

CAN INSTITUTIONAL INVESTORS SOFTEN DOWNSTREAM PRODUCT MARKET COMPETITION?



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I. INTRODUCTION

Developments in antitrust theory and practice have occurred more or less incrementally. The obvious examples include advances in the modeling and implementation of mergers in differentiated product industries and in auction theory; much of this is due to advances in and appreciation of game theory. Indeed, the typical Bertrand model now routinely used in merger simulations was introduced in the early 19th century. There have been some significant inflection points in antitrust thinking that quickened the pace of intellectual, policy and enforcement changes. These include, in the 1970s and 1980s, the “New Learning” associated with the Chicago School highlighting the shortcomings of relying solely or largely on the level of and changes in concentration for evaluating mergers. That New Learning resulted in significant changes in the Horizontal Merger Guidelines as well as an appreciation of the benefits of vertical relationships building upon the work of Ronald Coase, relationships that had been viewed as almost *per se* illegal. And there was the subsequent and inevitable pushback with “Newer Learning” (Post-Chicago antitrust) that highlighted the potential risk of exclusionary behavior by firms with market power, and questioned the need for market definition with advances in the modeling of competition or possession of direct evidence of that power.

Recently, a number of papers — one by Azar, Schmalz and Tecu, considering the airline industry, and another by Azar, Raina and Schmalz, considering the banking industry — have perhaps uncovered a surprising and unexpected source of heightened market power: the common ownership by third-party institutional investors of rival firms in various markets.²

The Azar et al. papers are motivated by the increase in the ownership stakes of institutional investors in firms in many

¹ Consultant, Charles River Associates. The views expressed here are solely my own and not those of Charles River Associates or my colleagues at Charles River Associates.

² Azar, Schmalz & Tecu, *Anticompetitive Effects of Common Ownership* (March 23, 2017) (hereinafter Azar et al. (A) or airline paper), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2427345; Azar, Raina & Schmalz, *Ultimate Ownership and Bank Competition* (July 23, 2016) (hereinafter, Azar et al. (B) or banking paper), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2710252. While using common ownership metrics that are not derived from a market power perspective nor focused on the price effects of common ownership, a recent paper concludes that common ownership improves product strategy coordination among the commonly-owned firms, resulting in (among other things) higher market shares and profitability of those firms. See He & Huang, *Product Market Competition in a World of Cross-Ownership: Evidence from Institutional Blockholdings* (January 2016) (forthcoming REVIEW OF FINANCIAL STUDIES), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2380426. This study focused on effects across all four-digit SIC industries within a single statistical analysis raising issues of both the correct market definition and the effects of failing to account for characteristics that differ across so many industries. With not much basis, the paper (at 6-7) dismisses any anticompetitive explanation for the results reported in the paper. At face value, the paper is in fact consistent with the Azar et al. findings.

industries. Azar et al. observe that institutional investors now account for 70-80 percent of all the stock in publicly traded companies. Further, the same four institutional investors (Berkshire Hathaway, BlackRock, Vanguard and JP Morgan) have financial interests in Delta, Southwest, American and United Continental. Similarly, the same four institutional investors are among the top six shareholders of three of the largest banks (J.P. Morgan Chase, Bank of America, and Citigroup). More generally, Baker cites research that large institutional investors “collectively own roughly two-thirds of the shares of publicly traded U.S. firms overall, up from about one-third in 1980.”³

The Azar et al. papers suggest that such common ownership by these investors provides an incentive for the firm's managers not to maximize the profits of the firm but rather the profits of the institutional investors across all of their holdings in it and rival firms. In taking into account the profits of the rival firms that accrue to its institutional investors (in line with their financial interest in those rivals), competition will be harmed: The managers of the firm will somehow understand that adopting strategies that reduce the profits of its rivals also reduce the profits that would accrue to the institutional investors. As a result, the managers will temper their rivalry with competitors to account for the effects of that rivalry on the returns to institutional investors and so consumer prices will increase, an outcome seemingly confirmed by those recent papers.

