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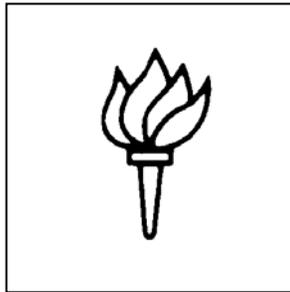
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C. Scott Hemphill and Marcel Kahan

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Recent scholarship considers the potential anticompetitive effects when institutional investors hold substantial stakes in competing firms. Empirical evidence reporting that common concentrated owners ("CCOs") are associated with higher prices and lower output poses a sharp challenge to antitrust orthodoxy and corporate governance scholarship.

We identify and examine the causal mechanisms that might link common ownership to higher prices. We distinguish potential mechanisms along three dimensions: whether the mechanism produces conflict with noncommon owners by inducing actions that raise CCO portfolio value at the expense of firm value; whether a mechanism targets specific firm actions as opposed to affecting firm activities across-the-board; and whether the mechanism is active (rather than passive), in the sense that the CCO undertakes some act in furtherance of its strategy, such as communicating with management or voting.

We consider whether each mechanism is tested by the existing empirical evidence, and whether the mechanism is plausible—that is, feasible, effective, and in a CCO's interest. Our main conclusion is that, for most proposed mechanisms, there is no significant evidence suggesting that institutional CCOs employ them, no strong theoretical basis for believing that they could and would want to do so, or both. The mechanism that is most consistent with the empirical evidence and most plausibly employed by institutional CCOs is selective omission: to press for firm actions that increase both firm value and the CCO's portfolio value, while remaining passive where the two conflict.

We make three major points. First, several mechanisms emphasized in the literature are not, in fact, empirically tested. Of particular interest, the leading empirical studies are limited to mechanisms that are conflictual and targeted. Second, some mechanisms are infeasible or else ineffective in raising portfolio value. Third, because most institutional investors have only weak incentives to increase portfolio value, it is not in their economic interest to pursue mechanisms that carry significant reputational or legal liability risks.

Our analysis has several important implications. First, any serious analysis of anticompetitive effects must pay careful attention to systematic differences in the incentives of different investor types. Second, CCOs often have procompetitive effects, particularly when they are invested in some but not all firms in an industry. Third, a convincing case for broad reform has not been made. We advocate a searching examination of the steps actually taken by CCOs and firms—the who, where, when and how predicted by the most plausible mechanisms.

Introduction

Institutional investors often own shares of firms that compete. For example, the T.

Rowe Price family of funds has a substantial ownership position in American, Delta, and United

Airlines. Recent scholarship considers whether such common concentrated owners ("CCOs")

might have an anticompetitive effect. Antitrust theorists have long suggested that CCOs have

interests that differ from those of owners of a single competing firm and might be able to

induce firms in which they hold a stake to further these interests.[1] Recently, empirical evidence

reporting that CCOs are associated with higher prices and lower output seems to confirm this

theory.[2]

This new evidence, and the dramatic growth in institutional investors over the last

several decades, have stimulated a major rethinking of antitrust enforcement. The Department

of Justice has investigated common ownership of competing airlines and acknowledged

concerns more generally about the anticompetitive effects of common ownership.[3] In 2018, the

Federal Trade Commission took these concerns a step further, conducting an all-day hearing

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[1] The leading contribution to economic theory is Daniel P. O'Brien & Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, 67 ANTITRUST L.J. 559, 579–80, 583, 608–11 (2000). *See also* Timothy F. Bresnahan & Steven C. Salop, *Quantifying the Competitive Effects of Production Joint Ventures*, 4 INT'L J. INDUS. ORG. 155 (1986). For further discussion of the theoretical literature, see *infra* Section I.A.

[2] The leading empirical study is Jose Azar, Martin Schmalz & Isabel Tecu, *Anticompetitive Effects of Common Ownership*, 78 J. FIN. 1513 (2018) [hereinafter AST]. There has been a great deal of additional empirical work, which is discussed in detail *infra* Sections I.C and II.A.

[3] *See* Steven Davidoff Solomon, *Rise of Institutional Investors Raises Questions of Collusion*, N.Y. TIMES, Apr. 13, 2016, at B3 (reporting Senate testimony by head of the Antitrust Division, stating that Division was investigating effects of common ownership in the airline industry).

examining the potential anticompetitive effects of common ownership.[4] In Europe, antitrust

enforcers have taken a more aggressive approach. Aside from announcing a potentially wide-

ranging inquiry into the effects of common ownership,[5] the European Commission actually

relied on theory and evidence about common ownership in its 2017 decision analyzing the

predicted anticompetitive effects of a $130 billion merger between Dow and DuPont.[6]

Academic commentators have advocated measures that go far beyond the agencies'

exploratory inquiries and examinations of individual transactions and industries. They urge that

funds must cease their ownership of competing firms, shrink to a fraction of their current size,

or lose the right to vote their shares in their portfolio companies.[7] This scholarship makes the

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[4] Competition and Consumer Protection in the 21st Century: Hearing Before the Fed. Trade Comm'n (Dec. 6, 2018), https://www.ftc.gov/system/files/documents/public_events/1422929/ftc_hearings_session_8_transcript_12-6-18.pdf.

[5] Margrethe Vestager, Competition in Changing Times (Feb. 16, 2018), https://ec.europa.eu/commission/commissioners/2014-2019/vestager/announcements/competition-changing-times-0_en (disclosing, as European Commissioner for Competition, that Commission is "looking carefully" at prevalence of common ownership given indications of its increase and potential for anticompetitive effects).

[6] Commission Decision M.7932, Dow/DuPont, 2017 O.J. (C __), 382–83, ¶¶ 2346–52, Annex 4, ¶¶ 51–60, Annex 5 (relying upon AST and related work for the proposition that traditional concentration measures understate anticompetitive effects).

[7] *See* Einer Elhauge, *Horizontal Shareholding*, 129 Harv. L. Rev. 1267 (2016) (urging antitrust enforcers to undo stock acquisitions that increase common ownership); Eric A. Posner, Fiona Scott Morton & E. Glen Weyl, *A Proposal to Limit the Anti-Competitive Power of Institutional Investors*, 81 Antitrust L.J. 669 (2018) [hereinafter PSW] (proposing that an investor should be limited to a maximum 1% total holding in an oligopolistic industry or else confine itself to shares in a single firm); Eric Posner, Fiona Scott Morton & Glen Weyl, *A Monopoly Donald Trump Can Pop*, N.Y. Times, Dec. 7, 2016, at A29 (arguing that the holdings of CCOs are "already illegal" but, "because the antitrust implications of institutional investment were not recognized until recently, legal action has not yet been taken"); Eric Posner & Glen Weyl, *The Real Villain Behind Our New Gilded Age*, N.Y. Times, May 1, 2018, http://www.nytimes.com/2018/05/01/opinion/monopoly-power-new-gilded-age.html ("Institutional investors need to be blocked from further expansion and forced to restructure. They should be allowed to own shares of no more than one company per industry, or to own no more than a small portion of every company—say, 1 percent—if they want to remain fully diversified."); *see also* Fiona Scott Morton & Herbert Hovenkamp, *Horizontal Shareholding and Antitrust Policy*, 127 Yale L.J. 2026 (2018).

startling suggestion that large index funds and many large actively managed mutual funds are incompatible with antitrust law. These proposals, if adopted, would transform the landscape of institutional investing.

Anticompetitive effects of CCOs pose a sharp challenge not only to antitrust orthodoxy, but to corporate governance scholarship as well. Corporate governance scholars have long viewed most institutional investors—and mutual funds in particular—as largely benign forces that fail to exercise their substantial powers.[8] Institutions—due to their large shareholdings, access to sophisticated advice, and economies of scope—have the potential to help overcome the collective action problems that plague corporate America. Alas, for the taste of corporate governance scholars, institutional investors have not been active enough.[9] In particular, mutual funds are mostly reactive: while they vote on proposals by management and other shareholders, they rarely sponsor precatory resolutions, do not run proxy contests, and generally do not openly push for the removal of ineffective management.[10] Thus, an important goal of corporate governance reformers has been to increase the activity level of institutional investors.[11]

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[8] *See, e.g.*, Edward B. Rock, *The Logic and (Uncertain) Significance of Institutional Shareholder Activism*, 79 GEO. L.J. 445 (1991); Bernard S. Black, *Agents Watching Agents: The Promise of Institutional Investor Voice*, 39 UCLA L. REV. 811 (1992); Bernard S. Black, *Shareholder Passivity Reexamined*, 89 MICH. L. REV. 520 (1990).

[9] *See, e.g.*, Lucian A. Bebchuk, Alma Cohen & Scott Hirst, *The Agency Problems of Institutional Investors*, 31 J. ECON. PERSP. 89 (2017).

[10] Marcel Kahan & Edward B. Rock, *The Insignificance of Proxy Access*, 97 VA. L. REV. 1347 (2011).

[11] *See, e.g.*, Ronald J. Gilson & Reinier Kraakman, *Reinventing the Outside Director: An Agenda for Institutional Investors*, 43 STAN. L. REV. 863 (1991); Joseph A. Grundfest, *Just Vote No: A Minimalist Strategy for Dealing with Barbarians Inside the Gates*, 45 STAN. L. REV. 857 (1993).

From the traditional corporate governance perspective, evidence that CCOs have an anticompetitive effect is therefore disconcerting. Many corporate governance scholars harbor doubts that this conclusion, so different from their long-held notions, can be correct. Moreover, even talk of potential antitrust liability or additional regulation of institutional investor voting could scare these already reluctant shareholders from becoming more assertive. Such threats could play into the hands of supporters of managerial primacy who, for their own reasons, have been skeptical about the influence of institutional shareholders.

The trigger for this outpouring of new scholarship, and the most important article in this literature, is an empirical study of the airline industry by Jose Azar, Martin Schmalz and Isabel Tecu (AST).[12] AST conclude that common ownership of competing airlines, evaluated at the route level, is associated with higher prices on that route.[13] The study's empirical results have been highly touted and heavily relied upon. While critics have subjected AST's methodology to

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[12] *See* AST, *supra* note 2.

[13] A related paper, which uses a similar methodology to study consumer banking, reaches similar conclusions. Jose Azar, Sahil Raina & Martin Schmalz, Ultimate Ownership and Bank Competition (July 24, 2016), http://ssrn.com/abstract=2710252 (unpublished manuscript) [hereinafter ARS]. For discussion of this and other empirical studies of common ownership, *see infra* Section I.A.

sustained scrutiny and disputed its results—a debate that continues to rage[14]—commentators

have advocated sweeping reform based on this and related studies.[15]

Missing from the debate thus far is a systematic explication and assessment of the

causal mechanisms that might link common ownership to higher prices. Yet such an inquiry is

important for several reasons. The absence of a plausible mechanism that generates the

observed results would raise doubts about proponents' preferred interpretation of the

statistical relationship between market outcomes and common ownership. Moreover, a finding

that only certain types of investors can plausibly avail themselves of the mechanism would

suggest narrower, more targeted reform proposals and enforcement actions, as well as

targeted investigations to uncover direct evidence of CCOs influencing corporate policy.

This article is an effort to fill that gap. We identify a wide range of potential mechanisms

linking common ownership to anticompetitive effects. We evaluate each mechanism using two

criteria. First, is the mechanism tested by the empirical literature—that is, would its use

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[14] *Compare* Daniel P. O'Brien & Keith Waehrer, *The Competitive Effects of Common Ownership: We Know Less than We Think*, 81 ANTITRUST L.J. 729 (2018) (arguing that AST findings are the result of reverse causation or joint determination); Pauline Kennedy, Daniel P. O'Brien, Minjae Song & Keith Waehrer, The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence (July 26, 2017), http://ssrn.com/abstract=3008331 (unpublished manuscript); Patrick J. Dennis, Kristopher Gerardi & Carola Schenone, Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry (Feb. 5, 2018), http://ssrn.com/abstract=3063465 (unpublished manuscript); Edward Rock & Daniel Rubinfeld, *Antitrust for Institutional Investors*, ANTITRUST L.J. (forthcoming 2018); Jacob Gramlich & Serafin Grundl, *Estimating the Competitive Effects of Common Ownership* (FEDS Working Paper No. 2017-029, 2017), http://ssrn.com/abstract=2940137 (replicating and critiquing methodology of banking study); *with* Jose Azar, Martin C. Schmalz & Isabel Tecu, The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence: Reply (Sept. 28, 2017), http://ssrn.com/abstract=3044908 (unpublished manuscript) (replying to criticisms); Jose Azar, Martin C. Schmalz & Isabel Tecu, Reply to "Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry" (Apr. 24, 2018), http://ssrn.com/abstract=3168095 (unpublished manuscript); Einer Elhauge, New Evidence, Proofs, and Legal Theories on Horizontal Shareholders (Jan. 4, 2018), http://ssrn.com/abstract=3096812 (unpublished manuscript) (critiquing critics of AST and ARS).

[15] *See supra* note 7 and accompanying text.

generate the observed empirical results? Second, is the mechanism plausible, in the sense that it is the mechanism feasible, effective, and in a CCO's interest?

As we explain, potential mechanisms differ along several dimensions. Some mechanisms produce conflict, rather than consensus, between the CCO and other firm shareholders, by inducing actions that raise CCO portfolio value at the expense of that firm's value. Some mechanisms target specific firm actions, as opposed to affecting the firm's actions across-the-board. And finally, some mechanisms are active (rather than passive): the CCO speaks with management, votes on a proposal, or otherwise takes some positive step in furtherance of the strategy.

Our evaluation of mechanisms yields three main results. First, some widely discussed mechanisms are, in fact, not tested through the methodology employed in the empirical literature. Specifically, the AST airline study and many others are limited to targeted mechanisms entailing a conflict and apply neither to consensus mechanisms[16] nor to across-the-board mechanisms.[17]

Second, some mechanisms face major challenges as to feasibility and effectiveness. To be feasible, a CCO must have the power and ability to employ the mechanism. Yet institutional investors generally lack the capacity to generate, transmit, induce, and monitor targeted active strategies.[18] To be effective, use of the mechanism must generate benefits to the CCO, by raising the value of companies held by the CCO net of any collateral value reductions caused by

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[16] *See infra* Part I.

[17] *See infra* Section II.A.

[18] *See infra* Part III.A.

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the mechanism. Yet most across-the-board strategies, such as the avoidance or suppression of pay-for-performance compensation structures, result in a wholesale dilution of incentives to maximize firm value that may exceed the benefits associated with such a strategy.[19]

Third, some mechanisms are implausible because they are not in an institutional investor's interest. To be in a CCO's interest, the profits that the CCO obtains from any net increase in portfolio value must exceed the costs to the CCO from employing a mechanism. Yet institutional CCOs generally have only weak incentives—much weaker that the institutional ownership literature presumes—to maximize the aggregate value of their portfolio securities.[20] Many mechanisms, meanwhile, entail significant legal and reputational risk to CCOs, making it unlikely that institutional CCOs would employ them.[21]

Our main conclusion is that, for most mechanisms, there is either no strong theoretical basis for believing that institutional CCOs could and would want to employ them or no significant evidence suggesting that they do employ them, or both.[22] However, our judgment is not uniformly negative. In particular, a mechanism that we call "selective omission" is consistent with both theory and the empirical evidence.[23] A CCO engaged in selective omission presses for firm actions that increase both firm value and portfolio value, while remaining silent

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[19] *See infra* Part II.B. A second effectiveness problem discussed infra, particularly for actively managed funds, stems from the long time frame needed to implement the strategy.

[20] Among other problems, institutional investors receive, as fees, only a small fraction of increased portfolio value, and increasing portfolio value may even reduce their fees. *See infra* Section IV.A.

[21] As we demonstrate, these risks—which arise as to targeted actions that reduce firm value and hence create conflict with other investors) as well as most consensus actions—include violations of investment advisors' fiduciary duty to its funds and clients. *See infra* Section IV.B.

[22] *See infra* Section V.A and table 3, which summarizes our assessment of each mechanism.

[23] *See infra* Section III.B.

as to actions where the two conflict. In addition, some across-the-board mechanisms may be plausibly employed, but substantial empirical evidence for their use is so far lacking.

Our analysis has several important implications. First, the empirical literature has paid too little attention to systematic differences in the incentives of different investor types. For example, advisors that mostly manage index funds must be distinguished from other CCOs in any serious analysis of anticompetitive effects.[24] Index funds are, at first blush, the most plausible culprits because they tend to own similar stakes across multiple competitors and maintain stable holdings over time, which, as we show, facilitates the use of certain mechanisms. Index funds, however, have the lowest incentives and the least capabilities to employ targeted mechanisms. Our analysis therefore suggests that index funds either play no significant role in generating anticompetitive effects or else, at a minimum, systematically employ different mechanisms than other types of institutional investors.

