

Paper Trail: Working Papers and Recent Scholarship

Editor's Note: Editor John Woodbury comments on a working paper that examines the effect institutional investors may have on competition downstream.

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—WILLIAM H. PAGE AND JOHN R. WOODBURY

Recent Papers

José Azar, Martin C. Schmalz & Isabel Tecu, *Anti-Competitive Effects of Common Ownership*, (Ross School of Business Working Paper 1235, Oct. 2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2427345

In this paper, José Azar, Martin C. Schmalz, and Isabel Tecu (Azar et al.) provide evidence on the competitive effects in downstream products markets resulting from the acquisition of financial interests by large diversified institutional investors upstream.¹ As is apparent in the references of the paper, there is a large finance literature on the role that institutional investors play in the management of those firms in which they have a financial interest, notwithstanding that these investments may be “passive” in the legal sense.² In principle, it may be possible for those investors to persuade rivals in a downstream market to soften competition with each other. If so, the investors (and their clients) would gain from the higher profits resulting from their financial interest in these firms.³ These effects, it is argued, may be especially pronounced in industries where institutional investors make investments in multiple firms within the industry (e.g., airlines).

Background

Before discussing Azar et al., it is instructive to first understand its theoretical forebearers. The framework for Azar et al.'s analysis is the theoretical model developed by Bresnahan and Salop and the later extension by O'Brien and Salop.⁴ Both papers show that partial ownership interests by one firm in a rival firm can generate more substantial anticompetitive outcomes than might be

¹ Azar and Tecu are colleagues of mine at Charles River Associates. Schmalz is an Assistant Professor of Finance at the University of Michigan's Stephen M. Ross School of Business.

² See, for example, the discussion in Azar et al., pp. 10–11.

³ In addition to considering the antitrust implications of the patterns of financial interests held by institutional investors, the paper also assesses the implications for evaluating frictions in corporate governance that might allow managers to deviate from maximizing the profits of the firm, concluding that they may not be as significant as indicated in the finance literature. Here I focus only on the antitrust implications of the paper's results.

⁴ Timothy F. Bresnahan & Steven C. Salop, *Quantifying the Competitive Effects of Production Joint Ventures*, 4 INT'L J. INDUS. ORG. 155 (1986); Daniel P. O'Brien & Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, 67 ANTITRUST L.J. 559 (2000).

indicated by the conventional Herfindahl-Hirschman Index (HHI) of concentration.⁵ This antitrust concern is reflected in Section 13 of the current Horizontal Merger Guidelines.⁶

To illustrate the effect with a simple example, suppose that firm A acquires a partial financial interest in rival firm B, entitling it to share in B's profits. Suppose as well that with the financial interest comes some measure of control over the management of firm B. To avoid being targeted for removal by A, the management of firm B might now account for the profits of firm A when maximizing its profits. In other words, firm B's management now has the objective of maximizing its own profits plus the profits of A, to the extent that A possesses control over B. As a result, B may price less aggressively against A, i.e., B may charge a price higher than would be the case if B maximized only its own profits.

Similarly, since A now possesses an interest in B, it will price less aggressively against B. Prior to A's acquisition of a financial interest in B, the price charged by A maximized firm A's profits. Any increase in price would cause A to lose sales to its rivals, including B, the lost profits of which would not be offset by the higher prices A would charge to those consumers remaining with A. But after A's acquisition of the financial interest in B, some of the profits lost from the reduced sales are "recovered" via A's share of the profits in B. Because ownership in B introduces this new revenue source for A, A has an incentive to raise its price when competing against B.

