COMMON OWNERSHIP: DO MANAGERS REALLY COMPETE LESS?

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This Article addresses an important question in modern antitrust: when large investment funds have holdings across an industry, is competition depressed?

The question of the impact of common ownership on competition has gained much attention as the role of institutional shareholding has grown, with the funds of the three largest management companies holding in aggregate approximately 21% of the shares of a typical S&P 500 firm. It is a source of acute disagreement among scholars and policymakers, with some who believe common ownership does depress competition seeking antitrust law reforms that would significantly constrain how investment funds operate. Neglected in this vigorous debate, however, is a careful analysis of how the persons who in the first instance actually make the decisions that determine an industry's competitiveness—firm managers—would act differently in the presence of common ownership. In essence, even if the common owners were to pressure firms to compete less, how, if at all, would that change the structure of incentives within which these managers work?

The forces that shape managerial decision-making at publicly traded firms have been the object of intense study by scholars of corporate governance for decades, primarily through use of managerial agency cost analysis. The question of how the dynamics among firms in a concentrated industry affect its level of competition has been subject to similarly intense scrutiny by industrial organization economists. We use learning from both

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of these fields to conclude that, at current levels, common ownership is unlikely to have a meaningful effect on the managerial structure of incentives in ways that the industrial organization theories suggest would affect competition. This conclusion thus cautions against the proposed antitrust reforms, which would solve a non-problem while adding to the costs of the investment vehicles of choice for tens of millions of ordinary Americans.

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INTRODUCTION

Institutional holdings of the country's publicly traded companies have increased substantially over the last few decades. Today, some investment funds have significant shareholdings in every public firm in each of the nation's major industries. This growth in common ownership has led to concerns that the funds will pressure firms to compete less aggressively and to calls to extend the antitrust laws so as to constrain the operations of these funds. Less attention, however, has been given to whether the managers of these commonly owned firms—the persons who in the first instance are making the decisions that determine an industry's competitiveness—would be likely to respond to any such pressure. We conclude that they would not, which suggests the undesirability of the proposed extensions of the antitrust laws with the costs they would impose on the investment vehicles of choice for tens of millions of ordinary Americans.

The particularly striking feature of the institutionalization of share ownership is the growth in the holdings of mutual funds and exchange-traded funds (ETFs), a growth driven primarily by the increasing popularity of funds that track broad-based indexes such as the S&P 500 or the Russell 2000. A mutual fund and an ETF are each an investment vehicle open to the public that is run by a management company, which typically runs a number of such funds. Three management companies alone—Vanguard, BlackRock, and State Street (the "Big Three")—manage funds holding in aggregate approximately 21% of the shares of a typical S&P 500 firm.[1] By dollar volume, the bulk of the funds managed by the Big Three are broad-based index funds and, in turn, the Big Three's broad-based index funds dominate this market. Because each of the Big Three has some actively managed funds and specialty index funds as well, the proportion of shares held in aggregate by the funds it manages varies somewhat from one corporation to the next. But, in a typical industry, each of the Big Three holds approximately 4-9% of the shares of every one of the industry's constituent publicly traded firms.[2] In other words, for each firm in an industry, a meaningful portion of the firm's shares is controlled by entities that concurrently hold shares in all the firm's relevant competitors, a pattern ordinarily referred to as "common

[1] Matthew Backus, Christopher Conlon & Michael Sinkinson, *Common Ownership in America: 1980-2017*, 13 AM. ECON. J.: MICROECONOMICS 273, 285 (2021).

[2] *See id.* at 285 fig.5 (showing that each of the Big Three held approximately 4%-9% of a typical S&P 500 firm in 2017).

ownership."[3]

An important literature has developed on this subject, noting the many industries in the United States with oligopolistic market structures[4] and arguing that the increase in common ownership in these industries substantially lessens competition and consequently raises prices for consumers of their products.[5] Moreover, it is argued that the enhanced profits arising from this restricted competition increase capital's share of national income vis-à-vis that of labor, worsening economic inequality.[6] All this happens, the literature suggests, even in the absence of any communication or engagement by the common owners with respect to the companies in which they are invested.[7] Concern about this claimed decline in competition,

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[3] Some scholars have referred to the common ownership issue as "horizontal shareholding." *See, e.g.*, Einer Elhauge, *Horizontal Shareholding*, 129 HARV. L. REV. 1267 (2016); Fiona Scott Morton & Herbert Hovenkamp, *Horizontal Shareholding and Antitrust Policy*, 127 YALE L.J. 2026 (2018).

[4] An oligopoly is a market structure comprised of a few firms such that each firm possesses some degree of market power. Across the spectrum of possible market structures, an oligopoly occupies an intermediate position, situated between the economic ideal of a perfectly competitive market and a monopoly.

[5] *See, e.g.*, José Azar, Martin C. Schmalz & Isabel Tecu, *Anticompetitive Effects of Common Ownership*, 73 J. FIN. 1513 (2018) [hereinafter Airline Paper] (empirically evaluating the effects of common ownership in the airline industry); José Azar, Sahil Raina & Martin Schmalz, *Ultimate Ownership and Bank Competition*, 2021 FIN. MGMT. 1 ([hereinafter Banking Paper] (empirically evaluating the effects of common ownership in the banking industry). José Azar laid the groundwork for the modern studies of common ownership in his 2012 dissertation. *See* Princeton University Doctoral Dissertations, 2011-2021, at https://dataspace.princeton.edu/handle/88435/dsp01w9505050d.

[6] *See, e.g.*, Elhauge, *supra* note 3, at 1291-1301.

[7] *See, e.g.*, *id.* at 1270 ("[A]ctive communication is unnecessary for horizontal shareholdings to have anticompetitive effects . . . . The anticompetitive incentive created by . . . horizontal shareholding is purely structural, changing the price-setting incentive of each firm acting separately."); Eric A. Posner, Fiona M. Scott Morton & E. Glen Weyl, *A Proposal to Limit the Anticompetitive Power of Institutional Investors*, 81 ANTITRUST L.J. 669, 686 (2017) ("[T]hese effects [of common ownership] do not require any communication among rivals in the product market, nor do they require any communication among different investors; they simply involve the direct effects of the common ownership . . . ."); José Azar, Martin Schmalz & Isabel Tecu, *Why Common Ownership Creates Antitrust Risks*, CPI ANTITRUST CHRON. 6 (June 2017) ("[I]t is an absence of incentives to compete (rather than an increased incentive to collude) that leads to reduced competition under common ownership." (emphasis removed)). To be clear, this Article does not contend that the Big Three do not actively communicate with or otherwise engage with their portfolio companies. The Big Three themselves acknowledge such engagement on corporate governance and other issues, though they do not suggest they communicate concerning an issuer's level of production, pricing, or other competitive issues. *See, e.g.*, BLACKROCK, OUR 2021STEWARDSHIP EXPECTATIONS (2020), https://www.blackrock.com/corporate/literature/publication/our-2021-stewardship-expectations.pdf [https://perma.cc/ZCS5-PZRJ]. Instead, the Article's objective is to

and about the inadequacy of traditional antitrust law in combatting this decline, has sparked regulatory proposals by leading scholars. These proposals aim to ameliorate the perceived problem through laws or enforcement actions by the federal antitrust agencies that would result in major changes in the operations of mutual-fund and ETF management companies.[8]

The literature arguing that increasing common ownership has lessened competition—what we will label the "common ownership literature"—is not free from controversy. Some scholars have questioned the persuasiveness of the empirical studies offered in support of this proposition.[9] Others have questioned whether the business model of the typical fund management company would lead it to take an action designed to lessen competition in an industry, whether it be the choice of how to vote the shares of the competing firms held by its funds, the sale of some such shares, or jawboning the managers of these firms while wielding the implicit or explicit threat of a negative vote or share sale.[10] A final question is whether, even in the face of such actions by common owners, the managers of firms in an oligopolistic industry would in fact make competition-affecting decisions that are different from what they would have made in the absence of common ownership. Although some attention has been paid to this last question,[11] it still awaits the kind of rigorous analysis that it deserves. This Article seeks to fill this void.

The question addressed here is important. Though unresolved as an

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interrogate the claim in the literature that common ownership can generate competitive harm apart from any such communication or engagement related to competitive issues.

[8] *See, e.g.,* Elhauge, *supra* note 3, at 1302-04; Posner, Morton & Weyl, *supra* note 7, at 708-710.

[9] *See, e.g.*, Edward B. Rock & Daniel L. Rubinfeld, *Antitrust for Institutional Investors*, 82 ANTITRUST L.J. 221, 240-46 (2018); Daniel P. O'Brien & Keith Waehrer, *The Competitive Effects of Common Ownership: We Know Less Than We Think*, 81 ANTITRUST L.J. 729, 748-758 (2017).

[10] *See, e.g.*, C. Scott Hemphill & Marcel Kahan, *The Strategies of Anticompetitive Common Ownership*, 129 YALE L.J. 1392, 1440-46 (2020); Lucian Bebchuk & Scott Hirst, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, 119 COLUM. L. REV. 2029, 2131-33 (2019). In a similar vein, others have questioned whether each common owner has sufficiently similar interests that common owners can be treated as one, with each taking actions to encourage the same competition-lessening decisions. *See, e.g.*, Menesh S. Patel, *Common Ownership, Institutional Investors, and Antitrust*, 82 ANTITRUST L.J. 279, 311-14 (2018).

[11] *See* Hemphill & Kahan, *supra* note 10; Rock & Rubinfeld, *supra* note 9, at 236-37; Noah J. Phillips, Comm'r, Fed. Trade Comm'n, Opening Remarks, FTC Hearing #8: Corporate Governance, Institutional Investors, and Common Ownership 9-10 (Dec. 6, 2018), https://www.ftc.gov/system/files/documents/public_statements/1454690/phillips_-_ftc_hearing_8_opening_remarks_12-6-18.pdf [https://perma.cc/DVZ7-M7VU].

empirical matter,[12] the proposition that increased common ownership reduces competition, and hence leads to higher consumer prices and exacerbates economic inequality, has considerable power as an idea. As a result, the idea has given rise to proposed significant policy changes that would come at a heavy cost in terms of economic benefits that these types of investment vehicles can confer on society, such as providing ordinary investors with an inexpensive means of diversifying their investments and broadly participating in our thriving capital markets. Given their costs, the proposed reforms should not be undertaken if a deeper examination suggests that there is no problem to fix in the first place. We conclude that this is exactly the case: common ownership, at least to the extent found in most industries today, is very unlikely to significantly affect firm managers' competition-related decisions.

Our approach is as follows. The forces that shape managerial decision -making have been the object of intense study by scholars of corporate governance for decades. For publicly traded corporations without a controlling shareholder, this has meant that primary attention has been paid to the agency costs of management: a cost-benefit analysis of the forces that limit the extent to which corporate managers, to satisfy their personal desires, make decisions that deviate from the ones that would maximize the value of the firm's shares. Similarly, the question of how the dynamics among firms in a concentrated industry affect its level of competition has been subject to intense scrutiny by industrial organization economists. We seek to use learning from both these fields to undertake a rigorous analysis of how, if at all, the existence of shareholders in common would affect the decisions of the firm managers in an oligopolistic industry.

Our decision to focus on managerial decision-making arises from the fact that it is decisions by firm managers—not shareholders—that in the first instance determine the firm behavior whose interaction results in an industry's level of competition. A fundamental feature of corporate law is that the corporation is managed under the direction and authority of its board of directors, who in turn choose the officials making day-to-day decisions

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[12] For example, the Airline Paper, *supra* note 5, found competitive harm from common ownership in the airline industry in the form of higher prices. However, subsequent studies found no empirical relationship between the extent of common ownership and airline ticket prices. *See, e.g.*, Pauline Kennedy, Daniel P. O'Brien, Minjae Song & Keith Waehrer, *The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence* (Soc. Sci. Rsch. Network, Working Paper, July 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3008331 [https://perma.cc/R2XU-3E42]; Patrick J. Dennis, Kristopher Geraldi & Carola Schenone, *Common Ownership Does Not Have Anti-Competitive Effects in the Airline Industry*, J. FIN. (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3063465 [https://perma.cc/2DXZ-FEA7].

(we will refer to the combination of the board and these managers as "management" or "managers").[13] The common ownership literature relates to companies that have *shareholders* in common. Therefore, it is important to keep in mind that the role of shareholders is legally circumscribed and limited to certain discrete matters such as electing directors (typically by majority vote), approving certain extraordinary transactions, and voting on nonbinding proposals for management consideration. An inquiry into how, if at all, common ownership can affect competition in an industry thus requires subtler investigation. Given shareholders' limited powers, it is imperative to know how an increase in the overlap of the shareholders of firms in an industry affects incentives facing these firms' managers when they make decisions affecting the industry's level of competition. Our conclusion is very little, at least at the levels of common ownership we have seen so far.

Our Article makes four key points, none of which has been given in-depth attention in the debate so far concerning common ownership's effect on competition:

1. The common ownership literature's critical assumption: firm managers have a concern with boosting other firms' net revenues. The theoretical and empirical work suggesting that common ownership reduces competition rests on the assumption that with common ownership, a firm's management will seek to maximize not its own firm's net revenues alone, but the sum of its firm's net revenues and, to one extent or another, the net revenues of the other firms in the industry in which its shareholders also have shares. In other words, the managers act as if to serve the interests of a hypothetical "blended shareholder" that represents some kind of averaging of the interests of the firm's common and non-common shareholders. This assumption is necessary for the conclusion that the managers of each firm will set its output level lower, resulting in higher prices, than they would in the absence of common ownership.

2. The basic conflict: a firm's non-common shareholders will want a higher level of output than would its common owners. Say that the big fund managers manage funds that in aggregate hold about 21% of the shares of each firm in an oligopolistic industry. Suppose that the other 79% of each firm is held by non-common owners, that is, shareholders who have no meaningful interest in any other firm.[14] The 21% common shareholders

[13] *See, e.g.*, DEL. CODE, tit. 8, § 141.

[14] To focus the analysis, we start with a circumstance in which a firm's shareholders are either common owners, in the sense that they maintain meaningful interests in each of the firm's relevant competitors, or non-common owners, in the sense that they maintain no meaningful interest in any rival firm. In actual markets, a firm's shareholders may also

would want each firm's managers to make output decisions that would maximize the firm's own net revenues but also some portion of rivals' net revenues, that is, decisions that would result in the industry's aggregate output being closer to or at the level a firm monopolizing the industry would choose. The 79% non-common shareholders of each firm would want its managers to make decisions that would maximize solely the net revenues of just that firm, the same goal that all shareholders would have if there were no common shareholders.

The standard workhorse model of oligopolistic competition—the Cournot model—assumes that each firm maximizes solely its own net revenues and shows that if they do so, the industry's level of production, though lower than with perfect competition, will be higher than if the industry were a monopoly. Thus, if the management of each firm adheres to the preferences of its 79% non-common shareholders, each firm will produce at this same level of output as if it had no common shareholders. In other words, prices would be the same as if there were no common ownership, and the presence of common owners would not reduce competition at all.

It is true that each firm's non-common owners would be made better off if all firms' managers were to adhere to the preferences of the common owners and suppress competition, because that would increase each firm's net revenue. However, this does not mean that the non-common owners at any given firm prefer that their own managers restrict competition. Instead, if all firms are suppressing competition in response to common ownership, the non-common owners at any given firm would be made even better off if their firm managers exploited the suppression in competition by the other firms and competed aggressively. So, the relevant question is: given the conflicting interests of common and non-common shareholders over firm output levels, what will management do?

3. An oligopolistic firm's managers' own preferences are the higher output level preferred by the non-common shareholders. In terms of their own preferences, the managers of an oligopolistic firm would likely want to choose the same higher level of output that the firm's non-common shareholders would want them to choose, not the level that the hypothetical blended shareholder would wish them to choose. The managers' positions in the firm are likely to give them, to one extent or another, a variety of benefits that most people desire: compensation, perquisites, power, prestige, the

include other shareholder types, such as shareholders who maintain meaningful interests in some or all relevant competitors in the industry and at levels that are proportionally different from those of the common owners. We discuss these shareholder types at later stages of the Article. As we discuss there, the presence of those shareholders does not alter the Article's conclusions. *See infra* Sections II.D, III.D.

pleasure of benefiting their associates in the firm, a sense of doing social good, and so on. The extent to which the firm can provide the managers with these desired benefits depends on its residuals: the difference between what it can sell its output for and the cost of producing that output, the maximization of which calls for the same higher level of output preferred by the non-common shareholders. The net revenues of a firm's competitors in the industry provide its managers with none of these benefits.

4. Management's structure of incentives will determine the output level it chooses, and the current level of common ownership will not alter these incentives relative to a baseline of no common ownership. The incentives faced by management have been, as noted above, the central focus of the study of corporate governance over the last few decades, a study usually characterized as concerning the agency costs of management. If common ownership were to alter managerial decision-making, it would be through changing this already familiar incentive structure, one that consists of a number of sticks and carrots. The sticks involve a variety of threats: (i) a proxy fight (the threat of management being voted out of office by its existing shareholders) and related mechanisms, such as using proxy access to nominate competing directors and voting against unopposed directors; (ii) a hostile tender (the threat that some person will purchase enough shares to be able itself to vote management out of office); (iii) an activist campaign (the threat that some person purchases a foothold stake in the firm and then persuades a sufficient number of existing shareholders to vote to replace management); (iv) sale of a share position (the threat of a shareholder with a significant block of shares selling and thereby depressing share price to the disadvantage of the managers); and (v) fiduciary duties (the threat of a derivative suit against the firm's directors and officers claiming that they are not acting in the best interests of the corporation and its shareholders). The carrots are the design of the managers' compensation packages and the managers' own shareholdings in the firm. A careful examination of these sticks and carrots suggests that none of them is changed meaningfully by the current level of common ownership relative to there being no common ownership at all.

This Article proceeds as follows. In Part I, we explore the standard Cournot model, the economist's workhorse model for studying oligopoly. We explain the way the common ownership literature builds on this conceptual framework through the use of particular assumptions about managerial behavior to construct a modified Cournot model. The modified model, in turn, leads to the conclusion, embraced by a number of antitrust law scholars, that common ownership lessens competition.

In Part II, again using the Cournot model as a foundation, we show how, for a firm with both common and non-common shareholders, there is basic conflict between the output level that is in the best interests of the common shareholders and the one in the best interests of the non-common shareholders, a conflict that is glossed over in the common ownership literature.

In Part III, we proceed to question the assumptions about managerial decision-making employed in the common ownership literature's modified Cournot model. We consider the case of an oligopolistic industry where firms have some common and some non-common owners and management faces corporate governance constraints designed to limit managerial agency costs. We examine how, in that scenario, each firm would make its output-level decision. We conclude that common ownership, at least at current levels, will not result in each firm in the industry choosing a different output level than if there were no common ownership. Therefore, we argue, common ownership at current levels will not generate appreciable competitive harm.

Part IV takes the lessons learned from the preceding analysis to comment on previous contributions to both sides of the common ownership debate. Part V concludes with an analysis of the policy proposals to extend the antitrust laws to address the common ownership issue and our own view of the best way forward.

I. CONCEPTUAL FOUNDATIONS: THE STANDARD COURNOT MODEL AND THE COMMON OWNERSHIP LITERATURE'S MODIFICATIONS

In our exploration of conceptual foundations, we start by going back to first principles and considering how firm managers in an oligopolistic industry would make their output-level decisions if there were no common ownership and no agency costs of management, with managers of each firm seeking to choose the output level that maximizes their own firm's net revenues. This involves an explication of the standard Cournot model, the workhorse model used by economists to study oligopoly. Under the standard model, each firm chooses output levels such that prices are higher than with perfect competition, but lower than if the industry consisted of a single monopoly firm.

We then repeat the analysis but with a new condition: a portion of each firm's shareholders are common shareholders, and the rest are not. Exactly mimicking the common ownership literature, we momentarily assume that the managers of each firm seek to maximize the interests of some hypothetical blended shareholder. This involves an explication of a modified version of the Cournot model that is the theoretical basis for the common ownership literature. The outcome of this modified model with each firm

seeking to maximize the sum of its own net revenues and some portion of the net revenues of all other firms in the market is that the industry's firms will choose output levels such that prices are higher than in a similarly concentrated oligopoly without common ownership. This outcome demonstrates the central and provocative tenant of the common ownership literature: even with no communication or coordination among the common owners, common ownership reduces competition.

This exploration of conceptual foundations sets the stage for Parts II and III. In Part II, again using the Cournot model as the foundation, we show how, for a firm with common and non-common shareholders, there is a basic conflict between the output level that is in the best interests of the common shareholders and the one in the best interests of the non-common shareholders. In Part III, we consider what this conflict means in the real world, where there are agency costs of management and a variety of corporate governance devices to minimize those costs. We conclude that, at least at the current levels of common ownership, managers' resolution of the conflict will not result in firms choosing a different output level than if there were no common ownership. As a result, we argue, current levels of common ownership will not increase prices.

A. Oligopolistic Firm Behavior in the Absence of Both Common Ownership and Agency Costs

As a foundational step in analyzing common ownership's influence on managerial incentives and objectives, consider first the baseline case in which there is neither common ownership nor agency costs of management. Agency cost theory, which contemplates a situation where a principal seeks to have an agent perform a task, is concerned with how the principal can get the agent to perform this task in a way as close to the principal's preferences as possible, taking account of the costs of incentives, monitoring, and enforcement.[15] Applied to corporate governance, the shareholders are the principal, and management is the agent.[16] In this application, therefore, the starting point is that a firm's shareholders have, as a body, specified preferences. To assume no agency costs means to assume that management can be costlessly incentivized to act perfectly in accordance with these preferences.

In this Section, we will seek to establish two main points. First, in a

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[15] *See, e.g.*, Steven Shavell, *Risk Sharing and Incentives in the Principal and Agent Relationship*, 10 BELL J. ECON. 55 (1979); Sanford J. Grossman & Oliver D. Hart, *An Analysis of the Principal-Agent Problem*, 51 ECONOMETRICA 7 (1983).

[16] *See, e.g.*, Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure*, 3 J. FIN. ECON. 305, 309 (1976).

world with no common ownership, the idea that a firm's shareholders prefer that management maximize the firm's own net revenues is a good working assumption for a study of competition in an oligopolistic industry. Second, in such an industry, if each firm's management acts to maximize solely its firm's net revenues, there is an equilibrium level of output in the industry that is less than if the industry were fully competitive and more than if it were a single firm monopoly.

1. Viability of the assumption that shareholders in a non-common ownership world prefer their firm to maximize net revenues. Owning a share of stock in a corporation confers one basic financial right: to receive dividends and other distributions. The capacity of the firm to make dividend payments and distributions over time is directly related to the size of its net revenues. Thus, when it comes to a firm's output-level decision, every shareholder of a corporation, all else equal, should prefer that the corporation's output level in each period be the one that, given its then existing productive capacity, maximizes its net revenues. Doing so is an essential part of maximizing the value of the corporation's shares.[17]

In reality, even under the assumption of no common ownership that we make in this baseline analysis, all things are not equal. Shareholders may have idiosyncratic interests leading them to prefer that the firm produce above or below the net revenue maximizing level. For example, a firm's shareholder may be an actual or prospective employee of that firm, a shareholder in another corporation that supplies the firm or that consumes its product, or may be a consumer of the firm's product.[18] The shareholder also may have views on the social consequences of the corporation's output decision that are not captured at the margin by the prices the corporation pays for its inputs or receives for its output.

This reality, however, does not mean that net revenue maximization is not the operative preference of shareholders as principals in the principal-agent relationship. For shareholders to have any role in the firm's decision as to output level (or as to any other matter), they need to coalesce on some preference. In theory, this could be some weighted average of the preferences

[17] A share's value is the discounted present value of all of the firm's expected future dividends and distributions. *See* RICHARD BREALEY, STEWART MYERS & FRANKLIN ALLEN, PRINCIPLES OF CORPORATE FINANCE 83 (2020).

[18] For example, a shareholder who was a consumer of the firm's output would want output higher than the profit-maximizing level because a higher output means a lower price. A shareholder who was a potential supplier to the firm (such as a prospective employee, who supplies labor) would prefer, all else equal, output to be above the net revenue maximizing level because that would amplify demand for what the shareholder seeks to supply to the firm.

of each shareholder,[19] but ascertaining this weighted average would be an impracticably complex task. Coalescing instead on net revenue maximization is the sensible solution since it is simple and, at least for firms with no common shareholders, is unlikely to be far off from the level that would have been called for by the weighted-average approach. For one thing, the preferences of the different shareholders are likely to cancel each other out to a considerable extent, with some preferring an output level that is higher, and others preferring one that is lower, than the net revenue maximizing level. Also, for most shareholders, the interests that give rise to any differences in the preferred level of output are likely to be distinctly second order,[20] in particular relative to the one interest – common ownership – that we have ruled out in our current baseline analysis.

One additional factor strongly suggests that net revenue maximization is a good working assumption when trying to model our hypothetical no common ownership, no agency-cost firm's output decision. Consider the situation back when the firm becomes a public company through a public offering of equity. The firm's promoters can raise the most cash for the least dilution of their own stakes in the company if the market expects that the firm will pursue net revenue maximization.[21] That requires as credible a promise as possible that the firm will in fact pursue this policy. So, through the choice of the firm's corporate law regime and the language of the articles of

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[19] Indeed, some prominent economic theorists argue that this is what managers should do as a normative matter and that firm managers should maximize shareholder utility rather than shareholder profit. *See* Oliver Hart & Luigi Zingales, *Companies Should Maximize Shareholder Welfare Not Market Value*, 2 J.L. FIN. & ACCT. 247 (2017). The issue before us, though, is the positive question of what message shareholders as a body are, at least in the absence ownership, likely to send as their preferences. We believe, as argued here and as is standard in the economics and common ownership literature that the message is to maximize the firm's net revenues.

[20] These interests are further reduced in importance by the fact that many portfolio investors in publicly traded stocks are not locked in to their holdings long term. If an investor can instead sell, the share price will be highest if the firm is maximizing its net revenues.

[21] In the simplest model, at the time of a firm's initial public offering, all of its shares are owned by its entrepreneurial founders and initial private investors (the "pre-offering holders"). The firm engages in the public offering in order to fund new real investments costing some set dollar amount. The shares that are sold in the offering will give their holders a pro rata claim on the future cash flows generated by the firm, thereby diluting the claims of the pre-offering holders. The greater the expected future cash flows of the firm with its new investment, the smaller is the number shares, relative to those owned by the pre-offering holders, that will need to be sold in order to raise the set dollar amount. This is because each such share can sell for more. The expectation that the firm will be run in a share value maximizing way translates into greater expected future cash flows than an expectation that it will not be run in this way. For a discussion of the role that mandatory periodic disclosure can play in this process, *see* Merritt B. Fox, *Regulating Public Offerings of Truly New Securities: First Principles*, 66 DUKE L.J. 673, 697-99 (2016).

incorporation, it is likely that the promoters will at least implicitly make such a promise because doing so is in their interests. And, in the absence of agency costs, this promise will be fulfilled. In essence, at the time of the offering, the promoters and the initial public shareholders tie the firm to this arrangement long term because doing so allows the most mutually advantageous transaction.

Given all this, it should come as no surprise that the assumptions that shareholders prefer that their firm maximize share value and that, in the absence of agency costs, managers seek to do so, are standard in the economics,[22] corporate finance,[23] and corporate governance[24] literatures. It is also considered by many commentators on corporate law as an obligation of management, at least where, as is usually the case, the corporate charter does not indicate to the contrary.[25]

We recognize, of course, that as our country's deep social and environmental problems have become more widely appreciated and our government's difficulties in meeting them more apparent, there has been a reinvigorated interest in the "stakeholder model" of the corporation, which holds that the purposes of the corporation should be broader than just to serve its shareholders' financial interests.[26] But even if many corporations shift their behavior to be of service to this broader sense of social responsibility, it is unlikely to affect the analysis of common ownership's impact on competition that follows here. To start, most such changes in corporate behavior would be unrelated to a corporation's output decision. In fact, producing at the net revenue maximizing output level would generate the most resources for pursuing these broader social objectives. Moreover, even where the output level is implicated, different social concerns might call for producing either above or below the net revenue maximizing level.[27] Finally, and even more relevant to this Article's inquiry, the issue being addressed here is the effect, if any, of the increase in common ownership on an

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[22] Profit maximization is the standard economic assumption of firm behavior across all market structures. *See* ANDREU MAS-COLELL, MICHAEL D. WHINSTON & JERRY R. GREEN, MICROECONOMIC THEORY 317 (perfectly competitive firms maximize profits), 384 (monopolists maximize profit), 387-400 (oligopolists maximize profits) (1995).

[23] *See* BREALEY, MYERS & ALLEN, *supra* note 17, at 8-9.

[24] *See, e.g.*, Henry Hansmann & Reinier Kraakman, *The End of History for Corporate Law*, 89 GEO. L.J. 439, 439 (2001). Corporate law scholarship is evolving on this issue. *See infra* note 26 and accompanying text.

[25] *See, e.g.,* PRINCIPLES OF THE LAW, CORPORATE GOVERNANCE: ANALYSIS AND RECOMMENDATIONS § 2.01(a) (AM. L. INST. 2005) ("[A] corporation should have as its objective the conduct of business activities with a view to enhancing corporate profit and shareholder gain.")

[26] *See, e.g.*, Grant M. Hayden & Matthew T. Bodie, *The Corporation Reborn: From Shareholder Primary to Shared Governance*, 61 B.C. L. REV. 2419, 2427-42 (2020).

[27] *See supra* note 20.

industry's output level. Consider a corporation seeking to serve broader social concerns and compare its output decisions with and without common owners. There is no obvious reason why the effect of common ownership on that firm's output decision (if any) would be any different than the effect of common ownership on the output decision of a firm that instead is concerned solely with choosing an output level that maximizes its own net revenue. In this regard, it is important to note that net revenue maximization is assumed to be the preference of shareholders in the common ownership literature's own baseline treatment of the situation where there is no common ownership.[28]

2. Where the managers of each firm in an oligopolistic industry act to maximize solely the firm's own net revenues, there will be less than full competition. We have established that in the absence of both common ownership and agency costs of management, a good working assumption is that the management of each firm in an oligopolistic industry will choose the output level that maximizes its own firm's net revenues. And, indeed, this is exactly what each of the seminal economic models of oligopolistic competition assumes.[29]

An oligopolistic industry is one that has few enough firms that each firm's choice of its own level of output will meaningfully affect the industry's aggregate production and price levels. A model of economic competition predicts how, in the absence of collusion, firms in such an industry will behave and what, as a result, the industry's aggregate level of output and price will be. We analyze these questions using the Cournot model. We choose this model from among the available possibilities for two reasons. First, the Cournot model is a standard model used in industrial organization economics.[30] Second, as discussed in the next Section, the Cournot model, in modified form, provides the theoretical base for the common ownership literature's analysis of what an oligopolistic industry's production and price levels will be when there are common owners.[31] Some common ownership

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[28] *See infra* Section I.B.

[29] As discussed in Section I.A.2.a *infra*, this is true of the classic Cournot model, in which firms choose their respective output levels without colluding. *See, e.g.*, Carl Shapiro, *Theories of Oligopoly Behavior*, *in* HANDBOOK OF INDUSTRIAL ORGANIZATION 329, 333-39 (R. Schmalensee & R. Willig eds., 1989). It is also true of the other major models of oligopoly, such as the Bertrand model (in which firms choose prices). *See, e.g.*, *id.* at 343-48.

[30] *See* Andrew F. Daughety & Jennifer F. Reinganum, *Cumulative Harm and Resilient Liability Rules for Product Markets*, 30 J. L., ECON. & ORG. 371, 377 (2012) ("The modeling of oligopoly is not a settled topic in economics, but the workhorse of industrial organization is the Cournot model . . . .").

[31] *See infra* Part I.B.

scholarship uses other industrial organization models of firm behavior,[32] but the Article's analysis carries over to those other market structures.[33]

a. The Cournot model. The Cournot model seeks to ascertain the equilibrium level of output for each firm in an oligopoly. In the original, non-common ownership version, the Cournot model assumes that management chooses its level of output in order to maximize solely its own firm's net revenues. In determining what output level does this, the managers of each firm face a tradeoff. On the positive side, each extra unit of output is another unit to sell, adding to the firm's total revenue. On the negative side, each extra unit adds to the industry's total level of output. In doing so, it depresses the price at which all of the industry's output will be sold, whether produced by this firm or some other firm in the industry.[34] By putting the positive and negative together, it is typically the case that each additional unit of output increases total revenue by less than the unit before, that is, the firm faces a declining marginal revenue curve. Economic theory postulates that the managers of a net revenue maximizing firm will set their output at the level such that the marginal revenue (MR) gain in producing an additional unit corresponds to the marginal cost (MC), that is, where $MR = MC$.

In making this calculation, however, the managers will need to recognize that what its firm's marginal revenue will be for any given level of its own output depends on the aggregate output level of all the other firms in the industry. The greater the aggregate output from the industry's other firms, the less the firm in question can add to its revenues by selling another unit. In other words, the firms' respective output levels are interdependent: each firm's marginal revenue curve determines its level of output (given its marginal costs), but the level of its marginal revenue curve will depend on the output decisions of all the other firms in the industry.

