Journal of Corporate Finance 100 (2026) 103037

Contents lists available at ScienceDirect

Journal of Corporate Finance

journal homepage: www.elsevier.com/locate/jcorpfin

Does common ownership raise antitrust concerns?☆

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ARTICLE INFO

Editor: S Kedia

JEL classification:
G23
G34
K21

Keywords:
Corporate governance
Common ownership
Antitrust
Institutional investors

ABSTRACT

Common ownership has raised growing antitrust concerns. We compile a comprehensive dataset of U.S. antitrust litigation cases from the Federal Trade Commission, the Department of Justice, and consumer-initiated lawsuits to shed light on these concerns. We find no robust relationship between common ownership of firm-pairs and the likelihood of these firms being jointly sued. Furthermore, common ownership is negatively associated with potential channels of collusion, such as interlocking directors and competitor-benchmarked executive pay. Evidence from institutional mergers and S&P 500 additions of rival firms supports our main conclusions. Overall, our results offer little support for the view that common ownership promotes explicit collusion.

> The agencies evaluate new learning from the academic community and are prepared to take action on common ownership when appropriate. Where sufficient evidence exists that the effect of particular acquisitions may substantially lessen competition, the agencies will consider appropriate responses, including possible enforcement actions.
>
> *Note by the United States, OECD Hearing on Common Ownership*
>
> (Commission and Department of Justice, 2017)

1. Introduction

Asset holdings managed by large institutional investors have surged dramatically in recent decades. As a result, major pension funds, mutual funds, and family trusts now frequently hold substantial equity stakes in multiple publicly traded companies, including direct competitors. This widespread pattern of common ownership has raised concerns that overlapping shareholders may weaken firms' incentives to compete aggressively, with potentially important product market consequences (see, e.g., Antón et al., 2023; Rotemberg, 1984; Hansen and Lott, 1996; Azar, 2020; Backus et al., 2019; López and Vives, 2019; Azar and Vives, 2021; He and Huang, 2017; Azar and Schmalz, 2017; Azar et al., 2022).

A central concern is that common ownership may encourage firms to engage in explicit forms of anti-competitive conduct, such as restricting output, coordinating prices, or discontinuing overlapping product lines. To the extent that common ownership facilitates such behavior, it may raise potential antitrust issues. These effects have garnered significant attention from legal and economic

☆ Simi Kedia was the editor for the article. We are grateful to the editor and one anonymous referee for their very helpful comments. We thank Martin Schmalz, Gordon Phillips, Jie (Jack) He, Pedro Matos, Ekaterina Volkova (discussant), Alminas Zaldokas (discussant), Omar Patricio Vasquez Duque (discussant) and participants at CELS 2022, FMCG 2022, FIRN 2022 for helpful comments. Huaizhou and Jason gratefully acknowledge the financial support of The Centre for Law, Markets and Regulation, UNSW. We thank Harry Li for his excellent research assistance. All errors are the authors' own.

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https://doi.org/10.1016/j.jcorpfin.2026.103037
Received 3 July 2025; Received in revised form 10 June 2026; Accepted 13 June 2026

Available online 19 June 2026

scholars, many of whom argue for a reassessment of the current antitrust enforcement framework and the potential need for new regulations specifically targeting common ownership (e.g., Elhauge, 2016, 2020; Scott Morton and Hovenkamp, 2018; Hemphill and Kahan, 2020; Posner et al., 2017; Posner, 2021). Proposals have included stricter enforcement of the Clayton Act (§7), challenging stock acquisitions that lead to significant common ownership among horizontal competitors, and capping institutional holdings in an industry to no more than 1% of its total size.

In contrast, other researchers find little or no evidence of anti-competitive effects and argue that common ownership does not pose a significant problem (e.g., Koch et al., 2021; Lewellen and Lowry, 2021; Dallas, 2018; Ginsburg, 2018). Moreover, regulations seeking to curb common ownership could have adverse consequences, particularly for the investment sector, by undermining diversification, risk-sharing, and hedging strategies critical to the welfare of investors.[1] In addition, Bebchuk and Hirst (2019), Bebchuk et al. (2017) and Bebchuk and Hirst (2018) argue that institutional investors are themselves subject to significant agency problems, limiting their incentives to actively influence or coordinate the competitive behavior of portfolio firms. From this perspective, regulations targeting common ownership would likely be both unnecessary and counterproductive, particularly given the limited enforcement resources available to antitrust authorities.

The ongoing debate over common ownership reflects a significant gap in the empirical literature. Existing studies have approached the issue indirectly, examining outcome variables such as pricing strategies, profit margins, investment patterns, and merger activities. Yet the overall evidence remains inconclusive (for detailed reviews, see Gerardi et al. (2024) and Schmalz (2021)). While common ownership may influence competition through indirect channels, little is known about whether these concerns translate into anti-competitive conduct serious enough to attract regulatory scrutiny or legal challenge. This paper seeks to contribute to this debate by exploring whether common ownership is associated with antitrust court proceedings and enforcement actions.

Directly observing anti-competitive behavior is inherently difficult. We therefore use antitrust litigation initiated by regulators or consumers as a proxy for explicit violations. This approach has limitations. In particular, sophisticated managers may engage in tacit or "behind-the-scenes" collusion that leaves no regulatory trace. However, this setting allows us to identify large, potentially detectable antitrust actions and examine their relationship with common ownership.

We assemble, to our knowledge, the most comprehensive antitrust litigation dataset to date. Using this data, we find no systematic evidence that common ownership increases a firm's risk of antitrust litigation. Across the range of common ownership measures we construct, most are unrelated to either government- or consumer-initiated antitrust cases. Any positive correlations we observe in consumer-initiated cases do not survive our causal identification tests.

To construct the dataset behind our empirical approach, we aggregate two litigation datasets and match all defendants to U.S. publicly traded firms. The first dataset comprises antitrust cases initiated by the Federal Trade Commission (FTC) and the Department of Justice (DOJ). The second consists of consumer-initiated cases sourced from LexisNexis and PACER; for these, we retain cases in which courts granted plaintiffs' motions, indicating judicial support for at least some claims of consumer harm.[2]

These court cases capture explicit and severe alleged anti-competitive behavior. In particular, government antitrust actions are pursued when agencies develop evidence of practices that may harm competition or consumer welfare.[3] Similarly, private plaintiffs usually advance only when they can present claims and evidence that the defendant's conduct harmed competition or consumer welfare.[4] Consequently, our final sample is tilted toward cases in which regulators or courts viewed the alleged conduct as sufficiently serious to warrant enforcement action or a favorable ruling on plaintiffs' motions.

To better understand our dataset, consider a 2019 FTC lawsuit filed against US Foods Holding Corporation, challenging its proposed $1.8 billion acquisition of the Services Group of America's food group companies. The allegation was that the acquisition could diminish competition in the broad-line food service distribution sector in various U.S. regions, potentially leading to higher prices and lower service quality. The FTC argued that the proposed merger represented an unfair method of competition, breaching Section 5 of the FTC Act, and could likely reduce competition, a violation of Section 7 of the Clayton Act. This case targeted a horizontal merger that may infringe on antitrust laws. Our sample also includes other types of litigation, such as price-fixing and exclusive dealing, as presented in Fig. 1. We offer further examples in Appendix A.

A distinctive feature of our data is the capacity to identify pairs of firms named in the *same* litigation, which can reflect alleged coordination or a common challenged transaction,[5] and to concurrently assess the level of common ownership between them. To analyze the relationship between common ownership and antitrust litigation, we construct firm-rival pairs using the Hoberg and Phillips (2016) TNIC3 peer classification within the S&P 1500 universe.[6]

We test our hypothesis using established common ownership measures from the literature (He and Huang, 2017; He et al., 2024; Newham et al., 2025; Anton and Polk, 2014; Harford et al., 2011). We find no significant relationship between common ownership and the probability that firm pairs are involved in government-initiated litigation. Although we observe some positive correlations in

[1] See BlackRock's discussion on the potential harm of regulating common ownership and index investing: https://www.blackrock.com/corporate/literature/whitepaper/viewpoint-index-investing-and-common-ownership-theories-eng-march.pdf.

[2] Our initial sample included cases brought by rival firms, but as these constitute less than 5% of the sample, we retain only consumer-initiated cases.

[3] For example, see the FTC's discussion at https://www.ftc.gov/news-events/news/press-releases/2023/09/ftc-sues-amazon-illegally-maintaining-monopoly-power.

[4] See, for example, https://www.arnoldporter.com/en/perspectives/advisories/2024/02/developments-in-us-antitrust-litigation-2023.

[5] For example, in merger cases, the pair typically comprises the acquirer and target firms.

[6] We focus on this sample because common ownership is more prevalent among these large firms, which also exert significant economic influence in product markets. Moreover, collusion cases are more likely to occur among competitors.

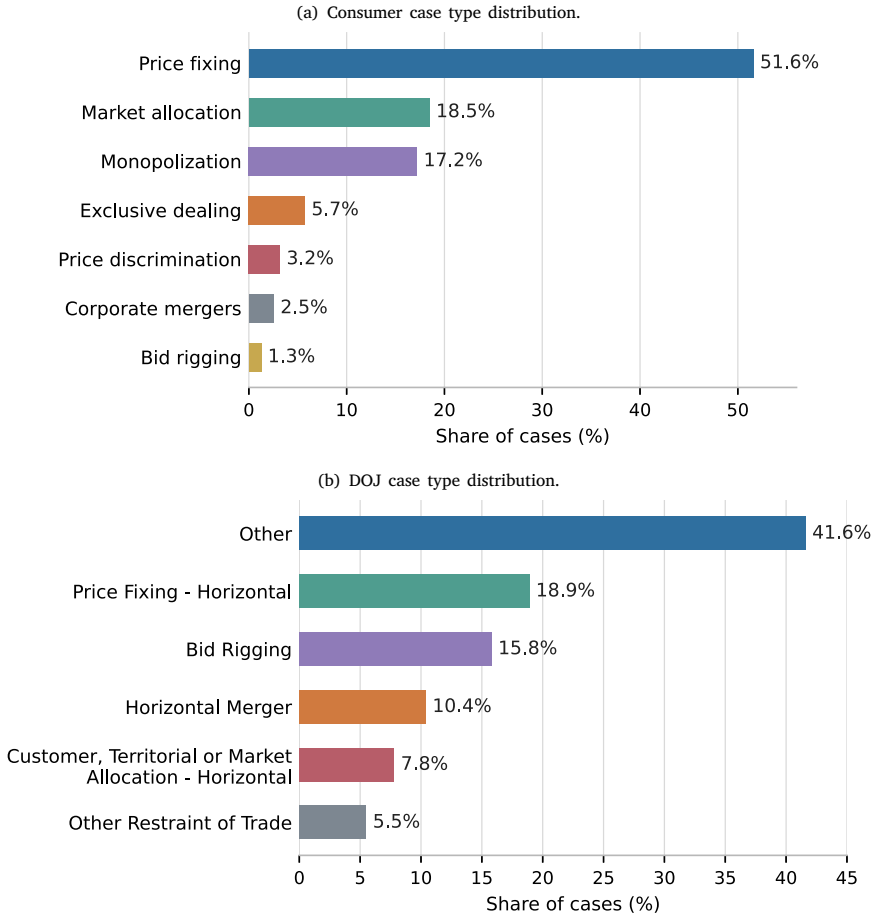

Fig. 1. Case-type distributions. Panel (a) reports consumer-initiated cases. Panel (b) reports DOJ cases, with multiple DOJ categories grouped under "Other".

successful consumer-initiated cases,[7] these patterns do not persist in our quasi-experimental analyses. To obtain causal evidence, we follow (He and Huang, 2017) (as refined by Lewellen and Lowry (2021)) and exploit major financial institution mergers as shocks to common ownership in a difference-in-differences framework. Using this identification strategy, we find no significant evidence that common ownership affects antitrust litigation in either government- or consumer-initiated cases.[8]

Importantly, the absence of observed antitrust litigation does not necessarily imply the absence of anti-competitive effects. If common ownership influences firm behavior, it may do so through subtle or difficult-to-detect forms of coordination that are less likely to trigger regulatory scrutiny or legal action. At the same time, more explicit forms of coordination, such as interlocking directorships or overt pricing agreements, are more visible and therefore more likely to attract enforcement attention. Consequently, litigation outcomes may provide only a partial view of the broader relationship between common ownership and competition. This limitation motivates our examination of observable coordination channels alongside litigation-based measures.

