

# Paper Trail: Working Papers and Recent Scholarship

*Editor's Note: Editor John Woodbury discusses a paper describing additional evidence that the multi-firm holdings of institutional investors have reduced competition, this time among banks.*

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—WILLIAM H. PAGE AND JOHN R. WOODBURY

## Recent Papers

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José Azar, Sahil Raina & Martin C. Schmalz, **Ultimate Ownership and Bank Competition (Mar. 16, 2016)** (Azar et al. 2016), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2710252](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2710252)

In a recent *Paper Trail*,<sup>1</sup> I discussed a study providing evidence that increased concentration among institutional investors in the airline industry resulted in significant fare increases and output reductions.<sup>2</sup> That paper began by noting that many of the same large institutional investors have holdings in multiple airlines. This raises the possibility that these investors may explicitly encourage the rival airlines to soften competition with each other. Alternatively, those investment links may result in management's unilaterally accounting for the returns to these investors in its profit-maximization decisions—that is, the returns to these investors become part of management's profit calculus, returns that also depend on the profits of the rival airlines. To measure the extent and ultimately the effect of these multiple-airline investment stakes on prices, the paper relied on the Modified Herfindahl-Hirschman Index (MHHI) of concentration. This metric includes as components the conventional Herfindahl-Hirschman Index (i.e., concentration on airline routes measured by airline shares) and an additional component reflecting the airline ownership stakes of the leading institutional investors.<sup>3</sup>

My discussion noted the paper's conclusion that the effect of accounting for institutional stake holders resulted in fares at least 10 percent higher than if institutional investors had no such investment stakes in the airlines.<sup>4</sup> It appears that this paper has already had an enforcement impact. In its ongoing investigation of the airline industry, the Justice Department is apparently assessing the extent to which communications between the airlines and these investors fostered or facilitated fare or capacity collusion.<sup>5</sup>

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<sup>1</sup> *Paper Trail: Working Papers and Recent Scholarship*, ANTITRUST SOURCE (Dec. 2014) [hereinafter *Paper Trail 2014*], [http://www.americanbar.org/content/dam/aba/publishing/antitrust\\_source/dec14\\_paper\\_trail\\_12\\_16f.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/dec14_paper_trail_12_16f.authcheckdam.pdf).

<sup>2</sup> José Azar, Martin C. Schmalz & Isabel Tecu, *Anticompetitive Effects of Common Ownership* (Ross School of Business Working Paper 1235, Apr. 21, 2015) [hereinafter Azar et al. 2015], [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2427345](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2427345). I discussed an earlier version of this paper. See *supra* note 1.

<sup>3</sup> See *Paper Trail 2014*, *supra* note 1, at 2–3; Daniel P. O'Brien & Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, 67 ANTITRUST L.J. 559 (2000).

<sup>4</sup> *Paper Trail 2014*, *supra* note 1, at 5.

<sup>5</sup> David McLaughlin & Mary Schlangenhein, *U.S. Looks at Airline Investors for Evidence of Fare Collusion*, BLOOMBERG.COM (Sept. 22, 2015), <http://www.bloomberg.com/news/articles/2015-09-22/do-airfares-rise-when-carriers-have-same-investors-u-s-asks>.

Among other issues, my discussion of the paper suggested caution in adopting general antitrust remedies addressing the extent of institutional ownership within U.S. markets until further research confirms the robustness of this effect.<sup>6</sup> In that vein, a more recent paper written by two of the authors of the airline paper—José Azar (a colleague of the reviewer's at Charles River Associates) and Martin Schmalz (Ross School of Business, University of Michigan)—along with Sahil Raina (Ross School of Business, University of Michigan) has extended the original analysis to the common institutional investor ownership of banks.

