Empirical Essays on Common Ownership

by

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To my family and friends

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CHAPTER 1

Synopsis

Abstract

This chapter provides a brief introduction to the field of common institutional ownership research. In a first step, I outline the motivation behind the dissertation. Next, I provide an overview of the dissertation, which is comprised of three interdependent research projects. I also summarize the key empirical results. The final section concludes.

1.1 Motivation

Common ownership is a reality of today's economy.

– Noah Joshua Phillips, *U.S. Federal Trade Commission (FTC), June 2018*[1]

Dating as far back as Smith (1776), modern corporate finance theory has generally been based on the assumption that the strict pursuit of corporate self-interest leads to a beneficial result for a single firm (e.g., value maximization). This view fits perfectly with corporate ownership structures involving large institutional investors with substantial holdings in a single firm.[2] As long as these investors do not hold significant stakes in other interacting firms, the pursuit of corporate self-interest by the single firm seems to be fully congruent with the financial interest of its owners.

However, things change if a firm's investors have other significant holdings in horizontally connected firms (e.g., natural competitors) or vertically dependent firms. These parallel investments in multiple firms are called common ownership, or overlapping ownership structures. They denote a practice whereby two or more firms become partially owned by the same set of investors. This change in perspective means that the single firm and its diversified investors are no longer necessarily pursuing the same interests.

To clarify, consider the portfolio of an institutional investor that contains two firms. Firm *A* is a supplier to firm *B*. Firm *A* wants to raise its prices, while firm *B* is logically opposed to it. If the investor were only invested in firm *A*, he would not care about firm *B*. However, because he is also invested in firm *B*, he is equally affected by the price increase. The positive effect on firm *A* is offset by the negative effect on firm *B*. Thus, the investor is less supportive of the price increase.

Table 1.1, which shows the current level of common ownership in the United States (U.S.), illustrates that this potential conflict of interest is by no means merely theoretical. Specifically, the Table lists the largest institutional investors of the top competitors in four core industries of the U.S. economy as of the end of 2018. We can therefore observe that common ownership is already deeply

Table 1.1
A vivid example of common ownership in the United States

This table reports the largest investors of the top competitors in four core industries of the U.S. economy as of the end of 2018. The underlying data come from the Thomson Reuters Institutional Managers (13f) Holdings Database.

		High-tech industry			
Apple	*%*	*Microsoft*	*%*	*Alphabet*	*%*
Vanguard	7.13	Vanguard	7.86	Vanguard	6.85
BlackRock	6.23	BlackRock	6.58	BlackRock	5.93
Berkshire Hathaway	5.26	State Street	3.96	Fidelity	3.99
		Durable goods industry			
Kimberly-Clark	*%*	*Clorox*	*%*	*Mohawk Industries*	*%*
Vanguard	7.97	Vanguard	12.05	Vanguard	8.51
BlackRock	7.10	BlackRock	8.26	Eagle Capital	5.97
State Street	5.18	State Street	6.15	BlackRock	5.68
		Nondurable goods industry			
Coca-Cola	*%*	*PepsiCo*	*%*	*Procter & Gamble*	*%*
Berkshire Hathaway	9.41	Vanguard	8.80	Vanguard	7.79
Vanguard	7.03	BlackRock	6.86	BlackRock	6.72
BlackRock	5.96	State Street	4.50	State Street	4.48
		Bank industry			
Wells Fargo	*%*	*Citigroup*	*%*	*Goldman Sachs*	*%*
Berkshire Hathaway	9.07	Vanguard	7.34	Vanguard	6.70
Vanguard	6.98	BlackRock	7.06	BlackRock	5.97
Price T Rowe	6.95	State Street	4.37	State Street	5.67

embedded in all industries of the economy. Moreover, this concentration of institutional ownership is not limited to the U.S.; it can be generalized to all other major economies.[3] The underlying institutional investor holdings data come from the Thomson Reuters Institutional Managers (13f) Holdings Database. The Securities and Exchange Commission (SEC) requires disclosure of this information in their 13f security section from all institutional investment managers with at least $100 million in assets under management for a given quarter. Collectively, such large asset management companies as Vanguard, BlackRock, and State Street hold substantial stakes in multiple firms across different industries.

The phenomenon of common ownership spans two strands of literature. First, it raises questions about the economic consequences along various corporate dimensions. This has generated studies about its impact on, e.g., advertising (Lu et al. (2022)), corporate governance (Antón et al. (2022)), accounting practices (Park et al. (2019)), innovation (López and Vives (2019)), and the labor market (Azar and Vives (2021)). However, much of the existing work has focused only on overlapping ownership structures within an industry. Little research to date has explored the broader economic effects (and across industries).

This dissertation embraces the wider view, and examines how common ownership influences its portfolio firms beyond any industry effects. I aim to shed light on whether and how common ownership affects firms along three core corporate finance dimensions: capital structure decisions, sustainability activities (with a focus on environmental issues), and corporate disclosure behavior. All three outcomes have been shown in recent studies to be of significant interest to institutional investors (Chu (2018), Serafeim (2018), Crane et al. (2019), Krüger et al. (2020), Garel et al. (2021),

and Ramalingegowda et al. (2021)), and should thus be considered as systematic risk factors for diversified common investors.

Second, common ownership has drawn attention from scholars and antitrust authorities (Elhauge (2020) and Posner (2021)) because of the potential eroding effects on product market competition (He and Huang (2017) and Azar et al. (2018)). For example, Azar et al. (2018) find that common institutional ownership between major airlines in the U.S. is associated with higher ticket prices. However, Dennis et al. (2022) dispute this result on a methodological basis. They argue that the measurement of common ownership is biased, and does not reflect a causal relationship with airline ticket prices. Azar et al. (2022) have rebutted this challenge with an analysis showing the criticism is unfounded and factually incorrect.

Ultimately, the debate over whether common ownership has a significant impact on competition is far from settled, and is therefore beyond the scope of this dissertation.[4]

The remainder of this introductory chapter is structured as follows. Section 1.2 provides a brief summary of the three independent empirical studies that compose this dissertation. Section 1.3 summarizes and concludes.

1.2 Overview of research projects

The cumulative dissertation comprises three independent empirical studies that investigate the influence of common ownership on firms' corporate decision-making. The first study examines the impact of overlapping ownership structures between two firms on their capital structure decisions. In particular, we use a two-step pairwise model approach from Fracassi (2017) to assess firms' similarity in their leverage decisions. Fracassi (2017) shows that social ties between directors and executives can influence similarity in capital investment decisions between firms. We take a slightly different perspective in the other two studies. We demonstrate how common investor peers matter in corporate environmental decisions and corporate disclosure decisions, respectively. In particular, we define a peer group based on its overlapping ownership structures to the focal firm.

The following sections briefly summarize the key findings of the studies, identification strategies, and background information.

Connected firms: Common ownership and corporate financial policy decisions (*Chapter 2*). The first study is co-authored with Wolfgang Drobetz, Sadok El Ghoul, Omrane Guedhami, and Henning Schröder. We attempt to answer whether common ownership affects firms' corporate financial policy decisions. In particular, we explore whether the simultaneous influence of institutional investors in commonly held firms creates similarities in leverage decisions across invested entities. Although the literature thus far has focused on the coordinated influence of institutional investors in a single firm or industry, it seems plausible that connected investors would jointly coordinate their activities across all of their common firms (Crane et al. (2019)).[5] Furthermore, influencing the leverage policies of firms should be an important aspect for diversified institutional investors. They are primarily concerned with the systematic risk of their investments, and should include firms' leverage decisions in their risk assessment.

After controlling for common drivers of corporate financial decisions, the results confirm our expectations. Firms connected through common institutional investor holdings exhibit a substantially higher degree of similarity in their financial policies than their unconnected (statistically and economically) counterparts. We adopt an approach similar to that of Antón and Polk (2014) to measure common ownership between firms. They show that firms with overlapping ownership structures exhibit excess comovements in their market returns. We then apply a two-step pairwise approach from Fracassi (2017) to measure firms' similarity in their corresponding financial policy decisions. Running a pairwise gravity model equation, along with U.S. corporate financial data from 1988 through 2018, we show that firms with overlapping ownership structures have more similar leverage, cash, and payout policies. The findings are robust after controlling for firm-level determinants of corporate financial policy targets, industry peer effects, and other known pair characteristics, as well as pair- and time-fixed effects.

We apply two different strategies to prove causality. First, building on previous work (Antón and Polk (2014), Koch et al. (2016), Crane et al. (2019), and Bajo et al. (2020)), we conduct a quasi-natural experiment based on the 2003 mutual fund scandal. In September 2003, several fund families, accused of illegal practices (e.g., "late trading" and "market timing"), negotiated settlements with the SEC. When the scandal was publicly disclosed, it caused to significant reputation-driven outflows from the funds involved, which began in the last quarter of 2003 and continued through the end of 2005. Funds not involved experienced inflows during this period (Houge and Wellman (2005), Zitzewitz (2009), and Koch et al. (2016)). This event created plausibly exogenous variation in firms' common ownership, depending on the level of ownership of each firm by affected funds prior to the scandal.

Second, we use a modified version of the Kempf et al.'s (2017) approach to measure common investors' distraction. This allows us to identify times when common investors are distracted by external events, and can no longer exert a significant influence on the firm. In sum, both identification strategies indicate that the relationship is causal. This confirms our main finding that firms connected through common institutional investor holdings exhibit a substantially higher degree of similarity in their financial policies because of this institutional connection.

Along the way to the final version included in Chapter 2 of this dissertation, the manuscript has been revised several times, based on helpful comments by experts in the field. We thank Wolfgang Bessler, David Florysiak, Michael Halling, Steffen Meyer, Ignacio Requejo, and Laura T. Starks for their valuable contributions.

Investor peer pressure in corporate environmental policy decision making (*Chapter 3*). The second study is co-authored with Wolfgang Drobetz and Henning Schröder. We investigate firms' decision-making in the environmental dimension of ESG. The term ESG captures the three dimensions of sustainability: environmental, social, and governance. We focus here on the first dimension, the environment, and aim to shed light on the interplay between common investor peers and the focal firm in environmental decision-making. Using the Antón and Polk's (2014) common ownership measure, we denote a firm as in the peer group if it has a common institutional investor base with the focal firm in a given year. A recent survey study by Krüger et al. (2020) highlights the importance

of climate risk assessment for institutional investors and their portfolio firms. However, it remains unclear what contributions each individual firm can make to protect the environment and decelerate climate change.

Managers maximize shareholder value, and investors seek the highest return on their invested capital. In a perfect setting, an independent authority would solve any resulting externality problems, such as human-caused climate change. In the real world, however, this is not the case. There are many stakeholders, and they would need to coordinate their activities, which they do not. Therefore, the relationship between managers and investors plays an increasingly important role in this context, because managers ultimately run the firm. They are under investor scrutiny, and their activities are incentivized by investors (e.g., compensation schemes). Some investors consider environmental protection as an expense that reduces the free cash flow of firms (and lowers potential payouts to investors). Others value environmental protection as a necessary expense that provides sustainable benefits to their portfolios and lowers systematic risk. Therefore, the right investment behavior in environmental improvements remains a veritable balancing act for managers: If they do too little, or too much, they could find themselves in an unpleasant situation at the annual meeting.

We draw inspiration from a study by Croson and Shang (2008) showing that donors tend to change their commitments in the direction of social information (i.e., donors increase their commitments when social information is above their prior commitments, and decrease them when social information is below). We posit that mimicking the signals of environmental decisions from common investor peer firms could be a dominant strategy for managers of the focal firm. Thus, we expect a significant degree of comovements between the environmental decisions of the focal firm and those of the common investor peer firms.

Using a comprehensive dataset of U.S. firms from 2001 to 2018, we find that firms adapt their environmental policy decisions in response to those of their common investor peer firms. This finding remains robust after controlling for focal firm-level determinants of environmental decisions, as well as peer-level characteristics. Our finding is also robust to sample composition, alternative environmental proxies, and endogeneity concerns. We believe that mimicking behavior is the key mechanism behind the observed comovements between investor peer firms and focal firms.

To show that our result confirms causal inference, we conduct a twofold identification strategy. First, we construct a modified version of the Kempf et al.'s (2017) investor distraction measure. This enables us to show that peer firms' environmental decisions only matter for the focal firm when the common investors are fully attentive (i.e., not distracted). For managers, having distracted common investors seems to be comparable to having no common investors.

Second, we apply a two-stage least squares instrumental variable regression based on a quasi-natural experiment. Our instrument is the proportion of peer firms that experienced a natural disaster in their state during the year. We identify natural disasters using data from the National Centers for Environmental Information, which capturs droughts, floods, heat waves, hurricanes (including tropical storms), and wildfires.[6]

We believe natural disasters are a valid instrument because managers cannot know ahead of time that their businesses may be affected in a given year. Therefore, they only adjust their environmental activities when confronted with an actual event. We find that natural disasters indeed generate

exogenous variation in common investor peer firms' environmental decision-making. This provides sufficient evidence of a causal relation.

Along the way to the final version included in Chapter 3 of this dissertation, the manuscript has been revised several times, based on helpful comments by experts in the field. We thank Miguel Antón, Mireia Giné, Peter Limbach, and Zacharias Sautner for their valuable contributions.

Investor peers matter: Empirical evidence from corporate earnings management (*Chapter 4*). The third study is co-authored with Wolfgang Drobetz, Sadok El Ghoul, Omrane Guedhami, and Henning Schröder. We analyze firms' disclosure decision-making under common ownership, specifically, accrual-based earnings management. This activity captures the application of accounting practices to improve firms' financial positions, and indicates a distortion of balance sheet quality. Because investors are dependent on high-quality balance sheets to evaluate firm performance, they should take notice of balance sheet decisions. To define the peer groups, we rely on the measure for common ownership from Antón and Polk (2014). It enables us to examine the effect of overlapping ownership structures on earnings management beyond industry affiliation.

Using a comprehensive set of U.S. firms over the 1990 to 2019 period, we find that firms' earnings management decisions are, to a large extent, influenced by their common investor peers (both statistically and economically). We interpret this finding as a common ownership-based peer effect. Managers mimic, or view, accounting practices of connected firms as a benchmark, which they view as accepted/preferred. This finding is robust after controlling for focal firm-level determinants of earnings management and other known peer-level characteristics, as well as industry, firm, and time fixed effects. We include level of institutional ownership and ownership concentration to control for the monitoring role of institutional investors.

Based on a modified version of the Kempf et al. (2017) investor distraction measure, we provide evidence of a causal link between focal firms' and peer firms' earnings management decisions. The measure also enables us to show how common investor peer effects differ from pure industry peer effects. It allows the link between the focal firm and its peers to be interrupted, while all industry linkages remain intact and unaffected by the shocks. It also qualifies a monitoring channel by showing that firms internalize common investor preferences, but only if they are able to effectively monitor them (i.e., they are not distracted).

Along the way to the final version included in Chapter 4 of this dissertation, the manuscript has been revised several times, based on helpful comments by experts in the field. We especially thank Stefano Bonini, Peter Limbach, and Yun Liu, as well as participants of my presentations at the 2022 Financial Management Association (FMA) European Conference in Lyon and the 2022 European Financial Management (EFMA) Annual Meeting in Rome, for their advice.

1.3 Conclusions

Taken together, the three studies in this dissertation provide empirical evidence that firms do not make corporate (financing) decisions in isolation. The first paper analyzes corporate financial pol-

icy decisions and the aggregate influence of common ownership; the last two document that managers are influenced by common investor peer firms, and consequently adopt/mimic their decisions. The empirical results show that corporate policies are strongly affected by common ownership. Specifically, the findings suggest that overlapping ownership structures shift the way firms make decisions in corporate financing issues, environmental activities, and disclosures. They also appear to influence corporate communication during conference calls (i.e., sentiments about climate change).

This dissertation adds to the capital structure and financial management literature by providing evidence of further interdependence between overlapping ownership structures and corporate (financial) policy decision-making. However, it leaves plenty of room for future research to explore the optimality of these decisions. It would be particularly instructive to better understand the mechanisms behind the strong comovements among institutionally connected firms. Establishing an observable communication channel between connected firms would provide strong evidence in favor of the portfolio-wide perspective that is motivated by the common ownership literature.

Endnotes

[1] The full statement is publicly available at: "https://www.ftc.gov/public-statements/2018/06/taking-stock-assessing-common-ownership".

[2] The term "institutional investor" covers a broad range of institutions that collect money for investment purposes (e.g., banks, pension funds, mutual funds, etc.).

