I. Introduction

In 1976, the world’s first index mutual fund was created by Vanguard founder Jack Bogle. This new type of fund was intended to serve as a low-cost investment opportunity that would produce “average” returns and a diversified portfolio. Forty-two years later, total assets of passive funds are now approaching $6.7 trillion. Since the financial crisis in 2008, an estimated $700 billion of U.S. and international equity has been flowing into passive funds annually. Accordingly, it is clear that consumers are opting for the inexpensive diversification passive indexes can offer while adhering to a set investor benchmark. The shift in allocation of equities from active to passive investing has led many academics and professionals to study the potential side effects of index investing.

One topic that has warranted attention in recent years is “common ownership” – whereby shareholders own significant stakes in multiple firms within a specific industry. Concern has been raised as a result of recent trends towards index investing that could have the potential to cause firms within a particular industry to act in anti-competitive ways.

There are two basic models of competition, Cournot and Bertrand, used when discussing the negative effects on traditional competition. The Cournot model assumes firms produce a homogenous product with fixed prices and simultaneously choose a set quantity to produce. The Bertrand model follows the same assumptions, except firms set prices and seek to satisfy all market demands. According to both models, firms compete against each other to reach an equilibrium price/quantity they can sustain. A monopoly occurs when a firm dominates a market, allowing it to price its products above the competitive equilibrium. Since the monopoly has no competitors to undercut it, it is able to profit at the expense of consumers. This concept has manifested itself various times in U.S. history with the most famous monopolies being the Standard Oil Company, United States Steel Corporation, and AT&T. The U.S. government has generally taken a position against trusts, passing legislation throughout the years such as the Sherman Antitrust Act of 1890, the Clayton Antitrust Act of 1914, and the Federal Trade Commission Act of 1914. It is now widely recognized that anticompetitive markets are detrimental to consumers’ interests and, consequently, the government has actively monitored the economy to stop the development of monopolies and trusts.
The government’s antitrust regulatory measures have almost exclusively focused on mergers and acquisitions over the last decades. However, recent trends in index investing have driven studies on common ownership that may suggest an entirely new source of anticompetitive effects for government consideration. Those studies are preliminary and many of their results have been contested. Yet if common ownership is found to be detrimental to consumers, the government will be tasked with finding a solution for a problem that is growing by hundreds of billions of dollars annually. This paper does not attempt to offer analysis of the common ownership issue but instead describes the academic literature on common ownership and discusses potential impacts going forward with consideration to potential policy implications.

II. Seminal Papers

Nearly two decades ago, Salop and O’Brien (2000) first developed a theory about “partial ownership,” an arrangement in which a company acquires “any part” of the stock of another company, regardless of whether the interest is controlling or what was paid. The concern was that such an arrangement could potentially have negative effects on competition. Expanding on traditional unilateral pricing objectives, the theory incorporated partial stock acquisition and mergers into an individual firm’s pricing objective. Broadly, the theoretical reasoning was that when shareholders had partial financial interest in rival companies through their shareholding, a firm’s pricing incentives would be reduced by conflicting interests. A reduction in pricing incentives would lead to higher prices compared to traditional competitive equilibrium prices. This anticompetitive effect brought about by common ownership has gained traction in literature due to recent investment trends toward passively managed/index funds. One of the greatest challenges for researchers is creating a statistical method that could accurately pinpoint the effects of common ownership.

**Objective and Methodology**

The first paper to use empirical and statistical evidence to address questions surrounding common and partial ownership was *Anticompetitive Effects of Common Ownership* by Jose Azar, Martin Schmalz, and Isabel Tecu (2018)." In their airline paper, Azar et al. (2018) focus on common ownership within the airline industry in an effort to narrow the scope of their research. The airline industry was a critical component to their framework due to the fact that extensive public information is available to differentiate the supply and demand of each specific departure and arrival for different airlines. To provide a rough illustration of the type of data used, the Department of Transportation’s Airline Origin and Destination Survey Database contains 10% of airline tickets issued each quarter, uses certain filters such as markets with an average of at least 20 passengers a day, and has retained over one million observations at the carrier-market-quarter level. Some summary statistics for the sample used by Azar et al.’s (2018) airline paper include: $219 average CPI-adjusted fare per passenger across markets, 3,930 average passengers per quarter per carrier-market, 18,429 passengers per market, 2.3 million average market population, and $42,000 average market income. They use these specific airline route-level price and quantity data to relate common ownership concentration to prices within the same firm, period, and industry.

The resulting relationship, after addressing the issues of identification, endogeneity, and reverse causality, could then be used to quantify the anticompetitive effects of higher levels of common ownership.