In this case, even if the HHI were unchanged by A's acquisition of the financial interest in rival B, post-acquisition prices would increase, other things equal. So, suppose the HHI was 2000 prior to A's acquisition of the financial interest in B, suggesting some degree of competition in the industry. After A's acquisition of the financial interest in B, the HHI remains unchanged, but the industry has become less competitive as A and B now have reduced incentives to compete against each other. It is in this sense that the HHI alone can overstate the actual degree of rivalry (to the extent that the HHI can be used as such an indicator). In response, O'Brien and Salop (building on Bresnahan and Salop) construct a modified HHI (MHHI) that takes into account partial ownership interests directly and varying levels of control or influence that the acquiring firm (i.e., the firm acquiring the financial interest in a rival) might have over the acquired firm and how that transforms the profit-maximizing calculus of the acquired firm.⁷

⁵ Of course, the HHI calculations are only the starting point for the competitive effects analysis.

⁶ U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines (2010), available at <http://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf>.

⁷ In particular, in the spirit of Azar et al. (equation (2), p.13), suppose institutional investor *i* acquires a financial interest in firm *j* and some resulting degree of control over firm *j*. Investor *i* earns its profits from investments in its *k*-firm portfolio (which depend on the profits of each firm *k*, all in the same downstream market as *j*) in addition to its share of the profits from *j*. For the acquired firm *j* and the investor *i* in *j*, the profit objective for *j* is:

$$\max_{x_j} \Pi_j = \pi_j + \sum_{(k \neq j)} \frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}} \pi_k$$

where β_{ik} is the profit share of investor *i* in all other firms *k*, γ_{ij} is the control parameter of acquiring firm *i* in acquired firm *j*, π_k are the profits earned by each firm *k* (other than *j*) in which the investor has a financial interest. Thus, firm *j* maximizes its standalone profits π_j and a linear combination of the profits earned by institutional investor *i* derived from the profits of those other *k* firms in which it has a financial interest.

Azar et al. note that "The weight that firm *j* puts on the profits of firm *k* in its objective function relative to its own profits is given by $\frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}}$." (p. 13.) As indicated below, some further intuitive clarification of this weight might prove useful to the non-technical reader.

Note as well that the weight attached to π_k depends in part on the magnitude of the control parameter γ_{ij} , i.e., the degree of control or "influence" that firm *i* has over firm *j*.

Relying on a Cournot model of (quantity) competition, O'Brien and Salop identify the MHHI as consisting of two components: the usual HHI and what O'Brien and Salop call the MHHI delta—the factor reflecting the extent of control or influence that investing firms possess over the acquired firm. Roughly speaking, there are two elements to the MHHI delta. First is the product of the weighted shares of each pair of firms commonly owned, summed over all such products. The higher is the product of those shares, the higher is the MHHI delta.⁸

The second component is the weight to be attached to each of those share cross-products.⁹ Roughly speaking, this weight is measured as the extent of cross-ownership by each of the acquired firm's investors in all other firms in the market relative to the extent of ownership of the acquired firm by the investor. The greater is the magnitude of cross-ownership relative to the within-firm ownership, the greater the weights and the higher the MHHI delta will be. If each of the acquiring firms' financial interests tends to be concentrated in a single or small subset of firms in the industry, the MHHI delta will be lower than otherwise because the extent of cross-ownership is relatively small, other things being equal.¹⁰

Most of the components of the MHHI delta are, in principle, available—market shares, the identity of the holder of the financial interest, and the magnitude of the financial interest. The measurability of the “control” parameter (γ_{ij}) is more difficult to pin down and typically requires difficult-to-confirm assumptions.

Detailed Summary of Azar et al.

The Azar et al. paper builds on this MHHI framework to consider the price effects of cross ownership in the airline industry.¹¹ However, unlike the examples above, the focus is not on whether one airline carrier has a financial interest in one or more rival carriers. Rather, it focuses on the price effects of cross ownership resulting from the stock holdings of large institutional investors in the airline industry. That is, institutional investors will have financial interests in multiple airlines operating on any particular route. One statistic that I found striking (but buried in the middle of the paper at p. 18) is that institutional investors account for nearly 80 percent of the airline carrier stock on the average route (an origin and destination, or O&D, pair).¹² The authors note as well that this pattern of significant financial interests in downstream rivals is common. For example, the same four institutional investors are among the top six shareholders in three of the largest banks (JP Morgan Chase, Bank of America, and Citigroup) and the leading five shareholders of CVS and Walgreens are identical (pp. 7–8).