Second, even to the extent that common concentrated ownership is associated with anticompetitive effects, the welfare effects of CCOs are ambiguous.[25] If CCOs do induce the anticompetitive outcomes for which they have been blamed, they also can be expected to push actions, such as the elimination of redundant expenditures, that increase profits by making the firm more efficient. Moreover, where CCOs own some but not all firms in a market, the effects are subtle. Such CCOs have different incentives, which cause them to avoid and even counteract the harms that have been attributed to common ownership.

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[24] *See infra* Section V.B.

[25] *See infra* Section V.C.

Third, our analysis indicates top priorities for further research.[26] The empirical literature, as it has developed so far, raises concerns that deserve significant attention, but are neither sufficient to establish that CCOs engage in selective omission nor well designed to test certain other plausible casual mechanisms. We suggest studies to fill the gap and emphasize the importance of seeking direct evidence of the steps taken by CCOs, and the responsive steps taken by firms, that produce anticompetitive results.

Finally, our analysis shows that, depending upon the specific mechanism at work, wide-ranging reform proposals are likely to be ineffective and counterproductive.[27] The most likely effects of these proposals, if adopted, are greater passivity by shareholders and fragmentation of institutional shareholdings in portfolio companies in all industries, not just in concentrated ones. The proposals would thus be ineffective if passive mechanisms are responsible for anticompetitive results; and they would be counterproductive because they reduce shareholder power and incentives to induce portfolio companies to increase their value in the range of circumstances where doing so is not anticompetitive.

This article proceeds in five parts. Part I sets out the fundamental distinction between conflict and consensus-based mechanisms and demonstrates that the bulk of the empirical evidence relates only to conflictual mechanisms. Part II assesses the plausibility and empirical evidence pertinent to across-the-board mechanisms. Part III analyzes targeted mechanisms. Part IV examines the economic interests of investment advisors, showing the small benefit and comparatively large costs of some mechanisms. Part V discusses the implications.

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[26] *See infra* Section V.D.

[27] *See infra* Section V.E.

I. Conflict and Consensus

As a matter of economic theory, the potential anticompetitive effects of common ownership have long been a concern.[28] As we explain in Section I.A, theories of anticompetitive ownership can be divided into two categories: whether the anticompetitive effects entail conflict, or instead consensus, among the firm's investors. Sections I.B and I.C spell out the implications of this distinction for assessing the empirical evidence—that the bulk of the economic evidence pertains to mechanisms of conflict, not consensus.

A. Two Theories of Anticompetitive Effect

To fix ideas, suppose that a CCO—call it "Whiterock"—owns 10% of the shares of American and Delta Airlines. Whiterock encourages each airline to compete less aggressively by reducing capacity and increasing prices. Whiterock's encouragement might take a variety of forms. The CCO might act as a "cartel ringmaster" by expressly spelling out and coordinating specific actions that each airline should take to maximize profits. Alternatively, Whiterock might make a public announcement about the desirability of capacity reduction, and thereby encourage collusion through consciously parallel decisions taken by the airlines. (To simplify

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[28] *See* Julio J. Rotemberg, *Financial Transaction Costs and Industrial Performance* (Mass. Inst. of Tech., Alfred P. Sloan Sch. of Mgmt., Working Paper No. 1554-84, 1984); Ariel Rubinstein & Menahem Yaari, *The Competitive Market as Cartel Maker: Some Examples* (London School of Economics Working Paper 83/84, 1983); O'Brien & Salop, *supra* note 1; *see also* Bresnahan & Salop, *supra* note 1; Oliver D. Hart, *On Shareholder Unanimity in Large Stock Market Economies*, 47 ECONOMETRICA 1057 (1979) (showing that shareholders agree on profit maximization as the firm goal under perfect competition).

matters for now, let us suppose that the CCO's conduct is lawful or else not detectable by antitrust enforcers.)

Such encouragement by a CCO would appear quite natural. This is particularly true where Whiterock's action, directed at the airline, has the effect of increasing that airline's profits. Indeed, we might expect the airline to welcome such assistance. And the welcoming attitude would be shared by other shareholders. In particular, a *noncommon* concentrated owner (NCO) with a stake in American alone would benefit if Whiterock were successful in inducing collusion. The NCO would neither disagree with nor oppose such an action by the CCO.[29]

However, not all actions by a CCO, taken to increase portfolio profits, are so friendly to the interests of an NCO. Some CCO actions directed at a firm instead *decrease* firm value in order to increase total portfolio profits. For example, a CCO that owns both a branded drug maker and its generic competitor might pressure the generic firm to settle or delay generic entry for the benefit of the branded firm, at the expense of the generic firm.[30] An action that

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[29] To take a further example, suppose Whiterock induces each airline to reduce capacity and lower its profits, for the benefit of its competitors. Each airline is harmed in the first instance by its own action but benefitted by the actions of its competitors. If Whiterock's success in reducing capacity at Delta *depends on Whiterock's success at American*, then the CCO's net positive effect on American is contingent on American's own actions. An NCO that owns shares of American can be expected to support American's participation in the scheme.

[30] For studies of this setting, see, for example, Jin Xie & Joseph J. Gerakos, *Institutional Horizontal Shareholdings and Generic Entry in the Pharmaceutical Industry* 15-16 (Tuck School of Business Working Paper No. 3285161, 2018), http://ssrn.com/abstract=3285161 (examining whether common ownership between generic and brand name drug producers makes generic more likely to settle); Melissa Newham, Jo Seldeslachts & Albert Banal Estañol, *Common Ownership and Market Entry: Evidence from Pharmaceutical Industry* 7-8 (June 1, 2018) (DIW Berlin Discussion Paper No. 1738, 2018), https://ssrn.com/abstract=3194394) (examining whether common ownership between generic and brand name drug producers makes generic less likely to enter).

reduces the firm's profits, in order to benefit the CCO's portfolio, is against the interest of other

shareholders, and in particular against the interests of an NCO. Thus, the NCO can be expected

to disagree with and resist the CCO's preferred action. This disagreement makes the firm the

site of a conflict of interest between the NCO, who seeks to maximize firm profits, and the CCO,

who seeks to alter the firm's objective function and maximize portfolio profits at the expense of

the firm.[31]

This divide—between CCO-induced firm actions (or firm failures to act) that generate a

conflict between CCOs and NCOs and those that generate a consensus—is fundamental.[32] In

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[31] A more subtle form of conflict arises when the CCO's presence has a net positive effect on firm value, but that positive effect is attributable to the CCO's independent effect on the actions of other firms. For example, return to the Whiterock example in note 29 *supra*, but now suppose that Whiterock induces Delta to take the action (beneficial to American) *regardless of Whiterock's success at American*. Whiterock's effect on American is now independent, and an NCO that owns shares of American can be expected to resist this action.

In the Appendix, we offer a numerical illustration of this point in which an American/Delta duopoly faces linear demand and competes in Cournot quantities. As shown there, where NCOs hold similar shares in American and Delta, the addition of a CCO increases the profits of both firms. When NCO shares differ, CCO presence still increases industry profits, but the airline with greater NCO presence benefits disproportionately, because it is in a stronger position to resist the CCO. It benefits from the CCO's influence on competitors, but does not itself engage in much value-reducing action. If the NCO stakes are sufficiently dissimilar, the presence of a CCO actually lowers the value of the airline in which an NCO exerts weaker influence.

[32] In general, the outcome of the conflict at one firm does not depend on the existence or outcome of a conflict in a competing firm. *But see* Einer Elhauge, How Horizontal Shareholding Harms Our Economy— And Why Antitrust Law Can Fix It 44 (Dec. 4, 2018), http://ssrn.com/abstract=3293822 (unpublished draft) ("One cannot separate horizontal shareholding's effect [i.e., the effect of a CCO] on their firm from its effect on the rival firms because horizontal shareholders by definition are invested in both and profit from reducing competition at both, not from hampering one firm to benefit the rival firms."). Elhauge's contrary view misses the quite different effects that a CCO can have on competing firms in a setting where a CCO and NCO have conflicting interests. A stark example is the pharmaceutical setting discussed in note 30 *supra* and accompanying text, in which one firm is harmed to benefit its competitor. More generally, in mechanisms where a conflict exists between CCOs and NCOs, the effect at each firm depends upon (and varies with) the number and importance of NCOs. *See supra* note 31. Indeed, the MHHI-based literature discussed in the next section postulates that a CCO tries to hamper independently each firm in its portfolio for the benefit of rival firms in the CCO's portfolio. *See infra* note 37.

the next section, we spell out an influential method used to estimate the degree to which CCOs

will be successful, in their conflict of interest with NCOs, to alter the objective function of the

firm.

B. Measuring Ownership Conflicts

The insight that a CCO might influence and thereby alter the objective function of the

firm is not new. Bresnahan, O'Brien, and Salop offered an influential model of the proposition

that a CCO, due to its common ownership interests, has a different objective function than an

NCO.[33] They modeled how common ownership would affect firm behavior, under different

assumptions about the degree of influence that CCOs and NCOs have over competing firms. The

key to their analysis is the Modified Herfindahl-Hirschman Index, or MHHI.[34]

As the name suggests, MHHI is a modification of the Herfindahl-Hirschman Index (HHI),

a commonly used measure of market concentration. In any market, the HHI is the sum of the

squared market shares of each competitor. In a monopoly—one competitor with a 100%

market share—the HHI is 10,000. In a duopoly of American and Delta equally sharing the

market, the HHI is 5000 ($50^2 + 50^2$). In a market with a very large number of small competitors,

the HHI approximates 0.

MHHI adjusts the HHI to account for ownership overlap among competing firms.[35] In the

absence of any ownership overlap, the HHI is equal to the MHHI. But if competitors have

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[33] Bresnahan & Salop, *supra* note 1; O'Brien & Salop, *supra* note 1.

[34] Technically, MHHIΔ rather than MHHI, as we explain shortly.

[35] Bresnahan & Salop, *supra* note 1; O'Brien & Salop, *supra* note 1. MHHI has been used as a tool of economic theory to describe both *cross-ownership*, where one firm holds a stake in a rival, and *common ownership*, where an investor (the CCO) holds stakes in competing firms. An early example of the latter

common owners, the MHHI exceeds the HHI. The difference between the MHHI and the HHI, in turn, is referred to as MHHIΔ. To continue with the American/Delta example, if CCOs had total control of both firms, the MHHI is 10,000, which is equal to the HHI (and MHHI) for monopoly. In this situation, MHHIΔ is 5000.[36]

In between, CCOs have partial control. Let us now assume that American and Delta have ten 10% owners apiece. Each owner might be either a CCO or else an NCO that owns a stake in just American or just Delta. If one out of ten owners is Whiterock, a CCO, the MHHIΔ is one-tenth as large as total control—500, compared to 5000.[37] The other nine owners, the NCOs, limit and counteract the influence of the CCO. As the number and importance of CCOs rise, MHHI increases.[38]

The intuition for these results is that a common 10% owner has both the incentive and some ability, as to a firm in which it holds a stake, to induce that firm not to maximize firm value, but instead to maximize the value of the CCO's joint stake in multiple competitors. In the extreme case of ten common 10% owners of all firms, that influence is complete and generates incentives equivalent to those of a monopolist.

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use is O'Brien & Salop, *supra* note 1, at 583 (discussing "proportional control" structures wherein "the Board and managers of the acquiring [sic—acquired] firm take into account their shareholders' interests in other firms . . . [by taking] shareholders' interests into account in proportion to their financial interests in the acquired firm"); *see also id.* at 579 (discussing "partial control" structures in which "decision makers of the acquired firm take into account the fact that certain of its shareholders hold financial interests in competing firms . . . [and] the influence of each shareholder is constrained by the other shareholders of the acquired firm").

[36] MHHIΔ = MHHI – HHI = 10,000 – 5000 = 5000.

[37] This calculation is set out in the Appendix.

[38] In this example, if there are n CCOs and $10 - n$ NCOs, then the numerator of each term is n% instead of 1%, and hence MHHIΔ = 500n. In the Appendix, we explain the basis for this calculation.

MHHIΔ has an important but often overlooked feature: MHHIΔ not only *increases* with the number and importance of *common* concentrated owners (the CCOs), but also *decreases* with the number and importance of *noncommon* concentrated owners (the NCOs). Importantly, NCOs do not merely reduce MHHIΔ mechanically by making fewer shares available to be held by CCOs, as in the ten-owner example above. It is sometimes assumed that this is the only effect.[39] But in fact, there is a second pathway by which noncommon concentrated ownership reduces MHHIΔ, namely by holding the shares not held by CCOs—the noncommon shareholdings—in a more concentrated fashion.

As an illustration, suppose once again that Whiterock owns 10% of both American and Delta; in addition, in each airline, an NCO holds a 10% stake, and the remaining shares are held by small, dispersed owners. Now MHHIΔ equals 2500, halfway to total control. If another NCO acquires from dispersed owners a 10% stake in American, and likewise at Delta, now there are *two* 10% NCOs at each airline. MHHIΔ *falls* to 1667, one-third of the way to total control.[40]

NCOs reduce MHHIΔ on the view that NCOs use their influence to induce a firm to maximize firm value, without regard to the effect on competitors. Put differently, MHHIΔ measures the degree to which a firm's profit maximization decision is *distorted* by concentrated owners with conflicts of interest.[41] As CCOs become more important in firm decision-making,

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[39] For an illustrative view, see Elhauge, *supra* note 32, at 22 ("Increased non-horizontal shareholding means lower levels of horizontal shareholding that would otherwise reduce competition at both the firm and its rivals, and thus diminishes MHHI and predicted anticompetitive effects").

[40] In the Appendix, we offer a more detailed explication of the contrasting effects on MHHI of CCOs and NCOs.

[41] This distortion can be seen directly in AST's formal model, which features a firm objective function in which the firm "maximizes its own profits, plus a linear combination of the profits of other firms in which the shareholders with control hold ownership stakes." Jose Azar, Martin Schmalz & Isabel Tecu, *Internet Appendix for "Anticompetitive Effects of Common Ownership"* 2 (2018),

the distortion increases; as NCOs become more influential, the distortion decreases. Conflicts of interest between NCOs and CCOs thus lie at the heart of the theoretical foundation for MHHIΔ and are reflected in the mathematical result that MHHIΔ increases as CCO ownership rises *but decreases as NCO ownership rises*.

C. Detecting Consensus Mechanisms

The disparate effect of CCOs and NCOs on the level of MHHIΔ limits the set of causal mechanisms tested by any analysis that relies on MHHIΔ. The causal mechanism must be one in which the conduct in question is preferred by CCOs *but is opposed by NCOs* because it reduces firm value. Otherwise, MHHIΔ is not a good measure of the role of common concentrated ownership.

Consider, for example, the AST airline paper. AST run regressions with the price of an airline ticket as the dependent variable and MHHIΔ on a particular route as the key independent variable. MHHIΔ is central to AST's analysis,[42] AST's critics and defenders,[43] and policy recommendations premised on the AST results.[44] Indeed, almost the entire empirical literature on common ownership, including the only other study that directly links common ownership to higher prices,[45] is based either on MHHIΔ or on related measures that, like

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http://www.readcube.com/articles/supplement?doi=10.1111%2Fjofi.12698 [hereinafter AST Appendix]. Formally, a firm maximizes its own profits plus an expression that mirrors the calculation of MHHI. For technical details, see *infra* note 151 of the Appendix.

[42] Other secondary metrics used by AST, such as the overlap among the largest 10 owners, share the feature that they properly test only conflict mechanisms. *See* AST, *supra* note 2, at 1544.

[43] *See, e.g.*, the papers debating the AST results discussed *supra* note 14.

[44] *See, e.g.*, Elhauge, *supra* note 7; PSW, *supra* note 7 (basing policy proposals on MHHI levels).

[45] *See* ARS, *supra* note 13.

MHHIΔ, decrease with the importance of NCOs.[46] Empirical evidence that CCOs employ

consensus mechanisms is thus lacking.

This entire literature is thus limited to testing conflict mechanisms, where CCOs and

NCOs try to push managers into opposite directions. Indeed, although AST is usually

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[46] *E.g.*, Miguel Anton, Florian Ederer, Mireia Gine & Martin Schmalz, *Common Ownership, Competition, and Top Management Incentives* (European Corporate Governance Institute, Finance Working Paper No. 511/2017, 2017), http://papers.ssrn.com/abstract=2802332 [hereinafter AEGS]; Rebecca DeSimone, Stealth Ownership and Executive Incentives (June 5, 2017) (unpublished manuscript); Heung Jin Kwon, Executive Compensation Under Common Ownership (Nov. 29, 2016) (unpublished manuscript); *but see* Lantian (Max) Liang, *Common Ownership and Executive Compensation* (Univ. Texas—Dallas Working Paper, 2016) (using metric of common ownership that does not imply conflict between CCOs and NCOs). We discuss these four compensation papers *infra* Part II.