The first innovation in methodology involves the implementation of a previously untested approach to measure the concentration of common ownership within an industry. Proposed in 1986 by Bresnahan and Salop and developed for partial ownership by Salop and O’Brien (2000), the modified Herfindahl-Hirschman Index (MHHI) is a competitiveness metric adapted from the HHI, an index that is commonly used in mergers to evaluate antitrust issues and is based on the

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1 Posted as a working paper in 2014, *Anticompetitive Effects of Common Ownership* was last revised in 2018. Even prior to its publication date, the paper was subject to extensive viewership and scholarly commentary.
Cournot Oligopoly model of quantity competition among firms producing homogeneous products.

In the equation below, $\beta_{ij}$ is the fraction of firm $j$ that is owned by owner $i$, and $\gamma_{ij}$ is the weight that the manager of firm $j$ places on owner $i$’s profits in calculating the profits of firm $j$. The market share of firm $j$ is $s_j$.

$$
\sum_j \sum_k s_j s_k \frac{\gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}} = \sum_j s_j^2 + \sum_j \sum_{k \neq j} s_j s_k \frac{\gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}},
$$

MHHI \hspace{1cm} HHI \hspace{1cm} MHHI delta

It is important to note that Azar et al. (2018) only include shareholders with holdings greater than 0.5% (voting and non-voting shares). This baseline restriction significantly reduces the amount of data and required computation power, assumes that shareholders with less than 0.5% have no impact on a firm manager’s pricing strategy, and includes a robustness check to ensure minimal effects of the shareholder group baseline on the calculated coefficients.

After establishing the necessary framework, Azar et al. (2018) create a panel regression and regress log(price) on MHHI delta (MHHID), HHI, additional controls, time-fixed effects, and market carrier fixed effects. As necessary, Azar et al.’s (2018) airline paper addresses issues of omitted variables by including fixed effects in their regression analysis and explaining why their results are inconsistent with the argument that endogeneity of market shares drove results. Finally, Azar et al. (2018) use three sets of tests to allay reverse causality concerns: a distributed-lag regression, a difference-in-differences and instrumental variable (IV) approach and associated panel-IV results based on BlackRock’s acquisition of Barclays Global Investors in 2009, which was a quasi-exogeneous shock to common ownership concentration across U.S. airline routes.

Findings and Implications

This paper’s data, methodology, and results were instrumental in bringing forth the issue of common ownership and in setting up a framework for statistical analysis in future research papers. In particular, their results were able to show a clear correlation between price and common ownership: an increase in MHHID from 0 to 2000 (the weighted average level of
MHHID in 2014Q4) is associated with a 4% increase in average fare price. Depending on the percentile of MHHID increase, this increase in price could be even higher, up to an 8% increase in price when going from the 10th to 90th percentile. While their findings are extremely significant, controversy quickly surrounded the robustness of the conclusions reached. Upon publication, the airline paper quickly gained significant viewership from both scholars and financial professionals, largely due to the significant regulatory repercussions that could potentially result.

Furthermore, with a more recent shift towards index and passively owned funds, most scholars expect these anticompetitive effects to only continue to increase. Therefore, if the validity of the airline paper’s results is confirmed, a growing swath of the financial sector could be significantly affected by potential regulatory activity.


Objective and Methodology

The centrality of Azar et al.’s (2018) airline paper for crucial unresolved antitrust policy issues is manifested in the publication of two significant seminal pieces of academic literature that further expand upon the growing topic of common ownership. One of these papers, Ultimate Ownership and Bank Competition by Jose Azar, Sahil Raina, and Martin Schmalz (2016), examines the effects of common ownership within the banking industry, specifically pertaining to depository fees and thresholds. Under traditional models of competition, areas with higher bank concentration would generally have lower prices because competition over market share would drive prices as low as possible. Instead, Azar et al. (2016) noticed that there was a large nation-wide variation in the prices of deposit products and that prices in densely populated locations like New York and California were more expensive than in the Midwest. To proceed with their research, Azar et al. (2016) were able to acquire “uniquely extensive branch-level” datasets on depository accounts, maintenance fees, and fee thresholds, which they paired with time-series and cross-sectional variation in prices. The explanation proposed and tested by Azar et al. (2016) was that common ownership and cross-ownership (whereby one firm acquires an equity stake in a rival firm) between banks had created an anticompetitive environment that was
negatively affecting prices for consumers. Although the MHHI used in the airline paper is useful in helping measure bank concentration, it would fail to adequately illustrate the level of competition within the banking industry due to the nature of banks and their potential for cross-ownership. The solution proposed by Azar et al. (2016) is to develop a new generalized Herfindahl-Hirschman Index (GHHI), which uses the same equation as the MHHI but with redefined variables that need to be calculated with cross-ownership. Referred to as “the ultimate financial interest and ultimate control shares of the different shareholders,” the new beta and gamma would give a GHHI value conveying the general level of bank competition and, after subtracting the original HHI, would result in the dependent variable GHHI Delta. Finally, using a similar methodology to Azar et al. (2018) – running panel regressions to test whether there is a significant correlation between GHHI Delta and prices – Azar et al. (2016) test the results of common and cross ownership concentration on bank deposit prices.

