing acquirers reduces the likelihood that the target receives a competing bid by 45%, suggesting that common ownership reduces competition in the market for corporate takeovers.<sup>55</sup>

Complementing a large set of papers on the effect of common ownership on innovation covered in my previous review, Gao, Shan, Gao, and Chan find positive effects of common ownership on innovation among Chinese firms.<sup>56</sup> As a reminder, positive effects of common ownership on innovation don't imply a positive effect on welfare: procompetitive effects of cost-reducing innovation have to be weighed against the simultaneous anticompetitive effects of common ownership in product market competition.

### Common Ownership outside Public Stock Markets

Whereas much of the attention to common-ownership-related competition problems has focused on public stock markets, this attention has likely been driven by data availability. It seems likely that much larger common ownership stakes are deliberately accumulated by institutional investors in private markets (whether with procompetitive or with anticompetitive effects).

Li, Liu, and Taylor show that when VCs are horizontal owners in start-ups with competing drug projects and one of those projects passes a Food and Drug Administration approval stage, the competing project at the other firm is more likely to be shutdown.<sup>57</sup> This article avoids endogeneity concerns with MHHIs by just using the existence of horizontal ownership and by using an instrumental variable (IV) to predict such horizontal ownership.

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49. Jin Xie, *Horizontal Shareholdings and Paragraph IV Generic Entry in the U.S. Pharmaceutical Industry*, 66 ANTITRUST BULL. 100 (2021).

50. Jin Xie & Joseph Gerakos, *The Anticompetitive Effects of Common Ownership: The Case of Paragraph IV Generic Entry*, 110 AEA PAPERS AND PROCEEDINGS 569 (2020).

51. Xie, *supra* note 49.

52. Miguel Antón et al., *Beyond the Target: M&A Decisions and Rival Ownership*, SSRN ELECTRONIC JOURNAL, Sept. 25, 2020, <https://ssrn.com/abstract=3226390> or <http://dx.doi.org/10.2139/ssrn.3226390>.

53. Chris Brooks et al., *Institutional Cross-Ownership and Corporate Strategy: The Case of Mergers and Acquisitions*, 48 J. CORP. FIN. 187 (2018).

54. Schmalz, *supra* note 2.

55. Mohammad (Vahid) Irani et al., *Common Ownership and Competition in Mergers and Acquisitions*, SSRN ELECTRONIC JOURNAL, Sept. 29, 2019, <https://ssrn.com/abstract=3461284> or <https://dx.doi.org/10.2139/ssrn.3461284>.

56. Kaijuan Gao et al., *The Power of Sharing: Evidence from Institutional Investor Cross-Ownership and Corporate Innovation*, 63 INT. REV. ECON. FINANCE 284 (2019).

57. Xuelin Li et al., *Do Venture Capitalists Stifle Competition?* (Jacobs Levy Equity Management Center for Quantitative Financial Research Paper, May 28, 2020), <https://ssrn.com/abstract=3479439> or <http://dx.doi.org/10.2139/ssrn.3479439>.

We know from theory that common ownership can enhance welfare if it facilitates technology spillovers and provides better ex ante incentives to innovate.<sup>58</sup> González-Uribe provides evidence for the importance of information exchanges between companies commonly owned by the same VC, perhaps because of innovation complementarities.<sup>59</sup> Eldar, Grennan, and Waldo show improved outcomes—from the perspective of shareholders—when VC-backed firms share common directors.<sup>60</sup>

A recent proposed rulemaking by the U.S. Federal Trade Commission and Department of Justice to change Hart-Scott-Rodino Act filing requirements to get better information on horizontal ownership by private equity firms may be a step in the direction of better understanding common ownership in private markets more broadly.<sup>61</sup>

### *New Empirical Results on Vertical Common Ownership*

Kedia, Rajgopal, and Zhou document the partial ownership stake by Berkshire Hathaway and Davis Selected Advisors of the credit ratings agency Moody's.<sup>62</sup> The two firms *collectively* owned about 23.5% of Moody's stock during a two-year period in the early 2000s. This ownership appears to have had the effect of triggering more favorable credit ratings by Moody's for these owners' portfolio firms, compared to the ratings by other, not commonly owned credit ratings agencies. This finding is consistent with the large shareholders changing the profit weights of Moody's in such a way as to induce the firm to potentially sacrifice reputation in order to benefit portfolio firms of their largest owners.

Kedia et al.'s results illustrate that the popular focus in common ownership debate on large asset management companies (often misleadingly labeled as “passive” or “index” funds) can be misleading. Berkshire Hathaway is not a passive investor but often chooses to be a large common owner. The study by Kedia et al. also shows that common ownership effects are not limited to horizontal shareholding but can also lead to distortions in product market outcomes when vertically related firms are commonly owned. Vertical common ownership links are not necessarily procompetitive.

Durrani shows that common ownership of a lender and borrower influences distressed borrowers' choice between different Chapter 11 regimes, “freefall” or “packaged.”<sup>63</sup> (In “freefall” bankruptcies, the firm enters Chapter 11 without having arranged the terms of restructuring with its stakeholders. In “packaged” bankruptcies, the debtor enters bankruptcy after negotiating the terms of a restructuring with its major stakeholders.) Durrani argues “freefall” deals are more beneficial to lenders. He then shows that indeed freefall bankruptcies are more likely when the borrowers' owners have a financial interest in the lender as well.

### *Reduction in the Cost of Debt*

One specific type of vertical common ownership is between banks and their borrowers; one particularly interesting outcome is on the price governing that relationship, namely, the cost of borrowing.

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58. Ángel L. López & Xavier Vives, *Overlapping Ownership, R&D Spillovers and Antitrust Policy*, 127 J. POL. ECON. 2394 (2019), <https://www.journals.uchicago.edu/doi/pdf/10.1086/701811>.

59. Juanita González-Uribe, *Exchanges of Innovation Resources Inside Venture Capital Portfolios*, 135 J. FIN. ECON. 144 (2020).

60. Eldar et al., *supra* note 27.

61. [https://www.ftc.gov/system/files/documents/federal\\_register\\_notices/2020/09/p110014hsractamendnprm09182020\\_0.pdf](https://www.ftc.gov/system/files/documents/federal_register_notices/2020/09/p110014hsractamendnprm09182020_0.pdf).

62. Simi Kedia et al., *Large Shareholders and Credit Ratings*, 124 J. FIN. ECON. 632 (2017).

63. Farooq Durrani, *Essays in Empirical Corporate Finance and Institutional Ownership* (Dissertation, Doctor of Philosophy, Temple University, Aug. 2020), [https://scholarshare.temple.edu/bitstream/handle/20.500.12613/307/Durrani\\_temple\\_0225E\\_14180.pdf?sequence=1](https://scholarshare.temple.edu/bitstream/handle/20.500.12613/307/Durrani_temple_0225E_14180.pdf?sequence=1).

Wang<sup>64</sup> complements the findings of Ojeda<sup>65</sup> that common ownership between banks and nonbank borrowers causes lower borrowing rates. The main difference is that Ojeda considers existing common-ownership links between industrial firms and their lenders, whereas He et al. study links between firms and banks they have not yet borrowed from. Also, the instrument He et al. use to shock common ownership is financial institution mergers, whereas Ojeda used passive investor ownership.<sup>66</sup> As such—despite potential challenges to the instrument used—this result ensures that the earlier qualitative finding is robust to different methods of measurement and identification. In a similar vein, Lin finds that common ownership correlates with—and, he argues, likely causes—reduced cost of debt, possibly because of improved monitoring, or because of reduced asymmetric information between bank and borrower.<sup>67</sup> Some other evidence also suggests that common ownership between banks and borrowers reduces debt costs but perhaps for anticompetitive reasons.<sup>68</sup>

The accumulated evidence increases confidence that common ownership effects are present also among vertically related firms. The interpretation of such effects is hampered by the difficulty of complementing the empirical findings with tractable and useful models. While welfare judgments are difficult in the absence of such models, the least that these studies show is that firm behavior does respond to the portfolios of the largest owners and thus strengthen the premise of the common ownership literature. The findings reject the neoclassical null hypothesis that corporate choices are independent of shareholder preferences.

