



BY JOSÉ AZAR, MARTIN SCHMALZ & ISABEL TECU <sup>1</sup>



## I. INTRODUCTION

The share of stocks beneficially owned by institutional investors has increased substantially over the last three decades. Together with a high and increasing level of concentration in the asset management industry,<sup>2</sup> this trend implies that a small number of institutional investors now constitute the largest shareholders of most publicly traded firms in the U.S. and in other developed economies. When the same set of investors owns most firms, they are bound to own several firms in the same industry. Such overlapping ownership interests among competitors, or “common ownership,” may imply a reduction in firms’ incentives to compete, compared to a situation in which competitors are controlled by separate sets of investors, and may thus create antitrust risks. Recent empirical research shows evidence for such anticompetitive effects of common ownership. These findings have since ignited a debate on the antitrust risk posed by institutional investors, its legal implications and potential solutions.

This article first illustrates the extent of present-day common ownership and discusses the economic logic of why common ownership leads to reduced incentives to compete and may cause anticompetitive outcomes. We then review some of the empirical evidence to date, discuss critiques of the same and explain the conceptual problems inherent with all potential policy solutions. The legal debate around these findings is discussed by a fast-growing literature, including contributions by other authors in this issue.<sup>3</sup>

---

<sup>1</sup> José Azar is Assistant Professor of Economics at University of Navarra’s IESE Business School, [jazar@iese.edu](mailto:jazar@iese.edu), Martin Schmalz is the NBD Bancorp Assistant Professor of Business Administration, Harry Jones Research Scholar, and Assistant Professor of Finance at the University of Michigan Stephen M. Ross School of Business, [schmalz@umich.edu](mailto:schmalz@umich.edu), and Isabel Tecu is an Associate Principal at Charles River Associates, [itecu@crai.com](mailto:itecu@crai.com). The conclusions set forth herein are based on independent research and publicly available material. The views expressed herein are the views and opinions of the authors and do not reflect or represent the views of Charles River Associates or any of the organizations with which the authors are affiliated.

<sup>2</sup> See Professor Elhauge’s article on this issue.

<sup>3</sup> For example, see Elhauge, (2015), “Horizontal Shareholding,” *Harv. L. Rev.*, 129, 1267; Baker, J. B. (2016), “Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge,” *Harvard Law Review Forum*, 129, 212-32; see also private law firms’ assessments e.g. <https://corpgov.law.harvard.edu/2016/05/24/antitrust-executive-order-and-common-ownership/> and <https://corpgov.law.harvard.edu/2016/03/31/cross-ownership-by-institutional-investors/>.

## II. EXAMPLES OF COMMON OWNERSHIP LINKS ACROSS INDUSTRY COMPETITORS

Table 1 shows the ownership structure of Virgin America before its acquisition by Alaska Air in 2016 as an example of an ownership structure which many think of as typical, but which in fact has become the exception rather than the norm. The largest three owners of Virgin America were entrepreneur Richard Branson, Cyrus Capital and Richard Branson’s Virgin Group Holdings. None of them held significant ownership stakes in competing U.S. airlines, as far as we are aware.<sup>4</sup> A standard reading would be that Branson and Cyrus Capital’s interest were in Virgin America’s – and no other U.S. airline’s – profits. Following economic logic, they would want Virgin America to lower prices or expand output to steal market shares from its competitors to the point where the benefits from doing so would outweigh the costs – in other words they would want Virgin America to compete. Note that Vanguard and BlackRock were also among Virgin’s top five owners, but given the presence of much larger owners we would not expect them to have much influence over Virgin America’s strategies.

<u>Virgin America</u>	<u>[%]</u>
Richard Branson	30.77
Cyrus Capital	23.52
Virgin Group Holdings	15.34
Vanguard	2.89
BlackRock	2.25
Alpine Associates Advisors	2.11
Hutchin Hill Cap.	2.09
Societe Gen	1.84
Apex Capital	1.74
Morgan Stanley	1.70

Figure 1: Ownership Shares of Virgin America, 2016 Q2. Source: S&P Capital IQ

Now, contrast Virgin America’s ownership structure to that of most other U.S. airlines shown in Figure 2. Their largest owners are all large diversified investors like Vanguard and BlackRock, while large “separate” owners, like Branson and Cyrus Capital in the case of Virgin America, are largely absent. Therefore, there are no owners with significant influence who have a strong interest in competition between these airlines.