One highly-regarded antitrust scholar in particular has labeled these findings as a “blockbuster” for antitrust analyses and enforcement policy.⁴ Three respected academics in a New York Times opinion piece characterized these findings in the following way: “The great, but mostly unknown, antitrust story of our time is the astonishing rise of the institutional investor — ...that buys stock in substantial quantities for the benefit of clients and customers — and the challenge that it poses to market competition.”⁵ Others have some (or many) reservations about relying now on these findings as a basis for a substantial if not radical change in antitrust policy. “Not so fast,” they say.

II. BACKGROUND

Building on earlier work, O'Brien and Salop developed a metric to consider the competitive effects of firms holding financial interests in rivals: a Modified Herfindahl-Hirschman Index (“MHHI”) which consists of the usual HHI plus a term (the MHHI Delta) that reflects the cross-ownership patterns of the firms in a particular market.⁶ Each firm maximizes its own profit after accounting for the effect of its actions on the profits of the other investing firms.

The Azar et al. papers extend the MHHI to common ownership of rival firms by institutional investors. The underlying theory is straightforward. To borrow an example from Rock and Rubinfeld,⁷ suppose a third party like Warren Buffet owned 51 percent of the shares of Firm A, giving Buffet effective control over that firm. Then the firm would continue to maximize its own profits, with Buffet sharing in those profits via his financial interest. Now suppose that Buffet acquires a 51 percent interest in rival Firm B. The manager of each firm will realize that an aggressive strategy towards its rivals will generate some losses to Buffet and so will temper such a strategy. Indeed, given that by assumption Buffet has effective control over both firms, the effect of the common ownership in this example is tantamount to coordinating the pricing of both firms (although Buffet's ownership and control fall short of a merger since there is no physical combination of the two firms and hence none of the typical efficiencies associated with mergers).⁸ And this would occur without any changes in the HHI.

³ Baker, *Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge*, Harvard Law Review (2016) (hereinafter, Baker) at 212, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2746874.

⁴ Elhauge, *Horizontal Shareholding*, Harvard Law Review (2016) (hereinafter, Elhauge) at 1267, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2632024.

⁵ Posner, Scott Morton and Weyl, *A Monopoly Donald Trump Can Pop*, New York Times (December 7, 2016), available at: https://www.nytimes.com/2016/12/07/opinion/a-monopoly-donald-trump-can-pop.html?_r=0.

⁶ O'Brien & Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, ANTITRUST LAW JOURNAL (2000) (hereinafter, O'Brien and Salop), 559-614.

⁷ Rock & Rubinfeld, *Defusing the Antitrust Threat to Institutional Investment in Corporate Governance* (March 2017) (hereinafter, Rock and Rubinfeld) at 3, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2925855.

⁸ While a 51 percent holding of the outstanding stock of the two firms is sufficient to provide Buffet with control, the fraction of shares actually required for control

The profit calculus for each firm's manager becomes more complicated as the number of third-party investors increases. One scenario in O'Brien and Salop used by Azar et al. in calculating the MHHI assumes that the firm manager maximizes the weighted average profits of all of its third-party investors, accounting for the interests of those investors in the firm. The weights will depend on (among other things) the control or influence each investor has with respect to its portfolio of rivals, the magnitude of the financial interest in those firms, and the market shares of those firms. As noted, these possibly anticompetitive ownership patterns can emerge without any apparent change in the HHI. In failing to account for the common ownership stakes of institutional investors, the HHI alone would overstate the extent of competition in any particular industry.

III. ESTIMATING THE COMPETITIVE EFFECTS OF COMMON OWNERSHIP

Having established the extensive common ownership patterns in both banking and airline markets, Azar et al. estimate separately the effects of the HHI and the MHHI Delta on airline pricing. The banking paper estimates the effect of the MHHI (without distinguishing between the HHI and the MHHI Delta) on interest rates on checking accounts and money market funds, monthly money market and checking account fees, and money market and checking account balance thresholds below which additional fees must be paid. With respect to the airline industry and in analyses that account for some reverse causality (discussed below), Azar et al. find that increases in the MHHI Delta raise airline fares on the order of 10-12 percent higher than would be the case if there were no common ownership by institutional investors of the airlines.⁹

With respect to the banking industry, Azar et al. find that for interest-bearing checking accounts, a one standard deviation increase in the MHHI (about 1500 points according to my calculations) leads to about an 11 percent increase in fees and an increase of about 17 percent in account thresholds.¹⁰ With respect to money market accounts, the increase in the MHHI results in a 3 percent increase in fees and a nearly 17 percent increase in account thresholds.