We study two observable practices often linked to coordination concerns: interlocking directorships and the selection of compensation peers from rival firms. Both practices can create channels through which firms become more aware of competitors' strategies and incentives, but they are also highly visible and subject to regulatory scrutiny. Interestingly, we find that common ownership is negatively associated with both forms of behavior. We do not interpret this evidence as implying that common ownership reduces coordination. Rather, our results are more consistent with firms avoiding coordination mechanisms that are explicit, observable, and therefore more likely to attract legal or regulatory attention.

To complement our firm-pair analysis, we next adopt a firm-level approach similar to Antón et al. (2023). We begin with two simple measures based on the number of common blockholders, which provide a transparent benchmark. We then incorporate more

[7] For example, one specification shows a small positive association between the number of common blockholders and the likelihood of consumer-initiated litigation.

[8] Results remain virtually identical when including all consumer-initiated cases, regardless of the outcome.

refined measures from the literature, including the "profit weights" metric (Boller and Morton, 2020; Antón et al., 2023; Backus et al., 2021), which captures the value an investor in a focal firm places on a rival's profits relative to its own,[9] as well as the ownership cosine similarity measure. Implementing these firm-level tests using the same TNIC3 industry classification as in the firm-pair analysis, we find that none of the measures is meaningfully related to the likelihood that a firm faces antitrust litigation.

To draw causal inferences at the firm level, we use the addition of industry competitors to the S&P 500 index as an exogenous shock to common ownership, following Boller and Morton (2020) and Antón et al. (2023). A key advantage of this approach is that the treatment of a focal firm i is determined by the entry of a rival firm j into the index, rather than by firm i's own inclusion, thereby mitigating endogeneity concerns. Consistent with the rest of our evidence, we find no significant effect of a rival's index inclusion on the focal firm's antitrust litigation risk. Taken together, the firm-pair, institution-merger, mechanism, firm-level, and S&P 500 tests yield a consistent message: the data do not support a robust link between common ownership and observed antitrust litigation.

Although our findings do not indicate a systematic relationship between common ownership and litigation outcomes, they do not rule out the possibility that common ownership influences firms' competitive behavior through less observable channels. Given the high costs and limited frequency of antitrust litigation, such outcomes are likely an incomplete proxy for underlying competitive conduct. Taken together with our evidence on interlocking directorships and compensation benchmarking, the results suggest that common ownership may shift coordination away from more explicit and observable forms of interaction. Overall, our findings highlight that the relationship between common ownership, governance, and competitive behavior is nuanced and may not be fully captured by litigation outcomes alone.

To the best of our knowledge, this is the first study to directly assess the relationship between common ownership and the likelihood of firms facing antitrust litigation. While prior literature has examined how common ownership relates to prices, margins, and various forms of coordination, these outcomes do not necessarily correspond to illegal anti-competitive behavior. As emphasized by Antón et al. (2023), higher prices may reflect a range of mechanisms, including changes in monitoring or internal inefficiencies, rather than explicit collusion. Our results therefore underscore the importance of treating the link between common ownership and antitrust concerns as an empirical question, and of carefully interpreting the absence of litigation effects in light of the broader institutional and governance context.

Our analysis of available litigation data reveals no convincing evidence linking common ownership to significant antitrust activity. This finding casts doubt on the view that common ownership systematically promotes explicit antitrust violations observable through litigation. Our results carry policy implications for recent calls to regulate common ownership on antitrust grounds: such actions should be evaluated against the limited litigation-based evidence currently available and the potential costs of restricting diversification and index investing. Our findings do not provide litigation-based support for antitrust concerns surrounding common ownership.

The remainder of the paper proceeds as follows: Section 2 reviews the theoretical and empirical literature underlying the tests of the anti-competitive effects of common ownership. Section 3 discusses our data sources and dataset construction process. Section 4 describes the empirical specifications and discusses our baseline regressions, causal inference tests, and findings. Section 5 concludes. Appendix A provides additional case examples and variable definitions. Appendix B provides supplementary information and tables.

2. Literature review

The common ownership hypothesis is based on the concern that when competitors in the same industry are jointly held by a small set of investors, managers of these firms may have incentives to lessen their level of competition by producing fewer units, fixing prices, reducing capital expenditure investments, innovating less or limiting their own entry into new markets. Given these concerns, the relationship between common ownership and antitrust-related outcomes has received extensive investigation, both from a theoretical and empirical perspective.

2.1. Theoretical literature

Common ownership and antitrust concerns have a rich theoretical history. As early as Hart (1979), scholars noted that under imperfect competition, investors holding shares in multiple firms within an industry might disagree on a firm's objective. This theoretical framework was further articulated by Rotemberg (1984). Specifically, Hansen and Lott (1996) formalized the argument that diversified shareholders have an incentive to induce firms to internalize externalities imposed on other firms within their portfolio.

Building on this logic, Azar (2011) developed a model of oligopoly with shareholder voting, implying that common ownership motivated by portfolio diversification effectively generates tacit collusion among shareholders. Similarly, Backus et al. (2019) focus on the canonical case of differentiated Bertrand competition with single-product firms; their results indicate that consumers face higher prices in the presence of common owners.

In contrast, there is literature on the "bright side" of common ownership. For example, López and Vives (2019) shows that common ownership can improve overall welfare and consumer surplus via R&D spillovers facilitated by common owners, which can generate substantial innovation.

[9] A profit weight of $\kappa_{ij} = 1$ between firms i and j implies that an investor in firm i values a one-dollar profit increase in firm j the same as in firm i.

More recently, Antón et al. (2023) suggested that common ownership can reduce competitive incentives of managers, particularly in the context of multi-product firms. They attribute this to the effect of common ownership on shareholder monitoring: intense monitoring of one firm that produces better performance can adversely affect rival firms within the same investment portfolio. To avoid cannibalizing returns, common owners may reduce their monitoring efforts, leading to managerial slack and a subsequent decrease in competition. Notably, this lessened competition does not necessitate coordination or communication between firms and is thus referred to as the "unilateral effect" of common ownership. However, alternative theories also highlight that cross-ownership may instead strengthen incentives to internalize governance externalities across firms (Acharya and Volpin, 2010). From this perspective, common ownership may improve coordination of shareholder oversight rather than weaken it, implying that its net effect on managerial effort and competitive behavior is theoretically ambiguous.

2.2. Empirical literature

Based on these theoretical foundations, significant effort has been dedicated to empirically testing whether common ownership leads to antitrust issues. The results to date remain largely inconclusive. Ideally, empiricists would like to have direct observations of anti-competitive behavior and then be able to link this to common ownership measures. However, such direct observations of anti-competitive behavior are difficult, if not impossible, to document. As alternatives, empiricists have turned to indirect measures of anti-competitive behavior. Influential studies by Azar et al. (2018, 2022) document a positive relationship between common ownership and prices in the airline and banking industries, respectively, suggesting price-fixing behavior by common owners. These papers attracted several responses such as Kennedy et al. (2017) and Dennis et al. (2022), which claim that no evidence of anti-competitive effects from common ownership can be found using alternative approaches. O'Brien and Waehrer (2017) points out that regressions of product market prices on common ownership measures could uncover a spurious relationship, even if common ownership has no actual causal effect on price. In addition, this early evidence is industry-specific (e.g., banking and airline industries), limiting the generalizability of these findings to other product markets.

To further investigate the potential anti-competitive effects of common ownership, the literature has developed other indirect measures of anti-competitive behavior that enable researchers to examine a large number of sectors of the economy. For example, Backus et al. (2021) measures common ownership for the universe of S&P 500 firms between 1980 and 2017 and shows that the incentives to collude implied by the common ownership hypothesis have grown dramatically during this period. He and Huang (2017) find evidence suggesting that common ownership facilitates explicit forms of product market collaboration such as within-industry joint ventures, strategic alliances, or within-industry acquisitions. Pawliczek et al. (2022) find that common ownership is positively associated with voluntary disclosures, and such increased disclosure aids in coordinating anti-competitive actions such as tacit collusion. However, none of the above pieces of empirical evidence can be treated as direct evidence of collusion. In fact, within-industry joint ventures and acquisitions and greater voluntary disclosures are not necessarily evidence of anti-competitive behavior. Also, other recent evidence provides grounds for skepticism. Koch et al. (2021) suggests that common ownership is neither robustly positively related to industry profitability or to output prices, nor is it robustly negatively related to measures of non-price competition. Lewellen and Lowry (2021) find that the anti-competitive effects, which the literature has attributed to common ownership, may well be caused by other factors.

Besides exploring the product market outcome effects of common ownership, another major stream of literature focuses on alternative channels through which common ownership might lead to anti-competitive behaviors. Several mechanisms have been proposed. Gilje et al. (2020) derive a measure that captures the extent to which common ownership shifts managers' incentives to internalize externalities. Antón et al. (2023) point out that managerial wealth is less sensitive to performance when a firm's largest shareholders own large stakes in rival firms because owners in industries with higher common ownership concentration have incentives to weaken managerial incentives to compete, as discussed earlier. Other potential collusive mechanisms include direct communication between investors and managers (Aryal et al., 2022), communication between rival officers or rival directors and other corporate governance actions. Also, consistent with the possibility of enhanced monitoring, He et al. (2019) provide empirical evidence that common and cross-ownership can incentivize institutional investors to play a more active monitoring role. This evidence highlights that the governance effects of common ownership are not unidirectional and may operate through multiple, potentially offsetting channels.

In summary, the current empirical literature does not provide direct evidence linking common ownership to explicit antitrust behaviors, and even the available indirect evidence remains inconclusive. Consequently, there is a pressing need in the literature to test more direct measures of anti-competitive behavior to better inform and advance the literature on this subject.

3. Data

To examine how common ownership is related to the probability that firms face antitrust litigation, we gather data on firm ownership, firm-specific information, and antitrust legal cases, which we describe in turn.

3.1. Ownership and stock information data

Our primary source of data on shareholdings of large investors comes from the FactSet (formerly Lionshare) ownership database, which contains the 13(f) filings required by the U.S. Securities and Exchange Commission (SEC) for all investment managers with over $100 million in holdings among a list of 13(f) securities. The filings collected by FactSet are quarterly, and cover the period 1999–2020. Most of the previous literature on institutional ownership relies on Thomson Reuters' 13F (S34) dataset, which unfortunately suffers from stale and omitted 13F reports, as well as excluded securities.[10] According to WRDS recommendations, researchers can use the FactSet 13F data or directly scrape SEC Edgar data as alternatives. In addition to data quality concerns, another challenge with current ownership data is the need to map holdings reported by subsidiaries back to the ultimate parent firm. A commonly accepted practice is to combine BlackRock's various subsidiaries to the parent level (initially raised by Ben-David et al. (2021), followed by Lewellen and Lowry (2021) and Anton et al. (2025), Antón et al. (2023), among others). Since BlackRock is not the only parent institution with multiple sub-filers, it would be ideal to apply similar aggregation to other parent institutions. Using the sub-filer-to-filer and filer-to-rollup institution mappings provided by FactSet, we can aggregate ownership reported by subsidiaries to the parent level. To support the quality of the ownership data we constructed from FactSet, we compare it with two other 13F datasets: Thomson Reuters' S34 (TR) and web-scraped data from Backus et al. (2021). We find that our ownership data accurately reflects 13F reports (without the data quality issues present in TR) while offering a higher level of aggregation for parent institutions with multiple subsidiaries than the purely web-scraped data. In Appendix B.1, we compare the data quality across the TR, web-scraped, and FactSet datasets, showing that FactSet data are of the highest quality.[11]

In addition to institutional ownership reported in Form 13F, there are two other major types of holdings: block ownership reported in Forms 13G/D and insider ownership reported in Forms 3, 4, and 5. As suggested in recent research such as Schwartz-Ziv and Volkova (2025), Antón et al. (2023), and Amel-Zadeh et al. (2022), it is important to incorporate both institutional (13F) and non-institutional large owners (reported in other SEC forms), as non-institutional shareholdings may be correlated with institutional ownership and the outcomes of interest. Therefore, we also extract holdings from the FactSet stakeholder dataset related to non-institutional ownership extracted from SEC Forms 13D/G and Forms 3, 4, and 5.[12] We then use the Committee on Uniform Security Identification Procedures (CUSIP) number for each security held to link these data with other databases.