In addition, studies of common ownership have examined investment levels, *see* German Gutierrez Gallardo & Thomas Philippon, Ownership, Governance and Investment (Mar. 2017) (unpublished manuscript) (regressing investment on HHI, MHHIΔ and an interaction term and finding that HHI and MHHIΔ are both negatively related to industry level investment, but the interaction term is positively related to investment); German Gutierrez Gallardo & Thomas Philippon, *Investment-less Growth: An Empirical Investigation* (Nat'l Bureau of Econ. Research, Working Paper No. 22897, 2016), http://ssrn.com/abstract=2880335 (finding positive association between common ownership and investment but cautioning that results do not establish causality).

A third set of papers examines outcomes within the pharmaceutical industry. *See* Xie & Gerakos, *supra* note 32 (using as metric $w_{jk}/(1+ w_{jk})$ where w_{jk} is the sum of the products of the generic drug producer's shareholders' respective voting percentage in the generic times the generic shareholders' respective equity stake in the brand name drug producer divided by the sum of the products of the generic drug producer's shareholders' respective voting percentage in the generic times the generic shareholders' respective equity stake in the generic; w_{jk} is the term multiplied by market shares and then summed over all firm pairs to calculate MHHIΔ is study of relationship between common ownership between generic and brand name drug producers and settlements)); Newham et al., *supra* note 32 (examining relationship between entry and common ownership and framework where interests conflict).

Finally, MHHI is used in Alon Brav, Wei Jiang & Tao Li, *Picking Friends Before Picking (Proxy) Fights: How Mutual Fund Voting Shapes Proxy Contests* (Columbia Business School Research Paper No. 18-16, 2018), http://ssrn.com/abstract=3101473 (examining relationship between MHHI and votes in proxy contests); Miguel Anton, Florian Ederer, Mireia Gine & Martin C. Schmalz, Innovation: The Bright Side of Common Ownership? (Mar. 10, 2017), http://ssrn.com/abstract=3099578 (unpublished manuscript) (common ownership can mitigate impediments to corporate innovation); Svetoslav Semov, Common Ownership, Competition and Firm Financial Policy (Apr. 19, 2017), http://ssrn.com/abstract=2888722 (unpublished manuscript) (finding that increases in MHHIΔ are associated with lower cash holdings). An exception is Marios A. Panayides & Shawn Thomas, Commonality in Institutional Ownership and Competition in Product Markets (May 8, 2017), http://ssrn.com/abstract=2965058 (unpublished manuscript) (finding that some measures of common ownership are significantly related to industry profitability, but not finding any significant relationship to prices).

characterized as testing the hypothesis that *CCOs have an anticompetitive effect*, their research design is equally consistent with testing the hypothesis that *NCOs have a procompetitive effect*.[47] An MHHI-based design thus not merely fails to test the use of consensus mechanisms favored by CCOs *and* NCOs; its empirical results, that increased NCO ownership is associated with lower prices, are inconsistent with their use.

To be sure, even though not tested by these papers, a CCO might well encourage firms to compete less aggressively in a way that an NCO would applaud. For example, as suggested in Section I.A, the CCO might serve as a cartel ringmaster or otherwise enhance collusive conduct by the rival firms. But the theoretical case for such assistance could not be grounded on the firm having a *different* objective function on account of the investment by CCOs. After all, both NCOs and, for that matter, dispersed owners would share this objective—to increase the firm's profits. Rather, the theoretical case would need to be grounded in a superior *ability* of common owners to accomplish this result, a topic that the MHHI line of inquiry—from Bresnahan, O'Brien and Salop to the modern empirical literature—does not address.

Common owners have some superior ability, the case must go, to induce firm-value increasing actions that require some form of coordination or parallelism between competitors. A coherent argument along these lines would need to specify what, specifically, common owners do to facilitate coordination that cannot be done equally well by firm managers,

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[47] This point has been acknowledged by one of AST's authors. *See* Martin C. Schmalz, Common Ownership and Competition: Facts, Misconceptions, and What to Do About It (Dec. 6, 2017), http://ssrn.com/abstract=3176696 (background paper for Organization for Economic Co-operation and Development roundtable on Common Ownership by Institutional Investors and Its Impact on Competition, DAF/COMP/WD(2017)93) ("Perhaps more important than the presence of common ownership is the absence of powerful undiversified shareholders who would benefit from increased competition.").

noncommon owners, or a host of other consultants and advisors. As applied to institutional investors, that account would need to establish that investment advisors possess the requisite information, power, and incentives to take such actions.[48] The theoretical basis for such an argument and the manner in which it would be tested empirically, however, would be entirely distinct from theoretical and empirical work that is premised on MHHI.

II. Across-the-Board Mechanisms

Beyond the question of conflict versus consensus, mechanisms that link common ownership to anticompetitive effects differ along a second dimension. Some mechanisms target specific decisions of the firm, while others operate across the board, affecting the entirety or a broad swath of the firm's operations. In this Part, we assess across-the-board mechanisms, deferring the analysis of targeted mechanisms to Part III.

The most commonly mentioned across-the-board mechanism is the structure of executive compensation—in particular, whether managers are paid for performance and thereby encouraged to compete aggressively in order to maximize firm value. In terms of the airline example, Whiterock benefits if American managers' low-powered incentives induce managers to live "the quiet life," thereby raising the value of Whiterock's holdings in Delta. Commentators have suggested that CCOs may actively work against pay for performance.[49]

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[48] Some scholars have begun to develop such a theory. *See* Menesh S. Patel, *Common Ownership, Institutional Investors, and Antitrust*, 82 ANTITRUST L.J. 279 (2018) (suggesting that a CCO may, by virtue of its ownership stake, have information about firm strategies that enables it to detect deviations from a collusive agreement); Edward B. Rock & Daniel Rubinfeld, Common Ownership and Coordinated Effects (2018) (unpublished draft) (suggesting that CCOs may have superior knowledge, influence, incentives, credibility, and power to support collusion, compared to NCOs).

[49] *See, e.g.*, AEGS, *supra* note 46; *see also* AST, *supra* note 2, at 1556 (citing AEGS).

More influential has been the proposition that CCOs are passive, and simply neglect or

otherwise passively fail to encourage more incentive compensation, leaving managers free to

live the quiet life.[50]

To a striking degree, however, across-the-board mechanisms are neither well-tested nor

generally plausible.[51] As Section II.A explains, the leading empirical studies do not provide a

proper test of the passive account. Moreover, the design of single-industry studies makes them

ill-suited for picking up across-the-board effects. In principle, cross-industry studies might help

fill the gap, but these have limitations of their own. In addition, some across-the-board

mechanisms are ineffective or infeasible and hence implausible, for reasons set out in Section

II.B.

A. Empirical Evidence

1. Detecting Passive Mechanisms

As explained in Part I, studies of common ownership, including AST's airline study, rely

upon MHHI or other measures of common concentrated ownership.[52] However, these

measures are poorly designed to test the role of passivity.

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[50] AST, *supra* note 2; Jose Azar, Martin C. Schmalz & Isabel Tecu, *Why Common Ownership Creates Antitrust Risks*, CPI ANTITRUST CHRONICLE, June 2017, at 10, 15 [hereinafter AST CPI] (arguing that it is "*an absence of incentives to compete (rather than an increased incentive to collude)* that leads to reduced competition under common ownership") (emphasis in original); *see also* Einer Elhauge, *The Growing Problem of Horizontal Shareholding*, CPI CHRON., June 2017, at 2 ("Nor does the anticompetitive effect require any communication between shareholders and managers, because managers know whether their leading shareholders are horizontal and know that lessening competition benefits those shareholders."); Elhauge, *supra* note 7, at 1270 (similar).

[51] These points generally apply to conflictual and consensus-based mechanisms alike.

[52] *See supra* Section I.C.

The problem is that some ownership changes alter the level of common concentrated ownership, yet have no effect on the level of passivity. Consider, for example, a shift from dispersed ownership to ownership by a CCO. As we showed in Part I, CCOs increase MHHIΔ, while NCOs lower MHHIΔ. Dispersed owners, due to their low stakes and low influence, literally drop out of the equation.[53] A change in ownership from dispersed owners to CCOs increases MHHIΔ, yet should have no effect if CCO passivity is the source of anticompetitive effects. The same is true of a merger of two CCOs. The problem is not limited to MHHIΔ or similar measures, but is endemic to any use of common concentrated ownership as the independent variable of interest. Common concentrated ownership measures are thus flawed metrics to test such passive mechanisms.[54]

Rather, a proper metric of passive mechanisms would *only* consider the extent to which NCOs are present in the shareholder base. CCO ownership would figure into such a comparison only indirectly, to the extent it replaces NCO ownership but not, as it does in the AST study, to the extent it replaces DOs or reflects increased concentration among CCOs. An empirical study of passive mechanisms would thus be very different from the design of AST and other studies.[55]

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[53] *See* O'Brien & Waehrer, *supra* note 14, at 29.

[54] The AST authors, in response to the criticism that they have not identified an observable mechanism linking CCOs to higher prices, have replied that such a critique "seems to reflect a misunderstanding of the economic mechanism that we argue can lead to anti-competitive outcomes. . . . It is hard to see why not implementing aggressive competition needs a mechanism or could produce measurable traces." AST CPI, *supra* note 50, at 15. This reply misses the mark insofar as our criticism is concerned. While a mere, passive failure by CCOs to implement aggressive competition may leave few traces, such a failure would not explain AST's empirical results; hence the results provide no support for the use of this mechanism.

[55] Other studies with the same limitation include ARS, *supra* note 13, and Xie and Gerakos, *supra* note 32.

2. Single-Industry Studies

Single-industry studies have a further drawback in detecting the use of across-the-board

mechanisms, stemming from the specific structure of the tests performed in these studies. For

example, AST exploit the fact that different airlines compete on different routes. They relate

route-level airline prices to a route-level measure of common ownership.[56] In regressions with

route-level price as the dependent variable and route-level common ownership and various

control variables as independent variables, route-level common ownership is positively related

to route-level prices.

This structure makes the study well suited to picking up targeted effects at the route

level. AST are able to distinguish the effects of common concentrated ownership from general

changes in competitive strategy over time. If a fund acquires a stake in some but not all

competitors, the route-level model predicts a differential impact on price for different routes,

depending on which airlines compete in each route. This differences-in-differences design

employed by AST is structured to pick up only such *differential* route effects, not effects that

arise equivalently for the entire route network.

But the setup of the study is poorly designed to test for firm-wide, across-the-board

effects. Route-level common ownership is not a proper metric to evaluate a mechanism that is

firm-wide rather than route-specific.[57] Moreover, because the airline study includes

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[56] The measure used, route-level MHHIΔ, is calculated by combining route-level market share data with
information about the ownership structure on that route.

[57] In an online appendix, AST report a set of regressions that includes a variable for an airline's average
MHHIΔ across all its routes. *See* AST Appendix, *supra* note 41. Average MHHIΔ across all routes is
positively associated with route-level prices. *See* Elhauge, *supra* note 32 (emphasizing this result as
evidence of firm-wide effects). However, average MHHIΔ across all routes lacks theoretical foundation
as an explanation for route-level pricing. Its level for (say) American flying on route #1 depends on

approximately 7000 different routes but only 56 different time periods, the principal source of

variation, as to both common ownership and prices, is likely variation across routes rather than

variation over time. But, from the perspective of an across-the-board mechanism, it is only

price variation over time that is relevant. An across-the-board mechanism, such as making pay

less sensitive to performance, should not generate route-level price variations in response to

differences in route-level common ownership. Thus, an empirical study of across-the-board

mechanisms would be quite different from the design of AST and other single industry

studies.[58]

3. Cross-Industry Studies

In principle, cross-industry studies are better suited than single-industry studies to

detect the presence of across-the-board mechanisms.[59] A second strand of the empirical

literature takes just such an approach by examining the relationship between common

concentrated ownership and executive pay for performance across different industries.

Considered as a set, however, the results of these papers yield no firm conclusion. For

example, Anton, Ederer, Gine, and Schmalz (AEGS) find a negative association between MHHI

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whether, on a different route #2 that American flies with Delta and United, Delta and United have
common owners. That attribute of route #2 has no evident impact on the price American would charge
on route #1.

[58] Other studies with the same limitation include ARS, *supra* note 13; Xie and Gerakos, *supra* note 32;
and Newham et al., *supra* note 32.

[59] On the other hand, industry-level analysis weakens any causal interpretation and raises concerns
about omitted variable bias. *See* Martin C. Schmalz, *Common-Ownership Concentration and Corporate
Conduct*, 10 ANNUAL REV. FIN. ECON. 1, [20–21] (2018).

Electronic copy available at: https://ssrn.com/abstract=3210373

and their measure of pay for performance.[60] DeSimone largely finds no statistically significant

relation between MHHI and her measure.[61] Kwon finds a positive association between MHHI

and relative performance incentives.[62] Liang finds that CEO compensation is positively related

to the performance of industry peers that share at least one common blockholder.[63]

Moreover, the papers share several limitations that recommend caution in interpreting

their results. First, all of them rely on ownership data that ignores the holdings of important

blockholders. The ownership data in these studies is based upon quarterly reports filed by large

institutional investors—so-called Form 13F filings. But other owners who do not file Forms 13F,

such as firm founders, managers, and (non-institutional) corporate holders, are often major

blockholders. A survey conducted by Alex Edmans and Clifford Holderness found that, for the

firms in their sample, 52% had an individual and another 11% had a corporation as its largest

owner.[64] For firms where the largest owner was an individual, the individual's block size was

32%, and the individual had a board representative in 91% of the firms. For firms in which the

largest owner was a corporation, the analogous figures were 39% and 83%.

Individual and corporate blockholders are presumptively much less likely to be CCOs

than the institutional investors that appear in the Form 13F data. The omission of such owners

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[60] *See* AEGS, *supra* note 46.

[61] DeSimone, *supra* note 46.

[62] Kwon, *supra* note 46.

[63] Liang, *supra* note 46.

[64] Alex Edmans & Clifford G. Holderness, *Blockholders: A Survey of Theory and Evidence* 95 tbl. 2 (European Corporate Governance Institute Finance Working Paper No. 475/2016, 2017), http://ssrn.com/abstract=2820976 (examining ownership in a sample of 375 firms as of 1995). All such blockholders had an ownership share of at least 5%. These results exclude 15 firms (out of 375) in which no individual or entity owned at least 5%.

is thus likely to yield incorrect calculations of MHHI. Moreover, to the extent that individual

blockholders are executives, they have substantial performance incentives derived from their

stockholdings that are largely ignored in the compensation studies.[65]

A further problem is the unclear theoretical relationship between MHHIΔ and

compensation at a particular firm. MHHIΔ is measured at the industry (or product market) level,

not the firm level, and can change even if nothing of consequences changes for a firm in the

industry. To illustrate, if a holder of stock in Delta were to acquire stock in United, industry

MHHIΔ would rise; but it is not evident why this should have any effect on executive

compensation at American, which experienced no change in common ownership.[66] On the

whole, therefore, these papers shed little light on whether many CCOs employ compensation-

related mechanisms.

B. Plausibility

The limitations in the extant empirical evidence about across-the-board mechanisms

does not mean that such mechanisms are not used. From a theoretical and anecdotal

perspective, compensation-related mechanisms are feasible, in the sense that CCOs have some

power and ability to employ the mechanism. Institutional shareholders regularly vote on

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[65] The same criticism applies to other papers that rely exclusively on 13F data, such as Gallardo & Philippon, *supra* note 46.

[66] This objection does not apply to Liang, which (unlike the other compensation papers) uses a firm-level metric of common ownership. But his results raise other questions. In particular, Liang finds that the positive relationship between CEO compensation and competitor performance at firms with common ownership is limited to markets with low levels of HHI (i.e., the most competitive markets) and to firm pairs with low levels of combined market shares. Yet, incentives of CCOs to induce executives to compete less aggressively should be weakest in the most competitive industries and with respect to firms with the lowest market shares.

compensation structures in say-on-pay and other votes, frequently discuss compensation in engagement meetings,[67] and at least implicitly claim expertise in evaluating compensation. By contrast, other across-the-board pathways suggested by commentators are unlikely to be feasible. In particular, it has been suggested that CCOs might try to manipulate a firm's capital structure or payout policies to make them compete less strongly or elect directors who favor a strategy involving less competition.[68] But shareholders have no direct influence over capital structure and payoff policies.[69] And while shareholders elect directors, most elections are uncontested, and there is no evidence that outside director candidates in uncontested elections stand for any particular competitive strategy or that institutional shareholders are given a choice of candidate to fill board openings.[70]

Beyond questions of feasibility, compensation-based mechanisms face two significant problems that undermine their effectiveness: the dilution of managerial incentives overall, and the relatively long time frame needed to accomplish the change.

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[67] AST, *supra* note 2, at 1556.

[68] AST, *supra* note 2, at 1553.

[69] Moreover, the link between capital structure or payout policies and price variation in particular product markets is highly unclear. *Cf.* AST, *supra* note 2, at 1553 (acknowledging that any such link is "subtle").