The Cournot model seeks to find an equilibrium set of outputs for the firms in the industry given this interdependence. Conceptually, the Cournot model starts by asking, for each firm in the industry, what level of output it would choose, given different possible aggregate levels of output of all the other firms in the industry. The equilibrium arises from the fact that each firm, in choosing its level of output, is subject to two opposing considerations. On the one hand, given any particular aggregate level of

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[32] *See, e.g.*, Matthew Backus, Christopher Conlon & Michael Sinkinson, *Common Ownership and Competition in the Ready-to-Eat Cereal Industry* 14 (Nat'l Bureau of Econ. Rsch., Working Paper No. 28350, 2021), https://www.nber.org/papers/w28350 [https://perma.cc/NM4Z-GR6S] (using the differentiated-goods Bertrand model).

[33] *See infra* note 135.

[34] The conclusion that a higher level of industry output leads to a lower price is the result of the standard economic assumption that the demand for the typical good is depicted by a downward sloping demand curve.

output by all the other firms, the more the firm in question constrains its own output, the higher the price at which it can sell each unit of that output. On the other hand, the more the firm constrains its output, the higher will be the marginal revenue curves of the industry's other firms and so the higher will be their respective levels of output. And the higher their levels of output, the lower will be the price at which the firm in question will be able to sell each unit of its output.

The result of this interaction is an aggregate industry level of production that is lower than it would be if the industry were perfectly competitive: each firm will constrain output somewhat so that, unlike with perfect competition, the industry price will be higher than each firm's marginal cost. But the aggregate production level will be higher than if the industry consisted of a single monopoly firm. Unlike in the monopoly situation, where the single firm fully feels each additional unit's price-depressing effect on the revenues of the industry as a whole, in an oligopoly, each individual firm feels the price depressing effect of an additional unit of output only on its own revenues, not the additional unit's price depressing effect on the revenues of the other firms.

b. An example of a Cournot equilibrium for an oligopolistic industry. To see the workings of the model numerically, consider an example of an industry, widgets, that consists of two firms, Firm A and Firm B. Suppose the demand curve for widgets is depicted by the equation $P = \$10 - Q/10{,}000$, where Q is the aggregate widget production of the two firms and P is the resulting price for any given Q. Also suppose, for ease of exposition, that the firms have identical costs, with MC equal to \$2 per additional unit, whatever is its level of production. Let q_A and q_B represent production amounts for Firms and A and B, respectively.

In this market environment, for a given level of Firm B's output, q_B, Firm A will choose its quantity, q_A, such that its quantity decision maximizes its net revenues. And, for a given level of Firm A's output, q_A, Firm B will choose its quantity, q_B, such that its quantity decision maximizes its net revenues. Denote the expected equilibrium output quantities of q_A and q_B to be Q_A and Q_B, respectively.[35] Calculations in the Appendix show that $Q_A = Q_B = 26{,}667$. At that quantity combination, each firm is maximizing its net revenues, given the quantity choice of the other firm. It follows that the system is in equilibrium: at these respective output levels, neither firm can increase net revenues by producing either more or less than its current output, holding fixed the other firm's quantity decision. In the Cournot oligopoly, therefore, market output is 53,333 widgets and so the market price is $P =$

[35] More precisely, Q_A and Q_B denote the Nash equilibrium of Cournot game.

$\$10 - 53{,}333/10{,}000 = \$4.67$. Because each widget costs $2 to produce, each firm makes net revenues of $26{,}667 * (\$4.67 - \$2.00) = \$71{,}201$, with industry net revenue being $2 * \$71{,}201 = \$142{,}402$.

c. Output and profits if the industry were purely competitive. Suppose that instead of an Cournot oligopoly, the market structure instead is perfectly competitive. Rather than just two firms, there are many firms, each with the same cost structure as Firms A and B such that no firm exercises any market power. In this case, the market price will equal the marginal cost of $2, instead of the Cournot price of $4.67, and industry output will be 80,000, instead of the Cournot level of 53,333.[36] In other words, even without collusion, the Cournot model suggests that prices will be higher, and industry output lower, in an oligopoly than if the industry were perfectly competitive. And because, in the example, each unit sells for its marginal cost of $2, each firm earns zero economic profit with perfect competition.

d. Output and profits if the industry were a monopoly. Finally, take another extreme and suppose that instead of a perfectly competitive market, the market is monopolized. There is just a single producer with the same cost structure as Firm A and Firm B. The monopolist makes its output decision in order to maximize its net revenue but faces no competitive constraints from rival firms. In this case, industry output is 40,000, which is lower than the Cournot oligopoly industry output of 53,333, and the market price is $P = \$6$, which is higher than the Cournot market price of $4.67.[37] Because each widget costs $2 to produce, the monopolist's net revenue, which is the total industry net revenue, is $40{,}000 * (\$6.00 - \$2.00) = \$160{,}000$, instead of the Cournot total industry net revenue of $142,402.

e. Forces working to keep the oligopoly output level above, and price below, the monopoly levels. Because the market price in a Cournot oligopoly is lower than the price if the industry were a monopoly, the shareholders of each firm, even without common ownership, would be better

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[36] In a perfectly competitive market comprised of firms each with the same constant marginal cost, the market price equals firms' $2.00 common (and constant) marginal cost. Rearranging the industry demand curve of $P = 10 - Q/10{,}000$, $Q = 100{,}000 - 10{,}000P$. With $P = \$2$, total industry output is $Q = 100{,}000 - (10{,}000 * 2) = 80{,}000$.

[37] The net revenue maximizing monopolist choses the level of output whereby $MR = MC = \$2$. Given the industry's demand curve, whereby $P = 10 - Q/10{,}000$, the monopolist's total revenue, $P * Q$, equals $(10 - Q/10{,}000) * Q = 10Q - Q^2/10{,}000$. So, its MR curve (the first derivative of the total revenue curve) is $10 - 2Q/10{,}000$. Equating MR and MC means choosing a level of output such that $10 - Q/5000 = 2$, which means that $Q = 40{,}000$. Given the demand curve $P = 10 - Q/10{,}000$, $P = 10 - 40{,}000/10{,}000 = \$6$.

off if the managers of all the industry's firms further constrained their respective individual firm output decisions such that they equaled, in the aggregate, the monopoly output level. But this will not happen, given the managerial incentives that we elaborate in Part III. Instead, the Cournot level of output is what will result in a no agency-cost world in which the shareholders of each firm seek to have their managers maximize *their own* firm's net revenues.[38]

To see why in terms of our example, remember that we concluded that Firm A and Firm B's combined net revenue of $142,402 is less than the $160,000 of industry net revenue if the industry was monopolized. Thus, the shareholders of each firm would be better off if *both* firms restricted their respective outputs so that, in the aggregate, output was reduced to the 40,000 level a monopolist would produce. The firms could accomplish this, for instance, by evenly splitting the monopoly output level of 40,000 widgets, with each producing just 20,000 instead of 26,667. Then, with the price of widgets at $6, each firm's net revenue would be $80,000 instead of $71,201, and the shareholders of the two firms would be better off than under the Cournot level of production.

But this is all merely hypothetical. The firms will not be able to sustain an output decision where they restrict output and each produce just 20,000 widgets. The reason is that, at that output combination, each firm has an incentive to exploit the other firm's decision to produce at low levels by itself producing more than the specified production of 20,000 units.

To see this, start the story with each firm producing 20,000 widgets and ask whether this is an equilibrium situation. That is, would each firm be content with its specified output decision, given the output decision of the other firm? The answer is no: there would be incentives for each firm, in seeking to maximize its net revenues, to increase its output level from 20,000. Consider this first from the point of view of Firm A. As the calculations in the Appendix show, if Firm B produces 20,000 widgets, then the output decision that maximizes Firm A's net revenues is 30,000 widgets, not 20,000 widgets, and Firm A's profits will be $90,000, more than the $80,000 if it had constrained itself to 20,000 units.

This opportunistic incentive is not limited to just Firm A; it is available to Firm B by parallel reasoning. As a consequence, any output

[38] Our analysis focuses on single period interactions between rival firms, rather than repeated interactions over time. Economic theory predicts that if firms engage in repeated interactions over time, they may be able to sustain the monopoly level of production. *See, e.g.*, James W. Friedman, *A Non-Cooperative Equilibrium for Supergames*, 38 REV. ECON. STUD. 1, 11-12 (1971). We focus on single period interactions because that framing allows us to highlight the key properties of the model used in the common ownership literature, which similarly focuses on single period firm interactions. *See infra* Section I.B.

combination in which the firms together produce less than the expected Cournot output level of production cannot be a sustained outcome. Each firm would have an incentive to produce more than the specified Cournot amount.

f. Conclusion. In sum, the Cournot model predicts that oligopoly leads to competitive harm in that, even without any collusion among firms in an industry, firm managers' aggregate output decisions (and therefore market price) are worse for consumers than if the market had been perfectly competitive. Because firm net revenues are higher than if the industry were perfectly competitive, the firms' shareholders are each made better off by the associated competitive harm to consumers. At the same time, the Cournot model predicts that the resulting market price is lower, and total industry output higher, than if the industry consisted of a single monopolist. Each oligopolistic firm's drive to maximize its own net revenues will prevent the firms in the industry from constraining their respective output levels to make aggregate industry output equal to the monopoly level or any amount less than the expected Cournot level of production. The question we turn to next is, does common ownership change any of this?

B. Oligopolistic Firm Behavior in the Absence of Agency Costs Where Managers Are Directed to Maximize the Interests of Each Firm's Blended Shareholder

The common ownership literature has a single key conclusion: common ownership in an oligopolistic industry diminishes managerial incentives to compete, even in the absence of collusion or communication.[39] Managers, it is claimed, constrain each commonly owned firm's level of output below that predicted by the standard Cournot model discussed in Section I.A above. That in turn increases aggregate industry profits and impairs consumer welfare by lowering output and increasing prices so that they are closer to monopoly levels. The common ownership literature's key conclusion, though, rests on a critical assumption: when the managers of a firm with common owners set their output level, they take account of the effect of that decision on the net revenues of their rival firms. This substitutes for the standard model's assumption that each firm's managers seek to maximize only its own firm's net revenues.

We describe here this modified Cournot model on which the common ownership literature relies. As in Section I.A, and as in the common ownership literature itself, we assume for now a no agency-cost world. The management of each firm with common owners is still the agent. In contrast

[39] *See supra* note 7 (collecting sources).

to the standard Cournot model, however, the assumed objective of the principal–the firm's shareholders–is to maximize the sum of the firm's own net revenues and some portion of the net revenues of its rivals, not just its own net revenues alone. In setting up the modified model in this way, our analysis mirrors the common ownership literature in all relevant respects.

Developing the modified Cournot model described in this Section illuminates key aspects of the common ownership literature that have largely gone unnoticed. As Part II explains, there are significant differences between the interests of a firm's non-common shareholders and its common shareholders. The common ownership literature's use of the modified Cournot model glosses over this conflict by assuming, without serious exploration, that managers will make output decisions based on some kind of averaging of these differing interests. In Part III, we show that this assumption is implausible. There, we introduce the reality of the agency costs of management and consider the mechanisms in our corporate governance system to deal with these costs. At least at current levels of common ownership, these very same mechanisms most probably also resolve the conflicts of interest between common and non-common shareholders *entirely* in favor of the non-common shareholders, resulting in output decisions no different than if there were no common ownership. Thus, the exposition in this Section of the modified Cournot model lays a necessary foundation for Part IV, where we engage the common ownership literature directly and critique the empirical and other findings that purportedly verify its conclusions. From this discussion, it will become clear that the case has not been made that common ownership is actually generating competitive harm sufficient to justify the significant policy changes advanced in this literature, a topic we turn to in Part V.

1. The concept of the "blended shareholder." In the modified Cournot model, as in the standard one, each firm's managers must decide their level of production in order to maximize shareholder welfare, taking as given the output decisions of rival firms. The primary difference between an environment with common ownership and without is that the shareholders, as already noted, have divergent preferences as to how vigorously their managers should compete. In the absence of common ownership, all firm shareholders prefer that their managers maximize own-firm net revenues. However, with common ownership, shareholders who hold significant interests across the industry's firms, that is, the common owners,[40] prefer that

[40] Thus, our definition of common ownership corresponds to the ownership patterns of the Big Three. We focus on the Big Three because they have been the primary subject of academic and other discussions of the common ownership issue. *See, e.g.*, Martin C. Schmalz, *How Passive Funds Prevent Competition*, ERIC POSNER (May 18, 2015),

their managers compete less than the non-common owners prefer, all else equal, because the reduction in competition inures to the benefit of rival firms in which the common owners also have ownership interests.

The common ownership literature assumes that this conflict is resolved in a particular way. The literature modifies the Cournot model so that firm managers, instead of maximizing own-firm revenues, seek to maximize the financial interest of a hypothetical shareholder who represents the average shareholder in a particular sense.[41] We will refer to this hypothetical shareholder as the "blended shareholder" and refer to the assumption that firm managers seek to maximize the wealth of this hypothetical shareholder as the "blended shareholder assumption." More specifically, in our discussion of how this idea underlies the common

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http://ericposner.com/martin-schmalz-how-passive-funds-prevent-competition [https://perma.cc/VQ3X-82CY]; Jan Fichtner, Eelke M. Heemskerk & Javier Garcia-Bernardo, *Hidden Power of the Big Three? Passive Index Funds, Re-Concentration of Corporate Ownership, and New Financial Risk*, 19 BUS. & POL. 298, 299-300 (2017); Matt Levine, *They're All Friends in the Index*, BLOOMBERG (July 20, 2020, 11:59 AM EDT), https://www.bloomberg.com/opinion/articles/2020-07-20/they-re-all-friends-in-the-index [https://perma.cc/FM3U-TCG4]; David McLaughlin & Annie Massa, *The Hidden Dangers of the Great Index Fund Takeover*, BLOOMBERG (Jan. 9, 2020, 1:40 PM EST), https://www.bloomberg.com/news/features/2020-01-09/the-hidden-dangers-of-the-great-index-fund-takeover [https://perma.cc/MS2N-LYRD]. We discuss other investor types in Section II.D *infra*.

[41] The modified Cournot model used in the common ownership literature is based on an economic model of managerial decision-making developed by Daniel O'Brien and Steven Salop, known as the O'Brien-Salop model. *See* Daniel P. O'Brien & Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, 67 ANTITRUST L.J. 559 (2000); *see also* Julio J. Rotemberg, Financial Transaction Costs and Industrial Performance (Apr. 1984) (unpublished manuscript), https://dspace.mit.edu/bitstream/handle/1721.1/47993/financialtransac00rote.pdf [https://perma.cc/HEK3-U66J] (developing a similar model). At the most general level, O'Brien and Salop seek to describe the objective of firm managers when there is overlap in ownership interests across rival firms. O'Brien and Salop acknowledge that managerial objectives in a common ownership environment will be determined by the particular corporate governance structure of the firm. However, to illustrate their approach, O'Brien and Salop assume that firm managers in common ownership environments act to maximize the weighted average of shareholders' portfolios across all firms in the relevant market. *See Id.* at 609-10. O'Brien and Salop do not specify how managers actually weigh shareholders' portfolios, recognizing that their general formulation "includes a wide variety of plausible assumptions about the amount of influence each owner has over the manager of the firm." *Id.* The common ownership literature, however, takes the O'Brien-Salop model one step further and assumes that managers weigh shareholders' portfolios in the particular manner discussed below. *See infra* note 43. In both the O'Brien-Salop model and the particular version of it used in the common ownership literature, *see infra* note 43, shareholders' returns are taken as payouts of firms' net revenues in proportion to the shareholders' ownership interests. *See* O'Brien & Salop, *supra*, at 609. *See also* Patel, *supra* note 10, at 289-92 (describing the O'Brien-Salop model and working through a numerical example).

ownership literature, we will assume that the blended shareholder of a given firm derives her wealth from a particular portfolio. That portfolio is comprised of shares of the given firm and its competitors in proportions reflecting the given firm's shareholders' average holdings in the given firm and in each of its competitors.[42] In other words, a firm's managers will, in the absence of agency costs, make their output decision with the goal of maximizing the combined value of all the firm's shares plus all the shares of the firm's rivals held by its own shareholders.[43]

2. The modified Cournot model where each oligopolistic firm's managers act to maximize the wealth of the blended shareholder. The common ownership literature, as discussed, analyzes managerial output decisions in common ownership, no agency cost environments using a Cournot model that is modified to assume that managers maximize the welfare of the blended shareholder, rather than, as is assumed in the standard model, own-firm net revenues. We will lay out the concept of this modified model followed by an example that shows how the aggregate industry level

[42] For instance, suppose that there are two firms, Firm A and Firm B, each with 100 shares outstanding. Firm A's shareholder 1 is a common owner who owns 20 shares of *A* and 20 shares of *B*, while Firm A's shareholder 2 is a non-common owner who owns the remaining 80 shares of A but no shares of B. The blended shareholder associated with Firm A, then, is a hypothetical shareholder who owns 50 shares of A and 10 shares of B.

[43] The common ownership literature assumes that the firm's corporate governance structure causes managers to make output decisions that take some account of their effects on the value of the common shareholders' holdings in rival firms, but *only fractionally* in proportion to the common shareholders' portion of the total shareholder franchise. That is, the common ownership literature parameterizes the O'Brien-Salop model, *see supra* note 41, so that firm managers are assumed to maximize the weighted average of shareholders' portfolio value, where the weights are proportional to shareholders' interests in the firm. *See, e.g.*, Airline Paper, *supra* note 5, at 1525 ("[W]e calculate the control share of shareholder *i* in firm *j* . . . as the percentage of the sole and shared voting shares of firm *j* held by shareholder *i*."); Posner, Scott-Morton & Weyl, *supra* note 7, at 683 (setting control shares equal to shareholders' fractional ownership interests). Our formulation instead assumes that firm managers *fully* take these effects into account and thus suggests that common ownership leads to greater reductions in competition than is suggested by the particular specification used in the common ownership literature. We choose our formulation because it more simply lays out how the common ownership model predicts that common ownership impairs competition. This is a better starting point than making an unexplored guess as to how a firm's corporate governance structure would resolve differences between common and non-common shareholders. We then undertake the needed exploration in Part III of how the corporate governance structures of publicly traded U.S. firms, at least at the current levels of common ownership, would in fact resolve these differences. We conclude there that such firms' managers, rather than taking *full* account of effect of an output decision's impact on the value of the shares of rivals held by the firm's shareholders, as in our formulation, or some *fractional* account, as specified in the common ownership literature, in fact take *no* account of these effects.

of production will be below what the standard Cournot model suggests, which is the key conclusion of the common ownership literature.

Recall our description in Section I.A of the standard Cournot model, where each firm's managers focus solely on their own firm's net revenues. There, the managers face a tradeoff in their determination of the firm's level of output. On the positive side, each extra unit of output is another unit to sell, adding to the firm's total revenue. On the negative side, each extra unit adds to the industry's total level of output and, as a consequence, depresses the price at which all of the industry's output will be sold. Now, suppose instead that a firm has shareholders in common with the other firms in the industry and, following the dictates of the common ownership literature, the managers of the firm seek to maximize the wealth of the firm's hypothetical blended shareholder. In that case, the managers view as amplified the negative side of the tradeoff, that is, the decline in the price of the industry's product due to their firm's additional unit of production. This is because the hypothetical blended shareholder is itself a common owner.[44] Thus, when the firm's managers maximize the blended shareholder's wealth, they care not only about the effect of the decline in price on their own firm's net revenues, but also, given the common shareholder's interest in the firm's rivals, on the effect, to some extent, of its extra unit of production on the net revenues of the other firms as well.

This analysis reveals a key implication of the modified Cournot model deployed in the common ownership literature. Because a firm's managers are assumed to maximize the welfare of a hypothetical blended shareholder who itself will be a common owner, in no agency cost environments they make output decisions that maximize the sum of the net revenues of their own firm plus and some portion of the net revenue of the *other firms* in the industry in which the firm's shareholders also maintain an ownership interest.

Label as OFN (other firm negative effect) the negative effect on the value of the blended shareholder's portfolio arising from the extra unit of output's impact on the net revenues of the other firms in the industry whose shares the blended shareholder holds. The managers of the firm in question will then set its level of output such that the gain in its own revenues from producing an extra unit, that is, its MR, equals the marginal cost of producing this extra unit, that is, MC, plus this other negative effect, OFN. In other words, it will choose the level of output where $MR = MC + OFN$ rather than where $MR = MC$. This amplified downside will lead the firm to choose a

[44] This follows from the definition of the blended shareholder. The blended shareholder is assumed to derive wealth from a portfolio that equals the average portfolio of the firm's shareholders after weighting those portfolios in proportion to the shareholders' interests in the firm. Therefore, if any of the firm's shareholders is a common owner, then the blended shareholder also has ownership interests in rival firms.

different point in the tradeoff between having an extra unit to sell and that extra unit's depressing effect on price. Since MR decreases with each additional unit of output, the output level at which $MR = MC + OFN$ will be below the output level at which $MR = MC$.[45]

In making this calculation, the managers of the firm in question will need to recognize that the level of the firm's own marginal revenue curve will depend on the aggregate output level of all the other firms in the industry. The modified Cournot model, like the standard model explored in Section A, again seeks to find the equilibrium set of outputs for the firms in the industry given this interdependence. The modified model, though, reflects the fact that firms with common ownership will be concerned to some extent with the net revenues of the other firms in the industry. In deciding the optimal level of production, the firm's managers still face the same trade-off as in the standard Cournot model: an output restriction raises the price at which that firm can sell each unit of its production, but the higher price also encourages an output expansion by the firm's rivals. At the Cournot equilibrium level of output, whether in the standard model or the modified one, these competing considerations net out so that the firm's managers have no incentive to decrease (or increase) production in order to maximize their own firm's net revenue, taking as given the output decisions of rival firms.

Common ownership, however, introduces another consideration in the firm's decision-making calculus: because a production curtailment generates an immediate price increase, rival firms, who are now able to sell their own output for more, are made better off by the output restriction. Thus, because the firm in question places a positive value to some extent on the net revenues of those rival firms, the output curtailment is associated with an additional benefit to the firm that is absent if its managers focused solely on their own net revenues, as is the case in the standard Cournot model. The implication of this additional benefit from output curtailment is an aggregate industry level of production that is lower, and a product price that is higher, than they would be if each firm instead sought to maximize solely its own net revenues. In other words, aggregate output would be constrained to a level closer to what it would be if the industry consisted of a single monopoly firm.

In sum, the common ownership literature assumes that firms in common ownership environments maximize the portfolio of a hypothetical shareholder who also has an ownership interest in one or more other firms in the industry. Because of this, each firm values not only its own net revenues

[45] A curve representing $MC + OFN$ for each possible level of output will be higher at all output levels than a curve just representing just MC. Thus, the $MC + OFN$ curve will intersect the firm's downward-sloping MR curve at a lower level of output than does the MC curve.

but to some extent the net revenues of those rival firms.[46] To this extent, the firm directly feels each additional unit of production's price depressing effect on the net revenues of other firms, not just on its own, when it makes its output level decision. Thus, although the aggregate industry level of production is not as low as it would be with a monopolist, where this price depressing effect would be fully felt, it is lower than where each firm seeks to maximize solely its own revenues, where the price depressing effect is not felt at all beyond its impact on each firm's own net revenues.[47] Common ownership, therefore, is expected to generate competitive harm under the modified Cournot model used in the common ownership literature.[48]

2. An example of a modified Cournot equilibrium for an oligopolistic industry with common ownership and managers as faithful agents for a firm's blended shareholder. To see the workings of the model numerically, consider, as in Section I.A, an example of an industry, widgets, that consists of two firms, Firm A and Firm B, with an industry demand curve for widgets again reflected by $P = \$10 - Q/10{,}000$. Each firm also has identical costs, with MC equal to $2 per additional unit, whatever its level of production.

The difference in the industry from the example in Section I.A is that the two firms have a certain amount of common ownership. Assume that Firms A and B each has 1,000,000 shares outstanding and three investors each hold 70,000 shares of A and 70,000 shares of B. Assume that for each firm the remaining shares are held by non-common owners. At this distribution of ownership, the hypothetical blended shareholder of Firm A owns 0.21 shares of Firm B for every share of Firm A they own. We will

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[46] The extent to which the firm values the net revenues of its rivals under the modified Cournot model is embodied in a term ordinarily referred to as kappa, which is discussed in *infra* Section IV.C.

[47] The exception would be the case of complete common ownership where every shareholder maintains an equal interest in every other firm in the industry. In this case, because the blended shareholder would have the same ownership interest in each industry firm,, the firms would jointly act like a monopolist.

[48] More recent common ownership models have more nuanced findings. For instance, in a recent paper, José Azar and Xavier Vives evaluate the properties of a modified Cournot model in a general equilibrium setting, rather than a partial equilibrium as in the original O'Brian-Salop model. *See* José Azar & Xavier Vives, *General Equilibrium Oligopoly and Ownership Structure*, 89 ECONOMETRICA 999 (2021). Their theoretical model predicts that an increase in common ownership can have either pro- or anti-competitive effects depending on whether the rise in common ownership is attributed to increased intra-industry common ownership or increased inter-industry common ownership. *See id.* at 1002. For another recent extension of the common ownership model, see C. Scott Hemphill & Marcel Kahan, Endogenous Choice of Stakes Under Common Ownership (unpublished manuscript) (Aug. 30, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3914327 (extending the O'Brian-Salop model to allow investors to choose their stakes in competing firms).

analyze this situation in accordance with our formulation of the modified Cournot model used in the common ownership literature. That is, a firm's managers, in making their output decision, are assumed to maximize the wealth of this hypothetical blended shareholder. The managers of Firm B are assumed to do the mirror image of this.

The decision rule of the managers of each firm can be restated in terms of net revenue maximization, consistent with the discussion above.[49] Let $q_A{}'$ and $q_B{}'$ represent production amounts for Firms A and B, respectively. For a given level of Firm B's output, $q_B{}'$, Firm A will choose its output, $q_A{}'$, such that its decision maximizes the sum of its net revenue and 21% of the net revenue of Firm B. Firm B will make an analogous choice in mirror like fashion.

Denote as $Q_A{}'$ and $Q_B{}'$, respectively, the expected equilibrium values for the two Firms A and B. As the calculations in the Appendix show, $Q_A{}' = Q_B{}' = 24{,}921$. At that quantity combination, each firm, given the quantity choice of the other firm, is maximizing the sum of its own net revenues and 21% of the revenues of the other firm. It follows that the system is in equilibrium: at these respective output levels, neither firm can further optimize its specified objective by producing either more or less than its current output, holding fixed the other firm's quantity decision.

C. Comparing No Common Ownership with Common Ownership Under the Blended-Shareholder Assumption

Compare the equilibrium amounts in the modified Cournot model example just above with the equilibrium results in Section I.A, which involved the same market and same two firms but with the managers of each seeking to maximize solely their own firm's net revenues. Without any collusion or even communication between the firms, competition will decrease where the managers faithfully pursue the interests of the hypothetical blended shareholder and seek to maximize the sum of their own firm's net revenues and 21% of the net revenues of the other firm. Specifically, each firm will produce 24,921 widgets instead of 26,667 widgets, the price will be $5.02 rather than $4.67, and industry profits will be $150,522 instead of $142,402.[50] At the same time, the industry is still more

[49] The only way that A's output decision for a given period affects A and B, and hence the value of A shares and B shares, is through its effects on these firms' respective costs and revenues in that period. Dollar for dollar, on a per-share basis, the greater the net revenues, the greater the addition to share value.

[50] With each firm producing 24,921 widgets, the total market output is 49,842, and so the market price is $P = \$10 - 49{,}842/10{,}000 = \$5.02$. Since each widget costs $2 to produce, each firm earns net revenues of $\$24{,}921 * (\$5.02 - \$2.00) = \$75{,}261$, with

competitive than if the industry were monopolized or if the two firms colluded to each produce half the output level that a monopoly would choose, that is, 20,000 units each.

This important output-reduction implication of the blended-shareholder assumption is intuitive. The common ownership literature assumes that common ownership leads Firm A's managers to care about the effect of their output decision not only on Firm A's net revenues but also, in part, on Firm B's net revenues. Each extra unit by Firm A, because it adds a unit to the total industry output of Q, reduces the price at which Firm B can sell each unit of its output by \$(1/10,000),[51] and thus reduces B's net revenue by $\$(1/10{,}000) * q_B'$. For a given level of production by Firm B, Firm A produces less than if its managers were focused only on their own firm's net revenues, because lower output by Firm A serves to benefit Firm B in the form of a higher market price. The blended shareholder assumption generates similar incentives on the part of Firm B's managers, who, for a given production decision by Firm A, produce less than if they were focused solely on maximizing own-firm net revenues.

II. THE CONFLICT BETWEEN COMMON AND NON-COMMON SHAREHOLDERS

In Part I, we explored the implications for competition arising from the assumption that the managers of a corporation with common ownership care to some extent about its output decision's impact on the net revenues of its rivals. We have no quarrel with the reasoning by which this assumption leads to the conclusion that common ownership decreases competition. It is important to realize, however, this assumption is just that, an assumption and not an established fact. This assumption concerns the firm's corporate governance structure and how, in that structure, managers resolve the differing preferences of the firm's various shareholders. As O'Brien and Salop, the authors of the modified Cournot model on which the common ownership literature relies, state:

> [W]here the owners have conflicting views on the best strategy to pursue, the question arises as to how the objective of the manager is determined. Ultimately, the answer turns on the corporate-control structure of the firm, which determines each shareholder's influence over decision-

industry net revenue being $2 * \$75{,}261 = \$150{,}522$. For the calculation of the comparable figures in the standard Cournot model example, see Section A of the Appendix.

[51] This can be seen from the inverse demand curve, $P = \$10 - Q/10{,}000$. Thus, $dP/dQ = -1/10{,}000$, that is, the price goes down by \$1/10,000 for each additional unit supplied to the market by the industry.

making within the firm.[52]

In this regard, our Article makes two key points. First, as we will demonstrate in this Part, there are sharp differences between the interests of a corporation's common and non-common shareholders with respect to its optimal level of output. Second, as we will work out in Part III, a study of the corporate-control structures of publicly traded corporations strongly suggests that this conflict is being resolved entirely in favor of the interests of the non-common shareholders, at least given current levels of common ownership. This means that the managers of firms with common owners will choose the same, standard Cournot model output level that they would have chosen in the absence of any common shareholders. In other words, the assumption that firm managers account for the net revenues of their rivals in making output decisions is not plausible. As a consequence, the conclusion that common ownership lessens competition has not been plausibly established by the common ownership literature.

A. The Interests of the Common Shareholders

The basic conflict relating to the optimal level of output between common and non-common shareholders can be illustrated by a return to the example we used in Part II with Firms A and B. Again, Firms A and B each has 1,000,000 shares outstanding and there are three investors, the common shareholders, who each hold 70,000 shares of A and 70,000 shares of B. The remaining shares of each firm are held by persons, the non-common shareholders, who do not hold any shares in the other firm.[53]

Consider the output level of Firm A that would maximize the wealth position of the common shareholders for a given production decision by Firm B. In the numerical example under consideration, because each common owner owns one share of B for each share it holds of A and thus receives the same allocation of Firm A's net revenues as those of Firm B—7% of the net revenues of each firm—each common owner cares solely about the two firms' combined net revenue, rather than how much either firm individually earns. The two firms' joint revenue is maximized when they jointly emulate a monopolist. Accordingly, for a given level of production by Firm B, every common owner prefers that Firm A produce an amount such that the two firms together jointly produce at the monopoly level. By analogous reasoning, for a given production decision by Firm A, the common owners prefer that Firm B produce an amount such that the firms' aggregate output

[52] O'Brien & Salop, *supra* note 41, at 609.

[53] We consider the circumstance in which some of a firm's shareholders maintain a meaningful interest in some but not all of the firm's rivals below. *See infra* Section II.D.

corresponds to the monopoly output.[54]

If the common owners were able to perfectly dictate the objectives of the two firms' managers, they therefore would have the firms jointly produce at the monopoly level, which, as shown in Part I, is 40,000. The market price would be $6.00 and, given that the marginal cost of every widget is $2.00, each firm would earn $4 on every unit produced. Total industry profit would therefore be $160,000 and each common owner would receive a total payoff of $11,200,[55] which is higher than if managers instead maximized the welfare of the blended shareholder.[56]

B. The Interests of the Non-Common Shareholders

Now consider the output level of the two firms that would arise if firm managers instead maximized the wealth position of the firms' non-common shareholders. Neither firm's non-common shareholders hold shares

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[54] Our numerical example assumes, for simplicity, that the common owners' fractional interests in Firm A are the same as their fractional interest in Firm B. If that were not the case, then the common owners would not necessarily prefer that the two firms jointly emulate a monopolist. For instance, if the common owners had high ownership interests in Firm A and a low ownership interest in Firm B, then the joint-monopolist output would not be the common owners' preferred output decision. At the joint-monopoly level of production, those common owners would be made better off, for instance, if Firm A increased production. That would cause Firm A's net revenue to increase at the expense of Firm B, and the common owners are the beneficiary of a relatively large portion of that gain to Firm A's net revenue and incur a relatively small portion of the loss to Firm B's net revenue. However, a circumstance in which the common owners had different fractional interests in the two firms would not alter the substantive analysis in the Article concerning the implausibility of a meaningful linkage between common ownership and competitive harm. We have also assumed that the common owners are homogenous, in that they maintain identical ownership interests across the firms in the industry. This assumption, which is also made for expositional ease, does not accord with actual common ownership levels. *See, e.g.*, *infra* note 110 (showing that the Big Three's ownership interests in the airline industry differ). These differences in common ownership patterns reinforce the Article's conclusion that current common ownership levels are not generating meaningful competitive harm. Heterogeneity in common owners' holdings would generate conflicts among the common owners as to their preferred level of competition abatement. These inter-common owner conflicts of interest would further serve to check common ownership's potential for competitive harm. *See infra* Section III.C.1.