## Estimation Techniques, Common Ownership Measures, and Identification

An interesting feature of the literature on common ownership arises due to its being positioned squarely between the financial economics and IO subdisciplines of economics. For reasons I discussed in previous work,<sup>69</sup> there is a tradition in IO that emphasizes the importance of addressing the endogeneity of market shares in product market studies, whereas it is acceptable or even uncontroversial in IO to make ad hoc assumptions about the objective of the firm and about the corporate governance mechanism that would lead firms to maximize objectives other than their own value—or indeed to ignore agency conflicts altogether. In contrast, the casual use of a market concentration index

64. Hui Wang, *Essays on Household and Corporate Finance* (Dissertation, Doctor of Philosophy, The University of Texas at Dallas, May 2020), <https://utd-ir.tdl.org/bitstream/handle/10735.1/8830/ETD-5608-042D-261859.33.pdf?sequence=5>.

65. Waldo Ojeda, *Common Ownership in the Loan Market* (2019), [https://waldotekampa.me/files/Ojeda\\_BankingCommonOwnership.pdf](https://waldotekampa.me/files/Ojeda_BankingCommonOwnership.pdf).

66. *Id.*

67. Luca Xianran Lin, *Friends with Threats: Credit Risk under Common Ownership* (Working Paper, Nov. 2018), [https://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2019-Azores/papers/EFMA2019\\_0120\\_fullpaper.pdf](https://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2019-Azores/papers/EFMA2019_0120_fullpaper.pdf).

68. Xiaoran Ni & David Yin, *Institutional Common Ownership and Cost of Capital*, SSRN ELECTRONIC JOURNAL, Nov. 1, 2019, <https://ssrn.com/abstract=3402919> or <http://dx.doi.org/10.2139/ssrn.3402919> and Guillermo Ramirez-Chiang, *Common Institutional Ownership of Industry Rivals and Borrowing Costs*, SSRN ELECTRONIC JOURNAL, 2019, also find a lower cost of debt/capital for more commonly-owned firms, where the effect seems to be intermediated by lower cash flow volatility and higher profits, perhaps due to reduced competition. For similar results, see Yangyang Chen et al., *Corporate Financing of Investment Opportunities in a World of Institutional Cross-Ownership*, SSRN ELECTRONIC JOURNAL, June 2020, <https://ssrn.com/abstract=3183581> or <http://dx.doi.org/10.2139/ssrn.3183581>. However, the use of financial institution mergers as a source of identifying variation in all of the latter studies may not be suitable, as per the discussion below of Katharina Lewellen and Michelle B. Lowry, *Does Common Ownership Really Increase Firm Coordination?* (Tuck School of Business Working Paper No. 3336343, July 15, 2020, J. FINANC. ECON., forthcoming), <https://ssrn.com/abstract=3336343> or <http://dx.doi.org/10.2139/ssrn.3336343>, and would benefit of reexamining whether a causal relation exists with alternative “shocks” to common ownership.

69. Schmalz, *supra* note 2.

that relies on potentially endogenous market shares, such as the HHI as an explanatory variable, is a mainstream attribute of the finance literature. Conversely, the bar in finance is much higher for convincing the audience of the existence of corporate governance mechanisms that could lead to objective functions of the firm to deviate from the ubiquitously assumed firm value maximization. A perhaps even greater challenge is to convince a finance audience of a measure that assumes firms behave in their shareholders' interest, without acknowledging agency problems as a first-order determinant of firm behavior. Relatedly, the modern IO literature emphasizes the use of structural models<sup>70</sup> over the reduced-form models used in the bulk of the finance literature.

In my view, there is no value ranking between these complementary approaches and in particular no superiority of structural methods over reduced-form methods in identifying causal effects. Instead, the different methods serve different purposes and complement each other. In the words of Nevo and Whinston, "one comes away with the impression that there is only a single way to conduct credible empirical analysis. This seems to us a very narrow and dogmatic approach to empirical work; credible analysis can come in many guises, both structural and nonstructural."<sup>71</sup> Further, "empirical analysis must not only deal with credible inference, but also with . . . 'extrapolation' . . . This is where structural analysis comes in."<sup>72</sup>

This reflection suggests that in order to make true progress, both the IO and finance fields need to become more tolerant and open-minded to appreciate the virtues of the methods and approaches used in the other field rather than focusing exclusively on the flaws and limitations of the other field's methods. Satisfying the criteria of both fields jointly (such as building realistic structural models of product market competition under common ownership that also feature governance frictions, endogenous ownership structure, and perhaps even endogenous asset prices) will be difficult or impossible. That said, the progress that has been made is built on borrowing from a variety of fields, including network analysis that is common in fields such as organization theory or sociology. I now detail the progress the literature has made in learning from each other's cross-fertilization of research methods and ideas, in particular between finance and IO. Such progress has been made with respect to structural estimates of common ownership effects, the derivation of new measures, and new identification strategies.

### Structural Estimates

Potentially, one of the most important papers of the past two years that approaches the topic from the perspective of the modern IO literature is a structural estimation of the competitive effects of common ownership by Park and Seo.<sup>73</sup> These authors respond to methodological critiques of AST's analysis (which, as AST point out, does not have an instrument for market shares), by using the standard structural techniques from the modern IO literature,<sup>74</sup> and apply them to the U.S. airline industry, for which AST provided reduced-form estimates.<sup>74</sup> They estimate demand and supply systems and allow the common ownership conduct parameter to take any value between  $-1$  (which would indicate firms put negative weight on rival firms' profits, perhaps because of pecuniary management incentives to

70. Tommaso Valletti, "Doubt Is Their Product": *The Difference between Research and Academic Lobbying*, PROMARKET.ORG (Sept. 28, 2020), <https://promarket.org/2020/09/28/difference-between-research-academic-lobbying-hidden-funding>.

71. Aviv Nevo & Michael D. Whinston, *Taking the Dogma out of Econometrics: Structural Modeling and Credible Inference*, 24 J. ECON. PERSPECT. 69, 70 (2010).

72. *Id.* at 71. See also Martin C. Schmalz, *Empirical Studies of Common Ownership-Effects on Product Markets & Innovation* (Presentation Slides, Dec. 6, 2018), <https://ssrn.com/abstract=3487349> or <http://dx.doi.org/10.2139/ssrn.3487349>.

73. Alex Haerang Park & Kyoungwon Seo, *Common Ownership and Product Market Competition: Evidence from the U.S. Airline Industry*, 48 KOREAN J. FINANC. STUD. 617 (2019).

74. Steven Berry et al., *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA 841 (1995).

74. Steven Berry et al., *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA 841 (1995).

that effect, perceptions of fiduciary duty, or for unmodeled “behavioral” reasons) and 1 (firms put as much weight on rival firms’ profits as in the theory, which assumes management acts in shareholders’ interest, proportional to the size of the investors’ stakes).