[3] The OECD organized a hearing on the rising influence of common ownership in 2017 (Mancini and Nyeso (2017)). Seldeslachts et al. (2017) find the same pattern for publicly listed German firms.

[4] See Schmalz (2018) for a comprehensive literature review of the role of common ownership in product markets.

[5] See Enriques and Romano (2019) for a broader review of institutional investor network theory and investor voting behavior.

[6] Data from the National Centers for Environmental Information (NCEI) are maintained by the National Oceanic and Atmospheric Administration (NOAA), and are publicly available at: "https://www.ncei.noaa.gov/access/billions/".

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CHAPTER 2

Connected firms: Common ownership and corporate financial policy decisions

WITH

W. DROBETZ, S. EL GHOUL, O. GUEDHAMI, AND H. SCHRÖDER

Abstract

Using a comprehensive dataset of U.S. firms for the 1988 to 2018 period, we document that firms connected through common institutional investor holdings exhibit a substantially higher degree of similarity in their financial policies than their unconnected counterparts. This common ownership effect is both statistically and economically significant. Quantile regressions confirm its presence across subsamples, with varying levels of financial policy similarity. Furthermore, a battery of robustness tests validate that the common ownership effect shapes financial policies. We use the 2003 mutual fund scandal as a source of exogenous variation in firms' overlapping ownership structures. We exploit the heterogeneity in institutional investor attention (distraction) across time in order to address concerns that the common ownership effect may be endogenous, and to establish causality. Our results indicate that the documented common ownership effect is causal.

2.1 Introduction

Firms are connected in a multitude of ways. They may be linked by personal connections among executives and directors, industry affiliations, geographic proximity, common analysts, or common institutional investors.[1] Academics and practitioners cite a growing sense that common ownership connectivity is on the rise among U.S. firms (e.g., Azar et al. (2018), Coates (2019), Gilje et al. (2020), and Backus et al. (2021)). The term common ownership, or overlapping ownership structures, refers to the practice whereby two or more firms become partially owned by the same set of institutional investors. Current literature holds that the influence of these common investors is, to a significant extent, due to joint activities by coordinating groups of investors connected through their network of institutional holdings (Crane et al. (2019)).

Given the considerable research, however, there is a lack of consensus as to whether the influence of cross-held firms creates excess comovements (similarities) in firms' financial policy decisions across invested entities. This study provides further evidence to resolve this question. To this end, we use U.S. corporate financial data covering the period 1988 through 2018, and investigate whether the presence of common ownership between firms affects their corporate financial policy decision-making.[2] Figure 2.1 summarizes our main research question.

Our results show that firms with overlapping ownership structures exhibit more similar financial policy decisions than their institutionally unconnected counterparts.[3] These results hold and re-

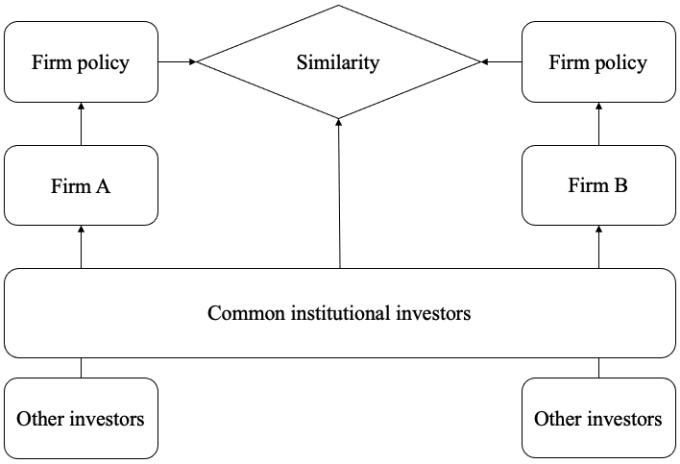

Figure 2.1. A stylized example of firms with overlapping ownership structures. This figure illustrates our research question: whether two firms with overlapping ownership structures exhibit more similarity in their financial policy decisions.

main robust after controlling for firm-level determinants of corporate financial policies, industry peer effects, and other known pair characteristics, as well as pair and time fixed effects. Specifically, we include general level of institutional ownership as an additional control variable. This allows us to rule out the possibility that our model may simply be capturing the general influence of institutional ownership.[4] In economic terms, having overlapping ownership structures increases similarity in firms' book leverage policy decisions by 4 percent. This is significant, compared to the sample average of dissimilarity in book leverage (10.9 percent). Therefore, it has an incremental impact on firms' similarity in book leverage of about 36.7 percent of its unconditional mean (4/10.9 = 36.7).

One challenge with studying firms' overlapping ownership structures is the potential for reverse causality. This is when firms with certain financial policy decisions attract investment by particular institutional investors. To rule out reverse causality, our corresponding identification strategy is twofold: First, we follow Antón and Polk (2014) and Koch et al. (2016), and use the 2003 mutual fund scandal as a source of plausibly exogenous variation in firms' common ownership. By applying a difference in differences (DiD) approach for this quasi-neutral experiment, we are able to show that the relationship is causal, and confirms our previous results.

Second, we use a plausibly exogenous shock on common investors' monitoring ability. This shows that managers have incentives to internalize the preferences of their common investors, if they are able to monitor them. This assumption is in line with previous findings holding that investor distraction reduces firm monitoring, and weakens managers' incentives to take actions that benefit shareholders (Kempf et al. (2017), Liu et al. (2020), and Gilje et al. (2020)). We use the Kempf et al. (2017) measure for investor distraction, and assume that distracted common investors will adversely affect managers. This may exacerbate the agency conflicts and information problems associated with loosening monitoring constraints, and increase the likelihood that they will take actions to benefit themselves, but hurt investor interests (e.g., empire building, or managerial overinvestment). Our results indicate that firms make less similar corporate financial decisions when their common investors are distracted. This indicates that common ownership has a causal effect

on corporate financial policy decision-making.

We further decompose total firm debt to test whether common investors prefer particular types, such as: 1) private debt instruments, including capital leases and bank loans, 2) market debt instruments, including commercial paper and bonds, or 3) other instruments, especially trade credit. Previous studies on corporate financial decisions highlight the heterogeneity of debt structure as an important factor in firms' leveraged policy decisions.

The first empirical evidence of the importance of different debt types comes from Barclay and Smith (1995a,b). In the same vein, Rauh and Sufi (2010) show that firms with better credit ratings tend to rely mainly on a single priority structure, while firms with lower credit ratings tend to diversify their priority structure by issuing both secured and subordinated debt.

In contrast, Colla et al. (2013) show that firms generally borrow with one type of debt, indicating an overall tendency toward specialization. However, they also find that large and rated firms simultaneously employ multiple debt types. Our evidence provides consistent support for more similar financial policy decisions caused by common ownership, but little support for common investor preferences for a specific debt instrument.

We conduct a battery of robustness tests to validate the notion that common ownership has a robust influence on financial policy decisions. First, we exclude the big four "supersized" institutions from our sample (BlackRock, Vanguard, State Street GA, and Fidelity), to ensure our findings are not driven by large passive (index) fund ownership. Second, we demonstrate that our finding is not biased by outliers in our sample by applying quantile regressions across each corporate financial policy. Third, we simulate a randomized assignment of our common ownership measure by applying a placebo test across different corporate financial policies. This ensures our results are not random, but are driven by our ability to correctly capture times when firms have overlapping ownership (institutionally connected) structures. Fourth, we reestimate the baseline regression by randomly reducing the original sample size to one-tenth. Fifth, we analyze whether firms with higher overlapping ownership structures also show more similarity in alternative corporate financial policies. We find evidence for more similar policy decisions related to market and operating leverage, as well as cash holdings and payouts. Sixth, we outline various scenarios in which firms may make more dissimilar policy decisions. Specifically, we test whether firms with tighter financial constraints, poorer governance, and higher threats of exit by institutional investors make more dissimilar policy decisions. We find no empirical support for these moderating factors.

We conclude that the presence of overlapping ownership structures serves as an independent factor that shapes firms' corporate financial policy decisions.

To alleviate remaining doubts about the economic relevance of our results, we also test whether more similar corporate financial policy decisions lead to more similar market outcomes. Previous literature (Jotikasthira et al. (2012), Antón and Polk (2014), and Koch et al. (2016)) shows that connected firms have strong comovements in stock prices and liquidity; we show that connected firms have more similar capital structure decisions. We conclude that firms with overlapping ownership structures should also have more similar market outcomes. In particular, we apply three proxies for firms' market outcomes: cost of equity, cost of debt, and firm valuation (measured by Tobin's q). We find that firms with overlapping ownership structures indeed exhibit more similar market outcomes

than their unconnected counterparts.

Our findings contribute to two strands of the literature. First, we extend existing literature on peer influence on firms' decision-making processes. Empirical work by Leary and Roberts (2014) and Grieser et al. (2022) shows that industry peer firms play an important role in determining corporate capital structures and financial policy decisions. They provide evidence that firms' financing decisions are often made in response to the financing decisions of these peers, and are not related to firm or peer firms' characteristics. In addition, Kaustia and Rantala (2015) and Gomes et al. (2022) show that firms connected through common analysts exhibit more excess comovements in corporate capital structure decisions. This suggests that firms rely on analysts' experience and expertise in assessing industry- and peer-level information.

Other studies document peer effects in firms' corporate policy decisions due to shared directors or socially connected executives. Specifically, Bouwman (2011) finds that firms with shared directors have similar corporate governance practices. Consistent with this, Fracassi (2017) shows that firms with socially connected directors and executives exhibit excess comovements in corporate policy decisions. These are due primarily to the personal beliefs of firms' socially connected managers. Our common ownership approach is well suited to identifying peer effects related to investors' strategic preferences. Managers are likely to observe the decisions of their investors in other firms, and to adopt peer firms' policy decisions in order to mitigate the risk of shareholder activism in their own firms.

Second, we extend the literature on firm behavior that is motivated by portfolio effects. Di Giuli et al. (2021) show that the dividend policies of newly added firms tend to move toward those of existing portfolio firms. Similarly, recent studies have found that common owners influence the strategic decisions of firms in order to internalize their impact on the value of other portfolio firms (e.g., fewer incentives for product market competition (He and Huang (2017) and Azar et al. (2018)), innovation spillovers (López and Vives (2019) and Antón et al. (2021)), and corporate governance (Edmans et al. (2019) and Antón et al. (2022))).

We build on these findings, and argue that common investors tend to affect the policies of their portfolio firms similarly. We posit that these parallel trends are the result of the aggregate influence of common investors.

Empirical evidence that overlapping portfolio positions coincide with greater aggregation of influence, and more coordination between investors, comes from Hong et al. (2005) and Pool et al. (2015). They show that socially connected mutual fund managers have more similar portfolio positions due to greater information sharing. This view is supported by Crane et al. (2019), who document that institutional investors form cliques in which they coordinate their voting behavior in a given firm. Moreover, Azar (2022) shows that firms with overlapping ownership structures are associated with a higher likelihood of sharing directors. This indicates that common ownership has an active influence on the composition of boards of directors.

Collectively, our results show that common ownership exerts an influence on firms' corporate financial decision-making processes that goes beyond the isolated effect of mere institutional ownership in a given firm. Common investors influence management similarly in both firms, independent of industry affiliation. These results add new insights to the debate on coordinated activism by

common ownership, and expand it to firms' corporate financial policy decision-making.

The remainder of this study is structured as follows. Section 2.2 describes the construction of our data, variables, and empirical strategies. Section 2.3 presents our main empirical results, while Section 2.4 details our two identification strategies. We document the prevalence of the common ownership effect across debt instruments in Section 2.5, and Section 2.6 presents our robustness tests. Section 2.7 outlines the economic consequences of similar financial policy decisions. Section 2.8 concludes.

2.2 Data and methodology

2.2.1 Data

Our initial sample is based on U.S. firms traded on the American Stock Exchange (AMEX), NASDAQ, and New York Stock Exchange (NYSE) from 1988 to 2018, and covered by the Compustat database. We exclude utilities (Standard Industry Classification (SIC codes) 4900-4999), and financial firms (SIC codes 6000-6999), because these industries are subject to heavy regulatory restrictions on their financial policy decisions. We further consider only firm-years for which Compustat provides fully consolidated balance sheet data, in order to eliminate the effect of intra-group financing activities. To minimize the influence of outliers, we remove firm-year observations where total assets are less than $1 million, and we winsorize all ratios at the 1% and 99% levels. All time-variant independent variables are lagged by one year relative to the dependent variables (at the firm or pair level) to alleviate simultaneity concerns. Definitions and sources for all variables are in Table A1.

Institutional holdings come from the Thomson Reuters Institutional Holdings (13f) Database. This directory contains equity ownership information on all institutional investment managers with at least $100 million in assets under management (AuM) by quarter.[5] We exclude institutional holdings in invested entities of less than 0.5% of total equity, as it is unlikely they will be able to influence their holdings (Azar et al. (2018)). Our baseline sample covers 79,117 firm-level observations in the first stage, which results in 78,413,262 unique pair-year observations in the second stage.[6]

We also decompose total firm debt into mutually exclusive debt types by merging our baseline sample with the Capital IQ database. Specifically, this enables us to distinguish among private debt, market debt, and other debt instruments.

In a final step, we investigate the impact of common ownership on firm performance. Following recent research (e.g., Hail and Leuz (2006), Dhaliwal et al. (2006), and El Ghoul et al. (2018)), we use four models to derive the ex ante cost of equity based on analysts' forecasts and stock prices from the Institutional Brokers Estimate System (I/B/E/S) database.[7] We estimate the cost of equity via the four models developed by Claus and Thomas (2001), Gebhardt et al. (2001), Ohlson and Juettner-Nauroth (2005), and Easton (2004). We use the average predicted value resulting from these models as our firm-specific cost of equity variable. Next, using the linking table provided by Chava and Roberts (2008), we merge the Thomson Reuters Dealscan Database with Compustat, and follow Engelberg et al. (2012) to estimate firms' cost of debt.[8]

2.2.2 Measuring common ownership

We create a firm-pair-level measure of common ownership between two firms, which is referred to as connectivity. Building on previous empirical work by Antón and Polk (2014), connectivity represents the extent to which an investor owns multiple shares within a pair of firms.

$$Connectivity_{ij,t} = \Sigma_{f=1}^{F}[\alpha_{i,f,t}(\frac{v_{i,t}}{v_{i,t}+v_{j,t}}) + \alpha_{j,f,t}(\frac{v_{j,t}}{v_{i,t}+v_{j,t}})]. \tag{2.1}$$

($\alpha_{i,f,t}$) is the fraction of firm i (firm j) held by common investor f in quarter t. We compute the firms' combined market value of equity (v) as the product of total shares outstanding times the corresponding price in quarter t. To construct pair-level connectivity measures, we aggregate the measures across all common institutional investors in each firm-pair.[9] A unique feature of our study is the dynamic nature of firms' overlapping ownership structures. We can track how their common ownership changes over the years, and conduct a longitudinal analysis of the relationship between corporate financial policy decisions and overlapping ownership structures.

2.2.3 Two-step approach

To evaluate the effect of common ownership on similarity in corporate financial policy decisions, we apply a two-step approach, based on Fracassi (2017). First, to evaluate whether two firms make more similar corporate financial policy decisions, we extract the unexplained portion of their financial policy decisions. To this end, we regress firm corporate financial policy on a set of commonly used control variables, including fixed effects, to capture the unexplained (idiosyncratic) part. Second, we compare the idiosyncratic parts of both firms, and assess whether the similarity in their corresponding policies is greater for pairs with overlapping ownership structures.

2.2.3.1 First stage: Estimating the idiosyncratic part of firms' corporate financial policy decisions

In the first stage, we measure the dissimilarity of the corresponding policy decisions between two firms. We begin by regressing each financial policy on its commonly used control variables. Fiscal year fixed effects are included in order to isolate the influence of aggregate time series trends. Firm fixed effects are included to account for time-invariant firm characteristics. All independent variables are also lagged by one fiscal year. Formally, we estimate the fixed effects panel regression model as follows:

$$Policy_{i,t} = \alpha + \beta_1 X_{i,t-1} + \beta_2 \overline{X}_{i,t-1} + \delta_{it} + \phi_t + \epsilon_{i,t}. \tag{2.2}$$

The dependent variable is one of firm i's financial policies in fiscal year (t). Covariate (α) denotes the constant. Control variables are captured by a matrix ($\beta_1 X_{i,t-1}$), with different vectors according to the corresponding financial policy typically proposed by other capital structure studies. One strand of recent research suggests that firms' corporate financial policy decisions are not determined independently of industry peers.[10]

To ensure that the idiosyncratic part of each policy is not biased by intra-sector linkages across firms (peer effects), we include them as peer-level controls ($\beta_2 \overline{X}_{i,t-1}$). They are constructed as the average of all firms within an industry-year combination, except for the focal firm itself, and include all previously used controls. We define industries by their 3-digit SIC codes. (δ_i) denotes firm fixed effects; (ϕ_t) denotes fiscal year fixed effects. $\epsilon_{i,t}$ is the firm-year-specific error term, which captures the idiosyncratic, unexplained part of each policy decision. The corresponding results are in Tables A2 to A5.