[55] Because industry profit is $160,000 and each common owner earns 7% of each firm's net revenue, a common owner, between its holdings in the two firms, receives $\$160{,}000 * .07 = \$11{,}200$. Although the two firms could evenly split production at 20,000 units each, the common shareholders would be indifferent as to the actual split so long as the total between the two was 40,000 units.

[56] As shown in Section I.B *supra*, under the blended-shareholder assumption total industry profit is $150,522. Each common owner therefore receives $\$150{,}522 * .07 = \$10{,}536.54$.

in the other firm, so their wealth position is not affected by the impact of their firm's output on the net revenues of the other firm. Thus, the output levels that would emerge if managers focused on maximizing the wealth of their firm's non-common owners (call those amounts q_{ANC} and q_{BNC}) would be the same output levels we calculated in Part I with regard to the standard Cournot model. So, $q_{ANC} = q_{BNC} = 26{,}667$. [57] As a result, the price of widgets would be $4.67 and each firm's net revenue would be $71,201.[58]

C. Embedding the Differing Interests in the Context of Oligopolistic Competition

It may occur to the reader that if the common shareholders prevailed in both firms and managed to incentivize the managers of each firm to fully account for the impact of the firm's output decision on the net revenues of the other, they could make the firm's non-common shareholders better off than if the managers of both firms adhered to making output decisions in accordance with the non-common owners' preferences. In other words, the non-common shareholders would gain if the two firms jointly emulated the monopoly level of production. As we have just seen, in that case, the price would be $6.00 and, supposing that the two firms split the monopoly level of production, each firm's net revenue would be $80,000. That would leave the non-common shareholders of each firm better off than if the managers of each adhered to their non-common shareholders' preference sin making their respective output decisions—in which case, as we have also just seen, the price would be $4.67 and each firm's net revenue would be $71,201.[59] So, one might conclude, the non-common shareholders of each firm should accede to having their firm's managers adhere to the common shareholders' preferences.

It is important to see the logical flaw in this thinking. It is true that each firm's common and non-common shareholders alike would be delighted if the managements of *both* firms each made decisions with the aim of maximizing the sum of all the profits of A plus all the profits of B, in which case the firms collectively would produce 40,000 widgets, and the price would be the same as if the industry were monopolized. If the management of either firm adheres to the interests of its 79% non-common shareholders, however, this will not occur because of the dynamics of oligopolistic

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[57] *See* Section A of the Appendix (providing calculations for the standard Cournot model).

[58] *See id.*

[59] While not the case in our running example, if common ownership were to cause the net revenues of one or more of the firms in the industry to fall, then those firms' non-common owners will have been made worse off by the common ownership levels of production.

competition. The non-common shareholders of each firm would want the *other* firm to constrain its output to a level below what it would be in the total absence of common ownership. But the non-common shareholders would then be better off if their own firm takes advantage of this opportunity to increase market share and has a level of output that actually is in excess of what it would have been in the total absence of common ownership.[60]

To see this point in terms of our example, suppose that the two firms are adhering to the preferences of the common owners and are each producing 20,000 units. Consider what the non-common shareholders of Firm A would want the firm to do, given that Firm B is constraining itself to producing 20,000 widgets. From the analysis in Part I, we know that if Firm B is producing 20,000 units, the output that maximizes Firm A's net revenues is 30,000. The price associated with this aggregate output of 50,000 would be $5.00 and Firm A's net revenues would be $90,000,[61] which is $10,000 higher than if Firm A produced 20,000 widgets. So, in this situation, the non-common shareholders of Firm A would not in fact be better off if they acceded to common shareholders and agreed to the managers of Firm A choosing the output level that the common shareholders would prefer.

More generally, if Firm B constrains output below the standard Cournot level, the non-common shareholders of Firm A would want A producing at or above the 26,667 standard Cournot model output level, not below that level.[62] The mirror image of this story applies if we started with Firm B as the example instead. So even though the non-common shareholders would be better off if both firms constrained themselves to producing at the joint monopoly level that would prevail if the common shareholders of both firms dictated the production level than if the firms produced at the standard Cournot level of production, the non-common shareholders of each firm act independently of the non-common shareholders of the other. For this reason, if the two firms were to accede to the preferences of the common shareholders and constrain output to the joint monopoly level, the non-common shareholders of each firm would want their managers to revert to the maximization of own-firm net revenues. That decision rule would make the non-common shareholders even better off, given that the other firm is adhering to the preferences of the common shareholders and constraining its level of production.

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[60] The reasoning here parallels the reasoning in Section I.B as to why firms in non-common ownership environments will not be able to sustain a collusive outcome in which they emulate a monopolist.

[61] *See id.*

[62] *See infra* Appendix fig.1 (showing that for every q_B less than 26,667, the output that maximizes Firm A's net revenue is greater than 26,667).

D. Semi-Common Owners

So far, we have envisioned the firm's shareholders as being one of two types: the common owners, who maintain a meaningful interest in each of a firm's relevant competitors; and non-common owners, who maintain no meaningful interest in rival firms. In actual markets, there may be shareholders with different ownership profiles. Scholars have documented an increase in diversification by institutional investors generally.[63] For this reason, in a given industry there likely will be at least some shareholders who maintain non-trivial but relatively small interests in some or all relevant competitors in the industry and at levels that are proportionally different than those of the common owners.[64] The presence of these shareholders, who we refer to as semi-common owners, does not disrupt the conclusions from the analysis so far.

Just as with the firm's common owners and its non-common owners, there is a conflict of interest between the firm's common owners and its semi-common owners. Namely, the semi-common owners will not necessarily want firm managers to agree to the quantity curtailment preferred by the common owners. To see this, consider our running numerical example with the given demand and cost functions, but suppose that there are three firms (A, B, and C) and that, in addition to common and non-common owners, there are three semi-common owners, as follows:

	Firm A	Firm B	Firm C
Common owners	21%	21%	21%
Firm A's non-common owners	64%		
Firm B's non-common owners		64%	
Firm C's non-common owners			71%
Semi-common owner 1	8%	8%	
Semi-common owner 2	5%	4%	4%
Semi-common owner 3	2%	3%	4%

Now, given this shareholding configuration, suppose that the common owners somehow prevailed at all three firms and incentivized each firm's managers to fully account for the effect of the firm's output decision on the net revenues of the other two firms. As discussed above, this would result in the three firms emulating a monopolist. Suppose that the three firms

[63] *See, e.g.*, Backus, Conlon & Sinkinson, *supra* note 1.

[64] By two shareholders having proportionally different holdings, we mean that for at least one pair of firms in the industry, the shareholders' ratios of holdings of those two firms are unequal.

equally split the monopoly level of production, so they collectively sell 40,000 widgets. In this case, because the net revenue of each firm will be higher than if the three firm managers focused on maximizing just their own firm's net revenues, the semi-common owners are made better off by the curtailment in competition, at least in the first instance.

Nonetheless, just like the non-common owners, each of the semi-common owners would reject the common owners' desired output choice. The reasoning is similar to the analysis above regarding the divergence in the preferences of the common owners and the non-common owners. Consider, for instance, semi-common owner 1. Because that shareholder maintains an interest in Firms A and B but not C, it would prefer that the managers of Firms A and B exploit the curtailment in competition by Firm C by jointly expanding production. That expansion in production would collectively benefit Firms A and B at the expense of Firm C. This, in turn, would benefit semi-common owner 1, because in contrast to the common owners, semi-common owner 1 does not care about the effect of Firm A and B's level of competition on Firm C's net revenues. Semi-common owners 2 and 3 do maintain interests in all three firms in the industry, but their interests in the three firms are proportionally different than the common owners' interests. For this reason, they too would reject the common owners' desired output curtailment in favor of some other output configuration.[65] As this analysis shows, the sharp conflict of interest between the firm's common owners and its non-common owners would remain despite the presence of any semi-common owners. Moreover, the presence of semi-common owners adds another dimension to shareholders' conflicts of interest. As embodied in the example above, a semi-common owner, in addition to not agreeing to the output reduction preferred by the common owners, may not share the output preference of any other semi-common owner.[66]

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[65] Consider, for instance, semi-common owner 2. While the common owners have the same proportional interests in each of the three firms, semi-common owner 2 has a greater proportional interest in Firm A than in Firm B or Firm C. Therefore, if the common owners were somehow to cause the three firm managers to split the monopoly output, then semi-common owner 2 would reject that output choice. For instance, if the three firms are producing at the split-monopoly outcome (i.e., 40,000/3 widgets), then, holding fixed the production amounts of Firms B and C, semi-common owner 2 would want the manager of Firm A to produce more than the split-monopoly outcome preferred by the common owners. Similar analysis shows that semi-common owner 3 likewise would reject the common owners' preferred output configuration in which the three firms emulate a monopolist. But here, because semi-common owner 3 has a relatively smaller interest in Firm A than in Firms B and C, if the three firms were to produce at the split-monopoly outcome (i.e., 40,000/3 widgets), then, holding fixed the production amounts of Firms B and C, semi-common owner 3 would want the manager of Firm A to produce less than the split-monopoly outcome.

[66] The three semi-common owners do not share the same desired output levels because their interests are proportionally different. The reasoning is parallel to why none of the three

III. OLIGOPOLISTIC FIRM BEHAVIOR IN THE PRESENCE OF BOTH COMMON OWNERSHIP AND AGENCY COSTS

The fundamental conflict between a firm's common and non-common owners unearthed in the previous Part can be further leveraged to evaluate this Article's central question: in the real world today, is common ownership likely to affect the level of competition in an oligopolistic industry? We start the answer to this question with the observation that, in the first instance, the managers of each firm in an oligopolistic industry, not the shareholders, are the persons who make their respective firms' output decisions and in so doing determine the industry's level of competition. In turn, it is the preferences of these managers and the incentive structures within which they operate that determine the output levels that they set. Thus, the task ahead of us is understanding whether, in the real world, the rise in common ownership has significantly changed these incentive structures. If it has not, it has not affected competition.

The preceding two Parts set the stage by exploring the relationships between firm managerial objectives and competition and between the interests of non-common versus common shareholders. Part I began by showing that in an industry with no common ownership, it is reasonable to attribute to each firm's principal—its body of shareholders—the objective that the firm's output be set at the level that maximizes that firm's net revenues. In the absence of agency costs, the firm's managers—the agent of these shareholders—will seek to meet that objective. Based on the assumption that this is in fact what managers do, the standard Cournot model predicts that the total output in an oligopolistic industry will be lower, and prices and firm profits higher, than if the industry were perfectly competitive, but not in each case by as much as if the industry instead consisted of a single monopoly firm.

We then went on to explore the modified Cournot model employed by the common ownership literature. This modified model assumes that where there is common ownership, the managers of each of the industry's firms will be the agents of some hypothetical blended shareholder and follow an altered objective: maximizing the sum of the firm's own net revenues and some portion of the net revenues of the industry's other firms. Given this assumption, the modified model shows that output will be yet lower, and prices and industry profits yet higher, than what is predicted by the standard Cournot model. This result is the primary conclusion of the common ownership literature: even without collusion or communication, common

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semi-common owners shares the same desired output level as the common owners.

ownership can generate competitive harm.

Part II shows, however, that taking the aggregate output level of all the other firms in the industry as given, this blended-shareholder assumption papers over the sharp difference between the output level that each firm's non-common shareholders would want and the one its common shareholders would want.[67]

This then leaves the final step in the analysis, which is the subject of this Part: what is the expected shape of managerial incentives in light of this divergence in shareholder preferences, where the firm's non-common owners prefer that the manager maximize own-firm net revenues, while the common owners prefer otherwise?

In the real world, of course, firms have agency costs of management. Because managers have their own objectives, shareholders, whether non-common or otherwise, cannot simply dictate their managers' decisions and expect full compliance. The whole modern law and economics approach to the corporate governance of dispersed shareholder firms has been to study the legal institutions and market practices that have arisen to prompt managers to act more in accord with shareholder desires. This approach recognizes, first, that creating incentives to align the interests of managers with those of shareholders and monitoring managerial behavior are costly and, second, that some residual divergence will persist because, beyond some point, the cost to the shareholders of further efforts to counter any divergence of interests will exceed their benefits. This literature has developed without regard to the possible effects of common ownership and under the assumption that the interest of the shareholders of each firm is to maximize solely its share value.

The key conclusion of this Article is that introducing common ownership does not change things, at least at current common ownership levels. Where a firm has both common and non-common shareholders, these very same institutions and practices work to assure that managers remain incentivized to maximize own-firm net revenues, and thus advance the interests of the firm's non-common owners, not the interests of some mix of common and non-common owners, as is assumed in the common ownership literature. As a consequence, at least with the current extent of common

[67] It is worth reiterating that, while it is the case that non-common owners may be made better off if all firm managers maximized the wealth of the blended shareholder, and therefore all managers competed less, that by itself is irrelevant. Instead, if all firm managers were to maximize the wealth of the blended shareholder, then the non-common owners of every firm could be made *even better off* if their firm's managers exploited rivals' production curtailment and instead produced at the non-common owners' preferred level of output, that is, maximized own-firm net revenues. In other words, taking as given the decisions of the other firms' managers, a firm's non-common owners are always better off if their managers produce at the higher, non-common owner preferred level of output.

ownership in most industries, the level of competition should be no different than if there were no common ownership, that is, the level predicted by the standard Cournot model depicted in Part I.

A. Managers' Own Preferences: The Higher Output Level Preferred by the Firm's Non-Common Shareholders

At least since Berle and Means' classic 1932 work,[68] corporate law scholars have recognized that managerial objectives and shareholder objectives may diverge along a variety of dimensions.[69] The potential divergence relevant to the common ownership debate is the extent of competition, which is embodied in the Cournot model as the firm's level of output. The starting point in trying to determine the effect, if any, of common ownership on competition is to identify the output levels that the managers would choose if they set them simply in response to their own interests.

One likely possibility is that managers prefer the same higher level of output that the firm's non-common shareholders would want them to choose. The managers' positions in their firm are likely to give them, to one extent or another, a variety of things that most people desire: compensation, perquisites, power, prestige, the pleasure of benefiting their associates in the firm, a sense of doing social good, and so on. The extent to which the firm can provide the managers with these desired things depends on its residuals: the difference between what it can sell its output for and the cost of producing that output, the maximization of which calls for the same higher level of output preferred by the non-common shareholders.[70] The profits of the other firms in the industry provide them with none of these things, assuming, as would normally be the case, these managers do not themselves own significant numbers of shares in their competitors. Of course, even if, as we

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[68] ADOLF BERLE & GARDINER MEANS, THE MODERN CORPORATION AND PRIVATE PROPERTY (1932).

[69] *See, e.g.,* MICHAEL C. JENSEN, A THEORY OF THE FIRM: GOVERNANCE, RESIDUAL CLAIMS, AND ORGANIZATIONAL FORMS 144-45 (2000) (summarizing the primary ways in which managerial and shareholder incentives may diverge).

[70] *See, e.g.*, MERRITT B. FOX, FINANCE AND INDUSTRIAL PERFORMANCE IN A DYNAMIC ECONOMY 121-23 (1987). The idea that the corporation has two types of claimants on its residuals is worked out in Oliver Williamson, *Corporate Governance*, 93 YALE L.J. 1197 (1984). Managers will also have an inherent desire to maximize net revenues because of labor-market considerations. Directors who want board seats at additional companies and officers who want more lucrative positions at other firms will shape their current conduct to make those future opportunities more likely. Because the non-common owners at those other firms will constitute the substantial majority, and because those non-common owners will want their managers to be net revenue maximizers, a director or officer will be more likely to obtain those future opportunities if they can demonstrate a track record of delivering high net revenues at their current company.

suggest, the managers and non-common shareholders share the same interest in the firm's output decision, there can be divergences of interest between managers and the non-common shareholders with regard to other matters such as the level of compensation, perquisites, effort, risk taking, interested party transactions, and new investments. But with regard to these other matters, the interests of the common and non-common shareholders should be aligned since no other firm's profits are affected and each kind of shareholder has the same interest in whatever portion of the firm's residuals are not consumed by managers.

It could be argued that even if the managers have the same interests as the non-common shareholders with respect to wishing to maximize solely the firm's own residuals, managers may prefer to work less rather than more, all else equal.[71] If so, when the two interests are combined, managers would prefer a lower level of output than the non-common shareholders. It is far from evident, however, that a decrease in production would allow leisure-inclined managers to work less. After all, firm managers generally are not directly involved in the output generation process, so their own labor effort would be unaffected by the firm's production amount, at least in the first instance.[72] In any event, whether managerial apathy may cause some managers to prefer an output amount less than the amount preferred by the firm's non-common owners is irrelevant to answering common ownership's competition question. Instead, an answer to that question requires a determination of whether common ownership serves to *amplify* any already-existing divergence between managerial incentives to compete and own-firm net revenue maximization. We turn to this question in the next Section.

B. The Structure of Managerial Incentives

The incentives faced by management have been, as noted above, the

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[71] In economic models of managerial decision-making, this possibility is usually modeled with the manager's utility being derived from both their compensation and effort, such that greater levels of effort generate lower levels of utility for a fixed amount of compensation. *See, e.g.*, Shavell, *supra* note 15, at 57.

[72] Stated in terms of the Cournot model, the managers just set the level of Q, while the production of that designated amount is left to others in and outside the firm. At the same time, there may be second order considerations that generate a negative relationship between the amount the firm produces and managers' level of leisure. For instance, if the firm produces less, perhaps leisure-motivated managers have more free time because they do not have to concern themselves with as many purchase orders or employees to manage. We do not take a stand on the net effect of these potentially countervailing influences, as their resolution does not affect the Article's conclusions. In the next Part of the Article, we turn to a related argument in the common ownership literature, namely that common ownership creates competitive harm because managers enjoy living "the quiet life." *See infra* Section IV.B.

central focus of the study of corporate governance over the last few decades, a study usually characterized as concerning the agency costs of management.[73] This extensive body of research has documented and analyzed an intricate incentive structure consisting of a number of sticks and carrots that shape managerial incentives, including incentives to compete.[74] If common ownership were to alter managerial decision-making with regard to output, it would be through its effects on this already familiar incentive structure.

The sticks of this incentive structure involve a variety of threats: (i) a proxy fight (the threat of management being voted out of office by its existing shareholders) and related mechanisms, such as using proxy access to nominate competing directors and voting against unopposed directors; (ii) a hostile tender (the threat that a person will purchase enough shares from current shareholders to be able itself to vote management out of office); (iii) an activist campaign (the threat that a person purchases a foothold stake in the firm and then persuades a sufficient number of existing shareholders to vote to replace management); (iv) a sale of a share position (the threat of a shareholder with a significant block of shares selling and thereby depressing share price to the disadvantage of the managers); and (v) fiduciary duties (the threat of a derivative suit against the firm's directors and officers claiming that they are not acting in the best interests of the corporation and its shareholders). Students of the role played by block shareholders often list "jawboning" as an additional influence on management,[75] but this will only be effective if backed up by one of the foregoing threats.[76]

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[73] *See, e.g.*, Zohar Goshen & Richard Squire, *Principal Costs: A New Theory for Corporate Law and Governance*, 117 COLUM. L. REV. 767, 769 (2017) ("For the last forty years, the problem of agency costs has dominated the study of corporate law and governance.").

[74] For a survey of this corporate governance infrastructure, see Andrei Shleifer & Robert W. Vishny, *A Survey of Corporate Governance*, 52 J. FIN. 737 (1997). Like the common ownership literature, the corporate governance literature assumes that managers are economically rational agents. Our analysis assumes the same. However, there is a literature that questions managerial rationality. *See, e.g.*, Douglas A. Bosse & Robert A. Phillips, *Agency Theory and Bounded Self-Interest*, 41 ACAD. MGMT. REV. 276 (2016). If managers are instead assumed to be irrational economic actors, then the effects of common ownership on managerial incentives is indeterminate.

[75] *See, e.g.*, Andrei Shleifer & Robert W. Vishny, *Large Shareholders and Corporate Control*, 94 J. POL. ECON. 461, 472 (1986) (defining the "'jawboning' mechanism" as pursuing "informal negotiations with incumbent management" as a "means of influencing policy").

[76] *See, e.g.*, Alex Edmans, *Blockholders and Corporate Governance*, 6 ANN. REV. FIN. ECON. 23, 27 (2014) ("[A] low stake lowers [a blockholder's] likelihood of . . . being able to 'jawbone' managers into changing strategy (because managers' receptivity may depend on the threat of a proxy fight if they are non-compliant)."); Bebchuk & Hirst, *supra* note 10, at 2088 (engagement by the Big Three not likely to be effective if not backed up by the threat of the use of the sticks discussed in the text).

The carrots in the managers' structure of incentives are the design of the managers' compensation packages and the managers' own shareholdings in the firm.

C. Today's Level of Investment Fund Common Ownership Is Unlikely to Alter Management's Structure of Incentives and Reduce Output

We conclude that the increases in common ownership that have occurred over the last few decades as a result of the growth in the holding of mutual funds and ETFs managed by the nation's largest investment management companies are unlikely to alter any of the sticks and carrots incentivizing the managers of oligopolistic firms in a way that would lead them to constrain output to a level below what it would have been without common ownership, that is, below the output level that each firm's non-common shareholder would want it to choose.[77] Explaining why requires an examination of each of the carrots and sticks referred to above. In this Section, we consider the baseline case in which a firm's shareholders are either common owners or non-common owners. We consider the relevance of semi-common owners in the next Section.

1. Proxy fights. Where, as today, common ownership arising from the nation's mutual funds and ETFs is in the neighborhood of 20% of most oligopolistic industries, the threat of a proxy fight to remove a firm's managers who refuse to constrain production below the level preferred by non-common shareholders is entirely empty.[78] But even if a proxy fight

[77] There is an active debate in the corporate governance literature about whether passive institutional investors such as the Big Three are able to affect corporate governance and corporate change generally. *Compare, e.g.*, Bebchuk & Hirst, *supra* note 1010 (concluding that the Big Three lack sufficient incentives to effectively engage in stewardship and corporate governance reform) and M. Todd Henderson & Dorothy Shapiro Lund, Opinion, *Index Funds Are Great for Investors, Risky for Corporate Governance*, WALL ST. J., June 23, 2017 (similar) with Marcel Kahan & Edward Rock, *Index Funds and Corporate Governance: Let Shareholders be Shareholders,* 100 B.U L. REV. 1771 (2020) (concluding that index funds have sufficient incentives to affect corporate change). We do not seek to wade into this larger debate and instead focus our analysis on the narrow question implicated by the common ownership literature: is the presence of the Big Three affecting firms' *competition-related* decisions? Our negative answer to this question is not inconsistent with other scholars' conclusions the Big Three are able to affect corporate decision-making in non-competition ways as the shareholder conflicts of interest discussed below that serve to mute common ownership's competitive effects are not necessarily present with respect to these other aspects of firm behavior.

[78] In a proxy fight, an insurgent shareholder tries to secure proxies from the corporation's other shareholders for the purpose of voting those shares in favor of one or more competing directors supported by the insurgent, who seeks to replace the incumbent directors. For discussion of the relevance of proxy fights in shaping corporate governance and managerial incentives, see Lucian A. Bebchuk & Marcel Kahan, *A Framework for Analyzing Legal*

occurred, the non-common shareholders, under our baseline analysis of two investor types, constitute a very substantial majority and are unlikely to vote for a change in management that would adopt a level of output below what they would prefer.[79] It is irrelevant to the analysis whether or not the managers of other firms are constraining production at the common-owner preferred level. In either case, as discussed in Part II, the firm's non-common owners, taking as given the decisions of the other firms, prefer that their own managers focus on the maximization of own-firm net revenues.

An important artery of corporate law scholarship evaluates how differing investor preferences can affect firm governance and managerial decision-making.[80] To the extent relevant to the common ownership issue, heterogeneity in common owners' preferences would serve to further mitigate common ownership's potential for competitive harm, including by further lessening the likelihood of a successful proxy contest by the common owners to oust incumbent managers.

In our analysis so far, we have assumed for expositional simplicity that a common owner's percentage interest in each of the industry's competing firms is the same as its interest in all the others. This is clearly an oversimplification: in any given industry, the data show that common owners generally do not have the same percentage ownership interests across rival firms.[81]

To see the implications of these differences in ownership interests,

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Policy Towards Proxy Contests, 78 CAL. L. REV. 1071, 1077-82 (1990).

[79] Among the class of non-common owners, retail shareholders are known to be apathetic when it comes to voting on ordinary matters. *See, e.g.*, Kobi Kastiel & Yaron Nili, *In Search of the "Absent" Shareholders: A New Solution to Retail Investors' Apathy*, 41 DEL. J. CORP. L. 55, 61-66 (2016) (providing data). However, retail shareholders are not apathetic in connection with proxy fights. For instance, retail shareholders were critical to the outcome of the 2015 proxy fight at DuPont on which the common ownership literature itself relies. *See infra* note 157. And retail shareholders would be especially active if the proxy fight involved an insurgent group seeking to oust the incumbent directors because the incumbent directors were causing the firm to take actions that are preferred by the firm's retail and other non-common shareholders.

[80] *See, e.g.*, Jesse M. Fried, *The Uneasy Case for Favoring Long-Term Shareholders*, 124 YALE L.J. 1554 (2015) (analyzing the divergent preferences of short- and long-term shareholders and their implications for managerial decision-making); Simone M. Sepe, *Corporate Agency Problems and Dequity Contracts*, 36 J. CORP. L. 113 (2010) (analyzing inter-investor conflicts and agency issues in a corporation with diverse investor types); Robert P. Bartlett, *Venture Capital, Agency Costs, and the False Dichotomy of the Corporation*, 54 UCLA L. REV. 37 (2006) (analyzing the implications of divergent investor preferences in venture capital funded start-ups); Ronald J. Gilson & Jeffrey N. Gordon, *Doctrines and Markets: Controlling Controlling Shareholders*, 152 U. PA. L. REV. 785 (2003) (analyzing the means by which controlling shareholders can extract private-control benefits at the expense of minority shareholders and discussing associated legal doctrine).

[81] *See, e.g.*, *infra* note 110.

consider the example of an industry consisting of two firms, A and B, and two common owners, X and Y. Suppose that common owner X has a disproportionately higher interest in A than in B, while common owner Y has a disproportionately higher interest in B than in A. In this case, the two common owners will have dissimilar preferences on the ideal level of competition and therefore dissimilar preferences on the managerial slate they would put up for election in a proxy fight. In a proxy fight at Firm A, while both common owners would prefer that the incumbent managers of Firm A be replaced with a slate of managers who competed less with Firm B, common owner X's preferred slate of managers would curtail production with B less than common owner Y's preferred slate would. These and other divergent preferences among the common owners would impede them from coalescing on a competing slate of managers to nominate in any proxy fight.[82]

In addition to a proxy fight, shareholders can communicate their dissatisfaction with directors by using proxy access to nominate competing directors for election[83] or by voting against directors at the annual meeting.[84] The analysis above forecloses these related mechanisms as pathways for

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[82] Other conflicts may also serve to prevent common owner consensus. For instance, as discussed below, common owners also maintain positions in market segments that may be affected by a dampening of competition in the relevant market, such as positions in firms that make purchases from firms in the relevant market. *See infra* notes 176-177. Differences in their holdings in these out-of-market but affected market segments would drive a further wedge in common owners' preferred reduction in competition. Finally, apart from these issues unique to common ownership, any proxy fight by the common owners to oust incumbent managers would have to overcome the usual significant impediments to proxy fights generally, such as the presence of a staggered board. *See, e.g.*, Lucian A. Bebchuk, John C. Coates & Guhan Subramanian, *The Powerful Antitakeover Force of Staggered Boards: Theory, Evidence, and Policy*, 54 STAN. L. REV. 887 (2002).

[83] More than three quarters of S&P 500 companies have adopted proxy access provisions, *see* Holly J. Gregory, Rebecca Grapsas & Claire Holland, *Proxy Access: A Five-Year Review*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Feb. 4, 2020), https://corpgov.law.harvard.edu/2020/02/04/proxy-access-a-five-year-review/ [https://perma.cc/2JYL-JNBN], which enable sufficiently large shareholders to nominate a certain number of directors for election. *See id.*

[84] The vast majority of S&P 500 companies, and the majority of all publicly traded U.S. companies, use majority voting for directors in uncontested elections. *See FAQ: Majority Voting for Directors* 1, COUNCIL INSTITUTIONAL INVS. (Jan. 2017), https://www.cii.org/files/issues_and_advocacy/board_accountability/majority_voting_directors/CII%20Majority%20Voting%20FAQ%201-4-17.pdf [https://perma.cc/P49R-X96N]. Under such a voting scheme, a director in an uncontested election retains their seat only if they receive more "for" votes than "against" votes. *See id.* In contrast, under plurality voting, a director in an uncontested election retains their seat so long as they get a single "for" vote. *See id.* In a circumstance involving plurality voting, a shareholder could choose to "withhold" their vote to signal their dissatisfaction with the director. *See* Joseph A. Grundfest, *Just Vote No: A Minimalist Strategy for Dealing with Barbarians Inside the Gates*, 45 STAN. L. REV. 857, 865 (1993).

common ownership to modify managerial incentives to compete. For example, even assuming the common owners share the same proportional ownership interests across firms in the relevant market, a firm's directors would not fear replacement by the common owners nominating their own candidates who (implausibly) advocate for curtailed production and competition. The directors would understand that the non-common owners strictly prefer the current directorial slate's competition strategy than that advocated by the competing candidates.[85]

2. Hostile tender offers. Corporate law scholarship teaches that managerial incentives are also shaped by the threat of a hostile tender offer,[86] through which a hostile bidder seeks to purchase sufficient shares from the target's shareholders that it is able to replace the target's managers through an eventual acquisition.[87] The question is whether there would ever be a credible threat of this sort incentivizing managers to compete less than would be preferred by the non-common shareholders. For the reasons set out below, we think there would not be.

For common ownership to affect firm managers' incentives to compete through the tender offer threat channel, it must be that they fear a common owner will seek their removal through a hostile tender offer because they refused to constrain production. Mutual funds and ETFs are not organized to pursue such an activity, and so any potential hostile tender offer

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[85] The common owners similarly will not be able to affect managerial decision-making through a Rule 14a-8 shareholder proposal that seeks to compel management to reduce output. The non-common owners would not support such an implausible proposal, and it would be excludable under Rule 14a-8(i)(7)'s ordinary business exclusion. *See* Amendments to Rules on Shareholder Proposals, Exchange Act Release No. 40018, 63 Fed. Reg. 29106, 29108 (1998), https://www.govinfo.gov/content/pkg/FR-1998-05-28/pdf/98-14121.pdf [https://perma.cc/3C97-LACT] ("The policy underlying the ordinary business exclusion rests on two central considerations. The first relates to the subject matter of the proposal. Certain tasks are so fundamental to management's ability to run a company on a day-to-day basis that they could not, as a practical matter, be subject to direct shareholder oversight. Examples include . . . decisions on production quality and quantity . . . . The second consideration relates to the degree to which the proposal seeks to 'micro-manage' the company by probing too deeply into matters of a complex nature upon which shareholders, as a group, would not be in a position to make an informed judgment.").

[86] *See* Frank H. Easterbrook & Daniel R. Fischel, *The Proper Role of a Target's Management in Responding to a Tender Offer*, 94 HARV. L. REV. 1161, 1174 (1981) ("[S]hareholders benefit even if their corporation never is the subject of a tender offer. The process of monitoring by outsiders poses a continuous threat of takeover if performance lags. Managers will attempt to reduce agency costs in order to reduce the chance of takeover, and the process of reducing agency costs leads to higher prices for shares."); *see also* Shleifer & Vishny, *supra* note 74, at 756 ("Takeovers are widely interpreted as the critical corporate governance mechanism in the United States . . . .").