The conclusion that common ownership by institutional investors can generate anticompetitive harm has already generated changes in enforcement policy. In its investigation of the airline industry, the Department of Justice ("DoJ") had been assessing the extent to which communications between the airlines and the large institutional stakeholders fostered or facilitated fare or capacity collusion.¹¹ Indeed, the Obama-appointed Assistant Attorney General for Antitrust at the DoJ told a Senate committee that the Antitrust Division is investigating common ownership "in more than one industry."¹² And apparently, the European Commission has relied on the MHHI to gauge the effects of common ownership.¹³ A trio of respected academics has proposed a very detailed and thoughtful enforcement superstructure to both monitor and reduce the anticompetitive harm from common ownership.¹⁴

So, is there anything that should give one pause before embarking on what might be a radical reset of antitrust enforcement policy? At the outset, the most obvious reason for pause is that these are the only two papers that indicate such a reset is necessary and (at least as of this writing), neither paper has appeared in any peer-reviewed journals (meaning that the

may be significantly less than 51 percent if stock ownership is widely dispersed and the remaining shareholders are unable to effectively block the actions of the larger shareholder.

9 It is not obvious that the right benchmark is *no* common ownership by institutional investors.

10 With respect to the banking study, Azar et al. use what they refer to as a "Generalized HHI" that accounts for investment holdings by Bank A in another Bank B, C and so on. For ease of exposition, I continue to use the MHHI nomenclature.

11 McLaughlin & Schlangenhein, *U.S. Looks at Airline Investors for Evidence of Fare Collusion*, Bloomberg.com (September 22, 2015), available at: <https://www.bloomberg.com/news/articles/2015-09-22/do-airfares-rise-when-carriers-have-same-investors-u-s-asks>.

12 Nigro, Jr., *Cross-Ownership by Institutional Investors*, Harvard Law School Forum on Corporate Governance and Financial Regulation (March 31, 2016), available at: <https://corpgov.law.harvard.edu/2016/03/31/cross-ownership-by-institutional-investors/>.

13 O'Brien & Waehrer, *The Competitive Effects of Common Ownership: We Know Less Than We Think* (February 2017), note 5, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2925855.

14 Posner, Scott Morton & Weyl, *A Proposal to Limit the Anti-Competitive Power of Institutional Investors* (March 25, 2017) (hereinafter, Posner et al.) (forthcoming, ANTITRUST LAW JOURNAL), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2872754. More modest proposals have been offered by Rock and Rubinfeld at 28-36, and by Elhauge at 1301-1316.

published papers could differ substantially from earlier versions). In an insightful consideration of these papers, Baker (among others, including myself) noted that “the empirical economic literature relating overlapping financial investor ownership to higher prices is in its infancy.” Before engaging in an antitrust reset, at a minimum, additional research to establish both the robustness of these two Azar et al. papers and to evaluate the effects in other industries would seem appropriate.

What follows is a discussion of both the conceptual and the empirical shortcomings that have been raised by others reviewing what I believe are earlier versions of the airline paper in particular. However, the most recent version of the Azar et al. airlines paper addresses many of these issues, as I highlight below. It would not be a surprise if revisions to the Azar et al. banking paper will similarly respond to referee critiques.

IV. BASIC CONCEPTUAL ISSUES

A. Relationship between the MHHI and Price

O'Brien and Waehrer note that there is no obviously monotonic relationship between the MHHI and price. Indeed, the simplest example is one that has been used in understanding the flaws in assuming HHI increases result in price increases. Suppose an exogenous shock results in the reduction in costs for one particular large firm. As a result, the firm lowers price, expands its output, and increases its market share. The HHI and the MHHI will both increase but price will fall. More generally, within the context of a simple model, O'Brien and Waehrer show that the relationship between the MHHI and MHHI Delta on the one hand and price on the other can be positive or negative as both increase.¹⁵

A related issue is the question of whether the underlying model that generates the MHHI relationship used by Azar et al. is appropriate for their analysis. The model — a Cournot model — is one that has been used, for example, to predict the effect of a merger on price changes in a homogenous goods market. Arguably, both the airline industry and the banking industry are more differentiated than homogenous. In addition to competing on fares, airlines compete on other dimensions such as baggage fees, frequent-flyer miles, food service, on-time performance and the like.¹⁶ Similarly, banks compete on the terms of savings and checking accounts such as minimum balances and credit card deals as well as interest and fees on checking and savings accounts.