[70] *See* Rock & Rubinfeld, *supra* note 14, at 17. To be sure, activist hedge funds sometimes obtain board representation without an election contest and, to that extent, have some ability to choose the person to add to the board. Activist hedge funds, however, are generally not CCOs. The possibility that a CCO will use the threat of casting "withhold" votes in uncontested elections on directors to pressure incumbent directors to pursue a targeted anticompetitive strategy (as opposed to the possibility that CCOs use votes to elect certain directors who favor a business strategy involving less competition) is discussed *infra* Part III.

1. Diluted Managerial Incentives

Most compensation-related mechanisms do not give the CCO an effective method to increase portfolio value because they weaken managers' overall incentive to compete.[71] Most compensation schemes are a blunt instrument, affecting managerial incentives generally. Use of such a mechanism is likely to have substantial adverse side effects on other aspects of the firm's operations. A CCO prefers managers to have weak incentives to maximize firm value only to the extent that this benefits another portfolio firm, but prefers strong incentives to maximize firm value in all other respects.

Dulling managerial incentives often carries heavy costs. AST borrow the phrase "quiet life" from a well-known article by Marianne Bertrand and Sendhil Mullainathan.[72] But that article actually illustrates these costs. of dulling managerial incentives. Bertrand and Mullainathan use the term for managers who pay inefficiently high wages, fail to close old plants or to open new ones, and run less productive plants. Whether CCOs accrue sufficient benefits from the less aggressive competition that may also result from reduced incentives, alongside these inefficiencies, is far from clear.

A wholesale dilution of incentives makes sense, if at all, only for firms where the bulk of managerial effort otherwise would be devoted to competition at the expense of other CCO portfolio firms. Where competition is directed against nonportfolio firms, or managerial actions increase the firm's profits without significantly harming rivals' profits, the costs of diluting

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[71] Two exceptions are noted below.

[72] Marianne Bertrand & Sendhil Mullainathan, *Enjoying the Quiet Life? Corporate Governance and Managerial Preferences*, 111 J. POL. ECON. 1043 (2003). Those authors, in turn, draw upon J.R. Hicks, *Annual Survey of Economic Theory: The Theory of Monopoly*, 3 ECONOMETRICA 1, 8 (1935) ("The best of all monopoly profits is a quiet life.").

incentives are likely exceed the benefits, and a CCO considering such a strategy is likely to steer

clear.[73]

An exception to this critique arises when a CCO favors absolute over relative

performance incentives.[74] Relative performance incentives, where compensation is based on

how a firm's performance compares to the performance of other firms in the industry,[75] have

both advantages and disadvantages over the more common absolute performance incentives.[76]

Compared to absolute performance incentives, relative performance incentives tend to

penalize firm managers if their competitors do well and reward them if competitors do poorly.

Since CCOs, unlike NCOs, are harmed when managers reduce competitor value and benefit

when managers increase competitor value—exactly the opposite of what relative performance

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[73] This discussion presumes that the CCO is capable of conscious strategizing. If the CCO passively accepts the managerial quiet life because it lacks any strategy at all—think of an index fund running on autopilot—then the fund's status *as a common owner* has no significance; it is a merely coincidental effect. For further discussion, see *infra* Part V.

[74] Other critiques may still apply, such as the need (discussed next) for a longer-term perspective that is often lacking in a CCO.

[75] We do not focus on a further type of relative performance incentive, which is to compare firm performance to the performance of the economy rather than a single industry.

[76] Relative performance incentives have the desirable property of imposing lower risk-bearing cost on managers than absolute incentives, which reward managers in part based on industry-wide and economy-wide developments that bear on firm performance but may be outside managerial control. At the same time, managers have some control over the extent to which a firm is exposed to industry-wide and economy-wide developments as well as over the industries their firms operate in, thus reducing risk-bearing costs (while potentially introducing other distortions). As for relative performance incentives, such incentives are hard to implement for firms that operate in multiple or hard-to-define industry segments. Moreover, in concentrated industries, relative performance incentives provide excessive incentives for managers to take actions that *reduce* competitor value and insufficient incentives for actions that increase both firm and competitor value. Actions that increase both firm value and competitor value can be either anticompetitive or procompetitive (for example, a cost saving device that is easily copied by competitors).

incentives reward—CCOs may actively favor, or passively fail to oppose, the use of absolute

over relative performance incentives to a greater extent than NCOs.[77]

2. Long Time Horizon

Across-the-board strategies based on voting or passivity, as opposed to direct

communications with firms, have a second problem that limits their effectiveness. It may take

several years of voting or passivity—whether about compensation or something else—before

the votes or failure to act affects competitive strategy. A multi-year lead time is likely to be

unworkable, at least as to CCOs that mostly manage active funds.[78]

The asset-weighted average portfolio turnover rate of actively managed U.S. equity

mutual funds and ETFs was 51% in 2011.[79] Even over a single year, industry holdings of active

funds change significantly. Moreover, market structure would often also change. At the time a

CCO casts its first vote or first decides to be passive, it would thus be difficult to predict what

competitive strategy will maximize its portfolio by the time it comes to fruition.[80] Thus,

strategies based on voting and passivity are not likely to be effective for active funds.

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[77] Liang, *supra* note 46, presents empirical evidence that institutional cross-ownership (defined as a common 5% holder for a firm pair) is associated with a positive relationship between CEO compensation and competitor performance. While this finding may be due to CCOs disfavoring relative performance measures, it is limited to markets with low levels of HHI (i.e., the most competitive markets) and to firm pairs with low levels of combined market shares.

[78] We return to this aspect of index funds *infra* Section IV.B.

[79] *See* VANGUARD GROUP, INC., MUTUAL FUNDS—LIKE ETFS—HAVE TRADING VOLUME 5 (Nov. 2012), http://personal.vanguard.com/pdf/s344.pdf. By comparison, the turnover rates for index mutual funds and ETFs were 9% and 15%.

[80] Although, as discussed, AST do not properly test for across-the-board mechanisms, they find that only common ownership by shareholders with a long-term horizon has a significant positive effect on prices. AST, *supra* note 2, at 1546.

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An exception to this critique arises in contested elections and in companies targeted by activists more generally, given the shorter time frame for action. Here, shareholders are faced with an activist who proposes a different business strategy than incumbent management, a component of which may include a different competitive strategy. By lending support to management or the activist, CCO may affect competitive strategy more quickly.[81]

III. Targeted Mechanisms

Targeted mechanisms relate to specific anticompetitive actions of the firm. As an illustration of the difference between targeted and across-the-board mechanisms, suppose that American, Delta, and United compete on two distinct routes. On Route 1, American and Delta share the market equally. On Route 2, by contrast, American and United share the market equally. As before, Whiterock owns 10% of American and Delta—but not United.

Compare three hypothetical actions that American might take, each of which requires the same amount of managerial effort and increases American's value by the same amount:

[1] reduce the price charged on Route 1, thereby reducing the profits and value of Delta;

[2] reduce the price charged on Route 2, thereby reducing the profits and value of United; or

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[81] As activists are generally NCOs, the most likely reason why strategies may differ on this dimension is that a management team, used to enjoying the easy life, faces an activist hedge fund advocating increased competition to raise firm value. This hypothesis could be tested by checking whether, in such situations, common ownership is associated with support for incumbents in concentrated industries.

[3] move its headquarters to a cheaper location, which saves money and has no effect

on its competitors' profits.

An across-the-board strategy, along the lines discussed in Part II, would be for

Whiterock to reduce managerial efforts at American by altering its management compensation

system, which would affect all three actions.[82] A targeted strategy, by contrast, would have

Whiterock induce American to reduce the price on Route 2 and move its headquarters but *not*

to reduce price on Route 1 (an action that, if taken, would increase the value of American but

harm Whiterock's investment in Delta).[83]

Targeted mechanisms of this sort—i.e., that give rise to conflict between a CCO and

other investors—are well tested by the empirical literature discussed in Part I. However, as we

explain in Section II.A, real-world CCOs would face substantial barriers in implementing

targeted active strategies. In Section II.B, we offer the alternative mechanism of selective

omission, which is equally consistent with the empirical evidence but is more plausibly

employed as it entails lower barriers to implementation.

A. Active Mechanisms

Targeted mechanisms avoid the blunt effects of across-the-board mechanisms: many

profit increasing actions are left undisturbed. Narrowness, however, comes at a price. First, this

targeted strategy may require the CCO to identify which specific actions harm its portfolio.

Here, Whiterock would have to know enough about route-level operations (capacity, prices,

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[82] *See supra* Section II.B.

[83] If Whiterock also owned shares in United, it might also oppose the price reduction on Route 2.

costs, and competitors) to form a view that competition on Route 1 is bad for its portfolio.[84]

Second, at least indirectly, Whiterock would need to communicate its preferences to

management: do not reduce price on Route 1, but do reduce price on Route 2 and move your

headquarters. Third, Whiterock would have to induce management to take the action that the

CCO prefers. Fourth, Whiterock would have to determine whether management took the action

Whiterock sought. Put differently, effective implementation of a targeted active strategy

requires generation, transmission, inducement, and monitoring.

Commentators have made several suggestions that bear on how a CCO might generate,

transmit, induce, and monitor observance of a targeted strategy. As to transmission, for

example, AST point to institutional investors' frequent meetings with management during

which competitive strategy could be discussed.[85] As to inducement, they suggest that a CCO

obtains leverage over managers through its voting power and its ability to sell shares and

depress the market price of the firm's stock.

While we agree with AST that a CCO may be able to generate, transmit, induce, and

monitor observance of a targeted strategy, doing so is complex. The complexities are enhanced

by the nature of the CCOs that have been the focus of recent studies and debates. In particular,

an effective targeted strategy probably requires the support and involvement of some top-level

managers as well as several other lower-level employees of the CCO, together with

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[84] It would generally not be sufficient for just firm management to have such knowledge since a CCO would need to monitor whether management faithfully executes the selective non-competition strategy.

[85] AST, *supra* note 2, at 1554–56. AST also note that "market-level capacity decisions are a frequent topic of conversation" in public earnings calls. *Id.* at 1555. However, the conversations cited appear to be sell-side analysts, rather than representatives of CCOs.

participation of senior executives and lower-level employees at the firm. Moreover, a targeted strategy is likely to generate some dissent both within the CCO and between the CCO and the firm and other firm owners. A targeted strategy is thus much more likely than an across-the-board mechanism to leave strong traces and dissatisfied players willing to point to them.

To see this and other difficulties with executing targeted active strategies, it is necessary to examine more closely the entities that are treated as CCOs. With a few exceptions, the most prominent CCOs identified in the literature about anticompetitive common ownership are entities with names such as "Blackrock," "Vanguard," or "Fidelity." That literature treats each as a single entity—as though there is only a single Fidelity, Vanguard and Blackrock. Consider, for example, "Fidelity," as analyzed by AST. "Fidelity" is FMR LLC ("FMR"), the legal entity that files the 13F forms that supply the ownership data AST use. FMR is an investment advisor and has investment power over the stock listed in the 13F. But FMR is not the "owner" of these shares in any economic sense. Rather, the shares are owned by various mutual funds sponsored by Fidelity and by other Fidelity clients.[86] The mutual funds, in turn, are owned by mutual fund shareholders, not by FMR or any FMR affiliate.

Treating "Fidelity" as a single owner of the assets of the various Fidelity mutual funds and its other clients is deeply problematic in two respects. First, that treatment implies that FMR acts like a single *owner*—and hence that it seeks to maximize its total portfolio. But in fact, as we explain in Part IV, an investment advisor that has investment power over certain shares has incentives that are quite different from those of an individual with an ownership stake in

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[86] *See* John Morley, *The Separation of Funds and Managers*, 123 YALE L.J. 1118 (2014); *see also* Douglas H. Ginsburg & Keith Klovers, *Common Sense About Common Ownership*, CONCURRENCES REV., May 2018, at [12].

those shares. Second, it implies that FMR acts like a *single* owner. As we now explain, such

treatment obscures the multi-layered structure and divergent interests within the investment

advisor.

Investment advisors are complex organizations. To run their investment and voting

operations, larger investment advisors generally employ fund portfolio managers, analysts, and

a centralized voting unit. These groups have different economic interests, different powers, and

different competencies. Fund portfolio managers make the ultimate investment decisions for

specific funds managed by the investment advisor. Fund portfolio managers differ from fund to

fund within the same investment advisor complex. For example, Fidelity's Contrafund has been

run by William Danoff since 1990 and its Growth Company Fund by Steven Wymer since 1997.

Fund portfolio managers are generally viewed as having incentives to maximize the

value of the fund they manage. Thus, Danoff cares much less about the performance of other

Fidelity funds than about the performance of his Contrafund.[87] The portfolio of a specific fund

(such as the Contrafund) is likely to differ from the portfolio of another fund (such as the

Growth Company Fund) and from the aggregate portfolio holdings of the investment advisor

(such as FMR) in the relative proportion of shares of competing firms held. As a consequence,

fund portfolio managers within the same investment advisor complex have interests that

conflict with one another and with the interests of the advisor as a whole. And since individual

funds will tend to own many fewer shares in a competing firm than the reported aggregate

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[87] *See* Fidelity Contrafund, Statement of Additional Information ("The primary components of each portfolio manager's bonus are based on the pre-tax investment performance of the portfolio manager's fund(s) and account(s) measured against a benchmark index and within a defined peer group assigned to each fund or account.").

stake of the investment advisor, no individual fund portfolio manager would have the influence over a firm attributed to the advisor based on the advisor's Form 13F stake.

This conflict among individual funds is neglected in analyses that view investment advisors such as Fidelity as a consolidated whole. For example, as characterized by AST, Fidelity at the end of 2016 "owned" 5.5% of the stock of Southwest, 7.3% of the stock of JetBlue, 10.7% of the stock of Spirit Airlines, and sizable but smaller stakes in several other airlines, making it one of the most significant CCOs. But the Fidelity Contrafund owned 1.9% in Southwest—which would make the fund Southwest's seventh largest holder—and no other airline stock. Danoff would thus have incentives to oppose any strategy that reduced the value of Southwest even if it increased overall Fidelity portfolio value. To be sure, the Fidelity Growth Company Fund held 0.5% of Southwest, 3.0% of JetBlue and 3.8% of Spirit Airlines.[88] Its portfolio value, like Fidelity's overall, could increase if Southwest sacrificed some of its profits for the benefit of its competitors. But its 0.5% stake would give Wymer little sway over management of Southwest, and it is unclear why Southwest would think that Wymer represented the entire 5.5% holdings of Fidelity.

Most investment advisors also employ analysts who specialize on certain firms and industries, supply research to fund portfolio managers, and are evaluated by them. Although some investment advisors have different analyst teams work with different fund portfolio managers, often a single analyst, or a single group, covers a certain portfolio company for all funds on a centralized basis. Since analysts focus on a smaller subset of firms than fund

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[88] *See* Fidelity Growth Company Fund, Annual Report (Form N-CSR) (Nov. 30, 2016), http://www.sec.gov/Archives/edgar/data/707823/000137949117000251/filing936.htm.

portfolio managers do, they probably have the largest amount of firm-specific information. However, their principal focus is to predict short and medium-term stock price changes to inform buy and sell decisions, not to generate suggestions to enhance portfolio value. While an analyst would benefit if the stock price of a firm she recently recommended to fund portfolio managers increased, it is unlikely that she would obtain equivalent benefits if the shares of a firm that has not been touted went up.

The centralized voting unit, as a practical and sometimes as a legal matter, generally controls the voting of the shares of advised funds and of other client assets where the client has delegated voting authority to the advisor. The voting unit may communicate with fund portfolio managers and analysts before it makes voting decisions and, depending on the advisor, fund portfolio managers or other fund officials have greater or lesser authority to deviate from the voting recommendations made by the voting unit. But the voting unit lacks the know-how and, ordinarily, the incentives to develop a targeted strategy and to monitor whether it is faithfully executed.

Of the three groups, analysts who cover an entire industry on a centralized basis are most likely to possess the industry knowledge and financial expertise to generate a targeted active strategy and to monitor its execution. Moreover, their job, at least to some extent, relates to all industry holdings by the investment advisor. Analysts who assist only certain fund portfolio managers or who cover only certain firms would be unlikely to take into account, respectively, holdings of other funds or in other firms. Fund portfolio managers would usually lack the requisite industry knowledge and also have potentially conflicting incentives to maximize fund portfolio value, rather than the aggregate portfolio value of the investment

advisor. Officials working at the investment advisor level and dealing with voting are unlikely to

possess the requisite industry knowledge and financial expertise.

Once generated, the strategy would have to be transmitted and its observance induced.

But analysts, on their own, are likely not able to do that. They would have to convey the

favored strategy to senior executives of the portfolio company—lower level firm managers

would be unlikely, on their own, to agree to a strategy that lowers firm profits. But analysts lack

control over investments and voting and generally stand lower in the hierarchy of mutual fund

officials than large fund portfolio managers.[89] Even if senior firm executives are willing to agree

to meet analysts, they may not be willing to heed their demands to pursue a firm value-

decreasing strategy.[90]

To put pressure on firm executives, analysts might try to brief voting officials on the

strategy. Investment advisor officials dealing with voting hold regular meetings with

management and the board and, perhaps, could use these meetings, and their control over

voting decisions, to induce executives to adopt the strategy favored by the analysts. Doing so

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[89] Equity portfolio managers with more than 10 years of experience had average salaries of $500,000 to $600,000. http://www.wallstreetoasis.com/forums/how-much-do-equity-portfolio-managers-make.