Following He and Huang (2017), we construct common ownership measures, which are limited to block holdings of 5% or more in both firms, as minority stakes are unlikely to influence managerial decisions. Given this threshold, relying exclusively on 13G/D filings might seem sufficient. However, historically, 13G/D amendments were only filed annually.[13] To capture more granular variations, we supplement these with 13F and other filings, allowing us to update holdings quarterly and align them with accounting data reporting dates.

Finally, we obtain firm-specific accounting and stock market data from the Center for Research in Securities Prices (CRSP) and the CRSP-Compustat Merged (CCM) database.

3.2. Legal cases data

3.2.1. Government-initiated litigation

We obtained antitrust merger cases initiated by the Federal Trade Commission[14] (FTC) and extracted information about the identity of the defendants, which we then matched with publicly traded companies. This process resulted in a dataset of 276 merger cases involving public firms from 1996 to 2020. Similarly, we collected antitrust cases from the Department of Justice's Antitrust Division[15] (DOJ), covering the period from 1899 to 2020, although cases prior to 1970 are relatively rare. After matching the defendants in these cases to public companies, we identified 721 antitrust cases from the DOJ.

We expect cases brought by the FTC and DOJ to be informative about potential anti-competitive behavior, as these agencies focus their efforts on firms and industries where they perceive significant risks to competition or consumer welfare. Their targeting process is based on detailed economic analysis and investigative work aimed at identifying mergers or business practices that could lead to monopolistic control or unfair market dominance. By focusing on factors such as market concentration, the potential for price-fixing, and barriers to entry, the FTC and DOJ select cases based on substantial concerns about potential harm to competition. Consequently, the cases in our dataset represent instances where regulators viewed significant anti-competitive activity as plausible, lending credibility to the empirical analysis of firm behavior and regulatory responses.

[10] See https://wrds-www.wharton.upenn.edu/documents/952/S12_and_S34_Regenerated_Data_2010-2016.pdf

[11] Appendix B.1 summarizes the extraction and aggregation procedure used for the FactSet ownership data.

[12] Specifically, Form 13D must be filed by any person or group acquiring beneficial ownership of more than 5% of a company's outstanding common stock. Form 13G must be filed by certain institutional investors, such as passive investors like mutual funds and pension funds, who acquire more than 5% of a company's outstanding shares. Form 3 is the initial statement of beneficial ownership, filed by individuals who become insiders of a company. Form 4 is filed by insiders to report changes in their ownership or transactions involving the company's securities. Form 5 is an annual statement of beneficial ownership, used by insiders to report any transactions that should have been reported on Form 4 but were not.

[13] This requirement changed to quarterly reporting in 2024.

[14] https://www.ftc.gov/legal-library/browse/cases-proceedings.

[15] https://www.justice.gov/atr/antitrust-case-filings-alpha.

3.2.2. Consumer-initiated litigation

We collect data on consumer-initiated antitrust lawsuits from various sources, beginning with the court opinion repository from the U.S. Government Publishing Office (USGPO), which includes a comprehensive list of litigation proceedings by participating district courts in collaboration with the USGPO from 2004 to 2020. Detailed case data are primarily sourced from LexisNexis and PACER (Public Access to Court Electronic Records), with some additional data taken from RECAP.[16] From these sources, we extracted case complaints and court opinions categorized as "Antitrust". Our selection criteria require a clear filing date, identifiable plaintiffs and defendants, and a court opinion on motions brought by the plaintiff. We focus on cases in which the court granted at least one plaintiff motion. We focus exclusively on cases involving unfair competition practices, as defined by the Clayton and Sherman Acts, typically centered on allegations of unfair price-setting practices that impede competition. These "motion granted" cases account for 57% of all cases collected and indicate judicial agreement with at least some aspects of the plaintiff's claims.

Favorable rulings for plaintiffs in these cases are informative about alleged anti-competitive behavior because the court must find the plaintiff's motion legally and factually sufficient at the relevant stage of the case. Such rulings do not necessarily establish final liability in every case, but they indicate that the claims survived judicial scrutiny and are therefore more probative than filings alone. As a result, these consumer cases provide a useful, though still imperfect, measure of potentially harmful anti-competitive conduct.

We also employed research assistants to manually review the antitrust cases. Their task was to classify the types of plaintiffs, including corporations, individuals, and other entities. Crucially, we specifically excluded instances initiated by government entities such as the FTC and DOJ to ensure the cases considered were consumer-initiated,[17] avoiding any duplication of government-initiated cases. Defendants are matched to public companies by manually aligning their names with firms in the CRSP Header file. Through this process, we collected data on 3116 unique lawsuits and 1656 unique defendant firms over the 2004–2020 period.

3.3. Data limitations

Although we have made every effort to compile a comprehensive dataset, we acknowledge certain limitations. First, our sample of antitrust lawsuits may not capture all anti-competitive activities during the sample period. The FTC and DOJ use their own filtering processes to target specific antitrust cases, which only enter our dataset after this selection. High litigation costs may also deter consumers from initiating lawsuits against certain anti-competitive practices, leading to further omissions. Nevertheless, we believe the litigated cases typically represent the more egregious examples of anti-competitive behavior, providing meaningful insight into their economic effects and significance.

Second, our data may reflect a degree of selection bias, as plaintiffs often prefer to take legal action against larger firms with greater financial resources. Because these larger companies also tend to exhibit higher levels of common ownership, this pattern could bias our findings. We attempt to mitigate this by accounting for various size-related and financial variables. We limit comparisons to differences within larger firms to reduce this bias. Despite these efforts, we recognize that completely eliminating this bias is not possible.

Overall, we acknowledge that our null results regarding common ownership and litigation do not prove the absence of all anti-competitive behaviors.

4. Results

4.1. Descriptive statistics for antitrust litigation

We begin our empirical analysis by providing an overview of our sample of antitrust lawsuits. Fig. 2a illustrates the annual distribution of antitrust cases initiated by consumers, while Fig. 2(b) shows the annual count of public firms involved in these consumer cases. Notably, there was a significant increase in antitrust cases during the 2006–2007 period, which aligns with the annual reports of the Department of Justice.[18] Fig. 3a displays the cases initiated by the FTC/DOJ; the number of such cases is substantially lower than those brought by consumers. FTC/DOJ cases typically include 20–40 cases per year involving public firms, with roughly 40 to 70 defendants from public firms, as shown in Fig. 3(b).

We next categorize the types of antitrust cases and present their distribution in Fig. 1. In Fig. 1(a), focusing on consumer-initiated cases, we observe that the majority (52%) of these cases fall into the category of "Price Fixing", with "Market Allocation" being the second most prevalent type. For cases initiated by the Federal Trade Commission (FTC), all are classified as "Horizontal Merger" cases that were blocked by the FTC. Regarding the Department of Justice (DOJ) cases, depicted in Fig. 1(b), we employ the DOJ classification. The aggregated "Other" category is the largest group; among the named DOJ categories, "Price Fixing – Horizontal" is the most prevalent, followed by "Bid Rigging" and "Horizontal Merger".[19]

To better understand the distribution of antitrust lawsuits across industries, we provide detailed descriptions of the cases and firms involved in antitrust litigation, categorized by the Fama–French 12 industry sectors, as shown in Table 1. Panel A presents

[16] https://free.law/recap. The Free Law RECAP project is an initiative aimed at improving public access to U.S. court records.

[17] We also find a few cases where the plaintiffs are rival firms (less than 5%); given their small number and special character, we exclude them from our analysis.

[18] For more information, see https://www.justice.gov/archive/opa/pr/2006/December/06_at_856.html

[19] Several DOJ categories are aggregated under "Other" to keep the figure readable.

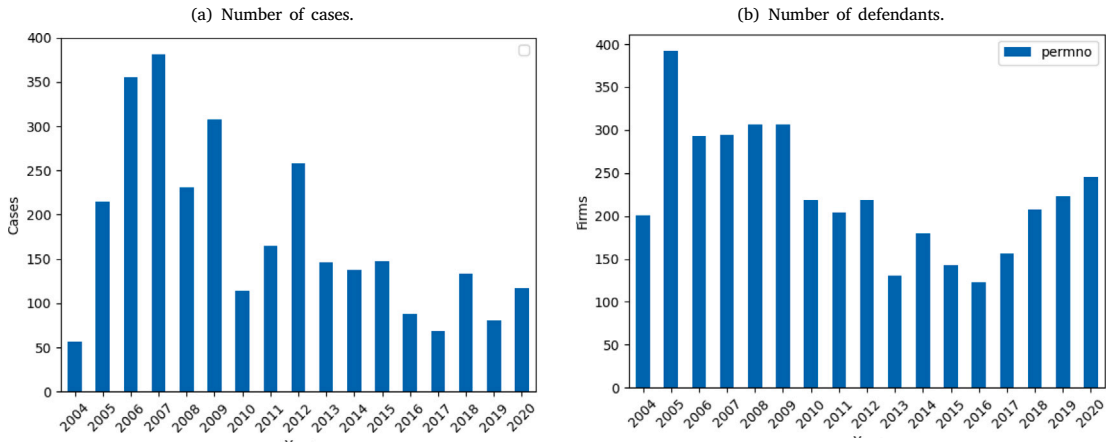

Fig. 2. Consumer cases.

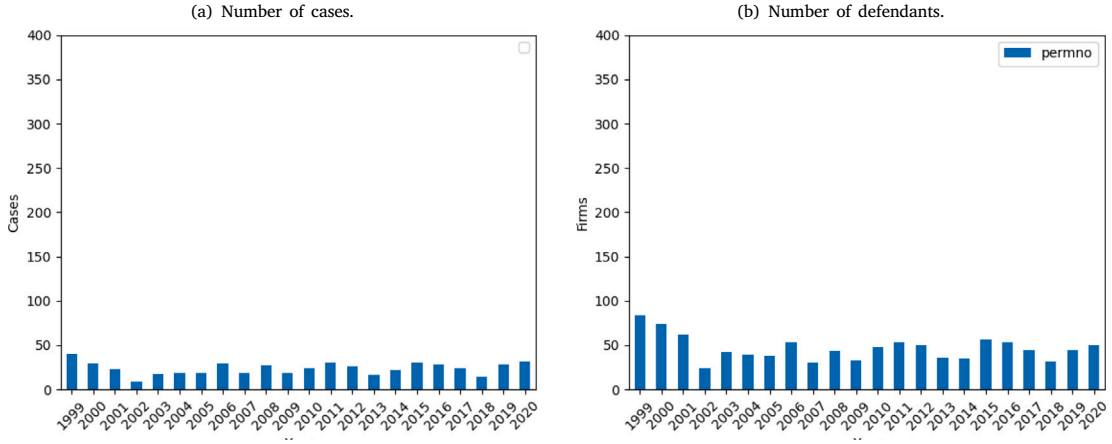

Fig. 3. FTC and DOJ cases.

the distribution of consumer-initiated cases, while Panel B focuses on cases initiated by the FTC/DOJ. Previous studies examining the connection between common ownership and antitrust outcomes have often centered on heavily regulated industries like airlines and banking. However, antitrust issues span the entire economy.