As a result, the MHHI used by Azar et al. may be generating results that are based on an inappropriate underlying model, which in turn casts some doubt on their interpretation of their results. Suppose that an investor has a financial interest in Firm A and acquires an interest in a rival Firm B. The competitive effect of that acquisition will depend on (among other things) the degree to which the output of A and B are substitutes. If in “product space,” few consumers of Firm A's output would not switch to that of Firm B if the price charged by A increases, then the anticompetitive effects will be overstated by any increase in the MHHI that might result because of the lack of consumer substitution between the outputs of those two firms.¹⁷ In his commentary, Patel concludes: “For that reason, it is not especially meaningful to ask whether, as a general matter, a high level of common ownership will result in substantial competitive harm since the answer depends on the structure of the relevant market.”

However, in the airlines paper, Azar et al. do in fact consider a metric based on the Bertrand model of differentiated product competition. (To anticipate an empirical issue below, a version of market shares is used in the Bertrand metric.) That metric does have a statistically significant effect on airline fares, but the effect appears to be far smaller than that of the MHHI Delta. However, the discussion of the “right” model in the paper is limited and it is not clear how one could compare the price effects for comparable changes in the MHHI Delta and the Bertrand-based metric.¹⁸

¹⁵ This issue is also discussed in Patel, *Common Ownership, Institutional Investors, and Antitrust* (April 2017) (forthcoming in the ANTITRUST LAW JOURNAL) (hereinafter, Patel) at 31-34, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2941031.

¹⁶ However, the Cournot model in the airline industry is more likely to be appropriate if capacity rather than price is the decision variable of focus.

¹⁷ An extended discussion of this point can be found in Patel at 37-40. This criticism has also been leveled at the use of the HHI for predicting the competitive effects of a merger in differentiated product markets.

¹⁸ I note that the paper (at 28) concludes that results are consistent with the Cournot model being more applicable than the Bertrand model, but the basis for that

B. Heterogeneity, Fluidity and Extent of Holdings

Rock and Rubinfeld note that while some of the leading institutional investors (focusing on Vanguard and BlackRock in particular) have financial interests in each of the major airlines, other institutional investors have interests in only some of the airlines. Using their example, Primecap has an 11.2 percent ownership interest in Southwest, a 7.6 percent interest in JetBlue, and no ownership interest in United or Delta. How are airline managers to align the interests of these diverse stakeholders? Rock and Rubinfeld note that “While Vanguard and BlackRock might plausibly have an economic incentive to prefer ‘soft competition,’ Primecap might well argue for Southwest and Jet Blue to undercut Delta and United if that is in the unilateral interest of Southwest and JetBlue.”¹⁹

A further complication for airline managers is the fluidity of institutional investor holdings. If the ownership stakes of these investors change frequently and non-trivially, the manager of each airline might find it necessary to alter strategies frequently. Such changes could generate a substantial cost for the airlines and may lead the managers to focus only on the stand-alone profits of the airline.

In addition, some observers have noted that institutional investors holding stakes in the airline industry may also hold financial interests in other markets related to the airline industry, such as food caterers, fuel service providers, rental cars and hotels.²⁰ If airline prices are higher as a result of the holdings of these investors, the demand and profits (quasi-rents or longer-term rents) of these related services will fall. Thus, it is possible that an institutional investor may earn higher airline profits from the reduction in airline competition but lose even greater profits from its stake in these related upstream or complementary services. Put differently, the airline manager would find its maximization of its own and investor profits a substantially more complex problem than “simply” considering the airline profit gains to the investors. The Azar et al. papers focus only on the institutional holdings in the particular industry (airlines and banking), not in related industries.²¹

C. Investor Control Issues

As noted above, the interests of institutional investors are not necessarily aligned, depending on both the extent of the financial interest in any particular airline (for example) and the breadth of the financial interest across airlines, including no interest by some investors in some airlines. How is the firm manager to account for these diverse interests? O'Brien and Salop resolve this conundrum in one control scenario by *assuming* that the managers of each firm “maximize a weighted sum of the shareholder's returns... Under this formulation, a higher weight on the profit of a particular owner is associated with a greater degree of influence [or control] by that owner over the manager. Different control scenarios then correspond to different sets of ‘control weights’ for the different owners.”