As Table A2 shows, we next conduct a regression analysis to isolate the idiosyncratic part of firms' policy decisions regarding (net) book leverage or net debt (equity) issuance. We build on prior work on capital structure decisions (e.g., Rajan and Zingales (1995), Faulkender and Petersen (2006), Lemmon et al. (2008), and Frank and Goyal (2009)), and control for the firm-level characteristics most robustly associated with leverage ratios for our baseline regression. Specifically, we include firm size, which proxies for firm excess debt to public and private debt financing; Tobin's q, which proxies for growth opportunities; profitability, which uses as a proxy for firm's market position, or internal cash available for investment funding; tangibility, which proxies for bankruptcy recovery rates; and R&D intensity, which proxies for firm operating riskiness. We also control for firms' general level of institutional ownership to ensure that the second stage captures an effect of institutional connectivity beyond the general level of institutional ownership. Other controls include a dividend payer indicator, capital intensity, operating leverage, and the Altman Z-score.

In Table A3, we isolate the idiosyncratic part of firm debt choice decisions in terms of private debt instruments, market debt instruments, and other instruments (trade credit). We include control variables for firm size, Tobin's q, profitability, dividend payer indicator, and tangibility. For the first two instruments, we follow Rauh and Sufi (2010) and Colla et al. (2013), and account for firm cash flow volatility, bond rating, and general book leverage ratio. For the other instruments, we control additionally for firm cash holdings, sales growth, gross profit margin, finished inventory, and raw materials (as suggested by El Ghoul and Zheng (2016)).

In Table A4, we extend our analysis to other corporate policy decisions: market leverage, operating leverage, cash holdings, and dividends. We control for commonly used variables from prior studies, such as market (operating) leverage from Chen et al. (2019), firm cash holding policy from Harford et al. (2008), and firm payout policy from Chu (2018).

In Table A5, we use three proxies for firm performance. First, as per El Ghoul et al. (2011), El Ghoul et al. (2018), and Gupta et al. (2018), we apply control variables that have been shown to be associated with firms' cost of equity financing. We proxy for firms' cost of equity capital, as implied by analysts' earnings forecasts and stock prices, using the four model approaches. In particular, the measure of the implied cost of equity capital is constructed ten months after the end of the fiscal year. This measure is the average predicted value by the residual income valuation models of Claus and Thomas (2001) and Gebhardt et al. (2001), and the abnormal growth models of Easton (2004) and Ohlson and Juettner-Nauroth (2005).[11] Moreover, we include stock return volatility, book-to-market ratios, book leverage, inflation, firm size, signed forecast error, analyst forecast dispersion, institutional ownership, and capital intensity.

Second, we follow Engelberg et al. (2012), and model firm cost of debt. We also control for firm

size, institutional ownership, Tobin's q, tangibility, profitability, credit ratings, past deal indicators, and several deal-level characteristics. Because we document the credit features at the time of creation, we focus on aggregate loan information rather than individual tranches. In particular, Sufi (2007) shows that concentrating on tranches would artificially increase the number of observations, and distort the true value of the estimation. Thus, tranches should not be considered independently of the aggregate loan observations. Third, we follow Buchanan et al. (2018), and model firm valuation by accounting for firm book leverage, firm size, institutional ownership, sales growth, capital intensity, tangibility, profitability, cash holdings, R&D intensity, and advertising intensity.

After controlling for well-known influencing factors in the respective policy decisions, we take the absolute value of the difference between the two idiosyncratic parts $|\Delta\epsilon_{i,j,t}|$ to provide a measure of similarity in the respective policy decisions. The higher the difference, the lower the similarity in decisions between the two firms. Note that a related concern is that our proxy is computed with a measurement error. However, since it occurs only in the dependent variable of the second stage, this does not bias our estimates.

Equation 2.3 shows the empirical design of our similarity estimation:

$$Policy\ Dissimilarity = |\Delta\epsilon_{ij,t}| = abs(\epsilon_{i,t} - \epsilon_{j,t}) \tag{2.3}$$

2.2.3.2 Second stage: Common ownership and corporate financial policies

In the second stage, we use a gravity model to estimate the effect of common ownership on firms' similarity in financial policy decisions.[12]:

$$\begin{aligned} ln(1+|\Delta\epsilon_{ij,t}|) =& \alpha + \beta_1 ln(1+Connectivity_{ij,t-1}) \\ &+ \beta_2 ln(Controls_{ij,t-1}) + \delta_{ij} + \phi_t + \eta_{ij,t}, \end{aligned} \tag{2.4}$$

where $(1+|\Delta\epsilon_{ij,t}|)$ is the natural logarithm of 1 plus the absolute difference of a firm-pair's idiosyncratic financial policy decisions. $(1+Connectivity_{ij,t-1})$ is the natural logarithm of 1 plus the proportion of common ownership between firms. $(Controls_{ij,t-1})$ is the natural logarithm of a set of control variables at the firm-pair level. δ_{ij} and ϕ_t are fixed effects for each firm-pair and fiscal year t. Standard errors are adjusted for heteroskedasticity and firm clustering.[13] In addition, we lag all independent variables by one fiscal year.

Because firms in a given pair may be systematically different, we include three core firm-pair-level-specific control variables: 1) absolute difference in firm size, 2) absolute difference in institutional ownership, and 3) an indicator variable for operating in the same 3-digit SIC industry. We take the logarithm of 1 plus the respective variable value (except dummy variables) to deal with zeros in these variables. To capture any residual or unobserved heterogeneity at the firm-pair level, we also include fixed effects for each firm-pair and fiscal year in the second stage.

Collectively, the similarity in financial policy decisions depends on the common ownership between the two firms, as well as on the general differences between the fundamental characteristics of the firms.

Table 2.1
Summary statistics

This table reports summary statistics for all firms and institutional investors in our sample from 1988 through 2018. For the firm level, it lists total number of firms, investors per firm, and institutional ownership. For the investor level, it shows number of investors, average portfolio size, firms per investor, and the Hirschman-Herfindahl Index (HHI), i.e., the sum of squared share ownership over all institutional investors within a firm. The summary statistic is shown across each fiscal year.

	Firm-Level			Investor-Level			
Fiscal Year	Number of Firms	Investors per Firm	Institutional Ownership	Number of Investors	Average Portfolio Size ($B)	Firms per Investor	HHI
1988	2,628	9.30	0.199	784	4.19	29.96	1,705
1989	2,549	9.44	0.206	793	5.06	29.24	1,689
1990	2,541	9.73	0.214	818	4.89	28.39	1,655
1991	2,596	10.26	0.236	850	7.27	29.42	1,552
1992	2,739	10.66	0.250	903	7.79	31.03	1,501
1993	3,087	9.70	0.237	955	10.89	32.61	1,620
1994	3,268	10.16	0.253	988	11.95	35.29	1,568
1995	3,463	9.88	0.256	1,047	15.42	34.23	1,605
1996	3,815	9.40	0.249	1,071	21.22	34.17	1,689
1997	3,974	9.89	0.258	1,161	29.26	34.17	1,632
1998	3,806	10.08	0.269	1,169	36.88	33.98	1,621
1999	3,841	10.24	0.266	1,186	54.10	33.50	1,601
2000	3,727	10.85	0.280	1,276	47.97	32.05	1,551
2001	3,426	11.59	0.299	1,196	46.15	34.41	1,453
2002	3,223	12.83	0.323	1,239	38.43	35.20	1,346
2003	3,095	13.95	0.335	1,330	42.24	34.27	1,255
2004	3,163	16.33	0.402	1,419	62.01	33.92	1,096
2005	3,090	17.22	0.430	1,523	63.73	32.56	1,046
2006	3,061	17.74	0.455	1,656	68.27	31.03	1,018
2007	3,010	17.89	0.485	1,765	69.18	29.10	1,014
2008	2,835	16.51	0.448	1,632	52.11	27.41	1,087
2009	2,660	17.06	0.433	1,539	56.85	28.01	1,072
2010	2,576	17.65	0.463	1,604	82.37	25.42	1,008
2011	2,410	19.07	0.493	1,693	86.72	25.20	964
2012	2,418	19.40	0.501	1,730	104.52	24.75	964
2013	2,467	19.89	0.513	1,842	130.24	24.59	958
2014	2,557	20.11	0.522	1,985	145.34	23.91	961
2015	2,512	20.31	0.534	2,021	147.81	23.90	976
2016	2,505	19.50	0.516	2,006	174.05	23.26	1,032
2017	2,530	19.09	0.516	2,028	209.62	22.83	1,061
2018	2,684	18.81	0.523	1,950	231.05	24.96	1,093

2.2.4 Descriptive statistics

Table 2.1 documents that the typical firm in 2018 had nearly nineteen distinct investors, which held 52.3 percent of firm equity capital in common. This is significantly more than the totals found just three decades earlier. In 1988, the typical firm had just nine distinct investors, with approximately 20 percent combined equity holdings.

On the investor level, we take a slightly different perspective. We observe that average portfolio size exhibits a similar secular time trend, increasing from $4.19 billion in 1988, to $231.05 billion in 2018. The number of distinct institutional investors increased from 784 to nearly 2,000. This enormous shift across decades may result from the increasing popularity of pooled investment vehicles, such as mutual funds and exchange-traded funds.

Table 2.2
Cross-sectional distribution of common ownership

This table reports the distribution of common ownership between two firms across time. *All firm-pairs* includes all possible pairs of firms in the sample; *Inter-industrial* indicates pairs of firms with overlapping ownership structures that are not in the same 3-digit SIC industry; and *Intra-industrial* indicates pairs of firms with overlapping ownership structures that are in the same 3-digit SIC industry. Moreover, the distribution is shown by the means, standard deviations, and 1st, 5th, 25th, 50th, 75th, 95th, and 99th percentiles for the common ownership variable. Detailed variable definitions are in Table A1.

			Percentiles						
	Mean	SD	1%	5%	25%	50%	75%	95%	99%
Panel A: All firm pairs									
Total	0.081	0.096	0.000	0.000	0.008	0.044	0.124	0.29	0.384
1988-1997	0.037	0.042	0.000	0.000	0.009	0.024	0.053	0.12	0.188
1998-2007	0.066	0.077	0.000	0.000	0.000	0.040	0.100	0.23	0.323
2008-2018	0.143	0.121	0.000	0.000	0.023	0.133	0.235	0.35	0.437
Observations									78,413,262
Panel B: Connected inter-industrial firm pairs									
Total	0.107	0.097	0.007	0.012	0.031	0.071	0.160	0.31	0.397
1988-1997	0.048	0.041	0.007	0.011	0.019	0.035	0.063	0.13	0.197
1998-2007	0.091	0.077	0.007	0.011	0.032	0.067	0.129	0.25	0.339
2008-2018	0.181	0.108	0.009	0.023	0.091	0.178	0.258	0.37	0.447
Observations									58,334,754
Panel C: Connected intra-industrial firm pairs									
Total	0.114	0.101	0.007	0.012	0.033	0.079	0.172	0.32	0.418
1988-1997	0.050	0.045	0.007	0.011	0.018	0.034	0.066	0.14	0.218
1998-2007	0.086	0.078	0.007	0.011	0.028	0.060	0.121	0.25	0.344
2008-2018	0.179	0.110	0.010	0.025	0.087	0.170	0.254	0.37	0.466
Observations									1,476,165

In the same vein, the concentration of investors per firm, measured by the Hirschman-Herfindahl index, decreased from 1,705 in 1988, to 1,093 in 2018. Holding all else equal, therefore, we would expect that corporate governance problems associated with dispersed ownership today are much worse than they were thirty years ago.

Table 2.2 shows the distribution of our common ownership measure over the past three decades. In Panel A, we observe that the magnitude of overlapping ownership structures between two firms has also increased, from 3.7 percent for 1988 to 1997, to 14.3 percent for 2008 to 2018. In general, the average firm-pair has overlapping ownership structures of about 8.1 percent of their combined equity capital. At the same time, the common ownership measure varies considerably among firm-pairs in our sample, with a mean (99th percentile) of 8.1 percent (38.4 percent). Hence, while our sample selection criteria reduce noise in the sample, we are confident there is no systematic selection bias.

The other two Panels (B and C) highlight the importance of accounting for all possible overlapping ownership structures between firms. We note that previous studies have focused mostly on overlapping ownership structures within the same industry. Our approach aims to uncover all possible connections between firms.

To illustrate the comprehensiveness of our approach, we split firms with overlapping ownership structures into inter-industry and intra-industry firm-pairs. Both panels show similar time trends,

with common ownership increasing steadily over the sample period. Regarding total number of observations, we observe that studies that focus only on firm-pairs within the same industry exclude the bulk of institutionally connected firms (1,476,165 vs. 58,334,754). We are therefore confident that our results provide new insights at a macroeconomic level, and not just at a specific industry level.

Table 2.3, Panel A, gives the descriptive statistics for the corporate financial policies of the first stage; Panel B gives them for the corresponding control variables. Variable definitions are in Table A1. Our main financial policy variable, book leverage, has a mean value of 21.4 percent, while the 25th and 75th percentile values are 1.9 percent and 34.3 percent, respectively. This indicates a large cross-sectional variation in book leverage. Similar cross-sectional variations also show the other three core financial policies (net book leverage, net debt issuance, and net equity issuance).

Moreover, by decomposing debt structure, we see that the average firm holds 51.8 percent of total debt in private debt instruments, and 44.7 percent in market debt instruments. The former is structured primarily with 7.7 percent in capital leases, and 44.1 percent in bank loans; the latter is structured with 0.7 percent in commercial paper, and 44 percent in bonds. In addition, the average firm has nearly 20 percent of its liabilities in other debt instruments (trade credit). The alternative corporate financial policies show that the average firm has a market (operating) leverage ratio of 21.9 percent (31.5 percent), and cash holdings (dividend payout) of 19.4 percent (1.1 percent). Examining our three proxies for firm performance, we find that firms have a mean cost of equity of 13.0 percent, a mean cost of debt of nearly 169 basis points, and a mean firm valuation (proxied for by Tobin's q) of 2.023.

Panel B shows the statistical distribution of all control variables. The average firm has an Altman Z-score of 0.72 (standard deviation equals 3.94), and capital intensity of 5.6 percent (standard deviation equals 6.2 percent). Approximately 38 percent of firms pay a dividend, average firm size is \$5.47 billion (standard deviation equals \$2.09 billion), average institutional ownership is 35.7 percent (standard deviation equals 25.8 percent), profitability is 5.3 percent (standard deviation equals 23.8 percent), R&D intensity is 6.5 percent (standard deviation equals 17.2 percent), and average tangibility ratio is 26.4 percent (standard deviation equals 22.5 percent).

Collectively, this distribution implies that all control variables vary widely across sample firms. For the remaining controls, we merely note that their summary statistics are comparable to those reported in previous capital structure studies (e.g., Lemmon et al. (2008), El Ghoul et al. (2011), Engelberg et al. (2012), Leary and Roberts (2014), El Ghoul and Zheng (2016), Halling et al. (2016), and El Ghoul et al. (2018)).

Table 2.4 reports the descriptive statistics for the firm-pair-level variables. Variable definitions are in Table A1. In Panel A, the average firm-pair has 8.1 percent overlapping ownership structures, and 75 percent of potential firm-pairs have common ownership. Examining our baseline policies, firm-pairs exhibit an average dissimilarity in (net) book leverage of 10.9 percent (16.2 percent) of total assets, with a 9.8 percent (13.9 percent) standard deviation. Net debt (equity) issuance has a mean of 11.7 percent (10.1 percent). The dissimilarity in private and market debt is at a comparable level, at 23.8 percent vs. 22.8 percent. Alternative corporate policies indicate significant differences in all four policies (market leverage, operating leverage, cash holdings, and dividends). Finally, dissimi-

Table 2.3
Descriptive statistics at the firm level

This table reports the summary statistics of our main firm-level variables. Panels A, B, and C report the number of non-missing observations, means, standard deviations, 1st percentile, 25th percentile, medians, 75th percentile, and 99th percentile for the listed variables. *Panel A* gives the statistics for the corporate financial policies, and *Panel B* gives the statistics for the corresponding control variables. The sample period is 1988 through 2018. Detailed variable definitions are in Table A1.