The authors note that (as with airlines) the stock ownership of banks by institutional investors is common and that these investors have stakes in multiple rival banks. For example, four of the same institutional investors (Vanguard, State Street, Fidelity, and BlackRock) have significant stakes in some of the largest banks in the United States: JP Morgan Chase, Bank of America, Citigroup, and Wells Fargo.<sup>7</sup> As with the airline industry analysis, these common ownership stakes raise the possibility that the investors use (explicitly or implicitly) their ownership clout to encourage or suggest that competition for bank deposits should be softened.<sup>8</sup>

And as with airlines—either via encouragement by institutional investors or via unilateral action by the bank managers—the bank managers in theory could account for the effect of the bank's actions not only on the bank's profits but also on the profits of the rival banks held by the investors. And, in that way, competition among banks for deposits could be reduced.

But the authors note an additional twist: “[M]any banks have asset management divisions that are shareholders of competitor banks. As a consequence, banking is an industry in which an effective concentration measure has to jointly take into account common ownership [by institutional investors] and cross ownership [by the banks themselves].”<sup>9</sup>

On that front, the authors extend the MHHI to account for these additional cross-ownership links to form what the authors refer to as the Generalized Herfindahl-Hirschman Index (GHHI) of concentration. As with the MHHI, the authors assume that

firms primarily focus on the economic incentives of those shareholders with the most control rights in the firm. The outcome is that the firm will put weight not only on its own profits but also on the profits of its competitors—to the extent that its most powerful shareholders also have stakes in those competitors.<sup>10</sup>

As shown in the paper's Figure VI (A) and reproduced below, the gap between the standard HHI and the GHHI is substantial and has been increasing at the county level (the geographic unit of observation for the statistical analysis).<sup>11</sup> Both indices were relatively flat until around 2007, after which the HHI remained relatively flat while the GHHI began rising substantially through 2013. The

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<sup>6</sup> Paper Trail 2014, *supra* note 1, at 9.

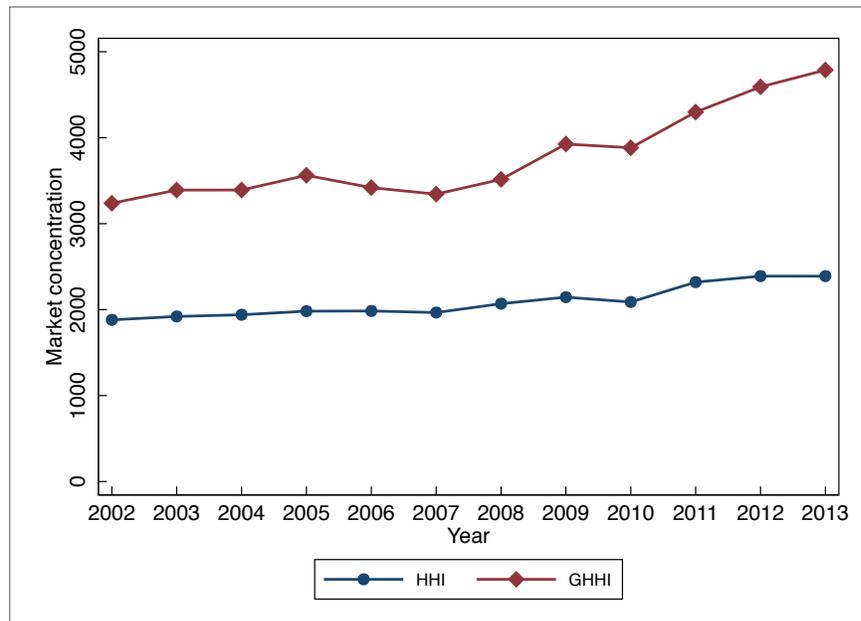
<sup>7</sup> Azar et al. 2016, Table I at 46.

<sup>8</sup> *Id.* at 4–5. A much more extensive and informative discussion of the “activism” by institutional investors can be found in the original airline paper. See Azar et al. 2015, *supra* note 2, at 32–36.

<sup>9</sup> Azar et al. 2016, at 2.