[90] To be sure, analysts could threaten managers with making a negative recommendation that would induce fund portfolio managers to sell the firm's stock. (Note that accounts that rely on such threats likely accept, at least implicitly, that the strategy is firm value-reducing; otherwise a threat seems unnecessary.) But it is doubtful that such threats could induce a firm to adopt a value-reducing strategy. If a stock sale depresses the stock price and the negative report is not warranted by fundamental factors, the fund would lose value and the analyst would look foolish. And since the anticompetitive strategy the CCO wants to induce is *value-reducing*, a firm's refusal to execute it should raise rather than lower its stock price. Moreover, analysts rely on good relations with management to obtain clarifications and get their questions answered. Antagonizing management is generally not conducive to their career prospects.

would be unusual, though, and almost certainly raise eyebrows.[91] Voting officials normally

discuss matters like compensation structure and corporate governance—issues on which they

regularly have to vote—or broad issues which require little firm-specific knowledge, like

whether the board has an executive succession plan or risk-management controls, and not

targeted strategies like route-level pricing.[92]

Alternatively, top-level managers of the advisor could get involved in the transmission

and inducement process. Top managers of the advisor would in principle have the strongest

incentives to maximize the overall profitability of the advisor (rather than fund-level returns).

Top advisor managers could arrange private meetings with senior firm executives, with or

without analysts present, where they would convey their thoughts on how the firm should be

managed.[93] Top managers of an advisor would more likely be viewed as peers by senior firm

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[91] *See* Dorothy S. Lund, *The Case Against Passive Shareholder Voting*, 43 J. CORP. L. 493, 519 (2018) ("active fund analysts, not members of corporate governance teams, are the primary drivers of informal meetings and interactions with management").

[92] *See, e.g.*, VANGUARD GROUP, INC., INVESTMENT STEWARDSHIP: 2017 ANNUAL REPORT 7, http://about.vanguard.com/investment-stewardship/annual-report.pdf.

[93] McCahery et al. report the results of a survey of institutional investors, indicating 63% of respondents had discussions with top management in the prior five years. Joseph A. McCahery, Zacharias Sautner & Laura T. Starks, *Behind the Scenes: The Corporate Governance Preferences of Institutional Investors*, 71 J. FIN. 2905, 2912 (2016). However, only 21% of the respondents were from mutual funds. *Id.* at 2910. Even setting aside the issue of whether top advisor managers would need to be present, public earnings calls are for multiple reasons an unlikely vehicle for a fund to induce a firm to pursue an anticompetitive strategy: as to conflictual strategies, other analysts who work for NCOs may voice opposition; public earnings calls are recorded and transcribed, leaving a record of past statements by any participant available to any other shareholder, reporter, or investigator whose suspicions are aroused; participants in calls can only talk if called on by management to ask a question, a format designed to have the company explain provide explanations to investors, not to have investors provide input on company strategy; and mutual fund analysts' active participation in these calls is so uncommon such that a high level of involvement would be likely to raise suspicion. Michael Jung, M.H. Franco Wong & X. Frank Zhang, *Buy-Side Analysts and Earnings Calls*, 40 J. ACCOUNTING RES. 1, 37–38 (2017).

executives and may have supervisory authority over voting officials and fund portfolio managers. As a result, they have more heft than analysts.

But even if top advisor managers are involved, they would also need analysts to monitor whether firm executives implement the targeted strategy they advanced and voting officials (or fund portfolio managers) to take actions if they do not. Indeed, failure by firm executives to heed a proposed strategy should be common. After all, the strategy favored by one CCO not only involves lower profits for the firm—which firm executives may resent—but also differs from the strategies favored by other CCOs that hold different stakes in competing firms and from those favored by NCOs.

Effective implementation of a targeted strategy would thus involve several different branches within the investment advisor—top advisor managers, analysts, voting officials and perhaps fund portfolio managers—and several management layers in firms, from senior management down to those, in the airline industry, making route-level pricing and capacity decisions.

In addition, implementation would make some officials at both the investment advisor and at the firm unhappy. Within the investment advisor, fund portfolio managers may be unhappy about the pursuit of a strategy that lowers the value of their fund's portfolio and voting officials about the intrusion by top advisor managers. Within the firm, executives may be unhappy about being pressured to pursue a strategy that lowers firm value. And among the firm's other owners, NCOs and other CCOs may be unhappy about the firm not pursuing their desired strategy.

B. Passive Mechanisms: Selective Omission

In the example of a targeted active strategy discussed in the preceding Section, Whiterock (the investor in American and Delta) advocated the suppression of competition on Route 1, promotion of competition on Route 2, and cost reduction. The first action reduced the value of American; the latter two actions increased the value of American; all three increased the value of Whiterock's portfolio.

An alternative targeted strategy is for Whiterock to press *only* for actions that increase the value of *both* American *and* its portfolio holdings, while "letting sleeping dogs lie" as to actions where the two conflict. For example, Whiterock could actively promote competition on Route 2 and cost reduction, while remaining silent about Route 1. Such selective omission is, in effect, a targeted passive mechanism. The two actions of Whiterock—promoting competition on Route 2 and cost reduction—match those that an NCO would take. CCOs engaged in selective omission generate an anticompetitive effect because they selectively fail to push— remain passive as to—certain firm value-increasing actions that would be procompetitive, rather than (as in an targeted active mechanism) because they actively push the firm to implement value-decreasing measures that are anticompetitive. It is only their failure to push for value-increasing procompetitive actions that is a source of conflict between a CCO and an NCO.

Compared to targeted active strategies, the selective omission strategy has a significant benefit: it does not entail affirmative promotion of a strategy that reduces firm value. While generation of a selective omission strategy would require similar effort to generation of the targeted active strategies described before, transmission, inducement and monitoring would be

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simpler. A CCO could rely on the persuasive force of its arguments, rather than on explicit or

implicit threats of consequences, as to strategies—all firm value increasing—it actively favors

and, as to these strategies, would find common cause with most other shareholders. It could

thus advocate these strategies openly; convey them to lower-level executives; and execute

them without involving top advisor managers or risking managerial resentment and

retaliation.[94]

Unlike the purely passive across-the-board mechanisms discussed in Part II, selective

omission could account for the results found by AST. Assume that firms, but for shareholder

pressure, would sometimes compete overly aggressively and sometimes compete insufficiently.

Compare the differences between NCOs, CCOs and dispersed owners across these two

scenarios. Compared to NCOs, CCOs would push less for aggressive competition where more

aggressive competition would increase firm value (because of its effect on the value of

competitors in which the CCO has a stake); compared to dispersed owners, CCOs would push,

along with NCOs, for less competition where aggressive competition would reduce firm value.

(See Table 1.)

The average effects of NCO, CCO and dispersed ownership on different firms (or

different product decisions, such as pricing on a particular route) would roughly align with the

effects of NCO, CCO and dispersed ownership on MHHIΔ: a move from DO to CCO ownership

increases MHHIΔ and, on average, increases prices (by increasing pressure to raise prices on

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[94] For similar reasons, transmission and inducement of a consensus strategy would be simpler. However, a consensus strategy that entails coordination among competitors would require monitoring and, as discussed *supra* Part I, is not tested by MHHIΔ. Moreover, as discussed *infra* Part IV, a consensus strategy may entail high legal and reputational and thus not be in the interest of institutional CCOs.

routes where less aggressive competition increases firm value); a move from NCO to CCO

ownership also increases MHHIΔ and, on average, also increases prices (by reducing pressure to

lower prices on routes where more aggressive competition increases firm value).[95]

Table 1: Comparison of NCOs, CCOs and DOs under Selective Omission

Increase firm value by:	Advocate?		
	NCO	CCO	DO
Less aggressive competition/higher price	Yes	Yes	
More aggressive competition/lower price	Yes		

IV. The Economic Interests of Investment Advisors

So far, we have assumed—alongside with literature in this field—that the objective of

CCOs is to raise portfolio value. But as we indicated in Part III, the archetypal CCO, the

investment advisor, has incentives quite unlike those of an individual who holds the ownership

stakes. In this Part, we elaborate on this argument. As we show, it is contrary to the financial

interest of investment advisors to pursue many of the proposed mechanisms.

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[95] A move from NCO to dispersed ownership increases MHHIΔ and has an indeterminate predicted effect on prices. Still, if CCOs effectively pursue selective omission, an increase in route-level MHHIΔ should be correlated with an increase in route-level prices. However, a more direct test of selective omission would include separate variables for CCO and NCO ownership.

A. Benefits

Although investment advisors have been treated as common concentrated *owners* in the literature, it bears repeating that they are not, in fact, the owners of the shares attributed to them. They lack an ownership interest both legally and economically.

The reason why investment advisors are treated as owners is that they have investment authority over the shares, which requires them to list these shares when filing a Form 13F.[96] The ownership of the shares, however, rests with the various mutual funds and other clients advised by the investment advisor. And the economic interest in these shares is held by the ultimate economic beneficiaries—in the case of mutual funds, by the mutual fund shareholders.

If an individual shareholder manages to raise the value of her portfolio securities by $1 billion, whether by inducing firms to adopt an anticompetitive strategy or through some other means, she would be $1 billion richer. But if an investment advisor manages to raise the value of the securities listed in its 13F filings by $1 billion, the value of the investment advisor does not increase by $1 billion. Not even close.[97]

To be sure, an investment advisor has *some* incentives to raise the value of the securities for which it acts as an advisor. Most directly, in the case of advised mutual funds, the advisor's annual fee is a percentage of the value of the assets under management. Hence, as the value of the assets under management grows, so does the advisor's fee.

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[96] *See* 17 C.F.R. § 240.13f-1.

[97] Corporate governance scholars have long noted the limited incentives of mutual fund managers. *See, e.g.*, Marcel Kahan & Edward Rock, *Hedge Funds in Corporate Governance and Corporate Control*, 155 U. Pᴀ. L. Rᴇᴠ. 1021, 1050–54 (2007); others have noted that these reduced incentives apply to the common ownership context. *See* Rock & Rubinfeld, *supra* note 14; Bebchuk, Cohen & Hirst, *supra* note 9.

But the applicable percentage is low. For equity index funds, the asset-weighted average fee in 2016 was 9 basis points.[98] For actively managed equity funds, it was 82 basis points.[99] Even assuming that the advisor expects to earn these fees for multiple years,[100] the advisor has a much smaller interest in increasing the value of the assets than an individual owner would have.

These lower incentives are further diluted because investment advisors are likely to bear some of the cost of anticompetitive conduct through their ownership of suppliers and customers.[101] Even if reducing capacity and raising prices raises *industry* profits, it is likely to have some adverse effects on suppliers and customers. Large investment advisors—and index fund advisors in particular—are almost certain to own shares in some suppliers and customers and thus bear a portion of these costs. To some extent, they therefore also bear the costs of anticompetitive conduct.

The issue with fees is not only that advisors receive only a small fraction of any increase in their portfolio value. Increasing overall portfolio value may even *reduce* their fees. The

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[98] INVESTMENT COMPANY INSTITUTE, 2017 INVESTMENT COMPANY FACTBOOK 93, http://www.ici.org/pdf/2017_factbook.pdf.

[99] *Id.* at 96.

[100] The number of years an advisor would earn fees would depend on the remaining period of time mutual fund shareholders and other clients keep their assets with an advisor before they withdraw them.

[101] *See, e.g.*, AST CPI, *supra* note 50, at 15 (acknowledging this critique); Jonathan B. Baker, *Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge*, 129 HARV. L. REV. F. 212, 225 (2016); Thomas A. Lambert & Michael E. Sykuta, *The Case for Doing Nothing About Institutional Investors' Common Ownership of Small Stakes in Competing Firms* 21 (Univ. of Missouri Sch. of Law Legal Studies Research Paper No. 2018-21, 2018), http://ssrn.com/abstract=3173787.

reason is that different funds or clients pay different percentage fees to the advisor.[102]

Increasing the value of stock held in low-fee paying funds at the expense of the value of stock held in high-fee paying funds can reduce overall fees even if it increases overall portfolio value. This problem is particularly acute for investment advisors—such as Blackrock—with large assets under management in both low-fee index funds and much higher-fee active funds.[103] Active and index funds run by the same advisor are likely to differ not only in fees, but also in the stocks held by these funds. While an index fund should hold similar percentages in all companies in an industry that are in the index, holdings by active funds are likely to be concentrated in a subset of such companies.

To illustrate these points, consider Primecap, one of the principal CCOs of airline stock according to AST. At the end of 2016, Primecap held, among other airline stock, 5.2% of the stock of Alaska Air and 6.3% of the stock of United Continental, with a combined value of $2 billion. Primecap acts as an advisor to the lower-fee Vanguard Primecap fund[104] and the higher-fee Primecap Odyssey funds as well as for other clients,[105] with its mutual funds accounting for

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[102] Lambert & Sykuta, *supra* note 101, at 21 (noting that different funds charge different fees).

[103] According to Blackrock's 10-K for 2017, assets under management include $311 billion in actively managed equity and $3,060 billion in ETF and non-ETF indexed equity. Blackrock, Inc., Annual Report 40 (Form 10-K) (Feb. 28, 2018), http://www.sec.gov/Archives/edgar/data/1364742/000156459018003744/blk-10k_20171231.htm. Fees from actively managed equity (including performance fees) totaled $1.8 billion, while fees from ETFs and non-ETF indexed equity amounted to $3.9 billion. Fees as a percentage of assets under management are thus 0.58% for actively managed equity and 0.13% for ETF and non-ETF indexed equity.

[104] The Vanguard Primecap fund charges annual fees of 0.33% to 0.39%. The calculations assume that Primecap earns fees of 0.36% on assets in this fund.

[105] The Odyssey funds charge fees of 0.64% to 0.69%. The calculations assume that Primecap earns fees of 0.65% on assets in this fund.

67% of the holdings in these two airlines.[106] Because of its joint holdings in Alaska Air and

United Continental, Primecap could increase its portfolio value by $5 million if it induced United

to pursue a strategy that reduced the value of United by $500 million and increased Alaska Air's

value by $700 million.[107] But because the lower-fee Vanguard Primecap fund holds most of the

Alaska Air stock but only about half of the United stock,[108] Primecap's annual fees adjusted for

the fund holdings would actually *decline* by $10,000.[109] Indeed, if Primecap had the opposite

opportunity—reduce Alaska Air's value by $700 million to increase United's value by $500

million—it would reduce portfolio value yet increase its fees. And even if Primecap charged the

same fee on all its funds, its annual fees (based on its average fund fee) would increase by only

$25,000.[110]

Mutual funds also have incentives to improve performance in order to generate net

inflows. But empirical evidence has shown that net inflows respond to relative performance,

not absolute performance.[111] As such, attracting net inflows would not generate significant

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[106] Primecap's 13F also includes shares that are in neither of these funds and we assume its advisory fees on these shares are equal to the fees it earns on the Odyssey funds.

[107] The increase in Alaska Air's value would increase Primecap's portfolio value by $36.4 million (5.2% of $700 million); the decrease in United's value would decrease Primecap's portfolio value by $31.5 million (6.3% of $500 million).

[108] The Vanguard Primecap Fund accounted 86.2% of Primecap's 13F holdings in Alaska Air but only 53.7% of the holdings in United.

[109] The change in Vanguard Primecap's value is (86.2%)($36.4 million) + (53.7%)(-$31.5 million) = $14.46 million. The change in the value of the Odyssey funds and other assets is (13.8%)($36.4 million) + (46.3%)(-$31.5 million) = -$9.56 million. The increase in fees from Vanguard Primecap is 0.36% of $14.46 million), or approximately $52,000. The decrease in fees from Odyssey funds and all other assets is 0.65% of $9.56 million, or approximately $62,000. The net effect on fees is therefore approximately -$10,000.

[110] This calculation assumes that Primecap earns fees of 0.52% on all its assets. 0.52% of $4.9 million is approximately $25,000.

[111] *See, e.g.*, Brad M. Barber, Xing Huang & Terrance Odean, *Which Factors Matter to Investors: Evidence from Mutual Fund Flows*, 29 REV. FIN. STUD. 2600 (2016); Jonathan Lewellen & Katharina Lewellen,

incentives for index funds, which are designed to neither underperform nor outperform the index benchmark. And for nonindex funds, the impetus to improve relative performance is associated with incentives quite distinct from maximizing portfolio values, and quite unrelated to MHHIΔ as conventionally measured.