[87] Depending on the circumstances, the hostile bidder may also simultaneously wage a proxy contest that seeks to oust one or more of the target's directors.

acquirer would need to be some other kind of common owner.[88] To profit from such a tender offer, this other common owner's gain from reducing the output level must be greater than the costs of acquiring a portion of an issuer's cash flow through an ordinary share purchase. That is, the gain must exceed the tender offer's considerable transaction costs plus the share price premium needed to acquire enough of the target's shares to squeeze out the remaining minority who fail to tender.[89] For that to be the case, the potential acquirer's percentage stake in competing firms in the industry would likely need to be large enough that the acquisition of the target's shares would, as illustrated below, create problems under existing antitrust law relating to the ownership of major stakes of multiple firms in an oligopolistic industry. In other words, the share acquisition would cause common ownership levels to reach such elevated amounts that, in contrast to current common ownership levels, they would generate sufficient competitive harm to violate existing antitrust law.

To see this, go back to the example employed in Parts I and II where Firms A and B are the two firms in the oligopolistic industry of widget production. Each firm has 1,000,000 shares outstanding and three investors each hold 70,000 shares of A and 70,000 shares of B, with the remaining shares of each company being held by non-common shareholders. Assume that each of these three investors is either a mutual fund or an ETF and so not a potential hostile tender offer acquirer. Initially, in accordance with the preferences of its managers, Firm A is producing at the level preferred by the firm's non-common shareholders, that is, the level that maximizes solely Firm A's net revenues. Is there somebody who would be motivated to engage in a hostile tender offer with the goal of taking over Firm A to cause it to reduce its output below the level preferred by the non-common shareholders? The way this person (say, Z) could conceivably profit from such a move would be if Z were a shareholder in Firm B: the lower A's production, the more profitable B will be.

The gains that flow to Z from the diminished competition must offset the costs that Z incurs in conducting the tender offer, or else the tender offer would not be economically rational. But, as we have noted, the cost to Z in

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[88] The acquirer would need to be a common owner because otherwise it would not benefit from any reduction in the target firm's level of competition.

[89] The typical acquirer in a hostile tender offer seeks full ownership of the target, thereby avoiding breach of fiduciary duty suits brought by remaining shareholders. Once the acquiror has acquired sufficient shares of the target, it can squeeze out the remaining target's shareholders through a statutory merger, ideally through a short-form merger, which avoids a shareholder vote and allows dissenters only appraisal rights. *See, e.g.*, DEL. CODE tit. 8, § 253. Under Delaware corporate law, for example, the acquirer must hold at least 90% of the outstanding shares to effect a short-form merger. *See id.* In a typical short-form merger, the remaining shareholders get the same consideration, with the same premium, as do those who tendered.

conducting the tender offer will be significant, owing not just to significant transaction costs but also to the considerable premium that Z would need to offer firm A's shareholders to entice them to tender their shares.[90] For this reason, the acquisition of A's shares would be economically rational for Z only if Z were a large shareholder in Firm B and the acquisition of Firm B by Z resulted in a significant reduction of competition in the relevant market. That is what would be need for the associated profitability gains to Firms A and B that flow to Z at least offset Z's significant tender-offer costs. However, because of this resulting substantial competitive harm, the transaction would violate Section 7 of the Clayton Act.[91] Accordingly, prevailing antitrust law would dissuade Z from commencing its tender offer in the first place. Of course, the mere threat of a hostile offer, without it actually being undertaken, could prompt managers of A to change their behavior because they do not want to lose their jobs. But this behavior change will only happen if the threat is credible, and the analysis here suggests that it would not be.

Even more to the point, there is little reason to think that the presence or absence of the three investment funds holding shares in both firms will affect the critical calculation that Z would need to undertake: comparing the gains to Z from A's output reduction with the costs of making a hostile offer. These costs are predominantly the premium over the pre-offer market price that must be offered to attract the tender of a sufficient number of shares plus the investment banking and legal fees involved, matters unrelated to the extent of mutual fund and ETF common ownership in the two firms.

3. Activist investors. As a general matter, managerial incentives may also be shaped by threatened or actual interventions by activist investors.[92] But it is very unlikely that an activist investor or a group of activists will target a firm in an oligopolistic industry to force it to constrain output below

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[90] *See, e.g.*, Sandra Betton & B. Espen Eckbo, *Toeholds, Bid Jumps, and Expected Payoffs in Takeovers*, 13 REV. FIN. STUDS. 841, 853 (2000) (for all single-bid takeovers opposed by management between 1971 to 1990, bidder offered a 40% average initial premium).

[91] *See* 15 U.S.C. § 18 (2021) (prohibiting acquisitions that substantially lessen competition); PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 1203c (4th & 5th eds., 2021 Cum. Supp.) ("[H]orizontal shareholding is reachable under §7 where the threat to competition is present."). Section 7 does include an exception for stock acquisitions made "solely for investment." 15 U.S.C. § 18 (2021). However, that exception applies "only if, and so long as, the stock is not used by voting or otherwise to bring about, or in attempting to bring about, the substantial lessening of competition," United States v. du Pont & Co., 353 U.S. 586, 589 (1957), and thus would be inapplicable to the scenario considered in the text.

[92] *See, e.g.*, Marcel Kahan & Edward B. Rock, *Hedge Funds in Corporate Governance and Corporate Control*, 155 U. PA. L. REV. 1021 (2007); Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 COLUM. L. REV. 863 (2013).

the level preferred by the non-common shareholders. Going back to our example just above (but without shareholder Z), assume that initially Firm A's current output is at the level preferred by A's non-common shareholders, that is, the level that maximizes solely Firm A's net revenues. The question, then, is whether, given the standard business model for activist investors, it is likely that such an investor would intervene to force A to constrain its level of output below that level.

The standard business model for such an intervention involves the activist undertaking four steps: (i) identify a firm where a change in the way it is run would increase its share price, (ii) acquire a foothold stake in the target firm of perhaps 5-7% of its outstanding shares, (iii) persuade enough of the target's shareholders of the desirability of the change to amass a majority vote to oust the incumbent managers if they do not adopt the change, and (iv) sell the shares at a profit after the change is adopted and the share price increases to reflect the improvement.[93]

The standard financial economics model of an issuer's share price is that it reflects the market's best estimate of the issuer's expected future dividends and other distributions to shareholders discounted to present value,[94] which in turn depend solely on the firm's expected net cash flow. Accordingly, an activist pursuing this business model would not push for a change in output level lower than what would be preferred by a non-common shareholder because to do so would lower, not increase, the issuer's share price. After all, the reason that non-common shareholders prefer this output level is that it is the one that maximizes their firm's own net cash flow.[95] And

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[93] See Gilson & Gordon, *supra* note 92, at 900.

[94] *See* BREALEY, MYERS & ALLEN, *supra* note 17, at 83.

[95] The specific production amount that maximizes the firm's net cash flow will depend on the quantity decision by the other firm. As shown by the best response function in the Appendix's Figure 1, if the other firm is producing at a relatively high quantity level, then the non-common owners will prefer that the firm produce less than if the other firm is producing at a relatively low quantity level. However, regardless of the other firm's quantity choice, the non-common shareholders' preferred level of output is the one that maximizes the firm's net revenues, given that other firm's quantity choice. Additionally, if both Firm A and Firm B constrained output, Firm A's net cash flow could very well go up and, with that, its share price. But, as discussed Part I, if Firm A constrained output, Firm B would in fact do the opposite and increase output, unless the sticks and carrots that determine the behavior of Firm B simultaneously pushed B's managers to constrain its output. The question of what might lead B's managers to constrain output is the same as the question we are investigating here, namely, what might lead A's managers to constrain output? In theory, an activist might simultaneously pursue multiple firms in an industry and solicit the common shareholders of each to join the effort. However, we are not aware of any example of such a simultaneous campaign happening. Moreover, any activist that tried such a strategy would be at high risk of violating Section 1 of the Sherman Act, 15 U.S.C. § 1 (2021), on the theory that the activist was serving as the hub of a hub-and-spoke conspiracy. *See, e.g.*, *United States v. Apple, Inc.*, 791 F.3d 290, 314 (2d Cir. 2015) ("[C]ourts have long recognized the existence of 'hub-and-

again, the presence or absence of the three investment funds holding shares in both Firm A and Firm B is not going to change this reality for the activist fund.[96] Consistent with this reasoning, Rock and Rubinfeld observe, "[a]lthough there have been dozens of activist hedge fund engagements, we are not aware of any in which the fight was over whether target management engaged in excessive competition."[97]

4. Sales of share blocks. Another way that a block shareholder can sometimes prompt the managers of a firm to change behavior is to threaten to sell its block of shares.[98] If the managers believe that the sale will depress the firm's share price for an appreciable period of time, they may accede to the blockholder's request because they want to avoid this price decline. How likely is it, though, that a threat of a block sale would prompt a firm's manager to curtail output below what is preferred by the non-common shareholders?

Consider again the Firm A and Firm B example used just above, and continue to assume that initially Firm A's output is at the level preferred by A's non-common shareholders, that is, the level that maximizes solely Firm A's net revenues. We should start by noting those blockholders who are not possible candidates for threatening to sell in order to push the managers of A to lower output below the level that maximizes solely A's own profits. First, no blockholder who does not own shares of Firm B as well would wish to do so, since such a reduction in output would be against its financial interest. Also, to the extent that the three funds in our example are index funds, they cannot successfully threaten to sell because they have no choice but to hold their position in Firm A: they are pledged to hold each stock in the index in proportion to its role in the index.[99] This observation is important because, as we noted earlier, a significant portion of the fund-driven increase in common ownership is the result of increases in the holdings by index funds.

But what about managed mutual funds, that is, investment funds that

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spoke' conspiracies in which an entity at one level of the market structure, the 'hub,' coordinates an agreement among competitors at a different level, the 'spokes.'").

[96] The activist also would have to surmount any of the target's defensive measures, such as a poison pill and the firm's directors having multi-year staggered terms. *See, e.g.*, Marcel Kahan & Edward Rock, *Anti-Activist Poison Pills*, 99 B.U. L. REV 915 (2019) (providing doctrinal and policy analysis of the use of poison pills against activists). Thus, even if the hypothetical activist were to seek a curtailment in output despite the economic irrationality of that decision, its likelihood of success would be further diminished by the need to persuade the directors to eliminate the defenses, something that would not be supported by the non-common owners.

[97] Rock & Rubinefeld, *supra* note 9, at 250.

[98] *See* Anat R. Admati & Paul Pfleiderer, *The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice*, 22 REV. FIN. STUD. 2645, 2647 (2009).

[99] Index funds likewise cannot increase their ownership positions to affect corporate change. For instance, they cannot increase their shareholdings in order to facilitate or support a proxy fight.

are not constrained to hold particular stocks? A threat to sell by one of them, it turns out, will also not be an effective way of prompting managers to reduce output below the level preferred by the non-common shareholders. This is because a blockholder's sale under these circumstances will at most only depress the firm's share price for a short period of time. So, the threat that managers will suffer if they do not lower output is not credible. Microstructure economics teaches us that the reason a share sale can depress price is because the market infers from the seller's order the possibility that the seller has negative nonpublic information not reflected in the price prior to the sale.[100] If, however, nothing comes out subsequently to suggest the existence of any negative news, the price will regain what it lost.[101] Again, the price reflects the market's best estimate of the issuer's expected future dividends and other distributions to shareholders discounted to present value. The sale by the common holder does not change what the future dividends and other distributions will be. So, as soon as the market perceives that there was no negative nonpublic information driving the sale, the price should be no different than if the sale had not occurred. Where the price dip is short lived, management is unlikely to suffer significantly.

5. Fiduciary duties. An officer or director of a corporation has fiduciary duties to the corporation of care and of loyalty, the breach of either of which can subject her to suits seeking injunctive relief or monetary damages. The duty of care requires the director or officer, even where no conflict of interest exists, to act in a manner that they reasonably believe is in the best interests of the corporation.[102] The duty of loyalty requires a director

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[100] *See, e.g.*, Lawrence R. Glosten & Paul R. Milgrom, *Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders*, 14 J. FIN. ECON. 71, 72 (1985); LARRY HARRIS, TRADING AND EXCHANGES: MARKET MICROSTRUCTURE FOR PRACTITIONERS 300 (2002).

[101] If the market is aware that the common shareholder is selling its position to make good on its threat, the price would not drop even in the first instance, since the market would know that this is not a sale from which it should infer that it was motivated by someone with negative nonpublic information. If the market is not aware, the sale may have a negative effect. But there are traders always searching to see if there is nonpublic information that justifies a price drop accompanying a large sale and then purchasing shares when they find none. *See* MERRITT B. FOX, LAWRENCE R. GLOSTEN & GABRIEL V. RAUTERBERG, THE NEW STOCK MARKET: LAW, ECONOMICS, AND POLICY 69-72 (2019).

[102] The American Law Institute's Principles of the Law, Corporate Governance: Analysis and Recommendations (ALI Corporate Governance Principles) describes the duty of care as follows: "A director or officer has a duty to the corporation to perform the director's or officer's functions in good faith, in a manner that [they] reasonably believe[] to be in the best interests of the corporation, and with the care that an ordinarily prudent person would reasonably be expected to exercise in a like position and under similar circumstances." PRINCIPLES OF THE LAW, CORPORATE GOVERNANCE: ANALYSIS AND RECOMMENDATIONS § 4.01(a) (AM. L. INST. 2005). Rather than a negligence standard, Delaware courts

or officer who has an interest in a proposed corporate action to behave fairly toward the corporation. In essence, her action will not validate any decision of the corporation to take action unless she can affirmatively show that the action is in the best interests of the corporation.[103] The discussion below shows that it is extremely unlikely that the threat of a suit claiming the violation of one of these duties will result in a firm constraining its level of output below what its non-common shareholders prefer.

As the above description of these two duties indicates, understanding each of them depends on the concept of the "best interests of the corporation." A corporation is an artificial legal person. Thus, what its best interests are must be a legal construct as well, created from the interests of the persons who have stakes in the corporation's decisions. There is some ambiguity in this legal construct. Section 2.01(a) of the American Law Institute's Corporate Governance Principles, for example, provides that "a corporation should have as its objective the conduct of business activities with a view to enhancing corporate profit and shareholder gain."[104] Returning to our illustrative Firms A and B, consider the position of Firm A. The question here is whether a court would interpret the concept of best interest in such a way that it would intervene to find a violation of the duty of either care or loyalty if the management of A chose the higher level of output that is preferred by the 79% of the shareholders of Firm A and that maximizes the firm's net cash flow. The answer seems obvious: the court would interpret the higher output level preferred by the 79% as more in the interests of the corporation than the lower output level preferred by the 21%, because that lower output generates a smaller cash flow and is preferred by only a minority of the shareholders.

To the extent that the concept of the best interests of the corporation relates to the interests of individual shareholders, rather than what generates the most net cash flow for the corporation over time discounted to present value, an argument could be made that the best interests of the corporation is the decision that maximizes the interests of the "blended shareholder," that is, the level of output that maximizes the aggregate wealth of the shareholders as a group. However, we can find no legal precedent that a corporate action shown to be in the best interests of a majority and to maximize the

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generally apply a gross-negligence standard in evaluating director duty-of-care claims. *See, e.g.*, *McMullin v. Beran*, 765 A.2d 910, 921 (Del. 2000).

[103] The ALI Corporate Governance Principles, for example, impose on directors and officers an "underlying obligation . . . , when interested in a matter affecting the corporation, to act fairly toward the corporation and its shareholders." PRINCIPLES OF THE LAW, *supra* note 102, at ch. V, Introductory Note (referencing § 5.01). Section 5.01 provides, in relevant part, "Directors [§ 1.13], senior executives [§ 1.33], and controlling shareholders [§ 1.10], when interested [§ 1.23] in a matter affecting the corporation, are under a duty of fair dealing . . . ." *Id.* at § 5.01.

[104] *Id.* at § 2.01(a).

corporation's cash flow is a violation of either the duty of care or loyalty on the grounds that the best interests of the corporation are really those of the blended shareholder. Moreover, it seems unlikely that a court will be persuaded to make such a ruling in the future. Whatever are the attractions of the argument that the corporation's interests are those of the blended shareholder, using such a standard in a duty of care or duty of loyalty case would create difficult problems of administration. And when applied to output-level decisions, it would undermine the policy of promoting competition that is at the heart of our antitrust laws.

A further, monumental roadblock to the success of duty of care cases based on the failure of management to constrain production below the level preferred by the non-common shareholders is the business judgment rule. The rule is based on the idea that judges are not business experts and so, as a general matter, a judge should not substitute her judgment for that of a firm's directors or officers.[105] The only exceptions are in instances where the director or officer is interested in the transaction, the procedures used are totally flawed, or it is self-evident that the decision lacks any reasonable basis for being in the best interests of the corporation and its shareholders.[106] Moreover, the party challenging the director or officer's conduct bears the burden of establishing the duty of care breach,[107] which creates a presumption of compliance.

6. Managerial compensation and shareholdings. There is also nothing in the carrots–managerial compensation packages and shareholdings–that would incentivize a firm's managers to constrain its level of output below what its non-common shareholders prefer. The ways that a manager's decisions influence the value of her compensation package relate to her firm's net cash flow. This is because her compensation package, to the extent that it deviates from straight salary, is typically tied in some way to the firm's net revenues or the value of its shares. The package will not reward her for any positive effect that her decisions have on the net revenues of the firm's competitors. So, her compensation package will create no incentive to constrain production below what would be preferred by the non-common shareholders. Her shareholdings in her firm work the same way since, as noted, she is unlikely to have significant holdings in the shares of her firm's

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[105] The seminal case describing the logic of the business judgment rule is *Dodge v. Ford Motor Co.*, 204 Mich. 459 (1919).

[106] *See, e.g.*, PRINCIPLES OF THE LAW, *supra* note 102, at § 4.01(c) ("A director or officer who makes a business judgment in good faith fulfills the duty under this Section if the director or officer: (1) is not interested [§ 1.23] in the subject of the business judgment; (2) is informed with respect to the subject of the business judgment to the extent the director or officer reasonably believes to be appropriate under the circumstances; and (3) rationally believes that the business judgment is in the best interests of the corporation.")

[107] *Id.* at § 4.01(d).

competitors.

The remaining issue is whether common ownership can cause firms to *alter* their executive compensation schemes such that managers are less incentivized to compete. For instance, if common ownership were to cause firms to adopt compensation schemes that were less tethered to the profits or share price of managers' own firms, this could incentivize managers to compete less vigorously than before. However, this is implausible. Common owners have no means of directly dictating executive compensation, as the board, not shareholders, sets executive compensation.[108] Nor would common ownership likely affect those who actually do dictate executive compensation schemes. If the board, for instance, were to modify the CEO's compensation in response to common ownership, such that the CEO was incentivized to compete less, this would disadvantage the much larger group of non-common owners, who would seek the board's removal. A board that modified executive compensation in a manner that incentivized managers to compete

[108] Shareholders do have an opportunity to vote on executive compensation, but only in certain circumstances. For example, stock exchange rules require shareholder approval of equity compensation plans. *See* INTERCONTINENTAL EXCH., INC., NYSE LISTED COMPANY MANUAL § 303A.08 (2021); NASDAQ, INC., THE NASDAQ STOCK MARKET LLC RULES, Rule 5635. Also, tax considerations may prompt the board to put particular compensation plans to shareholder vote. *See* Charles M. Yablon, *Overcompensating: The Corporate Lawyer and Executive Pay*, 92 COLUM. L. REV. 1867, 1892 n.69 (1992) ("It is true that shareholders now do not have the power to approve or disapprove most forms of compensation decisions directly, the major exceptions being stock option plans and employee stock purchase plans, which, to obtain favorable tax treatment, must be submitted to a shareholder vote . . . .").

Further, shareholders can try to influence executive compensation indirectly, but the available mechanisms are blunt means for affecting corporate change. For example, the Dodd-Frank Act provided shareholders with the right to vote on executive compensation through a say-on-pay vote, but that vote is non-binding on the board and simply affords shareholders an up-or-down vote on the board-determined executive compensation program for certain top-level executives. *See* 17 C.F.R. § 240.14a-21. Consistent with the advisory role of the say-on-pay vote, scholars have yet to identify a clear empirical relationship between the outcome of a say on pay vote and the amount of executive compensation. *See, e.g.*, Jill E. Fisch, Darius Palia & Steven Davidoff Solomon, *Is Say on Pay All About Pay? The Impact of Firm Performance*, 8 HARV. BUS. L. REV. 101, 102 (2018) ("Academic studies have reached inconsistent results about the effect of low say on pay votes but have generally failed to find conclusive evidence that issuers reduce executive pay packages in response to lower approval rates."); *see also* Fisch et al., *supra*, at 107-109 (discussing empirical findings). For a discussion of other indirect mechanisms available to shareholders to affect executive compensation, see Randall S. Thomas & Kenneth J. Martin, *The Effect of Shareholder Proposals on Executive Compensation*, 67 U. CIN. L. REV. 1021, 1043-55 (1999).

In any event, even if these two ways for shareholders to influence managerial compensation were more effective than we suggest here, the non-common owners will not be voting in a way that supports constraining production below the standard Cournot model because that is contrary to their interests.

less also would be subject to an activist campaign seeking to turn around the firm's drop in profitability.

D. The Common Owners Are Not Aided by the Presence of Semi-Common Owners

As discussed in Part II, in addition to common owners and non-common owners, industries likely include at least some semi-common owners, that is, shareholders who maintain non-trivial but relatively small interests in some or all relevant competitors and at levels that are proportionally different from those of the common owners. The analysis above is not affected by these shareholder types. Because of significant heterogeneity in semi-common owners' holdings of industry firms, the common owners cannot rely on the semi-common owners to cause firm managers to move away from own-firm net revenue maximization, as discussed below. Thus, despite the presence of semi-common owners, the legal institutions and market practices discussed above continue to incentivize managers to maximize own-firm net revenues.

To see the significant heterogeneity in semi-common owners' holdings, consider the airline industry, which is a focal point of the common ownership literature. Based on Form 13F data, Table 1 below shows the fractional holdings of United Airlines' largest shareholders (with Vanguard, BlackRock, and State Street aggregated as the Big Three) and, for each such top United shareholder, their fractional holdings in key rival airlines.

	United	Delta	AA	SWest	JetBlue	Spirit	Alaska
The Big Three (combined)	18.73	19.21	17.72	21.89	19.16	18.27	21.01
Primecap	9.72	3.57	7.80	11.05	5.54	0.38	4.18
Par Capital	2.41	0.55	0.78	0.42	0.64	1.65	2.27
Fidelity	2.35	2.00	0.30	4.32	12.06	4.18	0.44
U.S. Global	2.11	1.12	2.79	1.08	2.50	4.71	1.92
Geode	1.70	1.63	1.72	1.73	1.24	1.50	1.73
Altimeter	1.64						
Dimensional	1.54	0.84	0.19	0.87	3.26	4.38	2.04
Newport Trust	1.49	1.98					
LSV Asset Mgmt.	1.21	0.61	0.38	0.01	2.38		0.30
Two Sigma Adv.	1.18	0.19	0.27		0.02	1.51	0.12

Table 1: Fractional holdings of United Airlines' largest shareholders and those shareholders' fractional holdings in rival airlines as of 12/31/2020.[109]

[109] Based on Form 13F data drawn from WhaleWisdom. Every institutional investment manager that exercises investment discretion of more than $100 million in securities made available to the public under Section 13(f) of the Securities Exchange Act must file quarterly

As shown in Table 1, the top semi-common owners of United, in addition to having proportionally different holdings as to the Big Three, have proportionally different holdings as to each other. Thus, in addition to not sharing the common owners' preferred output combination, no semi-common owner in Table 1 has the same output preference as any other semi-common owner.[110]

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a Form 13F, which identifies the manager's holdings. *See* 17 C.F.R. § 240.14a-21.

[110] It is important to note that even the common owners' competition-relevant preferences will not be aligned. Table 1 above groups together the ownership interests of Vanguard, BlackRock, and State Street, but a disaggregation of those interests reveals that three fund managers have proportionally different holdings in the airline industry:

	United	Delta	AA	SWest	JetBlue	Spirit	Alaska
Vanguard	10.24	10.22	9.53	8.74	8.64	8.56	10.22
BlackRock	5.31	5.60	5.15	5.88	8.22	7.52	7.48
State Street	3.18	3.39	3.04	7.27	2.29	2.18	3.31

These divergent interests are not unique to the airline industry. *See, e.g.*, Posner et al., *supra* note 7, at 726-28 (presenting tables for a range of industries showing that common owners have proportionally different holdings in each of those industries). Accordingly, in a given industry, even the Big Three will not be in consensus as to their preferred output reduction. Moreover, while the Cournot model simplifies and assumes that a firm competes with all rival firms identically through its output decision, competition in actual markets is multifaceted, and a firm often will set a separate competitive strategy for each of the firm's many rivals. In such an instance, the common owners will be even less likely to coalesce around an agreed competition strategy since, for every firm in the industry, the common owners likely will have differing preferences about the manner and extent to which that firm should separately compete with each of the firm's rivals. This can be seen in the table above, which shows that, for any two airlines, the ratio of the three shareholders' interests in the two airlines are unequal. This property implies that the three shareholders have different preferences as to how much an airline's managers should sacrifice their own firm's revenue for the benefit of the other airline when in head-to-head competition with that other airline, all else equal. *See also* Rock & Rubinfeld, *supra* note 9, at 234-35 (making a similar argument). In fact, in their paper from which the common ownership model springs, O'Brien and Salop expressly note the possibility of a lack of consensus among common owners. *See* O'Brien & Salop, *supra* note 41, at 609 ("When multiple owners have partial-ownership interests, however, they may not agree on the best course of action for the firm."). Scholars have also sought to evaluate the extent of similarity and divergence in institutional-investor preferences outside of the common ownership context. *See, e.g.*, Ryan Bubb & Emiliano Catan, The Party Structure of Mutual Funds (Eur. Corp. Governance Inst., L. Working Paper No. 560/2020, Dec. 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3124039 [https://perma.cc/2Y6E-4WF6] (using mutual funds' voting patterns to evaluate their corporate governance preferences and finding that mutual funds are roughly organized into three parties that follow distinctive patterns of corporate governance philosophies). But there is nothing in this work to suggest that these patterns would lead to constraining production below the standard Cournot level or the extent of competition more generally, especially given the paper's findings of wide dispersion in institutional investors' corporate governance preferences and that many institutional investors' corporate governance preferences do not

Because of the divergent preferences of the semi-common owners, the corporate governance mechanisms discussed in the previous Part will continue to incentivize firm managers to maximize own-firm net revenues. As a representative example, consider the proxy fight mechanism. The way that the presence of semi-common owners could affect managerial decision-making through that mechanism is if the presence of those shareholders enabled the common owners to garner sufficient votes for a slate of directors who, if elected, would cause the firm to choose some diminished level of competition that a sufficiently large voting block of semi-common owners would prefer to own-firm net revenue maximization. That strategy seems highly unlikely to succeed for various reasons.

First, the common owners would need to identify a competitive strategy that a critical mass of semi-common owners would prefer to own-firm net revenue maximization, which may not be possible given the significant variation in semi-common owners' holdings in industry firms and those shareholders' interests in cognate markets that may be affected by competition in the relevant market.[111] Moreover, even if the common owners were able to make that determination, they would need to identify a director slate that would cause the firm to implement that strategy if elected. And while the identified slate likely would not affirmatively campaign on the position of softening competition in the very specific way that appeals to the sought-after voting bloc, the targeted semi-common owners would somehow need to know that that is the slate's intended strategy.

But even if we put these seemingly intractable issues to the side, the fluidity of semi-common owners' ownership interests would serve to impede the common owners' ability to nominate a director slate that a sufficiently large voting bloc of semi-common owners prefer to incumbent managers who are focused on own-firm net revenue maximization. This fluidity arises because while they may also passively manage index funds, semi-common owners manage active funds, continuously moving assets across firms and across sectors in order to fulfill the funds' investment objectives. Because of this active management, the distribution of the semi-common owners' shareholdings in industry firms will rapidly change, even over short periods of time.

	United	Delta	AA	SWest	JetBlue	Spirit	Alaska
Q1, 2020	0.78	1.38	0.23	1.24	7.24	14.87	2.71

align with the Big Three's preferences. *See id.* at fig. 2 (graphically depicting a two-dimensional measure of institutional investors' corporate governance preferences).

[111] *Cf. infra* note 176 and accompanying text (explaining that common owners may hold shares in providers, suppliers, or firms in complementary industries, all of which may benefit from increased competition in the relevant market).

Q2, 2020	0.76	0.38	0.12	3.16	6.12	6.97	2.48
Q3, 2020	0.79	0.74	0.12	2.58	8.12	4.88	0.85
Q4, 2020	2.35	2.00	0.30	4.32	12.06	4.18	0.44

Table 2: Fidelity's fractional holdings of the identified airlines for Q1-Q4, 2020.[112]

The fluidity of semi-common owners' ownership interests can be clearly seen in the airline industry. For instance, consider Fidelity, which as of June 2021 had $2.525 trillion in discretionary equity assets under management.[113] Based on 13F data, Table 2 above shows Fidelity's fractional holdings in the seven identified airlines for 2020 on a quarterly basis. The table shows that Fidelity's investment profile continuously changed over the depicted time period. As just one example, Fidelity had a greater fractional interest in Delta than in United in the first quarter (Q1) of 2020, while that relationship was reversed in the subsequent quarter. Given this, suppose the common owners evaluated shareholding distributions in Q1 2020 and identified a particular level of curtailment in United's extent of competition with Delta that would make Fidelity better off than if United continued under current management and maximized own-firm net revenue. Suppose that the common owners initiated a proxy fight at United with a managerial slate that would implement that diminished level of competition with Delta once elected. The common owners' level of expected support by Fidelity in that proxy fight would quickly drop, as in the very next quarter Fidelity had a greater proportional interest in United than in Delta and thus would weigh United's profits more than Delta's profits when determining its preferred level of competition between those two airlines. Similarly, because they too actively manage at least some of their funds, other semi-common owners also have rapidly changing investment profiles, which likewise would serve to prevent the common owners from honing in on a managerial slate that is preferred by a significant bloc of the semi-common owners.

E. Summary

The common ownership literature assumes that the management of a firm with common shareholders will seek to maximize not its own firm's profits alone, but the sum of its firm's profits and, to one extent or another, the profits of the other firms in the industry. Reflecting on the fact that the firm also has non-common shareholders–persons who do not hold shares in

[112] Based on 13F data drawn from WhaleWisdom.

[113] *See Fidelity by the Numbers: Asset Management*, FIDELITY, https://www.fidelity.com/about-fidelity/our-company/asset-management [https://perma.cc/SV4R-DEQD].

any of its competitors–the common ownership literature posits that common ownership causes management to choose an output level that maximizes the wealth of some hypothetical "blended shareholder." This proposition hides a basic conflict between the firm's non-common shareholders and its common shareholders. The non-common shareholders would want managers to choose the level of output that would maximize solely the firm's own net revenues, a level of output higher than what the hypothetical blended shareholder would prefer. This higher level of output is the same as would have been preferred by all the firm's shareholders if there had been no common shareholders. It is also the output level likely to be preferred by management because maximizing the firm's net revenues maximizes its ability to give managers the things they desire out of their positions. The firm's actual output depends on what level managers with these preferences decide given the incentive structure within which they work. This incentive structure consists of a set of sticks and carrots. The sticks are threats of a proxy fight, hostile tender offer, activist shareholder campaign, sale of share position, and fiduciary duty suits. The carrots are the managers' compensation packages and their own share ownership. A review of these sticks and carrots suggests that, relative to no common ownership, the existence of common ownership, at least at current levels, is unlikely to change how they work in any way that would lead to lower output levels and hence diminished competition.

IV. The Implications of the Analysis for the Common Ownership Debate

Our conclusion that common ownership is currently having no meaningful effect on managerial incentives to compete, and therefore on actual levels of competition, contributes in three significant ways to the larger debate over whether common ownership reduces competition. First, the analysis provides theoretical support to the empirical studies that, in contrast to the common ownership literature, find no evidence of a relationship between current levels of common ownership and competitive harm. Second, the analysis demonstrates the absence of any mechanism connecting common ownership to competitive harm not that does not involve coordination of the kinds already prohibited by antitrust law. Third, the analysis counsels against use of a concentration measure—the MHHI Delta—that is heavily relied on in the common ownership literature and in policy proposals based on that literature. We discuss these three points in turn.

A. The Analysis Supports the Empirical Studies Finding No Substantial Competitive Harm from Current Levels of Common Ownership

The common ownership literature's central tenet that common ownership decreases competition is largely built on the empirical results that the authors say support this conclusion. Contending scholars, however, have conducted studies that find no statistically significant evidence that common ownership has meaningfully reduced competition. The analysis in the preceding parts of this Article helps resolve this empirical debate. This analysis suggests that the contending scholars found no evidence because there was no evidence to find, and that the common ownership adherents' results were due to some other cause.