<sup>10</sup> *Id.* at 13. Having said that, for most of the approximately 3,000 counties in the paper's sample (about 80%), the difference between the MHHI and the GHHI is less than 100 points (where both indices are measured over the HHI range of 0 to 10,000). For 231 counties, the difference is more than 200 points. Azar et al. 2016, at 2–3. It is puzzling why the authors did not provide examples of the extent of the cross-ownership links among banks themselves, as they did with institutional investors. That may be, as just noted, that there is often little difference between the GHHI and MHHI, i.e., that the institutional investor links are typically far more important than the bank cross-ownership links.

<sup>11</sup> The figure is extracted from Azar et al. 2016, Figure VI (A) titled “County-level bank concentration,” at 67.



Source: Azar et al. (2016)  
Figure VI (A), County-level  
bank concentration

mean of the GHHI over the entire period is about 1,400 points higher than the mean HHI, and for 2013, the gap appears to be about 2,500 points.<sup>12</sup>

If one were to use the HHI itself as a structural indicator of whether banking competition has become less significant, one might reach the conclusion that (other things equal) it has not. The GHHI, however, tells a far different story of seemingly and significantly reduced competition. As Figure VI (A) might suggest, because there appears to be little correlation between the HHI and GHHI, the authors point out that use of the HHI instead of the GHHI to determine the pricing effects of banking concentration could lead to a conclusion of little or no effect of concentration on prices. That conclusion could be wrong because the analysis would have failed to account for the common- and cross-ownership links across the banks by institutional investors and the banks themselves.<sup>13</sup>

Having constructed the GHHI using detailed data from a variety of sources, the authors then consider the effect of the GHHI on money market and interest-bearing checking account maintenance fees, account balance thresholds (below which the fee is imposed), and interest rates on CDs, money market funds, and interest-bearing checking accounts. In the “baseline” regressions, the standard HHI rarely has a significant effect on these outcome variables. This is not a surprise, given how stable the HHI series is over time (as shown in the figure above). By contrast, the GHHI is almost always highly significant, suggesting that the GHHI is a much more powerful metric for gauging competition than the HHI.<sup>14</sup>

<sup>12</sup> Azar et al. 2016, Table II at 47 and Figure VI (A) at 67. The authors note (at 3) that this gap “compares to regulatory thresholds for merger review of 200 HHI points.” But this comparison seems to suggest that the right benchmark is no common or cross ownership. In a merger context, one would be focused on the change in the GHHI, not its level, and comparing that to the 200-point threshold. However, it is not even clear that after accounting for the common- and cross-ownership links, the threshold should be the same as that for the HHI. Putting aside the 200 point threshold, the more important point is that the gap between the GHHI and HHI certainly could suggest a far less competitive market than one might have thought considering only conventional measures of concentration.

<sup>13</sup> *Id.* at 12.

<sup>14</sup> It would have been interesting to consider whether the MHHI would have performed as well, given the similarity between the two indices and given the reduced data requirements for the MHHI alone. *See supra* note 10.

But the authors note that it is possible that “investors predict banks’ profit margins, buy more stock in those banks, and thus generate the link between the GHHI and prices [of interest].”<sup>15</sup> Using an instrumental variable technique, the paper attempts to account for this possibility of reverse causality. The baseline results remain robust. The HHI is rarely statistically significant while the GHHI is almost always highly significant.

Given the statistical strength of the GHHI effect, a key question is how empirically important the GHHI effect is. To some extent, this depends on the question being asked. The paper reports that for interest-bearing checking accounts, “a one-standard deviation increase [about 1500 points] in the GHHI due to changes in common ownership leads to an increase of \$1.33 in fees (an 11% increase) and an increase of \$719 in thresholds (a 16.8% increase).”<sup>16</sup> Putting this in perspective, “The effect of a one-standard deviation increase in the GHHI is comparable to 20% of the growth in fees [between 2003 and 2013] and 17% of the growth in thresholds for interest-bearing accounts in that period.”<sup>17</sup> The paper found similar large GHHI effects for money market account fees and thresholds.<sup>18</sup>

As an alternative gauge, suppose one were reviewing a merger between two banks. I used the data provided in the paper and the results in Table IV to assess the effect of a 500-point increase in the GHHI (about a 15% increase over the sample mean of 3,250) on maintenance fees and thresholds.<sup>19</sup> That is, I assume there is a banking merger that generates that increase in the GHHI.