⁸ This is similar to the calculation of the HHI delta from a merger as twice the product of the shares of the merging firms. Using the same notation as earlier (see *supra* note 7), the MHHI calculation is as follows:

$$MHHI = HHI + \sum_{k \neq j} S_j S_k \frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}},$$

where that last sum is the MHHI delta and S_j and S_k are the downstream shares of Firms j and k . See Azar et al., equation (7), p.14.

⁹ This weight is the same as that which weights the profits of firm k by firm j when j maximizes its profits. See *supra* notes 7 and 8.

¹⁰ I am drawing heavily from the O'Brien and Salop paper to explain the intuition behind these weights. See O'Brien & Salop, *supra* note 4, at 612. Azar et al. might consider offering a similar description to render the results more useful and intuitive to the non-economist practitioner.

¹¹ Azar et al. use the term “common ownership” rather than cross-ownership. I use cross-ownership instead, given the intuition behind the “weight” component of the MHHI delta just discussed.

¹² It appears that this share may include large non-institutional owners as well (defined as those holding greater than 5% of the shares outstanding) (p. 18).

Thus, a key motivation for the paper is whether holdings like these—particularly given their ubiquity—have anticompetitive effects notwithstanding the fact that these institutional investors are regarded as “passive” investors.¹³ If the holdings were truly silent (i.e., the investors had no control or influence over the acquired firm), there would be no MHHI delta effect.

But as the paper points out, these passive investors are not silent.¹⁴ As one example, Azar et al. cite an executive of an institutional investor (State Street Global Advisors) as stating that “the option of exercising our substantial voting rights in opposition to management provides us with sufficient leverage and ensures our views and client interests are given due consideration.” (pp. 8–9.) Based on this kind of anecdotal evidence and extensive references to the finance literature on corporate governance, the authors conclude that these investors may talk softly to management but carry a big stick. Azar et al. note that “the evidence suggests that frequent and active communication, explicitly about product market strategy, does take place between the largest investors and their portfolio firms.” (p. 12.)

This activism by institutional investors is the basis for assuming that they have some influence over the airline carriers in which they have acquired a financial interest, influence that may be used to soften downstream airline competition in particular. Disturbingly, perhaps, Azar et al. report that one former legal counsel to a large investor noted that engagements with corporate management can be used to “throw the switch from developing market share to instead exercise market power to get margins up.” (p. 10.)

Azar et al. assume that the influence by an institutional investor over the decisions of the carrier in which it has acquired a financial interest is proportional to the share of the carrier’s voting stock held by the investor.¹⁵ In that case, one can think of the manager of any particular carrier (say, American) maximizing American’s profits and the profits of the institutional investors in American. As noted above, the weight that the manager would place on profits of the institutional investor (earned via its share of profits in the other carriers in which it invests) would depend (very roughly speaking) on the extent of the investor’s influence on the decisions of American’s management (measured by the share of voting stock held by the investor), and the size of the investor’s financial interest (measured by the share of voting plus non-voting stock) in other carriers vs. its financial interest in and degree of influence over American.¹⁶

After collecting the data on the institutional ownership of the airline carriers and data on carrier passenger shares on O&D pairs (over 7,000 such pairs), Azar et al. first construct the MHHI delta for each O&D pair in each quarter Q1 2001–Q1 2013. Across routes, the average MHHI is about 7,000, while the average HHI is about 5200. The average MHHI delta in these city pairs is over 1,600. (See Table 1 in Azar et al. for the market-level statistics.) This would seem to suggest that ignoring the effects of cross-ownership by institutional investors can create substantial

¹³ Azar et al. describe what they see as the current legal definition of a “passive” investor, pp. 10–11.