Azar et al. assumes that the degree of control or influence of the institutional investor is proportional to the fraction of shares held by the investor. While that may sound reasonable, that is not the only form that control scenarios may assume. In addition to proportional control, O'Brien and Salop also consider various other scenarios, including ones in which the laws regarding fiduciary obligations prevent (if effective) managers from acting in the interests of the larger shareholders which may harm minority shareholders.

But the assumption of proportional control can lead to counter-intuitive results. Suppose an investor holds a one percent share in all rival firms while numerous other investors individually have very small shareholdings in only one of the firms in the

conclusion (other than citing some other literature) is not obvious. For a contrary view, see the discussion in Patel at 34-40 and the sources cited therein.

19 In addition, it may be necessary to distinguish between investors with short and long time horizons. For example, see Pukthuanthong, Turtle, Walker & Wang, *Litigation Risk and Institutional Monitoring* (November 2016) (forthcoming, JOURNAL OF CORPORATE FINANCE), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2872515.

20 See Baker at 31; Woodbury, *Paper Trail: Working Papers and Recent Scholarship*, 14 ANTITRUST SOURCE (Dec. 2014) (commenting on the airline paper) at 6, available at: http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/dec14_paper_trail_12_16f.pdf.

21 Rock and Rubinfeld suggest that given this heterogeneity and fluidity in holdings by institutional investors, “the only strategy that will win support among the investors is to maximize the value of the single [firm] without paying attention to what happens to competitors.”

market. The theory underlying the MHHI with proportional control would result in that one percent shareholder having effective control over all rivals and exercising that control to generate a near monopoly outcome. That does not seem to be a plausible outcome.²² One control scenario suggested by Patel allows the common owners to exercise some control only if their holdings in the various firms exceed a certain threshold.

Indeed, Azar et al. (A) in fact consider limiting the “control” shareholders to the top 10, top 5, top 3, and top 2 shareholders as well as just the leading shareholder. Azar et al. conclude that “Only common ownership by shareholders ranked first and second has a positive and highly significant effect on ticket prices.” That analysis still leaves open the question above that the largest shareholder, with a very small share while all other shareholdings are trivial, could seemingly lead to a near monopolization of the industry.

Interestingly, in the airline paper, Azar et al. describe the use of a voting power index rather than ownership shares as an alternative metric for control and the paper concludes that the proportional control assumption is not a driver of the results.²³ The discussion of this index is very brief, with no discussion of the construction of the metric and so is difficult to comment on. It is not clear whether the fare effects of changes in this index leads to ones comparable to the results using the MHHI. However, that metric likely includes the market shares of the airlines and so raises some empirical issues discussed below.

D. Incentivizing Management to Maximize the Profits of the Common Owners

While the model used by Azar et al. assumes that managers will take into account the shares held by the common owners and so maximize the profits of those owners accounting for their interests in rival firms, an important question is what creates the incentives for managers to do so. Azar et al. (A) provides a discussion of alternative influence channels. They include “doing nothing” which would lead managers to generally become less aggressive because of seemingly lax oversight of management.²⁴ Or institutional investors may become more aggressive in coaxing management to soften competition with rivals or acquire and use board positions to directly or indirectly threaten management.