Both panels suggest that antitrust litigation is pervasive across all twelve Fama–French industries. In consumer-initiated cases, the finance and business equipment sectors record the highest number of firms and cases involved in antitrust litigation, which aligns with expectations given the large number of customer-facing firms. In contrast, the oil, gas, and utility sectors exhibit the least involvement. Interestingly, Panel B reveals that the FTC/DOJ most frequently targets firms in the healthcare industry, while the consumer durables sector attracts the fewest lawsuits from these agencies. This suggests that government institutions exhibit distinct enforcement patterns compared to consumers when addressing antitrust violations.

4.2. Summary statistics

Table 2 presents summary statistics for the key variables in our study. Panel A focuses on firm-pair-level variables, while Panel B provides firm-level variables. In Panel A, the indicator variable reflects the involvement of firms in FTC/DOJ and consumer cases. This variable is set to one if *both* firms i and j in a pair are involved in the *same* case litigated in a given year and zero otherwise. The raw unconditional probability of a firm-pair being involved in the same FTC/DOJ case is approximately 1.95×10^{-4} (i.e., 1.95 basis points), while for successful consumer-initiated cases, it is around 1.98×10^{-3} (i.e., 19.8 basis points). For consistency with the regression tables – where the dependent variable is expressed in basis points – we scale these indicators by 10^4. As shown in Panel B, the unconditional probability of a firm being involved in a legal case is 1% for FTC/DOJ cases and 3% for consumer-initiated cases. Therefore, simultaneous litigation of a firm-pair is a relatively rare event, attributable to the stringent evidentiary standards

Table 1
Industry distribution for antitrust litigation.

Panel A: Litigation by customers							
Fama French 12 For industry i	Firms involved A_i	Firms by industry (%) $A_i/\sum(A_i)$	Number of cases B_i	Cases by industry (%) $B_i/\sum(B_i)$	Total firms C_i	Firms involved probability (%) A_i/C_i	Cases per firm B_i/C_i
Consumer nondurables	45	5.49%	201	5.13%	1401	3.21%	0.14
Consumer durables	30	3.66%	149	3.8%	572	5.24%	0.26
Manufacturing	65	7.94%	457	11.66%	2429	2.68%	0.19
Oil, gas, and coal extraction and products	32	3.91%	53	1.35%	1293	2.47%	0.04
Chemicals and allied products	28	3.42%	96	2.45%	491	5.7%	0.20
Business equipment	105	12.82%	941	24.02%	4581	2.29%	0.21
Telephone and television transmission	45	5.49%	95	2.42%	854	5.27%	0.11
Utilities	30	3.66%	25	0.64%	399	7.52%	0.06
Wholesale, retail, and some services	73	8.91%	211	5.39%	2541	2.87%	0.08
Healthcare, medical equipment, and drugs	83	10.13%	460	11.74%	2973	2.79%	0.15
Finance	190	23.2%	717	18.3%	5719	3.32%	0.13
Other	93	11.36%	513	13.09%	3500	2.66%	0.15
Panel B: Litigation by FTC & DOJ							
Fama French 12 For industry i	Firms involved A_i	Firms by industry (%) $A_i/\sum(A_i)$	Number of cases B_i	Cases by industry (%) $B_i/\sum(B_i)$	Total firms C_i	Firms involved probability (%) A_i/C_i	Cases per firm B_i/C_i
Consumer nondurables	24	6.37%	28	5.94%	1401	1.71%	0.02
Consumer durables	2	0.53%	2	0.42%	572	0.35%	0.0
Manufacturing	52	13.79%	61	12.95%	2429	2.14%	0.03
Oil, gas, and coal extraction and products	25	6.63%	30	6.37%	1293	1.93%	0.02
Chemicals and allied products	27	7.16%	33	7.01%	491	5.5%	0.07
Business equipment	51	13.53%	73	15.5%	4581	1.11%	0.02
Telephone and television transmission	30	7.96%	32	6.79%	854	3.51%	0.04
Utilities	16	4.24%	17	3.61%	399	4.01%	0.04
Wholesale, retail, and some services	32	8.49%	36	7.64%	2541	1.26%	0.01
Healthcare, medical equipment, and drugs	63	16.71%	99	21.02%	2973	2.12%	0.03
Finance	27	7.16%	30	6.37%	5719	0.47%	0.01
Other	28	7.43%	30	6.37%	3500	0.8%	0.01

This table reports the distribution of antitrust lawsuits across industries, classified using Fama–French 12 industry codes. The column "Firms Involved" presents the number of firms involved in antitrust litigation in each industry. "Firms by Industry (%)" reports the percentage of firms in each industry relative to the total number of firms. The total number of antitrust cases in each industry is reported under "Number of Cases". "Cases by Industry (%)" reports the percentage of cases in each industry relative to the total number of cases. The column "Total Firms" contains the total number of firms in each industry. "Firms Involved Probability (%)" is calculated as the number of firms involved in antitrust litigation in a particular industry divided by the total number of firms in that industry. Similarly, "Cases per Firm" is calculated as the total cases in a particular industry divided by the total number of firms in that industry. Panel A represents the entirety of consumer-initiated cases, while Panel B provides a summary of litigation initiated by the FTC and DOJ.

required to successfully litigate antitrust cases or be targeted by the FTC/DOJ. Despite this rarity, our sample still includes thousands of such cases.

4.3. Firm-pair level analysis

In the study of common ownership, the literature often uses a firm-pair-year panel to explore bilateral effects on outcomes such as mergers, strategic alliances, and joint ventures. This methodology is consistent with Lewellen and Lowry (2021) and Gilje et al. (2020). For our analysis, we include all firms within the S&P 1500 from 1999 to 2020. Each firm i is paired with rival firms j, defined by using the Hoberg and Phillips (2016) TNIC3 peer classification, in each year. Our results remain robust when we relax this restriction and pair firm i with all other firms in the sample, rather than exclusively with rivals.

The outcome of interest in the firm-pair-level approach is the indicator variable $I(Both\ Involve)_{i,j,t+1}$, which is equal to one if both firms i and j are defendants in the same case filed in year $t+1$, and zero otherwise. When two firms are named in the same antitrust lawsuit, either by the FTC/DOJ or by consumer plaintiffs whose claims receive favorable rulings, it indicates that the alleged conduct was sufficiently serious to support joint litigation.

Table 2
Summary statistics.

	N	Mean	25%	Median	75%	Std. Dev.
Panel A - Firm pair level						
I(Involved in FTC and DOJ cases, ×10,000)	394,375	1.95	0.00	0.00	0.00	139.72
I(Involved in consumer cases, ×10,000)	317,055	19.81	0.00	0.00	0.00	444.61
Min. Kappa	394,375	0.55	0.00	0.72	0.88	0.39
Cosine	394,375	0.68	0.00	0.99	1.00	0.46
Min. common ownership	394,375	0.09	0.00	0.06	0.14	0.08
Harford, Jenter and Li	394,375	0.05	0.00	0.04	0.08	0.04
Anton and Polk	394,375	0.09	0.00	0.07	0.15	0.09
No. common blockholders	394,375	1.21	0.00	1.00	2.00	1.03
I(Common Blockholder Exists)	394,375	0.68	0.00	1.00	1.00	0.46
GGL linear	239,102	12.19	0.94	3.10	10.03	91.43
GGL full attention	239,102	79.31	39.23	69.30	106.74	53.32
GGL concave	239,102	209.53	56.93	125.21	260.05	305.45
GGL convex	239,102	0.35	0.00	0.01	0.04	32.47
GGL fitted	239,102	219.78	64.27	157.14	309.73	215.07
ln(Average Mkt. Cap)	394,375	8.42	7.44	8.31	9.30	1.33
Size between 50% and 200%	394,375	0.28	0.00	0.00	1.00	0.45
Average ownership percentage	394,375	0.30	0.21	0.30	0.39	0.13
Product similarity (HP)	394,375	0.05	0.01	0.03	0.07	0.05
Avg. No. blockholders	394,375	3.56	2.50	3.50	5.00	1.82
Panel B - Firm level						
I(Involved in FTC and DOJ cases, ×100)	29,179	1.11	0.00	0.00	0.00	10.46
I(Involved in consumer cases, ×100)	23,494	2.94	0.00	0.00	0.00	16.88
Kappa (VW, TNIC)	29,179	0.56	0.30	0.50	0.79	0.36
Cosine (VW, TNIC)	29,179	0.53	0.31	0.49	0.72	0.31
Kappa (EW, TNIC)	29,179	0.56	0.33	0.52	0.79	0.32
Cosine (EW, TNIC)	29,179	0.52	0.35	0.49	0.67	0.27
No. Common Blockholders	29,179	3.16	2.00	3.00	4.00	1.78
I(Common Blockholder Exists)	29,179	0.92	1.00	1.00	1.00	0.26
Ownership Percentage	29,179	0.03	0.02	0.03	0.03	0.01
Market Share	29,179	0.19	0.01	0.06	0.25	0.27
ln(Mkt. Cap)	29,175	7.94	6.82	7.78	8.96	1.55
Leverage	29,062	0.23	0.06	0.19	0.35	0.20
ROA	29,114	0.09	0.04	0.08	0.13	0.08
Volatility	29,179	0.07	0.02	0.04	0.08	0.09
Tobin's Q	29,175	1.95	1.15	1.50	2.17	1.57
No. Blockholders	29,179	3.92	3.00	4.00	5.00	2.05

This table presents summary statistics for the variables used in our main analysis. Panel A presents data at the firm-pair level, including indicator variables for both FTC/DOJ cases and consumer cases. These two indicators are reported on the same scale used in the firm-pair regression tables (Tables 4, 5, and the pair Appendix tables), namely the raw 0/1 indicator multiplied by 10,000 (i.e., expressed in basis points of probability). The common ownership measures are described in Section 4.3.1. Panel B focuses on firm-level data and includes two indicator variables identifying whether a firm is litigated in antitrust cases; these are multiplied by 100, so Panel B means are already in percentage points, consistent with the firm-level regression tables. The sample period is from 1999 to 2020.

Table 3
Pairwise correlations of common ownership measures.

	Min. kappa	Cosine similarity	Min. Common ownership	Harford, Jenter, and Li	Anton and Polk	GGL fitted
Min. Kappa	1.0000					
Cosine similarity	0.9582	1.0000				
Min. common ownership	0.7408	0.7233	1.0000			
Harford, Jenter, and Li	0.7265	0.7287	0.9960	1.0000		
Anton and Polk	0.7224	0.7204	0.9906	0.9941	1.0000	
GGL fitted	0.3602	0.3766	0.5219	0.5273	0.5207	1.0000

This table reports the pairwise correlations of common ownership measures at the firm-pair level.

We incorporate a variety of control variables in our analysis. "Average Ownership Percentage" is the average proportion of shares held collectively by institutions and blockholders in the two firms and captures the general ownership level. The variable "Size between 50% and 200%" is an indicator for whether the market capitalization of the first firm is between half and double the size of the second firm in the pair. The variable "ln(Average Mkt. Cap)" measures the average market capitalization of the two firms.[20] We also include the pair-wise variable "Product Similarity (HP)" from Hoberg and Phillips (2016), which evaluates the textual similarity of the firms' product descriptions in their 10-K filings. Our findings are not sensitive to excluding these controls.

4.3.1. Firm-pair measures for common ownership

Following the existing literature, we construct seven measures of common ownership for each firm pair. We begin with two simple benchmark measures based on common blockholders. These measures are easy to interpret and less susceptible to measurement error, and have therefore been widely used in the common ownership literature (e.g., He and Huang, 2017; He et al., 2024).

The first measure is the number of common blockholders shared by firms i and j:

$$\text{No. Common Blockholders}_{i,j} = |I^{i,j}| \tag{1}$$

where $I^{i,j}$ denotes the set of investors who block-hold both firms i and j.

The second measure is an indicator variable, $I(\text{Common Blockholder Exists}_{i,j})$, that equals one if firms i and j share at least one common blockholder, and zero otherwise.