	Obs.	Mean	SD	p1	p25	p50	p75	p99
Panel A: Corporate financial policies								
Table A2								
Book leverage	79,117	0.214	0.203	0.000	0.019	0.177	0.343	0.811
Net book leverage	79,117	0.020	0.361	−0.911	−0.207	0.065	0.279	0.752
Net debt issuance	68,995	0.030	0.148	−0.293	−0.021	0.000	0.041	0.814
Net equity issuance	60,978	0.042	0.208	−0.211	−0.005	0.000	0.009	1.369
Table A3								
Private debt	25,261	0.518	0.422	0.000	0.042	0.505	1.000	1.000
Capital leases	25,261	0.077	0.232	0.000	0.000	0.000	0.012	1.000
Bank loans	25,261	0.441	0.417	0.000	0.000	0.338	0.951	1.000
Market debt	25,261	0.447	0.418	0.000	0.000	0.411	0.915	1.000
Commercial paper	25,261	0.007	0.049	0.000	0.000	0.000	0.000	0.225
Bonds	25,261	0.440	0.413	0.000	0.000	0.403	0.892	1.000
Trade credit	46,147	0.197	0.155	0.006	0.084	0.157	0.269	0.725
Table A4								
Market leverage	74,976	0.219	0.240	0.000	0.011	0.136	0.351	0.928
Operating leverage	79,117	0.315	0.292	0.000	0.107	0.244	0.432	1.515
Cash holdings	79,119	0.194	0.226	0.000	0.027	0.101	0.280	0.933
Dividends	79,117	0.011	0.026	0.000	0.000	0.000	0.011	0.160
Table A5								
Cost of equity	41,153	0.130	0.079	0.046	0.089	0.108	0.140	0.519
Cost of debt (in basis points)	11,204	168.975	127.733	15.000	75.000	150.000	225.000	605.000
Tobin's q	79,117	2.023	1.663	0.572	1.090	1.477	2.265	10.103
Panel B: Controls								
Advertising intensity	69,639	0.011	0.028	0.000	0.000	0.000	0.008	0.160
Altman Z-score	79,117	0.724	3.937	−21.183	0.455	1.652	2.586	5.274
Analyst forecast dispersion	41,153	0.132	0.329	0.000	0.016	0.037	0.096	2.250
Book-to-market	41,153	0.513	0.406	−0.068	0.250	0.418	0.662	2.264
Capital intensity	79,117	0.056	0.062	0.000	0.018	0.037	0.070	0.338
Cash flow volatility	25,261	0.110	1.201	0.005	0.020	0.037	0.079	0.863
Deal amount	11,204	5.689	1.287	2.944	4.828	5.704	6.586	8.854
Deal in past 1-3 years	11,204	0.285	0.452	0.000	0.000	0.000	1.000	1.000
Deal in past 4-6 years	11,204	0.048	0.214	0.000	0.000	0.000	0.000	1.000
Deal in 7 years or later	11,204	0.014	0.116	0.000	0.000	0.000	0.000	1.000
Deal maturity (years)	11,204	1.226	0.644	−0.693	1.099	1.609	1.609	2.079
Dividend payer	79,117	0.384	0.486	0.000	0.000	0.000	1.000	1.000
Finished inventory	46,147	0.098	0.126	0.000	0.000	0.060	0.139	0.657
Firm size ($Billion)	79,117	5.467	2.085	1.221	3.947	5.336	6.863	10.600
Gross profit margin	46,147	0.102	2.087	−14.806	0.241	0.374	0.555	0.913
Inflation	41,153	0.025	0.009	0.001	0.021	0.025	0.030	0.054
Institutional ownership	79,117	0.357	0.258	0.000	0.122	0.337	0.562	0.927
Number of covenants	11,204	1.971	1.925	0.000	0.000	2.000	3.000	6.000
Number of lead arranger	11,204	0.294	0.591	0.000	0.000	0.000	0.000	2.398
Number of participants	11,204	1.703	0.943	0.000	1.099	1.792	2.398	3.664
Number of tranches	11,204	0.262	0.417	0.000	0.000	0.000	0.693	1.386
Profitability	79,117	0.053	0.238	−1.106	0.033	0.109	0.167	0.395
R&D intensity	79,117	0.065	0.172	0.000	0.000	0.005	0.070	0.681
Raw materials	46,147	0.078	0.099	0.000	0.000	0.049	0.113	0.506
Sales growth	69,639	0.122	0.391	−0.657	−0.029	0.068	0.192	1.947
Signed forecast error	41,153	0.066	0.477	−1.080	−0.060	0.000	0.090	2.480
Stock return volatility	41,153	0.124	0.070	0.036	0.076	0.107	0.152	0.399
Tangibility	79,117	0.264	0.225	0.003	0.086	0.196	0.379	0.896
Unrated	25,261	0.692	0.462	0.000	0.000	1.000	1.000	1.000

Table 2.4
Descriptive statistics at the pair level

This table reports the summary statistics of the main variables on firm-pair levels. Panels A, B, and C report the number of non-missing observations, means, standard deviations, 1st percentile, 25th percentile, medians, 75th percentile, and 99th percentile for the listed variables. *Panel A* shows statistics for the common ownership variables, *Panel B* shows statistics for the dissimilarities in corporate financial policies, and *Panel C* for the corresponding control variables. The sample period is 1988 through 2018. Detailed variable definitions are in Table A1.

	Obs.	Mean	SD	p1	p25	p50	p75	p99
Panel A: Common ownership								
Connectivity	78,413,262	0.081	0.096	0.000	0.008	0.044	0.124	0.384
Connectivity > 0 %	78,413,262	0.763	0.425	0.000	1.000	1.000	1.000	1.000
Number of common investors	59,810,919	3.889	3.096	1.000	1.000	3.000	6.000	13.000
Distraction	78,413,262	0.009	0.020	0.000	0.000	0.000	0.000	0.082
Panel B: Dissimilarities in corporate financial policies								
Table 2.5								
Book leverage	78,413,262	0.109	0.098	0.001	0.037	0.083	0.152	0.453
Net book leverage	78,413,262	0.162	0.139	0.002	0.059	0.127	0.227	0.636
Net debt issuance	78,333,409	0.117	0.134	0.001	0.032	0.073	0.149	0.703
Net equity issuance	59,720,990	0.101	0.150	0.001	0.022	0.051	0.112	0.796
Table 2.8								
Private debt	12,496,131	0.238	0.213	0.003	0.073	0.178	0.345	0.918
Capital leases	12,496,131	0.095	0.153	0.001	0.014	0.033	0.092	0.739
Bank loans	12,496,131	0.245	0.216	0.003	0.076	0.185	0.356	0.926
Market debt	12,496,131	0.228	0.206	0.002	0.069	0.169	0.331	0.886
Commercial paper	12,496,131	0.014	0.044	0.000	0.001	0.002	0.005	0.198
Bonds	12,496,131	0.229	0.205	0.003	0.070	0.170	0.332	0.886
Trade credit	25,606,092	0.081	0.076	0.001	0.026	0.059	0.112	0.351
Table 2.12								
Market leverage	71,226,595	0.126	0.113	0.002	0.043	0.095	0.177	0.511
Operating leverage	78,415,855	0.110	0.134	0.001	0.028	0.066	0.138	0.680
Cash holdings	78,415,855	0.096	0.090	0.001	0.030	0.070	0.135	0.410
Dividends	78,285,088	0.012	0.021	0.000	0.002	0.005	0.013	0.121
Table 2.13								
Cost of equity	19,234,890	0.045	0.059	0.000	0.011	0.026	0.053	0.310
Cost of debt	797,586	69.247	69.926	0.918	23.323	50.532	91.815	348.349
Tobin's q	61,626,816	0.838	1.024	0.008	0.220	0.506	1.047	5.259
Panel C: Controls								
Abs. diff. firm size	78,413,262	4.814	24.430	0.003	0.124	0.535	2.222	70.526
Abs. diff. institutional ownership	78,413,262	0.266	0.201	0.003	0.101	0.225	0.394	0.811
Same rating	12,496,131	0.435	0.496	0.000	0.000	0.000	1.000	1.000
Same industry	78,413,262	0.025	0.156	0.000	0.000	0.000	0.000	1.000

larities in firm performance for the average firm-pair is 4.5 percent in the cost of equity, nearly 70 basis points in the cost of debt, and 83.8 percent in valuation (proxied for by Tobin's q).

Panel B shows that only about 2.5 percent of possible firm-pairs operate in the same industry, with a median difference in firm size of $535 million, and a median difference in institutional ownership of 22.5 percent in equity capital.

2.3 Baseline results

To get a sense of how overlapping ownership structures impact the similarity between firms' financial policy decisions, Figure 2.2 compares how average dissimilarity changes across quintiles of common ownership. We expect a higher degree of overlapping ownership to lead to greater similarity in policy decisions regarding (net) book debt and net debt (equity) issuance. As expected, the degree of dissimilarity in the corresponding decisions (denoted by the blue line) decreases steadily and almost linearly with larger common ownership.

To validate the pattern from Figure 2.2 in a more advanced setting, we next apply Fracassi (2017) two-step regression analyses. We examine the relationship between common ownership and firm similarity in corporate financial policy decisions. In the first stage, as discussed in Section 2.2.3.1, we regress (net) book leverage and net debt (equity) issuance on a comprehensive set of controls. We present the regression estimates from Equation 2.2 for the four financial policies in Table A2.[14]

In the second step, we capture the idiosyncratic, unexplained part of each firm policy decision, and implement it in our second stage as a dependent variable. We present the baseline regression estimates of gravity Equation 2.4 in Table 2.5.

Despite controlling for firm, industry, and general institutional ownership in the first stage, our second-stage panel regression may not fully account for fundamental differences between the two firms. Therefore, we use a set of controls that are more likely to capture these differences: 1) absolute difference in firm size, 2) institutional ownership, and 3) an indicator for operating in the same industry. All independent variables are also lagged by one year. We account for serial correlation by allowing clustering of the error terms at both firm levels. By adding fiscal year effects and pair fixed effects to all of our regressions, we isolate the influence of aggregate time series trends, and control for all time-invariant characteristics of the pair of firms.[15]

The results in columns (1) and (2) reveal that the common ownership effect (*Connectivity*) is strongly negatively associated with both book and net book leverage policies' dissimilarity. The negative sign indicates that a higher degree of common ownership between firms is correlated with higher similarity in (net) book leverage policy decisions. Technically, overlapping ownership structures are associated with a decrease in dissimilarity of (net) book leverage policy decisions by 4.0 percent (4.8 percent) ($p \leq 0.01$). In economic terms, consider that the average dissimilarity of firm-pairs' book leverage policy is 10.9 percent. Therefore, being institutionally connected has an incremental impact on firm-pairs' dissimilarity in book leverage of about 36.7 percent of its unconditional mean (4/10.9 = 36.7).

Columns (5) and (6) reinforce these findings. They show comparable results for changes in (net) book leverage ratios.[16] This finding is reassuring, because it indicates that unobserved firm-pair-specific heterogeneity is not responsible for our findings. Two firms with overlapping ownership structures are more likely to be exposed to the same aggregate influence of their common investors, and, therefore, to change policy strategies similarly over time.

In columns (3) and (4), we examine net debt- and net equity-issuing activities. We aim to determine whether and how firms are directly influenced by their common investors in financing decisions. In both columns, firms with overlapping ownership structures show a statistically signifi-

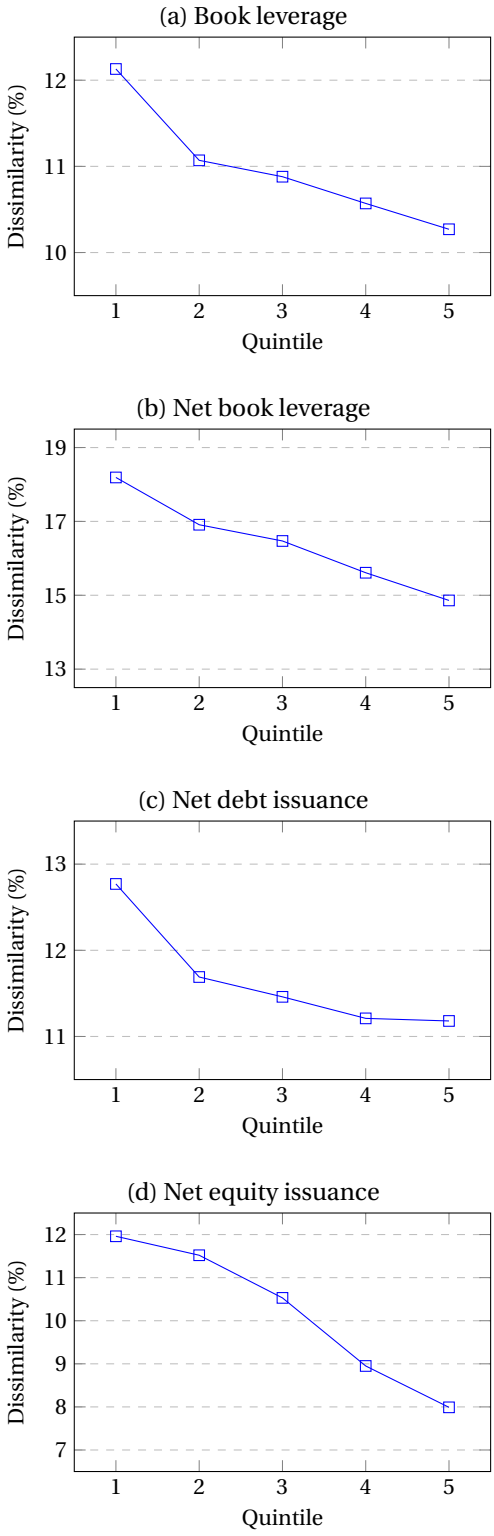

Figure 2.2. An overview of policy dissimilarities across different quintiles of common ownership. This figure shows the dissimilarity in each financial policy for each quintile of common ownership (connectivity) over the 1988 to 2018 sample period. The first quintile (1 = lowest) exhibits no common ownership; the last (5 = highest) exhibits the highest proportion of common ownership. We calculate quintiles separately for each fiscal year in order to capture secular trends across our sample period. Corporate financial policies are shown in the subfigure headings. Detailed variable definitions are in Table A1.

Table 2.5
Second stage: Baseline regressions

This table shows the second stage of the baseline regression. The formal design is defined in Equation 2.4. The unit of observation is at the firm-pair-year level. The dependent variables are in the header line, and in levels (columns (1)-(4)) or first differences (columns (5)-(6)). *Connectivity* measures the total value of both firms' equity capital held by all common investors of the firm-pair, scaled by total market capitalization of both firms. We include control variables for same-industry characteristics and differences in size and institutional ownership, i.e., *Abs.Diff.Firm Size* (*Abs.Diff.Inst.Ownership*) is the absolute difference between *Firm size* (*Institutional ownership*) of the two firms. Detailed variable definitions are in Table A1. We lag *Connectivity* by one fiscal year because the decisions about current (observed) financial policy outcomes were made at the last annual meeting. All other independent variables are also lagged by one fiscal year. We include a constant in all specifications (unreported). The sample period is 1988 through 2018. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity and clustering for both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses.

	Dependent variable in levels				Dependent variable in changes	
	Book leverage	Net book leverage	Net debt issuance	Net equity issuance	Δ Book leverage	Δ Net book leverage
	(1)	(2)	(3)	(4)	(5)	(6)
Connectivity	−0.040***	−0.048***	−0.018***	−0.072***	−0.024***	−0.033***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Same Industry	0.000	0.000	−0.002	−0.002	−0.001	−0.001
	(0.795)	(0.741)	(0.233)	(0.139)	(0.356)	(0.501)
Abs. Diff. Inst. Ownership	0.003**	0.003**	0.007***	−0.003	0.003***	0.000
	(0.017)	(0.041)	(0.000)	(0.136)	(0.001)	(0.686)
Abs. Diff. Firm size	−0.002***	−0.002***	−0.009***	−0.004***	−0.002***	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	78,413,262	78,413,262	78,333,409	59,720,990	78,413,262	78,413,262
Adj. R-squared	0.288	0.238	0.162	0.440	0.146	0.139

cantly higher similarity in financing decisions (1.8 percent and 7.2 percent). The results reinforce our previous findings that common ownership alters firms' financing behavior more similarly compared to their unconnected counterparts.