Irrespective of the particular subsample they use, the authors estimate the common ownership conduct variable to be close to 1, suggesting that the weight firms actually put on rival firms is almost precisely as large as the common ownership incentives in an agency-free model.<sup>75</sup> Moreover, the authors find that “airline companies linked through higher common ownership are more likely to coordinate to a larger degree in setting airfare prices”<sup>76</sup> and conclude that

Our finding is largely consistent with Azar et al. (2018a), who show that common ownership increases prices in the U.S. airline industry using the reduced-form regression model, . . . Meanwhile, our finding is in contrast with that of Kennedy et al. (2017), who argue that airline companies do not take into account their shareholders’ common ownership in setting prices using the structural model.<sup>77</sup>

The contrast to the earlier structural estimation by Kennedy et al. is explained by a different choice of sample that is more consistent with the established literature.

Park and Seo also remind the reader that “Kennedy et al. (2017) find that the coefficient of common ownership is insignificant, which however does not reject the hypothesis that common ownership has a positive effect on prices nor does it provide any evidence on the relationship between common ownership and market competition. A part of their estimation results including the negative effect of distance on marginal costs contradicts economic logic and is inconsistent with previous literature such as Berry and Jia<sup>78</sup> and Ciliberto and Williams.”<sup>79,80</sup>

Researching the same industry but with a different model and different outcomes, Ruiz-Pérez<sup>81</sup> develops and estimates a structural model of entry and pricing using U.S. airline data. In a first stage, airlines choose to enter markets; only the second stage involves choosing prices given market presence. Consistent with the interpretation in AST that common ownership affects pricing through top management’s strategic capacity decisions rather than operating and market-level pricing decisions,<sup>82</sup> he finds that common ownership affects entry into airlines markets and hence market structure but has no direct effect on prices. Common ownership can thus affect prices *indirectly* through market structure—even if there are no significant *additional* effects at the from pricing decisions. The possibility of indirect price effects through common ownership’s effect on market structure is a parallel of Ruiz-Pérez’s paper also with the corporate governance model proposed by Antón et al. that was discussed above.<sup>83</sup>

Asai and Charoenwong, mentioned above,<sup>84</sup> provide a structural model to estimate the quantitative impact of common ownership on the price of government contracts. Common ownership is related to more identical bids in procurement auctions, which the authors interpret as bid-rigging.

75. *Id.* at 634–40.

76. *Id.* at 635.

77. *Id.* at 636, referring to the study by Kennedy et al., *supra* note 35, sponsored by the U.S. mutual fund industry’s lobby organization ICI.

78. Steven Berry & Panel Jia, *Tracing the Woes: An Empirical Analysis of the Airline Industry*, 2 AM. ECON. J. MICROECONOMICS 1 (2010).

79. F. Ciliberto & J. W. Williams, *Does Multimarket Contact Facilitate Tacit Collusion? Inference on Conduct Parameters in the Airline Industry*, 45 RAND J. ECON. 764 (2014).

80. Park & Seo, *supra* note 73, n.12.

81. Ruiz-Pérez, *supra* note 38.

82. AST, *supra* note 1, at 1555–56; Elhauge, *Causal Mechanisms*, *supra* note 8, at II.C.

83. Antón et al., *supra* note 10.

84. Asai & Charoenwong, *supra* note 48.

## Common Ownership Data and Measures

Because any measure of common ownership is an attempt at summarizing the information contained in a matrix describing the entire ownership and control structure of an industry or market as a single number, a lot of potentially relevant information is necessarily lost. As a result, there cannot be such a thing as a single “right” measure of common ownership.<sup>85</sup> (There can be bad measures, though—such as those that fail to capture economic incentives and behavior.) Therefore, instead of stubbornly insisting on a single best measure, researchers should be mindful of the potential of not measuring the quantity with the relevant economic content. Researchers should also be mindful that a measure that captures economic behavior in one context—for example, an industry whose ownership is dominated by institutional investors—might not be suitable in another industry—perhaps one in which foundations or individuals who may have different incentives from institutional investors are important shareholders or in a jurisdiction with different corporate governance arrangements. Because no one measure has been identified that perfectly captures economic incentives and firm behavior, measurement error and attenuation bias are likely outcomes of many attempts at measuring common ownership effects and should be considered as the benchmark explanation when interpreting null effects.

A step forward has been contributed by Backus et al. in a paper documenting the increase of common ownership from 1980 among S&P 500 firms.<sup>86</sup> They first advocate for replacing the commonly used MHHI delta measure of common ownership concentration with profit weights. The profit weights capture to which extent the most powerful investors in one firm hold stakes in competitors. Advantages of that measure vis-à-vis the previously popular MHHI delta index include that (i) profit weights can be calculated at the firm instead of the market level and therefore provide more granular variation that can be used for identification; (ii) profit weights do not feature market shares, which can be endogenous and lead to challenges to interpretation, but retain other attractive features of MHHI delta discussed in Schmalz;<sup>87</sup> and (iii) profit weights can be decomposed into a “cosine similarity” that measures the degree of common ownership in investors’ portfolios and an investor concentration index, which captures the size distribution of blockholders (without the need for artificial and discrete cutoffs, such as 5%). The fact that profit weights are free from market shares also has a disadvantage. Previous work indicates that common ownership effects may only be present in concentrated markets.<sup>88</sup> High horizontal shareholding between firms with small market shares may have no anticompetitive effect, which this measure would wrongly conclude counts against any claim that horizontal shareholding does have anticompetitive effects in general.<sup>89</sup>

Due to the advantages of their measure, Backus et al. are thus able to decompose the drivers behind the increase in common ownership of U.S. public firms over the past decades.<sup>90</sup> Perhaps most importantly, they find that the increase in common ownership is not exclusively driven by an increase in the size of the large asset management companies sponsoring some of the largest index funds and that are often (mis)labeled as “passive” investors.<sup>91</sup> Instead, it is also driven by the increased diversification of all institutional investors, including active funds, as foreseen by Rotemberg.<sup>92</sup> Recall that diversified investors may have little reason to oppose common owners’ governance agendas if they have the effect

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85. I am grateful for the formulation of this insight to Dirk Jenter, a coauthor of a pioneering study on common ownership Jarrard Harford et al., *Institutional Cross-Holdings and Their Effect on Acquisition Decisions*, 99 J. FINANCE. ECON. 27 (2011).

86. Matthew Backus et al., *Common Ownership in America: 1980-2017*, AM. ECON. J. MICROECON. forthcoming. [hereinafter: Backus et al., *Common Ownership*].

87. Schmalz, *supra* note 2.

88. See Elhauge, *How Horizontal Shareholding Harms*, *supra* note 3, at 225, 237, 243, 248–249.

89. *Id.* at 211, 225, 237–38, 248–49, 251–52.

90. Backus et al., *Common Ownership*, *supra* note 86.

91. *See Id.*

92. Rotemberg, *supra* note 16.

of lessening competition (as likewise predicted in a section on shareholder “unanimity” by Rotemberg).<sup>93</sup> The profit weight measure of common ownership and its components have been used in various empirical papers already, including Boller and Scott Morton, and Antón et al.<sup>94</sup>

Because Backus et al. source some of their data directly from the Securities and Exchange Commission (SEC) website rather than from a data vendor,<sup>95</sup> their data may be less likely to suffer from mistakes that 13F data from Thomson-Reuters are known to suffer from.<sup>96</sup> As such, their data on institutional shareholdings of S&P 500 firms are probably the best easily accessible data set on ownership presently available to researchers. Researchers involved in cross-industry studies should be aware of the limitations implied by that scope and its likely consequences for attenuated estimates and other econometric biases.

In the meantime, other scholars have developed alternative measures of common ownership that have various other advantages and disadvantages. Brito, Elhauge, Ribeiro, and Vasconcelos derive the firm’s objective function with a probabilistic voting model that assumes shareholders with higher financial stakes will take greater interest in the managerial actions.<sup>97</sup> Doing so yields the result that managers maximize a control-weighted sum of the shareholders’ relative returns. This formulation is similar to the “profit weights” approach discussed above but is an important contribution on account of it being grounded in microeconomic foundations.