Relative fund performance is improved if the share price of a company in which a fund is *overweight* relative to the benchmark rises and the share price of a company in which a fund is *underweight* drops.[112] To illustrate, recall the airline example from Part III. Suppose that there is a route in which American, Delta, and United compete, and share the market equally. Whiterock (as before) owns 10% of American and Delta. Three NCOs each own 10% in one airline. A CCO of all three airlines, Redrock, owns 10% of each. The MHHIΔ for this route, calculated in the conventional fashion, is 3333.[113]

To see the impact of relative performance, we need a benchmark. Suppose that the benchmark would have investors hold, given their size, 5% of each airline. Thus, each NCO is overweight in its airline and underweight in the two others, while Whiterock is overweight in American and Delta, and Redrock is overweight in all three airlines. Table 2 reports the degree to which each investor is over- or underweight in each airline.

Institutional Investors and Corporate Governance: The Incentive to be Engaged (2018) (unpublished draft) (finding that, for large institutions, flow incentives are significantly less important that direct incentives generated by an increase in portfolio value).

[112] *See, e.g.*, Kahan & Rock, *supra* note 97.

[113] This calculation is set out in the Appendix.

Table 2. Investor Holdings Relative to Benchmark

| | Holdings and *over/underweight* | | |
	American	Delta	United
Benchmark for each investor	5%	5%	5%
NCO for American	10%	0%	0%
	+5%	*−5%*	*−5%*
NCO for Delta	0%	10%	0%
	−5%	*+5%*	*−5%*
NCO for United	0%	0%	10%
	−5%	*−5%*	*+5%*
Whiterock	10%	10%	0%
	+5%	*+5%*	*−5%*
Redrock	10%	10%	10%
	+5%	*+5%*	*+5%*

To capture the interaction of relative performance with common ownership, we can calculate an alternative "relative performance" version of MHHIΔ, in which the economic stake of each investor is based *solely* on the relative performance incentives—where being overweight is equivalent to a long position to the extent a fund is overweight and being underweight is equivalent to holding a short position. For example, as to American's NCO, the MHHIΔ is calculated assuming that the NCO has a control share of 10% in American and 0% in Delta and United, corresponding to its actual ownership stake, and an economic stake of 5% in American and 5% short positions in Delta and United, corresponding to its relative performance incentives. In this example, the relative performance MHHIΔ equals 0, the same as if the three airlines were held entirely by dispersed owners.[114] But if, for example, Redrock were a large index fund such that its benchmark (given its size) would entail holding 10% of each airline, this

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[114] This calculation is set out in the Appendix.

ownership structure would produce an MHHIΔ of –4444. As this example illustrates, any

relative performance incentives are not well proxied by MHHIΔ.[115]

B. Costs

The costs to advisors of employing the mechanisms we have discussed above go beyond

the costs of generating and implementing a strategy that leads to anticompetitive results. They

include, depending on the specific mechanism involved, significant reputational and legal risks if

use of the mechanism is detected.

The institutional investors likely to have the largest common ownership stakes in any

industry will be—and the institutional investors that AST find as having the largest common

ownership stakes in the airline industry are—some of the largest and best-known investment

advisory companies, such as Vanguard, Blackrock, Fidelity, and T. Rowe Price. The assets

managed by these companies run to the trillions of dollars; their products are marketed to

retail and institutional investors including defined benefit and defined contribution pension

plans, charities, endowments, and central banks;[116] and their business operations are highly

regulated.[117]

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[115] *See also* Lewellen & Lewellen, *supra* note 111, tbl.7 (finding that, in industries with less than 25 firms, a majority of institutional shares are held by entities for which rival flow incentives are negative; that is, the institution benefits in relative performance terms if its rivals do poorly).

[116] Blackrock, Inc. (Form 10-K), *supra* note 103, at 1.

[117] *Id.* at 10 ("virtually all aspects of [its] business operations are subject to various laws and regulations around the world," including the Investment Company Act, the Securities and Exchange Act, ERISA, and a multitude of other U.S., European and Asian-Pacific regulations); *id.* at 18–27 (containing three-and-a-half page "Legal and Regulatory Risks" disclosure, as long as the four risk sections on Market and Competition Risk, Risks Related to Investment Performance, Risks Related to Human Capital, and Risks Related to Key Third Party Relationships combined).

From a strategic perspective, these companies do not want to generate controversy. Controversy and scandals are prone to attract attention from regulators and to generate withdrawals from investors. Even a small difference in the growth rate of assets under management, say 4% compared to 5%, would mean $50 billion fewer assets under management for Vanguard and $21 billion fewer for Fidelity. In fact, mutual fund companies have been largely successful in staying on everybody's good side and the industry as whole, and the largest players, in particular, enjoy a squeaky-clean image.

Any suggestion that an investment advisor as a whole—not just some obscure analyst or a portfolio manager of an individual fund—had a policy of encouraging firms to pursue an anticompetitive strategy could be damaging. An article in the *Wall Street Journal* detailing internal deliberations within an investment advisor on how best to get firms to adopt such a strategy would be highly detrimental. And a criminal investigation, let alone an indictment, could be devastating.

Legal risks to advisors arise from several sources: the possibility that the mechanism engenders a violation of the antitrust laws for the portfolio company or, more worryingly, implicates the advisor itself in a violation; the possibility that the mechanism involves a breach of fiduciary duty by the advisor to the advised funds and clients; and the possibility that the mechanism entails a violation of the federal securities laws.

A CCO pursuing a targeted active strategy—for example, pressing several airlines to avoid competition with one another—might well face antitrust liability. The interactions between the CCO and each portfolio firm could be regarded as vertical agreements in restraint of trade or as facilitation of a cartel among the firms, with the CCO serving as the cartel's

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ringmaster. Even if the firms do not communicate among themselves, the CCO's involvement

could expose them to liability on a "hub-and-spoke-and-rim" theory of liability, in which an

agreement among the firms ("along the rim") is inferred from the interactions between the

CCO (the hub) and each firm.[118] The exact scope of inferring a horizontal agreement is not well

settled, but a common formulation is that liability attaches when the hub makes an offer to

each firm, which is accepted with the knowledge that (and perhaps in reliance upon the fact

that) the other firms have accepted as well. Moreover, the hub is regarded as an integral (and

joint and severally liable) part of the resulting conspiracy, despite its vertical relationship to the

other conspirators.[119]

Furthermore, investment advisors face potential legal risks for breach of fiduciary

duty.[120] Investment advisors provide services to mutual funds, separate legal entities, and other

clients that own the shares of portfolio companies. The advisor owes an independent fiduciary

duty to each fund and each other client.[121] If an advisor votes a client's shares in a manner that

increases the advisor's overall portfolio value, but reduces the client's portfolio value, or

otherwise uses the leverage of being in control of a client's shares to induce a firm to adopt a

strategy that is not in the best interest of the client, it violates its fiduciary duties.

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[118] *See, e.g.*, Toys "R" Us v. FTC, 221 F.3d 928, 932–36 (7th Cir. 2000). *See also* Interstate Circuit v. United States, 306 U.S. 208 (1939) (dicta).

[119] *See, e.g.*, United States v. Apple, Inc., 791 F.3d 290, 321–25 (2d Cir. 2015).

[120] *Cf.* O'Brien & Waehrer, *supra* note 14, at 6, 33–34 (discussing fiduciary duty of managers, rather than advisors).

[121] *See, e.g.*, John Morley, Too Big to Be Activist [9] (2018) (unpublished manuscript) ("each client is a separate locus of fiduciary duties").

Different mutual funds in the same family and advised by the same advisor, and different other clients, will own different stakes in competing firms. Any strategy that leads to a reduction in the value of one portfolio company for the benefit of other companies in the advisor's portfolio is liable not to be in the interest of some of the advisor's clients.[122] To return to our example from Section IV.A, if Primecap induced United to pursue a strategy that reduced the value of United by $500 million and increased Alaska Air's value by $700 million, its overall portfolio value would increase by about $5 million, the portfolio value of the Vanguard Primecap fund would increase by $14.5 million, but the value of the assets held in the Primecap Odyssey funds and of other assets held outside the Vanguard Primecap fund would decline by $9.6 million.[123]

From the perspective of fiduciary duty, the safest solution is for the voting group to base its recommendations on what vote maximizes the value of a portfolio company. In the event that a portfolio fund manager believes that a different vote is in the interest of her fund, the fund could depart from the recommendations. Indeed, mutual funds in the same family sometimes vote differently.[124] As long as an advisor does not affirmatively act in a manner that

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[122] To be sure, a client with shares in many oligopolistic industries and a long-term horizon may, across stocks and over time, come out ahead if the advisor used its control to maximize overall portfolio, rather than client portfolio, value. Such a client may thus consent to such use. Without a client's consent, however, an advisor could not on its own decide to act for the benefit of some client portfolios and against the interest of others on the hope that, in the end, everyone will come out ahead. *See also* Vanguard Proxy Voting Guidelines, http://pcg.law.harvard.edu/wp-content/uploads/2016/09/5-Vanguards-proxy-voting-guidelines-_-Vanguard.pdf (stating that Vanguard's Proxy Oversight Committee is charged to vote each fund's shares in the best interest of that fund's shareholders).

[123] As calculated *supra* note 109, the value of Vanguard Primecap would increase by $14.46 million, while the value of assets in the Primecap Odyssey funds and other assets would decline by $9.56 million.

[124] Fund families differ in the extent to which funds in the family vote alike, but fund voting is often highly centralized at the family level. *See* Stephen Choi, Jill Fisch & Marcel Kahan, *Who Calls the Shots in Director Elections*, 3 HARV. BUS. L. REV. 35, 48 (2013); *see also* Jan Fichtner, Eelke M. Heemskerk & Javier

Electronic copy available at: https://ssrn.com/abstract=3210373

reduces the value of a portfolio company, it faces no serious risk of liability for breach of

fiduciary duties. Thus, across-the-board passive mechanisms and selective omission—which

merely involve a failure to take actions that would increase the value of a portfolio company—

do not create material fiduciary duty risks.

Finally, investment advisors would face some legal risks under the securities laws. The

principal risk arises under Rule 10b-5, which forms the basis for the prohibition of insider

trading.[125] If an advisor obtains material nonpublic information from a firm manager about her

company and that manager breaches her fiduciary duties in conveying that information, the

advisor must abstain from trading stock in that company until the information is disclosed.

Targeted active mechanisms create the most 10b-5 concerns. At first blush, there might

seem to be no issue. The CCO is trying to direct the firm, as opposed to gleaning material

nonpublic information from it. However, matters are not so simple. Targeted active

mechanisms would likely be implemented through private meetings; thus, any information

learned would often be nonpublic. In such private meetings, firm managers may indicate that

they will follow the strategy pushed by a CCO. If that strategy relates to a significant segment of

the firm's operations, this information could be material. And since the firm manager would

agree to a strategy that lowers firm value, and would presumably do so to avoid the adverse

ramifications from refusing to agree, the manager would breach her fiduciary duties to the

company and its shareholders. By contrast, mechanisms that involve no communications with

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Garcia-Bernardo, *Hidden Power of the Big Three? Passive Index Funds, Re-Concentration of Corporate Ownership, and New Financial Risk*, Bus. & Pol., Apr. 2017 (presenting empirical data).
[125] Chiarella v. United States, 445 U.S. 222 (1980) (basing prohibition of insider trading on violation of Rule 10b-5).

firm managers, mechanisms where any communications take place in public settings, and communications where firm managers do not pursue an action that involves a breach of duty would not generate equivalent concerns.

To be sure, with respect to breaches of fiduciary duty and Rule 10b-5, the monetary liability even if a violation is established may be small. However, the associated reputational penalty may be much larger. Assume, for example, that, in the context of a governmental investigation or a civil lawsuit, an internal memo by Whiterock is discovered. The memo shows calculations of how a certain strategy by American would lower the firm's profits while raising profits for Delta, and then concludes that Whiterock would benefit if American pursued that strategy because its holdings in Delta would rise by more than its holdings in American would decline. Whiterock may be able to settle a breach of fiduciary duty suit by clients who hold only stock in American for a small amount. But the reputational damage would be much higher.

Notably, any monetary liability or reputational penalty would be borne by the investment advisor, *not* by the advised mutual fund shareholders or other client that received the lion's share of the benefit from any increase in portfolio value. The advised fund shareholders or other client would generally not be involved in the wrongdoing and have no particular reputational stake. The investment advisor would thus bear the full legal and reputational costs but would benefit only fractionally from an increase in portfolio values. As a result, the advisor should be reluctant to employ a mechanism that engenders significant costs if detected and a significant risk of detection.

The possibility that a mechanism, if detected, could result in legal liability or reputational harm affects not just the cost-benefit calculus. It also bears on the leverage a CCO

has over firm management to induce it to pursue a firm value-reducing strategy. To the extent

that firm management (or, for that matter, an NCO) is aware of the mechanism, it could

threaten the CCO with publicly disclosing its use if a CCO retaliates against management for not

observing the CCO-favored strategy. The CCO, as a result, would have more to lose than firm

management. The only plausible mechanisms, therefore, are ones where either the firm

management is not aware of its use, where detection would result in no legal liability or

reputational harm, or where firm management has no incentives to disclose the use of the

mechanism.

From a cost-benefit perspective, it is therefore unlikely that an advisor would want to

employ targeted active mechanisms. Targeted active mechanisms generate the highest risks of

material legal and reputational sanctions if detected and, as discussed in Part III, the highest

risks of detection. In comparison, across-the-board mechanisms and selective omission

generate lower risks of detection[126] (their implementation requires no illicit communications or

arrangements with the targeted firm) and sanction.

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[126] The likelihood of detection of across-the-board mechanisms also depends on whether a CCO has
established voting guidelines that presumptively determine its votes on certain recurring issues and has
conflict of interest policies that subject votes that deviate from these guidelines to special scrutiny. For
example, at T. Rowe Price, certain index funds are not permitted to cast votes inconsistent with its
guidelines (and must abstain on matters not governed by guidelines). At its other funds, votes
inconsistent with voting guidelines must be approved by its proxy committee. *See* T. Rowe Price, Proxy
Voting Guidelines, http://www3.troweprice.com/usis/content/trowecorp/en/utility/policies/
_jcr_content/maincontent/polices_row_1/para-mid/thiscontent/pdf_link/pdffile. At State Street, the
Asset Stewardship team has the sole discretion to decide on votes, may not disclose any voting decision
to individuals not affiliated with the voting process prior to the meeting dates, and must report any
votes in deviation from the guidelines to the Proxy Review Committee on a quarterly basis. *See* State
Street Global Advisors, 20188SSGA Conflict Mitigation Guidelines (Mar. 16, 2018),
http://www.ssga.com/our-insights/viewpoints/2018-ssga-conflict-mitigation-guidelines.html. Such
guidelines and policies make it harder for an investment advisor to execute any across-the-board
mechanism involving voting unless a larger number of advisor officials are aware of and actively
participate in the execution of the mechanism.

V. Implications

In this Part, we draw several implications from our analysis. First, we summarize the results of our evaluation of potential mechanisms, distinguishing those that are more or less supported by the available theory and evidence. Next, we explain the central importance of investor type to the analysis of CCOs. Then we identify a persistent gap in our empirical understanding of common ownership, namely direct evidence about the "who, where, when, and how" employed by COOs. Finally, we explain our bases for concluding that the case for radical reform has not been proved.

A. Assessing Mechanisms

In Parts I through IV, we identified and then assessed a wide range of potential mechanisms linking CCOs to anticompetitive outcomes. Our assessment evaluated each mechanism according to four criteria: whether the mechanism is actually tested by the empirical evidence; whether the mechanism is effective; whether the mechanism is feasible; and whether the expected benefits to an institutional CCO from employing the mechanism are likely to exceed its expected costs.

We conclude that, as to most mechanisms, there is no strong theoretical basis for believing that institutional CCOs would want to employ them or else no significant evidence suggesting that they do employ them (or both). For example, the empirical evidence for the use of across-the-board mechanisms is scant and most of these mechanisms are of doubtful effectiveness. Targeted active mechanisms are difficult to execute and, given the risk of detection, entail substantial legal and reputational risks.

The risk of detection has a further implication for any assessment of the likelihood that the mechanism is actually in use. From a Bayesian perspective, one starts with some prior probability based (among other things) on theoretical arguments that CCOs have an interest in increasing their portfolio values, and information regarding the effectiveness and feasibility of various mechanisms. Empirical studies such as AST prompt an updating of this prior probability. To the extent that certain mechanisms as well as other factors could lead to the results that AST found, the posterior probability *conditional on the empirical result found* is higher than the prior probability.

But lack of direct evidence of the use of the mechanism leads to a further updating. To the extent that one would have expected such evidence to have emerged, the posterior probability *conditional on such evidence of its use not having emerged* is lower than the prior one. To us, the absence of any direct evidence of the use of targeted active strategies where the direct evidence should be plentiful casts significant doubt on whether these strategies are used.

However, our assessment is not uniformly negative. Selective omission would appear to be potentially effective and feasible; would be consistent with the evidence in AST; and could conceivably generate benefits for institutional investors that exceed the legal and reputational risk. Some specific across-the-board mechanisms, although substantial empirical support is so far lacking, are also theoretically feasible and, at least for certain CCOs, likely to be effective. Our assessment of mechanisms is summarized in Table 3.