2.4 Identification

2.4.1 Exogenous variation in firm connectivity

The previous finding from the baseline regression indicates that common ownership has a significant effect on firms' similarity in corporate financial policy decision-making. However, we need further tests to prove that the association between common ownership and firms' similarity in policy decisions allows for causal inferences. It is important to note that institutional investors may simply prefer to invest in firms with more similar corporate financial policy decisions. Thus, these parallel investments may potentially create the relationship between common ownership and more similar financial policies.

To address this possible endogeneity (reverse causality), and validate our baseline finding, we apply a difference-in-differences (DiD) approach with exogenous variation in firms' overlapping ownership structure. Specifically, we use the exogeneity of a change in common ownership caused by the 2003 mutual fund scandal. Previous studies have used this investor-related shock to provide evidence of a causal relationship between common ownership and stock market return (Antón and Polk (2014), stock liquidity (Koch et al. (2016)), corporate governance (Crane et al. (2019)), and firm performance (Bajo et al. (2020). The 2003 scandal revolved around abusive transactions (market timing and late trading strategies) that led to excess returns to select institutional investors. When the scandal was made public by the Securities and Exchange Commission (SEC), it led to significant outflows from the involved funds. In contrast, funds not involved in the scandal experienced large inflows during the same period.[17]

To construct our treatment (control) group, we follow the literature (Antón and Polk (2014) and Koch et al. (2016)), and limit our sample to those firms that were ex ante potentially affected by the scandal. In particular, we construct a hypothetical common ownership ratio by taking all holdings of affected investors (by the scandal) and scaling it by the total common ownership between the two firms in the year preceding announcement of the scandal. Firms owned to a high degree by investors implicated in the scandal should experience a substantial decrease in common ownership compared to those owned to a lesser degree. Such a change in overlapping ownership structures can be plausibly considered as exogenous to the corresponding corporate financial policy decision. In other words, when an investor is essentially forced by the SEC to close a position in a specific firm, the overlapping ownership structure of that firm with other firms ceases to exist. It is unlikely that this shock will be correlated with the idiosyncratic part of a firm's corporate financial policy decision.

Formally, we estimate the following DiD approach:

$$\begin{aligned} ln(1+|\Delta c_{i,j,t}|) = &\alpha + \beta_1 treatment_i \times post + \beta_2 treatment_t \\ &+ \beta_3 post + \beta_4 ln(X_{Ci,j,t-1}) + \eta_{i,j,t}. \end{aligned} \tag{2.5}$$

$ln(1+|\Delta\epsilon_{i,j,t}|)$ is the natural logarithm of 1 plus the absolute difference of a firm-pair's idiosyncratic financial policy decisions. The *treatment* variable is an indicator that equals 1 if a firm-pair's hypothetical common ownership ratio is in the top tercile of all affected firm-pairs listed in 2002 (the year prior to the scandal), and 0 if it is in the bottom tercile. The *post* variable is a dummy that equals 1 for fiscal years after 2005, and 0 otherwise. Specifically, we use observations from the period before (1999 to 2002) and after (2005 to 2007) the scandal. We include all control variables from the baseline model in Equation 2.4. By adding year fixed effects and pair fixed effects to our policies, we can isolate the influence of aggregate time series trends, and control for all time-invariant characteristics of the firm-pair. Finally, we account for serial correlation by allowing clustering of the error term at both firm levels.

We expect a positive relationship for the interaction term. This is because firms owned to a higher degree by the affected investors face an exogenous reduction in common ownership. This should result in more dissimilar financial policy decisions. We present our regression estimates in Table 2.6.

The estimated coefficient on the interaction term has an economically and statistically positive relationship with all financial policies, except net equity issuance. Specifically, we find a DiD estimation for book leverage of 0.005 ($p \leq 0.05$). In economic terms, this implies an increase in dissimilarity of approximately 5 percent, considering that the unconditional average dissimilarity in book leverage in this sample period is 0.104. Column (5) shows that our treatment variable is highly relevant by indicating a strongly significantly negative relationship to common ownership for the 2005-2007 period (after the scandal).

Overall, firms affected by the scandal have a lower degree of similarity in their corporate financial policy decisions after the scandal. This indicates a less strict (more powerful) enforcement of their common investor preferences. The evidence strongly supports our assumption that common ownership causes firms' corporate financial policy decisions to be more similar.

2.4.2 Distracted common ownership: Reduced monitoring capacity

To further address concerns about endogeneity, we use plausible exogenous variation in the ability of common investors to monitor their holdings. This type of distraction arises from attention-grabbing events in industries unrelated to firm fundamentals. It allows us to further assess the causal influence of common ownership on similarity in corporate financial policy decisions.

We use a modified version of the Kempf et al. (2017) investor distraction measure, and apply it to our sample of common investors. Formally, we calculate common investor distraction for each firm-pair by using Equation (1) (distraction) and Equation (2) (weighting factor) (Kempf et al., 2017, pp. 1668–1669). However, note that we switch from an individual-firm perspective to a firm-pair level in order to capture times when the corresponding common investors are distracted.

Conceptually, we calculate our distraction measure in four steps. First, we use exogenous shocks to unrelated industries held by the common investors of a particular firm-pair. In this way, we can identify periods when they were likely to be distracted from the focus firm-pair. Second, we define an industry shock as belonging to the highest or lowest decile of industry market returns across all twelve Fama-French industries in a given quarter. We therefore capture the most extreme indus-

Table 2.6
Difference-in-differences: Mutual fund scandal

This table reports the difference-in-differences (DiD) estimation of firms' corporate policy decisions after their ownership was affected by the September 2003 mutual fund scandal. The formal regression design is defined as in Equation 2.4. The unit of observation is at the firm-pair-year level. The dependent variables are shown in the header line. The *treatment* identifier equals 1 if the institutional connectivity owned by scandal funds in September 2003 is higher than the median (in the top tercile), and 0 otherwise. The sample includes the four (three) years prior to (after) the mutual fund scandal period, which was mainly September 2003 through September 2004. Therefore, *post* is an indicator variable that equals 1 for all years after 2004. The set of controls is the same as in Table 2.5. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. The sample period is 1999 to 2007. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity and clustering of both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table A1.

Dependent variables	Book leverage	Net book leverage	Net debt issuance	Net equity issuance	Connectivity
	(1)	(2)	(3)	(4)	(5)
Treatment × Post	0.005**	0.008***	0.005*	0.001	−0.014***
	(0.015)	(0.003)	(0.083)	(0.689)	(0.000)
Same Industry	−0.003	−0.005	0.002	0.001	−0.007**
	(0.426)	(0.135)	(0.712)	(0.934)	(0.039)
Abs. Diff. Inst. Ownership	0.005	0.015***	0.023***	0.028***	−0.058***
	(0.265)	(0.010)	(0.006)	(0.000)	(0.000)
Abs. Diff. Firm size	−0.001**	−0.002***	−0.011***	−0.002**	−0.001**
	(0.047)	(0.002)	(0.000)	(0.024)	(0.031)
Pairs FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	1,341,894	1,341,894	1,340,832	977,599	1,341,894
Adj. R-squared	0.317	0.242	0.118	0.310	0.600

try returns (both positive and negative) in a given quarter.[18] Third, we construct *Distraction* at the firm-pair level by aggregating it across all common investors for each firm-pair. Finally, we calculate a fiscal year average to obtain a unique proportion of distraction for each firm-pair. A higher level of distraction means a higher level of attention diverted from common investors, and a lower level of monitoring intensity. In other words, the distraction measure takes a higher value if the exogenous shock occurs in unrelated industries, if the shocked industries are more important in the common investor's portfolio, and if the distracted common investors are important for the firm-pair's overlapping ownership structure.

To conduct this analysis, and test whether distracted common investors differ from their non-distracted counterparts, we use the framework from Equation 2.4. We extend it with an interaction term of our main explanatory variables, *Connectivity* and *Distraction*, as follows:

$$\begin{aligned} ln(1+|\Delta\epsilon_{i,j,t}|) = &\alpha + \beta_2 ln(1+Connectivity_{i,j,t-1}) \\ &+ \beta_2 ln(1+Connectivity_{i,j,t-1}) \times ln(1+Distraction_{i,j,t}) \\ &+ \beta_3 ln(Controls_{i,j,t-1}) + \delta_{ij} + \phi_t + \eta_{i,j,t}. \end{aligned} \tag{2.6}$$

We control for all firm-pair characteristics from the gravity model regression methodology in Equation 2.4. Each regression is estimated using standard heteroskedasticity-adjusted errors, and clustered at both firm levels. We expect a positive relationship for the interaction term, because firm-pairs owned to a higher degree by distracted common investors face an exogenous reduction in their institutional monitoring capacity. This should result in more dissimilar financial policy decisions. We use distraction as a contemporaneous measure because the weights for constructing this measure are based on information from the previous quarter. The results are in Table 2.7.

The estimation of the interaction term in column (1) shows that having distracted common investors leads to more dissimilar corporate financial policy decisions. The effect is both statistically ($p \leq 0.01$) and economically significant. A mean distracted common ownership base (with, e.g., 1 percent distracted common investors) reduces the effect of common ownership (*Connectivity*) on firms' similarity in corporate financial policy decisions by 12% (0.038 vs. 0.043).[19] Columns (2)-(4) confirm this pattern. The estimated coefficients on common ownership, as well as the interaction of this variable with common investor distraction, remain economically large and statistically significant. Specifically, the estimates in column (4) imply that being institutionally connected increases similarity by 7.7 percent. Having at least a 13.6 percent distracted common investor base eliminates this similarity (0.077/0.568).

Taken together, these results suggest that firm managers are only concerned about the corporate financial policy preferences of their common institutional investors in the presence of monitoring. In other words, when common investors' monitoring capacities are distracted, firm managers have fewer reasons to internalize the effects (externalities) of their corporate financial policy decisions on other firms in the portfolio. Ultimately, this leads to more dissimilar policy decisions.

Table 2.7
Investor distraction

This table shows the regression results for analyzing the effect of investor distraction on firm-pairs' financial policies. The formal regression is defined in Equation 2.6. The unit of observation is at the firm-pair-year level. The dependent variables are shown in the header line. *Connectivity* measures the total value of both firms' equity capital held by all common investors of the firm-pair, scaled by the total market capitalization of both firms. We use an inverse measure of monitoring capacities (*Distraction*), which is the weighted average exposure of firm investors to the shocked industries. First, we use exogenous shocks to the unrelated industries held by a given firm's investors in order to identify the time periods during which they were likely to be distracted from the focal firm. We define an industry shock if the industry is in the highest or lowest return percentile across all twelve Fama-French industries in a given quarter. We then construct firm-level distraction measures by aggregating measures across all common investors for each firm. Finally, we calculate an average annual measure for each firm-pair. Higher Distraction implies higher levels of attention distracted from shareholders and lower levels of monitoring intensity. The set of controls is the same as in Table 2.5. We lag *Connectivity* by one fiscal year because the decisions about current (observed) financial policy outcomes were made at the last annual meeting. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. Detailed variable definitions are in Table A1. The sample period is from 1988 to 2018. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity and clustering for both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses.

Dependent variables	Book leverage	Net book leverage	Net debt issuance	Net equity issuance
	(1)	(2)	(3)	(4)
Connectivity × Distraction	0.464***	0.478***	0.376***	0.568***
	(0.000)	(0.000)	(0.000)	(0.000)
Connectivity	−0.043***	−0.052***	−0.021***	−0.077***
	(0.000)	(0.000)	(0.000)	(0.000)
Distraction	−0.114***	−0.121***	−0.079***	−0.134***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	0.000	0.000	−0.002	−0.002
	(0.801)	(0.746)	(0.233)	(0.136)
Abs. Diff. Inst. Ownership	0.003**	0.003*	0.007***	−0.003*
	(0.031)	(0.065)	(0.000)	(0.092)
Abs. Diff. Firm size	−0.002***	−0.002***	−0.009***	−0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Pair FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	78,413,262	78,413,262	78,333,409	59,720,990
Adj. R-squared	0.289	0.238	0.163	0.440

2.5 Decomposing debt structure

We build next on previous research showing the importance of firms' debt heterogeneity to corporate financial policy decisions (Barclay and Smith (1995a), Barclay and Smith (1995b), Rauh and Sufi (2010), and Colla et al. (2013)). To this end, we take a closer look at debt structures and common ownership. We decompose total firm debt into three main instruments to test whether common investors prefer a particular instrument: 1) private debt instruments, including capital leases and bank loans, 2) market debt instruments, including commercial paper and bonds, and 3) other instruments, including trade credit. The main difference between the first two is that banks have a superior capacity to screen borrowers and reduce information asymmetries by implementing covenants. Trade credit, on the other hand, is more effective than the other two types of debt at curbing borrower opportunism. Burkart and Ellingsen (2004) show that trade creditors are more effective in lowering the risk of moral hazard, since they lend illiquid assets, while banks lend cash (and equivalents). In particular, it appears to be more difficult for opportunistic borrowers to surreptitiously divert illiquid assets out of the creditor's scope of action than in the case of cash.

Table 2.3 reveals that bank loans, at approximately 85 percent (0.441/0.518), appear to be the dominant choice of private debt instruments. Capital leases total about 15 percent (0.077/0.518). We note a similar pattern with bonds as the preferred market debt instrument compared to commercial paper (98 percent vs. 2 percent). Overall, firms rely slightly more on private debt instruments than on market debt instruments when composing their debt structure (51.8 percent vs. 44.7 percent).

To begin, we regress each debt instrument on its commonly used control variables.[20] We present the regression estimates of Equation 2.2 for the six debt instruments in Table A3.[21] As described in Section 2.2.3, we capture firms' idiosyncratic part of each debt instrument decision, and regress it in the second stage on the control variables related to firm-pair characteristics. Because we are examining different debt instruments, we add an indicator variable for having the same S&P credit rating to the existing set of controls from the baseline (Table 2.5).

Table 2.8 presents the regression estimations of Equation 2.4. Across the three debt instruments, columns (1), (4), and (6) show that common ownership is strongly positively associated with similarity in the corresponding debt instrument. This suggests that the baseline results of Table 2.5 are not driven by common investors' specific preference for one or two debt instruments. In column (5), however, for commercial paper, we observe no statistically significant effect. One possible explanation for this result is that commercial paper is mainly used by very large firms with good credit ratings to finance new investments, as this type of financing saves more registration costs than other debt instruments (Colla et al. (2020)). However, the shorter maturity compared to other debt instruments may lead to a maturity mismatch between assets and liabilities. Consequently, commercial paper on the one hand increases a borrower's debt capacity, but on the other hand creates an unbalanced loan portfolio that is unlikely to be of particular interest to common investors. Another explanation is that it plays only a minor role in the structure of market debt (only 2 percent). Thus, it may be largely irrelevant for common investors.

Table 2.8
Second stage: Common ownership and debt specialization

This table shows the second-stage regression results of our debt specialization model. The formal regression design is defined in Equation 2.4. Panel A uses private debt instruments, where dependent variables are shown in the header line, and *total (PD)* is the sum of capital leases, revolvers, and term loans. Panel B uses market debt instruments, where dependent variables are shown in the header line, and *total (MD)* is the sum of commercial paper and bonds (senior and subordinated bonds). The sample period is 1990 to 2018. All specifications include both firm and year fixed effects. The set of controls is the same as in Table 2.5, with one additional control variable for firms' S&P domestic long-term issuer credit rating. We lag *Connectivity* by one fiscal year because decisions about the current (observed) financial policy outcome were made at the last annual meeting. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. Standard errors are adjusted for heteroskedasticity and clustering of both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table A1.