¹⁴ This discussion, contained on pp. 7–12, is worth reading in and of itself.

¹⁵ This is one of the control scenarios considered by Salop and O’Brien, *supra* note 4, at 583.

¹⁶ See *supra* note 7. In passing, let me note that while mentioning investor “influence,” O’Brien and Salop most often focus on some form of direct control exercised by the acquiring firm. That control may be a result of being a larger stockholder when other shareholders have very small shares or result from “super-majority” decisions that can be blocked by a minority shareholder. Exercising “influence” over carrier management is a more vague and less “testable” concept. As I note below, it would be useful if at some point the mechanism by which this “influence” can translate into anticompetitive outcomes could be modeled explicitly, although doing so is likely far beyond the scope of this particular paper even if at all do-able. This is particularly true with respect to institutional investors, many of whom have relatively small financial stakes in the carrier. See, in particular, Azar et al., Appendix D.

“false negatives” in using the HHI alone to gauge the likelihood of adverse competitive effects of (say) a merger. Put differently, suppose initially the carriers were separately owned (i.e., no cross ownership) and the average HHI was 5,200—a highly concentrated market under the Horizontal Merger Guidelines. If institutional investors then adopted the current average pattern of ownership, and the Guidelines thresholds were applicable, the MHHI delta would be about 1,600, well above the 200 point increase in the HHI that would result in the agencies presuming that the increase would be “likely to enhance market power.” (Section 5.3)

The calculation of the MHHI and the MHHI delta is mechanical, given the requisite data and the assumption of proportional control. The more direct test of the competitive impact of this cross ownership is the MHHI delta effect on prices. To that end, Azar et al. regress the log of the average fare of each carrier in each quarter on the HHI, the MHHI delta, and a number of control (right-hand side) variables. In an alternative specification, the log of the average fare on the city-pair is used as the dependent (left-hand side) variable. The approach taken is similar to other price-HHI studies in the airline industry.¹⁷

In comparing the effects of the HHI vs. the MHHI delta on the average fare at the carrier level, using the basic ordinary least squares (OLS) specification with no additional controls (other than some fixed effects), Azar et al. use the following thought experiment. If the MHHI delta were to increase from 0 (no cross ownership) to 10,000, then the predicted fare increase would be 22 percent, about the same effect for an HHI increasing from 0 to 10,000. (p. 24.)¹⁸ In the specification with full controls, the effects are somewhat smaller but still substantial. Using the same thought experiment as before, the predicted fare increase associated with an increase in the MHHI delta from 0 to 10,000 is 13 percent. (p. 24.) However, using the average fare across carriers in a route as the variable of interest instead of the fare of the specific carrier, the effect of the MHHI delta using the same thought experiment is a fare increase of 5 percent. (p. 25.)

These results seem generally robust to specification changes. Alternative specifications include limiting the MHHI delta calculations to only the larger investors, running separate regressions for each quarter, including different control variables, running a quantity rather than price version of the analysis, and using instrumental variables to account for possible endogeneity issues. In particular, after accounting for possible endogeneity issues,¹⁹ Azar et al. conclude that “ticket prices are at least 10% higher because of common ownership alone, compared to a counterfactual world in which firms are separately owned [i.e., no cross ownership].” (p. 30.)

Azar et al. argue that based on the paper’s results, “empirical measures of market concentration should take [institutional investor] ownership into account. This can be accomplished by calculating MHHIs” (pp. 35–36).²⁰ If the agencies were to follow this prescription, the way mergers are evaluated would undergo significant changes. However, Azar et al. wisely (in my view) note that further study is required to determine whether the MHHI delta effect in airlines is present in

¹⁷ See the references cited in Azar et al., including, notably, Severin Borenstein, *Airline Mergers, Airport Dominance, and Market Power*, 80 AM. ECON. REV. (PAPERS AND PROCEEDINGS) 400 (1990), and Jan K. Brueckner, Darin Lee & Ethan S. Singer, *Airline Competition and Domestic US Airfares: A Comprehensive Reappraisal*, 2 ECON. TRANSP. 1 (2013).