Table 3: Assessment of Mechanisms

Mechanism	Tested?	Effective?	Feasible?	Risk?
Consensus	No			
Conflict:				
Across-the-Board Passive	No	No (mostly)	Yes	Very Low
Across-the-Board Active	No	No (mostly)	Mixed	Low
Targeted Active	Yes	Maybe	Very difficult	High
Targeted Passive (Selective Omission)	Yes	Maybe	Yes (difficult)	Low

B. The Importance of Investor Type

Our analysis reveals a pervasive shortcoming in the analysis of CCOs: the failure to carefully distinguish among different types of owners. Our analysis shows the need to think more carefully about how incentives differ systematically by owner type and how investment advisors that mostly advise index funds differ from other institutional CCOs.

1. Owner Types

Owner types differ systematically in the benefits they would obtain from employing the mechanisms we have discussed and in the reputational costs of employing the mechanisms. Given the typical fee structure, investment advisors that manage predominantly index funds—Vanguard, State Street, and Blackrock—have lower incentives (relative to size) than investment advisors that manage predominantly active funds. As large institutions subject to extensive regulation, mutual fund advisors in general, and Vanguard, State Street, and Blackrock in particular, may also face high costs if they are implicated in antitrust violations or other actions

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that generate adverse publicity. Actively managed funds would have relatively stronger incentives since they charge higher fees and can strategically allocate a greater portion of their assets to industries where pursuit of anticompetitive strategies may be profitable. Hedge funds, which charge much higher asset-based fees than even actively-managed mutual funds as well as steep performance-based fees and which have less to lose from adverse publicity, as well as individual investors, would have even stronger incentives than investment advisors for actively managed mutual funds. Even if we had conclusive evidence that CCOs who are hedge funds or individuals employ a mechanism, that would shed little light on whether investment advisors for mutual funds do so as well.

Systematic differences in incentives between different types of owners also complicate any assessment of passivity mechanisms. Mutual fund advisors are more likely to be CCOs than individual investors and hedge funds; and among mutual fund advisors, index fund advisors are more likely to be industry-wide CCOs than active funds. As a result, changes in MHHIΔ may be correlated with changes in the average incentives of shareholders to raise firm value.

Consider, for example, two industries, both duopolies, with mutual fund CCOs holding significant stakes in the duopolists in the first industry and hedge fund NCOs holding significant stakes in the duopolists in the second. Let us suppose that empirical evidence shows that pay-for-performance incentives are lower in the first industry than in the second—a finding corresponding roughly to the results in AEGS. The difference could be due to CCOs encouraging firm value-reducing anticompetitive strategies in order to maximize the value of their portfolio—for example, by failing to push for performance incentives. But the difference in managerial incentives could instead be due to the fact that the *mutual-fund* CCOs in the first

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industry have lower incentives to encourage firm value-increasing strategies than the *hedge-fund* NCOs in the second industry—that they are passive not because passivity benefits their portfolio but because they lack, compared to NCOs, incentives to take firm-value increasing actions. To distinguish among these explanations, one would need to compare two industries, one with mutual fund CCOs and another with *mutual fund* NCOs; that is, one would have to control for owner type. Such an examination has not yet been pursued.

2. The Special Case of Index Fund Advisors

Two of the largest investment advisors, prominently featured in AST's list of CCOs, manage predominantly index funds. State Street Global Advisors manages hardly any active domestic equity funds. Vanguard has a quantitative equity group that manages or co-manages some active domestic equity funds, but the assets of these funds constitute a very small portion of Vanguard's total domestic equity assets under management.[127]

On the one hand, index funds are paradigmatic CCOs. They own, in equal proportions, all firms represented in the index. To the extent the index includes most of the relevant competitors, they benefit when industry profits rise. In the airline industry, for example, Alaska, United, Delta, American and Southwest are all in the S&P 500 index, and JetBlue is in the S&P Midcap index. Whereas increased ownership by an advisor of active funds may or may not raise MHHIΔ, given its ownership of some but not all competitors,[128] increased ownership shares by

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[127] In addition, some funds bearing the Vanguard name, such as the Vanguard Primecap Fund, are advised by different investment advisors (e.g. Primecap Management). *See supra* Part IV.

[128] *See* Appendix*.*

index funds is much more likely to have such an effect. Index fund growth would thus appear to be a major contributor to the observed increase in MHHIΔ.[129]

Moreover, index funds (absent a change in the index) do not change their relative portfolio composition. In theory, that leaves index funds better positioned to benefit from mechanisms that require longer time horizons, such as voting and across-the-board passive mechanisms.[130]

But advisors that predominantly manage index funds face particularly difficult challenges in employing targeted mechanisms. The task of portfolio managers in index funds is to generate returns that match that index. Even more so than portfolio managers for active funds, they lack the incentives and the expertise to design targeted strategies.[131] And investment analysts focusing on particular firms or industries are not needed at index funds. A dearth of in-house analysts makes generation of a targeted strategy harder.

Transmission of a targeted strategy may also be harder. When interacting with firm executives, analysts or their equivalent at Vanguard and State Street, who advise only the small actively-management business segment, would clearly not be viewed as representing the views of Vanguard or State Street as a whole. Top-level managers at State Street and Vanguard subscribe to an indexing culture. For them, to hold meetings with voting officials or senior firm executives to discuss issues like route-level pricing and capacity would be exceedingly odd.

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[129] *See* AST, *supra* note 2.

[130] *See supra* Part II.

[131] *Cf.* Frank Partnoy, *Are Index Funds Evil?*, ATLANTIC MAG., Sept. 2017, http://www.theatlantic.com/magazine/archive/2017/09/are-index-funds-evil/534183 ("[Vanguard's] index-fund managers don't engage with companies about their businesses.").

Indeed, based on their published information, it seems that index fund advisors in their dealings with portfolio companies focus on broad governance issues and do not get involved in business strategy.[132]

On the whole, therefore, the set of potentially effective and feasible mechanisms available to Vanguard and State Street differs from the respective sets available to investment advisors that largely manage active funds (or that, like Blackrock, have an active fund business that is large in absolute size). In particular, index-fund advisors like Vanguard or State Street may have difficulty developing and executing a selective omission strategy. On the other hand, because of their longer investment horizon, they may be better equipped to execute across-the-board strategies, such as disfavoring relative performance incentives and supporting management against activists who advocate more aggressive competition. Whether Vanguard and State Street pursue any of these strategies and whether they have a material anticompetitive impact merits further inquiry.[133]

C. Beneficial Effects of Common Owners

To the extent that common concentrated owners have the ability and the incentives to affect company behavior, there is no reason to believe that they limit themselves to reducing competition. Rather, they can also be expected to induce economically efficient actions by

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[132] Vanguard, for example, held 954 engagement meetings worldwide during 2017. According to Vanguard, the most frequent topics discussed during these meetings are governance (58%), executive compensation (55%), board of directors (including gender diversity) (52%), risk oversight (14%), and "activism and contentious transactions" (16%). *See* VANGUARD GROUP, *supra* note 92, at 7.

[133] *See also* Brav et al., *supra* note 46 (not finding evidence that index funds are less likely to support activists).

firms, where such actions increase firm value and do not unduly threaten the CCO's other portfolio holdings.[134]

To illustrate these points, let us return once again to our airline example, and focus on a strategy of selective omission, which is in our view is the best supported mechanism. Consider three types of profitable action that American might take, not all of which are available at a given moment: raise price on a particular route if the price is too low; lower price on a route if it is too high; and reduce marginal costs, thereby improving efficiency. Some of these profitable strategies raise social welfare, and others lower it. The price reductions and improved efficiency generally increase social welfare (and consumer welfare), while the price increases generally have the opposite effect. These strategies are summarized in Table 4.

Table 4: Actions that Increase Profits of Airline A

	Social welfare	Advocate?		
		NCO (American)	Whiterock (American, Delta)	Redrock (all airlines)
Raise price on Route 1	−	Yes	Yes	Yes
Raise price on Route 2	−	Yes	Yes	Yes
Improve A's efficiency	+	Yes	Yes	Yes
Reduce price on Route 1	+	Yes		
Reduce price on Route 2	+	Yes	Yes	

Consider how an NCO and Whiterock (a CCO), each of which has a 10% stake in American, would try to use their influence over the airline. The NCO would favor any action that raises American's profits. Whiterock would favor some but not all profitable actions. It would

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[134] In addition, concentrated ownership more generally can have positive social welfare effects. *See* Anton et al., *supra* note 46.

favor efficiency enhancements, profitable price increases, and profitable price reductions on Route 2. However, it would tend not to favor a profitable price reduction on Route 1, at the expense of its holdings in Delta, and would tend to stay passive rather than advocating such a price reduction.[135] These preferences are depicted in Table 4.[136]

The net welfare effect of Whiterock's ownership is ambiguous. Whiterock's ownership would induce more profit-increasing price increases—a welfare loss—but on the other hand, support efficiency improvements and some (albeit not all) profitable price reductions, resulting in welfare gains. Indeed, even Redrock, a CCO that held stakes in all three airlines would favor a mix of welfare-enhancing and welfare-inducing actions.[137]

D. The Need for More—and Different—Evidence

The available evidence, particularly AST, deserves the significant attention it has received from us and others. Yet, the results do not establish which specific causal mechanism, if any, links common concentrated ownership to anticompetitive outcomes and which investors employ such mechanisms. But confirming that such a link exists, and understanding what form it takes and how widespread it is, is crucial in order to determine whether any and what kind of

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[135] The price drop increases American's profits (which is good for Whiterock) but at the expense of Delta's profits (which is bad for Whiterock), and it is unclear a priori which effect is larger.

[136] Table 4 also describes the preferences of a CCO invested in all three airlines. Redrock would (like Whiterock) favor profitable price increases and efficiency enhancements. Compared to Whiterock, Redrock would be more likely to stay passive as to price reductions on a wider range of routes (for example, Route 2), given its wider set of holdings.

[137] Our point of comparison here is dispersed ownership. As we explain below, *infra* Section V.E, it is likely that reform proposals designed to address anticompetitive effects of common concentrated ownership would result in more dispersed ownership, rather than noncommon concentrated ownership.

response is appropriate. Moreover, without a good understanding of mechanism, a court is properly reluctant to generalize from empirical results about airlines to other industries.[138]

The obvious next step, then, is to gather more evidence. There is an ongoing effort to do just that, in the form of studies assessing whether there exists a statistical link between certain ownership structures and anticompetitive outcomes. This work is valuable, and the first four parts of this article provide guidance as to what kinds of additional statistical studies we think should be undertaken.

Beyond the statistical work, we urge a further focus. The goal should be to obtain *direct* evidence—the who, where, when and how—for the steps taken by CCOs that produce anticompetitive results, and the responsive steps taken by firms to implement them. The existence and nature of such evidence varies depending on the mechanism. Thus, we have also provided guidance about where to look for direct evidence for a specific causal mechanism.

Either type of study should be informed by a deeper understanding of the "who" question—that is, structure and function of large investment advisors. This point is obvious but bears emphasis because the empirical literature has failed to highlight important differences among investment advisors.

The AST article is illustrative. The authors provide a table listing the top holders of nine U.S. airlines. The entities most commonly featured as one of the top five holders, and hence the most logical candidates for the "who" responsible for results found by AST, are Blackrock (all nine), Vanguard (all nine), Primecap (five), Fidelity (four), and Berkshire Hathaway (four).

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[138] *See* Baker, *supra* note 101, at 231 (making this point).

Together, these five entities account for 31 of the 45 top-five holder entries; no other entity

appears among the top-five more than twice.

Yet, there are reasons to doubt both that these entities accounted for the statistical

results found by AST and that they actually employ mechanisms that produce anticompetitive

results. One reason relates to an aspect of MHHIΔ that we did not emphasize in Part I. Share

ownership enters the MHHIΔ formula twice—as the "control share" and as the "ownership

share." High levels of MHHIΔ are generated as a CCO has a high control share in one competitor

and a high ownership share in another competitor.[139] To calculate the MHHIΔ, AST count as

"control share" only those shares over which an investor has sole or shared voting power.[140]

But Vanguard, in its Form 13F, disclaims voting power over more than 90% of its holdings.[141]

Therefore, its holdings would only have a minimal effect on AST's MHHIΔ calculations. Likewise,

Fidelity disclaimed voting power over 75% to 85% of its stock in the airlines, and Primecap

disclaimed voting power over 60% to 85%. Measured by voting power, all of these holdings

would drop out of the list of top-5 airline holders reported by AST and most would drop out of

the top ten. And Berkshire Hathaway, though a large owner as of year-end 2016 (the source for

AST's table), does not seem to have been an owner of airline stock in the 2001 to 2014 period

of the AST study. As measured by AST, therefore, none of these four entities were important

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[139] To see this, recall that MHHIΔ includes this term in the numerator: $\sum_i \gamma_{ij}\beta_{ik}$, where ɣ is the control fraction and β is the ownership fraction. This term increases in ɣ$_{ij}$ (the control fraction of owner *i* in firm *j*) and β$_{ik}$ (the ownership fraction of owner *i* in firm *k*).

[140] AST, *supra* note 2, at 1525 ("[W]e calculate the control share . . . as the percentage of the sole and shared voting shares . . . held by shareholder *i*. Similarly, we calculate the ownership share . . . as the percentage of all shares (voting and non-voting) . . . held by shareholder *i*.")

[141] *See, e.g.*, Vanguard Group Inc., Report for the Quarter Ended December 31, 2013 (Form 13F) (Feb. 12, 2014) (claiming investment authority over 49,674,722 shares in Delta Airlines, but sole or shared voting authority over only 1,171,283 of these shares).

CCOs in the 2001 to 2014 period and changes in ownership by these entities probably made no

material contribution to the regressions run by AST.

Blackrock thus looms large. It is a significant holder in all nine airlines and claims voting

power over most of its shares. But Blackrock's incentives are most misspecified by AST. Because

Blackrock has a majority of its assets in low-fee indexed portfolios but a significant minority in

much higher-fee actively managed portfolios, portfolio value maximization for Blackrock as a

whole is *not* approximately the same as fee revenue maximization. As a result, if CCOs try to

induce anticompetitive actions in order to maximize *their own profits*, Blackrock's misspecified

objective function would make it a poor candidate to generate the results found by AST. The

"who" of the who, where, when and how remains as murky as ever.

E. The Unproven Case for Broad Reform

As already noted, the literature thus far does not establish which specific causal

mechanism, if any, links CCOs to higher prices or which investors employ such mechanisms.

Given the absence of a clear mechanism as well as the present extent of the empirical

literature, we consider the case for broad reform to be not proven. Moreover, we disagree with

the view that mechanism identification can or ought to be simply dispensed with, or that

reform efforts or enforcement actions against institutional investors should simply charge

ahead in the meantime.

Our analysis furnishes three bases for disagreement. First, as explained above, the

welfare effects of CCOs are ambiguous. Second, investment advisors differ on multiple fronts

that relate to the likelihood that they would use one of the strategies we discussed: the

benefits they would obtain from raising portfolio value, the costs from exposure that they

induce anticompetitive actions, their ability to generate targeted mechanisms, their

dependence on access to managers, and their portfolio turnover. These differences are a

further reason for skepticism about reforms that fail to attend to these differences. It also bears

note that these proposals go well beyond the results obtained by AST which, for example,

states that the statistical link between MHHIΔ and higher prices is confined to common owners

with low portfolio turnover.[142]

Third, ambitious reform is beset by several perverse consequences. For example, as

noted in the Introduction, PSW propose that investors be limited to holding either no more

than 1% of the stock of companies in specified oligopolistic industries or to holding the stock of

only a single company in any such industry.[143]

Consider the implications of the proposal for large investment advisors like Blackrock,

Fidelity, and T. Rowe Price whose holdings would go beyond the 1% limit. For advisors to active

funds, being confined to a single stock in an industry would be extremely problematic. Large

advisors manage assets in different funds and for a large number of clients. But funds (and

clients) would not agree as to what stock to pick. Fund investment choices are affected by the

fund objectives—growth or value, large cap or small cap—and the views of the fund portfolio

manager. Since active funds are marketed on the bases of these objectives and on the track

records of fund portfolio managers, limiting a fund to a single stock in an industry would place it

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[142] AST, *supra* note 2.

[143] PSW, *supra* note 7; *see also* Scott Morton & Hovenkamp, *supra* note 7. Institutional investors that manage only index funds could also opt for pure passivity—not casting any votes and abstaining from any meetings with executives.

at a severe competitive disadvantage, compared to funds managed by smaller advisors that are not constrained by the 1% limit.