Findings and Implications

The initial findings of the research establish a strong correlation between GHHI market concentration and depository prices, which Azar et al. (2016) attempt to develop into a causal relationship by instrumenting GHHI measurements with county-level variations from the growth of index funds. The explanation that Azar et al. (2016, p. 3) provide is that “index fund growth-induced variation in GHHI is strongly correlated with higher fees, thresholds, and deposit spread, which, if we assume aggregate index fund growth is not primarily a result of cross-county variation in banking outcomes, indicates that index fund growth causes higher prices for banking products.” The order of economic magnitude is slightly lower than that of the Azar et al. (2018) airline paper, with a standard deviation increase in GHHI associated with a $0.56 (~5%) increase in maintenance fees and a $408 (10%) increase in fee thresholds for the average interest-bearing checking account. Much like the Azar et al. (2018) airline paper, the Azar et al. (2016) banking paper incorporates a difference-in-differences analysis to support their findings and address identification and endogeneity concerns. In their analysis, Azar et al. (2016) show that 2013 deposit prices can be predicted using only information on county-level bank organizations, ownership, and prices from ten years prior. Azar et al. (2016) argue that these findings mitigate endogeneity concerns because it is unlikely that index fund ownership would be determined by prices years into the future.
The results found in *Ultimate Ownership and Bank Competition* were particularly significant because they illustrated the potential for common ownership to be prevalent across industries and gave credence to the findings in the airline paper. The findings also posed potential cross-ownership issues for banks involved in both depository practices as well as large-scale investment funds. In the event that anticompetitive effects of cross and common ownership were validated, they could signify a potential crossroad for banks and their investment branches. Furthermore, the development of the GHHI and the resulting methodology has opened new possibilities for research using a more flexible framework. While the paper’s results do depict a high potential for anticompetitive activity in this sector, they do specifically mention that these results do not give any insight into corporate governance but instead can be used as insight towards future research.


**Objective and Methodology**

In their paper *Common Ownership, Competition, and Top Management Incentives*, Miguel Anton, Florian Ederer, Mireia Gine, and Martin Schmalz (2018) expand on the topic of managerial incentives to induce strategic and competitive behavior due to common ownership. In particular, this paper examines the relationship between common ownership and executive compensation and its interaction with their performance and that of rivals.

As a background framework for the paper, it is well accepted from a theoretical standpoint that top management should have incentives that align their interests with those of the firm. In the case of rising levels of common ownership within competing firms, some have raised the potential issue of reduced levels of competition and an associated reduction in performance incentives given by shareholders to management. Therefore, the empirical question analyzed in the Anton et al. (2018) executive compensation paper is whether firms whose ownership structure is dominated by shareholders with strong interest in competition do reward their top managers with more pronounced performance-based incentives than firms lacking such interest.

As a framework for structuring their research, Anton et al. (2018, p.4-5) first document the “extent to which the same set of diversified investors own natural competitors in U.S.
industries” by looking at the 2,000 largest publicly traded firms and showing how common investors and top shareholders have changed over time. Following their results, Anton et al. (2018) choose the sensitivity of managers’ wealth with their firm’s performance as the primary outcome variable in qualitatively measuring top management incentives. They reason that annual income flows inaccurately reflect managerial incentives since overall wealth is a better indicator of a manager’s true compensation. After running tests on the association between wealth-performance sensitivities and common ownership, Anton et al. (2018) check for robustness and strengthen the argument for a causal relationship by using a potentially exogeneous variation in ownership caused by a mutual fund scandal in 2003.

Findings and Implications

A noteworthy statistic taken from the data illustrates the prominence of big institutional investors: in 2017 BlackRock and Vanguard were among the top five shareholders in 70% of the world’s largest 2,000 publicly traded firms. Furthermore, ownership-adjusted levels of industry concentration are frequently twice as high as shown by traditional measurement indexes. Their primary work is drawing a link between the rising levels of common ownership and incentives by testing the sensitivity of managers’ wealth with their firms’ performance. Anton et al. (2018) found that these sensitivities have a strong negative association with common ownership across a comprehensive panel of U.S. stocks. In fact, they found that “executives in the most commonly owned industries received up to $888k (a quarter of total average pay) more than managers in the least commonly owned industries.” These results have quantitatively significant magnitudes and remain similar regardless of whether Anton et al. (2018) employ the MHHID, a model-free measure of top-five shareholder overlap, or a simple alternative measure of connected stocks. Robustness concerns were also addressed by controlling for HHI, size, book-to-market, and volatility among other factors. Finally, their identification strategy – using a mutual fund scandal that led to a massive change in ownership – yielded results similar to the panel regression.