¹⁸ While there is nothing wrong in principle with this experiment, it is a stumbling block for a reader. After all, most mergers involve something less than a HHI going from zero to 10,000. A more revealing approach would be to begin with some level of the MHHI and compare the fare effect of an increase in the HHI component of (say) 500 with an increase in the MHHI delta by 500.

¹⁹ That is, it is possible that increases in the ownership shares of the institutional investors result from fare increases rather than fare increases resulting from increases in the ownership shares.

²⁰ Again, even if the MHHI replaced the HHI as the gauge of market rivalry, this would only be the start of the competitive analysis.

other industries as well before implementing substantial changes to merger policy specifically and antitrust policy generally.

Final Comments

I believe that Azar et. al. have uncovered an empirical regularity worth pursuing further, one that may raise substantial questions regarding the competitive effects of the “passive” financial interests of institutional investors. This is all the more significant given the ubiquity of institutional investments. The paper certainly raises the issue of whether communications between institutional investors and the firms in which they have a financial interest have crossed an antitrust line. Nonetheless, I remain cautious about the interpretation and policy implications of the paper’s results.

For example, the premise of the MHHI delta is that the firm managers will maximize their own profits and the profits earned by (in this case) the institutional investors across all of their financial interests in the airline industry. But the airlines component of the portfolios of institutional investors may be quite small. Suppose that institutional investors also have interests in complementary inputs (such as airline-related services—e.g., maintenance, baggage, and food services—and online travel agencies). Then increases in airline fares are likely to result in reduced demands for these complementary inputs and so reduce the profits of the institutional investors. To me that would suggest that *ex ante*, I would likely find little in the way of significant results on an MHHI delta focused solely on the airline interests. Of course, the results of the paper show my prediction to be inaccurate. But given the broader set of investor interests, the possibility of spurious correlation remains.²¹ In any event, it would be useful to account for the investor’s other share holdings or for Azar et al. to explain why such an accounting is unnecessary, even though the airline shareholdings may account for a relatively small share of the institutional investor portfolio.²²

In a somewhat related vein, the paper does not address constraints on the management’s ability to maximize something other than its own standalone profits. As noted earlier, on average, nearly 80 percent of airline stock is held by institutional investors. It is possible that the remaining stockholdings are concentrated in a single airline. Suppose that absent the influence of institutional investors, the standalone profits of the carrier would be maximized by behaving as a maverick. Instead, with such influence, the carrier cedes some profits to other carriers by not being a maverick. As a result, the non-institutional shareholders may be harmed, leaving management possibly exposed to shareholder suits for violation of fiduciary obligations.²³ Still, that might mean only that the estimated MHHI delta effect is lower than it might otherwise be and so is not necessarily inconsistent with the results of Azar et al. And, of course, the likelihood of winning such a suit may be small.

I would also have predicted that the shares of any single institutional investor were sometimes too small to expect that those shares would lead the managers of the airline carriers to pay attention to these shareholders. Put differently, the amount of influence exerted by at least some of these stockholders would seem to be non-existent even if “influential” shareholders were limited to the top 10.²⁴ For example, for Delta, Wellington Management’s share of Delta’s stock was about

²¹ Perhaps due to limited imagination, I have not identified candidates for an omitted variable that might generate a spurious correlation.

²² See, for example, the discussion of the BGI portfolio in Azar et al. at p. 26.

²³ See the discussion in O’Brien & Salop, *supra* note 4, at 580–81.

²⁴ I note that Azar et al. suggest (based on other results) that “the control rights of the largest five to ten shareholders are most relevant for the implementation of the anti-competitive effects of common ownership regarding product pricing.” (p. 34.)