Another approach might be to tie the manager’s income to the profits of the entire industry rather than the individual firm itself. In a recent paper, Anton and fellow coauthors observe that “it is in the asset managers’ [common owners’] interest to structure executive pay in such a way that managers have weakened incentives to compete aggressively against their industry rivals.”²⁵ Empirically, the paper tests the proposition (among others) that the form of executive compensation depends in part on the MHHI Delta (i.e. the difference between the MHHI and the “ordinary” HHI). Based on their empirical analysis, Anton et al. conclude that “managerial incentive contracts can give managers economic reasons to act in their shareholders’ anticompetitive interests.” The higher is the MHHI Delta, the more likely it is that executive compensation is tied to industry rather than firm performance. If true, that would provide some basis for concluding that individual firm managers maximize something other than their firm’s standalone profits.²⁶

One issue with this conclusion is that it conflicts with statements made by some leading firms and institutional investors. For example, Rock and Rubinfeld note that two major airlines — Delta and American — base executive compensation on (e.g.) Delta’s performance relative to other airlines, which would encourage rather than discourage greater competition. Similarly, they note that Vanguard has viewed relative performance-based compensation as the appropriate mechanism to maximize the individual firm’s value. Further complicating the interpretation of the Anton et al. results is a second paper that relies on an

22 This example is due to Carl Shapiro, cited by O’Brien and Waehrer at 29.

23 This same metric was proposed by O’Brien and Waehrer at 29-30. I note in passing that Azar has also developed complementary indices, as yet untested. Azar, *Portfolio Diversification, Market Power, and the Theory of the Firm* (January 2017), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2811221.

24 Of course, a “do-nothing” approach may reduce profits if it permits the managers to become inefficient.

25 Anton, Ederer, Gine, and Schmalz, *Common Ownership, Competition, and Top Management Incentives* (November 2016) (hereinafter, Anton et al.) at 1, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885826.

26 Elhauge (at 1278-1281) makes a similar point. However, it is not obvious how this empirical result, if it is robust, maps into the manager’s profit maximization calculus that accounts for the interests of each common owner that underlies the use of the MHHI.

estimation approach similar to Anton et al. and reaches the opposite conclusion, namely that executive compensation is more closely tied to firm performance relative to the industry as common ownership increases.²⁷

V. BASIC EMPIRICAL ISSUES

Azar et al. estimate a reduced form relationship between price and the MHHI in the banking paper and the HHI and MHHI Delta in the airline paper, which (roughly speaking) assumes that the HHI, MHHI and MHHI Delta are exogenous (i.e., not affected by random shocks in demand or costs and resulting price changes), an assumption the two papers attempt to relax using various econometric techniques. Nonetheless, there have been questions raised about the robustness of the estimation in the airline and banking papers.

One key issue is whether the MHHI or MHHI Delta are capturing the effects solely of common ownership or something more. Azar et al. made efforts to ensure that one could interpret the MHHI or MHHI Delta as “causing” the higher fares as opposed to some other variable that was correlated with both the ownership variables and the prices. This effort is particularly extensive in the airlines paper.

Rock and Rubinfeld note that the Azar et al. construction of the MHHI Delta uses the average number of market passengers as weights across airline routes in the statistical analyses and that construction may have resulted in a spurious correlation between fares and the MHHI Delta.²⁸ If the results depend on larger markets, i.e. markets with a greater number of passengers, that are more concentrated to begin with, then the positive relationship between airline fares and the MHHI Delta may be spurious: “the major airlines have higher margins on those routes, due to greater market power, increased efficiencies, or a combination of both.” If these larger-market traits are responsible for the price-MHHI Delta relationship, then the MHHI Delta is not the cause of the higher fares.

In addition, Rock and Rubinfeld argue that over the time period spanned by the airline paper, demand for airline service was increasing as the economy recovered from the Great Recession. If the demand for airline service grew relatively more in the larger markets, fares would tend to increase and again generate a spurious positive relationship between fares and the MHHI Delta. O’Brien and Waehrer make a similar observation.

The most recent version of the Azar et al. airlines paper does test for these possibilities and finds that the MHHI Delta continues to have a statistically significant impact on airline fares for all but the very largest and smallest markets, although the effect increases as the size of the market increases.

O’Brien and Waehrer also note that market shares used in both the HHI, the MHHI, and the MHHI Delta are also affected by prices. Using their airline example, suppose that there is an increase in demand on a particular route and one airline is better poised than its rivals to take advantage of that increased demand. With demand increasing, prices will tend to rise and the share of the advantaged airline will rise. The HHI, MHHI, and MHHI Delta will tend to increase as well, suggesting that the MHHI and MHHI Delta “caused” the price increase when in fact the price increase was due to an increase in demand and an advantaged airline, not a result of seemingly anticompetitive ownership arrangements.