Some academic literature on common ownership does not clearly distinguish between equity owners and assets managers. A distinction, however, needs to be drawn between asset managers which, as a result of their financial intermediary function, manage multiple portfolios with equity stakes and the real owners of the equity. Such distinctions can be important for understanding the nuanced economic incentives of owners and assets managers, which can potentially affect anti-competitive behavior.

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further signaling that wealth-performance sensitivities decline when industries increase levels of common ownership.

Given U.S. antitrust policy and regulation, such monopoly-like effects could have far-reaching implications for both consumers and the government. From a consumer perspective, common ownership may lead to artificially high prices disproportionate to wage growth. Yet government regulation of large financial institutions could also hurt consumers who have increasingly used these institutions to diversify and invest their wealth. At the present moment, consumers have few alternatives for diversifying their wealth besides actively managed funds, which in recent years have not been outperforming their benchmarks. Therefore, the government would be tasked with proposing a feasible solution that would not severely limit a core part of the financial sector.

III. Critics’ Papers

The seminal literature was critical in bringing forth the topic of common ownership. However, not all researchers found the arguments compelling. For some scholars, the logic behind the anticompetitive effects seemed shaky while the theory remains to be proven. In particular, the modelling of firm behavior, investor behavior, and incentives are all intangible notions that are difficult to quantify—and slight alterations can yield significant results. A few researchers found those exact problems with the original papers and actively worked to propose alternative conclusions.


Critique and Alternative Methodology

In 2017, Federal Reserve economists Jacob Gramlich and Serafin Grundl conducted their own research on common ownership using data from SEC 13f filings, RateWatch, and the Federal Deposit Insurance Corporation’s Summary of Deposits (SOD).

After comparing their own results with the results from the airline and banking papers, Gramlich and Grundl (2017) expressed various concerns with the MHHI/GHHI methodology
and proposed an alternative solution in their paper titled Testing for Competitive Effects of Common Ownership.

The main source of debate for Gramlich and Grundl (2017) lies with the use of MHHI/GHHI and market concentration since it introduces possible issues with endogeneity, interpretation, and data.

More specifically, Gramlich and Grundl (2017) argue that by using a concentration measure as the dependent variable, the right side of the regression can potentially have a market outcome variable: quantity. By having a market outcome variable on the right side of the regression, regression results will inaccurately predict correlation between the variables.

The essence of this argument is rooted in traditional economic theory; specifically, the basic assumptions surrounding Cournot competition (firms set quantity) and Bertrand competition (firms set price). Gramlich and Grundl (2017) point out that the HHI-based metrics are grounded only in Cournot competition and will not produce accurate results in a market setting involving Bertrand competition. Therefore, they believe a weight-based approach dominates traditional MHHI/GHHI-based measures because the approach is agnostic to the form of competition.

Gramlich and Grundl (2017) conducted an analysis based on the weights that firms place on each other’s profits. The equation modelling their methodology is functionally similar to the MHHI except that Gramlich and Grundl (2017) removed the assumption of Cournot competition and reverted towards a more general profit maximization function.

Findings and Implications

A benefit of the weight approach proposed by Gramlich and Grundl (2017) is that it allows for firm-level predictions. The HHI, MHHI, and GHHI, as modelled by the previous papers, vary at the market-time level, meaning the results only give insight into the overall market. By using a weighting framework, data and results will vary at the market-time-firm level, which allows market outcome results to be analyzed with respect to individual firms.
Although this result would remove potential endogeneity from the regression, there is still debate about whether this alternate methodology accurately represents the data.

When applying their numbers to the banking industry, the weight-based price regression utilized by Gramlich and Grundl (2017) suggests mixed and muted evidence on the competitive effects of common ownership. In some instances, they did find a slightly positive relationship between the price and weight metrics, whereas in other instances they found negative relationships. Furthermore, in all cases, Gramlich and Grundl (2017) found the magnitude of change in price to be significantly lower than the change implied by the Azar et al. (2018) airline paper (3-7%). If results from the Gramlich and Grundl (2017) banking paper are robust, the inconclusive findings would fail to support either the Azar et al. (2018) airline paper or the Azar et al. (2016) banking paper and would imply that common ownership is not negatively affecting consumer prices. Furthermore, from an academic perspective, their results may also put into question the findings of almost all the papers that utilize the MHHI/GHII framework.