	Private debt instruments			Market debt instruments			Other instruments
Dependent variables	Total (PD)	Capital leases	Bank loans	Total (MD)	Commercial paper	Bonds	Trade Credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Connectivity	−0.041***	−0.029***	−0.036***	−0.026**	0.002	−0.029**	−0.021***
	(0.001)	(0.000)	(0.003)	(0.034)	(0.365)	(0.021)	(0.000)
Same Industry	−0.001	−0.001	−0.002	0.000	0.000	0.000	0.000
	(0.668)	(0.673)	(0.583)	(0.944)	(0.448)	(0.912)	(0.943)
Same Rating	0.010***	0.002*	0.010***	0.008***	−0.001*	0.008***	
	(0.000)	(0.053)	(0.000)	(0.001)	(0.068)	(0.001)	
Abs. Diff. Inst. Ownership	−0.008**	0.003	−0.009**	−0.006	0.000	−0.006	0.001
	(0.035)	(0.328)	(0.018)	(0.154)	(0.950)	(0.106)	(0.674)
Abs. Diff. Firm size	−0.002***	−0.001***	−0.002***	−0.002***	0.000	−0.003***	−0.001***
	(0.000)	(0.002)	(0.000)	(0.000)	(0.183)	(0.000)	(0.000)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,496,131	12,496,131	12,496,131	12,496,131	12,496,131	12,496,131	25,606,092
Adj. R-squared	0.395	0.700	0.401	0.412	0.616	0.402	0.320

2.6 Robustness

2.6.1 Exclusion of supersized asset managers

In this section, we conduct a series of robustness tests of our baseline result that common ownership influences firms' corporate financial policy decisions. We limit our sample to investors outside the four supersized asset managers (Blackrock, Vanguard, State Street Global Advisors, and Fidelity) to illustrate that the shift in similarity is not driven by these giants alone.[22] The rise of exchange-traded funds in recent decades has made common ownership by these four more likely. To address this issue, we reestimate Equation 2.4, using the same empirical specifications and controls, but excluding these four from the calculation of common ownership. Table 2.9 reports the results.

As shown in the previous tables, common ownership (*Connectivity*) tends to lead to more similar firm financial policy decisions. Specifically, the effect of common ownership is stable across each policy decision (columns (1) to (6)), which is comparable to the baseline result from Table A5. This finding provides evidence that the effect of common ownership is likely to be independent of the presence of the four major asset managers.

2.6.2 Quantile regressions

To further explore whether our results are driven by outlier firms with unique financial policy decisions and lower common ownership, we employ quantile regressions across all financial policies (from the baseline, Table A5) for the 20th, 40th, 60th, and 80th percentiles. The results are in Table 2.10.

A similar pattern emerges across the percentiles of financial policy dissimilarity, along with the common set of control variables. We find that the common ownership coefficient (*Connectivity*) is negative and statistically significantly related to each financial policy (book leverage, net book leverage, net debt issuance, and net equity issuance). Even if a firm-pair exhibits the lowest initial dissimilarity in book leverage (see column (1)), the presence of overlapping ownership structures reduces it by a further 0.7 percent ($p \leq 0.01$). These results indicate that the association between firms' similarity in corporate financial policy decisions and common ownership is not sensitive to different percentiles of the corresponding financial policy.

2.6.3 Randomization tests

The objective of our randomized tests is twofold. First, we rule out validity concerns based on our common ownership measurement. If *Connectivity* is indeed driving the similarity in corporate financial policy decisions, we expect that a randomized *Connectivity* assignment will not be related. However, if there is an effect on similarity, it is because our results are only driven by a general trend in more similar corporate financial policy decisions. Such a trend would not be captured by our control variables or by different fixed effects.

Technically, we employ a simulation where firm-pairs randomly obtain a degree of common ownership. We run the same regression framework as in Equation 2.4 with our standard set of control variables. We then repeat the simulation 100 times. This indicates that we run the placebo test with

Table 2.9
Absence of supersized asset managers

This table shows the results of modifying the baseline regression by removing the four supersized asset managers from our sample (Blackrock, Vanguard, State Street, and Fidelity). The formal regression design is defined in Equation 2.4. The dependent variables are shown in the header line, and are in levels (columns (1)-(4)) or first differences (columns (5)-(6)). The unit of observation is at the firm-pair-year level. Dependent variables are shown in the header line. *Connectivity* measures the total value of both firms' equity capital held by all common investors of the firm-pair, scaled by total market capitalization of both firms. The set of controls is the same as in Table 2.5. We lag *Connectivity* by one fiscal year because the decisions about current (observed) financial policy outcomes were made at the last annual meeting. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. Detailed variable definitions are in Table A1. The sample period is 1988 to 2018. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity and clustering of both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses.

	Dependent variable in levels				Dependent variable in changes	
	Book leverage	Net book leverage	Net debt issuance	Net equity issuance	Δ Book leverage	Δ Net book leverage
	(1)	(2)	(3)	(4)	(5)	(6)
Connectivity	−0.036***	−0.044***	−0.033***	−0.099***	−0.030***	−0.044***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	0.000	0.000	−0.002	−0.002	−0.001	−0.001
	(0.791)	(0.737)	(0.230)	(0.134)	(0.354)	(0.497)
Abs. Diff. Inst. Ownership	0.005***	0.005***	0.007***	−0.001	0.004***	0.000
	(0.000)	(0.001)	(0.000)	(0.611)	(0.000)	(0.640)
Abs. Diff. Firm size	−0.002***	−0.002***	−0.009***	−0.004***	−0.002***	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	78,413,262	78,413,262	78,621,101	64,281,303	78,413,262	78,413,262
Adj. R-squared	0.288	0.238	0.163	0.440	0.146	0.139

Table 2.10
Quantile regression

This table shows the results of the second stage of the pair model using quantile regressions at the 20%, 40%, 60%, and 80% percentiles. The unit of observation is at the firm-pair-year level. The dependent variables are shown in each panel header line. *Connectivity* measures the total value of firms' stocks held by all common investors of the two stocks, scaled by total market capitalization of the two firms. We lag *Connectivity* by one fiscal year because the decisions about current (observed) financial policy outcomes were made at the last annual meeting. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. Detailed variable definitions are in Table A1. The sample period is 1988 to 2018. All specifications also include year fixed effects. Standard errors are adjusted for heteroskedasticity by the Powell's (1991) kernel estimator. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses.

	Percentile			
	20%	40%	60%	80%
	(1)	(2)	(3)	(4)
Panel A: Book leverage | Observations: 78,413,262				
Connectivity	−0.007***	−0.017***	−0.032***	−0.063***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	−0.003***	−0.003***	−0.003***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Inst. Ownership	0.003***	0.005***	0.007***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Firm size	0.000***	0.000***	−0.001***	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Panel B: Net book leverage | Observations: 78,413,262				
Connectivity	−0.021***	−0.043***	−0.072***	−0.117***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	0.004***	0.008***	0.013***	0.020***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Inst. Ownership	0.003***	0.006***	0.010***	0.015***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Firm size	−0.002***	−0.003***	−0.005***	−0.007***
	(0.000)	(0.000)	(0.000)	(0.000)
Panel C: Net debt issuance | Observations: 78,337,790				
Connectivity	−0.011***	−0.024***	−0.043***	−0.069***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	−0.003***	−0.005***	−0.006***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Inst. Ownership	0.002***	0.004***	0.007***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Firm size	0.000***	0.000***	−0.001***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Panel D: Net equity issuance | Observations: 60,198,696				
Connectivity	−0.017***	−0.043***	−0.095***	−0.238***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	0.006***	0.014***	0.026***	0.048***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Inst. Ownership	0.001***	0.002***	0.003***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Abs. Diff. Firm size	−0.001***	−0.002***	−0.003***	−0.008***
	(0.000)	(0.000)	(0.000)	(0.000)
Year FE	Yes	Yes	Yes	Yes

Table 2.11
Randomization tests

Panel A shows the results from the placebo regressions. *Connectivity* is randomly assigned to firm-pairs in each year based on the true proportions of its distribution and implemented in the framework of Equation 2.4. We repeat this procedure 100 times, and summarize the mean distribution of the coefficient and p-value on the variable of interest. Panel B shows the results from the random sampling regressions. We randomly draw one-tenth of the initial sample size with replacement, repeat it procedure 500 times, and summarize the mean distribution of the coefficient and p-value on the variable of interest. The unit of observation is at the firm-pair-year level. The dependent variables are shown in the header line. The set of controls is the same as in Table 2.5. We lag *Connectivity* by one fiscal year because the decisions about current (observed) financial policy outcomes were made at the last annual meeting. All controls are also lagged by one fiscal year. A constant is included, but not reported, in all specifications. Detailed variable definitions are in Table A1. The sample period is 1988 to 2018. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity and clustering of both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses.

Dependent variables	Book Leverage	Net book leverage	Net debt issuance	Net equity issuance
	(1)	(2)	(3)	(4)
Panel A: Randomized institutional connectivity assignment: 100 repetitions				
Coefficient on connectivity				
Mean	0.000	0.000	0.000	0.000
P-value on connectivity				
Mean	0.511	0.4713	0.508	0.482
Panel B: Random sampling with replacement: 500 repetitions				
Coefficient on connectivity				
Mean	−0.204	−0.241	−0.096	−0.340
P-value on connectivity				
Mean	0.000	0.000	0.012	0.000
Controls	Yes	Yes	Yes	Yes
Pair FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

a different set of institutionally connected firm-pairs each round, based on the true proportions of the common ownership distribution. To do this, we retain the actual sample, but shuffle it. Therefore, we keep the real distribution of firms with overlapping ownership structures constant, but any common investor connection between firms is random. The results are in Panel A of Table 2.11.

We find that the coefficient for common ownership (*Connectivity*) across each policy (columns (1) to (4)) is nearly 0, and the p-values are unexceptionally statistically insignificant (> 0.1). This comports with a theoretically "true" placebo effect. In contrast, the coefficient for the truly connected firm-pairs in the same regression framework, Table 2.5, is consistently negatively related to policy dissimilarity, and is statistically significant ($p \leq 0.01$). Thus, we can confirm that common ownership is an important determinant for similarity in firms' financial policy decisions.

Second, we eliminate concerns that our analysis may be influenced by sampling bias. In our case, this may occur because the population of firms that have (do not have) overlapping ownership structures may be under- (over-) represented. To overcome this issue, we run multiple regressions by randomly reducing the original sample size to one-tenth. We randomly draw one-tenth of the initial sample size with replacement, repeat the procedure 500 times, and summarize the mean distribution of the coefficient of common ownership and its p-value. This allows us to account for any potential sampling bias in our baseline specification of Table 2.5. We report the results in Panel B of Table 2.11.

In columns (1) to (4), all coefficients on common ownership (*Connectivity*) confirm our baseline findings. We show that firms with overlapping ownership structures exhibit substantially higher similarities in corporate financial policy decisions. The coefficients of these estimations are higher than those in our baseline regressions (see Table 2.5). However, increasing the number of repetitions should lead to the same coefficient magnitudes.[23] Therefore, we conclude that neither sample size nor sampling bias materially affects our inference.

2.6.4 Alternative corporate financial policies

The question also arises whether common ownership-induced similarity in corporate financial policies is restricted to the four policies from the baseline (Table 2.5). We show in previous sections that (net) book leverage and net debt (equity) issuance decisions are significantly influenced by common ownership between both firms. However, these four policies are not the only discretionary decisions managers make. We turn next to alternative policy decisions, and explore whether common ownership also affects them. We extend our baseline regression to, e.g., market leverage, operating leverage, cash holdings, and dividends. The key selection criterion for the alternative corporate policy variables is that firm managers be able to actively influence them. Therefore, we focus on dividends, without accounting for share repurchases. Previous literature on payout policy suggests that managers have more influence over dividend ratios than share repurchases, which are more sensitive to general economic conditions.[24]

We first regress each alternative corporate financial policy on its commonly used control variables.[25] We present the regression estimates of Equation 2.2 for these four alternative policies in Table A4. After extracting the idiosyncratic part of each policy, we compare the absolute value of

Table 2.12
Second stage: Alternative corporate financial policies

This table shows the second stage of the alternative corporate financial policy regressions (see Table A4 for the first stage). The formal regression design is defined in Equation 2.4. The unit of observation is at the firm-pair-year level. The dependent variables are shown in the header line and are in levels. *Connectivity* measures the total value of both firms' equity capital held by all common investors of the firm-pair, scaled by the the total market capitalization of both firms. The set of controls is the same as in Table 2.5. Detailed variable definitions are in Table A1. All independent variables are lagged by one fiscal year. A constant is included, but not reported, in all specifications. The sample period is 1988 to 2018. All specifications include both firm and year fixed effects. Standard errors are adjusted for heteroskedasticity, and clustering for both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses.

Dependent variables	Market leverage (1)	Operating leverage (2)	Cash holdings (3)	Dividends (4)
Connectivity	−0.038***	−0.044***	−0.018***	−0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Industry	−0.001	0.000	0.001	0.000
	(0.414)	(0.880)	(0.551)	(0.186)
Abs. Diff. Inst. Ownership	0.004**	0.003**	0.000	0.000
	(0.012)	(0.041)	(0.705)	(0.275)
Abs. Diff. Firm size	0.000	−0.001***	−0.001***	0.000***
	(0.413)	(0.000)	(0.000)	(0.000)
Pair FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	69,877,574	78,415,855	78,415,855	78,285,088
Adj. R-squared	0.266	0.502	0.313	0.460

the differences in these residuals among all possible firm-pairs in the sample. For each specification, we add the same set of controls as in the baseline regressions. All regressions include pair and year fixed effects. The standard errors are adjusted for heteroskedasticity and clustering for both firms.[26]

Table 2.12 reports the second stage of the alternative corporate financial policy regressions. The unit of observation is at the firm-pair-year level. The corresponding dependent variables are shown in the header line. The coefficient estimation of common ownership (*Connectivity)* is negative and statistically significant ($p \leq 0.01$) across all alternative policies (columns (1) to (4)). This suggests that market leverage, operating leverage, cash holdings, and the dividend policy are substantially more similar for firms with overlapping ownership structures than for their unconnected counterparts. In economic terms, we find that common ownership has an incremental impact on a firm-pair's corresponding policy dissimilarity of about 17 percent (3.8/21.9) for market leverage, 14 percent (4.4/31.5) for operating leverage, 8 percent (1.8/22.6) for cash holdings, and 19 percent (0.5/2.6) for dividends. Taken together, the results suggest that, in addition to the observed similarity in our baseline corporate financial policy decisions (i.e., book leverage, net book leverage, net debt issuance, and net equity issuance), the similarity of the alternative policy decisions is also influenced by common investor preferences.

2.6.5 Moderating factors

We would also expect the influence of common investors on corporate financial policy decisions to vary under certain circumstances. First, we consider financial constraints as a moderating factor. For financially constrained firms, raising external capital is not a realistic option. Thus, we would expect to observe more dissimilarities in our baseline policy decisions (i.e., (net) book leverage and debt (equity) issuance) vis-á-vis other firms. Specifically, we use the Kaplan and Zingales (1997) and Whited and Wu (2006) indices to proxy for firms' external financial constraints.

Second, we consider bad governance as another moderating factor. Firms with entrenched managers may not be responsive to the demands of their common investors. Thus, managerial entrenchment may reduce the effect of common ownership on the similarities in corresponding policy decisions. We use Bebchuk et al.'s (2009) entrenchment index to proxy for this concern.[27]

Third, market-level financial constraints may also adversely impact common investors' ability to influence policy decisions. For this reason, we use two macro-level constraints instead of firm-level constraints as an additional moderating factor. Specifically, we use default spreads for the debt side and seasoned equity offering (SEO) windows for the equity side.[28]

Fourth, we follow the literature, and use the decimalization shock between August 2000 and April 2001. This variable is a plausibly exogenous variation to liquidity that increases ex post the threat of exit by institutional investors (Bharath et al. (2013), Edmans et al. (2013), and Crane et al. (2019)). The direction of the effect on common ownership here is ambiguous. While a plausible threat of exit is favorable to a single investor, current research holds it may be less so for common ownership structures (Edmans and Manso (2011) and Crane et al. (2019)).

In a final step, we reestimate the baseline model, and add interaction effects between common ownership *(Connectivity)* and the four moderating factors. For each specification, we add the same set of controls as in the baseline regressions. All regressions include pair and year fixed effects. The standard errors are adjusted for heteroskedasticity and clustering for both firms. In untabulated results, we fail to find empirical support for any of these moderating factors. The interaction terms between common ownership and the four moderating factors are all statistically insignificant ($p > 0.1$).

We conclude that the presence of overlapping ownership structures can serve as a monitoring channel, independent of other external factors. This implies that common investors prefer certain policy outcomes, and managers care about these preferences when mandated to do so. Our result in Section 2.4.2 further highlights this potential monitoring channel by showing that firms with distracted common investors make more dissimilar policy decisions than those with attentive common investors. We posit that how they communicate their preferences to management is not important, because they do not need to engage in activism on votes or a threat of exit to achieve their preferred policy decisions. Instead, their means can be achieved informally during the fiscal year through ongoing communication between investors and management. Such behavior is consistent with a "behind-the-scenes-intervention" strategy, whereby shareholders engage in pre-vote negotiations with management to ensure their preferences are taken into account (McCahery et al. (2016) and Dressler (2020)).