We then consider other commonly used measures from the literature. For the third measure, we follow Backus et al. (2020) to calculate the *profit weights*, a measure built on previous work by Rotemberg (1984), Bresnahan and Salop (1986), and O'Brien and Salop (2000). These authors extend the basic framework of own-firm profit maximization to one where firms maximize cash flows to their investors, resulting in managers placing positive weights on their rivals' profits. The profit weights of firm i on firm j are defined as

$$\kappa_{i,j} = \frac{\sum_o \gamma_{io}\beta_{jo}}{\sum_o \gamma_{io}\beta_{io}} \tag{2}$$

where β_{io} represents the share of firm i held by shareholder o, and γ_{io} denotes the control share of firm i held by the same shareholder. In line with previous literature, e.g., Backus et al. (2020) and Antón et al. (2023), we adopt the baseline assumption of proportional control, where $\gamma_{io} = \beta_{io}$. In essence, $\kappa_{i,j}$ quantifies the value to firm i of a dollar of profit earned by its competitor, firm j. These profit weights serve as a measure of the channel through which common ownership affects firm i's behavior.[21]

The profit weight in our analysis can exhibit significant asymmetry. For example, firm i might assign a lower profit weight to firm j, while firm j might place a higher value on the profits of firm i. In such scenarios, coordination hinges on the willingness of the firm with the lower profit weight. For example, if firm j has a higher profit weight in firm i, it would expect a greater payoff from coordination due to its profits derived from firm i's success. However, firm i may have a lower expected payoff, as it does not benefit similarly from firm j's profits, and the costs of collusion or potential litigation might outweigh the benefits, leading to a failure in coordination. Therefore, we use the minimum value between $\kappa_{i,j}$ and $\kappa_{j,i}$ to create a symmetric measure.

$$Min.Kappa_{i,j} = \min(\kappa_{i,j}, \kappa_{j,i}) \tag{3}$$

This approach acknowledges that the incentive for coordination is contingent on both parties, especially those with less to gain. Our findings remain consistent using average or maximum profit weights across firm pairs.

Following Backus et al. (2020) and Boller and Morton (2020), we further decompose each $\kappa_{i,j}$ into an ownership similarity term and a measure of investor concentration.

$$\kappa_{i,j} = \cos(\beta_i, \beta_j) \times \sqrt{\frac{IHHI_j}{IHHI_i}} \tag{4}$$

The first component of the profit weights is the cosine similarity measure, designed to quantify the overlap between two vectors: $\beta_i = (\beta_{io_1}, \beta_{io_2}, \ldots, \beta_{io_n})$ and $\beta_j = (\beta_{jo_1}, \beta_{jo_2}, \ldots, \beta_{jo_n})$. These vectors represent the ownership shares of firms i and j by their common shareholders, identified as $o_1, o_2, \ldots, o_n$. We use this measure as our fourth measure.

$$\cos_{i,j} = \cos(\beta_i, \beta_j) \tag{5}$$

The second component of profit weights involves calculating relative shareholder concentration using the "Investor Herfindahl–Hirschman Indices" (IHHI). For firm i, the IHHI is calculated as $IHHI_i = \sum_o \beta_{io}^2$, and similarly, for firm j, it is $IHHI_j = \sum_o \beta_{jo}^2$. A higher concentration implies that, all else being equal, firms with more concentrated ownership are more likely to prioritize their own profits over those of their competitors. However, IHHI, in isolation, does not capture common ownership. Therefore, we have chosen not to include the IHHI as a standalone measure in our analysis.

[20] Our findings remain robust when using alternative size measures such as total assets, total sales, and total employees. Our findings are also consistent when specifying the average size or individual size measures of firms i and j separately in the regression.

[21] A higher $\kappa_{i,j}$ implies that the owner of firm i derives greater benefit from the profits of rival firm j, suggesting a stronger incentive for firm i to reduce competition with j.

The fifth measure, $Min.Own_{i,j}$, as described by Newham et al. (2025), calculates the sum of the minimum ownership stakes held by a common owner c in both firms i and j, aggregated across all common owners $c \in I^{i,j}$, where $I^{i,j}$ denotes the set of investors who block-hold both firms i and j, and $\alpha_{c,i}$ denotes the fraction of firm i's shares held by investor c.

$$Min.Own_{i,j} = \sum_{c \in I^{i,j}} \min(\alpha_{c,i}, \alpha_{c,j}) \tag{6}$$

For example, if firms i and j have two common owners, c_1 and c_2, with c_1 owning 5% and 7% of firms i and j, respectively, and c_2 owning 14% and 11%, the overlap measure would be 5% + 11% = 16%.

The sixth measure, $HJL_{i,j}$, introduced by Harford et al. (2011), multiplies, for each common investor, the fractions of shares the investor holds in firms i and j and divides this product by the sum of the two stakes, with the summation again running over the set $I^{i,j}$ of common investors defined above.

$$HJL_{i,j} = \sum_{c \in I^{i,j}} \frac{\alpha_{c,i}\alpha_{c,j}}{\alpha_{c,i} + \alpha_{c,j}} \tag{7}$$

The seventh measure, $AP_{i,j}$, proposed by Anton and Polk (2014), uses market capitalization to weigh the relative importance of investor ownership in each pair of firms before aggregating across investors.

$$AP_{i,j} = \sum_{c \in I^{i,j}} \alpha_{c,i} \frac{\bar{v}_i}{\bar{v}_i + \bar{v}_j} + \alpha_{c,j} \frac{\bar{v}_j}{\bar{v}_i + \bar{v}_j} \tag{8}$$

where $\bar{v}_i$ and $\bar{v}_j$ denote the average market capitalization of firms i and j, respectively. This weighting ensures that larger firms receive proportionally more weight in the common ownership measure.

We provide pairwise correlations among these common ownership measures in Table 3. Perhaps not surprisingly, these measures are highly correlated: many measures have correlations over 95%, and the vast majority are over 50%.

As an additional robustness check, we follow Gilje et al. (2020) and construct the GGL measure, which captures managerial incentives to internalize how a firm's actions affect the value of other firms in the investor's portfolio. This measure combines ownership shares and portfolio weights to reflect the extent to which common investors may encourage firms to take into account rivals' outcomes. For brevity, we present the formal definition and implementation details in Appendix B.1.1, and report the corresponding results in Appendix B.

4.3.2. Baseline

To investigate the bilateral effect of common ownership on the probability that two firms are included in the same antitrust lawsuits, we estimate the following regression:

$$I(Both\ Involve)_{i,j,t+1} = \alpha + \beta \cdot CO_{i,j,t} + \theta \cdot X_{i,j,t} + \lambda_i + \lambda_j + \lambda_t + \epsilon_{i,j,t+1} \tag{9}$$

$I(Both\ Involve)$ is an indicator variable set to one if the two rival firms i and j are involved in the same antitrust case(s) at time t+1,[22] and zero otherwise. For numerical readability the regression dependent variable is this indicator multiplied by 10,000 (basis points of probability), so a coefficient of β corresponds to a change of $\beta/100$ percentage points in the probability of joint litigation. We caution that – because joint litigation is a rare event (unconditional probability of 0.2% for consumer cases and 0.02% for FTC/DOJ cases) – even modest coefficients on this scale can correspond to nontrivial proportional changes relative to the sample mean. $CO_{i,j,t}$ denotes the common ownership measure between firms i and j at time t, as discussed in Section 4.3.1, and is standardized by its sample standard deviation so that coefficients describe the effect of a one-standard-deviation increase in the measure. $X_{i,j,t}$ includes all control variables as described in the table notes. Additionally, we incorporate firm-specific fixed effects λ_i and λ_j, as well as year fixed effects λ_t, to account for unobserved heterogeneity across firms and time. The results remain similar when firm-pair fixed effects are included instead of individual firm fixed effects.

In Table 4, we find no evidence that common ownership is related to antitrust litigation brought by the FTC/DOJ: all seven common-ownership coefficients are statistically insignificant, and six of the seven point estimates are negative. In consumer-initiated cases reported in Table 5, all seven common-ownership point estimates are positive, and two are marginally significant at the 10% level. Specifically, a one standard deviation increase in the Anton–Polk measure is associated with a coefficient of 3.93 basis points—equivalently a 0.039 percentage-point (t = 1.80) increase in joint-litigation probability, and each additional common blockholder is associated with a coefficient of 4.03 basis points (0.040 percentage points; t = 1.78). The indicator for the existence of at least one common blockholder is positive but insignificant (coefficient = 9.62 basis points, or 0.096 percentage points; t = 1.61), and the remaining weighted measures (Min. Kappa, Cosine, Min. Common Ownership, Harford–Jenter–Li) are all insignificant. Relative to the unconditional consumer-litigation probability of 0.2%, the two marginally significant estimates represent roughly a 20% proportional increase; the LPM slopes capture the average covariation between the standardized common-ownership measure and the rare outcome, and should not be read as bounded probability predictions. Results for GGL measures are reported in Table B3 in Appendix B: for FTC/DOJ cases none of the five GGL variants is statistically significant, and for consumer cases three of the five variants (Full Attention, Concave, and Fitted) are significant while the other two are not, so the GGL evidence is mixed. We

[22] Our findings remain consistent when extending the analysis from $t+1$ to $t+5$ and beyond, allowing for a gradual manifestation of the effects of common ownership.

Table 4
Firm-pair level analysis: FTC and DOJ cases.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I(Common blockholder exists)	−0.34						
	(−0.56)						
No. common blockholders		0.03					
		(0.09)					
Min. kappa			−0.07				
			(−0.26)				
Cosine				−0.14			
				(−0.51)			
Min. common ownership					−0.16		
					(−0.34)		
Harford, Jenter and Li						−0.23	
						(−0.47)	
Anton and Polk							−0.12
							(−0.25)
ln(Average Mkt. Cap)	−3.30***	−3.31***	−3.31***	−3.31***	−3.31***	−3.31***	−3.31***
	(−3.46)	(−3.46)	(−3.46)	(−3.46)	(−3.46)	(−3.46)	(−3.46)
Size between 50% and 200%	1.34	1.33	1.34	1.34	1.35	1.35	1.34
	(1.62)	(1.60)	(1.62)	(1.62)	(1.63)	(1.64)	(1.62)
Average ownership percentage	−7.18	−7.01	−7.10	−7.17	−6.96	−6.93	−6.97
	(−1.60)	(−1.57)	(−1.59)	(−1.60)	(−1.55)	(−1.54)	(−1.55)
Product similarity (HP)	44.90***	44.83***	44.89***	44.90***	44.96***	44.99***	44.92***
	(3.72)	(3.73)	(3.72)	(3.72)	(3.74)	(3.74)	(3.74)
Avg. No. blockholders	0.71	0.63	0.67	0.71	0.69	0.71	0.67
	(1.26)	(1.10)	(1.20)	(1.26)	(1.24)	(1.27)	(1.21)
Firm *i* FE	✓	✓	✓	✓	✓	✓	✓
Firm *j* FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Obs.	394,150	394,150	394,150	394,150	394,150	394,150	394,150
Adj. R^2	0.06	0.06	0.06	0.06	0.06	0.06	0.06

This table reports firm-pair regression estimates of the antitrust indicator on common ownership measures using FTC and DOJ cases. Firm pairs are formed using the Hoberg and Phillips (2016) TNIC3 peer classification within the S&P 1500 universe. The raw dependent variable, $I(Both\ Involve)_{i,j,t+1}$, equals one if firms i and j are jointly involved in the same FTC or DOJ antitrust lawsuit in year $t+1$, and zero otherwise. For numerical readability the regression dependent variable is this indicator multiplied by 10,000 (i.e., expressed in basis points of probability); the reported means in Table 2 Panel A are on the same scale. Min. Kappa, Cosine, Min. Common Ownership, Harford–Jenter–Li, and Anton–Polk are standardized to have unit standard deviation, so their coefficients describe the effect of a one-standard-deviation increase. No. Common Blockholders is reported as a raw integer count, so its coefficient describes the effect per additional common blockholder; I(Common Blockholder Exists) is a 0/1 indicator, so its coefficient describes the effect of having any common blockholder versus none. Control variables include average firm size (ln(Average Mkt. Cap)), a size-similarity indicator (Size between 50% and 200%), average ownership percentage, product similarity (Hoberg and Phillips, 2016), and the average number of blockholders across the two firms. t-statistics with standard errors clustered at both firms' level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All potentially unbounded variables are winsorized at the 1% level to mitigate the impact of outliers. The sample period is from 1999 to 2020.

emphasize, however, that the overall firm-pair evidence remains non-robust across litigation types: none of the common-ownership measures – including the GGL variants – is significant for FTC/DOJ cases.