Moskalev provides a voting model spelling out conditions under which shareholders with similar portfolios can be regarded as a single block (because shareholders with similar portfolios tend to vote in similar ways).<sup>98</sup> Given the fact that larger blocks tend to command greater control, his finding is potentially fundamental at finding the right level of aggregation of shareholder portfolios in constructing profit weights or common ownership concentration indexes for empirical work. It may also help inform the question to which extent a reduction in investor concentration without changing portfolio composition would help—or not—in reducing common ownership incentives. As of yet, however, Moskalev’s model has not been empirically validated.

Illustrating the different focus of the finance vis-à-vis the IO literature, Gilje et al. propose a measure of common ownership that takes governance frictions into account.<sup>99</sup> They note that, taking as given the size of an institutional investor’s governance team and thus resource constraints, having more firms in the portfolio enables less attention to any given firm. Their measure assumes that less attention means the firm will put less weight on the respective shareholder’s preferences. The model does not capture the feature that larger institutions tend to employ larger governance teams (but, they note, could be adjusted for such effects) and thus push that resource constraint, perhaps as a result of being more likely to be pivotal in voting contests.<sup>100</sup> In other words, attention in their model is

93. *Id.*

94. Lysle Boller & Fiona M. Scott Morton, *Testing the Theory of Common Stock Ownership*, SSRN, July 6, 2020, <https://ssrn.com/abstract=3644036> or <http://dx.doi.org/10.2139/ssrn.3644036>; Antón et al., *supra* note 10.

95. Backus et al., *Common Ownership*, *supra* note 86, at 13.

96. See Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 236 n.128 (collecting literature pointing to inaccuracies in the 13F data that require corrections).

97. Duarte Brito et al., *Modeling Horizontal Shareholding with Ownership Dispersion*, SSRN ELECTRONIC JOURNAL, Oct. 31, 2019, <https://ssrn.com/abstract=3264113> or <http://dx.doi.org/10.2139/ssrn.3264113>.

98. Moskalev, *Funds of A Feather: Influencing Corporate Elections by Voting Together* (2019), <https://alexmoskalev.com/jmp> shows that shareholders with similar portfolios tend to vote in similar ways, and in cases with close to perfect correlation in voting behavior can be regarded as a single block as per the companion paper by Alexandr Moskalev, *Objective Function of a Non-Price-Taking Firm with Heterogeneous Shareholders*, SSRN Working Paper, available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3471564](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3471564).

99. Gilje et al., *supra* note 19.

100. Another problem with their model is that they are not capturing the facts that larger institutions (1) can spread any effort costs in figuring out how to vote across more firms, see Elhauge, *Causal Mechanisms*, *supra* note 8, at 45–46, and (2) have

determined by the fraction of a firm in the investor's portfolio rather than the dollar amount an investor has committed to a given position; a theory based on fixed cost of monitoring would predict attention as a function of the dollar amount rather than the portfolio fraction. That potential criticism aside, their measure has the advantage that it captures common ownership of any combination of firms, not just those in the same industry or those competing in the same product market. As such, an attractive feature of the measure is that it can be used in studies of governance of unrelated firms. But the measure is not suitable to capture the economic incentives of strategically related firms. In fact, it is unsuitable for use in studies of competitive effects of common ownership because the derivation of their measure, in fact, explicitly rules out "strategic interactions between managers"; it remains unclear to me why the authors nevertheless believe their paper provides "important context for recent work on common ownership and firms' strategic choices."<sup>101</sup>

### Identification

Various "natural experiments" have been proposed in the literature to isolate variation in ownership that can be used for identification and causal inference. Having a variety of such experiments in the arsenal is important for the literature because an instrument that might be valid in one circumstance might not be valid in another. For example, the BlackRock-BGI merger provides a strong first stage for IV regressions in the cross section of U.S. airline markets and European beverage markets, but it may not provide a strong first stage for markets in other industries. Moreover, it might provide a strong stage for a cross section of markets, but not for a cross section of firms, or industries.

A new such idea for identification was recently supplied by Boller and Scott Morton.<sup>102</sup> They pioneer the use of S&P500 index inclusion of *competitors* as a shock to the ownership of firms that are already in the index. The basic idea is that the shareholders of an index incumbent—and in particular index funds tracking that index—are compelled to buy stakes in any company that gets added to the same index. When that new entrant is an industry competitor, such forced buying increases the extent to which the incumbent's largest owners have economic interests in the product market rival. Whereas Boller and Scott Morton<sup>103</sup> and, independently Antón et al.,<sup>104</sup> verify that common ownership does in fact increase after a rival's index addition, the strategy of using index addition of rivals for identification is not subject to the same endogeneity concerns that challenges the strategy of using variation in ownership caused by the addition of the target firm itself. (When a firm gets added to the index, not only does its shareholder composition change but so does the extent of analyst coverage, media attention, and many other variables that could potentially affect the outcome.)

Boller and Scott Morton<sup>105</sup> show that when a firm gets added to the S&P 500 index, competing index incumbents experience abnormal positive stock returns. Further, they show that this effect occurs only when the added firm is not already in some other S&P index, which corresponds to cases in which the addition to the S&P 500 index is more likely to cause a more significant increase in horizontal shareholding levels. Their result is consistent with the notion that increases in common

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larger shareholdings in each firm than other shareholders, which gives them both more influence and more incentives to exercise that influence. *See id.* at 57–58 ("while small institutional investors with high percentage gains on average reap an increased annual cash flow of \$22,300 if a firm they hold increases in value by 1%, a large institutional investor on average gains \$335,900 in annual cash flow from the same 1% increase in value. As Lewellen and Lewellen point out, 'the largest institutional investors—because of their size—actually have stronger incentives to be engaged than many activist investors.'").

101. *Id.* at 8.

102. Boller & Scott Morton, *supra* note 94.

103. *Id.*

104. Antón et al., *supra* note 10.

105. Boller & Scott Morton, *supra* note 94.

ownership increase the expected future profitability of the competing incumbents, as well as with the notion that common ownership reduces firms' risk, cost of capital, and hence investors' discount rates. Both channels—increased profitability or reduced discount rates—can be predictions of models in which common ownership reduces competition.

Similarly, Antón et al.<sup>106</sup> use index additions of rivals to verify that thus caused increases in common ownership lead to reductions in the wealth-performance sensitivity of top managers, which is the prediction of their model of top management incentives under common ownership. Reiterating the theme that assumptions for the validity of the same identification strategy to identify a causal effect differ across contexts, note the different time scale of the outcomes in these two studies: Boller and Scott Morton study short-term stock price reactions, whereas Antón et al. study long-term changes over several years. If there exist factors that confound the short-term effects of index additions of competitors, the same factors don't necessarily confound the analysis of long-term effects, and vice versa.

Whereas a new source of plausibly exogenous variation has been contributed to the literature, previous instruments have come under attack. Lewellen and Lowry<sup>107</sup> criticize the use of a set of institutional mergers as a source of identifying variation for common ownership studies at the firm or industry level, among others on account of being correlated with firm characteristics related to the global financial crisis. They also criticize the use of additions to the S&P500 and Russell index reconstitutions because such events are associated with changes in many variables other than common ownership, and index reconstitutions do not change the holdings at the institution level at which governance is exercised (as opposed to changing ownership at the fund level, and thus perhaps notions of "passive ownership" or "active ownership"). They also argue that the merger between BlackRock and BGI is not suitable because different types of firms were differentially affected.