Moreover, even if all portfolio managers within an investment advisory complex could agree about what company to invest in, that choice would change over time. Switching from one stock to another (say from Delta to United) as firm fortunes and investor views change would be a logistical nightmare. To obtain exposure to the airline industry while investing in only in Delta, a large advisor like Fidelity or Blackrock would have to take substantial positions in that company. The investment advisor would then have to divest itself from most of its Delta stock before it could buy a single share of United.[144] By the time the advisor was permitted to buy United stock, United's stock price might no longer present an attractive investment opportunity. To avoid these constraints, clients would probably move assets from larger investment advisors to smaller ones, for which the 1% industry limit would not be binding.

Given the disadvantages, the PSW proposal would increase fragmentation among advisors.[145] Fragmentation would have several effects. For companies in the oligopolistic

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[144] For example, according to AST, Blackrock held between 5.6% and 7.6% of the stock in each of the six largest U.S. airlines, suggesting holdings of about 6% of the industry. Assuming Blackrock wanted to maintain its overall exposure to airlines and held only Delta stock in an amount equal to 6% of the industry, it would have to hold about 23% of Delta's outstanding stock. If Blackrock then decided that that United would be a better investment than Delta, it would be forced to sell 19% of Delta stock to bring its industry holdings to less than 1% before it could acquire any shares of United. During the transition period, Blackrock's investments would be substantially underweight in airline stock overall, making it more difficult for investors to obtain the benefits of diversification.

[145] The fragmentation would affect both index funds and active funds. As to index funds, the most likely effect is to split off such funds from actively managed funds. This, albeit for different reasons, is how Fidelity handles its index funds: they are advised by Geode, the voting of their shares is determined by a different group than the one that determines the vote of shares in other Fidelity funds, and their assets are not included in Fidelity's 13F, 13D and 13G filings. For some advisors, stand-alone index funds may either already fall below the 1% limit; if not, they could either be broken apart further or opt for pure passivity.

industries targeted by the proposal, fragmentation could lead to fewer anticompetitive results. However, this benefit only arises if CCOs employ an active mechanism. As we have explained, combining two CCOs into a larger one, or splitting a CCO in two, has no impact on anticompetitive effects achieved through pure passivity.[146] On the other hand, fragmentation would reduce the procompetitive benefits of concentrated ownership, such as efficient management, with ambiguous net effects. Meanwhile, in *non-oligopolistic* industries, increased fragmentation is likely to have purely adverse effects, by reducing the power and incentives of institutional holders to induce managers to increase company value.[147] A final effect is on the fees paid by investors to advisors, which should increase due to the multiplication of fixed costs amidst the subdivision of advisors.

But even putting aside the issue of reform, investigating whether and how CCOs generate anticompetitive outcomes is valuable. Sunlight is an effective disinfectant. As we have shown, to the extent that a mechanism creates the risk of legal liability or reputational harm to an investment advisor, the advisor would want to use it only as long as the risk of detection is sufficiently low. The attention drawn by AST and others to a possible link have raised the risk of detection, which may on its own tend to eliminate the use of such a mechanism.

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[146] *See supra* Part II.

[147] If, as appears to be a necessary premise for reform proposals, CCOs increase portfolio value by inducing firms to adopt firm-value decreasing measures and by means that may violate antitrust laws and the CCOs' fiduciary obligations, they presumably also do so by inducing firms to increase firm value by enhancing the efficiency of their operations.

Conclusion

In this article, we have identified and examined a wide range of mechanisms by which CCOs might cause anticompetitive outcomes. Some of them—notably, consensus mechanisms and across-the-board passive mechanisms—remain largely untested by the empirical literature. Others, including most targeted active mechanisms, require actions that are implausible for an institutional CCO to take. The mechanism that is tested by the data and plausibly consistent with institutional CCO capacities and incentives is selective omission. If this or other mechanisms are in fact employed by CCOs, there should be visible traces in the actions of CCOs and responses of firms. Searching for such direct evidence is therefore an urgent project for future research.

Even though it remains unclear whether CCOs might cause anticompetitive outcomes—and if so, which ones, and how—it may be tempting to follow the principle that "better safe than sorry." On this view, even a small probability of CCOs having anticompetitive effects supports a strong prophylactic response. An NCO might appear to be a safe pair of hands, fostering competition while preserving incentives to maximize firm value. And indeed, a leading figure in the literature about CCOs has extolled the ownership structure of Virgin America, in which Virgin's founder holds a large stake.[148] Such an NCO has "incentives to encourage the firm to innovate, invest in increased capacity, reduce costs, and increase market share at the expense of the firm's rivals."[149]

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[148] Schmalz, *supra* note 47 (describing Richard Branson's 31% stake in Virgin Atlantic).
[149] *Id.*

This temptation should be resisted. As we have explained, getting rid of CCOs also means a significant loss of procompetitive benefits, particularly for investors that own some but not all of the firms in a market. Moreover, NCOs—particularly individual owners with large stakes—come with downsides of their own. Such owners have stakes that may enable them to dominate the board and insulate them from being ousted by their fellow shareholders—rendering them virtually unaccountable. They may use their power not, or not just, to encourage firms to innovate or compete, but to take part in varied forms of self-interested actions that have long been the scourge of corporate law scholarship.[150] It is against just such conduct that institutional investors such as Vanguard, State Street and BlackRock can provide a useful bulwark. Analyzing ownership structure purely through the lens of antitrust law—and embracing reforms that hobble CCOs to obtain hoped-for antitrust benefits—thus misses an important part of the story.

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[150] Such "private control benefits" include transactions that benefit the owner, hiring the owner or family members to corporate positions, timing corporate distributions to fit the owner's personal tax and liquidity needs, or refusing to sell the company at a price attractive to other shareholders. For an introduction to a large literature, see Ronald J. Gilson & Jeffery N. Gordon, *Controlling Controlling Shareholders*, 152 U. PA. L. REV. 785 (2003); Alexander Dyck & Luigi Zingales, *Private Benefits of Control: An International Comparison*, 59 J. FIN. 537 (2004); Zohar Goshen & Assaf Hamdani, *Corporate Control and Idiosyncratic Vision*, 125 YALE L.J. 560 (2016).

Appendix

1. Calculating MHHI

Section I.B offers, as an illustrative example, two airlines (American and Delta) that equally share the market. To calculate MHHI, we begin with the following general formula:

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

where i indexes owners, and j indexes firms. s_j is the market share of firm j, γ_{ij} is the control fraction of owner i in firm j, and β_{ij} is the ownership fraction of owner i in firm j. [151] For two firms with market shares of 50% apiece, HHI equals 5000. MHHIΔ is calculated as follows:

$$MHHI\Delta = \underbrace{(50)(50) \frac{\sum_i \gamma_{iA} \beta_{iB}}{\sum_i \gamma_{iA} \beta_{iA}}}_{\substack{Firm\ A\ takes\ Firm\ B \\ into\ account}} + \underbrace{(50)(50) \frac{\sum_i \gamma_{iB} \beta_{iA}}{\sum_i \gamma_{iB} \beta_{iB}}}_{\substack{Firm\ B\ takes\ Firm\ A \\ into\ account}}$$

The first term represents the extent to which Firm A takes Firm B's profits into account due to common ownership. The core of the calculation is in the numerator: $\gamma_{iA} \beta_{iB}$ is nonzero when owner i has partial control of Firm A combined with partial ownership of Firm B. CCOs fit the bill; NCOs do not.

Let us further assume, following the literature, that control is proportional to ownership. Then, for a CCO with a 10% stake in both airlines, $\gamma_{iA} \beta_{iB} = (10\%)(10\%) = 1\%$. For each NCO with a 10% stake in firm A, $\gamma_{iA} \beta_{iB} = (10\%)(0\%) = 0$. As for the denominator, $\gamma_{iA} \beta_{iA} = (10\%)(10\%) = 1\%$, for each CCO or NCO. The second term, which represents the

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[151] For comparison, in AST's formal model, firm j maximizes its own firm profits plus this expression:

$$\sum_{k \neq j} \frac{\sum_i \gamma_{ij} \beta_{ik}}{\sum_i \gamma_{ij} \beta_{ij}} \pi_k.$$

See AST Appendix, *supra* note 41, at xx.

extent to which Firm B takes Firm A's profits into account, is symmetric. Thus, if there is one

CCO and nine NCOs:

$$MHHI\Delta = (50)(50)\frac{1\%}{(10)(1\%)} + (50)(50)\frac{1\%}{(10)(1\%)} = 500.$$

Table A.1 calculates MHHI and MHHIΔ for a wide range of levels of CCO and NCO

ownership. For example, one of the scenarios described is a duopoly with four 10% CCOs and

six 10% NCOs (panel 1, column 3). The MHHIΔ is 2000. But if, instead of NCOs, the noncommon

shares are held instead by a very large number of dispersed owners (DOs), the MHHIΔ is 5000

and the MHHI rises to 10,000 (panel 2, columns 3 and 4). If on the other hand the remaining

shares are held by NCOs in a more concentrated fashion, the MHHI falls. For example, if the

remaining shares are held by a single 60% NCO, MHHIΔ falls to 500 (panel 2, column 1).[152]

Table A.1: Common Concentrated Owners and MHHI

Number of Firms	HHI	MHHI and *MHHIΔ*				
		[0] 0 10% CCOs 10 10% NCOs	[1] 1 10% CCO 9 10% NCOs	[2] 2 10% CCOs 8 10% NCOs	[3] 4 10% CCOs 6 10% NCOs	[4] 10 10% CCOs 0 10% NCOs
2	5000	5000 *0*	5500 *500*	6000 *1000*	7000 *2000*	10,000 *5000*
10	1000	1000 *0*	1900 *900*	2800 *1800*	4600 *3600*	10,000 *9000*
100	100	100 *0*	1090 *990*	2080 *1980*	4060 *3860*	10,000 *9900*

Assumptions: firms have equal shares; each firm has ten 10% owners.

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[152] For the first term, the numerator $\sum_i \gamma_{iA}\beta_{iB} = 4\%$. The denominator $\sum_i \gamma_{iA}\beta_{iA} = (4)(1\%) + (1)(60\%)(60\%) = 40\%$. The second term is symmetric. Thus, $MHHI\Delta = (50)(50)(4\%/40\%) + (50)(50)(4\%/40\%) = 500$.

Number of Firms	HHI	MHHI and *MHHIΔ*			
		[1] 4 10% CCOs 1 60% NCO	[2] 4 10% CCOs 3 20% NCOs	[3] 4 10% CCOs 6 10% NCOs	[4] 4 10% CCOs 60% DOs
2	5000	5500	6250	7000	10,000
		500	*1250*	*2000*	*5000*
10	1000	1900	3250	4600	10,000
		900	*2250*	*3600*	*9000*
100	100	1090	2575	4060	10,000
		990	*2475*	*3860*	*9900*

Assumptions: firms have equal shares; each firm has four common 10% owners.

Comparing the two panels illuminates the similar effect on MHHI from subtracting NCOs and adding CCOs. Column 3, with four 10% CCOs and six 10% NCOs, is identical in both tables. Eliminating NCOs entirely (panel 2, column 4) has the same effect as moving up to complete common ownership (panel 1, column 4), resulting in an MHHI of 10,000. In the other direction, combining three 20% NCOs into a single 60% NCO (panel 2, column 1) reduces MHHI to the same extent as cutting the number of CCOs down from four to one (panel 1, column 1).

2. CCOs and Firm Profits: The Case of Cournot Duopoly

Consider a duopoly of American and Delta competing in Cournot quantities, with linear demand and no costs of production. The equilibrium price is given by *P = 1 – q_A – q_D*. Table A.2 shows quantity, price, and profits, for different ownership structures characterized by one NCO for each firm and either one or no CCO. MHHIΔ is calculated using the assumptions employed by O'Brien and Salop and by AST.

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Table A.2: Quantity, Price and Profits Under Cournot Duopoly

	CCO	American NCO	Delta NCO	MHHIΔ	q_A	q_D	Q	Price	Profit$_A$	Profit$_D$	Total Profits
[1]	0	any %	any %	0	0.33	0.33	0.66	0.33	0.11	0.11	0.220
[2]	10	10	10	2500	0.29	0.29	0.57	0.43	0.12	0.12	0.245
[3]	10	10	5	3250	0.38	0.15	0.54	0.46	0.18	0.07	0.249
[4]	10	20	10	1750	0.36	0.23	0.59	0.41	0.15	0.09	0.241
[5]	10	90	10	1280	0.40	0.20	0.60	0.40	0.16	0.08	0.240

Where NCOs hold similar shares in American and Delta, the addition of a CCO will increase the profits of both firms (compare profits in case 2, with a 10% CCO and a 10% NCO at each airline, to lower profits in case 1, with no CCO) . However, where NCO stakes are sufficiently dissimilar, the addition of a CCO reduces the value of the firm where the NCO exerts less influence (compare Delta profits in case 1 to its lower profits in cases 3, 4, and 5).

3. Ownership of Some, but Not All, Firms

Suppose that American, Delta, and United have equal shares on a route. If each airline has a 10% NCO and Redrock owns 10% of all three, MHHIΔ is the sum of six terms. The first of these ("term A-D") is the product of market shares times this expression:

$$\frac{\gamma_{[NCOA]A}\beta_{[NCOA]D} + \gamma_{[R]A}\beta_{[R]D}}{\gamma_{[NCOA]A}\beta_{[NCOA]A} + \gamma_{[R]A}\beta_{[R]A}} = \frac{10\%(0\%) + 10\%(10\%)}{10\%(10\%) + 10\%(10\%)} = 1/2$$

Term A-D reflects the weight American places on the profits of Delta in relation to its own profits. Terms D-A, A-U, U-A, D-U, and U-D proceed in the same way. Thus, MHHIΔ equals (100/3)(100/3)(6)(1/2) = 3333.

Now suppose that Whiterock acquires 10% of American and Delta from dispersed owners. Once again, MHHIΔ is the sum of six terms. Term A-D is the product of market shares times this expression (term D-A is symmetric):

$$\frac{\gamma_{[NCOA]A}\beta_{[NCOA]D} + \gamma_{[R]A}\beta_{[W]D} + \gamma_{[W]A}\beta_{[BB]D}}{\gamma_{[NCOA]A}\beta_{[NCOA]A} + \gamma_{[R]A}\beta_{[R]A} + \gamma_{[W]A}\beta_{[W]A}} = \frac{10\%(0\%) + 10\%(10\%) + 10\%(10\%)}{10\%(10\%) + 10\%(10\%) + 10\%(10\%)} = 2/3$$

Term A-U (and likewise term U-A):

$$\frac{\gamma_{[NCOA]A}\beta_{[NCOA]U} + \gamma_{[R]A}\beta_{[R]U} + \gamma_{[W]A}\beta_{[W]U}}{\gamma_{[NCOA]A}\beta_{[NCOA]A} + \gamma_{[R]A}\beta_{[R]A} + \gamma_{[W]A}\beta_{[W]A}} = \frac{10\%(0\%) + 10\%(10\%) + 10\%(0\%)}{10\%(10\%) + 10\%(10\%) + 10\%(10\%)} = 1/3$$

Term United-American (and likewise term United-Delta):

$$\frac{\gamma_{[NCOU]U}\beta_{[NCOU]A} + \gamma_{[R]U}\beta_{[R]U} + \gamma_{[W]U}\beta_{[W]A}}{\gamma_{[NCOU]U}\beta_{[NCOU]U} + \gamma_{[R]U}\beta_{[R]U} + \gamma_{[W]U}\beta_{[W]C}} = \frac{10\%(0\%) + 10\%(10\%) + 0\%(10\%)}{10\%(10\%) + 10\%(10\%) + 0\%(0\%)} = 1/2$$

Thus, MHHIΔ equals

$$\left(\frac{100}{3}\right)\left(\frac{100}{3}\right)\left(\frac{1}{3} + \frac{1}{3} + \frac{2}{3} + \frac{2}{3} + \frac{1}{2} + \frac{1}{2}\right) = 3333,$$

which is the same level of MHHIΔ as a market with a 10% NCO and Redrock alone.

4. Relative Performance MHHIΔ

This calculation assigns control weights based on absolute ownership, just as with conventional MHHIΔ. Ownership share β*ij* is not absolute ownership but ownership *relative to the benchmark*—that is, the degree to which investor *i* is overweight or underweight in firm *j*. To illustrate (building on the assumptions in the previous section), for American and Delta, MHHIΔ is the sum of two terms: the extent to which American maximizes Delta profits, and the extent to which Delta maximizes American's profits. The first of these is the product of market shares times this expression:

$$\frac{\gamma_{[NCOA]A}\beta_{[NCOA]D} + \gamma_{[R]A}\beta_{[R]D} + \gamma_{[W]A}\beta_{[W]D}}{\gamma_{[NCOA]A}\beta_{[NCOA]A} + \gamma_{[R]A}\beta_{[R]A} + \gamma_{[W]A}\beta_{[W]A}} = \frac{10\%(-5\%) + 10\%(5\%) + 10\%(5\%)}{10\%(5\%) + 10\%(5\%) + 10\%(5\%)} = 1/3.$$

MHHIΔ is calculated by performing equivalent calculations for each of the six airline pairs,

multiplying the results by the product of market shares (33.3%*33.3%) and summing up the

products.

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