However, at least with respect to airlines, Azar et al. do include, as controls, factors such as (among others) changes in fuel costs and per-capita income. While these controls may mitigate the concerns raised by Rock and Rubinfeld and O’Brien and Waehrer, they would not have eliminated the effect of prices on the market shares used in the HHI, MHHI and MHHI Delta. As a result, spurious correlation may remain an issue.²⁹

27 See the discussion in O’Brien and Waehrer (at 31-32) of a paper by Kwon, *Executive Compensation under Common Ownership*, Department of Economics, University of Chicago (November 29, 2016).

28 See, for example, the discussion in Table 3 of Azar et al. (A).

29 This is most obviously a concern in the airline paper where the possible reverse causality between fares and the HHI remains unaddressed.

O'Brien and Waehrer also note that investors may choose to invest in successful companies and because of their success, those firms may be able to charge higher prices. In this case, the MHHI and MHHI Delta could be associated with higher prices but only because the firms themselves were particularly successful and attracted investors, not because of any anticompetitive ownership effects arising from the investors' stakes in the firms.

In the airline paper, Azar et al. do in fact account for the possibility of this "reverse causality." In the most straightforward approach, Azar et al. argue that "if common ownership causes higher prices, but higher prices don't cause common ownership [to increase], one would expect higher prices to follow increases in common ownership, and not higher common ownership to follow higher prices." The paper finds that MHHI Delta changes that follow the price change have no statistically significant effect on future prices while those that precede the price change have such an effect.

Still, Azar et al. note the possibility that "some investors are very well informed about route-level demand changes several months before the fact but cannot tell which airline serving the route will benefit more, therefore buy[ing] shares of all airlines with high market shares in precisely those routes..." If that were the case, the MHHI Deltas could increase as prices increase but the increase in the financial stakes would not have caused the increase.

To address this concern, the paper uses an "instrumental variable" approach to account for this possibility in the MHHI Delta that (if successful) would eliminate or greatly mitigate the question of reverse causality. In that effort, Azar et al. account for both the mergers in airline industry and the emergence from the Great Recession.³⁰ In doing so, Azar et al. continue to find a positive relationship between the MHHI Delta and air fares (estimating that common ownership increased air fares by 10-12 percent). However, the market shares used in the HHI component of the analysis could still create a spurious correlation with prices to the extent that both are correlated with other price-affecting variables and so bias the results.³¹

In the airline paper, Azar et al. also test a different relationship to address causality issues. Instead of assessing the relationship between the HHI and MHHI Delta on fares, the paper assesses the effect of the HHI and MHHI Delta on passenger volumes. The paper finds that increases in the MHHI Delta (and the HHI) lead to statistically significant reductions in passenger volumes. The obvious criticism here is that the market shares used in the HHI and MHHI are also affected by airline fares and so the results are biased.

VI. CONCLUSION

These two Azar et al. papers have created an obvious stir in the antitrust community. They have led to a rapid endorsement by respected antitrust practitioners of the papers' surprise findings and have already affected some agency investigations. Indeed, some of these practitioners have already proposed frameworks for addressing the ownership stakes of institutional investors, the most detailed being that of Posner et al.³² Perhaps it is not so surprising that those findings have also given rise to careful critiques of the airline and banking papers even though these papers have yet to be published in peer-reviewed journals.

There are some points worth emphasizing. First, the study of the competitive effects of common owners — institutional investors — has just begun. The results of the two papers are certainly intriguing but this is likely just the tip of the research iceberg. More effort to both revisit the banking and airline industries using other techniques and modeling approaches to address the robustness of these results, the channels of investor control or influence and the generality across markets should be conducted before concluding that antitrust enforcement policy needs to become proactive in addressing the potential for

30 Rock and Rubinfeld (at 12-13) criticize Azar et al. for not taking these confounding factors into account. It appears that the Rock and Rubinfeld paper assessed a somewhat earlier version of the airline industry paper.

31 Azar et al. (at 20-30) also use an instrument for the MHHI in its analysis of banking markets. However, that instrument also includes bank market shares, which raises the same kind of causality issues discussed in connection with the airline analysis in Azar et al. (A).