1. The common ownership literature's empirical results. Two significant empirical papers sparked the recent academic and policy interest in common ownership. In the first paper, which we refer to as the "Airline Paper," José Azar, Martin Schmalz, and Isabel Tecu evaluated whether common ownership was impairing competition in the airline industry.[114] Using fixed-effects panel regressions, Azar, Schmalz, and Tecu found a statistically significant relationship between airline prices and a measure of common ownership discussed below, the MHHI Delta, and concluded that common ownership resulted in ticket prices being 3 to 7 percent higher on the average U.S. route than they would be without common ownership.[115] The authors also conducted a series of econometric tests in order to exclude the possibility that their results were being driven by other possible factors that might tend to move both airline prices and their measure of common ownership in the same direction and hence be an alternative explanation for their results.[116]

In the second, which we refer to as the "Banking Paper," José Azar, Sahil Raina, and Martin Schmalz evaluated the effects of common ownership in the banking sector.[117] In their baseline results, Azar, Raina, and Schmalz find that their measure of common ownership was positively related to the amount of bank deposit fees and deposit thresholds.[118] As in the Airline Paper, the authors of the Banking Paper conducted additional analysis for purposes of establishing a causal, rather than a mere correlative, connection between common ownership and competitive harm.[119]

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[114] *See* Airline Paper, *supra* note 5.

[115] *See id.* at 1517.

[116] *See id.* at 1517-18.

[117] *See* Banking Paper, *supra* note 5. Their analysis also incorporates the existence of so-called partial ownership interests, which occur when one firm maintains an interest in a rival firm. *See id*. at 3. For a thorough legal and economic analysis of partial ownership interests, see David Gilo, *The Anticompetitive Effect of Passive Investment*, 99 MICH. L. REV. 1 (2001).

[118] *See* Banking Paper, *supra* note 5, at 19-22. For simplicity, when discussing the Banking Paper, we will use "price" to refer to these two variables.

[119] *See id.* at 22-33.

The potential positive relationship between common ownership and competitive harm that the authors of these two papers suggest their results show has attracted considerable attention from legal scholars and policymakers, some of whom have called for dramatic changes in antitrust law and enforcement policy in order to intervene and correct common ownership's perceived competitive harm.[120] The two papers have also opened up an entire line of rich academic research, with scholars from disparate fields seeking to determine whether common ownership is linked to other macroeconomic or firm-level phenomenon.[121]

2. Critiques of the common ownership literature's empirical claims, and studies finding no evidence that common ownership meaningfully reduces competition. The Airline and Banking Papers have not escaped criticism. One line of attack has been to critique the papers on their own merits by arguing that a variety of methodological problems cloud their

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

[121] As but one example, researchers also have evaluated the relationship between common ownership and innovative activity and research and development ("R&D"). *See, e.g.*, Ángel L. López & Xavier Vives, *Overlapping Ownership, R&D Spillovers, and Antitrust Policy*, 127 J. POL. ECON. 2394 (2019); Miguel Antón, Florian Ederer, Mireia Giné & Martin Schmalz, Innovation: The Bright Side of Common Ownership?, (May 25, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3099578 [https://perma.cc/V6W2-TY7Y]; Jie He & Jiekun Huang, *Product Market Competition in a World of Cross-Ownership: Evidence from Institutional Blockholdings*, 30 REV. FIN. STUD. 2674 (2017); Leonard Kostovetsky & Alberto Manconi, Common Institutional Ownership and Diffusion of Innovation (Apr. 15, 2020) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2896372 [https://perma.cc/QYB8-D99Z]; Paul Borochin, Jie Yang & Rongrong Zhang, Common Ownership Types and Their Effects on Innovation and Competition (May 14, 2020) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3204767 [https://perma.cc/J78Q-NCG9]; Bin Qiu, Institutional Multiple Holdings and Corporate Innovation (Aug. 26, 2017) (unpublished manuscript), http://www.fmaconferences.org/Boston/Institutional_Investor_Diversification_and_Corporate_Innovation(FMA_2017).pdf [https://perma.cc/N7PU-W9LE]. Scholars have also evaluated how common ownership by other investor types affects firm behavior. *See, e.g.*, Ofer Eldar, Jillian Grennan & Katherine Waldock, Common Ownership and Startup Growth (June 11, 2020) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3406205 [https://perma.cc/AT3N-3M4A] (evaluating the effects on startup success of common ownership in startups by venture capital investors).

empirical analysis[122] and their policy implications,[123] some of which we will discuss in more detail below.

At least as important, a number of scholars have conducted their own empirical studies that have yielded results failing to show evidence of a relationship between common ownership and any meaningful amount of competitive harm. In widely reported findings, for instance, Pauline Kennedy, Daniel O'Brien, Minjae Song, and Keith Waehrer used the same data as in the Airline Paper but a different empirical methodology, and found that common ownership had no statistically significant effect on airline prices.[124] Subsequent empirical research by other scholars likewise found little or no competitive harm of common ownership in either airlines or banking.[125] Still other studies generated empirical results indicating no

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[122] For an early and comprehensive critique, see O'Brien & Waehrer, *supra* note 9. Matthew Backus, Christopher Conlon, and Michael Sinkinson recently reviewed the literature and concluded that "[w]hile the authors of these early papers deserve credit for shining a spotlight on this issue, the methods used in the early papers–regressions of prices on opaque and theoretically problematic measures of ownership concentration–are unreliable in many contexts." Matthew Backus, Christopher Conlon & Michael Sinkinson, *The Common Ownership Hypothesis: Theory and Evidence*, ECON. STUD. BROOKINGS 2-3 (Jan. 2019), https://www.brookings.edu/wp-content/uploads/2019/02/ES_20190205_Common ownershipCommon Ownership.pdf [https://perma.cc/BLC6-9765]. For additional critiques of the Airline and Banking Papers' empirical methodology, see Rock & Rubinfeld, *supra* note 9, at 240-46; and Hemphill & Kahan, *supra* note 10, at 1404-07, 1411-12; Jeremy McClane & Michael Sinkinson, Uncommon Implications of the Common Ownership Hypothesis (July 30, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3902736. *See also* Daniel P. O'Brien, Price Concentration Analysis: Ending the Myth and Moving Forward (July 26, 2017) (unpublished manuscript), papers.ssrn.com/sol3/papers.cfm?abstract_id=3008326 [https://perma.cc/BS8E-HJCH].

[123] *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 730 ("[O]ur analysis leads us to conclude that both researchers and policy authorities are getting well ahead of themselves in calling for and implementing policy changes based on this research. While the correlations identified in the research to date might seem to suggest that an increase in common ownership has anticompetitive effects, our analysis shows that this is not a valid inference.").

[124] Kennedy et al., *supra* note 12. The authors of the Airline Paper provide a reply to Kennedy et al. in José Azar, Martin C. Schmalz & Isabel Tecu, The Competitive Effects of Common Ownership: Economic Foundations and Empirical Evidence: Reply (Sept. 21, 2018) (unpublished manuscript), papers.ssrn.com/sol3/papers.cfm?abstract_id=3044908 [https://perma.cc/WH8E-75DM].

[125] *See* Dennis, Geraldi & Schenone, *supra* note 12 (reporting the results of an empirical analysis indicating that common ownership is not having a causal effect on airline ticket prices); Jacob Gramlich & Serafin Grundl, Estimating the Competitive Effects of Common Ownership (Fed. Rsrv. Bd., Fin. & Econ. Discussion Series 2017-029, Apr. 21, 2017), https://www.federalreserve.gov/econres/feds/files/2017029r1pap.pdf [https://perma.cc/4RUQ-T3DL] (providing preliminary empirical results, based on an empirical methodology different than the Banking Paper's, showing that common ownership is having at most a small effect on prices and quantities in the banking industry); Eric Lewis

statistically significant positive relationship between common ownership and competitive harm in other industries. For instance, in a recent study published in the *Journal of Financial Economics*, Andrew Koch, Marios Panavides, and Shawn Thomas conducted an empirical analysis that indicated that common ownership is not positively related to prices or industry profitability and is not negatively related to measures of non-price competition.[126] However, there have also been some studies of industries other than banking or airlines going the other way.[127]

3. Evaluating the empirical literature as a whole. Although, as just

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& Randy Chugh, Common Ownership and Airlines: Evaluating an Alternate Ownership Data Source (U.S. Dep't of Just., Antitrust Div., Econ. Analysis Grp., Discussion Paper EAG 19-1, Apr. 2019), https://www.justice.gov/atr/page/file/1181681/download [https://perma.cc/GWB4-HPAQ] (finding that common ownership results are sensitive to data sources and that some data sources yield results showing no statistically significant relationship between common ownership and airline prices); McClane & Sinkinson, *supra* note 122 (replicating the Airline Paper and showing that a relationship between common ownership and price increases can be obtained using completely random levels of common ownership or low levels of common ownership); *see also* Katharina Lewellen & Michelle Lowry, *Does Common Ownership Really Increase Firm Coordination?*, 141 J. FIN. ECON. 322 (2021) (concluding that there is little robust empirical evidence that common ownership affects firm behavior); José Azar & Xavier Vives, Revisiting the Anticompetitive Effects of Common Ownership (Sept. 27, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3805047 (using data from the airline industry and finding that while increases in intra-industry common ownership are associated with higher prices, increases in inter-industry common ownership are associated with lower prices). *But see* Alex Haerang Park & Kyoungwon Seo, *Common Ownership and Product Market Competition: Evidence from the U.S. Airline Industry*, 45 KOREAN J. OF FIN. STUD. 617 (2019) (conducting empirical analysis showing that common ownership is generating higher prices in the airline industry).

[126] *See* Andrew Koch, Marios Panayides & Shawn Thomas, *Common Ownership and Competition in Product Markets*, 139 J. FIN. ECON. 109 (2021).

[127] *See* Mohammad Torshizi & Jennifer Clapp, *Price Effects of Common Ownership in the Seed Sector*, 66 ANTITRUST BULLETIN 1 (2021) (finding a positive relationship between common ownership and soy, corn, and cotton prices); *see also* Lysle Boller & Fiona Scott Morton, Testing the Theory of Common Stock Ownership, (Nat'l Bureau of Econ. Rsch., Working Paper No. 27515, 2020), https://www.nber.org/papers/w27515 [https://perma.cc/3VJ7-KLXJ] (using event study methodology and finding that increased common ownership is associated with increased firm value); Melissa Newham, Jo Seldeslachts, & Albert Banal-Estanol, Common Ownership and Market Entry: Evidence from Pharmaceutical Industry, (DIW Discussion Paper No. 1738, 2019), https://www.econstor.eu/bitstream/10419/206644/1/dp1738rev.pdf [https://perma.cc/NN3J-Q7D3] (finding that increased common ownership between a branded pharmaceutical firm and a potential generic entrant is negatively related to the likelihood of market entry by the generic firm); *cf.* Jin Xie & Joseph Gerakos, *The Anticompetitive Effects of Common Ownership: The Case of Paragraph IV Generic Entry*, 110 AEA PAPERS & PROC. 569 (2020) (finding the common ownership between a branded pharmaceutical firm and a generic entrant is positively related to the likelihood that the two parties will enter into a settlement agreement in which the generic manufacturer agrees to stay out of the market).

discussed, much of the scholarship since the Airline and Banking papers finds no evidence that the current level of common ownership is generating meaningful competitive harm, the totality of the empirical evidence is mixed.[128] This Article's analysis aids in the resolution of this empirical impasse. All else equal, where two bodies of empirical work respectively support opposing hypotheses, but one hypothesis is the more plausible of the two, the work supporting the more plausible hypothesis is more likely to be the correct one.

Our analysis suggests that the hypothesis that common ownership at current levels reduces competition is highly implausible. The more implausible a hypothesis, again all else equal, the more likely that results in a study purporting to support the hypothesis, though consistent with the hypothesis, are in fact due to something else.[129] Also, the more implausible the hypothesis, the more likely it is that the reason a study failing to find statistically significant evidence in support of the hypothesis fails to do so is

[128] *See supra* notes 5, 124-126 (citing empirical studies). The empirical findings are similarly mixed with respect to common ownership's effects on non-competition outcomes, such as innovation and R&D. *Compare* Antón et al., *supra* note 121 (finding a positive relationship between common ownership and innovation), He & Huang, *supra* note 121 (same), *and* Kostovetsky & Manconi *supra* note 121 (same), *with* Borochin et al., *supra* note 121 (finding that the relationship between common ownership and innovation depends on investor type), *and* Qiu, *supra* note 121 (finding a negative relationship between common ownership and innovation).

[129] In essence, the best that an empirical study of the sort such as the Airline and Banking Papers can do is provide a Bayesian updating of what was known prior to the study with regard to the likelihood of the hypothesized causal relationship between common ownership and prices being correct. Imagine a test, free from econometric problems, that has results with regard to the relationship between common ownership and higher prices that are sufficiently strong to be considered to be statistically significant at 95% level in a two-tailed test. This tells us only that *if* in fact common ownership did *not* lead to higher prices, and if we ran this test 100 times in 100 parallel universes (each with all the same factors at work affecting price that are not otherwise fully and accurately controlled for in the study), then we would get results this strong no more than five times out of the 100. This is not the same as saying that if, in a single test in a single universe, we observe results this strong, there is less than a 5% chance that common ownership does not lead to increases in price. To see what statistically significant results tell us about the likelihood that greater common ownership leads to higher prices, we have to start with what, prior to considering the results of the test and based on the previously available evidence, we believed to be the likelihood that greater common ownership leads to higher prices. In other words, the fact that the results are this strong adds to the odds that common ownership leads to price increases, but to determine what these new odds are, we would need to know our view of the odds before taking account of the test and its results. If the hypothesis is implausible, as we find it is, the upshot is that other things we know about the world—the things that indicate the implausibility of the hypothesis—suggest that the odds being updated by the study started at a very low level. Put another way, this other information suggests that there is a good chance that the strong results we observed were one of those five times in 100 that a test could get such results despite common ownership in fact not having any effect on prices.

that the hypothesized relationship does not exist (rather than that it does exist but the test just does not have enough power to find it). All of this helps explain why standard empirical methodology suggests that one start with a plausible hypothesis before one does a statistical study to see if one can reject with a high degree of statistical confidence the theory that the hypothesis is wrong (the null hypothesis), rather than going out to look for strong statistical relationships and then considering which null hypothesis the results might reject and which hypothesis the results support.

A final point should be noted in connection with our argument that the implausibility of the common ownership hypothesis reduces the persuasiveness of any empirical findings in its support. The hypothesis, as we have seen, rests on the assumption that common ownership leads firm managers to consider other firm profits in their output decisions. There is empirical evidence, however, that in fact that firm managers continue to pursue own-firm net revenue maximization despite the presence of common ownership.[130] In other words, our analysis showing the implausibility of the common ownership literature's hypothesis of common ownership reducing competition itself has affirmative empirical support.

B. The Analysis Demonstrates the Lack of a Non-Coordinated Mechanism Connecting Common Ownership to Competitive Harm

In addition to facilitating resolution of the core empirical debate in the common ownership literature, this Article's analysis also helps answer the literature's core theoretical question. That question, sometimes referred to as the "mechanism question," asks whether there is any plausible mechanism connecting common ownership to competitive harm.[131] Numerous scholars and policymakers have considered the mechanism question.[132]

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[130] In a recent paper, Matthew Backus, Christopher Conlon, and Michael Sinkinson used detailed consumer and scanner data from the ready-to-eat cereal market to empirically evaluate the plausibility of the common ownership hypothesis. *See* Backus, Conlon & Sinkinson, *supra* note 31. As the authors explain, their empirical findings consistently reject the common ownership hypothesis in favor of own-firm profit maximization. *Id.* at 38.

[131] *See* David I. Walker, *Common Ownership and Executive Incentives: The Implausibility of Compensation as an Anticompetitive Mechanism*, 99 B.U. L. REV. 2373, 2375 (2019) ("A key question in [the common ownership] debate is: What mechanism would translate the anticompetitive preferences of common owners into competition-reducing actions by the managers of the commonly held companies? To a significant degree, the persuasiveness of the anticompetitive narrative depends on the identification of a plausible mechanism.").

[132] *See, e.g.*, *id.*; Scott Morton & Hovenkamp, *supra* note 3, at 2031 ("The theoretical literature to date does not identify what mechanism funds may use to soften competition."); Hemphill & Kahan, *supra* note 10, at 1398 ("Missing from the [common ownership] debate

1. Common ownership will not lead to reductions in competition absent coordination. This Article provides an answer to the mechanism question that goes straight to the behavior of the persons whose decisions in the first instance determine the level of competition: firm managers. As shown in Parts I-III, it is highly unlikely that common ownership at current levels is causing any additional distortion in managerial incentives to maximize own-firm net revenues. As such, there is no plausible non-coordinated mechanism connecting current levels common ownership to competitive harm.[133] The modifier "non-coordinated" is important. The Article's analysis purposely carved out, and did not address, the prospect of common ownership generating competitive harm through an increased likelihood of collusion or coordinated conduct, such as common owners serving as ringleaders among their portfolio firms.[134] As discussed earlier, the

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thus far has been a systematic explication and assessment of the causal mechanisms that might link common ownership to higher prices."); Einer Elhauge, *The Causal Mechanisms of Horizontal Shareholding*, 82 OHIO ST. L.J. 1 (2021) (evaluating various mechanisms of potential competitive harm); Phillips, *supra* note 11, at 5 ("Understanding [common ownership's] mechanism is . . . critical to developing a coherent legal theory of antitrust harm, and ultimately to crafting an appropriate remedy."); Eric A. Posner, *Policy Implications of the Common Ownership Debate*, 66 ANTITRUST BULL. 140, 143-44 (2021) (discussing mechanisms that have been advanced in the literature); Anna Tzanaki, *Varieties and Mechanisms of Common Ownership: A Calibration Exercise for Competition Policy* (Aug. 25, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3779856 [https://perma.cc/S5QJ-MA2C] (same).

[133] For another corporate governance-focused analysis of common ownership and competitive harm, see Noah J. Phillips, Comm'r, Fed. Trade Comm'n, Taking Stock: Assessing Common Ownership, Prepared Remarks for The Global Antitrust Economics Conference (June 1, 2018), https://www.ftc.gov/system/files/documents/public_statements/1382461/phillips_-_taking_stock_6-1-18_0.pdf [https://perma.cc/N64V-ULMK] at 7-9 (expressing skepticism that managers will favor common owners over non-common owners).

[134] For a comprehensive analysis of common ownership and coordinated conduct, see Edward B. Rock & Daniel L. Rubinfeld, *Common Ownership and Coordinated Effects*, 83 ANTITRUST L.J. 201 (2020) [hereinafter Rock & Rubinfeld, *Coordinated Effects*]. In earlier work, Rock and Rubinfeld, commenting on the Airline Paper, stated they were "unaware of any substantial evidence that institutional investors have, in fact, organized an airline cartel." Rock & Rubinfeld, *supra* note 9, at 240. For additional analysis of common ownership and coordinated conduct, see Elhauge, *supra* note 3, at 1273-74; Patel, *supra* note 10, at 318-23; and D. Daniel Sokol, *Debt, Control, and Collusion*, EMORY L.J. (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3802548 [https://perma.cc/4WWR-HES8]. Furthermore, it is important to note that the focus of the analysis was solely on common ownership's effect on competition, not its effect on any other aspect of firm behavior. The Article therefore takes no position on whether, and the extent to which, common ownership affects any non-competition aspects of firm behavior, such as those non-competition aspects evaluated in the literature. *See, e.g.*, *supra* note 121 (collecting studies evaluating the relationship between common ownership and R&D).

provocative and novel claim of the common ownership literature is that, even in the absence of communication or coordinated conduct, common ownership can generate competitive harm by altering managerial incentives to compete. The analysis above shows there is no such change to managerial incentives, at least at current levels of common ownership.[135]

Thus, to the extent common ownership currently is generating any appreciable competitive harm, the causal mechanism cannot be a pure distortion of incentives to compete and instead must be the product of additional collusion or coordinated conduct among an industry's firms that is enhanced by the presence of common ownership. Using the nomenclature of antitrust, our analysis shows that any potential harm from common ownership must be through coordinated effects, rather than unilateral effects.[136] This is

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[135] In this sense, an additional contribution of this Article is that it provides a corporate governance justification for the continued use of the standard Cournot model to evaluate oligopoly behavior even in common ownership environments, at least at current levels. Of course, depending on industry characteristics, some other model of industrial organization may better describe the industry than does the Cournot model. For instance, if firms sell differentiated goods and compete on price, then the differentiated-goods Bertrand model would provide a better descriptor of the industry than would the standard Cournot model. *See, e.g.*, Jeffrey M. Perloff & Steven C. Salop, *Equilibrium with Product Differentiation*, 52 REV. ECON. STUD. 107 (1985) (developing a consumer-preferences model for differentiated products). However, the Article's reasoning and conclusions are equally applicable to those other market structures. For example, if firms compete in accordance with the differentiated goods Bertrand model, then because the introduction of common ownership would not alter managerial objectives to compete for the reasons previously discussed, firms would continue to compete in accordance with that standard model despite the presence of common ownership. Furthermore, because the standard industrial organization models of firm behavior continue to appropriately describe firm behavior at current common ownership levels, the Article also rejects the use of additional modifications to those standard models sometimes used in the common ownership literature. *See, e.g.*, Airline Paper, *supra* note 5, at 1548-49 (providing analysis based on a modified version of the differentiated-goods Bertrand model that assumes that firms place weight on rivals' net revenues). Indeed, O'Brien & Salop consider a differentiated-goods Bertrand model in which shareholders can have concurrent interests in rival firms. *See* O'Brien & Salop, *supra* note 41. But just like in their modified Cournot model, O'Brien and Salop leave the control weights unspecified in their modified Bertrand model. *See* O'Brien & Salop, *supra* note 41, at 611.

[136] Using different analysis, Rock and Rubinfeld reach a similar conclusion. *See* Rock & Rubinfeld, *Coordinated Effects*, *supra* note 134, at 203 ("We are unconvinced by [the Airline Paper's] 'unilateral' effects analysis . . . [but] increased concentration of shareholdings *could* make coordination of conduct among competitors easier and more effective."). In a non-U.S. context, at least one empirical study has documented a positive relationship between common ownership and coordinated conduct. *See* Kentaro Asai & Ben Charoenwong, Ownership Networks and Bid Rigging (Dec. 2020) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3298152 [https://perma.cc/CC76-3AMM] (finding a positive relationship between identical bidding in public procurement auctions in Singapore and common ownership).

a critical conclusion because it suggests that there is no need for new antitrust regulation aimed at the underlying functioning of the investment fund industry.

2. Executive compensation. The Article also complements specific strands of the scholarship directed at the mechanism question. One important question in the literature is whether executive compensation can serve as a potential mechanism linking common ownership to competitive harm. Scholarly consensus on the issue has yet to form. Some scholars argue that executive compensation can and does serve as a mechanism that connects common ownership and competitive harm,[137] but others reject that connection.[138] The empirical evidence is likewise mixed.[139]

The Article's analysis rejects the role of executive compensation as a plausible connective mechanism. As discussed in Part III, common ownership, at least at current levels, cannot be expected to cause boards to alter compensation schemes in a manner that diminishes executives' incentives to compete because that would harm the much more sizable group of non-common owners. And the common ownership literature does not establish otherwise. To support the conclusion that executive compensation links common ownership to competitive harm, the literature relies on an economic model by Miguel Antón, Florian Ederer, Mireia Giné, and Martin Schmalz.[140] While this model nicely captures some of the salient features of firm decision-making, it is based on an assumption of corporate control that renders its key theoretical conclusion inapplicable to markets as we currently observe them. The primary theoretical conclusion that emerges from the Antón et al. model is that an increase in common ownership causes

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[137] *See* Miguel Antón, Florian Ederer, Mireia Giné & Martin Schmalz, Common Ownership, Competition, and Top Management Incentives, J. POL. ECON. (forthcoming), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2802332 [https://perma.cc/L9H5-WMGM] (first developing a theoretical model and then finding that, in firms with more common ownership, managerial incentives are less performance sensitive).

[138] *See* Walker, *supra* note 131 (arguing that executive pay is not a plausible mechanism linking common ownership to competitive harm). *See also* Matthew J. Bloomfield, Henry L. Friedman & Hwa Young Kim, Common Ownership, Executive Compensation, and Product Market Competition (Oct. 5, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3936918 (empirical analysis finding that common ownership has no, or a marginally positive, effect on the use of revenue-based pay).

[139] *See* Hemphill and Kahan, *supra* note 10, at 1413 (reviewing the empirical evidence and concluding that "the results of these papers [considered as a set] yield no firm conclusion"). This view is echoed in an article one of whose coauthors, Daniel O'Brien, is the coauthor of the modified Cournot model that is the theoretical heart of the common ownership literature: "the relationship between compensation and common ownership is at best unsettled." O'Brien & Waehrer, *supra* note 9, at 763.

[140] *See* Antón et al., *supra* note 137 (developing the model).

managerial compensation to be less sensitive to own-firm profitability, which then causes managers to become less incentivized to engage in conduct that improves firm productivity and in turn causes prices to rise.[141]

That paper's theoretical finding that common ownership makes managerial compensation less sensitive to firm profitability, however, is driven by the important modelling assumption that each firm has one or more common owners who directly set managerial compensation because they are controlling shareholders.[142] Under that assumption, the model's key theoretical conclusion readily follows: because each firm's controlling common owner sets their firm's managerial compensation, then, as the extent of common ownership increases, the common owners alter managerial compensation so that it is less tied to firm profitability because they further benefit from the resulting drop in competition.[143]

Of course, this modelling assumption is incongruent with both observed ownership levels and the nature of corporate decision-making. First, even considered collectively, common owners are not controlling shareholders, at least at current ownership levels, and as a group ordinarily only hold approximately 21% of the shares of a representative S&P 500 firm.[144] Second, and as discussed, shareholders, whether controlling or otherwise, do not directly set managerial compensation.[145] In sum, while the Antón et al. model is mathematically appealing and predicts that an increase in common ownership causes managerial compensation to be less tied to own-firm profits, that prediction is driven by a modeling assumption that does not accord with actual markets or the nature of corporate decision-making. Under more realistic assumptions, there would be no expected link between

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[141] *See id.* at 17 (Proposition 1).

[142] *See id.* at 7, 12 & 13 ("Each firm [in the model] is owned by a majority owner and a set of minority owners. . . . Each owner i owns a (majority) stake in firm i as well as shares in other firms . . . [E]ach majority owner i publicly proposes an incentive contract . . . for her manager."). Note that because the common owners maintain an interest in other firms in the industry, the assumption that the common owner sets managerial compensation is effectively a recasting of the blended shareholder assumption. *See id.* at 13 (explaining that the common owner's objective when setting managerial compensation in the model is "to essentially maximize[] a weighted average of her own firm's and other firms' profits").

[143] *See id.* at 17 ("As common ownership . . . increases, the (majority) owner of firm i cares relatively more about the net profits of firm j in the industry. . . Thus, each owner now prefers competition to be softer between the firms that she partially owns.").

[144] *See* Backus, Conlon & Sinkinson, *supra* note 1, at 285. It is true that other institutional investors collectively hold sizable positions in publicly traded firms, but those other investors will not necessarily share the same competition-based preferences as the common owners. *See supra* Section II.D. It therefore seems highly unlikely that the common owners could form some form of controlling shareholder coalition with other investors for the purpose of making managerial compensation less sensitive to firm profitability.

[145] *See supra* note 108 and associated text.

common ownership and the degree to which managerial compensation is linked to firm profitability, at least at current common ownership levels.[146]

The common ownership literature also grounds its suppositions and conclusions on the empirical findings of Antón et al., which document a negative relationship between common ownership and the sensitivity of managerial wealth to own-firm profitability.[147] However, the lack of an expected theoretical connection between common ownership and the sensitivity of managerial compensation to firm profitability suggests caution in interpreting those results. Because of the absence of a plausible mechanism connecting common ownership at current levels with the sensitivity of managerial compensation to firm profitability, the statistical relationship between the two observed in the literature may reflect spurious correlation rather than any true causal relationship. Other scholars have critiqued on both theoretical and empirical grounds Antón et al.'s conclusions regarding the linkage between common ownership and the sensitivity of managerial wealth to own-firm profitability.[148]

The common ownership literature further relies on the empirical results from an earlier version of the same paper by Antón et al. The earlier version suggests that, with higher levels of common ownership, firms are more likely to use a managerial-compensation package based solely on own-firm performance instead of one that uses relative performance evaluation (RPE), that is, a compensation package that is benchmarked in terms of the profits or share price performance of a firm's competitors.[149] In other words,

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[146] To see this, consider the baseline case where common owners collectively have 21% interest in every firm in a market segment and the remaining 79% is held by non-common owners. If a firm's board were to modify managerial compensation so that it is less connected to firm profitability and managers responded by curtailing firm productivity, the board would be subjected to shareholder activism by the non-common owners, potentially seeking their ouster, because the firm, and therefore the non-common owners, would be better off if their firm's managers increased firm productivity, holding fixed the decisions of the other firms' managers.

[147] *See, e.g.*, Elhauge, *supra* note 132, at 15 ("[Antón et al.] confirmed the practical significance of [their theoretical model] with a new cross-industry empirical study, which shows that . . . in industries with higher horizontal shareholding levels, corporations adopt compensation methods that make changes in executive wealth less sensitive to their own firm's performance." (emphasis removed)).

[148] *See, e.g.*, Walker, *supra* note 131, at 2392-2411; *see also* Hemphill & Kahan, *supra* note 10, at 1409-1419 (critiquing Antón et al. and, more generally, the wider class of claimed linkages between common ownership and competitive harm that target the firm's output broadly, such as the structure of executive compensation).

[149] *See, e.g.*, Martin C. Schmalz, *Common Ownership and Competition: Facts, Misconceptions, and What to Do About It*, ORG. ECON. CO-OPERATION & DEV. 8 n.4 (2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3176696 [https://perma.cc/TN5D-7ZTE] ("It is known . . . that common ownership can explain the scarcity of relative performance evaluation, a prediction for which Antón, Ederer, Giné, and Schmalz (2016)

all else equal, with an RPE compensation package, the manager will earn less if the competitors are doing better than her firm, and more if they are doing worse. The flaw in the common ownership literature's interpretation of these results is that, as explained in Part III, the kind of managerial compensation package that the study claims is more associated with common ownership—one based solely on own-firm performance—does not create an incentive for the managers to choose an output level below the own-firm net revenue maximizing level preferred by non-common shareholders. Moreover, as David Walker has observed, there is an incongruity between the common ownership literature's argument here and the sharp *increase* in the use of RPE compensation packages in general during the very same period as the increase in common ownership.[150] Indeed, Delta and American, two of the three most important players in the industry that has been the common ownership literature's primary exhibit – airlines – appear to use RPE and Vanguard, the ultimate common owner, pushes for it as a general matter.[151] The fact that over time there has been a parallel positive increase in the use of RPE and in the extent of common ownership over time raises the question of whether, at any given moment in time, any negative relationship between the use of RPE and the extent of a firm's common ownership is not due to some third factor associated with industries that have both high common ownership and low RPE use, rather than common ownership causing low RPE use.[152]

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provided first support."); Martin C. Schmalz, *Why Firms' Shareholders Condone Seemingly "Excessive" Executive Pay Packages, and What It Means for the Economy*, PROMARKET (July 6, 2016), https://promarket.org/2016/07/06/firms-shareholders-condone-seemingly-excessive-executive-pay-packages-means-economy/ [https://perma.cc/XVV5-2TSZ] ("[W]hen industry competitors are more commonly owned, we should expect to see (a) higher unconditional top management pay that is (b) less related to the firm's performance, and (c) more related to rival firms' performance. This is precisely the pattern present in the data, as the new paper shows.").

[150] *See* Walker, *supra* note 131, at 2384-91 (discussing and documenting the rise of relative compensation schemes).

[151] Rock & Rubinfeld, *supra* note 9, at 248-49.

[152] Rather than creating an incentive to choose an output level that is less than own-firm net revenue maximizing, relative performance evaluation (RPE) compensation schemes may create an incentive to choose an output level that is greater than is net revenue maximizing, since doing so drives down the profits of competitors. This mis-incentive is presumably considered worthwhile because it is more than compensated for by the package's greater precision in rewarding other kinds of managerial actions, such as greater efforts to cut costs, that enhance the firm's net revenues. This is a tradeoff that would probably vary from one industry to another. Thus, in an industry with an extensive use of RPE compensation schemes, an equilibrium could exist with higher output and lower prices than predicted in the standard Cournot model. s discussed in Part III, we find it implausible that a corporate board would alter the form of compensation package in response to an increase in minority common shareholders when doing so hurts the interests of the continuing substantial majority shareholders who are not common owners. And, as just noted in the text, we think the

3. The inertia mechanism. A closely related mechanism discussed in the literature is what we refer to as the "inertia mechanism." This mechanism posits that common ownership can generate competitive harm because common owners do not push managers to compete as hard in the marketplace as they would if the common owners were instead non-common owners.[153] This, it is argued, aligns with the preferences of firm managers, who prefer to live a "quiet life," which can be better achieved if firms are not actively competing with one another.[154] When more carefully thought through, however, this theory becomes unconvincing. The theory rests on two pillars. First, firm managers, in their desire for an easy life, have interests that align with those of the common shareholders. Second, because of this interest alignment, managers will be in a better position to indulge these interests when the proportion of common shareholders increases. Neither pillar is strong.

a. Interest alignments among common shareholders, non-common shareholders, and managers. In terms of managerial interests aligning with common as opposed to non-common shareholders, we should start by noting that the intellectual foundation of the "quiet life" idea in economics relates to monopoly rather than oligopoly. In contrast to monopoly, in oligopoly there are competitors and the central issue is how each firm relates to its

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longitudinal data helps support the idea that any evidence of a cross sectional relationship between firms with higher common ownership and lower use of RPE compensation schemes is due to some common factor rather than a causal relationship.