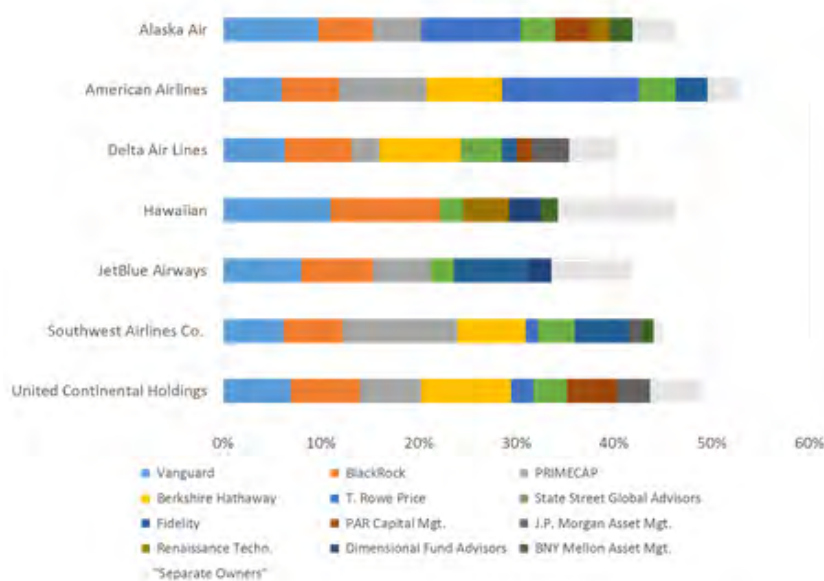


Figure 2: Largest Owners of U.S. Airlines (as of 2016Q4)

<sup>4</sup> Branson also held large ownership interests in other non-U.S. airlines. It is our understanding that none of these airlines operated in the same markets as Virgin America.

Notes: Figure shows holdings by the top ten shareholders for each airline that hold at least three percent of shares. Owners that do not hold shares of any other of the airlines shown are grouped into “separate owners.” Source: S & P Capital IQ.

These common ownership links are not limited to airlines; they are rather the rule in other industries as well. Figure 3 shows an example for U.S. banks: BlackRock, Vanguard and State Street are among the top five beneficial owners of each of the largest banks, and Fidelity and Berkshire Hathaway frequently complete the top five owners.

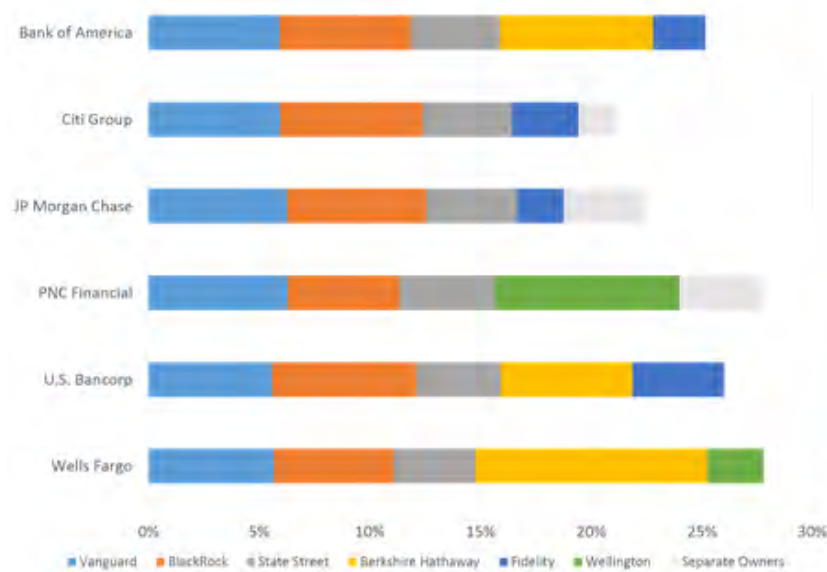


Figure 3: Largest Owners of U.S. Banks (as of 2016Q2)

Notes: Figure shows the holdings by the top five shareholders for each bank. Owners that do not hold shares of any other of the banks shown are grouped into “separate owners.” Source: S&P Capital IQ.

This overlap of owners among competing firms is not limited to the U.S. Among European banks, as of 2016, BlackRock was the largest shareholder of HSBC, Deutsche Bank, Banco Popolare di Milano and Banco Bilbao Vizcaya Argentaria, 33 of the FTSE 100 firms, and 10 of the DAX 30. Deutsche Börse and the London Stock Exchange share two of their top-three investors; Bayer and Monsanto have five of their largest six investors in common, etc.