**Critique and Alternative Methodology**

In the paper titled *The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence*, Pauline Kennedy, Daniel O’Brien, Minjae Song, and Keith Waehrer (2017) provide their own analysis into the effects of common ownership on airline prices. The first step in evaluating the Azar et al. (2018) airline paper involved collecting data that was similar to the data used in the original paper. Kennedy et al. (2017) constructed their data set from four main sources: The Airline Origin and Destination Survey, the Air Carrier Statistics database, Thomson Reuters Equity Ownership, and the Bureau of Labor Statistics. The resulting summary statistics match reasonably well with less than a 10% difference in mean and standard deviation in most cases. Using this data set, Kennedy et al. (2017) decided to implement an alternative method to conduct their regression analysis because they disagreed with various aspects of the methodology used by Azar et al. (2018). According to Kennedy et al. (2017), the first major flaw of Azar et al. (2018) involves the methodology behind the MHHI concentration measure. Kennedy et al. (2017) argue that the MHHI depends on both common ownership and
market share, but the Azar et al. (2018) airline paper only instrument for common ownership, leaving market share potentially endogenous. Furthermore, Kennedy et al. (2017) argue that price and the MHHI are equilibrium effects that depend on cost and demand factors and the structure of ownership and control. Therefore, they believe the relationship between price and MHHI cannot be a reliable predictor of the relationship between price and common ownership.

The solution Kennedy et al. (2017) provide is to replace the MHHI concentration measures with indices of common ownership incentives, as these indices are the relevant primitives of the theory of partial ownership. To address the potential exogenous nature of these indices, Kennedy et al. (2017) estimate the price regression using two-stage least squares with two instruments that are correlated with the common ownership indices but not with airline supply and demand factors: BlackRock’s Acquisition of Barclays Global Investors and airline participation in the Russell 1000 stock market index. The resulting price regression does not depend on endogenous market shares, although it does fail to account for potential interactions between the incentive terms and market variables. As a result, Kennedy et al. (2017) view their results as a more robust analysis of the Azar et al. (2018) airline paper’s results rather than as an overarching analysis of the effects of common ownership. To solve this issue, Kennedy et al. (2017) estimate a structural model of the airline market in which airlines are treated as differentiated Bertrand competitors with objectives that incorporate common ownership. In this case, they use a nested logit model for demand of airline travel, since consumers can be separated by the decision to travel by air or not to travel by air. Finally, they introduce and estimate a new single parameter that scales the common ownership indices relative to its value under proportional control, where managers’ weighing of investor preferences is proportional to their voting shares.

Findings and Implications

After estimating the supply and demand sides of the model using the generalized method of moments (GMM), Kennedy et al. (2017, p. 21) regress the “first derivative of the moment condition with respect to the parameter of each endogenous variable on all exogeneous variables, including the excluded instruments.” The F-statistic for the joint significance of the instruments is 40.29, 1607.33, and 273.42 for the price, within-market share, and common ownership incentive term, respectively. On the other hand, the parameter that was created to scale each
incentive term relative to its value under proportional control was insignificant with a p-value greater than 0.2. Based on these results, Kennedy et al. (2017) rejected the null hypothesis that common ownership raises price, as predicted under the assumption of proportional control. While the coefficient on the incentive term was insignificant, the estimates of most of the other parameters were statistically significant and had the right sign (compared to a similar model estimated by Berry and Jia in 2010). Even though the significance of the parameters does not affect the rejection of the null hypothesis, the parameter’s significance and consistency with traditional theory help support that the data and regression were done properly.

The implications of Kennedy et al.’s (2017) main conclusion that common ownership does not increase price are similar to those discussed after Gramlich and Grundl’s (2017) banking paper results, but a few of Kennedy et al.’s (2017) intermediate steps also provide further insight for future research. Specifically, the methodology utilized by Kennedy et al. (2017) includes more technical structural models to estimate supply and demand in the market context. In an approach quite different from the original airline papers, the process used by Kennedy et al. (2017) could change the way researchers tackle the issue of common ownership. In terms of their conclusions, Kennedy et al.’s (2017) rejection of the null hypothesis suggests that when faced with pricing decisions, managers are unlikely to be influenced by investors with proportional control, which is why common ownership has no effect on price. If this is true, it may have greater implications related to corporate governance and how institutional investors handle shareholder voting.