6.3 percent while that of Winslow Capital Management was about 1.6 percent. (Appendix D.) While the Delta airline manager might have an incentive to pay attention to the shareholdings of Wellington, why be concerned about the views of Winslow Capital?

While the paper's robust statistical results are impressive, the model estimated by Azar et al. is effectively a reduced-form model. The mechanism by which the financial interest of an institutional investor in an airline carrier translates into some measure of control or influence of the carrier is not modeled. Given the relatively small shares of many of the institutional investors in airlines in particular, a better understanding of how relatively small shares translate into sizeable influence would help push the paper's results closer to the center of the table of merger policy discussion.²⁵

To be sure, the assumption of proportional control made by Azar et al. seems to "work" in terms of empirical results. But before developing a merger policy that accounts for the portfolio composition of institutional investors, it would be very helpful to better understand both conceptually and empirically how that financial interest translates into control. That is, a structural model may prove more useful than a reduced form. That analysis might be able to highlight issues in the translation of ownership to control that suggest that the MHHI delta is not as predictive as one might think.²⁶ Alternatively, it may highlight why relatively small financial interests by institutional investors can lead to influence over the acquired firm.

One reason why even the smaller institutional investors "count" in terms of influence or control could be that if these smaller investors were to reduce their ownership stake in any particular airline, that might be viewed as a signal that at least some institutional investors have lost confidence in the airline management, leading to other stock sales. That may be one approach to considering a structural model of how small financial shares can result in significant influence by the investor, although it would not necessarily suggest that influence proportional to stockholdings is the appropriate control parameter. It may suggest instead that the degree of influence is more than proportional to those holdings but that may also suggest that the results of Azar et al. understate the effect of institutional ownership on fares.²⁷ I am not suggesting that this paper should develop that structural model but rather this is one possible, albeit complex, avenue for future research.

The empirical analysis includes the presence of Southwest as a separate route-specific control, one that consistently has a statistically-significant negative effect on fares. While this may be a standard outcome for these kinds of analyses, one wonders how this is consistent with the paper's conclusion that cross ownership by institutional investors results reduces airline competition. The top 10 institutional investors account for 46 percent of Southwest's voting shares, higher than the 39 percent share in Delta. (See Appendix D.) So, why haven't institutional investors in

²⁵ Azar et al. observe (at n.7) that their "results may be less surprising to that part of the literature that has documented the power of relatively small, 'activist' institutional shareholders to implement changes in executive compensation and turnover and other corporate decisions." While Azar et al. do not explicitly cite papers in this literature thread, but a discussion of that literature would have been helpful.

²⁶ The vagueness of this control mechanism is suggested by Azar et al. in an earlier version of this paper (on file with author) but not carried through to this version. In that version, Azar et al. note that "[i]f shareholders *find a way to implement the anti-competitive incentives* implied by common ownership and measured by the MHHI delta, we should see a price impact . . ." (emphasis added). Of course, it goes without saying that any enforcement policy would have to weigh the benefits from the policy against the costs, which would likely be in the form of reduced efficiency in the capital markets.

²⁷ Azar et al. observe that the estimated effect of the MHHI delta may be biased towards zero "in part because we work under the assumption that control is strictly proportional to vote shares To the extent that de facto control differs . . . we will obtain attenuated estimates [of the MHHI delta effect]." (p. 24.)

Southwest tempered Southwest's rivalry with other airlines? Of course, it is possible that the indicator variable for Southwest simply identifies Southwest as a lower quality (hence, lower price) carrier. But that would suggest that the Azar et al. analysis might consider more quality controls, such as on-time performance, lost baggage rates, etc. to ensure that the MHHI delta is not capturing differential quality effects.