32 Rock and Rubinfeld (at 28-32) and Elhauge (at 1314-1316) offer more modest proposals (with a reaction to Elhauge by Baker (at 223-232) that considers the limitations and hurdles of developing an enforcement policy). The Posner et al. design of one possible set of guidelines highlights how complicated the task could be.

anticompetitive effects.³³ For that reason, I have not here discussed proposals to remedy these effects. Indeed, while the proposals focus generally on possible ownership limits that could be imposed on institutional investors, recall that the most recent Azar et al. airline paper finds that only the top two common owners “count.”

Second, while some observers have criticized the methodology of Azar et al., many of those criticisms were addressed in the latest version of the airline paper — perhaps not completely, but still quite thoroughly. And the finding that a higher MHHI Delta leads to higher airline fares persists. I would expect that the banking paper would also be revised to account for similar criticisms. This is not a criticism of the criticisms. The speed with which the so-far unpublished Azar et al. results have already affected antitrust enforcement demanded a (relatively) quick response and highlights the potential broad ramifications if the Azar et al. findings are robust across different methodologies and markets.

Third, O’Brien and Waehrer (for example) show that in theory, there is no reason to believe that the MHHI or MHHI Delta would always result in higher prices and that an increase in the MHHI can be positively related to prices with no change in the extent of common ownership. Baker and Woodbury express reservations as a result of the failure of the constructed MHHI to account for investments in complements by institutional stakeholders, which could mitigate or reverse any incentive to encourage price increases. While Azar et al. find such a relationship in spite of such concerns, the failure to account for those concerns again raises the question of spurious correlation.

While they may not have resolved all of the econometric or conceptual issues involved in estimating the price-MHHI relationship, the airline paper in particular has become more robust and certainly makes it difficult to dismiss the findings out of hand. More research will inform antitrust practitioners about both about the size and generality of the adverse effects of common ownership. As research progress is made on that front, then it would make sense to consider the appropriate policy prescription (assuming the progress finds a robust relationship between price and common ownership by institutional investors).

Finally, even if future research is consistent with the findings of Azar et al. and that research would serve as a basis for changing antitrust policy, that policy change should weigh the costs of taking action against institutional investors with respect to any capital market efficiencies resulting from those investments. For example, Baker identifies three possible sources of inefficiency if restrictions are imposed on institutional investors: effects on the cost of diversification by retail investors, on corporate governance and on liquidity concerns.³⁴ While Baker and Posner et al. offer insightful arguments as to why these concerns may be of less concern than one might think, Rock and Rubinfeld as well as O’Brien and Waehrer highlight the potential for common ownership restrictions to both increase the costs of diversification for retail investors who have purchased highly-diversified index funds and to reduce the ability of institutional investors to provide counsel to firm managers.³⁵

In sum, the findings of Azar et al. are certainly intriguing and have spawned a debate on the competitive significance of the actions of institutional investors. There should be little doubt that further research should be pursued by these and other researchers to validate (or not) the anticompetitive effect and the generality of that effect of shareholdings by institutional investors. If that effect is robust, it could justify significant changes in policy. But it would be premature and potentially very costly to do so without that further evidence.

33 For example, O’Brien and Waehrer (at 27-28) suggest an alternative, more comprehensive but transparent approach to modeling the price effects of common ownership that would directly account for changing cost and demand conditions as well as the control mechanism, all embedded in a model of competition.

34 One very preliminary study suggests another efficiency, that common ownership by institutional investors may facilitate the spread of innovation. Kostovetsky & Manconi, *Common Institutional Ownership and Diffusion of Innovation* (April 2017), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2896372.

35 Within its highly-detailed proposed antitrust guidelines for institutional investor holdings, the Posner et al. paper (at 26) would exempt index funds that committed to being purely passive investors (e.g., engaging only in “mirror voting”). Rock and Rubinfeld (at 2 and 27) also consider the adverse corporate governance effects of restrictions on the holdings of institutional investors. Others have come to a different conclusion. Baker notes (at 228) that if institutional investors are restricted to having a stake in only one firm, they will tend to invest more in that single firm and “with larger ownership stakes, each of the remaining investors would have a greater incentive than before to monitor firm management, so corporate governance would more likely improve overall...” In their proposal to prevent anticompetitive harm from the holdings of institutional investors, Posner et al. (at 37) echo that point.