Elhauge has pointed out severe problems with Lewellen and Lowry's argument, as it applies to studies of competitive effects of common ownership, including their use of arbitrary cutoffs that mask large parts of the variation in common ownership.<sup>108</sup>

Whereas Lowry and Lewellen motivate their study with the evidence and policy discussion from the "airlines" and "banking" papers by Azar et al.,<sup>109</sup> the Lewellen and Lowry study has nothing substantive to say about either the airline or banking study, nor any other study analyzing product market competition: it does not investigate the suitability of the BlackRock-BGI merger in the context of a cross section of U.S. airline markets or any other product market. Readers should bear in mind that an instrument that is valid in one context might not be in another and vice versa. As such, the general message that shocks from financial institution mergers are, in general and generically, not valid instruments, is unfounded. Nevertheless, authors of papers studying firm- or industry-level effects of common ownership should carefully consider whether any of these criticisms apply to their setting.

Another point worth keeping in mind is deficient data quality, which affects this study as much as other cross-industry studies discussed below. Lewellen and Lowry do not consistently aggregate

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106. Antón et al., *supra* note 10.

107. Lewellen & Lowry, *supra* note 68.

108. These problems include that (1) they use industry definitions that bear little relation to market definitions, unlike the airline and banking studies; (2) they actually do find effects from financial mergers but reject that finding on the faulty ground that although increased horizontal shareholding increased the income of the horizontally owned firms relative to firms outside the industry, it did not do so relative to firms inside the industry, when that is precisely what one would expect to the extent that industries do correlate to market definitions because anticompetitive effects would predictably increase market wide prices; and (3) their analysis is not focused on finance mergers that actually create significant increases in horizontal shareholding. See Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 245–249.

109. Azar et al., *supra* note 86.

holdings to the level at which shares are voted but only do so for one institution, private firms are missing, individual owners are missing, dual-class control shares are not considered, and so on.<sup>110</sup> All of the above are likely to lead to measurement error and attenuation bias. The empirical concern about data quality is hard to assess, however, until and if the authors choose to make code and data available upon publication.

Yegen<sup>111</sup> also criticizes the use of financial-institution mergers as a source of identifying variation, but mainly on account on the changes in ownership being not long-lasting.<sup>112</sup> In other words, there does not seem to be a useful “first stage” in this frequently used instrument. Indeed, the difference-in-difference study by He and Huang<sup>113</sup> that pioneered this technique provides no evidence that the mergers lead to lasting increases in common ownership.

Similar to Lewellen and Lowry, Yegen<sup>114</sup> also motivates his paper, among others, with the airline and banking studies by AST<sup>115</sup> and Azar, Raina, and Schmalz.<sup>116</sup> However, as Lewellen and Lowry,<sup>117</sup> his paper does not feature any analysis of the instruments the airline and banking papers use, for the purposes for which these papers use them, namely, a market-level analysis. As such, his paper can only be taken as a critique of a small part of the literature and specifically the part using a large set of financial institution mergers to generate firm-level variation in ownership in cross-industry studies. His results cannot be taken as broad a critique of the entire literature using other sets of mergers for different purposes. In other words, Yegen shows that a specific set of M&As does not serve well as an identification strategy for a specific purpose. It does not follow that a different set of M&As (or any one particular M&A) would not serve well as an identification strategy for a different purpose. The concerns about data quality and processing laid out above also apply similarly (though not identically) to this study.

In sum, the critiques of previous identification techniques used in the literature are important contributions to the literature, and they should be taken into account by readers and producers of research in the area. However, the true implications of the findings are much narrower than the authors’ writing suggests.

## Issues with Industry-Level Studies

Existing literature has emphasized that anticompetitive effects of common ownership are only measurable in the larger and more concentrated subsets of markets and that measuring such effects requires variation across markets in the level of common ownership for identification.

The literature hosts many theoretical reasons why effects should be heterogeneous. Antón et al.’s<sup>118</sup> theoretical model requires significant competitive interactions between firms for the proposed corporate governance mechanism to cause market-level variation in product market outcomes. Inderst and

110. Lewellen & Lowry, *supra* note 68, at 10. This concern does not equally affect within-industry across-market studies. For example, AST, *supra* note 1, hand-collected individual ownership from proxy filings and ensured dual-class control structures are not a feature of the industry they study. AST made their data and code available voluntarily on the *Journal of Finance* website upon publication of their paper.

111. Eyub Yegen, *Common-Ownership and Portfolio Rebalancing* (Proceedings of Paris Dec. 2019 Finance Meeting EUROFIDAI – ESSEC, Mar. 1, 2019), <https://ssrn.com/abstract=3345779> or <http://dx.doi.org/10.2139/ssrn.3345779>.

112. A related problem is that the lion’s share of financial institution mergers cause little effect on common shareholding levels even in the short run. See Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 249.

113. Jie (Jack) He & Jiekun Huang, *Product Market Competition in a World of Cross-Ownership: Evidence from Institutional Blockholdings*, 39 REV. FIN. STUD. 2674 (Aug. 2017), <https://academic.oup.com/rfs/article-abstract/30/8/2674/3098499>.

114. Yegen, *supra* note 111.

115. AST, *supra* note 1.

116. Azar et al., *supra* note 86.

117. Lewellen & Lowry, *supra* note 68.

118. Antón et al., *supra* note 10.

Thomas point out that whether a merger between commonly owned firms increases or decreases competition depends on various assumptions and should be judged on a case-by-case basis.<sup>119</sup> Lopez and Vives also predict that common ownership effects on firm innovation, cost structure, output, prices, and welfare critically depend on parameters that differ across industries, firms, and perhaps even markets, such as the degree of technological spillovers between the commonly owned firms.<sup>120</sup> No theory I am aware of predicts that if effects are present and measurable in some specific markets, they should also be equally present in all other markets, or in all industries, or on average across markets, firms, and industries.

Empirically, the literature has also emphasized cross-sectional differences in competitive effects of common ownership. AST show that, using their methodology, effects are only measurable in large and concentrated U.S. airline markets.<sup>121</sup> Gibbon and Schain infer increases in markups of 3.1% following increases in common ownership among European manufacturing firms but emphasize the effect is concentrated in low-tech industries; in high-tech industries, by contrast, common ownership appears to trigger more innovation.<sup>122</sup> Bindal finds that “anticompetitive effect of common ownership are stronger in industries that have similar products.”<sup>123</sup> Specifically, she finds higher gross margin, higher returns, and reduced R&D expenditures for more commonly owned firms when the firms are close in product space, but not otherwise.

Kini, Lee, and Shen<sup>124</sup> find that firms with more common ownership face greater product market threats, as inferred from textual analysis of companies’ 10-K filings, but mainly in industries with greater potential for investment spillovers. Perhaps because spillover effects are weaker in industries with fewer players, the effect is weakened in industries with greater concentration. Antón et al.<sup>125</sup> show preliminary results on corporate innovation as a function of common ownership, documenting that the data display the heterogeneous pattern predicted by Lopez and Vives:<sup>126</sup> the relation between common ownership and innovation is more positive when technological spillovers are greater, but less positive, or more negative, when product market spillovers between commonly owned firms are greater. For these, and many other reasons laid out, for example, in Schmalensee,<sup>127</sup> authors running cross-industry regressions should be extra careful with the interpretation of their results, whereas within-industry studies that make across-market comparisons are less likely to suffer from the same conceptual problems.