### III. THE ANTITRUST ECONOMICS OF COMMON OWNERSHIP

Economists have long theorized that such common ownership of firms by the same investors reduces incentives to compete, compared to a situation in which each firm is controlled by “separate owners” that do not have significant stakes invested in competitors. The logic is simple: The benefit of competing aggressively – gains in market share – comes at the expense of firms in the same industry, and reduces industry profits. A common owner that holds equal shares in all firms can therefore not benefit from aggressive competition. When common owners crowd out separate owners as the most powerful shareholders, firms thus lose owners that support an aggressive competitive strategy.

Whether these predictions are borne out in practice remains an empirical question, given multiple challenges one could think of on theoretical grounds. Giving a clean empirical answer is challenging as well. Recent empirical research addresses these challenges, and has found that market-level increases in common ownership correlate with increased consumer prices in local U.S. airlines and banking markets. Various tests support a causal interpretation of these correlations. In what follows, we review these studies and discuss some of the criticisms levied against them.

## IV. EMPIRICAL EVIDENCE

### A. The “Airlines Paper”

The first paper to quantify the anti-competitive incentives arising from common ownership, and to test whether they have a measurable impact on competition, is a study by Azar, Schmalz and Tecu of the U.S. airline industry.<sup>5</sup> This paper documents that (1) anti-competitive incentives from common ownership are large – an order of magnitude above what would trigger agency concerns in a standard merger investigation – and (2) airfares are higher, likely in the range of 3-12 percent, due to common ownership.

The paper measures market concentration arising from common ownership using the ownership-modified version of the Herfindahl-Hirschman Index (“HHI”) developed by Salop and O’Brien<sup>6</sup> and adopted by regulators worldwide.<sup>7</sup> Like the traditional HHI, this modified HHI (“MHHI”) depends on market shares, but unlike the traditional HHI it also depends on the extent the controlling shareholders of a given firm have financial stakes in all the firms in the market. For example, a market with two equally sized firms has an HHI of 5,000. If these two firms are owned by the same set of investors and these investors jointly control the firms, the ownership-modified HHI (MHHI) is 10,000 – reflecting that the two firms will maximize their investors’ profits by acting as a monopoly. The gap between the MHHI and the traditional HHI, referred to as the “MHHI delta” measures the extent to which market concentration is due to common ownership alone. (In the example above, the MHHI delta is  $10,000 - 5,000 = 5,000$ .) The MHHI is an attractive index of market concentration as, just like the HHI, it is proportional to the market-share weighted average price-cost margin across the firms in the market under Cournot competition.<sup>8</sup>

Figure 5, taken from the paper, plots the passenger-weighted average HHI and the average MHHI on U.S. airline routes over the last decade. The gap between the MHHI and the HHI, which measures the degree of common ownership, was around 2,000 at the beginning of the period, declined to around 1,000 in 2006-2007, and then increased to about 2,500 in 2014. To put these numbers in perspective, the DoJ/FTC 2010 Horizontal Merger Guidelines state that, in highly concentrated markets (i.e. markets with an HHI greater than 2,500), mergers involving changes in the HHI of more than 200 points are “presumed likely to enhance market power.” Thus, the average MHHI delta in the airline industry due to common ownership in 2014 implies a relative increase in concentration relative to HHI that is more than 10 times higher than the threshold that would likely generate antitrust concerns according to the guidelines.

5 Azar, Schmalz, & Tecu, “Anti-Competitive Effects of Common Ownership,” available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2427345](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2427345).

6 See Salop & O’Brien, “Competitive Effects of Partial Ownership: Financial Interest and Corporate Control,” 67 *Antitrust Law Journal* 559-614 (2000). See also Bresnahan & Salop, “Quantifying the Competitive Effects of Production Joint Ventures,” 4 *International Journal of Industrial Organization* 155-175 (1986); Reynolds & Snapp, “The Economic Effects of Partial Acquisitions and Joint Ventures,” 4 *International Journal of Industrial Organization* 141 (1986).