In fairness to the common ownership adherents, if we were wrong in both these regards and common owners in fact desired less use of RPE and are successful in pushing managers to adhere to the common owners' desires, we can see how output, instead of being above the Cournot level as might happen with the use of RPE, instead be at the Cournot level. Note though that would result in own firm net revenues being lower: the gain from producing at the Cournot level rather than above would not be as great as the loss due to non-RPE compensation package's lower precision in rewarding other kinds of net revenue-enhancing actions. Still, we doubt the final condition here: that common owners desire less use of RPE. RPE represents a higher powered incentive scheme for managers to increase net revenues by cutting costs and improving their products. We share David Walker's skepticism that the Big Three would want to substitute lower powered incentives for higher powered one just to stifle competition a bit. See Walker, *supra* note 131, at 2400. Walker also notes that fund resistance to RPE is contrary to their publicly stated positions. *Id.*

[153] *See, e.g.*, Martin C. Schmalz, *Common Ownership, Concentration and Corporate Conduct*, 10 ANN. REV. FIN. ECON. 413, 434 (2018) ("'[D]oing nothing' is a mechanism by which common owners can induce portfolio firms to internalize shareholders' interests in other firms, including their anticompetitive incentives.").

[154] *See, e.g.*, Airline Paper, *supra* note 5, at 1518 ("[N]ot explicitly demanding or incentivizing tougher competition between portfolio firms may allow managers to enjoy the 'quiet life' . . . and thus lead to an equilibrium with reduced competition and sustained high margins"); Azar, Schmalz & Tecu, *supra* note 7, at 5 ("[M]utual funds may simply not push firms to compete aggressively, and managers may consequently enjoy a 'quiet life' without aggressive competition.").

competitors.[155] The dominant focus in oligopoly theory is what effect an oligopolistic market structure has on each firm's *decision as to output level*. Not surprisingly, that is exactly the focus of the models on which the common ownership literature itself is built. Yet there is no reason to think it is any harder to decide to produce at a higher level than to decide to produce at a lower level.

Moreover, as we discussed in Part III, when it comes to the output decision, the managers already desire what is in the interests of the non-common shareholders: the level of output that maximizes solely the firm's own residuals, that is, maximizing the difference between what it can sell its output for and the cost of producing that output. This is because it is from these residuals that managers can make room for the things that matter to them, such as compensation, perquisites, power, prestige, the pleasure of benefiting their associates in the firm, and a sense of doing social good. We could add to this list, if managers truly do prefer not to work hard, that choosing the level of production that maximizes own-firm net revenues creates the most space to indulge this taste as well without facing the loss of their jobs. Thus, the managers likely need no pressure from the firm's shareholders to want to choose the level of output that maximizes own-firm

[155] For support of the inertia mechanism, the common ownership literature ordinarily cites to John R. Hicks' classical article, "The Theory of Monopoly," and Marianne Bertrand and Sendhil Mullainathan's more recent empirical analysis of managerial preferences. *See, e.g.*, Airline Paper, *supra* note 5, at 1518 (citing John R. Hicks, *The Theory of Monopoly*, 3 ECONOMETRICA 1 (1935), and Marianne Bertrand & Sendhil Mullainathan, *Enjoying the Quiet Life? Corporate Governance and Managerial Preferences*, 111 J. POL. ECON. 1043 (2003)). First, Hicks' work does not support the common ownership hypothesis. The common ownership literature relates to oligopolistic industries, in which each firm does face at least some competitors. By contrast, Hicks' analysis concerns the benefits to managers of operating in monopolistic companies, where there are no competitors and thus managers can enjoy the "quiet life." *See* Hicks, *supra*, at 8 ("The best of all monopoly profits is a quiet life."). The idea there is that a monopoly environment provides a cushion for a manager wishing to indulge in behaviors that involve less effort but generate less profits. Unlike the manager of a firm in a more competitive situation, the monopoly's manager can indulge in such behavior without revenues falling so much that the firm is bankrupted. The paper by Bertrand and Mullainathan does not support the supposition that managers of oligopolistic firms prefer to be idle and that an output reduction satiates that preference. The primary conclusion about managerial preferences that Bertrand and Mullainathan draw from their empirical analysis is that managers are hesitant to undertake cognitively difficult activities. *See* Bertrand & Mullainathan, *supra*, at 1067 ("Our findings are in fact much more consistent with a quiet life hypothesis, in which managers are reluctant to undertake cognitively difficult activities."). It does not follow that causing the firm to produce less is cognitively more or less difficult than causing the firm to produce more. Additionally, to the extent managers are hesitant to undertake cognitively difficult activities, that further undercuts the common ownership model. Trying to appease the interests of a hypothetical shareholder who is a constructed amalgam of each of the firm's shareholders would be much more cognitively difficult than just maximizing own-firm net revenues.

residuals. Therefore, any reduction in pressure resulting from an increase in the proportion of common to non-common owners should not matter.

While the effort in *making* an output-level decision does not vary with the level chosen, one could argue that *implementing* a decision to produce at a higher level requires more effort than implementing a decision to produce a at lower level. This could lead, in turn, to a decision to produce at a lower level than would maximize the firm's net revenues. We are skeptical of this argument, however. We suspect that the persons making the output-level decision are top corporate officials, who do not do most of the implementation work. The common ownership literature adherents make no effort to show that a decision to have a higher level of output does involve more effort by these top officials.

What though about areas where the level of managerial effort can affect firm performance, such as cutting costs or improving product quality? It is not obvious that there is any difference between the interests of common and non-common shareholders when it comes to managerial efforts of these kinds. Indeed, the opposite seems much more likely. It may be true that if a single firm cuts its costs or improves its product, doing so may reduce the profits of its competitors, just like if a single firm increases production. But if all the firms in the industry cut costs or improve the product, profits of the industry as a whole, and of each firm within it, are likely to go up, which is the opposite of what happens if all firms increase production.[156] It is what all firms do in equilibrium that is the focus of the common ownership literature. Yet an equilibrium where reduced management effort leads to higher costs or less product improvement is unsatisfactory for both common and non-

[156] This can be seen in the numerical example of the baseline Cournot model examined in Section I.A. Suppose that there is an industry-wide cost reduction so that, instead of the two firms each having a marginal cost of $2, they instead each have marginal cost of $1. Working through a similar analysis as in Section I.A, it can be shown that at this lower cost, each firm's net revenues are higher than its net revenues when marginal cost was $2. Specifically, at this lower marginal cost, it can be shown that each firm produces 30,000 units and the market price is $4. *See* MAS-COLELL ET AL., *supra* note 22, at 391-92 (providing calculations for a generalized two firm Cournot model with linear demand and constant marginal cost). So, because of the mutual cost reduction each firm earns net revenues of 30,000*($4-$1) = $90,000, which is higher than each firm's net revenues of $71,201 when they had the higher marginal cost of 2. *See supra* Section I.A. An industry-wide product improvement can be modeled in the baseline Cournot model by a rightward shift in the demand curve, because this means that for any given quantity, consumers are willing to pay a higher price. So in the example considered in Section I.A, a product improvement can be represented by the inverse demand curve shifting from P = 10 – Q/10,000 to P = 20 – Q/10,000. It can be shown that this product improvement causes each firm to produce 60,000 units and the market price to be $8. *See id.* The product improvement therefore enables both firms to earn net revenues of 60,000*($8-$2) = $240,000, which too is higher than each firm's net revenues before the industry-wide product improvement.

common ownership. So, that equilibrium is not one that either common owners or non-common owners would be motivated to stay passive about. Again, the common ownership literature adherents make no effort to show that there is a difference in interests between the common and non-common shareholders with regard to the level of managerial effort exerted in these directions. And if there is not such a difference, an increase in common ownership will not change the level of pressure on managers to exert these efforts.

b. Pressures on managers from an increase in common ownership. Moreover, even if the interests of managers with regard to promoting competition were for "quiet life" reasons aligned with common shareholders' interests, it would not matter. As we showed in Part III, to the extent that the interests of common and non-common shareholders differ, the pressures on firm managers are exclusively to advance the interests of the non-common owners, at least given the current level of common ownership. Thus, even if common owners prefer managerial inertia and do not push managers to cut costs or improve their products as vigorously as do non-common owners, the increase in common ownership to date has made no difference in managerial incentives to compete. These incentives remain trained on own-firm net revenue maximization.[157]

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[157] The one exception, at least in theory, relates to the effectiveness of the activist hedge fund in correcting any "quiet life"-driven deviation by a firm from the net revenue maximization output level (a deviation which, for the reasons stated in the text, we find most unlikely). The Big Three are often the "deciders" in whether an activist hedge fund effort succeeds. *See* Kahan & Rock, *supra* note 77, at 1814. The idea would be that, with common ownership, an activist fund would be less likely to launch an effort against the firm's managers. The reason would be that, even though a majority of shareholders are non-common and would support the campaign, the absence of common shareholders' support would make gathering the needed number of proxies more difficult. For all the reasons discussed in this Section, we find this scenario extremely unlikely. The only example to suggest otherwise offered by the common ownership literature's adherents–the 2015 proxy fight loss by Nelson Peltz and his hedge fund Trian for seats on DuPont's board, *see* Airline Paper, *supra* note 5, at 1558 nn. 36-37; Schmalz, *supra* note 40–in fact turns out to not be supportive of the common ownership hypothesis. The claim in the common ownership literature is that competition considerations caused the Big Three to vote against the campaign, *see* Schmalz, *supra* note 40, but the Big Three voted against Peltz and Trian for reasons wholly unrelated to competition, *see, e.g.*, Ronald Orol, *Why DuPont Beat Nelson Peltz in the Biggest Proxy Fight in Years*, THESTREET (May 20, 2015, 9:30 AM EDT), https://www.thestreet.com/markets/mergers-and-acquisitions/why-dupont-beat-nelson-peltz-in-the-biggest-proxy-fight-in-years-13158047 [https://perma.cc/CU5Y-EMY5]. Additionally, retail investors (i.e., non-common owners) also voted against Peltz and Trian in large numbers. *See* Orol, *supra*. The Airline Paper cites a blog post by John Coffee as suggesting that the Big Three voted against Peltz because his success would hurt their investments in DuPont's competitors. *See* Airline Paper, *supra* note 5, at 1558 ("The most plausible hypothesis is that the large asset managers are concerned about the impact of hedge fund activism on their broader portfolio." (quoting John C. Coffee, *The Lessons of DuPont:*

4. Selective omission. This Article's analysis also complements and adds to the recent work by Scott Hemphill and Marcel Kahan, who also critically evaluate the mechanism question.[158] Hemphill and Kahan first create a typology of potential mechanisms and reject each of them but one as implausible.[159] The mechanism that they do not rule out is referred to as "selective omission." This refers to a practice whereby a common owner presses the firm's managers for actions that increase both the net revenues of the firm and the common owner's portfolio value, while remaining silent as to actions where those two objectives conflict.[160] Hemphill and Kahan suggest that the selective omission mechanism could be a conduit for competitive harm. They reason that if the common owner were instead a non-common owner, then the shareholder would not remain silent with respect to firm actions that have countervailing effects on the net revenues of the firm and the common owner's portfolio value. Instead, they would affirmatively push for actions that increase firm value and affirmatively reject actions that decrease firm value.[161]

Our analysis shows that even the one mechanism not ruled out as implausible by Hemphill and Kahan–selective omission–would at most only be relevant under extraordinary circumstances. To review, when it comes to deciding on a level of output (something where deciding on a high level requires no more effort than deciding on a low one), the interests of managers and non-common shareholders are the same–the net revenue maximizing output level. Therefore, if common shareholders are passive on the question, that will have no effect on the output decision. When it comes to other types

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Corporate Governance for Dummies, COLUM. L. SCH. BLUE SKY BLOG (June 1, 2015), https://clsbluesky.law.columbia.edu/2015/06/01/the-lessons-of-dupont-corporate governance-for-dummies/ [https://perma.cc/LV7F-CQ9V])). However, Coffee's actual explanation was that the funds were long-term investors in DuPont and were concerned that Peltz was aiming for a short-term gain that would be damaging to the company in the longer run. *See Coffee*, *supra* (noting, after the quoted language above, that "indexed investors are there for the long-term and will suffer the consequences if the activists' short-term engagement with the firm produces longer-term losses"). Also, the common ownership literature suggests that the way Peltz wanted DuPont to become more competitive was to invest more in R&D. *See, e.g.*, Schmalz, *supra* note 40. But as we noted above in the text, common owners and non-common owners would both want all the industry's firms to invest in positive net present value R&D projects because, unlike if all firms expand production, profits for the industry are likely to go up, not down. *See supra* note 156 and accompanying text.

[158] *See* Hemphill & Kahan, *supra* note 10.

[159] *See id.* at 1400 ("Our main conclusion is that, for most mechanisms, there is either no strong theoretical basis for believing that institutional [common owners] could or would want to employ them, no significant evidence suggesting that they do employ them, or both."). For analysis in response, *see* Elhauge, *supra* note 132, at 33-45.

[160] *See* Hemphill & Kahan, *supra* note 10, at 1400.

[161] *See id.* at 1427-29.

of managerial action – cost cutting and product improvement – ones where taking it would both require managerial effort and, for any given firm, benefit it while hurting its competitors, if all the firms in the industry forgo the action, both common and non-common shareholders will be worse off. Thus, the common shareholders are better off joining forces with each firm's non-common shareholders and pushing managers to undertake the action rather than remaining passive. So, where a firm's managers fail to cost cut or improve their product, this is not an occasion where it would be in the best interests of a common shareholder to engage in selective omission.

A further consideration is a "compared to what" question. To the extent that the growth in common ownership comes from a diminution in the proportion of shareholders who are retail, retail investors are not organized and suffer from rational apathy, so they are not great monitors.[162] In other words, to the extent that the Big Three are in fact passive, they are not necessarily any more passive than the retail shareholders they replaced and so their growth may not signal any reduction in shareholder pressure for any kind of action. And to the extent that the growth in index funds is due to a small proportion of investors investing in managed funds that were not common owners, the managed funds themselves are not known to be aggressive monitors themselves.

The only situation where common shareholder passivity might matter is where managers, contrary to their own interests, mistakenly produce at a level lower than the standard own-firm net revenue maximizing Cournot level and an activist hedge fund seeks to correct the situation. It is conceivable that in this situation the common shareholders would not add their support to the activist because they would see maintaining the status quo as in their interest. This situation seems unlikely, however, both because managers would probably not persist in behavior contrary to their own interests and because of all the other mechanisms set out in Part III that push managers to choose the own-firm net revenue maximizing level.[163]

5. Crowding Out. The airline paper suggests three possible causal links between common ownership and a decline in competition, two of which – the idea that common ownership leads to managerial compensation packages that discourage competition[164] and the "inertia" idea that common owners will be passive and not join an activist hedge fund campaigns aimed at pushing a firm's managers to compete more effectively[165] – have been rebutted above. The third is that common owners "crowd out" activist hedge

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[162] *See supra* note 79.
[163] *See also supra* note 157.
[164] Airline paper, *supra* note 5, at 1556-57.
[165] *Id.* at 1518.

funds.[166] The authors are not explicit as to what "crowding out" means. For this to be distinct from the inertia mechanism, however, it must be the idea that because of the rise of common ownership, it is harder for activist shareholders to acquire their typically 5% to 7% stake that they use as their base before going out to persuade other owners to vote with them in a proxy fight aimed at changing how the firm is managed. The idea that such "crowding out" would have a significant effect on the likelihood of a successful activist hedge fund campaign does not accord with modern corporate finance theory. Even if the Big Three hold, say, 21% of the shares of each company in an industry, the other 79% are still held by other investors who will sell their shares if they believe that the price in the market is above the value to them of continuing to hold their shares. And that price, prior to the activist hedge fund putting in its buy orders, will be the same – the market's view of the expected future cash flow to be paid to the holder of the share discounted to present value – whether the Big Three own no shares or 21%. The standard textbook theory conclusion is that the demand curve for a given stock is flat,[167] which would mean that the presence or absence of the Big Three would not affect the price at which the activist hedge fund could then buy. To the extent that real world markets might deviate somewhat from this textbook conclusion,[168] the common ownership adherents have not shown that the deviation is sufficient to significantly affect the likelihood of activist hedge fund success, i.e., that despite the remaining large pool of shares available to be traded in a public market, it would be significantly more costly to acquire 5%-7% of the shares relative to the Big Three not holding 21% of the shares.[169]

6. Justifications for the assumed blended-shareholder objective. As we have seen, the common ownership literature's two most central papers—

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[166] *Id.* ("[C]oncentrated owners such as hedge fund activists have been shown to push their target firms to compete more aggressively against industry rivals. Competitive concerns thus arise when concentrated owners get crowded out by diversified institutions that also hold large stakes in industry rivals.").

[167] Myron S. Scholes, *The Market for Securities: Substitution versus Price Pressure and the Effects of Information on Share Price*, 45 J. OF BUS. 179, 182 (1972) ("[T]he market will price assets such that the expected rates of return on assets of similar risk are equal. If any particular asset should be selling to yield a higher expected return due solely to the increase in the quantity of shares outstanding . . . investors seeing these profit opportunities would soon arbitrage them away").

[168] *See, e.g.,* Jeffrey Wurgler & Ekaterina Zhuravskaya, *Does Arbitrage Flatten Demand Curves for Stocks?,* 75 J. BUS. 583 (2002).

[169] Rock and Rubinfeld reach a similar conclusion, describing the idea as "puzzling." See Rock & Rubinfeld, *supra* note 9, at 250. *See also id.* ("[I]ndex funds collectively holding only around 16 percent of the stock of a typical airline will hardly prevent activist hedge funds from acquiring large (e.g., 9 percent) positions. Indeed, as discussed earlier, Warren Buffett acquired substantial positions over a short period of time.")

the Airline Paper and the Banking Paper—simply assume that managers of firms in common ownership environments will seek to maximize the within-industry portfolio of a hypothetical blended shareholder. The papers use this blended-shareholder assumption to test whether a higher level of common ownership is associated with higher prices.[170] Some common ownership scholars, however, have sought to develop more foundational economic models that have managers pursuing the interests of the blended shareholder as the predicted outcome of their theories, rather than assuming such behavior as a first principle.[171]

While these foundational models are mathematically elegant, they suffer from a similar problem as the common ownership model in that they are based on assumptions that are at odds with the actual corporate governance landscape. The model by José Azar is representative.[172] He develops a game-theoretic voting model based on ones from political science in which competing politicians seek to adopt positions over a range of possibilities to attract sufficient votes for election. In applying this to the election of directors, he has directorial candidates in the model propose strategies for the firm and shareholders vote for directors based on those proposed strategies, which the elected directors then go on to implement.[173] Given this setup and additional assumptions, Azar's model predicts,

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[170] To conduct the estimations in the Airline and Banking Papers, the researchers had to not just specify, but also calculate, the control weights that managers place on shareholders' portfolios. Setting the control weights to correspond to shareholders' ownership interests, *see, e.g.*, *supra* note 42, facilitates that calculation because data are available on large institutional investors' ownership interests via their 13F filings. *See* Airline Paper, *supra* note 5, at 1523-25 (equating control weights with ownership interest and using 13F data). It should be noted in this regard that a number of researchers have observed that 13F filings contain errors, including 13F filings relating to ownership interests in airlines. *See, e.g.*, Backus et al., *supra* note 122, at 11-12 ("The authors of this current paper noticed when examining ownership of airlines that many filings contained errors around bankruptcy events.").

[171] *See, e.g.*, José Azar, Portfolio Diversification, Market Power, and the Theory of the Firm (Aug. 23, 2017) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2811221 [https://perma.cc/DE4M-U57B]; Duarte Brito, Einer Elhauge, Ricardo M. Ribeiro & Helder Vasconcelos, Modelling the Objective Function of Managers in the Presence of Overlapping Shareholding (Mar. 26, 2019) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3264113 [https://perma.cc/C7GH-AGXH]; Duarte Brito, António Osório, Ricardo Ribeiro & Helder Vasconcelos, *Unilateral Effects Screens for Partial Horizontal Acquisitions: The Generalized HHI and GUPPI*, 59 INT'L J. INDUS. ORG. 127 (2018); Alexandr Moskalev, Objective Function of a Non-Price-Taking Firm with Heterogeneous Shareholders (Mar. 5, 2019) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3471564 [https://perma.cc/R4T8-56UN].

[172] See Azar, *supra* note 171.

[173] *See id.* at 10-11.

accurately under the provided assumptions, that managers will propose and implement strategies that maximize the welfare of a blended shareholder.[174] However, for the model to support the blended-shareholder assumption used in the common ownership literature, the strategy proposed by the directorial candidates must relate to the firm's output decision (or, more generally, the firm's eventual level of competition). This is simply not how we observe elections for directors working in the real world. Proxy statements do not include statements on candidates' preferred level of competition, let alone candidates' preferred output decision, and there is no evidence that they campaign on this basis.[175] Additionally, Azar's model, like other models that endeavor to microfound the use of the blended-shareholder assumption, are probabilistic voting models, in that when managers propose strategies, they are assumed to be uncertain as to how shareholders will vote. While directors may have such uncertainty as a general matter, they would not have that uncertainty with respect to the issue that is relevant to the common ownership model—the firm's level of output or its amount of competition generally. Instead, directors would know with certainty that the firm's majority non-common owners would unequivocally vote for the proposal that maximizes own-firm net revenues.

7. Other considerations. Finally, this Article's analysis buttresses the findings of other scholars who have identified an array of reasons why, regardless of the mechanism, we should be skeptical about common ownership generating any competitive harm. For instance, common owners may also hold positions in downstream suppliers, input providers, or firms in complementary industries. These other ownership interests would diminish or eradicate the common owners' interest in lessened competition in the relevant market.[176] As perhaps the most obvious example, if a common owner

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[174] *See id.* at 13.

[175] *See, e.g.*, Rock & Rubinfeld, *supra* note 9, at 239 ("[W]e see no evidence that shareholders vote on competitive strategy and no evidence that directors run on a 'platform' that is directed towards a competitive strategy. In proxy statements, the information provided is limited to qualifications, expertise and other directorships, and director stock ownership and compensation."); Hemphill & Kahan, *supra* note 10, at 1415 ("[T]here is no evidence that outside director candidates in uncontested elections stand for any particular competitive strategy . . . .").

[176] *See, e.g.*, John R. Woodbury, *Paper Trail: Working Papers and Recent Scholarship*, ANTITRUST SOURCE 6 (Dec. 2014), https://media.crai.com/sites/default/files/publications/Paper-trail-antitrust-source-Dec-14.pdf [https://perma.cc/CWR2-TH3F]; Douglas H. Ginsberg & Keith Klovers, *Common Sense About Common Ownership*, CONCURRENCES REV., May 2018, at 8; Menesh S. Patel, *Common Ownership and Antitrust: Eight Critical Points to Guide Antitrust Policy*, ANTITRUST CHRON. 4 (2019), https://www.competitionpolicyinternational.com/common-ownership-and-antitrust-eight-critical-points-to-guide-antitrust-policy-2/ [https://perma.cc/6ET6-3RBF].

also maintains a large position in a firm that purchases products from the commonly owned firms, the common owner's position in the downstream purchaser would cause it to prefer more, not less, competition by the product market firms, all else equal.

As made transparent by the analysis in Section I.B, the common ownership model used in the literature does not take these offsetting considerations into account, as the model focuses solely on shareholders' portfolios in the relevant market, not in other markets. Thus, even under the blended-shareholder assumption used in the common ownership literature—which this Article argues is an incorrect assumption, at least at current levels of common ownership—the common ownership model exaggerates common ownership's competitive effects by failing to take into account common owners' shareholding positions in industries outside of the relevant market.[177] This is an especially important consideration, since it is the large-scale index funds managed by the Big Three, which have significant ownership positions in all publicly traded firms in industries spanning the economy, that have been primarily responsible for driving up common ownership levels.

C. The Analysis Cautions Against the Use of the Key Common Ownership Concentration Metric: MHHI Delta

The common ownership literature makes extensive use of a metric for measuring the impact of common ownership known as MHHI Delta,[178] though as discussed below some more recent common ownership research

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[177] *See, e.g.*, Jonathan B. Baker, *Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge*, 129 HARV. L. REV. F. 212, 217 (2016) (explaining that common ownership studies "do not account for the potentially countervailing impact of financial investors' ownership interests in inputs, complementary products, and customers, or for the potentially countervailing impact of vertical integration by the firms into complementary lines of business"). Furthermore, intra-common-owner conflicts of interest resulting from the diversity of funds they maintain would serve to further check any competitive influence of common ownership. *See, e.g.*, John D. Morley, *Too Big to Be Activist*, 92 S. CAL. L. REV. 1407 (2019) (explaining how large investment managers have significant internal conflicts of interest because they operate such a broad array of funds); Madison Condon, *Externalities and the Common Owner*, 95 WASH. L. REV. 1, 57-59 (2020) (discussing investment managers' fiduciary duties to fund beneficiaries, who may have conflicting interests).

[178] The MHHI Delta has been used, for example, to estimate the effect of common ownership on airline prices. *See* Airline Paper, *supra* note 5, at 1528. It also has been used to describe the extent of common ownership in a given industry, *see, e.g.*, Antón et al., *supra* note 137, at 37; as a rough predictor of common ownership's potential competitive harm, *see* Posner, Morton & Weyl, *supra* note 8, at 687-89; and as a component of policy proposals aimed at addressing common ownership's perceived antitrust concerns, *see* Elhauge, *supra* note 3, at 1301-02.

also uses additional measures, such as the kappa measure.[179] The MHHI Delta is the basis of the literature's central empirical claims—that higher levels of common ownership have led to higher prices in the airline and banking industries—and it is the trigger for some of the literature's recommended policy responses. The analysis in this Article suggests that these uses of the MHHI Delta can lead to seriously mistaken conclusions. Specifically, as discussed below, the MHHI Delta introduces econometric problems that can result in a finding that a higher level of common ownership leads to higher prices when, in fact, it has no such effect. And it can recommend antitrust interventions where none are called for.

1. Problems with use of the MHHI Delta in estimating any impact of common ownership on prices. Using the MHHI Delta to study the impact of having multiple investment fund common owners on an industry's competitiveness can create serious problems. To see why, it is important first to understand what the metric stands for and why it was developed.

For several decades, economists have used a metric called the HHI, which is a measure of the level of concentration in an industry.[180] In theory at least, the higher the HHI, the greater is the burden of an industry's concentration on its competitiveness.[181] Though subject to several criticisms,[182] the HHI has been widely used as a guide to policy. For example, a merger between two firms that leads to an HHI score above a certain threshold will prompt scrutiny by antitrust agencies and can lead to an injunction preventing the merger or a divestment order unwinding it.[183]

For reasons discussed in Section I.B, if an industry has common

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[179] *See infra* Part IV.C.3.

[180] The HHI is the sum of the squares of the market shares of the firms in the relevant market. *See Herfindahl-Hirschman Index*, U.S. DEP'T OF JUST. (July 31, 2018), https://www.justice.gov/atr/herfindahl-hirschman-index [https://perma.cc/H58K-9ZAH].

[181] If the market is a Cournot oligopoly with homogeneous goods, then there is a known positive relationship between the HHI and a measure of the price markup in the industry. *See, e.g.*, Janusz A. Ordover, Alan O. Sykes & Robert Willig, *Herfindahl Concentration, Rivalry, and Mergers*, 95 HARV. L. REV. 1857, 1863-65 (1982). Also, under certain circumstances, there is a relationship between the HHI and the ability of firms to detect defection from a collusive agreement, which is a precondition to successful collusion. *See* George J. Stigler, *A Theory of Oligopoly*, 72 J. POL. ECON. 44 (1964).

[182] For instance, it is understood that the HHI is a relatively poor predictor of competitive harm in markets in which firms sell differentiated products and engage in Bertrand competition, and economists have developed alternate competition measures for these types of markets. *See, e.g.*, Louis Kaplow & Carl Shapiro, *Antitrust*, *in* 2 HANDBOOK OF LAW AND ECONOMICS 1073, 1085–86 (A. Mitchell Polinsky & Steven Shavell eds., 2007) (discussing the diversion ratio).

[183] *See* U.S. DEP'T JUST. & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES § 5.3 (2010), www.justice.gov/atr/horizontal-merger-guidelines-08192010 [https://perma.cc/92J9-TD6M] (noting that the antitrust agencies, when evaluating the likely competitive effects of a proposed merger, often calculate the HHI).

ownership *and* the common owners have influence over the output decisions of the firms in which they own shares, the burden on competition arising from a given level of concentration can be aggravated. The MHHI (the modified HHI) was developed to deal with situations where these twin conditions are a reality.[184] The MHHI Delta is the difference between the HHI and the MHHI. The idea in the common ownership literature is that an industry whose HHI is not above the threshold could still prompt concern when the MHHI Delta is added into the calculation.[185]

The MHHI Delta is a theoretically sound measure. Mathematically, it arises out of the O'Brien-Salop model discussed above, which serves as the progenitor of the theory on which the common ownership literature is based.[186] However, to use the MHHI Delta in a regression designed to determine the effect of common ownership on prices or for public policy purposes, the metric must first be calculated. This calculation involves two objectively measured factors–the market shares of the industry's firms and the extent of investors holdings across industry firms. But—and as a point that is often un- or understated in the common ownership literature—the MHHI Delta also includes the researcher's own subjective evaluation, in the form of control weights, of the extent of common ownership's influence on managerial incentives. That subjective evaluation is captured by the researcher's choice of control weights – another component of the MHHI – which reflect the influence that the firm's various shareholders are assumed to have on the manager's output decision.[187] These control weights reflect the

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[184] One example, considerably less controversial than assuming that these twin requirements are met because of common ownership in an industry attributable primarily to the Big Three, is where one firm in an industry acquires a substantial stake in a competitor. As others have noted, the O'Brien & Salop model—the theoretical heart of the common ownership literature—was in fact developed with a focus on this less controversial example. *See* Rock & Rubinfeld, *supra* note 9, at 231.

[185] It is worth noting that a driving idea behind why a higher HHI should give rise to concern about a lack of competition is that collusion and enforcement of collusive agreements through detection of defection become easier as the number of players in an industry decreases. George Stigler suggested this idea in his seminal 1964 article. *See* Stigler, *supra* note 181. In contrast, common ownership, the factor that gives rise to an industry's MHHI being greater than its HHI, leaves unaffected the number of players.

[186] *See* O'Brien & Salop, *supra* note 41, at 610-11.

[187] Formally, if we index shareholders by i and firms by j, and if $\beta_{i,j}$ is the fraction of shares in firm j held by investor i, $\gamma_{i,j}$ measures the weight that the manager of firm j places on the portfolio of shareholder i, and s_j measures the market share of firm j, then the MHHI Delta is defined as:

$$\text{MHHI Delta} = \sum_j \sum_{k \neq j} \left(\frac{\sum_i \gamma_{i,j} * \beta_{i,k}}{\sum_i \gamma_{i,j} \beta_{i,j}} \right) * s_k s_j$$

fact that the reason for deriving a modified HHI is the assumption that common owners have some influence on their firms' output decisions and that firm managers trade off the preferences of the non-common owners for those of the common owners to some specified extent. For this reason, the MHHI Delta is not a pure reflection of the amount of common ownership in a given industry. Instead, the metric embodies common ownership's competitive effects *under the researcher's chosen specification* about how common ownership affects managerial incentives. While a variety of specifications are theoretically possible, the common ownership literature largely focuses on just one: the literature calculates the MHHI Delta using the blended-shareholder assumption discussed above. That is, the literature assumes that the common shareholders have a degree of influence in proportion to their holdings.[188]

The analysis in this Article shows that this specification is incorrect. Because current levels of common ownership are not expected to lead managers to meaningfully depart from own-firm net revenue maximization, the correct MHHI Delta is zero in any given industry.[189] This is an important observation because the common ownership literature's claim of reduced competition is largely built on the empirical findings in the Airline and Banking papers that greater common ownership leads to higher prices in

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See id. at 597. Therefore, calculation of the MHHI Delta requires a specification of how managers trade off the preferences of the firm's shareholders, which is reflected by the control weights $\gamma_{i,j}$, as well as data on shareholder ownership levels and firms' market shares.

[188] More precisely, the common ownership literature assumes the particular variant of the blended-shareholder assumption discussed in *supra* note 41, whereby managers are assumed to maximize a weighted average of shareholder portfolios such that the weights correspond to shareholders' ownership interests in the firm. *See also supra* note 42 (using a stylized example to illustrate the assumption). Therefore, with respect to the formula discussed in *supra* note 164, the MHHI and MHHI Delta calculated in the common ownership common ownership literature assume that the control weights ($\gamma_{i,j}$) correspond to shareholders' ownership interests in the firm ($\beta_{i,j}$). In contrast, in their work from which the common ownership common ownership literature derives its model, O'Brien and Salop develop a formula that is generalized and expressly does not specify the control weights. Instead, the authors explain that the weights will depend on the firms' control structures. *See* O'Brien & Salop, *supra* note 41, at 610.