In disregard of these theoretical considerations and earlier empirical findings, as well as the first-order consideration that industries are much larger than markets, a paper written by the employees of Vanguard (a common owner in many industries, and second in total AuM only to BlackRock), Wang,

119. Roman Inderst & Stefan Thomas, *Common Ownership and Mergers between Portfolio Companies*, WORLD COMPETITION 551-576 (2019), preprint at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3425856](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3425856). See also Roman Inderst & Stefan Thomas, *Price Pressure Indices, Innovation, and Mergers Between Commonly Owned Firms*, 10 J.E.C.L. & PRACT. 572 (2019), preprint at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3426336](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3426336).

120. López & Vives, *supra* note 58.

121. See figures 5 and 6 in José Azar et al., *Internet Appendix for: ‘Anticompetitive Effects of Common Ownership’*, <https://onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1111%2Fjofi.12698&file=jofi12698-sup-0001-Internet-Appendix.pdf>.

122. Alexandra J. Gibbon & Jan Philip Schain, *Rising Markups, Common Ownership, and Technological Capacities* (DICE Discussion Papers No. 340, 2020), <https://ssrn.com/abstract=3622912>.

123. Shradha Bindal, *When Does Common Ownership Matter?* (Working Paper, Jan. 23, 2019, at 5), [https://editorialexpress.com/cgi-bin/conference/download.cgi?db\\_name=AFA2020&paper\\_id=288](https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=AFA2020&paper_id=288).

124. Omesh Kini et al., *Common Institutional Ownership and Product Market Threats*, SSRN ELECTRONIC JOURNAL, Sept. 25, 2019, <https://ssrn.com/abstract=3301998> or <http://dx.doi.org/10.2139/ssrn.3301998>.

125. Antón et al., *supra* note 10.

126. López & Vives, *supra* note 58.

127. Richard Schmalensee, *Inter-Industry Studies of Structure and Performance*, in 2 HANDBOOK OF INDUSTRIAL ORGANIZATION 951-1555 (R. SCHMALENSSEE & R. WILLIG, 1989).

Plagge, Rowley, and Aliaga-Díaz hypothesizes “that if anticompetitive effects due to common ownership were present within individual industries, then the same anticompetitive outcomes should be observed when the data is expanded to cover all industries and over an extended period of time.”<sup>128</sup> Without further substantiation of that hypothesis by economic theory, the authors do “not find conclusive evidence that common ownership is associated with industry-level profit.”<sup>129</sup> At the risk of repetition, a failure to find measurable common ownership effects for industry profit margins has nothing to say about whether there are anticompetitive effects of common ownership in specific markets. The latter is what is relevant for antitrust enforcement.

Koch, Panayides, and Thomas adopt the same premise as the Vanguard paper, namely, that the existence of market-level effects within parts of specific industries that are relevant for antitrust enforcement implies that there should be robust measurable effects in cross-industry comparisons.<sup>130</sup> In contrast to earlier findings by Azar (2011)<sup>131</sup> and Panayides and Thomas (2017),<sup>132</sup> who use similar techniques, Koch et al. do not find robust evidence for increased markups on average. The change from Panayides and Thomas’s conclusions to those by Koch, Panayides, and Thomas is remarkable.<sup>133</sup>

Neither the Wang et al. nor the Koch et al. study acknowledges that their results could be driven and investigates whether their results are in fact driven, by attenuation bias due to not aggregating holdings consistent with governance practices, by missing individual shareholders, or by using overly broad industry definitions rather than market definitions. The latter imply that most of what the authors code as increases in common ownership does not correspond to actual increases in common ownership at the product market level. Neither do they examine the various other data problems the literature has struggled with.<sup>134</sup>

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128. Haifeng Wang et al., *Common Ownership and Industry Profitability: A Crossindustry View*, SSRN ELECTRONIC JOURNAL, Aug. 1, 2019, at 2, <https://ssrn.com/abstract=3437129> or <http://dx.doi.org/10.2139/ssrn.3437129>.

129. *Id.* at 5.

130. Andrew Koch et al., *Common Ownership and Competition in Product Markets*, J. FINANC. ECON. (2020), <https://doi.org/10.1016/j.jfineco.2020.07.007>. They furthermore assert that “In the limit, if all firms become commonly owned by one institution, then the anticompetitive behavior predicted by the COC hypothesis should clearly become apparent.” *Id.* at 6. Note that to be able to measure common ownership effects, the *variation* in common ownership on the right-hand side, rather than the level, provides identifying variation. If all firms were perfectly commonly owned, and did not compete at all, there would be no identifying variation for the econometrician to measure any effects of common ownership on competition, although common ownership has removed all competition from the economy.

131. José Azar, *A New Look at Oligopoly: Implicit Collusion through Portfolio Diversification*, SSRN ELECTRONIC JOURNAL, NOV. 8, 2011, <https://ssrn.com/abstract=1993364> or <http://dx.doi.org/10.2139/ssrn.1993364>.

132. Marios Panayides & Shawn Thomas, *Commonality in Institutional Ownership and Competition in Product Markets*, SSRN ELECTRONIC JOURNAL, Jan. 1, 2017, doi:10.2139/ssrn.2965058.

133. *Id.* 122 abstract concludes: “We find, in a broad sample of industries, that common ownership is robustly positively associated with industry profitability but not with industry output prices. Also, subsequent to experiencing dramatic increases in common ownership over short periods of time, industries significantly reduce investment in additional capacity and spending on non-price competition for market share, i.e. capital expenditures net of depreciation, selling expenses, and advertising. . . . Results from a natural experiment are consistent with plausibly exogenous increases in common ownership causing increased profitability. Taken together, the results are consistent with common blockholders influencing firms’ managers to internalize negative between-firm externalities and curtail capacity expansion and spending on non-price, market-share competition, i.e. to pursue industry-portfolio value maximizing policies as opposed to strictly pursuing individual-firm value maximizing policies.”

134. See Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 249–254. Elhauge points out that they also ignore their own finding that a large increase in MHHI delta does significantly increase profits, citing various flawed reasons *Id.* Note the industry definition problem systematically biases their results toward lower coefficients and lower statistical significance. *See id.* at 245–46. If one can find effects despite such that just shows the actual effects likely have to be huge enough to overcome the bias. But it means one definitely cannot use industry definitions to support any claim that there are no anticompetitive effects. *Id.* at 246 nn.177–78.

Whether those problems indeed drive the starkly different findings between the Wang et al.'s<sup>135</sup> and Koch et al.'s<sup>136</sup> papers vis-à-vis the earlier papers apparently using similar methods and data, but coming to different conclusions is difficult to ascertain, because a detailed discussion is missing, and Koch et al. have not followed the example of Azar et al. by voluntarily sharing data and code to their paper upon publication. (The Wang et al. paper is still a working paper.) Koch et al. also explicitly refused to make code available on request. That said, the primary concern with the approach of both papers is methodological; fixing the data quality issues would not address the conceptual concerns.

In sum, measuring correlations between markups and industry-level common ownership does face challenges in terms of their theoretical foundation and therefore has only limited interpretation. However, an important asymmetry exists between the interpretation of significant versus insignificant results. Significant correlations would only be suggestive of competitive effects of common ownership. A lack of such correlation has even less of a meaningful interpretation, because the results could be purely due to attenuation error due to low data quality and the quality of data construction, the use of unsuitable measures, or other challenges. I conclude that it remains true that, to test whether common ownership has effects in industries beyond those that have been examined, market-level studies have to be run in these industries, industry by industry—or regulators have to turn to considering structural presumptions. There is no shortcut by way of running cross-industry studies.

## Data Quality as a Crucial Ingredient to High-Quality Research

Lacking quality of ownership data has also been the source of erroneous claims of an absence of anticompetitive effects in past literature.