Interpreting the results causally, the 500-point GHHI increase would generate an increase of \$0.11 in the monthly money market fees and about \$0.45 in the monthly checking account fees. As a percentage of the mean fees in the sample, that is equivalent to a 1% increase and a 4% increase in the money market fees and checking account fees, respectively.

There is a larger impact on the account thresholds. The increase in money market thresholds from the 500-point GHHI increase would be about \$166 (or an increase of about 6% above the mean threshold) and about \$243 for checking account thresholds (also an increase of about 6% above the mean threshold). On one hand, the direct competitive harm to consumers is more difficult to isolate, because many consumers likely would be below the thresholds in any event.<sup>20</sup> On the other hand, it is reasonable to infer that an important dimension of competition by banks for deposits is rendered less significant in an empirically important way by such an increase in the GHHI.

But there is another dimension to the analysis that may be more significant. Looking at Figure VI (A) above, between 2007 and 2013, the GHHI appears to have increased by about 1,600 points (or more).<sup>21</sup> Based on the results of the instrumented regressions, that would suggest an accom-

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<sup>15</sup> Azar et al. 2016, at 20.

<sup>16</sup> *Id.* at 24. Note that in the model the effect of a change in the GHHI on the various outcome variables is linear, i.e., independent of the level of the GHHI. It is possible that a given change in the GHHI has a larger (or smaller) impact in more concentrated markets than in markets more removed from competitive concerns.

<sup>17</sup> *Id.* at 24–25.

<sup>18</sup> *Id.* at 24.

<sup>19</sup> *Id.* at 51–53. Given some data complexities in constructing the interest rate variables, the price effects of GHHI changes on interest rates are more difficult to calculate. *See* Azar et al. 2016, at 9–10.

<sup>20</sup> However, the thresholds, the maintenance fees, and the interest rates are likely simultaneously determined, something not accounted for in the paper.

<sup>21</sup> A caveat here is that these calculations are based on the “raw” GHHI data, not the instrumented GHHI. However, the authors note that instrument and the GHHI are very highly correlated. Azar et al. 2016, at 23.

panying increase in the monthly money market and checking account fees of \$0.34 and \$1.44, respectively. While the 2007 mean levels of these variables are not included in the paper, these changes imply that the money market and checking account fees as of 2013 are, respectively, 3.5% and 12% higher than the overall sample means. The account balance thresholds for both checking accounts and money market accounts are also higher in 2013—about 18% higher than the overall sample means.

The results suggest that increases in the ownership links of institutional investors and banks have had (judged by these results) a significant adverse secular effect on bank competition (less so for fees than for thresholds).

The two previous examples—a bank merger and evaluating the secular trend in the banking GHHI—are relatively easy to assess, given the focus on a data-rich banking industry. Suppose, however, that either two institutional investors chose to merge or an institutional investor chose to significantly increase its shareholdings generally. In both cases, a competitive analysis taking into account the factors discussed above would be far more extensive than current conventional merger analysis. In both cases, any market in which the institutional investors had shareholdings would have to be assessed in combination with all other institutional investors to estimate the competitive impact of those changes. One could imagine that this would be a difficult exercise in that it requires data not only on the institutional investors but also the downstream firms in which they invest, including the various markets in which each of those downstream firms operates. For each of those markets, a GHHI would need to be calculated, and that may require information from those downstream firms even though they are not direct parties to the merger or the stock acquisition.<sup>22</sup>