**Objective and Methodology**

In *Executive Compensation under Common Ownership*, Heung Jin Kwon (2016) expands on the common ownership topic by looking at potential incentives and driving points for anticompetitive behavior in the form of executive compensation. Intuitively, in an anticompetitive environment, one might expect a reduction in the alignment of executive incentives to soften competition, and Kwon (2016) attempts to test and quantify this reduction.
To begin approaching this issue, Kwon (2016) uses 1993-2013 data in the ExecuComp Database, which provides annual panel data of executive compensation, ExecuComp SIC industry codes, and proxy disclosures by single-segment firms. Although similar to Anton et al.’s (2018) executive compensation paper on common ownership and top management incentives, Kwon (2016) used relative performance evaluations (RPEs) to study whether executive compensation was affected by common ownership, as measured by MHHID. The methodology involves calculating pay-performance elasticities from the data – how annual flow compensation changes with own and peer performance – and then implicitly testing the ratio of peer pay-performance elasticity to own pay-performance elasticity with common ownership. Kwon (2016) couples this implicit test with an explicit test, in which he studies the determinants of the use and size of incentive awards tied to RPEs with contracts from 2014 proxy disclosures, to address concerns that elasticities do not accurately reflect current and past performances. To address potential endogeneity concerns, Kwon (2016) used the firm’s addition to the S&P Composite 1500 as an instrumental variable, which is particularly useful in identifying the effects of investors with common ownership because S&P 1500 membership generally increases the ownership by quasi-indexers who are the main source of common ownership.

**Findings and Implications**

Unlike Anton et al.’s (2018) executive compensation paper and the results that are implied in the Azar et al. (2018) airline paper, Kwon (2016) found a positive relationship associating common ownership with RPEs both explicitly and implicitly, which would imply executives receive more pay for outperforming peers under common ownership. Kwon’s implicit approach found that executives in industries with high common ownership received around 2% less pay than executives in industries with low common ownership when their counterparts performed well. The explicit approach yielded results that corroborated these results: the probability of using RPEs increases by as much as 20% if a firm moves from the industry with the lowest common ownership to the highest. Therefore, Kwon (2016) concludes that executive pay is not the driving force behind the anticompetitive effects found by Azar et al. (2018). Although they do refute Anton et al.’s (2018) executive compensation paper, these findings do not directly impact the Azar et al. (2018) airline paper’s findings; instead, they imply that something else is causing the purported anticompetitive effects.
In addition to casting reasonable doubt on the causal nexus between anticompetitive executive compensation and outcomes of common ownership, Kwon’s results provide greater insight into corporate governance implications and the role that institutional investors play in making executives more efficient. Kwon also provides insight into the individual influence of shareholders by observing a strong association when running regressions on the use of RPEs with only the top five common owners in each industry.

IV. Antitrust Policy Implications

Although the foundation of empirical evidence on common ownership is still in its early stages, lawmakers, government regulators, financial investors and prominent academics are already discussing the challenges of potential antitrust implications. Antitrust regulation has long been a controversial topic in the United States, with regulation dating back to the 1890s when the Sherman Antitrust Act was passed to make price fixing and collusion illegal. In 1914, the Sherman Antitrust Act was followed by the Clayton Act and establishment of the Federal Trading Commission (FTC) pursuant to the FTC Act, which protected consumers from unfair mergers and created a federal agency to investigate and prevent unfair business practices. These three pieces of legislation are still in force today and, while many argue that they are outdated, currently form the backbone for antitrust regulation in the United States. Considering the modern concept of common ownership did not even exist when these acts were initially passed, the introduction of common ownership and its potential anticompetitive effects have raised serious questions for government and the financial sector.


Einer Elhauge is one of the most vocal scholars to have tackled the subject. In his essay *Horizontal Shareholding*, he argues that not only does horizontal shareholding have anticompetitive effects but that significant steps can and must be taken to regulate the industries involved. He also believes there are several broader implications to consider when thinking about horizontal shareholding/common ownership. One such implication is solving the complex
question regarding the lack of growth in certain areas of the U.S. economy; specifically, the failure of high corporate profits to flow into corresponding growth opportunities through expansion, job opportunities, and wage growth. Through current and historical levels of profit and economic growth measures, Elhauge (2015) shows a disconnect between firm profits and overall economic/job growth. He further indicates that horizontal shareholding is creating an anticompetitive environment causing companies to divert profits towards stock buybacks and executive compensation. While the logic seems plausible—expansion usually involves higher competition with competitors, which is why in recent times companies are expanding less with their profits—research on the topic has not been empirically explored.

While many researchers discuss the necessity of regulatory changes, Elhauge (2015) also discusses the nature of regulation and how it would be enacted. The first solution proposed by Elhauge (2015) involves utilizing a very specific clause of current antitrust regulation to outlaw stock acquisition in situations of high common ownership concentration. The clause, Clayton Act § 7, has traditionally been applied in an anticompetitive merger context but can be extended due to its sweeping language. It states,

“No person shall acquire… the whole or any part of the stock… of one or more persons engaged in commerce or in any activity affecting commerce, where… the effect of such acquisition… may be substantially to lessen competition.”

The only change necessary would be an alternative framework for judging what would “lessen competition” within an industry, which is the main focus in many common ownership papers: using MHHI as the new index for competition with common ownership. While this solution would likely resolve purported issues of anticompetitive effects, it would come at the cost of significant diversification benefits or significant changes in the structure and governance of modern passive/index funds.