In a 2017 paper provocatively titled “Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry,” Dennis, Gerardi, and Schenone made some strong claims regarding robustness—or, rather, the lack thereof—of AST’s “airline paper.”<sup>137</sup> For example, Dennis et al. claimed that AST’s results lost their significance if regressions were not weighted by route size (passenger volume), that the results were not robust to the use of what they considered standard filters in the literature, not robust to AST’s empirical choice regarding the treatment of “shared” voting rights, and that the results were driven only by the largest 5% of routes, among others.<sup>138</sup>

All of these claims were wrong. This is not an opinion, but a statement of fact. First of all, the first versions of the paper didn’t follow AST’s data construction but omitted the aggregation of holdings reported in 13Fs to the level of the institution that controls and votes the shares. As such, the paper’s baseline was not AST, and none of their statements regarding robustness applied to AST. Second, the authors themselves withdrew the claims regarding robustness when using AST’s replication kit, albeit the correction took place in less prominent ways than would be desirable to increase transparency. The latest (2020) version of their paper shows that AST’s results are robust to the third decimal to the empirical choice regarding “shared” voting rights,<sup>139</sup> the results remain significant without regression

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135. Wang et al., *supra* note 128.

136. Koch et al., *supra* note 130.

137. Dennis et al., *supra* note 34, at 3.

138. *Id.* at 3, 4.

139. *Id.* at 36.

weights,<sup>140</sup> and they are not driven by the largest 5% of markets.<sup>141</sup> Every single one of the filters the authors argued to be standard in fact makes AST's results stronger.<sup>142</sup>

Nevertheless, the latest version of Dennis et al.'s paper insists on the claim, featured in their title, that common ownership does not have anticompetitive effects in the airline industry. Note this claim goes beyond claiming that their study not finding any anticompetitive effects: it asserts that their findings imply that if there were any effects, their methodology would have found them.

The remaining basis for the claim is that the paper now shows, among others, that AST's results are not robust if one overwrites the regulatory ownership data and replaces the data with alternative data of the authors' own conception. Specifically, the authors make the discretionary choice of changing the voting rights that institutions declare to the SEC to be not under control of the institution in question to be in fact voted by the institution.<sup>143</sup> It is of course not surprising that replacing actual data with alternative data causes insignificant results, perhaps due to measurement error and attenuation of estimates. This change from earlier versions in Dennis et al.'s treatment of voting designations is difficult to spot for the reader. Rather than offering a transparent description of the change compared to the earlier claim, the authors simply removed the following portion from the earlier draft of the paper to justify their discretionary change of data: "It is clear what institutions record under the designation of shares owned with no voting rights. . . . The designation of "sole" voting rights is also relatively clear." They then argue that these designations are arbitrary and should be overridden.<sup>144</sup> No explanation is given for why what the authors found to be "clear" in the earlier version of their paper is not deemed to be clear anymore in the present version. The latest version now just shows that if one overrides the regulatory data and replaces the information provided by the SEC with author-generated, discretionary, alternative values, the significance of the coefficients disappears in the case of market-carrier-level regressions—but remains unchanged if quantitatively reduced in market-level regressions.<sup>145</sup>

The authors' writing furthermore purports to show that modeling the transfer of control and cash flow rights from equity to bond holders in bankruptcy results in insignificant results. (AST merely showed that repeating pre-bankruptcy values for ownership attenuates the common ownership coefficient in bankruptcies and that removing bankruptcies altogether increases point estimates.) What Dennis et al.'s empirical work actually shows, however, is that assuming that cash flow and control rights disappear and are not held by any investor at all attenuates the results. The fact that shareholders did not in fact lose all cash flow and control rights in all of the airline bankruptcies in question is ignored by the empirical work of Dennis et al. as well. Interestingly, statistically significant results continue when they take the more neutral approach of either (1) excluding bankruptcy periods or (2) assuming that expected shareholder control rights during bankruptcy reflect what they actually get at the end of bankruptcy, as Elhauge has pointed out previously.<sup>146</sup>

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140. *Id.* at 23. Cf. José Azar et al., *Reply to: "Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry,"* SSRN Working paper [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3168095](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3168095), for an analysis that is in fact based on a replication of AST.

141. *Id.* at 23. Cf. Azar et al., *supra* note 140, for an analysis that is in fact based on a replication of AST.

142. *Id.* at 24. Whereas Appendix A.9 shows increases in point estimates for every one of the deviations from AST's empirical choice, these results are described on 24 in the main text as "does not significantly affect the HHI delta coefficient estimate." In unweighted regressions, which do not correspond to AST's baseline results, most but not all point estimates increase due to the application of filters.

143. *Id.* at 14.

144. *Id.* 2018 version, at 3.

145. *Id.* at 15, 36.

146. Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 231–32.

The main remaining empirical claim in the 2020 version of Dennis et al. is that it is variation in market shares rather than ownership that is the main driver of the relation between airline ticket prices and common ownership; the paper features no discussion of the various placebo tests by AST that AST think rule out a decisive role of endogenous market shares. Furthermore, their claim has been contradicted by several other studies both on empirical and on theoretical grounds, none of which discussed by Dennis et al. For example, Kennedy et al. show that a market-share free index of common ownership still correlates positively with prices.<sup>147</sup> As such, the positive panel correlation between common ownership and prices in U.S. airline markets does not rely on measures of common ownership that contain potentially endogenous market shares.

The potential endogeneity of market shares is also ruled out as a driver of the positive price effect of common ownership in the structural approach by Park and Seo, who also prove that it is by no means correct that there are no measurable anticompetitive effects of common ownership in U.S. airline markets, even if it was correct that the reduced-form methods of AST or Dennis et al. don't detect them.<sup>148</sup> Elhauge has also pointed out several other substantive problems with the analysis of Dennis et al.<sup>149</sup> Lastly, Dennis et al. do not note that the empirical pattern they observe can be the prediction of a model in which common ownership causes all variation in market shares, output, and prices—such as the one by Antón et al.<sup>150</sup>

In sum, Dennis et al.'s earlier claims regarding lack of robustness of AST's along a number of dimensions have been withdrawn and replaced with tests showing remarkable levels of robustness along these same dimensions. Their interpretation that the positive link between common ownership and prices in U.S. airlines is just due to endogenous market shares rather than variation in ownership has been rejected by four different studies, on both empirical and theoretical grounds.

The second retraction of earlier empirical claims is by Rock and Rubinfeld, who wrote one of the earliest critiques of AST and who greatly influenced the legal literature that followed.<sup>151</sup> One of their arguments against likely anticompetitive effects of common ownership is that there was in fact “dramatically” less common ownership than suggested by AST. Taken at face value, this assertion raises the question (later iterated by various other commentators, including Lambert and Sykuta and Phillips)<sup>152</sup> of why managers would side with a minority of common shareholders against a majority of undiversified ones.<sup>153</sup>

However, their empirical claim was incorrect to begin with, as the authors have recently acknowledged. To support the premise of the argument, Rock and Rubinfeld produced a table of U.S. airline ownership that purported to show the airline ownership positions of those investors that featured

147. Kennedy et al., *supra* note 35, at 31.

148. Park & Seo, *supra* note 73.

149. First, in their regression that allows real market shares to vary but fixes horizontal shareholding levels as constant, all they show is that horizontal shareholding has more anticompetitive effects the more concentrated the markets are, which is precisely what the anticompetitive theory would predict. *See* Elhauge, *How Horizontal Shareholding*, *supra* note 3, at 225. Second, in their regression that ignores actual market shares, their regression creates a systematic negative bias by using  $1/N_{\max}$  rather than  $1/N$ . *See id.* at 226. Third, they added endpoint price trend variables and an endpoint share proxy that also create negative biases. *Id.* at 226–28.