7 For example, see Regulation (EEC) No 4064/89, Merger Procedure, Case No IV/M.1383 – *Exxon/Mobil*. The MHHI has also been cited by the European Commission in its review of the *Schneider/Legrand* merger (Case No COMP/M.2283 - *Schneider/Legrand*), and by the Competition Tribunal of South Africa in its review of the *Primedia/Capricorn* merger (Case No: 39/AM/MAY06). In the E.C. Merger Guidelines, it is explicitly stated that “In markets with cross-shareholdings or joint ventures the Commission may use a modified HHI, which takes into account such share-holdings” (see Guidelines on the assessment of horizontal mergers under the Council regulation on the control of concentration between undertakings, 2004/C 31/03, footnote 25, *Official Journal of the European Union* 5.2.2004, C31/5-31/15). The U.S. Merger Guidelines discussion of partial acquisitions does not mention the MHHI directly, but the framework outlining the analysis of partial acquisitions is consistent with the roles of financial interests and degree of influence on which the MHHI is based (see U.S. DoJ and FTC Horizontal Merger Guidelines (August 2010) at Section 13).

8 The HHI is derived from the same model but under the assumption that firms are separately owned. The MHHI can therefore be thought of a generalization of the HHI that allows for different ownership structures.

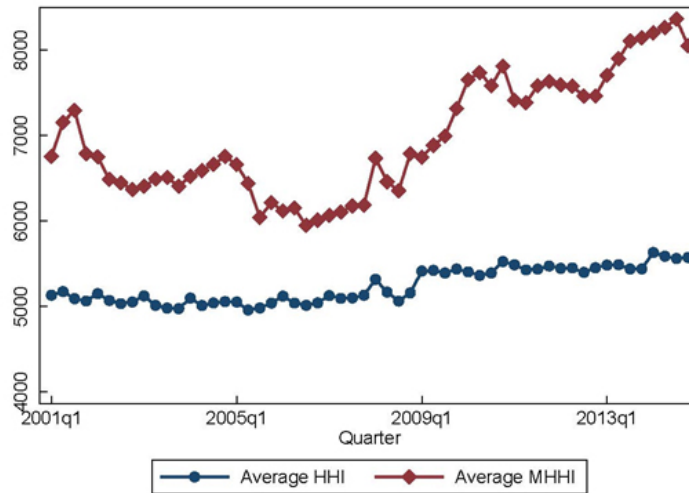


Figure 5: Average HHI and MHHI in the U.S. Airline Industry, Quarterly 2001-2014  
Source: Azar, Schmalz and Tecu.

To study whether market concentration due to common ownership has measurable effects on competition, the paper correlates route-level variation over time in the MHHI delta with variation in airfares on the same route. This approach “differences out” route- and carrier-specific time-invariant determinants of price, as well as industry-wide time-varying shocks such as macroeconomic conditions or oil prices. In addition, the regressions control for route-specific time-varying factors that may be correlated with fares as well as the MHHI delta, such as the traditional HHI, the number of non-stop carriers, the presence of low-cost carriers, the share of connecting passengers and market demographics.

There is a legitimate concern that the thus-estimated correlations do not capture a causal effect of common ownership concentration on fares, or at least not an unbiased estimate thereof. For example, it could be that the effect, at least partially, works the other way around, i.e. that changes in fares may induce changes in common ownership concentration; under reasonable assumptions, this would lead to an underestimation of the effect in the baseline analysis. Another concern could be that not all confounding influences are appropriately controlled for, such that the estimate may capture the effect that some other “omitted” factor has on both common ownership concentration and prices.

The paper addresses these concerns by providing a series of additional tests. For example, it shows that passenger volume and common ownership concentration are negatively correlated, which suggests that the positive relationship between common ownership and higher fares cannot be explained by demand shocks that common shareholders may correctly foresee. It also estimates the effect that the increase in common ownership concentration resulting from BlackRock’s acquisition of Barclays Global Investors (“BGI”) in 2009 had on fares. This acquisition is a helpful “experiment” because the changes in route-level ownership structures implied by the merger were arguably not caused by expected route-level changes in U.S. airfares. Any measured effect must therefore work from increased common ownership to higher fares, rather than the other way around.

The BlackRock/BGI acquisition also illustrates how a merger in the asset management industry may affect competition in the product markets in which the asset managers hold ownership interests. The estimates suggest that the acquisition itself increased average ticket prices by about half a percent.

As the paper discusses, it is likely that the effect operates through multiple complementary channels. For example, unlike undiversified activist investors or founder-entrepreneurs that retain a large stake, mutual funds may simply not push firms to compete aggressively, and managers may consequently enjoy a “quiet life” without aggressive competition. However, common owners can also be directly involved in business decisions under the umbrella of corporate governance engagements, accept executive compensation packages that reward industry performance in addition to individual firm performance, and



vote for directors and executives that are likely to consider the common owners' interests.<sup>9</sup> Importantly, as the competition-reducing effects of common ownership are first of all unilateral, the mechanism can be much more subtle than an explicit call for collusion on behalf of investors.