One might argue that many investors are passive, and therefore our results simply reflect that passive owners do not engage extensively in corporate governance. Although Appel et al. (2016) make the case that passive investors are indeed active in governance, we address this concern by restricting our focus to active investors, who are expected to influence firm decisions. We classify active investors using three distinct methods. We begin by using Schedule 13D filings, which are submitted by activist investors. Next, we use FactSet to identify investors who explicitly state that they pursue active investment strategies. Finally, we examine hedge fund holdings, since hedge funds tend to be more active than other institutions. As reported in Table B4 (13D), Table B5 (Active), and Table B6 (Hedge Fund), these alternative definitions do not overturn the baseline pattern: the FTC/DOJ estimates remain statistically insignificant, and the consumer-case evidence remains limited and sensitive to the ownership definition.

For comparison, we also calculate our common ownership measures using only the Big 4 fund families (Vanguard, BlackRock, State Street, and Fidelity), as these are primarily passive investors. These estimates likewise do not show a robust positive relationship, as shown in Table B7. We find a similar pattern when using index fund holdings (defined by FactSet), which we report in Table B8. In addition, Table B9 in Appendix B repeats the analysis on a matched sample that conditions on the focal firm experiencing litigation in year t; common ownership again shows no positive association with joint litigation.

In general, the firm-pair evidence is mixed: we find no systematic relationship between common ownership and FTC/DOJ litigation, and only a marginal, non-robust positive association with consumer-initiated litigation.

4.3.3. Identification strategy: Financial institution mergers

Thus far, our results suggest a mixed, and generally non-robust, correlation between common ownership and antitrust litigation. However, it is important to note that these results are merely correlations and do not imply causation. To study whether this

Table 5
Firm-pair level analysis: Consumer cases.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I(Common blockholder exists)	9.62						
	(1.61)						
No. common blockholders		4.03*					
		(1.78)					
Min. kappa			4.76				
			(1.64)				
Cosine				4.21			
				(1.55)			
Min. common ownership					3.47		
					(1.55)		
Harford, Jenter and Li						3.52	
						(1.61)	
Anton and Polk							3.93*
							(1.80)
ln(Average Mkt. Cap)	−35.11***	−34.97***	−34.67***	−35.07***	−34.81***	−34.91***	−34.71***
	(−2.64)	(−2.64)	(−2.64)	(−2.64)	(−2.63)	(−2.63)	(−2.63)
Size between 50% and 200%	5.43**	5.16*	5.24*	5.42**	5.20*	5.26*	5.14*
	(2.00)	(1.91)	(1.96)	(2.00)	(1.93)	(1.95)	(1.91)
Average ownership percentage	20.33	14.74	21.77	20.13	12.30	12.06	11.83
	(0.43)	(0.31)	(0.46)	(0.42)	(0.25)	(0.25)	(0.24)
Product similarity (HP)	328.19***	326.75***	327.32***	328.22***	326.88***	327.13***	326.80***
	(5.38)	(5.38)	(5.40)	(5.38)	(5.37)	(5.37)	(5.37)
Avg. No. blockholders	−0.92	−0.83	−1.07	−0.78	0.17	0.16	0.06
	(−0.14)	(−0.13)	(−0.17)	(−0.12)	(0.03)	(0.02)	(0.01)
Firm i FE	✓	✓	✓	✓	✓	✓	✓
Firm j FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Obs.	316,870	316,870	316,870	316,870	316,870	316,870	316,870
Adj. R^2	0.05	0.05	0.05	0.05	0.05	0.05	0.05

This table reports firm-pair regression estimates of the antitrust indicator on common ownership measures using consumer-initiated antitrust cases. Firm pairs are formed using the Hoberg and Phillips (2016) TNIC3 peer classification within the S&P 1500 universe. The raw dependent variable, $I(Both\ Involve)_{i,j,t+1}$, equals one if firms i and j are jointly involved in the same consumer antitrust lawsuit in year $t+1$, and zero otherwise. For numerical readability the regression dependent variable is this indicator multiplied by 10,000 (i.e., expressed in basis points of probability); the reported means in Table 2 Panel A are on the same scale. Min. Kappa, Cosine, Min. Common Ownership, Harford–Jenter–Li, and Anton–Polk are standardized to have unit standard deviation, so their coefficients describe the effect of a one-standard-deviation increase. No. Common Blockholders is reported as a raw integer count, so its coefficient describes the effect per additional common blockholder; I(Common Blockholder Exists) is a 0/1 indicator, so its coefficient describes the effect of having any common blockholder versus none. Control variables include average firm size (ln(Average Mkt. Cap)), a size-similarity indicator (Size between 50% and 200%), average ownership percentage, product similarity (Hoberg and Phillips, 2016), and the average number of blockholders across the two firms. t-statistics with standard errors clustered at both firms' level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All potentially unbounded variables are winsorized at the 1% level to mitigate the impact of outliers. The sample period is from 2004 to 2020.

relationship has a causal interpretation, we follow the methodology of He and Huang (2017), using mergers of financial institutions as a quasi-natural experiment that shifts common ownership between affected firms. The identifying assumption is that the characteristics of individual firms in financial institutions' investment portfolios should not directly relate to the merger events among these financial institutions. This assumption is considered reasonable, given that these institutions typically own shares in hundreds or thousands of companies, rendering it improbable that their merger decisions are affected by individual portfolio firms. Although Lewellen and Lowry (2021) indicates that financial institution mergers may be connected with broader industry trends, they nevertheless provide a useful source of variation in common ownership levels.

Following the refined methodology of Lewellen and Lowry (2021), we use data from 64 mergers announced between 1980 and 2015 and limit our analysis to the 1999–2015 period to match our main specification. We proceed in two steps. First, we identify all firms in which one of the merging financial institutions held a block of at least 5% of shares in the quarter before the merger announcement. Second, we form firm pairs (i and j, as well as j and i) where both firms belong to the same 3-digit SIC industry.[23] In each pair, firm i is block-held by merging institution m but not by institution n, whereas firm j is block-held by institution n but not by m. The merger between institutions m and n therefore results in firms i and j becoming commonly owned by the newly merged entity. For each treatment pair i and j, we select a matched control pair i and j'. We select j' such that it shares the same SIC3 industry classification as i and j, has the market capitalization closest to j in the quarter before the merger and is not block-held by institution n. We estimate the following difference-in-differences specification:

$$I(Both\ Involve)_{i,j,t} = \alpha + \beta_1 Treat \times Post + \lambda_{i,j,M} + \lambda_{t,M} + \epsilon_{i,j,t} \tag{10}$$

[23] We apply these criteria in our main results to adhere strictly to the approach of Lewellen and Lowry (2021). We have also checked an alternative construction based on Hoberg–Phillips peers, and the qualitative inference for antitrust litigation is unchanged.

Table 6
Identification: Financial institution mergers.

Panel A — Institution mergers and pair-wise common ownership			
	Min. block holding	Min. kappa	Cosine
	(1)	(2)	(3)
Treat × Post	0.32**	1.01***	0.91**
	(2.56)	(3.44)	(2.46)
Year × Merger FE	✓	✓	✓
Firm-pair × Merger FE	✓	✓	✓
Obs.	38,512	38,512	38,512
R^2	0.68	0.66	0.69
Panel B — Institution mergers and antitrust litigation			
	FTC-DOJ	Consumer	Either
	(1)	(2)	(3)
Treat × Post	0.12	0.34	0.47
	(0.74)	(0.54)	(0.69)
Year × Merger FE	✓	✓	✓
Firm-pair × Merger FE	✓	✓	✓
Obs.	38,512	38,512	38,512
R^2	0.14	0.19	0.20

This table presents the results of the difference-in-differences analysis using mergers of large financial institutions as a source of exogenous variation in common ownership, following He and Huang (2017) and Lewellen and Lowry (2021). *Treat* indicates that the firms are block-held by the individual merging institutions before the merger, so that the merger causes them to share a common blockholder; *Post* is an indicator for the years following the merger event. In Panel A, the dependent variables are firm-pair common-ownership measures (minimum block holdings, minimum Kappa, and ownership cosine similarity). In Panel B, the dependent variable is the joint-litigation indicator, multiplied by 100 so that coefficients represent percentage-point changes in the probability of joint litigation; we report separate columns for FTC/DOJ cases, consumer cases, and either type of case. All specifications include baseline controls (coefficients suppressed for brevity). *t*-statistics adjusted for clustered standard errors at the merger event × year level are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All potentially unbounded variables are winsorized at the 1% level. The sample period is from 1999 to 2015, using mergers announced between 1980 and 2015.

In this specification, i and j represent the two firms in a pair, and t denotes time. The variable $I(Both\ Involve)_{i,j,t}$ is an indicator for whether both firms in a pair are involved in antitrust cases in year t. We multiply this variable by 100 so that coefficients represent percentage point changes in litigation probability. The variable $Treat$ is an indicator set to one for the treatment firm pairs and zero for the control pairs, while $Post$ is an indicator equal to one for the years after the merger event. Both indicators are absorbed by the fixed effects. $\lambda_{i,j,M}$ and $\lambda_{t,M}$ represent pair-merger fixed effects and merger-year fixed effects. We use a pre-post window of five years (the event window totals 11 years, including the current year). The summary statistics of key variables of this sample are reported in Table B10.

First, we test whether common block ownership is affected by institutional mergers in Panel A of Table 6. Similar to He and Huang (2017) and Lewellen and Lowry (2021), we find sizable effects of institutional mergers on common ownership: minimum block holdings rise by 0.32 percentage points ($t = 2.56$, significant at 5%), minimum Kappa rises by 1.01 percentage points ($t = 3.44$, significant at 1%), and ownership cosine similarity rises by 0.91 percentage points ($t = 2.46$, significant at 5%). These estimates show a statistically significant first-stage relationship. In Panel B, we report the estimated treatment effects for FTC/DOJ cases, consumer anti-competitive cases, and either type of case. The estimates are 0.12 ($t = 0.74$), 0.34 ($t = 0.54$), and 0.47 ($t = 0.69$) percentage points respectively: all positive in sign but none statistically significant. Thus, despite the sizable increase in common ownership induced by institutional mergers, we do not find evidence that treated pairs face a higher likelihood of antitrust litigation post-merger compared to control pairs.

The litigation results are similar when we exclude merger events that occurred during the financial crisis: the consumer-case estimate remains close to zero, while the FTC/DOJ and combined-case estimates are negative and statistically insignificant. As Lewellen and Lowry (2021) point out, earlier results could be driven by the differential responses of firms (or industries) to the 2008 financial crisis. We report these robustness tests in Table B11.

4.3.4. Collusion incentives

Our findings thus far paint a mixed picture: some firm-pair common-ownership measures correlate positively with consumer-initiated litigation, but these correlations are not robust across measures or litigation types, and the institution-merger DiD does not find a statistically significant reduced-form effect on litigation. These results do not preclude the possibility that common ownership increases the propensity for collusion, which litigation data may fail to fully capture, as we discussed earlier in the data limitation section. Consequently, common ownership may remain a concern for regulators. In this section, we examine whether common ownership is associated with managerial incentives for firm pairs to collude. We investigate two potential indicators.

First, we consider the tendency to appoint interlocking directors. Common owners may prefer placing interlocking directors on the boards of competing firms to facilitate communication and coordination. However, it is important to note that the existing

Table 7
Common ownership, interlocking directors, and compensation peers.