Of course, all of this assumes that the antitrust agencies would accept the use of the GHHI (or MHHI) in merger enforcement specifically and antitrust enforcement generally—and that it would make sense to do so. In a thoughtful consideration of antitrust enforcement in light of the airline and banking findings, Jonathan Baker points out the limitations and hurdles of incorporating institutional investor relationships into antitrust policy.<sup>23</sup> For example (and among other issues), suppose that in some specific matter, one or more institutional investors has stakes not only in the ultimate downstream firms of concern but also in some of the input suppliers to those firms. If the analysis concludes that heightened downstream market power would reduce the demand for the input suppliers, the institutional investor may be worse off if its share of the increased profits of the ultimate downstream firm does not at least offset the loss in profits for the upstream input suppliers to that firm.<sup>24</sup>

In addition, I noted in my discussion of the airline industry results that further research is necessary (although the analysis of the banking industry is one important effort in that regard) before the GHHI (or MHHI) becomes a pillar of antitrust enforcement. Baker similarly notes that “the empirical economic literature relating overlapping financial investor ownership to higher prices is

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<sup>22</sup> While it is not unusual for the agencies to request information from rivals of the merged firm, the scope of such a request could be much broader if the GHHI were used as a gauge of the merger’s effect on competition. Of course, it is possible that the agencies could exempt small shareholdings in particular markets.

<sup>23</sup> Jonathan Baker, *Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhaug*, 129 HARV. L. REV. F. 223 (2016), <http://harvardlawreview.org/2016/03/overlapping-financial-investor-ownership-market-power-and-antitrust-enforcement-my-qualified-agreement-with-professor-elhaug/>.

<sup>24</sup> *Id.* at 225 & n.65; see also Paper Trail 2014, *supra* note 1, at 6. Note that the profit-maximization problem facing a firm’s managers becomes far more complex if the manager must account not only for institutional investor stakes in the firm’s rival but also in its input suppliers.

in its infancy.”<sup>25</sup> Azar et al. also urge the antitrust agencies to “allocate considerable resources to understanding the role of institutional investors in product pricing and capacity decisions.”<sup>26</sup> In addition, Azar et al. observe that “much care would have to be taken to appropriately weigh the benefits and costs of the current structure of the asset management industry.”<sup>27</sup>

Having emphasized the need for further study, antitrust practitioners nonetheless may well (and perhaps should) experience some unease as a result of these two papers. In both cases, the statistical analyses are robust in suggesting that antitrust policy may have overlooked a significant analytic component that has reduced competition and so harmed consumers.<sup>28</sup> ●

—JRW

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<sup>25</sup> Baker, *supra* note 23, at 231.

<sup>26</sup> Azar et al. 2016, at 34.

<sup>27</sup> *Id.* at 35. Interestingly, Baker cogently addresses possible claims of adverse capital market effects that might flow from the expanded antitrust review, such as impaired corporate governance and increased costs of portfolio diversification, and finds them unpersuasive. Baker, *supra* note 23, at 227–31.

<sup>28</sup> I should note that while I have focused on the antitrust implications of the paper, the paper itself suggests other ramifications flowing from the antitrust analyses, such as increasing income inequality and crime. These and other broader issues are discussed in greater detail in Einer Elhauge, *Horizontal Shareholding*, 129 HARV. L. REV. 1267, 1278–1301 (2016), <http://harvardlawreview.org/2016/03/horizontal-shareholding/>, and Baker, *supra* note 23, at 212–23. See also my discussion of Elhauge, *supra*, in *Paper Trail: Working Papers and Recent Scholarship*, ANTITRUST SOURCE (Oct. 2015), [http://www.americanbar.org/content/dam/aba/publishing/antitrust\\_source/oct15\\_paper\\_trail\\_10\\_19f.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/oct15_paper_trail_10_19f.authcheckdam.pdf).