### ***B. Evidence from other Industries***

Recent research suggests that the findings generalize to other industries. Azar, Raina and Schmalz provide a study of bank competition in local deposit markets across the U.S.<sup>10</sup> They show that changes in the degree to which banks serving a particular U.S. county are commonly owned correlate positively with changes in account fees and fee thresholds for various deposit products, and negatively with deposit rates. Moreover, a recent multi-industry study by Gutiérrez and Philippon finds that underinvestment relative to investment opportunities in the U.S. is in large part driven by industries with high market concentration and ownership by quasi-indexers, i.e. common ownership.<sup>11</sup>

### ***C. Criticisms***

The empirical findings to date have sparked a lot of debate both in academic journals and in the media, and several potential criticisms have been raised. Most critiques give theoretical reasons why one should not expect the anti-competitive effects to materialize in practice, or point to the welfare benefits of diversification for small investors.

Perhaps the main theoretical criticism is the claim that no plausible mechanism exists that could translate the anti-competitive incentives of common ownership into market outcomes. This argument falls short of explaining why, empirically, taking into account shareholders' economic interests does help to explain firms' product market behavior. Moreover, the claim that a mechanism is lacking seems to reflect a misunderstanding of the economic mechanism that we argue can lead to anti-competitive outcomes. As explained above, it is *an absence of incentives to compete (rather than an increased incentive to collude)* that leads to reduced competition under common ownership. It is hard to see why *not* implementing aggressive competition needs a mechanism or could produce measurable traces. The critics stay silent on the question what would make firms compete in the *absence* of a large shareholder or manager with material incentives to do so.

An alternative critique is that an analysis of shareholder's competitive incentives within an industry may be too narrow, as shareholder's interests may extend to upstream or downstream industries. For example, a significant fraction of an airlines' tickets is sold to other corporations, which are likewise partially owned by the airlines' common shareholders, and similarly, the suppliers of jet fuel are owned to a significant extent by the same investment firms. Once this is taken into account, the critics argue shareholders may benefit from increased airline competition because it may increase profits for other corporations they partially own. We agree that these vertical relationships could change the theoretical predictions, although in which direction is open. While raising valid reasons why one may not find an empirical relationship, these arguments do not critique the methodologies employed by the papers finding that common ownership is linked to anti-competitive effects at the industry level.

The main criticism of our empirical methodology seems to be related to the use of the MHHI as an index of common ownership concentration.<sup>12</sup> In what follows, we go over some of the criticisms of the MHHI and offer our response.

- Criticism: The MHHI depends on market shares. Changes in market shares that are unrelated to common ownership

9 A recent news article details the active roles that mutual funds are taking in their portfolio firms more generally, see Flaherty & Kerber (2016), "U.S. lawsuit against activist ValueAct puts mutual funds on alert," Reuters, <http://www.reuters.com/article/us-valueact-lawsuit-funds-idUSKCN0X92E6>. The "airlines" paper also discusses various potential channels for "direct" engagement.

10 Azar, Raina & Schmalz, "Ultimate Ownership and Bank Competition," available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2710252](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2710252).

11 Gutiérrez & Philippon, "Investment-less Growth: An Empirical Investigation," available at: <http://www.nber.org/papers/w22897>, April 2017 version.

12 Others have also criticized the use of airport-pairs rather than city-pairs as the unit of analysis in the airlines paper. However, the paper shows the results hold up when one uses city-pairs.

may affect the MHHI as well as prices, leading to a spurious correlation between MHHI and prices.

This concern is theoretically valid. To test whether it is empirically relevant, the airlines paper's analysis of the BlackRock/Barclays Global Investors acquisition uses changes in the MHHI delta that are by construction not affected by changes in market shares, while also controlling for the HHI before the acquisition.<sup>13</sup> In this set-up, changes in market shares do not affect the independent variables in the estimation, and thus any correlation between them and price cannot be explained by changes in market shares. The airlines paper also does not find an effect of the MHHI delta on price when we calculate the MHHI under the "placebo" assumption that only small shareholders exert control over the firm. This shows that there is no "mechanical effect" of the MHHI delta on price as some critics have feared based on theoretical considerations.

- Criticism: The MHHI is an index calculated from ownership and control rights but not a "raw" measure of common ownership.