	Interlocking director (1)	Comp. peers (2)
Treat × Post	−0.46***	−0.49**
	(−5.14)	(−2.17)
Year × Merger FE	✓	✓
Firm-pair × Merger FE	✓	✓
Obs.	38,512	26,646
R^2	0.57	0.56

This table reports difference-in-differences estimates using mergers of large financial institutions as a source of exogenous variation in common ownership. *Treat* identifies firms that are block-held by the individual merging institutions prior to the merger, and *Post* is an indicator for the years following the merger event. *Interlocking Directors* equals one if the firm-pair shares at least one director on their boards, and zero otherwise. *Comp. Peers* equals one if at least one firm in the pair selects the other as a compensation peer, and zero otherwise. Both indicators are multiplied by 100 so that coefficients represent percentage-point changes in the probability of the outcome. All specifications include baseline controls (coefficients suppressed for brevity). *t*-statistics adjusted for clustered standard errors at the merger event × year level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period for interlocking directors spans from 1999 to 2015, covering S&P 1500 firms, and from 2006 to 2015 for compensation peers.

corporate opportunity doctrine renders such appointments burdensome to directors on a legal and reputational basis. In addition, appointing directors to multiple firms is costly for owners. Therefore, our analysis of interlocking directors yields largely indicative results.

Second, we investigate whether common ownership is related to firms benchmarking manager pay against the performance of rival firms by selecting them as compensation peers.[24] This benchmarking could potentially encourage collusion, as synchronized compensation might encourage managers to coordinate between firms to improve the performance of their peers, thereby boosting their own compensation. Owners might exert pressure on the board to align managerial incentives in this manner. This mechanism corresponds to the governance channel explored in Antón et al. (2023), suggesting that common ownership influences pay-for-performance sensitivity in CEO compensation contracts.

To assess these incentive channels, we use the identification strategies outlined in the previous section based on mergers of financial institutions. Our methodology remains the same, except that we replace the dependent variable with two indicators: one for the presence of at least one interlocking director between a pair of firms, and another reflecting whether at least one firm in the pair has selected the other as a compensation peer. Consistent with the rest of the paper, both indicators are multiplied by 100 so that coefficients are expressed in percentage points.

The results are presented in Table 7. Contrary to a simple view that common ownership facilitates collusion through observable governance channels, we find that treated firm pairs experience a 0.46 percentage-point decline in the likelihood of sharing an interlocking director (coefficient = −0.46, t = −5.14, significant at 1%) and a 0.49 percentage-point decline in the likelihood of one firm selecting the other as a compensation peer (coefficient = −0.49, t = −2.17, significant at 5%). Relative to the unconditional mean of 0.72 percentage points for interlocking directors, the first effect represents roughly a 64% decline. Both effects are negative and statistically significant.

These findings admit multiple interpretations. One possibility is that common ownership reduces incentives for costly monitoring or governance interventions, consistent with the "managerial slack" view (e.g., Antón et al. 2023). However, an alternative interpretation is that managers move away from explicit and easily detectable forms of coordination, such as interlocking directorships or compensation benchmarking, toward more subtle or covert strategies. Such a shift need not imply weaker governance. On the contrary, it may reflect more active monitoring and coordination by common owners, who internalize cross-firm externalities and encourage firms to adopt less visible forms of interaction. This interpretation is consistent with the empirical evidence in He et al. (2019), who show that common and cross-ownership can strengthen institutional investors' monitoring incentives, as well as the theoretical predictions of Acharya and Volpin (2010) that cross-ownership can alleviate governance externalities.

We do not take a strong stance on which channel dominates. Instead, our results highlight that the relationship between common ownership, monitoring, and coordination is inherently ambiguous and ultimately an empirical question. What we can conclude is that observable, explicit forms of coordination decline with common ownership, even though the underlying incentives and mechanisms may operate through less visible channels.

Overall, these findings suggest that there is no evidence that common ownership increases the adoption of observable business practices that could facilitate collusion. At the same time, they underscore the importance of interpreting such evidence cautiously, as the absence of observable coordination does not necessarily imply the absence of underlying competitive interactions shaped by common ownership.

[24] Beginning in 2006, the U.S. Securities and Exchange Commission (SEC) mandated public firms to disclose their compensation peers in their proxy statements, a move aimed at enhancing the transparency of the pay-setting process. The data utilized in our study are sourced from ISS Incentive Labs.

Table 8
Firm-level effect of common ownership on antitrust litigation.

	FTC/DOJ						Consumer					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I(Common Blockholder Exists)	0.36						0.19					
	(0.88)						(0.18)					
No. Common Blockholders		−0.04						0.14				
		(−0.56)						(1.16)				
Kappa (VW, TNIC)			0.10						−0.01			
			(0.91)						(−0.05)			
Cosine (VW, TNIC)				0.05						0.09		
				(0.54)						(0.60)		
Kappa (EW, TNIC)					0.08						−0.03	
					(0.89)						(−0.17)	
Cosine (EW, TNIC)						0.03						0.10
						(0.29)						(0.53)
Ownership percentage	−12.71	−8.33	−10.07	−10.87	−9.90	−10.56	1.15	−4.18	2.07	1.35	1.83	1.20
	(−1.08)	(−0.69)	(−0.87)	(−0.94)	(−0.85)	(−0.91)	(0.05)	(−0.17)	(0.09)	(0.06)	(0.08)	(0.05)
Market share	0.73	0.72	0.73	0.72	0.73	0.72	0.98	0.96	0.97	0.98	0.97	0.99
	(0.92)	(0.91)	(0.92)	(0.91)	(0.92)	(0.91)	(0.63)	(0.62)	(0.63)	(0.63)	(0.62)	(0.63)
ln(Mkt. Cap)	−0.34	−0.34	−0.34	−0.34	−0.34	−0.33	1.49***	1.50***	1.49***	1.49***	1.50***	1.49***
	(−1.51)	(−1.52)	(−1.55)	(−1.52)	(−1.53)	(−1.51)	(4.03)	(4.06)	(4.04)	(4.02)	(4.04)	(4.02)
Leverage	−0.69	−0.68	−0.68	−0.68	−0.68	−0.68	1.87	1.85	1.87	1.88	1.87	1.89
	(−1.06)	(−1.04)	(−1.04)	(−1.04)	(−1.04)	(−1.04)	(1.28)	(1.26)	(1.28)	(1.29)	(1.27)	(1.29)
ROA	1.46	1.49	1.49	1.51	1.47	1.51	−6.63**	−6.55**	−6.62**	−6.61**	−6.63**	−6.61**
	(0.96)	(0.98)	(0.97)	(0.99)	(0.97)	(0.99)	(−2.39)	(−2.36)	(−2.39)	(−2.39)	(−2.39)	(−2.39)
Volatility	−0.56	−0.54	−0.55	−0.54	−0.57	−0.54	−0.35	−0.34	−0.34	−0.36	−0.34	−0.36
	(−0.51)	(−0.49)	(−0.50)	(−0.49)	(−0.51)	(−0.49)	(−0.13)	(−0.13)	(−0.13)	(−0.13)	(−0.12)	(−0.13)
Tobin's Q	0.11	0.11	0.11	0.11	0.11	0.11	−0.38**	−0.38**	−0.38**	−0.37**	−0.38**	−0.38**
	(1.29)	(1.28)	(1.30)	(1.28)	(1.28)	(1.28)	(−2.40)	(−2.40)	(−2.40)	(−2.40)	(−2.40)	(−2.40)
No. blockholders	0.05	0.08	0.06	0.05	0.06	0.05	0.22**	0.14	0.22**	0.22**	0.22**	0.23**
	(0.99)	(1.11)	(1.21)	(1.14)	(1.26)	(1.15)	(2.29)	(1.12)	(2.29)	(2.32)	(2.23)	(2.37)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Obs.	28,726	28,726	28,726	28,726	28,726	28,726	23,155	23,155	23,155	23,155	23,155	23,155
R^2	0.14	0.14	0.14	0.14	0.14	0.14	0.25	0.25	0.25	0.25	0.25	0.25

This table reports firm-level regression estimates of the relationship between the antitrust litigation indicator and common ownership measures, along with control variables. The observations are at the firm-year level from 1999 to 2020 for FTC/DOJ cases and from 2004 to 2020 for consumer cases. The dependent variables, *FTC/DOJ* and *Consumer*, equal one if firm i is involved in an antitrust lawsuit in year $t+1$ and zero otherwise; each is multiplied by 100 so that coefficients represent percentage-point changes in litigation probability. Kappa and Cosine measures are value-weighted (VW) or equally-weighted (EW) averages across each focal firm's TNIC3 rivals (Hoberg and Phillips, 2016) and are standardized to have unit standard deviation, so their coefficients report the percentage-point change in litigation probability per one-standard-deviation increase. *No. Common Blockholders* counts the institutional investors that hold blocks of 5% or more in both the focal firm and any of its TNIC3 rivals (kept on its raw integer scale, so its coefficient reports the per-additional-blockholder effect); *I(Common Blockholder Exists)* is a 0/1 indicator for whether that count is positive (kept on its raw scale, so its coefficient reports the effect of having any common blockholder versus none). Control variables include ownership percentage, market share (SIC4), ln(market capitalization), leverage, ROA, volatility, and Tobin's Q. Standard errors are robust to heteroscedasticity and clustered at the firm level. t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All potentially unbounded variables are winsorized at the 1% level to mitigate the impact of outliers.

4.4. Firm level analysis

4.4.1. Baseline

The influence of common ownership on a firm's antitrust exposure need not operate through a particular firm-pair channel; it could also manifest at the firm level, regardless of which specific rival the firm is paired with. We therefore complement our firm-pair evidence with a firm-level specification that relates each firm's antitrust-litigation risk to a summary measure of common ownership between the firm and its set of product-market rivals. This specification aggregates pairwise ownership links into a firm-level measure and serves as a descriptive check on whether common ownership is systematically associated with litigation risk at the firm level.

We emphasize that this firm-level exercise is not designed to distinguish between alternative mechanisms. In particular, it does not directly speak to how common ownership affects monitoring or governance. As discussed above, the relationship between common ownership and monitoring is theoretically ambiguous and remains an empirical question. Some studies argue that diversified common owners may have weaker incentives to monitor management (e.g., Antón et al. 2023, Hansen and Lott 1996), while others document more active monitoring and internalization of governance externalities under common or cross-ownership (e.g., He et al. 2019, Acharya and Volpin 2010). Our firm-pair results on interlocking directors and compensation peers (Table 7) are consistent with both interpretations and do not allow us to adjudicate between them. Accordingly, we interpret the firm-level

Table 9
S&P 500 inclusions.

Panel A — S&P 500 inclusions and common ownership				
	Kappa VW	Cosine VW	Kappa EW	Cosine EW
	(1)	(2)	(3)	(4)
Treat × Post	7.76***	4.09***	3.90**	2.38**
	(3.96)	(3.16)	(2.28)	(2.34)
Controls	✓	✓	✓	✓
Year × Inclusion FE	✓	✓	✓	✓
Firm × Inclusion FE	✓	✓	✓	✓
Obs.	257,458	257,458	257,458	257,458
Adj. R^2	0.34	0.39	0.26	0.39

Panel B — S&P 500 inclusions and antitrust litigation		
	FTC/DOJ	Consumer
	(1)	(2)
Treat × Post	0.94	−1.23
	(1.44)	(−0.62)
Controls	✓	✓
Year × Inclusion FE	✓	✓
Firm × Inclusion FE	✓	✓
Obs.	257,458	156,506
Adj. R^2	0.05	0.31

This table presents difference-in-differences estimates using the addition of competitors to the S&P 500 index as a shock to common ownership, following Boller and Morton (2020) and Antón et al. (2023). Industry competitors are identified using the Hoberg and Phillips (2016) TNIC3 pairwise peer network, consistent with our firm-pair and firm-level analyses. The sample construction is described in Section 4.4.2. In Panel A, the dependent variables are firm-level common-ownership measures: value-weighted and equally-weighted Kappa and ownership cosine similarity, each multiplied by 100. In Panel B, the dependent variable equals one if the firm is involved in antitrust litigation in year $t+1$ and zero otherwise, multiplied by 100 so that coefficients represent percentage-point changes. The *Treat* indicator equals one for firms already in the S&P 500 that are TNIC3 peers of the newly added firm, and zero for control firms (S&P 500 members who are *not* TNIC3 peers of the added firm); *Post* equals one for the years following the inclusion event. The analysis uses 104 index inclusions, 110 unique treated firms, and 374 unique control firms. Control variables include ln(market capitalization), leverage, volatility, and the number of blockholders. t-statistics adjusted for Year × Inclusion clustering are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The sample period is from 1999 to 2020 for FTC/DOJ cases and from 2004 to 2020 for consumer cases.

analysis narrowly as evidence on whether common ownership correlates with firm-level antitrust litigation risk, without attributing any observed relationship to a specific underlying channel.