Posner, Scott and Weyl (2017) point out a fundamental flaw in the way institutional investors may be charged under Elhauge’s (2015) proposed framework. Specifically, firms could be litigated as long as their holdings were shown to lessen competition at a point, which gave institutional investors “interactive risk” with other firms. In other words, Posner et al. (2017, p.
argue that “institutions obeying the law at one moment could become liable simply because other institutions changed their holdings and thereby made an industry less competitive.”

Instead, Posner et al. (2017, p. 9) advocate a change in existing regulation which would “publicly commit to a safe harbor for institutional investors who own or manage assets in no more than one firm per industry or with total value of less than 1% of the industry.” Regulation similar to that proposed by Posner et al. (2017) would signify a significant change for institutional firms, and research would be necessary in determining if the costs of change would outweigh the benefits of eliminating anticompetitive effects in an industry.


Lambert and Sykuta (2018) analyzed the costs and benefits of the regulation ideas proposed by the aforementioned authors. Their comprehensive analysis provides insight into the specific decision costs of regulation for government officials. They argue that enforcing and judging regulation surrounding Elhauge’s (2015) Section 7 proposal would require complex solutions to opaque problems, many of which would involve defining markets in a subjective and difficult manner. It would also require extremely high levels of due diligence for investors to ensure they are not held liable. As an extension to that decision cost, Lambert and Sykuta (2018) argue that a reduction in available funds to diversify would be far more detrimental to consumers than a marginal decrease in competitive markets. From the standpoint of regulation, their suggestion is to do nothing simply because the “problem” posed by common ownership has no feasible low-cost solution.

V. Conclusions

Recent academic work has cast doubt on whether common ownership can be at the root of anticompetitive behavior causing the prices of consumer goods and services to increase. On the other side of the cost-benefit spectrum, the increasingly common use of passive index-based investment vehicles has led to unprecedented investment diversification opportunities for investors. Retail investors have disproportionately benefited from such low-cost investment
strategies by enabling them to invest their savings with very positive outcomes. The rise of passive investing raises central policy questions about its impact on both competition and capital markets. This paper summarizes the leading academic studies and lays down the most notable regulatory policy proposals that have been put forth to address the anticompetitive concerns. As many have argued, an important regulatory challenge may be to mitigate anticompetitive effects while preserving the retail investment cost savings and other benefits created by institutional investors.

VI. Statistical Notes

- **Panel analysis** is a statistical method, widely used in social science, epidemiology, and econometrics to analyze two-dimensional (typically cross-sectional and longitudinal) panel data. The data is usually collected over time and over the same individuals and then a regression is run over these two dimensions. Multidimensional analysis is an econometric method in which data is collected over more than two dimensions (typically, time, individuals, and some third dimension).

- In a **fixed-effects model**, subjects serve as their own controls. The idea is that whatever effects the omitted variables have on the subject at one time, they will also have the same effect at a later time; hence their time-invariant effects will be constant, or “fixed.” However, in order to hold true, the omitted variables must have time-invariant values with time-invariant effects.

- **Difference-in-Differences (DID)** calculates the effect of a treatment (i.e., an explanatory variable or an independent variable) on an outcome (i.e., a response variable or dependent variable) by comparing the average change over time in the outcome variable for the treatment group, compared to the average change over time for the control group. This method, although intended to mitigate the effects of extraneous factors and selection bias, may still be subject to certain biases depending on how the treatment group is chosen.

- **Generalized Method of Moments (GMM)** is a general framework for deriving estimators that use assumptions about the moments of random variables to derive an
objective function. Kennedy et al. (2017) use GMM to estimate the demand and the supply models jointly.