While the paper suggests that it would be premature (i.e., without further research) to overhaul the agencies' current merger and antitrust practices, one might be surprised with the lack of discussion of the efficiency losses in the event of false positives. Presumably, the engagements of institutional investors in prodding the downstream firms to reduce costs, explore alternative markets, and engage in new product development can serve both consumers and the competitive process. In other words, these engagements perfect corporate governance by better aligning corporate management with shareholder interests.²⁸ Along these lines, Azar et al. point to a paper (co-authored by Azar), describing results "consistent with increased efficiency due to common ownership . . ." (See n. 6). Further, one control variable included in the econometric analyses is the overall fraction of shares held by institutional investors. That variable is consistently negative, i.e., the greater the ownership interests of institutional investors, the lower the airfares. This too would be consistent with an efficiency story. It would have been helpful if the authors had considered the potential efficiency consequences of using (e.g.) an MHHI screen rather than the HHI screen.²⁹

I noted earlier that Azar et al. might consider looking at the price effects of increases in the HHI v. MHHI delta by showing how, beginning from a given MHHI, the price effects of specific increases in the HHI (e.g., a delta of 500) differ from equivalent increases in the MHHI delta, and how those more modest changes affect prices. A change of 10,000 in the HHI and MHHI delta does not convey how more realistic changes in the two would affect average fares.

Relatedly, it would have been interesting to see what the estimated fare effects would be if the paper had used just the MHHI rather than the HHI and MHHI delta. For purposes of the paper, of course, it is the decomposition of the MHHI into its HHI and MHHI delta components that matters. But one would like to think that using just the MHHI would generate similar results.³⁰

Finally, as suggested above, the role of some of the "control" variables is unclear. For example, Azar et al. include the top 5 holdings as a percentage of total institutional investments and the concentration of institutional investors' ownership shares in the carriers in an O&D pair. It is not apparent why these variables should be expected to have an effect over and above the MHHI

²⁸ Of course, the paper suggests that this better alignment may come at the cost of higher downstream prices for consumers. As Azar et al note that "the benefits of diversification, good governance, and competitive product markets can therefore not be studied in isolation." (p.5.)

²⁹ Azar et al. allude to another policy implication in stating that "only shareholders with undiversified portfolios have an incentive" to "push their firms to aggressively compete." (p. 4.)

In an earlier version of the paper, Azar et al. more directly suggest a possible policy response of restricting institutional investment to a single downstream firm in a market. (To be complete, the paper notes that it is unclear whether such a policy would increase net welfare, although whether the reference is to total or consumer welfare is unspecified.) That would permit the efficiencies of institutional investment to be realized for the firm in question and eliminate the anticompetitive potential associated with investments in multiple rivals within a market. Of course, whether the single-firm restriction should instead be an n-firm restriction depends on the efficiencies that the investor brings to the table. Investing in one firm in a market may enable the institutional investor to more easily (i.e., at lower marginal cost) identify efficiency-enhancing possibilities in other firms in the same market, offsetting any incremental anticompetitive risk (assuming the results of Azar et al. prove to be widely robust across different markets).

³⁰ Using the MHHI alone assumes that the price effects of the HHI and the MHHI delta are the same. I don't believe that Azar et al. tested whether the effects are statistically different, although Azar et al. report that the HHI and MHHI delta effects are similar.

delta, or more generally, why they are included as controls.

Expositional issues aside, my most significant reservations remain the failure to account for all of the holdings (or at least the complementary-input holdings) of the institutional investors, an omission that raises the possibility of spurious correlation, and the omission of any real efficiency discussion. At worst, Azar et al. have uncovered an empirical regularity that is worth pursuing, one with potentially significant ramifications for merger policy specifically and antitrust generally. For these reasons, the paper is well worth the read. Whether that regularity should lead to broader competitive concerns and significant policy changes requires more research and a careful weighing of the efficiency losses that could be associated with such policy changes. But Azar et al. is clearly an interesting start to that process. ●

—JRW