150. Antón et al., *supra* note 10.

151. Edward B. Rock & Daniel L. Rubinfeld, *Defusing the Antitrust Threat to Institutional Investor Involvement in Corporate Governance* (NYU Law and Economics Research Paper No. 17-05, 2017), <https://ssrn.com/abstract=2925855>.

152. Noah Joshua Phillips, *Protection in the 21st Century Corporate Governance, Institutional Investors, and Common Ownership* (Opening Remarks of Commissioner, FTC Hearing #8: Competition and Consumer, NYU School of Law, New York, NY Dec. 6, 2018), <https://www.ftc.gov/public-statements/2018/12/opening-remarks-commissioner-noah-joshua-phillips-ftc-hearing-8>.

153. Thomas A. Lambert & Michael E. Sykuta, *The Case of Doing Nothing about Institutional Investors' Common Ownership of Small Stakes in Competing Firms* (University of Missouri School of Law Legal Studies Research Paper No. 2018-21, 2018), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3173787](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3173787); Phillips, *supra* note 152.

among the top-ten investors of the largest six U.S. airlines.<sup>154</sup> However, instead of entering the true ownership stakes from a data source such as 13F filings, Rock and Rubinfeld entered the number zero whenever the investor in question didn't hold a top-ten stake in the competing airline in question as per AST's Table 1. The resulting ownership matrix falsely shows dozens of zeros, incorrectly purporting that a majority of top shareholders were not common owners of competitors. Given the apparent influence of this claim on the literature that followed as well as the public policy debate,<sup>155</sup> it is important that the authors did retract this claim.<sup>156</sup>

Given this history, the study of whether common shareholdings constitute a majority of shareholdings in any given firm or industry is of first-order importance. Banal-Estañol et al. in this volume provide such an analysis.<sup>157</sup> They show that, among the significant shareholders of large U.S. pharmaceutical companies, common investors hold the majority of shares between almost all large firms in the industry. Similarly, Griffin shows that BlackRock, Vanguard, and State Street, by 2019, jointly "possess sufficient voting power to determine the outcome of a majority of shareholder proposals."<sup>158</sup> Backus et al. show that common shareholding is so extensive that the average weight that an S&P 500 firm puts on the profits of another firm in the same industry rose to 0.75 by 2017.<sup>159</sup>

## Conclusion

This review has highlighted important advances in the literature on competitive effects of common ownership. Much progress has been made on the question of the governance mechanism by which common ownership can influence product market outcomes, and much new research has been produced that shows common-ownership effects in other industries, in other geographies, and on other outcomes. The further development of alternative measures of common ownership, of estimation techniques, and of identification strategies is ongoing and benefits from a fruitful interaction between IO and finance researchers. Data quality and gaps in theory remain the perhaps greatest bottlenecks in the literature.

An exciting area for future research is the reexamination of previous questions in corporate finance and governance as well as in IO that have thus far been conducted under the premise that firms are separately owned or do not interact. Top journals in finance, accounting and IO, and among the top five economics outlets have been receptive to advances in the literature. As such, the field is not only growing fast but also remains an attractive area for researchers to make contributions.

In light of the explosion of evidence that present-day levels of common ownership affect firms' strategic behavior and product market outcomes, it appears increasingly untenable for competition authorities worldwide to have limited, if any, knowledge of who are the owners of the firms they regulate, or to ignore that information for most practical purposes. After all, the regulation of concentrated asset ownership is their domain. The assumption that underlies most research and policy on

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154. Rock & Rubinfeld, *supra* note 151, at 6.

155. See, e.g., Lambert & Sykuta, *supra* note 153.

156. *Id.* <https://twitter.com/edwardbaronrock/status/1277277188056920072>. The authors did not issue a formal correction to the journal to date to my knowledge. The authors also didn't correct other inaccuracies in their paper, such as the claim that shareholders with heterogeneous portfolios would only agree on strategies that maximize firm value rather than industry value (an idea disproven as early as Oliver D. Hart, *On Shareholder Unanimity in Large Stock Market Economies*, 47 *ECONOMETRICA* 1057 (1979), [www.jstor.org/stable/1911950](http://www.jstor.org/stable/1911950) and Rotemberg, *supra* note 16), or the claim that incentive schemes of airline managers that reward relative margins (rather than relative stock returns) are procompetitive.

157. Albert Banal-Estañol, Melissa Newham & Jo Seldeslachts, *Common Ownership in the U.S. Pharmaceutical Industry: A Network Analysis*, 66 *ANTITRUST BULL.* 68 (2021); preprint available at [https://www.barcelonagse.eu/sites/default/files/working\\_paper\\_pdfs/1216.pdf](https://www.barcelonagse.eu/sites/default/files/working_paper_pdfs/1216.pdf).

158. Caleb Griffin, *Margins: Estimating the Influence of the Big Three on Shareholder Proposals*, *SMU LAW REVIEW* (forthcoming 2020), at 1.

159. Backus et al., *Common Ownership*, *supra* note 86, at 1–2, 23–24.

antitrust enforcement, namely, that firms with different names are separately owned, or generally behave this way, has little support but has instead been strongly rejected by dozens of studies. As such, the call for better and more comprehensive ownership data is louder than ever.

In that light, it is regrettable that the U.S. SEC planned to go the opposite way and lift the threshold for 13F filings, from which much of the ownership information in existing research is taken. Until now, institutional investors with more than US\$100 m have been obliged to report; the SEC plans were to lift that threshold to \$3.5bn.<sup>160</sup> Doing so would have absolved most institutions from filing 13Fs ownership reports. Whereas the largest institutions would still appear in the data, the ownership stakes of the smaller players wouldn't, which would make it very difficult or impossible to get a full picture of the ownership and control structure of firms that is at the heart of common ownership research. Furthermore, in the age of fully automated digital reporting, it seems difficult to justify a cost rationale for that move. If large institutions that are not absolved from reporting by the change nevertheless support it, it must be for other reasons. Transparency will suffer, and research on common ownership and beyond will be significantly hampered. Economists across fields have thus filed a petition against the change.<sup>161</sup>

Some hope comes from the U.S. Department of Justice and Federal Trade Commission's consideration of a change to the Hart–Scott–Rodino-Act reporting rules, which would become stricter in some ways.<sup>162</sup> Whereas that move can be interpreted as a small success of the academic research on the competitive effects of common ownership, it would not make up for the loss of data from the SEC's planned rule changes. Also, the rule has not been implemented in ways that would indeed capture the most important common owners.

Greater hope comes from efforts in other jurisdictions. Among those with common-ownership-related research efforts that are public at the time of this writing, the European Commission has come forward with a report on common ownership in Europe, discussed above, and India's Competition Authority is studying common-ownership effects in private equity.<sup>163</sup> However, ownership data remain scant and of imperfect quality also there.

Given the importance of data quality in co-determining the quality of research in the past years, the right move for competition authorities would be to collect comprehensive ownership information for both publicly traded and significant private firms and make it available in an easily usable form to researchers worldwide.

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160. <https://www.sec.gov/news/press-release/2020-152>.

161. [https://docs.google.com/spreadsheets/d/1Mc5jXuVJG8qSxrVqTZN4of3RKB2x7neX\\_TWUY-oyiQE/edit#gid=0](https://docs.google.com/spreadsheets/d/1Mc5jXuVJG8qSxrVqTZN4of3RKB2x7neX_TWUY-oyiQE/edit#gid=0).

162. <https://www.natlawreview.com/article/proposed-hsr-amendments-will-affect-financial-investors>.

163. Rosati et al., *supra* note 46; <https://www.bloomberqint.com/business/competition-comm-to-conduct-market-study-on-private-equity-investments-chairperson>.