VII. Literature Overview

<table>
<thead>
<tr>
<th>Category</th>
<th>Author, Year</th>
<th>Title</th>
<th>Brief Description, Key Findings</th>
<th>Related Papers, Relationship</th>
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</thead>
<tbody>
<tr>
<td>Seminal</td>
<td>Azar, Schmalz &amp; Tecu (2018)</td>
<td>Anticompetitive effects of common ownership</td>
<td>Methodologically, it uses airline route Modified Herfindahl Hirschman Index Delta (MHHID) to measure the degree of market concentration increase caused by stock acquisition-led horizontal shareholdings. Findings suggest a common ownership-led average ticket price increase of 3%-7%.</td>
<td>One of the three main papers at the center of the common ownership debate, focusing on the airline industry.</td>
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<td></td>
<td>Azar, Raina &amp; Schmalz (2016)</td>
<td>Ultimate ownership and bank competition</td>
<td>Methodologically, it employs a generalized HHI (“GHHI”) measure that allows for competitors to directly own each other. Findings suggest a common ownership-led increase in bank fees, coupled with a decrease in deposits’ interest rates.</td>
<td>One of the three main papers at the center of the common ownership debate, focusing on the banking industry.</td>
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<td></td>
<td>Antón, Ederer, Giné &amp; Schmalz (2018)</td>
<td>Common ownership, competition, and top management incentives</td>
<td>Methodologically, it measures common ownership concentration with MHHID. Findings suggest a common ownership-led use of relative performance evaluations (RPEs) and misalignment of pay with performance that rewards industry-wide success over individual firm’s when it undercuts same-industry rivals.</td>
<td>One of the three main papers at the center of the common ownership debate, focusing on executive compensation.</td>
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<td>Critics</td>
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<td><strong>Gramlich &amp; Grundl (2017)</strong></td>
<td><em>Testing for competitive effects of common ownership</em></td>
<td>Empirically, it uses a methodology for analyzing the effects of common ownership on competition focused directly on the weights that firms place on each other’s profits. Findings suggest mixed and muted evidence on the competitive effects of common ownership, posing serious doubt about any economically substantial causal link between common ownership and pricing in the banking industry. Applies a new approach for analyzing the competitive effects of common ownership on prices to data from the banking industry, as an alternative to industry concentration (“MHHI” and “GHHI”) used by Azar et al. (2016) Banking Paper. Despite some degree of consistency with the anti-competitive effects found by the Azar et al. (2016) banking paper, G&amp;G found more muted effects and lack of robustness in their findings.</td>
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<td><strong>Kennedy, O’Brien, Song &amp; Waehrer (2017)</strong></td>
<td><em>The competitive effects of common ownership: Economic foundations and empirical evidence</em></td>
<td>Methodologically, it estimates both linear price regressions and a structural oligopoly model that accounts for the interactions among common ownership incentive terms and other market variables. Potentially endogenous market shares are excluded to avoid changes in price-common ownership relationship due to variation in these shares. Findings suggest no evidence of common ownership-led increase in airfare prices. Datasets match very closely to Azar et al.’s (2018) airline paper to conduct a comparative methodological analysis of the two papers. Concludes inappropriateness of price-concentration regressions for causal inference. Reverses the results of the Azar et al. (2018) airline paper.</td>
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<td><strong>Kwon (2016)</strong></td>
<td><em>Executive compensation under common ownership</em></td>
<td>Methodologically, it uses MHHID to test how the ratio of peer pay-performance elasticity to own pay-performance elasticity changes with common ownership, complemented with the explicit test of RPE. Findings show an association between higher common ownership of natural competitors and a greater use of relative performance evaluation in executive compensation contracts, i.e. less alignment of pay with industry performance. Challenges the results of Anton et al.’s (2018) executive compensation paper, though it uses the same mechanism that drives its results, i.e., MHHID. Whereas Anton et al. (2018) estimate pay-performance sensitivities, Kwon estimates pay-performance elasticities.</td>
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<td><strong>Antitrust Policy</strong></td>
<td><strong>Elhauge (2015)</strong></td>
<td><strong>Horizontal shareholding</strong></td>
<td>Finds a common ownership-driven reduction of firms’ incentives to compete with each other and associated liability of institutional investors. Advocates for the use of Section 7 of the Clayton Act by antitrust agencies and private litigants to counter the anticompetitive effects arising out of common shareholding.</td>
<td>Uses the analysis and empirical evidence provided by the Azar et al. airline (2018) and banking (2016) papers as a basis for proposing enforcement actions aimed at curbing the anticompetitive effects of common shareholding under the current antitrust law regime.</td>
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<td><strong>Posner, Scott Morton &amp; Weyl (2017)</strong></td>
<td><strong>A proposal to limit the anticompetitive power of institutional investors</strong></td>
<td>Introduces a safe harbor proposal in which investors in oligopolistic industries would have to limit their holdings of an industry to either no more than 1% of the industry or to a single firm per industry at the peril of government litigation. By contrast, passively-managed index funds would not be subject to any size limitation.</td>
<td>Surveys seminal papers and uses their findings and conclusions as a basis for their thoughts about the potential dangers thereof. Although in agreement with Elhauge’s (2015) idea that it warrants regulatory action under Section 7 of the Clayton Act, it disagrees in regards to the solution proposed of ensuing lawsuits by regulators and private antitrust plaintiffs.</td>
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<td><strong>Lambert &amp; Sykuta (2018)</strong></td>
<td><strong>The Case for Doing Nothing About Institutional Investors’ Common Ownership of Small Stakes in Competing Firms</strong></td>
<td>Argues that courts and antitrust enforcers should reject calls for expanded antitrust intervention that entail an extraordinary amount of implementation costs and imperil the functioning of capital markets.</td>
<td>Opposes Elhauge (2015) and Posner et al.’s (2017) calls for increased antitrust public enforcement efforts.</td>
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VIII. References