The notion that common investors act in concert to achieve preferred outcomes is in line with the collaboration benefit hypothesis suggested by Enriques and Romano (2019). In particular, the authors argue that collaboration among institutional investors allows for performance improvements over investors outside the collaboration. A key reason is the intra-investor group division of labor. Each group member can concentrate its monitoring efforts on a firm in which it has a comparative advantage in terms of screening costs. On the one hand, this division of labor leads investors to act as a single entity. This may explain why firms with overlapping ownership structures are more likely to make similar policy decisions. On the other hand, managers could reduce their risk of being closely monitored by these common investor groups, and anticipate their preferred capital structure, in order to enjoy the "quiet life."

2.7 Common ownership and market outcomes

Previous literature on overlapping ownership structures between firms shows that the connectivity may cause strong comovements in stock prices (Jotikasthira et al. (2012) and Antón and Polk (2014)) and liquidity (Koch et al. (2016)). We extend these findings by shedding light on the relationship between common ownership and similarity in corporate financial policy decisions. We have shown that it leads to more similarity. Next, we explore whether it also leads to more similar market outcomes.

To test this idea, we implement an implied cost of equity (debt) and firm value (represented by Tobin's q) analysis using our two-stage approach.[29] Specifically, we reestimate the first stage of Equation 2.2, and regress the cost of (debt) equity and firm value on a policy-specific set of controls. Table A5 shows the first stage of the three alternative proxies for firms' market outcomes.[30] In the second step, we capture firms' idiosyncratic, unexplained part of each market outcome, and implement it in our second stage as a dependent variable. The second-stage regression estimates are in 2.13.

The results show that firms' overlapping ownership structures strongly influence similarity in market outcomes. The coefficient estimation of common ownership (*Connectivity*) is negative and statistically significant ($p \leq 0.01$) in columns ((1)-(3)). To put this into economic perspective, consider that the mean dissimilarity of firm-pairs' cost of equity (debt) is 4.5 percent (69.247 basis points). Thus, being institutionally connected has an incremental impact on firm-pairs' dissimilarity in the cost of equity (debt) of about 40 percent (1.49 percent) of its unconditional mean. The impact on valuation falls in between, at about 14 percent.

Taken together, we find that the effect of common ownership on firms' similarity is not limited to financial policy decisions. It also affects other market outcomes, such as firm performance.

2.8 Conclusion

This study examines the corporate financial policy decision-making of institutionally connected firms. We contribute to the fast-growing common ownership literature by examining the effects of overlapping ownership structures on similarity in financial policy decisions. Using institutional

Table 2.13
Second stage: Firm performance and common ownership

The unit of observation is at the firm-pair-year level. The formal regression design is defined in Equation 2.4. The dependent variables are shown in the header line. *Connectivity* measures the total value of firm stocks held by all common investors of the two stocks, scaled by total market capitalization of the two firms. All specifications include both firm and year fixed effects. The set of controls is the same as in Table 2.5, with one additional control variable for firms' S&P domestic long-term issuer credit rating. In columns (1) and (3), all independent variables are lagged by one fiscal year. The sample period is 1988 to 2018 in columns (1) and (3), and 1988 to 2016 in column (2). A constant is included, but not reported, in all specifications. Standard errors are adjusted for heteroskedasticity, and clustering for both firms. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table A1.

Dependent variables	Cost of equity (1)	Cost of debt (2)	Tobin's q (3)
Connectivity	−0.018***	−1.031***	−0.114***
	(0.000)	(0.000)	(0.000)
Same Industry	0.000	0.047	−0.009**
	(0.848)	(0.340)	(0.031)
Abs. Diff. Inst. Ownership	0.004**	0.259***	0.019***
	(0.018)	(0.000)	(0.001)
Abs. Diff. Firm size	0.000	−0.027***	−0.011***
	(0.924)	(0.000)	(0.000)
Same rating		−0.060***	
		(0.000)	
Pair FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	19,234,890	797,586	61,626,816
Adj. R-squared	0.338	0.128	0.411

ownership information from 1988 to 2018 for U.S. firms, we show that overlapping ownership structures affect the way firms make corporate financing decisions. This effect persists after controlling for firm-, time-, and industry-specific characteristics.

We address concerns about endogeneity and the direction of causality by using the 2003 mutual fund scandal as an exogenous shock to investor overlap. We also use investor distraction levels as a plausible source of exogenous variation in our common ownership measure. In these cases, we find a causal relationship between similarity in corporate financial policy decisions and common ownership. The probability of having detached or distracted overlapping ownership structures seems to motivate managers to make more decisions that benefit themselves but could hurt common investors. Specifically, without overlapping ownership structures, and with the full attention of these common investors, we find more dissimilar policy decisions across our main variables.

Further tests show that our baseline results are robust to excluding the big four "supersized" institutions (BlackRock, Vanguard, State Street, and Fidelity) from our sample of investors. We can also extend our results to alternative discretionary corporate financial policies, such as operating leverage, cash holdings, and dividends. In further support of the persistent effect of common ownership, we show that a random assignment between firms does not lead to any significant effect. Moreover, to ensure our results are not biased by outliers in our sample, we apply quantile regressions across each financial policy. Finally, we show that firms' overlapping ownership structures are a source of

more similarity in market outcomes, such as cost of equity, cost of debt, and valuation (Tobin's q).

Taken together, one question remains: how common investors communicate their preferences for certain financial decisions. We are able to show that monitoring capabilities are one reason why firms' policy decisions are so similar. In particular, firms with attentive common investors make more similar policy decisions than those with inattentive common investors. Given that we have no information on capital structure proposals, we assume common investors hold informal meetings with their invested firms to communicate their preferences. This is consistent with the findings of McCahery et al. (2016), who show that institutional investors tend to interact heavily with management behind the scenes. Furthermore, we find no empirical support for governance via the threat of exit, which is line with Edmans and Manso (2011) and Crane et al. (2019). They find that a plausible exit threat is weaker for common institutional investors, and is therefore less useful as a governance tool. We encourage further empirical work to explore the channel of how common investors coordinate and communicate their preferences.

Endnotes

[1] Previous research has found that the consequences of such connections can lead to various outcomes, including preferential treatment by lending conditions (Engelberg et al. (2012)), learning from industry peers' decision making (Foucault and Fresard (2014), Leary and Roberts (2014), Grennan (2019), and Grieser et al. (2022)), better equity financing conditions (El Ghoul et al. (2013)), shifting corporate policy decisions, due to common analysts' preferences (Kaustia and Rantala (2015), Israelsen (2016), and Gomes et al. (2022)), and investor network effects on voting behavior (Crane et al. (2019), Wong (2020), and Brav et al. (2021)).

[2] In this study, we follow previous literature, and use the terms common ownership and overlapping ownership structures interchangeably.

[3] In fact, our model specification technically measures the dissimilarity of the corresponding policy decision.

[4] The forms of influence in firms' strategic corporate decisions are widespread among institutional investors, and usually arise from different time horizons or distinct preferences (Bushee (1998); Hartzell and Starks (2003), Gaspar et al. (2005), Chen et al. (2007), and McCahery et al. (2016)).

[5] See Aragon et al. (2013) for a detailed introduction to the Securities and Exchange Commission's Form 13F filings.

[6] The term "unique pairs" means each firm is paired only once with every other firm.

[7] See El Ghoul et al. (2011) for an overview of the benefits of the implied cost of equity approach.

[8] The linking table is publicly available at: https://finance.wharton.upenn.edu/ mrrobert/styled-9/styled-12/index.html.

[9] To ensure we only include common institutional investors that have the ability to exercise influence, we consider shareholdings at the two quarter-ends, before and after the end of firm *i*'s and *j*'s fiscal years.

[10] Empirical evidence for industry peer effects in investment policy comes from Foucault and Fresard (2014), leverage policy comes from Leary and Roberts (2014) and Grieser et al. (2022), and payout policy comes from Grennan (2019).

[11] For the sake of brevity, we do not tabulate the underlying assumptions or results of the four models here, and we do not state their valuation equations. However, they are available from the corresponding author upon request.

[12] The gravity model is often used in economics studies that focus on trade flows between two countries. For a theoretical foundation, see Anderson (1979). For recent finance studie in which it is used, see Fracassi (2017), Richmond (2019), Lustig and Richmond (2020), and Azar (2022)

[13] See Petersen (2009) and Cameron et al. (2011) for a comprehensive discussion about how and why to double-cluster standard errors.

[14] Column (1) shows our baseline policy, in which we explore firms' book leverage policy. As expected, profitability has a negative and significant coefficient ($p \leq 0.01$). The coefficients on firm size (+), Tobin's q (-), and tangibility (+) also have the expected signs, and are statistically significant ($p \leq 0.01$). Model quality is fairly good, with a nearly 70 percent adjusted R-squared. For columns (2) to (4), we briefly note that all statistically and economically significant control variables show the expected relationship, which are generally in line with prior studies. This indicates that our sample is comparable to those used in prior studies (e.g., Rajan and Zingales (1995), Lemmon et al. (2008), Frank and Goyal (2009), and Leary and Roberts (2014)).

[15] In untabulated analyses, we also confirm that our baseline results remain qualitatively unchanged when 1) clustering standard errors at the pair level, 2) implementing fixed effects at both firm levels, and 3) changing the industry classifications to Fama-French 49 or a 2-digit SIC.

[16] We modify our two-stage approach by redefining firm-pairs' dissimilarity in financial policies as the absolute value of the first difference over time of corporate financial policy dissimilarity in (net) book leverage. The new measure is a proxy for how similar firm-pairs change financial policy decisions over time. We implement this modification of the outcome variable in our baseline regression model using the same set of control variables as in Equation 2.4.

$$Policy\ Change\ Dissimilarity = |\Delta\Delta\epsilon_{i,j,t}| = abs((\epsilon_{i,t} - \epsilon_{j,t}) - (\epsilon_{i,t-1} - \epsilon_{j,t-1})), \tag{2.7}$$

[17] See Houge and Wellman (2005) and Zitzewitz-2009 for a comprehensive summary of this scandal.

[18] Our results are robust to alternative industry specifications as 3-digit SIC industries.

[19] 0.038 = 0.043 - 0.464 * 0.01

[20] See Section 2.2.3.1 and Table A1 for a detailed summary of how these five debt measures are calculated.

[21] Overall, the control variables have the expected association with the corresponding dependent variable. Specifically, in columns (1) to (3), firms that rely more on private debt instruments are smaller and less indebted on average. Houston and James (1996); Johnson (1997) cite similar results, in showing that reliance on bank loans decreases firm size and total leverage. In columns (4) to (6), we find that reliance on market debt instruments increases with firm size, less volatile cash flows, and total leverage, as well as the presence of a credit rating. Hadlock and James (2002) and Denis and Mihov (2003) report similar findings. Column (7) shows that firms that are smaller and more profitable, with fewer tangible assets, higher cash holdings, and higher sales growth, rely more on trade credit. El Ghoul and Zheng (2016) report similar findings.

[22] To focus only on these top asset managers as the main index funds is analogous to Azar et al. (2021).

[23] Due to calculation limitations, we are not able to significantly increase the number of repeti-

tions.

[24] Guay and Harford (2000) and Jagannathan et al. (2000) show that repurchases tend to respond more than dividends to pro-cycle conditions.

[25] See, e.g., Chen et al. (2019) for control variables for firm's market (operating) leverage policy, Harford et al. (2008) for cash holding policy, and Chu (2018) for payout policy.

[26] See Section 2.2.3.1 and Table 2.1 for a detailed summary of how these four alternative measures of firms' financial policy decisions are calculated.

[27] Data on the Bebchuk et al.'s (2009) Entrenchment Index are publicly available at: "https://www.law.harvard.edu/faculty/bebchuk/data.shtml".

[28] Data on the SEO windows, according to Jay R. Ritter, are available publicly at: "https://site.warrington.ufl.edu/ritter/ipo-data/".

[29] See Section 2.2.3.1 and Table A1 for a detailed summary of how we calculate these three proxies for firms' market outcomes.

[30] In column (1), for example, we observe positive correlations between the volatility of stock returns and the book-to-market ratio, as well as between the level of book debt and the implied cost of equity of a firm. Column (2) shows that larger firms with higher credit ratings tend to have lower deal spreads. Moreover, deal amount and deal maturity are negatively correlated with deal spreads. Column (3) shows that firms' valuations are higher when they are more profitable, have a higher proportion of institutional ownership, and higher sales growth. Overall, the statistically significant coefficients in each column have the expected signs, and are consistent with prior studies (see El Ghoul et al. (2018) for cost of equity, Billett et al. (2007), Bharath et al. (2011), and Engelberg et al. (2012) for cost of debt, and Buchanan et al. (2018) for firm valuation).

Appendix

See next page for Table A1-A5.

Table A1
Variables descriptions and data sources

This table shows the descriptions of the variables used in this study. Data are available from Compustat, Institutional Brokers Estimate System (I/B/E/S), Thomson Reuters DealScan, S&P Capital IQ, and Thomson Reuters Institutional Managers (13f) Holdings. Compustat variable names are denoted by their Xpressfeed pneumonic in parenthesis.

Variable	Description	Source(s)
	Firm-specific variables	
Advertising intensity	Annual advertising expenses (xad) scaled by total sales (sale)	Compustat
Altman's Z-score	Measure of the risk of going bankrupt within the next two years. Calculation is based on Altman (1968): (((3.3*pi+sale+1.4*re+1.2*(act-lct))/at)	Compustat
Analyst forecast dispersion	Measured by the coefficient of variation of one-year-ahead analyst forecasts of earnings per share	Compustat & I/B/E/S
Bank loans	Sum of drawn credit lines and term loans scaled by total debt	Capital IQ
Bonds	Sum of senior bonds and subordinated bonds scaled by total debt	Capital IQ
Book leverage	Sum of debt in current liabilities (dlc) and total long-term debt (dltt) scaled by total assets (at)	Compustat
Book-to-market	Book value of equity (seq+txdb+itcb-ps) scaled by market value of equity (prccf*csho;or mkvalt)	Compustat
Capital intensity	Capital expenditures (capx) scaled by total assets (at)	Compustat
Capital leases	Capital leases scaled by total debt	Capital IQ
Cash flow volatility	Standard deviation of operating income before depreciation (oibdp) over previous 3 years scaled by total assets (at)	Compustat
Cash holdings	Cash and marketable securities (che) scaled by total assets (at)	Compustat
Commercial paper	Commercial paper scaled by total debt	Capital IQ
Cost of debt	Tranche-weighted all-in drawn spreads on each loan package	Dealscan
Cost of equity	Equally weighted averages of the Claus and Thomas (2001), Gebhardt et al. (2001), Easton (2004), and Ohlson and Juettner-Nauroth (2005) models	Compustat & I/B/E/S
Credit rating	Dummy variable indicating whether the firm has a AAA, AA, A, BBB, BB, or B S&P domestic long-term issuer credit rating (splticrm)	Compustat
Deal amount	Natural logarithm of total amount of the loan package	Dealscan
Deal in past 1-3 years	Dummy variable that equals one if the firm has borrowed from a lead arranger in the syndicate during the prior three years; and zero otherwise	Dealscan
Deal in past 4-6 years	Dummy variable that equals one if the firm has borrowed from a lead arranger in the syndicate during the four to six years before the current loan; and zero otherwise	Dealscan
Deal in 7 years or later	Dummy variable that equals one if the firm has borrowed from a lead arranger in the syndicate more than seven years before the current loan; and zero otherwise	Dealscan
Deal maturity	Natural logarithm of total maturity of the loan package	Dealscan
Dividend payer	Dummy variable that equals one if the firm paid any dividends (dvc+dvp) during the fiscal year; and zero otherwise	Compustat
Dividends	Sum of common dividends (dvc) and preferred dividends (dvp) scaled by total assets (at)	Compustat

(*continued*)