It is unclear how this criticism relates to the empirical results. That said, the MHHI takes into account the relative ranking and power of shareholders and the relative sizes of firms, which are sources of variation "raw" measures fail to capture. We therefore prefer the MHHI as a measure that can be derived from economic theory.

- Criticism: The MHHI relies on assumptions regarding the extent to which owners control a firm. It is not clear how ownership maps to control, and whether ownership by investors maps to control in the same way as ownership by other industry participants does.<sup>14</sup>

We agree that the precise relationship between control shares and *de facto* control is not settled; indeed the empirical literature on this question is severely limited. Therefore, the airlines paper shows that results are robust to sensible variations of this assumption. The results remain largely unchanged when only the top 10 or top 5 shareholders are assumed to exert control, or when one uses a Banzhaf index of voting power instead of ownership shares.

## V. POLICY IMPLICATIONS

Two implications seem to be clear: In assessments of market concentration, regulators should not only consider the number of firms and their market shares, but also measure to what extent these firms are commonly owned by the same investors. Only to the extent that common ownership is measured can its effects be studied. Second, given that consolidation in the asset management industry is a key contributor to common ownership links, further consolidation in the financial sector should be evaluated with an eye towards potential implications for product (and input) markets of the asset managers' portfolio firms.

A conceptual problem makes it challenging to propose policy actions that are Pareto improving. Disallowing large mutual fund families to offer fully diversified products would have perhaps significant welfare costs. Disallowing large shareholders that hold competitors from exercising their voting rights is problematic as well, as it creates a wedge between cash flow and control rights; in other words, it creates or exacerbates corporate governance problems. These considerations highlight a "trilemma" of the mutually inconsistent goals of product market competition, shareholder diversification and good corporate governance. Given that diversification and good governance primarily serve investor interests, the debate about the balance between these two goals versus the macro-economic and socially desirable properties of efficient product markets has been controversial.<sup>15</sup>

<sup>13</sup> An earlier version of the airlines paper controlled for the contemporaneous HHI, which, as O'Brien & Waehrer have pointed out, may be affected by current prices and thus lead to bias in the estimation. Using the HHI before the acquisition addresses this issue.

<sup>14</sup> Observers have also noted that, when one assumes control proportional to ownership, the MHHI can make perhaps unintuitive predictions in extreme situations. For example, if a single common owner holds only one percent of each firm in the industry and 10,000 "separate" owners hold equal proportions of the remaining shares of each firm, then the MHHI will be nearly 10,000, implying the firms would act almost as monopoly. This extreme situation does not correspond to realistic patterns in the data, which makes the empirical import of this consideration doubtful. Also, even though the implication may seem unintuitive in this example, it illustrates an important logic that the MHHI reflects but that other measures miss: The control that a given shareholder exerts depends on its ownership share *relative to other shareholders*. Even a shareholder with a small ownership stake in absolute terms may exert a large degree of control if they are the largest shareholder.

<sup>15</sup> For example, Novick et al. propose to disregard the studies to date, while Posner et al. propose to limit holdings of large institutions to one firm per industry, or to

The policy response to the common ownership problem should also be nuanced for reasons that fall outside the “trilemma” explained above. Some theories predict potential pro-competitive effects of common ownership under specific conditions. For example, recent research proposes a potential positive role of common ownership on innovation in industries with high degrees of technological spillovers, or for customer-supplier relationships.<sup>16</sup>

## VI. CONCLUSION

Recent empirical research has uncovered evidence consistent with a negative causal effect of common ownership on competition. Given the potentially momentous implications for antitrust practice, these findings have aroused much attention. Amid that background, it is important to keep in mind that the empirical literature on the anti-competitive effects of common ownership is still in its infancy. The methodologies used are still subject to debate, and changes in methodologies may change the empirical results and therefore some of the conclusions. However, given the extent of common ownership in the present-day U.S. economy and in many other economies abroad, and the continuing trend towards concentration and diversification in the asset management industry, we expect that the debate that the topic has generated in recent years will continue in the future.

---

one percent of the shares of multiple firms in a given industry, see: <https://www.blackrock.com/corporate/en-us/literature/whitepaper/viewpoint-index-investing-and-common-ownership-theories-eng-march.pdf> and [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2872754](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2872754), respectively.

16 López & Vives, “Cross-ownership, R&D Spillovers, and Antitrust Policy,” available at: <http://blog.iese.edu/xvives/files/2016/05/Lopez-Vives-may-2016.pdf>; Freeman, “The Effects of Common Ownership on Customer-Supplier Relationships,” available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2873199](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2873199).