To examine the firm-level relationship, we first construct two simple measures based on common blockholders between each focal firm i and its set of TNIC3 peers P_i. Specifically, we compute (i) the number of common blockholders between firm i and its TNIC3 industry peers, and (ii) an indicator for whether firm i shares at least one common blockholder with its TNIC3 peers. These measures provide transparent benchmarks for the extent of overlapping ownership at the firm level.

We then aggregate the pairwise measures κ_{ij} across each focal firm's set of TNIC3 peers by taking either an equally weighted or value-weighted average, denoted as $\bar{\kappa}_i$:

$$\text{EW (Equally-weighted) } \bar{\kappa}_i = \frac{1}{|P_i|}\sum_{j\in P_i}\kappa_{ij},$$
$$\text{VW (Value-weighted) } \bar{\kappa}_i = \frac{1}{\sum_{j\in P_i} v_j}\sum_{j\in P_i}\kappa_{ij}v_j. \tag{11}$$

where P_i is the set of TNIC3 peers of firm i in a given year and v_j is the stock market value of peer j. We refer to these two variables as CO (EW Kappa) and CO (VW Kappa), respectively. We also construct analogous firm-level measures based on cosine similarity.

Using the above measures, we estimate the following firm-level panel specification:

$$I(Involve)_{i,t+1} = \alpha + \beta \cdot CO_{i,t} + \theta \cdot X_{i,t} + \lambda_i + \lambda_t + \epsilon_{i,t} \tag{12}$$

where $I(Involve)_{i,t+1}$ equals one if firm i faces antitrust litigation in year $t+1$[25] and zero otherwise. As in the firm-pair specification, we multiply this indicator by 100 so that coefficients are expressed in percentage points. $CO_{i,t}$ includes the firm-level common ownership measures described above, including both the aggregated Kappa and cosine measures, as well as the two blockholder-based measures. $X_{i,t}$ is a vector of controls, and λ_i and λ_t denote firm and year fixed effects, respectively.

[25] Results are similar when allowing for longer horizons.

In Table 8, we find essentially no evidence that common ownership is correlated with the probability of antitrust litigation at the firm level. Kappa and Cosine measures are standardized to have unit standard deviation (so their coefficients report the percentage-point change per 1 SD), while No. Common Blockholders and I(Common Blockholder Exists) are reported on their natural scales (per additional common blockholder and per 0/1 switch, respectively). For government-initiated litigation in columns (1)–(6), all six common-ownership coefficients are small in magnitude and statistically insignificant. For consumer-initiated litigation in columns (7)–(12), the picture is likewise null: the value-weighted and equally-weighted Kappa and Cosine measures are all statistically insignificant (all $|t| \leq 0.60$), and neither No. Common Blockholders (0.14, $t = 1.16$) nor I(Common Blockholder Exists) (0.19, $t = 0.18$) loads significantly once we control for the firm's total number of blockholders. The total-blockholders control itself is positive and significant for consumer cases (coefficient ≈ 0.22, $t \approx 2.3$), which suggests that firm-level litigation risk is more strongly associated with the overall number of blockholders than with blockholders shared with rivals. As a falsification check, Table B12 in Appendix B recomputes the Kappa and Cosine measures using common ownership with *non-peer* firms; as expected, these placebo measures are unrelated to litigation risk.

Although the TNIC3-based baseline is null, we also explore cross-sectional heterogeneity using ex-ante governance measures—the E-index (Bebchuk et al., 2009), CEO-chair duality (Jensen, 1993), institutional ownership (Gillan and Starks, 2003; Shleifer and Vishny, 1986), and board independence (Hermalin and Weisbach, 1998)—to check whether any common-ownership effect emerges in sub-samples defined by governance quality. These tests use the same TNIC3 peer set as our baseline. As reported in Table B13, none of the interactions between the TNIC3-based Kappa or Cosine measures and any of the four governance variables is statistically significant, which is consistent with the null baseline. We present these results as descriptive rather than as direct evidence for any particular channel; the relationship between common ownership and monitoring remains an open empirical question on which the literature is divided.

4.4.2. Evidence from S&P 500 index inclusions as an identification strategy

For the firm-level setting, we use the addition[26] of *rival* firms to the S&P 500 index as a shock to common ownership. This approach, initiated by Boller and Morton (2020) and adopted by Antón et al. (2023), involves observing changes when a stock i is added to the S&P 500. For industry competitors j already in the index, their own institutional and block ownership remains unchanged. However, the common ownership weights for investors holding firm j change when these investors also acquire shares in the newly added rival firm i. This effect arises because many investors add the entrant firm i to their portfolios, which alters the level of common ownership between the two firms.

We examine whether the likelihood of treated firms (those affected by the addition of a rival to the index) encountering antitrust litigation differs from that of control firms (whose common ownership weights remain unaffected by the addition of a non-rival firm). For instance, if Firms X, Y, and Z are industry rivals and Y and Z are already in the S&P 500 while X is newly added, the owners of Y and Z are likely to add X to their portfolios, thus increasing the common ownership weights for Y and Z. In this scenario, Y and Z become the treated firms, while other existing firms in the S&P 500 serve as control firms.[27]

For the period from 1999 to 2020, we identify 562 additions to the S&P 500. Following the methods of Boller and Morton (2020) and Antón et al. (2023), we then focus on "true inclusions", excluding those promoted from the S&P MidCap 400 or S&P SmallCap 600 indices. We also exclude firms that are removed from the index on the same day of inclusion, leaving us with 104 true inclusions for our sample where we find at least one TNIC3 peer that is already in the index. Our DID specification then follows (Antón et al., 2023) as below

$$I(Involve)_{i,t+1} = \alpha + \beta_1 Treat \times Post + \theta \cdot X_{i,t} + \lambda_{i,a} + \lambda_{t,a} + \epsilon_{i,t+1} \tag{13}$$

where i represents firms, t represents years, and a indexes S&P 500 inclusion events. $I(Involve)_{i,t+1}$ is an indicator variable equal to one if firm i is involved in antitrust cases in year $t+1$, and zero otherwise. Rivals are identified using the Hoberg and Phillips (2016) TNIC3 pairwise peer network, consistent with our firm-pair and firm-level analyses: for each newly added firm x, the treated S&P 500 members in year t are those that are TNIC3 peers of x, and the control group is the set of S&P 500 members in year t that are not TNIC3 peers of x. $X_{i,t}$ is a vector of control variables, while $\lambda_{i,a}$ and $\lambda_{t,a}$ represent firm × index inclusion event and year × index inclusion event fixed effects, respectively. The main effects of the interaction term are absorbed by the fixed effects: *Treat*, which equals one if firm i (already in the index) experiences the addition of a TNIC3 peer, and *Post*, which is set to one for the years following the addition (and zero otherwise). We use a 5-year pre-post window (totaling 11 years including the current year), consistent with Antón et al. (2023). Summary statistics for key variables in this sample are reported in Table B15.

In Panel A of Table 9, we find that the addition of a TNIC3 peer to the S&P 500 index has positive and statistically significant effects on all four common-ownership measures. Value-weighted Kappa rises by 7.76 percentage points ($t = 3.96$), value-weighted cosine similarity rises by 4.09 percentage points ($t = 3.16$), equally-weighted Kappa rises by 3.90 percentage points ($t = 2.28$), and

[26] One might also consider using exclusions of firms from the index. However, we do not use exclusions for two reasons. First, the paper that initiated this method, Boller and Morton (2020), shows that (page 19 in their SSRN version) exiting firms tend to be removed because they are acquired, go private, or declare bankruptcy. In such cases, measuring the change in common ownership between the exiting firm and its product market competitor in the index is often not possible. The remaining companies are typically moved to either the S&P Midcap 400 or S&P Smallcap 600. Because these firms remain in a major index, their institutional ownership does not change significantly. For these reasons, the literature does not use exits. Second, we tested using exits and confirmed this observation: we could not find a strong first stage for the exit and common ownership measures. As a result, we did not use exits.

[27] We also construct an alternative control group using TNIC3 peers of firm X that sit in the S&P MidCap 400 or SmallCap 600 indices (rather than S&P 500 non-peers), and the null reduced-form pattern is unchanged, as presented in Table B14.

equally-weighted cosine similarity rises by 2.38 percentage points ($t = 2.34$), all significant at conventional levels. These first-stage results show that peer additions to the index create meaningful variation in common ownership. Panel B presents the reduced-form effect on antitrust litigation. Neither coefficient is statistically significant: the FTC/DOJ coefficient is 0.94 ($t = 1.44$) and the consumer coefficient is −1.23 ($t = -0.62$). Thus, despite the sizable first-stage impact on common ownership, a rival's index inclusion does not generate a statistically significant change in the focal firm's likelihood of being named in antitrust litigation. These null reduced-form results are consistent with our firm-level baseline findings and reinforce the paper's broader message that common ownership does not robustly predict antitrust litigation. As a robustness check, Table B14 reports the same DiD with an alternative control group constructed from TNIC3 peers outside the S&P 500 (in the S&P MidCap 400 and SmallCap 600 indices); the null reduced-form pattern is unchanged.

5. Conclusion

Academics and policymakers closely examine the effects of investors, particularly institutional ones, holding large equity stakes in competing firms. A key question is whether shared ownership among rivals leads firms to reduce competitive activities to maximize joint profits. Research on this topic yields mixed results. While some studies suggest that common ownership may dampen competition, others find no significant impact on key outcomes such as prices or profitability. Additional evidence is therefore valuable for understanding the link between common ownership and anti-competitive behavior.

By analyzing U.S. antitrust cases, we provide direct empirical evidence on the relationship between common ownership and litigation, a salient consequence of anti-competitive conduct. While some measures of common ownership are positively correlated with consumer-initiated litigation, these correlations are not robust across measures or litigation types and do not persist under causal identification strategies based on financial-institution mergers or S&P 500 index additions. Overall, our findings do not provide robust evidence of a systematic relationship between common ownership and observed antitrust litigation.

We also examine several observable practices often associated with coordination, such as interlocking directorates and compensation peer benchmarking. We find that these practices become less prevalent with greater common ownership. However, these patterns do not lend themselves to a single interpretation. They may reflect a reduction in explicit and easily detectable forms of coordination, but could also be consistent with shifts toward less observable channels or changes in governance and monitoring. As such, our results do not allow us to draw definitive conclusions about the underlying mechanisms linking common ownership to firm behavior.

Future research will benefit from richer and more direct measures of competitive conduct, which would allow for a clearer assessment of how common ownership shapes firms' strategic interactions and governance outcomes.

CRediT authorship contribution statement

Huaizhou Li: Writing – review & editing, Writing – original draft, Methodology, Data curation, Conceptualization. **Leo Liu:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation, Conceptualization. **Ronald Masulis:** Writing – review & editing, Writing – original draft, Conceptualization. **Jason Zein:** Writing – review & editing, Writing – original draft, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Jason Zein and Huaizhou Li reports financial support was provided by The center for law, market and regulation, UNSW. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jcorpfin.2026.103037.

Data availability

Data will be made available on request.

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