[189] This can be seen in the equation in note 187 *supra*. Pick any firm *j* and consider one of the firm's shareholders, shareholder *i*. One option is that shareholder *i* is a non-common owner. This means that, for this shareholder i in firm j, $\beta_{i,j} > 0$ but $\beta_{i,k} = 0$ for any firm k other than firm j. Thus, for any non-common owner, $\gamma_{i,j} * \beta_{i,k} = 0$ for any firm k other than firm j. The second option is that shareholder i is a common owner. If firm managers focus just on the interests of the non-common owners, then, for this shareholder i in firm j, $\gamma_{i,j} = 0$, so $\gamma_{i,j} * \beta_{i,k} = 0$ for every firm k. Therefore, for each shareholder in firm j, $\gamma_{i,j} * \beta_{i,k} = 0$ for any firm *k* other than firm *j*. Thus, the numerator in the equation in *supra* note 187 is 0, which means that the MHHI Delta is zero.

those industries.[190] Yet these findings rely on a misspecified MHHI Delta.

Various scholars have questioned the common ownership model's use of the MHHI Delta.[191] In particular, it has been recognized that, because of endogeneity problems, specifying the control weights as some positive number when in fact they should have been zero can result in a finding that a higher level of common ownership leads to higher prices when it in fact has no such effect.[192] The problem arises because when the control weights are non-zero, factors other than the amount of common ownership can simultaneously affect both the MHHI Delta and price.[193] Therefore, even if common ownership has no effect on competition and prices, those other factors could generate a positive relationship in the data between the MHHI Delta and price. This could lead to the erroneous conclusion that the observed positive correlation between the MHHI Delta and price shows a positive causal relationship between common ownership (as captured by the MHHI Delta) and prices. For example, an increase in demand can lead to both an increase in prices and an increase in MHHI Delta, which creates a positive statistical association between the MHHI Delta and prices without there being any causal relationship between the two.[194]

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[190] The baseline panel regressions in the Airline Paper regress price on the MHHI Delta (as well as the HHI and other covariates) to empirically assess the relationship between common ownership and airline prices. *See* Airline Paper, *supra* note 5, at 1528. As discussed, the Banking Paper's analysis evaluates both common ownership and partial ownership interests. *See* Banking Paper, *supra* note 5, at 3. The concentration metrics used in the banking paper therefore are analogous to the MHHI Delta and the MHHI but modified to incorporate partial ownership interests. *See* Banking Oaper, *supra* note 5, at 86 (deriving the GHHI Delta and GHHI, which is the sum of the HHI and GHHI Delta). The baseline panel regressions in the banking paper regress price on the GHHI. *See id.* at 17.

[191] *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 744–48; Rock & Rubinfeld, *supra* note 9, at 240-46; Patel, *supra* note 10, at 304-23; Hemphill & Kahan, *supra* note 10, at 1406-09; McClane and Sinkinson, *supra* note 122, at 16-22.

[192] *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 744-47, 752-56.

[193] In other words, when the control weights are not zero and there is common ownership, the MHHI Delta is endogenous in a regression of price on the MHHI Delta. This arises in the first instance because, when the control weights are not zero, the MHHI Delta is a function of the firms' market shares. This can be seen in the equation in *supra* note 187 and the discussion in note 189 *supra*. The common ownership model assumes that $\gamma_{i,j} = \beta_{i,j}$. That is, the weight that the manager of firm j places on the portfolio of shareholder i equals shareholder i's fractional interest in the firm. With reference to the discussion in *supra* note 189, this means that for every common owner in firm k, $\gamma_{i,j} * \beta_{i,k} > 0$ for at least one firm k other than Firm j. This, in turn, means that the numerator in the equation in note 187 *supra* is not 0, which means that the MHHI Delta calculated in the literature is some function of the market shares of the firms subject to common ownership. The endogeneity of the MHHI Delta for non-zero control weights arises because market shares are not exogeneous. This is because various market factors can simultaneously affect both market shares and price. *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 752-56.

[194] *See, e.g.*, *id.* at 752-56 (discussing the endogeneity issue and providing an example

In sum, the empirical findings in the Airline and Banking papers that set off the common ownership alarm bells are based on a modified concentration measure, the MHHI Delta, that assumes without support that corporate managers, in deciding on the firm's output level, seek to satisfy the preferences of the hypothetical blended shareholder. The analysis in Parts II and III not only belies that assumption, but also questions the plausibility of the Airline and Banking papers' empirical findings, which are based in the first instance on regressions of price and the MHHI Delta.[195] While those regressions show a relationship between the MHHI Delta and competitive harm,[196] that relationship could merely be attributed to exogenous changes other than common ownership that simultaneously affect the MMHI Delta and either price or another measure of competitive harm.[197]

2. Inappropriateness of MHHI Delta for policy purposes. As

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of spurious correlation between price and the MHHI Delta based on shifting market demand that affects both price and the MHHI Delta via firms' market shares).

[195] As noted, the baseline regressions in the Airline and Banking Papers regress price on one of the modified concentration measures. *See supra* note 190. In this way, the estimations in those papers are structure-conduct-performance estimations that were once routine in the industrial organization literature but have since fallen out of favor, in part because of endogeneity concerns. *See, e.g.*, Xavier Vives, *Common Ownership, Market Power, and Innovation*, 70 INT'L J. INDUS. ORG. 1, 4 (2020) (describing structure-conduct-performance estimations and their relation to the Airline and Banking Papers); Matthew Backus, Christopher Conlon & Michael Sinkinson, Empirical Studies of the Effects of Common Ownership at 10-12 (2021), *available at* https://www.dropbox.com/s/cielt8q3uh5vkwe/BCS_ESECO.pdf?dl=0 (similar); William N. Evans, Luke M. Froeb & Gregory J. Werden, *Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures*, 41 J. INDUS. ECON. 431 (1993) (analyzing endogeneity issues in concentration-price regressions and applying the analysis to regressions in the airline industry). *See also* Steven Berry, Martin Gaynor & Fiona Scott Morton, *Do Increasing Markups Matter? Lessons from Empirical Industrial Organization*, 33 J. ECON. PERSPS. 44, 46-48 (2019) (describing the primary reasons why industrial organization economists have moved away from structure-conduct-performance estimations).

[196] *See supra* Section IV.A.1. *But see supra* notes 124-125 (identifying studies showing no statistically significant relationship or a limited relationship).

[197] Other scholars have questioned the findings of the Airline and Banking Papers because of the endogeneity concerns discussed above. *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 752-56; Rock & Rubinfeld, *supra* note 9, at 240-42; Thomas A. Lambert & Michael E. Sykuta, *The Case for Doing Nothing About Institutional Investors' Common Ownership of Small Stakes in Competing Firms*, 13 VA. L. & BUS. REV. 213, 243-48 (2019). In their original papers, the authors of the Airline and Banking Papers conducted additional econometric analysis to address these and other potential endogeneity issues. *See* Airline Paper, *supra* note 5, at 1517-18; Banking Paper, *supra* note 5, at 3-4. That econometric analysis also has been critiqued. *See, e.g.*, O'Brien & Waehrer, *supra* note 9, at 756-57; Rock & Rubinfeld, *supra* note 9, at 242-45. For a response to some of these critiques, see Einer Elhauge, *How Horizontal Shareholding Harms Our Economy–And Why Antitrust Law Can Fix It*, 10 HARV. BUS. L. REV. 207 (2020).

discussed below, Einer Elhauge calls on the federal antitrust agencies to mount wide-scale investigations of common ownership in industries based on high MHHI and MHHI Delta concentration thresholds.[198] Yet a high MHHI Delta (or a high MHHI) assumes the problem that it is supposed to measure. To calculate it requires the assumption that common shareholders influence the output decisions of firms in the industry.

3. *The kappa measure.* Some recent research into common ownership also uses another common ownership metric usually referred to as kappa.[199] Kappa algebraically arises out of the O'Brien-Salop model and represents the implied weight that a firm's manager places on the net revenues of rival firms under the postulates of that modified Cournot model.[200] Just like the MHHI Delta, to calculate kappa for purposes of conducting empirical analysis or setting policy, it is necessary to specify the control weights reflecting the influence that the firm's various shareholders are assumed to have on the manager's output decision.[201] In other words, calculating kappa requires the

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[198] *See* Elhauge, *supra* note 3, at 1302-03 (calling on federal antitrust authorities to investigate any horizontal stock acquisition which has or will create a MHHI Delta of over 200 in a market with a MHHI over 2500).

[199] For example, the baseline regression of Antón et al., *supra* note 137, that seeks to empirically ascertain if common ownership causes executive compensation to be less connected to firm profitability uses kappa as its measure of common ownership. *See* Anton et al., *supra* note 137, at 35. *See also* Backus, Conlon & Sinkinson, *supra* note 1 (using kappa); Boller & Fiona Scott Morton, *supra* note 127 (same). Other measures of common ownership have also been developed in the literature. *See, e.g.*, Erik P. Gilje, Todd A. Gormley & Doron Levit, *Who's Paying Attention? Measuring Common Ownership and Its Impact on Managerial Incentives*, 137 J. FIN. ECON. 152 (2020) (developing the GGL measure).

[200] As others have shown, the manager's specified objective in the O'Brien-Salop model can be recast as the manager choosing their firm's output level to maximize own firm net revenue and a weighted average of the net revenues of all rival firms. *See, e.g.*, Backus, Conlon & Sinkinson, *supra* note 195, at 2-4. Specifically, using the notation in footnote 187, the objective of manager of firm j in the O'Brien-Salop model can be represented as the manager choosing its firm's level of output level to maximize:

$$\Pi_j + \sum_{k \neq j} \kappa_{j,k} * \Pi_k$$

where Π_j is firm j's profit and the profit weights, $\kappa_{j,k}$, are defined as:

$$\kappa_{j,k} = \frac{\sum_i \gamma_{i,j} * \beta_{i,k}}{\sum_i \gamma_{i,j} * \beta_{i,j}}$$

See id. Kappa for firm j is the vector of profit weights $\kappa_{j,k}$ for all rival firms k.

[201] In other words, the researcher must specify the $\gamma_{i,j}$'s that appear in the definition of $\kappa_{j,k}$ in supra note 200.

researcher make an a priori assumption about how common ownership affects managerial incentives to compete. Thus, kappa, like the MHHI is not a pure measure of common ownership but instead embodies the researcher's chosen specification about how common ownership affects managerial decision-making. And again, just like the MHHI Delta, the literature generally calculates kappa using the blended shareholder assumption discussed above, which posits that common shareholders influence managerial decision-making in proportion to their holdings.[202] If, as this Article contends, common ownership at current levels does not cause managers to deviate from own-firm net revenue maximization, then kappa will be zero for each in a given market segment.[203]

V. POLICY CONCLUSIONS

The common ownership literature's claim that common ownership lessens competition has led to a number of proposed changes in antitrust policy aimed at the workings of the nation's investment funds. These proposals have received serious attention in policy circles,[204] undoubtedly due in part to the literature's suggestions that the lessened competition is leading to higher prices and, through the profits they generate, to an exacerbation of income inequality as capital's share of national income grows at the expense of labor and hence of consumers.[205] This Article's analysis

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[202] One notable exception is Backus, Conlon & Sinkinson, *supra* note 1, who calculate kappa using various alternate specifications of the control weights. *See, e.g.*, *id.* at fig. 13.

[203] This can be seen by using reasoning similar to *supra* note 189 in *supra* note 200.

[204] The Federal Trade Commission has shown an especially keen interest in the common ownership issue. The Commission has held a hearing on the subject, *see FTC Hearing #8: Competition and Consumer Protection in the 21st Century*, FED. TRADE COMM'N (Dec. 6, 2018), https://www.ftc.gov/news-events/events-calendar/ftc-hearing-8-competition-consumer-protection-21st-century [https://perma.cc/XZ6P-LGU4] (collecting materials from an FTC hearing on common ownership), and FTC commissioners have engaged on issue and assessed the leading proposals discussed below. *See, e.g.*, Phillips, *supra* note 133 (discussing the Elhauge and Posner et al. proposals). Very recently, the FTC also issued a set of compulsory process resolutions directed at enforcement areas the Commission deems important, which includes common ownership. *See* Federal Trade Commission, *FTC Streamlines Consumer Protection and Competition Investigations in Eight Key Enforcement Areas to Enable Higher Caseload* (Sept. 14, 2021), *available at* https://www.ftc.gov/news-events/press-releases/2021/09/ftc-streamlines-investigations-in-eight-enforcement-areas.

[205] *See* Elhauge, *supra* note 3, at 1291-1301; Eric Posner & E. Glen Weyl, *Mutual Funds' Dark Side*, SLATE (Apr. 16, 2015, 9:46 AM), slate.com/articles/news_and_politics/view_from_chicago/2015/04/mutual_funds_make_air_travel_more_expensive_institutional_investors_reduce.html [https://perma.cc/W9E7-EDD6] (arguing that common ownership by mutual funds exacerbates economic inequality); Zohar Goshen & Doron Levit, Common Ownership and the Decline of the American Worker (Apr. 22, 2021) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3832069.

indicates, however, that common ownership is not leading to such problems. These proposals are unwarranted because they are a solution to a non-problem that will burden a system by which tens of millions of Americans, for low fees, get a market return on their savings while minimizing risk through broad diversification. They also would divert the country's limited antitrust enforcement capacity away from more important targets at what may be a crucial time.

A. The Absence of Need for the Proposed Reforms

As a starting point, we note that antitrust laws already prohibit *collusive* conduct, and the federal antitrust agencies routinely investigate, litigate, and criminally prosecute claims for collusion.[206] So, although the critics of common ownership by mutual funds and ETFs have not yet pointed to any evidence that the increase in these funds' holdings has led to any instances of collusion, to the extent common owners might facilitate collusion or coordinated conduct by the firms in which they invest, there already exists an enforced legal prohibition on that conduct.[207] And, as the Article shows, there is no good reason to think that common ownership is generating appreciable competitive harm through any *non-collusive* mechanism, which is the central claim of the common ownership literature. So, the tools exist to fight situations where problems might develop, and there is no reason to develop tools to fight problems that have not developed.[208]

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[206] The antitrust agencies' investigations, civil litigation, and criminal prosecutions of collusion extend far beyond instances of collusion in product markets. *See, e.g.*, *Health Care Company Indicted for Labor Market Collusion*, U.S. DEP'T JUST. (Jan 7, 2021), https://www.justice.gov/opa/pr/health-care-company-indicted-labor-market-collusion [https://perma.cc/LH9S-WKT2] (describing a criminal indictment concerning collusion in a labor market, where an employer allegedly conspired with rivals to not solicit rivals' employees).

[207] *See* Edward B. Rock & Daniel L. Rubinfeld, *Does Common Ownership Explain Higher Oligopolistic Profits?* 12-13 (N.Y.U. Sch. of L., L. & Econ. Rsch. Paper Series, Working Paper No. 20-18, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3627474 [https://perma.cc/GY2P-MELD] ("Likewise, there are a variety of other plausible coordinated scenarios in which shareholders can cause competitive harm, such as if shareholders act as a trustworthy conduit for communication among competitors, advocate an industry-wide anticompetitive compensation structure or possibly even as the spreader of anticompetitive practices. In each of these cases, depending on the factual context, shareholder conduct may violate existing antitrust law and be subject to sanctions.") (footnote removed); Ginsberg & Klovers, *supra* note 176, at 3 (explaining that antitrust agencies have considerable expertise with hub-and-spoke conspiracies, the exchange of competitively sensitive information, and conscious parallelism and can apply the current legal framework to common ownership).

[208] In addition to prevailing antitrust law, other existing regulatory factors act to

To be clear, this Article does not advocate for a hands-off approach to common ownership. First, as noted, the Article's objective was to evaluate whether common ownership can generate competitive harm *apart from any communication or coordinated conduct*. We cannot deny the possibility that, as some as argued, common ownership could generate competitive harm by facilitating coordination or collusion.[209] To the extent that evidence arises suggesting that this has occurred, it would be improper for the antitrust authorities to not investigate and, if warranted, challenge this behavior.

Second, the Article's analysis has focused on current levels of common ownership, not hypothetical sharply higher levels. It is certainly the case that at some point common ownership could be high enough to affect managerial incentives to compete. To take an extreme example, if each firm in an industry had the same set of shareholders so that all the firms were totally commonly owned, then there would be a heightened risk of competitive harm. For each firm in that scenario, all its shareholders would prefer that its managers compete less, all else equal.[210] This Article does not support a non-intervention policy at higher levels of common ownership that generate a meaningful modification to managerial incentives to compete and associated competitive harm.[211]

That said, we do not think it is inevitable that broad-based index funds will ultimately have such a large share of the market that common ownership would reach a level requiring intervention. These funds have grown in recent years partly because of a growing awareness among the investing public of the virtues of diversification and partly because, through the application of technology and economies of scale, fund managers, particularly the Big Three, have been able to offer such funds for very low fees. There is evidence,

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disincentivize common owners from facilitating collusion by their portfolio companies. For instance, as John Morley has carefully explained, a large passive investment manager that seeks to exercise control over one of its portfolio companies may incur significant regulatory burdens under Sections 13(d) and 16 of the 1934 Act. *See, e.g.*, Morley, *supra* note 177, at 1427-34.

[209] *See supra* note 134 (collecting sources that analyze common ownership and coordinated conduct).

[210] However, all else may not be equal. As noted, common owners may also have interests in related industries. These intra-common ownership conflicts may diminish common owners' preferences for reduced competition in the relevant market. *See supra* note 176 and accompanying text. Additionally, and as also noted above, common owners' heterogenous interests in the firms in the relevant market would further check common ownership's competitive harm. *See supra* notes 109-110 and accompanying text.

[211] As others have noted, there is an important need for additional theoretical and empirical research into common ownership. *See, e.g.*, Hemphill & Kahan, *supra* note 10, at 1447-50. As reflected by the current paper, one important open line of research is to determine the threshold at which common ownership is expected to generate meaningful modifications to managerial incentives to compete.

though, that managed funds, using fundamental analysis, can, at least prior to taking out their fees, make above-market returns by finding underpriced and overpriced stocks and trading accordingly. The more money under the management of such funds, however, the harder it is to do this. Each fund needs to find more and more such opportunities, and they get harder to find. The converse is true as well: the less money under management, the easier it is to find opportunities sufficiently good to cover the management fees and give investors above-market returns. This suggests that, as an increasing portion of the country's savings go into broad-based index funds, managed funds will be able to offer the prospect of above-market returns and an equilibrium will be reached between the low fees and diversification of the broad-based index funds and the slightly higher after-fee expected returns on managed funds.[212]

B. The Leading Proposed Reforms and Their Costs

Two reform proposals by leading antitrust scholars would prohibit or legally burden common ownership even in circumstances involving no collusion or coordination. One proposal by Einer Elhauge calls on the federal antitrust agencies to mount wide-scale investigations of common ownership in industries with MHHI scores above a certain threshold.[213] Another well-known and detailed proposal by Eric Posner, Fiona Scott Morton, and Glen Weyl would prohibit common ownership except at *de minimis* levels.[214] Under this latter proposal, investors in an oligopolistic industry would be required to choose between holding only the shares of a single one of the industry's firms or, if it wished to hold shares in more than one firm in the industry, holding no more than 1 percent in any such firm.[215] The only way

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[212] A model of investment-fund equilibrium of this sort, along with empirical support, is worked out in Jonathan B. Berk & Jules H. van Binsbergen, *Measuring Skill in the Mutual Fund Industry*, 118 J. FIN. ECON. 1 (2015). *See also* Jill Fisch, Assaf Hamdani & Steven Davidoff Solomon, *The New Titans of Wall Street: A Theoretical Framework for Passive Investors*, 168 U. PA. L. REV. 17, 32 (2019) (noting that actively managed funds compete with index funds for investors); Bernard S. Black, *Agents Watching Agents: The Promise of Institutional Investor Voice*, 39 UCLA L. REV. 811, 879-80 (1992) (same). *But see* Lucian A. Bebchuk & Scott Hirst, *The Specter of the Giant Three*, 722 B.U. L. REV. 721 (2019) (concluding that the Big Three could cast as much as 40% of the votes in S&P 500 companies within two decades).

[213] *See* Elhauge, *supra* note 3, at 1303. For additional exposition of his proposal, including a robust response to critiques, see Elhauge, *supra* note 197.

[214] *See* Posner et al., *supra* note 8, at 678, 708-10. For additional discussion of this proposal, see Posner, *supra* note 132, at 146-47.

[215] *See* Posner et al., *supra* note 8, at 678, 708. More precisely, the proposal relates to effective firms. For purposes of their proposal, an investor is considered to hold the shares of more than a "single effective firm" if the investor is "invested in more than one firm, and

out of this required choice would be if the investor was a purely passive index fund that engages in no corporate governance activities of any sort.[216] Investors that fail to meet the criteria would be subject to lawsuits by the antitrust agencies.[217]

Other scholars have critiqued these policy proposals, and this Article supports the critiques. These other scholars argue that the proposals would yield little or no gain in competition, but the scholarly critiques are largely based on other grounds. For example, many critiques arise from econometric problems that scholars see in the common ownership literature's empirical results or from skepticism that fund management companies would take action designed to lessen competition in an industry.[218] This Article, with its focus on the incentives of corporate managers, complements and strongly reinforces the conclusions of these other scholars by showing that common ownership at current levels is unlikely to generate competitive harm except possibly through facilitating collusion or coordinated conduct, which is already prohibited under existing antitrust law.[219]

The Posner et al. proposal would generate significant social costs. Consider first its application to broad-based index funds. The Big Three offer such funds with fees and expenses that are well less than 1/10th of 1%. The investment fund industry has a good number of players and would not appear to have large barriers to entry, so the dominance of these three firms suggests there are considerable economies of scale in running such funds. Thus, there is a real concern that the Posner et al. proposal, in limiting each fund to 1% of every firm in an industry, would in essence replace the Big Three with the little twenty-one and, in so doing, substantially raise costs per dollar under

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the total market share of all firms [the investor] holds any stake in is greater than HHI/10,000 in the oligopoly." *Id.* at 708 (emphasis removed).

[216] An index fund is deemed "purely passive" if it "commits to engage in no communication with top managers or directors, to vote its shares in proportion to existing votes so that it has no influence in any corporate governance decision, and to own and trade stocks only in accordance with clear and non-discretionary public rules, such as matching an index as closely as possible." *Id.* at 709 (emphasis and footnote removed).

[217] *See id.* at 678. For a proposed legislative prohibition on common ownership, see Posner & Weyl, *supra* note 205 (discussing limiting the stakes of institutional investors through legislative action).

[218] *See, e.g.*, Rock & Rubinfeld, *supra* note 9, at 263-67; Hemphill & Kahan, *supra* note 10, at 1450-52; Ginsberg & Klovers, *supra* note 176, at 6; Lambert & Sykuta, *supra* note 197, at 248-269; Thomas A. Lambert, *Mere Common Ownership and the Antitrust Laws*, 61 B. C. L. REV. 2913, 2957-62 (2020); Rock & Rubinfeld, *supra* note 207, at 12; *see also* Koch et al., *supra* note 126, at 113 ("Based on our findings of no widespread influence of common ownership on industry competition, policies limiting common ownership do not currently appear warranted."); Alessandro Romano, *Horizontal Shareholding and Network Theory*, 38 YALE J. ON REG. 363, 366 (2021) (arguing that the policy proposals could have the unintended effect of reducing the level of competition in product markets).

[219] *See supra* notes 206-206 and accompanying text.

management, costs that would be passed on to investors.[220] Fee differences of even a fraction of 1% can make a substantial difference for long-term investments, such as for retirement or college. That is of particular concern because these funds are the investment vehicles of tens of millions of ordinary Americans.

Under the Posner et al. proposal, the Big Three could keep their market shares and accompanying low costs, but only if they step out of their current corporate governance role completely. Our point here is that common and non-common shareholders share the same interests over everything except the level of output. Where the interests are shared, these big management companies can play an important role and, in so doing, improve the governance of the country's public companies.[221] While some scholars argue that these management companies underinvest in their corporate governance efforts, they do so from the perspective of wanting them to do more, not less.[222]

The Posner et al. proposal would also burden the operations of managed investment funds, which might generate economic harm by reducing the accuracy of prices in the secondary markets.[223] In essence, if a fund already had 1% of the shares of one company in an industry, it would face significantly diminished incentives to engage in fundamental-value research to look for mispricing among any other firms in the industry. If the fund found one or more underpriced firms, it could not use what it learned

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[220] *See, e.g.*, Bebchuk & Hirst, *supra* note 10, at 2129-31 (making a similar point but with respect to corporate governance activities by the Big Three).

[221] Indexed and managed funds each perform their own corporate governance functions. Index funds are motivated by the fact that they cannot exit poorly run firms, and they are helped by economies of scale and scope with respect to pushing for broad, market-wide governance standards. *See* Kahan & Rock, *supra* note 157, at 1776-77; *see* also Fisch, Hamdani & Solomon, *supra* note 212 (arguing that index funds are motivated to improve corporate governance across their broad portfolios of firms as a way to compete with managed funds). Managed funds, which are much less diversified, are more motivated and, through the work of their analysts, better situated, to identify specific problems at particular firms. *See* Kahan & Rock, *supra* note 157, at 1789 & 1808. For an example of fund efforts with respect to governance, see Matthew D. Cain, Jill E. Fisch, Sean J. Griffith & Steven Davidoff Solomon, *How Corporate Governance Is Made: The Case of the Golden Leash*, 164 U. PA. L. REV. 649, 678-94 (2016).

[222] *See, e.g.*, Bebchuk & Hirst, *supra* note 10, at 2119-26; Lucian A. Bebchuk, Alma Cohen & Scott Hirst, *The Agency Problem of Institutional Investors*, 31 J. ECON. PERSPS. 89, 100-01 (2017). Additionally, because of the Big Three's passivity in corporate governance efforts relative to other types of investors, these scholars do not believe that Big Three are facilitators of significant anticompetitive conduct. *See, e.g.*, Bebchuk, Cohen & Hirst, *supra*, at 108-09.

[223] *See* Merritt B. Fox & Kevin S. Haeberle, *Evaluating Stock-Trading Practices and Their Regulation*, 42 J. CORP. L. 887, 890-891 (2017) (discussing the social benefits of accurate share prices in secondary markets).

unless it sold its stake in the original firm.[224]

Additionally, both these proposals would require substantial antitrust resources to implement.[225] This is not a prosaic consideration, as there is a growing consensus that antitrust resources must be urgently deployed to correct substantial anticompetitive conduct occurring at key pressure points of the U.S. economy.[226] The policy proposals advanced in the literature to prohibit or limit common ownership would divert precious antitrust resources away from rectification of these actual competitive concerns.[227]

This Article's analysis also informs the propriety of proposals on the other end of the liability spectrum that would immunize common owners

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[224] This dampening effect on the incentives to engage price-accuracy-enhancing fundamental value research is similar to the effect of restrictions on short selling. *See* Merritt B. Fox, Lawrence R. Glosten & Paul C. Tetlock., *Short Selling and the News: A Preliminary Report on an Empirical Study*, 54 N.Y.L. SCH. L. REV. 645, 648-49 (2010).

[225] Elhauge's proposal would cause the antitrust agencies to incur significant antitrust expenses in mounting investigations and potential antitrust litigation. While these enforcement resources would be avoided if institutional investors reshaped themselves in a manner that allowed them to fall within Posner et al.'s safe harbor, Posner et al.'s proposal would necessitate the use of significant antirust resources in other ways. For instance, their proposal would require the antitrust agencies to identify yearly a set of markets deemed to be oligopolies based on concentration numbers and a set of market factors. *See* Posner, Scott Morton & Weyl, *supra* note 8, at 698. To mitigate this significant expenditure of antitrust resources, Posner et al.'s proposal would have the agencies sequentially identify the industries appearing on the oligopoly list, starting "with industries where there is empirical evidence of competition problems due to common ownership or other clear empirical evidence of concentration." *Id.*

[226] Perhaps most important are the calls for antitrust action against the large technology companies, which are perceived to be exploiting market dominance in contravention of antitrust laws and to the detriment of consumer wellbeing. *See, e.g.*, Menesh S. Patel, *Merger Breakups*, 2020 WIS. L. REV. 975, 1022-23 & nn.230-32 (2020) (citing calls by policymakers, scholars, and advocates for the breakup up of large technology companies). Indeed, the Department of Justice and Federal Trade Commission have each commenced pathbreaking and far-reaching antitrust litigation against a large technology platform. These antitrust challenges and other antitrust enforcement in the technology space, as well as enhanced antitrust enforcement in other market segments, will necessitate the use of considerable antitrust resources. *See, e.g.*, Carl Shapiro*, Protecting Competition in the American Economy: Merger Control, Tech Titans, Labor Markets*, 33 J. ECON. PERSPS. 69, 70 (2019) (explaining the need for additional antitrust enforcement resources directed at merger review, exclusionary conduct by dominant firms, and employer-side monopsony power in labor markets).

[227] This is an especially important consideration, since antitrust enforcement resources have been steadily declining. *See, e.g.*, Fiona M. Scott Morton, *Reforming U.S. Antitrust Enforcement and Competition Policy*, WASH. CTR. EQUITABLE GROWTH (Feb. 18, 2020), https://equitablegrowth.org/reforming-u-s-antitrust-enforcement-and-competition-policy/ [https://perma.cc/E4S2-C8GR] ("The resources expended on enforcing the antitrust laws in the United States are lower as a proportion of Gross Domestic Product than they were for most of the mid-1900s and have experienced a notable decline since 2000.").

from antitrust liability if certain conditions are met. For instance, Ed Rock and Dan Rubinfeld have proposed an antitrust safe harbor that would shield investors who limit their holdings to 15%, refrain from board representation, and only engage in ordinary corporate governance activities.[228] While this bright-line rule would provide institutional investors with relative legal certainty, it could have unintended consequences. If, for example, six institutional investors each maintained a 10% interest in rival firms, then those common owners would predominate over the non-common owners. In that scenario, managerial incentives to compete may be mitigated to such an extent that antitrust intervention is necessary.[229]

For this reason, it would be imprudent at this time for policymakers to make large-scale modifications to antitrust policies in response to common ownership, such as through wide-scale antitrust investigation of common ownership, prohibitions of common ownership, or safe harbors. As the Article's analysis shows, these policies are not just overbroad. They could also generate significant social cost, ultimately to the detriment of the very consumers that antitrust seeks to serve.[230]

CONCLUSION

With the investment funds of the three largest management companies now holding in aggregate around 21% of the shares of a typical S&P 500 firm, the common ownership issue has become a lightning rod for scholarly debate. The adherents of the common ownership literature make the provocative claim that these kinds of cross-industry holdings are leading to higher prices and less competition and can do so even in the absence of

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[228] *See* Rock & Rubinfeld, *supra* note 9, at 270-77.

[229] Rock and Rubinfeld acknowledge possibilities like this. *See* Rock & Rubinfeld, *supra* note 9, at 271 n.144 ("A caveat: although in the current distribution of shareholdings, investments of less than 15% do not pose any significant antitrust risk, in an alternative universe in which, for example, six investment funds each controlled 15% of each of the airlines, the safe harbor would have to be re-evaluated.").

[230] In light of the Article's analysis, the optimal policy response is for the antitrust agencies to follow a case-by-case approach to common ownership through which they continue to monitor common ownership and target specific instances of anticompetitive conduct. *See also* Patel, *supra* note 10, at 282-83 (similarly calling for a case-by-case approach to common ownership); *accord* Rock & Rubinfeld, *supra* note 207, at 12 ("[A]ny intervention addressing the anti-competitive effects of common ownership should require a specific showing of such effects, based on particularized industry findings."). The Article's analysis can aid in that targeted approach. For instance, if the market segment of interest includes semi-common owners whose competition-based preferences are aligned with the common owners' preferences, then the corporate governance mechanisms discussed above are more likely to serve as a bridge between common ownership and non-coordinated competitive harm, all else equal. *See supra* Section III.D.

communication or collusion among firm managers or common shareholders. Others have critiqued this conclusion, mainly questioning the adherents' empirical results or the idea that investment funds with holdings across an industry would, as shareholders in each firm in the industry, push each firm to compete less. Largely neglected in this debate is a careful analysis of how the persons who in the first instance actually make the decisions that determine an industry's competitiveness—firm managers—would act differently in the presence of common ownership. After all, shareholders, whether common or non-common, do not and cannot directly determine how vigorously their firms compete. Instead, that decision is made by the managers that the firm's shareholders collectively appoint to act on their behalf.

Training attention on managerial decision-making yields important insights. It forces a critical assessment of the economic model of decision-making that lies at the heart of the common ownership debate. In both the standard Cournot model of oligopolistic competition and the modified Cournot model, which is the theoretical basis of the common ownership literature, the critical decision is each firm's output level. The lower the industry's total output, the higher the price of its product. This modified Cournot model assumes that when a firm's shareholding body begins to include persons who own shares in the firm's rivals, the firm's managers, in making the firm's output decision, jettison the goal of maximizing own-firm net revenue maximization and instead choose an output level that maximizes some portion of the net revenues of rival firms. The idea is that this objective serves a hypothetical "blended shareholder" whose interests involve some kind of averaging of the interests of the common and non-common shareholders.

This blended-shareholder assumption hides a basic conflict between the two groups. The common shareholders would want each firm's managers to make output decisions that incorporate to some extent the net revenues of rival firms. That is, common shareholders would prefer decisions that result in the industry's aggregate output being closer to the level that a firm monopolizing the industry would choose. The non-common shareholders, who gain nothing from any increase in net revenues of the firm's rivals, would want managers to choose the level of output that would maximize solely the firm's own net revenues. This is the same level as would have been preferred by all the firm's shareholders if there were no common shareholders. It is also the output level likely to be preferred by management because maximizing the firm's own net revenues maximizes its ability to give managers the things they desire out of their positions.

Determining how managers would resolve this sharp conflict between the firm's common owners and non-common owners cannot be done in the

abstract. Instead, that question must be analyzed in relation to the incentive structure within which mangers work. This incentive structure consists of a set of sticks and carrots that have been analyzed by corporate law scholars for decades. The sticks are threats of a proxy fight (and the related mechanisms of nominating competing directors and voting against unopposed directors), hostile tender offer, activist shareholder campaign, depressing share price by the sale of a large block of shares, and fiduciary duty suits. The carrots are the managers' compensation packages and their own share ownership. As we have seen, an analysis of these sticks and carrots suggests that, relative to no common ownership, the existence of common ownership, at least at current levels, is unlikely to change how the sticks and carrots work in any way that would lead to an output level lower than if the firm had no common shareholders. Thus, contrary to what is predicted by the common ownership literature's underlying theory—the modified Cournot model—the presence of common ownership does not appreciably lessen competition.

This managerial-focused analysis helps resolve a number of open issues pertinent to the common ownership debate and also informs significant policy debates. First, the analysis substantiates the claims of researchers who have found no empirical connection between common ownership and competitive harm. Similarly, the analysis reinforces the arguments of certain scholars that the findings that do show an empirical connection are driven by spurious correlation rather than any true causal relationship. Second, the analysis informs the important mechanism question in the literature and shows that there is no non-coordinated mechanism that connects common ownership to competitive harm, at least at current levels of common ownership. Third, the analysis yields another reason why researchers and policymakers should reject, or at least be extremely skeptical about, basing analysis or policy on the modified concentration measure, the MHHI Delta. The manner in which that metric is calculated and used in the literature relies on the erroneous blended-shareholder assumption. As a result, the metric can, due to endogeneity, lead to a result that appears to show an association between common ownership and higher prices when none exists.

Finally, and perhaps most important, the Article's analysis raises a cautionary red flag to policymakers who may be contemplating significant modifications to antitrust law or policy in response to common ownership. At current common ownership levels, such policies, while well-intentioned, would be imprudent. Existing antitrust law is well-suited to address any plausible competitive harm resulting from common ownership. Any significant retooling of antitrust law or policy for purposes of eradicating or significantly tamping down on current levels of common ownership would be an ill-advised effort to solve a non-problem. Such a reform would add to

the costs of the investment vehicles of choice for tens of millions of ordinary Americans for such major life purposes as retirement and the education of their children.

Appendix

Calculations and Depictions for the Examples in Part I

A. The Example of a Standard Cournot Model for an Oligopolistic Industry

As discussed in the text of this Article, the example involves an industry, widgets, that consists of two firms, Firm A and Firm B. The demand curve for widgets is depicted by the equation $P = \$10 - Q/10{,}000$, where Q is the aggregate widget production of the two firms and P is the resulting price for any given Q. The firms have identical costs, with marginal cost (MC) equal to $2 per additional unit, whatever is its level of production. Let q_A and q_B represent production amounts for Firms A and B, respectively.

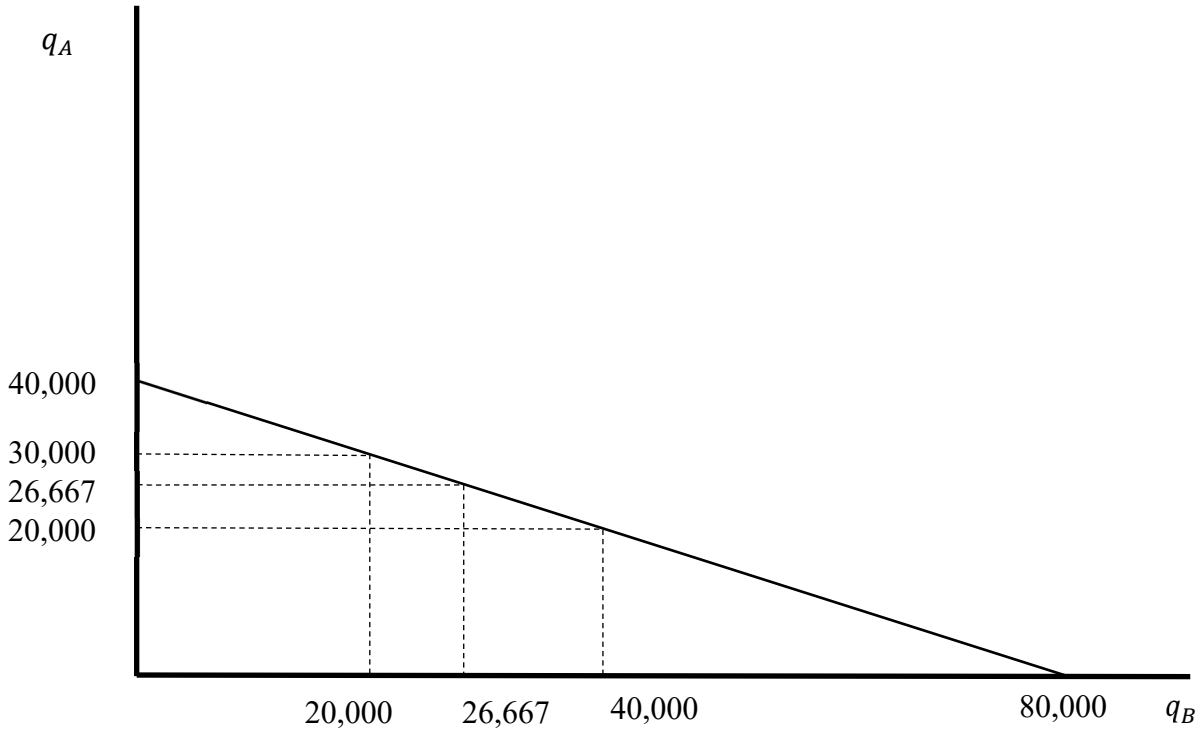

Figure 1: Best Response Function for Firm *A*. The figure depicts Firm A's best response function, which provides the output decision by Firm A (q_A) that maximizes Firm A's net revenues given the output decision by firm B (q_B). So, for example, with Firm A seeking to maximize its net revenues, if firm B produces 40,000 widgets, Firm A should produce 20,000 widgets, and if Firm B produces 20,000 widgets, Firm A should produce 30,000 widgets.

In this market environment, for a given level of Firm B's output, q_B, Firm A will choose its quantity, q_A, such that its quantity decision maximizes its net revenues. Based on our assumptions concerning the industry demand curve for widgets and concerning each firm's costs, it can be shown that the net revenue maximizing production amount for Firm A, given Firm B's

production amount, is given by the equation: $q_A = 40{,}000 - q_B/2$.[1] In game theory, this function is referred to as Firm A's best-response function, as it represents Firm A's optimal response to Firm B's quantity choice. It can similarly be shown that Firm B's best-response function is given by the equation: $q_B = 40{,}000 - q_A/2$.

Figure 1 depicts Firm A's best response function. For a given output choice by Firm B on the horizontal axis, the vertical axis provides the output for Firm A that maximizes Firm A's net revenue. So, for instance, if Firm B produces 20,000 widgets, then the output that maximizes Firm A's net revenue is 30,000 widgets. Firm A's best response function is downward sloping, which represents the fact that if Firm B produces more, this expanded output decision will depress the market price. That, in turn, will decrease Firm A's marginal revenue, which will incentivize Firm A to produce less.

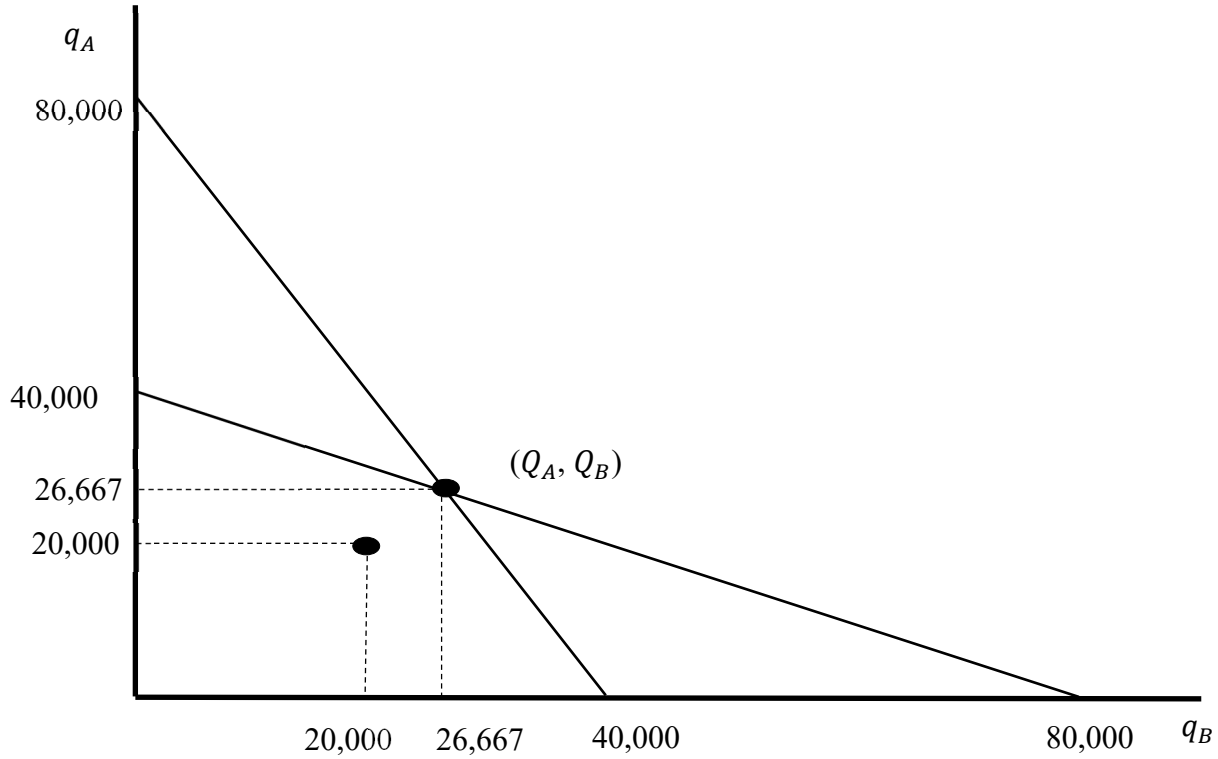

Figure 2: Firms' Best Response Functions and Optimal Output Decisions. The figure graphs Firm A and Firm B's best response functions. Firm A's best response function is the line that is lower on the left side of the graph and higher on the right side of the graph. The output combination at the intersection of the two best-response functions is Q_A and Q_B, the net revenue maximizing output decision of each firm holding fixed the output decision of the other firm. The other output combination identified in the figure is where the firms split the monopoly outcome and each firm produces 20,000 units. However, as we will

[1] This expression can be derived as follows. $Q = q_A + q_B$, and so $P = 10 - (q_A + q_B)/10{,}000$. Total revenue to Firm A $(TR_A) = P * q_A = [10 - (q_A + q_B)/10{,}000] * q_A = 10q_A - {q_A}^2/10{,}000 - q_A q_B/10{,}000$. Marginal revenue to Firm A is the first derivative of this expression, that is, $MR_A = 10 - 2q_A/10{,}000 - q_B/10{,}000$. To maximize net revenue, the managers of Firm A choose the output level such that $MR = MC$. $MC = \$2$, and so $10 - 2q_A/10{,}000 - q_B/10{,}000 = 2$. Rearranging, $q_A = 40{,}000 - q_B/2$.

discuss below, this combination does not represent an equilibrium set of outputs absent collusion between the two firms.

Denote the expected equilibrium output quantities for the two firms to be Q_A and Q_B, respectively.[2] Given the firms' best response functions, $Q_A = Q_B = 26{,}667$.[3] At that quantity combination, each firm is maximizing its net revenues, given the quantity choice of the other firm. It follows that the system is in equilibrium: at these respective output levels, neither firm can increase net revenues by producing either more or less than its current output, holding fixed the other firm's quantity decision.

Graphically, the expected output combination, Q_A and Q_B, lie at the intersection of the two firms' best response functions.[4] Figure 2 above plots the two firms' best-response functions, given the specified demand function and marginal costs, and identifies the firms' expected output under the assumption of net revenue maximization. At that level of output, each firm produces 26,667 widgets, that is, $Q_A = 26{,}667$ and $Q_B = 26{,}667$. In the Cournot oligopoly, therefore, market output is 53,333 widgets,[5] and so the market price is $P = \$10 - 53{,}333/10{,}000 = \$4.67$. Because each widget costs \$2 to produce, each firm makes net revenues of $26{,}667 * (\$4.67 - \$2.00) = \$71{,}201$, with industry net revenue being $2 * \$71{,}201 = \$142{,}402$.[6]

As noted in the text of the Article, the shareholders of each firm, even without common ownership, would be better off if the managers of all the industry's firms further constrained their respective individual-firm output decisions such that, in the aggregate, they equaled the monopoly output level. In that scenario, industry profits would be \$160,000. That could be achieved, for example, if *both* firms evenly split the monopoly output level of 40,000 widgets, with each producing just 20,000 instead of 26,667. Then, with the price of widgets at \$6, each firm's net revenue would be \$80,000 instead of \$71,201. This, however, will not happen. The reason is that each firm, in seeking to maximize its own net revenues, has an incentive to exploit the other firm's decision to produce at low levels by itself producing more than the specified production of 20,000 units.

Consider this first from the point of view Firm A. For 20,000 widgets to be an equilibrium level of output for Firm A, it must be the output decision that maximizes its net revenues, given that Firm B is producing 20,000 units. This is not the case: an output decision of 20,000 is not Firm A's best response to Firm B producing 20,000 units. This can be seen from Figure 1, which shows that if Firm B produces 20,000 widgets, then the output decision that maximizes Firm A's net revenues is 30,000 widgets, not 20,000 widgets. If Firm A were to produce 30,000 units when

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[2] More precisely, Q_A and Q_B denote the Nash equilibrium of Cournot game.

[3] This is derived from the two best response functions, $q_A = 40{,}000 - q_B/2$ and $q_B = 40{,}000 - q_A/2$. Accordingly, $q_A = 40{,}000 - (40{,}000 - q_A/2)/2$. Rearranging, $q_A = 80{,}000/3 = 26{,}667$. If this is so, then $q_B = 26{,}667$ as well.

[4] That is because each firm's best response function, by construction, provides that firm's net revenue maximizing output decision, holding fixed the output of the other firm. If Q_A and Q_B are net revenue maximizing choices for each firm, given the output of the other firm, then it must be that for Firm A, Q_A is a best response to Q_B, and for Firm B, Q_B is a best response to Q_A. In other words, Q_A and Q_B are on both firms' best response functions and therefore at their intersection.

[5] Specifically, because $Q_A = 80{,}000/3$ and $Q_B = 80{,}000/3$, *see* Appendix, *supra* note 3, industry output equals $2 * (80{,}000/3)$, or 55,333.33.

[6] We round all calculations. In this example, the market price is 14/3 and each firm's production is 80,000/3. We round these values to 4.67 and 26,667, which yield the provided net-revenue value of \$71,201. Each firm's net revenues using the unrounded values for the market price and each firm's production is $80{,}000/3 * (\$14/3 - \$2) = 80{,}000/3 * (\$14 - \$6)/3 = \$640{,}000/9 = \$71{,}111$.

Firm B produced 20,000 units, then the price would equal $P = \$10 - 50{,}000/10{,}000 = \$5$. With the cost of each unit being \$2, Firm A would generate net revenues of $30{,}000 * (\$5 - \$2) = \$90{,}000$, which is higher than the \$80,000 net revenue associated with Firm A producing 20,000 units when Firm B produces 20,000 units.

In other words, if Firm B restricts itself to only producing 20,000 widgets, then that will translate into a relatively high market price. It is in Firm A's self-interest to exploit that higher market price by itself expanding production beyond 20,000 widgets. This opportunistic incentive is not limited to Firm A.[7] This can be seen in Figure 2, which also plots the joint monopoly outcome where each firm restricts output by producing just 20,000 units. As shown there, that quantity combination is not on either firm's best response function and, instead, each firm has an incentive to produce more than 20,000 widgets.[8] Further, as also shown in that figure, any output combination in which the firms produce less than the expected Cournot output level of production cannot be a sustained outcome because each firm would have an incentive to produce more than the specified amount.[9]

B. The Example of a Modified Cournot Model for an Oligopolistic Industry with Managers as Agents for a Firm's Hypothetical Blended shareholder

As in the first example, the widget industry consists of two firms, Firm A and Firm B, with an industry demand curve for widgets reflected by $P = \$10 - Q/10{,}000$, and where each firm has identical costs, with marginal cost (MC) equal to \$2 per additional unit, whatever its level of production.

As noted in the text, the difference in the industry from the example above is that the two firms have a certain amount of common ownership. Assume that Firms A and B each has 1,000,000 shares outstanding, and three investors each hold 70,000 shares of A and 70,000 shares of B. Assume that for each firm the remaining shares are held by non-common owners. At this distribution of ownership, the hypothetical blended shareholder of Firm A owns 0.21 shares of Firm B for every share of Firm A they own. We will analyze this situation in accordance with our formulation of the modified Cournot model used in the common ownership literature, whereby a firm's managers, in making their output decision, are assumed to maximize the wealth of this hypothetical blended shareholder. The managers of Firm B are assumed to do the mirror image of this. Note that the managers' decision rule can be restated in terms of net revenue maximization, consistent with the discussion above. In particular, Firm A's managers choose the output of Firm A that maximizes the sum of Firm A's net revenue and 21% of the net revenue of Firm B, taking as fixed the output decision of Firm B.[10] Firm B's managers proceed analogously.

Recall that we label as OFN (other firm negative effect) the negative effect on the value of the blended shareholder's portfolio arising from the extra unit of output's impact on the net revenues of the other firms in the industry whose shares the blender shareholder holds. This means

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[7] By parallel reasoning, if Firm A produces just 20,000 widgets, then Firm B has an incentive to take advantage of the associated higher price by itself producing more than 20,000 widgets, because that output choice, holding fixed Firm A's output choice of 20,000, will allow Firm B to earn higher net revenue than if it produced just 20,000 units.

[8] In game-theoretic terms, it is not a Nash equilibrium for firm managers to split the monopoly outcome.

[9] As shown in Figure 2, for any such output combination, each firm's best response to its rival's output is to produce more than the specified output.

[10] The only way that Firm A's output decision for a given period affects Firms A and B, and hence the value of Firm A shares and Firm B shares, is through its effects on these firms' respective costs and revenues in that period. Dollar for dollar, on a per-share basis, the greater the net revenues, the greater the addition to share value.

the managers of the firm in question will set its level of output such that the gain in its own revenues from producing an extra unit, its MR, equals the marginal cost of producing this extra unit, its MC, plus this other negative effect, OFN. In other words, it will choose the level of output where $MR = MC + OFN$ rather than where $MR = MC$. Thus, this amplified downside will lead the firm to choose a different point in the tradeoff between having an extra unit to sell and that extra unit's depressing effect on price. Since MR decreases with each additional unit of output, the output level at which $MR = MC + OFN$ will be below the output level at which $MR = MC$.[11]

Let $q_A{}'$ and $q_B{}'$ represent production amounts for Firm A and B, respectively. In this market environment, for a given level of Firm B's output, $q_B{}'$, Firm A will choose its output, $q_A{}'$, such that its decision maximizes the sum of its net revenue and 21% of the net revenue of Firm B. Each extra unit by Firm A, because it adds a unit to the total industry output of Q, reduces the price at which Firm B can sell each unit of its output by \$(1/10,000),[12] and thus reduces Firm B's net revenue by $\$(1/10{,}000) * q_B{}'$. Given that Firm A's objective is to maximize the welfare of the blended shareholder, the managers of Firm A only weigh its output decision's impact on the net revenues of Firm B to the extent of .21, or 21%, relative to the decision's impact on the net revenues of Firm A. Accordingly, letting OFN_A reflect Firm A's OFN, then $OFN_A = .21 * (q_B' * 1/10{,}000)$.

Based on our assumptions concerning the industry demand curve for widgets and concerning each firm's costs, given any particular output level of Firm B, that is, $q_B{}'$, it can be shown that the output level of Firm A that meets the modified objective of maximizing the sum of Firm A's net revenues plus 21 percent of Firm B's net revenues can be calculated by setting $q_A{}' = 40{,}000 - .605 * q_B{}'$.[13] In other words, this expression depicts Firm A's best response function, given the modified objective. It can similarly be shown that Firm B's best response function is given by the question: $q_B{}' = 40{,}000 - .605 * q_A{}'$.

The solid line in Figure 3 below depicts Firm A's best response function under the blended-shareholder assumption. For comparison, the dashed line depicts Firm A's best response function under the standard Cournot model, where the managers of Firm A are assumed to maximize Firm A's net revenue alone.

Figure 3 highlights a fundamental implication of the blended-shareholder assumption that drives the theoretical conclusion in the common ownership literature that common ownership reduces managerial incentives to compete: for any non-zero level of Firm B's output, Firm A's optimal decision is to produce less under the blended-shareholder assumption than under the standard Cournot model. For instance, if Firm B produces 40,000, then, as shown in Figure 3, Firm A's optimal decision under the blended-shareholder assumption in the common ownership

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[11] A curve representing $MC + OFN$ for each possible level of output will be higher at all output levels than a curve just representing just MC. Thus, the $MC + OFN$ curve will intersect the firm's downward sloping MR curve at a lower level of output than does the MC curve.

[12] This can be seen from the demand curve, $P = \$10 - Q/10{,}000$. Thus, $dP/dQ = -1/10{,}000$, that is, the price goes down by \$1/10,000 for each additional unit supplied to the market by the industry.

[13] As discussed in the text, to maximize the sum of Firm A's net revenues plus 21% of Firm B's net revenues, Firm A chooses the output level such that $MR_A = MC + OFN_A$, where OFN_A is 21% of the negative effect of an extra unit of Firm A's output on Firm B's net revenues. The first step is to calculate OFN_A. As noted in the text, $OFN_A = .21 * (q_B{}' * 1/10{,}000)$. Earlier, we calculated MR_A, which equals $10 - 2q_A/10{,}000 - q_B/10{,}000$. *See* Appendix *supra* note 1. We have assumed that $MC = \$2$. So, choosing the level of output whereby $MR_A = MC + OFN_A$ means choosing the level at which $10 - 2q_A/10{,}000 - q_B/10{,}000 = 2 + .21 * 1/10{,}000 * q_B{}'$. Solving this equation for $q_A{}'$ shows that $q_A{}' = 40{,}000 - .605q_B{}'$, which is thus Firm A's best response function. By parallel reasoning, $q_B{}' = 40{,}000 - .605q_A{}'$, which is Firm B's best response function.

literature has Firm A producing 15,800 units. By contrast, Firm A would produce 20,000 units if instead Firm A's managers sought, as in the standard Cournot model, to maximize solely Firm A's net revenues.[14]

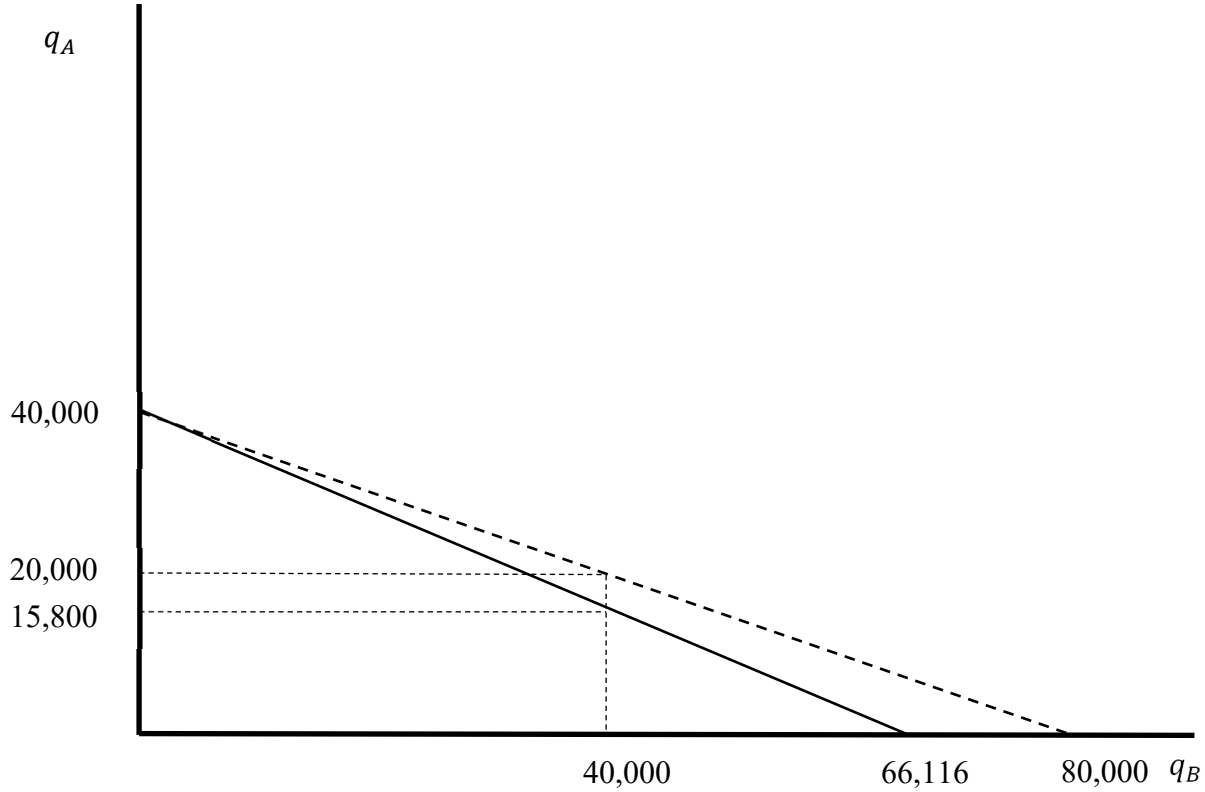

Figure 3: Best Response Function for Firm A Under Both the Blended-Shareholder Assumption and the Standard Cournot Assumption. The figure depicts Firm A's best response function under the blended-shareholder assumption (dark line) and Firm A's best response function under the standard Cournot assumption that firm managers seek to maximize their own firm's net revenues (dashed line). The figure shows that, for any non-zero amount of Firm B's production (q_B), Firm A's optimal decision is to produce less under the blended-shareholder assumption than the Cournot assumption.

As in the standard Cournot model, the equilibrium output quantities for the two firms will be at the intersection of these modified best-response functions. Denote the expected equilibrium output quantities for the two firms as $Q_A{}'$ and $Q_B{}'$, respectively. Given the firms' best response functions, it can be shown that $Q_A{}' = Q_B{}' = 24{,}921$.[15]

[14] Recall that in this modified Cournot model example, where the managers of Firm A seek to maximize the sum of Firm A's net revenues and some portion of Firm B's net revenues, $q_A{}' = 40{,}000 - .605q_B{}'$. *See* Appendix *supra* note 13. So, if $q_B{}' = 40{,}000$, then $q_A{}' = 40{,}000 - .605 * 40{,}000 = 15{,}800$. In contrast, in the standard Cournot model, where Firm A seeks to maximize solely its own net revenues, $q_A{}' = 40{,}000 - q_B{}'/2$. *See* Appendix *supra* note 1. So, if $q_B = 40{,}000$, $q_A = 40{,}000 - 40{,}000/2 = 20{,}000$.

[15] This is derived from the two best response functions, $q_A{}' = 40{,}000 - .605q_B{}'$ and $q_B{}' = 40{,}000 - .605q_A{}'$.

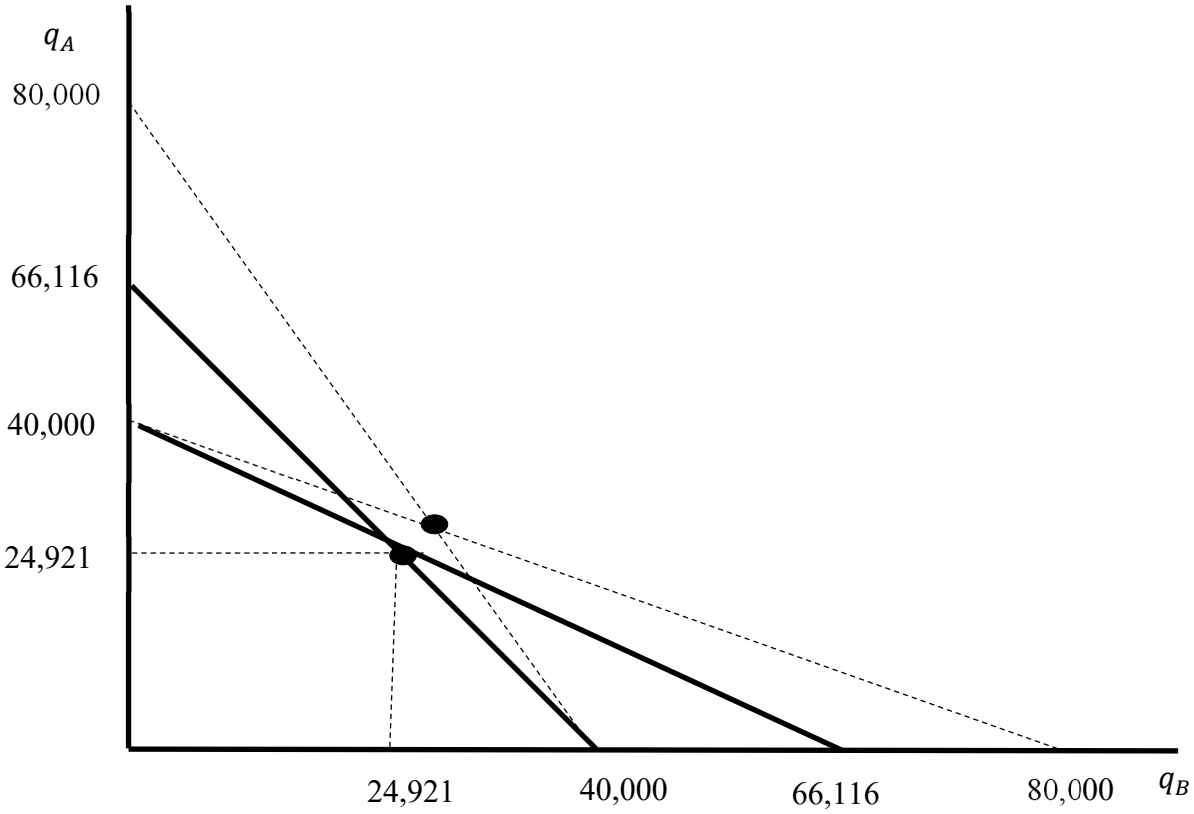

Figure 4: Firms' Best Response Functions and Optimal Output Decisions Under Both the Blended-Shareholder Assumption and the Standard Cournot Assumption. The figure depicts Firm A and Firm B's best response functions under the blended-shareholder assumption (dark lines) and their best response functions under the standard Cournot assumption that firm managers seek to maximize their own firm's net revenues (dashed lines). The two firms' equilibrium output levels under either assumption lie at the intersection of their best response functions associated with the imposed assumption.

Figure 4 above provides the analysis graphically. The figure depicts the two firms' best response functions under the blended-shareholder assumption (the dark lines) and the standard Cournot assumption that firm managers seek to maximize own-firm net revenues (the dashed lines). The equilibrium under the blended-shareholder assumption and the equilibrium under the standard Cournot assumption occur at the intersection of the respective best response functions. As shown in Figure 4, both firms produce less under the blended-shareholder assumption than under the standard Cournot assumption.

Accordingly, $Q_A{}'$ is the value of $q_A{}'$ that satisfies: $q_A{}' = 40{,}000 - .605 * (40{,}000 - .605q_A')$. Rearranging, $q_A{}' = 15{,}800 + .366q_A{}'$. So, $.634q_A{}' = 15{,}800$, and therefore $Q_A{}' = 15{,}800/.634 = 24{,}921$. $Q_B{}'$ can be shown by parallel calculations to also equal 24,921.