Table A1 — *continued*

Finished inventory	Percentage of inventory that is finished goods (invfg) scaled by cost of goods sold (cogs)	Compustat
Firm size	Natural logarithm of total assets (at)	Compustat
Gross profit margin	Ratio of total sales (sale) minus cost of goods sold (cogs) to total assets (at)	Compustat
Inflation	Realized inflation rate calculated over the next year	Compustat & I/B/E/S
Institutional ownership	Percentage of firm's equity capital held by institutional investors	13f Holdings
Market debt	Sum of commercial paper, senior bonds, subordinated bonds, and scaled by total debt	Capital IQ
Market leverage	Sum of debt in current liabilities (dlc) and total long-term debt (dltt) scaled by the total value of assets $(prcc_f * cshpri + dlc + dltt + pstkl - txditc)$	Compustat
Net book leverage	book leverage (dltt+dlc) less cash and short-term investments (che) to total assets (at)	Compustat
Net debt issuance	book leverage (dltt+dlc) less lagged book leverage to lagged total assets (at)	Compustat
Net equity issuance	Sales of equity (sstk) minus purchases of equity (prstkc) to lagged total assets (at)	Compustat
Number of covenants	Natural logarithm of total number of covenants within each loan package. A covenant is either a debt issuance sweep, equity issuance sweep, excess cash flow sweep, dividend restriction, financial covenant, or a net worth covenant	Dealscan
Number of lead arrangers	Natural logarithm of total number of lead arrangers within each loan package. A lead arranger is a bank with the following lender roles: Lead arranger, Arranger, Co-arranger, Admin agent, Agent, and Co-agent	Dealscan
Number of participants	Natural logarithm of total number of non lead arrangers within each loan package	Dealscan
Number of tranches	Natural logarithm of total number of tranches within each loan package	Dealscan
Operating leverage	Sales, general, administration expenditures (xsga) scaled by total assets (at)	Compustat
Private debt	Sum of capital leases, revolving credit lines, term loans, and scaled by total debt	Capital IQ
Profitability	Operating income before depreciation (oibdp) scaled by total assets (at)	Compustat
Raw materials	Percentage of inventory that is unfinished goods (invrm) scaled by cost of goods sold (cogs)	Compustat
R&D intensity	Research and development expenditures (xrd) scaled by total assets (at)	Compustat
Sales growth	Annual sales growth (percent change in sale)	Compustat
Signed forecast error	Measured as the difference between one-year-ahead consensus earnings forecasts and realized earnings deflated by beginning of period assets per share	Compustat & I/B/E/S
Stock return volatility	Standard deviation of stock returns over the previous twelve months	Compustat
Tangibility	Net property, plant, and equipment (ppent) scaled by total assets (at)	Compustat
Tobin's q	Book value of assets (at) minus book value of equity (seq+txdb+itcb-ps) plus market value of equity (prccf*csho; or mkvalt) scaled by total assets (at)	Compustat
Total debt	Sum of commercial paper, revolving credit lines, term loans, senior bonds, subordinated bonds, capital leases, and general other borrowings	Capital IQ

(*continued*)

Table A1 — *continued*

Trade credit	Trade payables (ap) scaled by the book value of total liabilities (lt)	Compustat
Unrated	Dummy variable that equals one if the firm has no a S&P domestic long-term issuer credit rating (splticrm); and zero otherwise	Compustat
	Firm-pair-specific variables	
Absolute difference in firm size	Absolute difference between both firms' total assets (at)	Compustat
Absolute difference in inst. ownership	Absolute difference between both firms' institutional ownership	Compustat & 13f Holdings
Connectivity	A measure of institutional investor overlap between two firms, as in Antón and Polk (2014)	Compustat & 13f Holdings
Dissimilarity in corporate financial policy	The corresponding policy dissimilarity is measured as the natural logarithm of the absolute value of the difference between both policy residuals. The residuals represents the idiosyncratic component of the corresponding policy in the first-stage of the two-stage approach. Calculation is based on Fracassi (2017)	Compustat
Distraction	A measure of institutional shareholder distraction, as in Kempf et al. (2017)	Compustat
Same industry	Dummy variable that equals one if both firms are in the same industry (three-digit SIC code); and zero otherwise	Compustat
Same rating	Dummy variable that equals one if both firms have the same S&P domestic long-term issuer credit rating (splticrm); and zero otherwise	Compustat

Table A2
First stage: Baseline regressions

This table shows the regression results of the first stage of baseline model in Table 2.5. The formal regression design is defined in Equation 2.2. The unit of observation is at the firm-year level. The dependent variables are shown in the header line. The industry-peer-averages for the dependent variable and all control variables are taken across all of the firms in the industry except the focal firm itself. Industries are defined by three-digit SIC codes. All independent variables are lagged by one fiscal-year. A constant is included, but not reported, in all specifications. The sample period is from 1988 to 2018. The standard errors are adjusted for heteroskedasticity and within-firm clustering. All specifications include firm and year fixed effects. Symbols (***), (**), and (*) indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses. A detailed definitions of the variables are provided in Table A1.

Dependent variables	Book leverage	Net book leverage	Net debt issuance	Net equity issuance
	(1)	(2)	(3)	(4)
Firm size	0.041***	0.071***	−0.038***	−0.043***
	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's q	−0.004***	−0.013***	0.009***	0.031***
	(0.000)	(0.000)	(0.000)	(0.000)
Profitability	−0.026***	0.037***	0.017**	−0.209***
	(0.002)	(0.007)	(0.023)	(0.000)
Tangibility	0.130***	0.392***	−0.052***	0.054***
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional ownership	−0.035***	−0.043***	0.060***	−0.016***
	(0.000)	(0.000)	(0.000)	(0.007)
Dividend payer	−0.007***	−0.009**	0.016***	0.002
	(0.009)	(0.014)	(0.000)	(0.353)
Capital intensity	0.022	0.120***	0.298***	0.050**
	(0.202)	(0.000)	(0.000)	(0.016)
Operating leverage	−0.009	0.052***	0.011*	−0.012
	(0.197)	(0.000)	(0.066)	(0.299)
Altman Z-score	−0.011***	−0.015***	0.006***	−0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
R&D intensity	−0.032***	−0.033***	0.027**	0.205***
	(0.001)	(0.010)	(0.026)	(0.000)
Industry peer averages	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	79,117	79,117	68.995	60.978
Adj. R-squared	0.699	0.797	0.086	0.465

Table A3
First stage: Debt specialization regressions

This table shows the regression results of the first stage of the regression model in Table A3. The formal regression design is defined in Equation 2.2. The unit of observation is at the firm-year level. The dependent variables are shown in the header line. All independent variables are lagged by one fiscal-year. A constant is included, but not reported, in all specifications. Columns (1) to (6) the sample period is from 1990 to 2018. All specifications include for both firms and year fixed effects. Column (7) the sample period is from 1988 to 2018. The industry-peer-averages for the dependent variable and all control variables are taken across all of the firms in the industry except the focal firm itself. Industries are defined by three-digit SIC codes. The standard errors are adjusted for heteroskedasticity and within-firm clustering. Symbols (***), (**), and (*) indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses. A detailed definitions of the variables are provided in Table A1.

	Private debt instruments			Market debt instruments			Other instruments
Dependent variables	Total (PD)	Capital leases	Bank loans	Total (MD)	Commercial paper	Bonds	Trade Credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm size	−0.035***	−0.016***	−0.019**	0.035***	0.002***	0.033***	−0.033***
	(0.000)	(0.003)	(0.048)	(0.000)	(0.001)	(0.000)	(0.000)
Tobin's q	−0.006*	0.004	−0.010***	0.006*	0.001***	0.005	
	(0.065)	(0.131)	(0.001)	(0.099)	(0.003)	(0.159)	
Profitability	0.049*	0.008	0.041*	−0.056***	0.003**	−0.058***	0.042***
	(0.053)	(0.549)	(0.092)	(0.010)	(0.035)	(0.007)	(0.000)
Dividend payer	0.010	0.000	0.010	−0.009	0.000	−0.009	
	(0.340)	(0.977)	(0.354)	(0.402)	(0.841)	(0.406)	
Tangibility	0.052	0.058**	−0.005	−0.059	0.003	−0.061	−0.095***
	(0.251)	(0.030)	(0.910)	(0.176)	(0.534)	(0.158)	(0.000)
Cash flow volatility	0.004***	0.000	0.004***	−0.004***	0.000	−0.004***	
	(0.004)	(0.384)	(0.005)	(0.007)	(0.284)	(0.009)	
R&D	0.015	0.006	0.009	−0.046	0.004**	−0.050	
	(0.756)	(0.818)	(0.816)	(0.226)	(0.020)	(0.189)	
Unrated	0.081***	0.002	0.079***	−0.089***	−0.001	−0.088***	
	(0.000)	(0.717)	(0.000)	(0.000)	(0.304)	(0.000)	
Book leverage	−0.287***	−0.192***	−0.096***	0.317***	−0.009***	0.327***	
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	
Institutional ownership	−0.037*	−0.015	−0.022	0.038*	−0.003	0.041*	0.015**
	(0.087)	(0.225)	(0.319)	(0.073)	(0.188)	(0.054)	(0.013)

(*continued*)

Table A3 — *continued*

Dependent variables	Private debt instruments			Market debt instruments			Other instruments
	Total (PD)	Capital leases	Bank loans	Total (MD)	Commercial paper	Bonds	Trade Credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cash holdings							0.022***
							(0.007)
Sales growth							0.005***
							(0.001)
Gross profit margin							−0.003***
							(0.001)
Finished inventory							−0.021
							(0.159)
Raw materials							−0.017
							(0.303)
Industry peer averages	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,261	25,261	25,261	25,261	25,261	25,261	46,092
Adj. R-squared	0.654	0.610	0.626	0.673	0.514	0.665	0.697

Table A4
First stage: Alternative corporate financial policies

This table shows the regression results of the first stage of the alternative corporate policies regression in Table A4. The formal regression design is defined in Equation 2.2. The unit of observation is at the firm-year level. The dependent variables are shown in the header line. The industry-peer-averages for the dependent variable and all control variables are taken across all of the firms in the industry except the focal firm itself. Industries are defined by three-digit SIC codes. All independent variables are lagged by one fiscal-year. A constant is included, but not reported, in all specifications. The sample period is from 1988 to 2018. The standard errors are adjusted for heteroskedasticity and within-firm clustering. All specifications include firm and year fixed effects. Symbols (***), (**), and (*) indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses. A detailed definitions of the variables are provided in Table A1.

Dependent variables	Market leverage	Operating leverage	Cash holdings	Dividends
	(1)	(2)	(3)	(4)
Firm size	0.060***	−0.046***	−0.027***	0.000
	(0.000)	(0.000)	(0.000)	(0.473)
Tobin's q	−0.012***	−0.007***	0.009***	0.000***
	(0.000)	(0.000)	(0.000)	(0.007)
Profitability	−0.075***	−0.101***	−0.032***	−0.003
	(0.000)	(0.000)	(0.000)	(0.135)
Tangibility	0.175***	0.063***	−0.270***	0.003
	(0.000)	(0.000)	(0.000)	(0.181)
Institutional ownership	−0.064***	−0.013*	0.010	−0.002**
	(0.000)	(0.094)	(0.113)	(0.047)
Dividend payer	−0.019***	−0.001	0.002	
	(0.000)	(0.643)	(0.445)	
Capital intensity	−0.093***	−0.015	−0.089***	−0.009***
	(0.000)	(0.399)	(0.000)	(0.002)
Operating leverage	−0.011*		−0.067***	
	(0.090)		(0.000)	
Altman Z-score	−0.010***	−0.004***		
	(0.000)	(0.007)		
Cash holdings				0.004**
				(0.031)
Book leverage				−0.008***
				(0.000)
R&D intensity	−0.041***	0.011		
	(0.000)	(0.657)		
Industry peer averages	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	74,976	79,119	79,119	79,023
Adj. R-squared	0.720	0.788	0.801	0.520

Table A5
First stage: Firm performance regressions

This table shows the regression results of the first stage of the regression model in Table A5. The formal regression design is defined in Equation 2.2. The dependent variables are shown in the header line. In columns (1) and (3) independent variables are lagged by one fiscal-year, and the unit of observation is at the firm-year level. In column (2) the unit of observation is at the loan deal-year level. The sample period is in columns (1) and (3) from 1988 to 2018, and from 1988 to 2016 in column (2). A constant is included, but not reported, in all specifications. Columns (1) and (3) include for both industry-peer-averages and firm fixed effects. The industry-peer-averages for the dependent variable and all control variables are taken across all of the firms in the industry except the focal firm itself. Industries are defined by three-digit SIC codes. Column (2) include seniority fixed effects, which indicates whether the loan is explicitly secured, whether it is unsecured, or whether this information is missing in Dealscan. All specifications include year fixed effects. The standard errors are adjusted for heteroskedasticity and within-firm clustering. Symbols (***), (**), and (*) indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are reported in parentheses. A detailed definitions of the variables are provided in Table A1.

Dependent variables	Cost of equity (1)	Cost of debt (2)	Tobin's q (3)
Stock return volatility	0.065***		
	(0.000)		
Book-to-market	0.021***		
	(0.000)		
Book leverage	0.037***		0.062
	(0.000)		(0.383)
Inflation	0.038		
	(0.788)		
Firm size	−0.001	−4.295**	−0.407***
	(0.610)	(0.024)	(0.000)
Signed forecast error	0.018***		
	(0.000)		
Analyst forecast dispersion	0.007***		
	(0.000)		
Institutional ownership	0.001	−66.912***	0.272***
	(0.732)	(0.000)	(0.000)
Tobin's q		−6.266***	
		(0.000)	
AAA credit rating		−68.106***	
		(0.000)	
AA credit rating		−62.738***	
		(0.000)	
A credit rating		−59.251***	
		(0.000)	
BBB credit rating		−26.469***	
		(0.000)	
BB credit rating		17.202***	
		(0.000)	
B credit rating		69.495***	
		(0.000)	

(*continued*)

Table A5 — *continued*

Dependent variables	Cost of equity (1)	Cost of debt (2)	Tobin's q (3)
Deal in past 1-3 years		−10.536***	
		(0.000)	
Deal in past 4-6 years		−9.461**	
		(0.025)	
Deal in past 7 years or later		−16.186***	
		(0.002)	
Deal amount		−8.463***	
		(0.000)	
Deal maturity		−9.071***	
		(0.000)	
Number of covenants		3.951***	
		(0.000)	
Number of tranches		49.317***	
		(0.000)	
Number of participants		−13.295***	
		(0.000)	
Number of lead arranger		0.146	
		(0.925)	
Sale growth			0.112***
			(0.000)
Capital intensity	0.004		0.837***
	(0.704)		(0.000)
Tangibility		10.493**	−0.186
		(0.043)	(0.103)
Profitability		−187.399***	0.954***
		(0.000)	(0.000)
Cash holdings			0.959***
			(0.000)
R&D intensity			3.076***
			(0.000)
Advertising intensity			0.575
			(0.434)
Industry peer averages	Yes		Yes
Seniority FE		Yes	
Firm FE	Yes		Yes
Year FE	Yes	Yes	Yes
Observations	41,153	11,204	69,639
Adj. R-squared	0.438	0.512	0.582

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CHAPTER 3

Investor peer pressure in corporate environmental policy decision making

WITH

W. DROBETZ and H. SCHRÖDER

Abstract

Using a comprehensive dataset of U.S. firms for the period 2001 to 2018, we study the effect of common ownership on firms' environmental policy decision-making. Specifically, we define peer groups based on overlapping ownership structures between firms, so-called common institutional investor peer firms. We denote a firm as belonging to the common investor peer group if it shares a common institutional investor base with the focal firm in a given year. We find that firms seem to adapt their environmental policy decisions to those of their common investor peer firms. This finding remains robust after controlling for focal firm-level determinants of environmental decisions, as well as various peer-level characteristics. Our finding is also robust to sample composition, alternative environmental proxies, and endogeneity concerns. We believe that mimicking behavior is the key mechanism behind the observed comovements between common investor peer firms and focal firms. Further evidence suggests that mimicking behavior is more prominent for firms with "greener" common investors, those that are larger and more innovative, and those that disclose corporate information more transparently. We also posit that common investor peer effects on focal firms' corporate environmental decisions increase in importance in the presence of capital market pressures. In general, our findings are not limited to environmental policy decisions, and can be extended to more informal environmental contexts, such as the pure managerial "sentiment on climate change."

3.1 Introduction

Since Grossman and Hart (1979) and Rotemberg (1984), it has been a common practice in economics to consider the interests of institutional investors in a firm's decision-making process. In the current literature, this practice is focused on the role of institutional investors and their involvement in corporate environmental, social, and governance (ESG) issues. Gillan et al. (2021) review this literature, and conclude that the overall evidence is mixed. On the one hand, some studies document a positive relationship between institutional ownership and firms' ESG activities (Chava (2014), Gloßner (2019), Dyck et al. (2019), and Chen et al. (2020)). On the other hand, some literature reports an opposite negative relationship between institutional ownership and firms' ESG quality and performance (Gillan et al. (2010), Borghesi et al. (2014), El Ghoul et al. (2016), and Hwang et al. (2022)), or even no specific effect on ESG (Graves and Waddock (1994), Fernando et al. (2017), and Nofsinger et al. (2019)).

In addition, there is a growing strand of literature on institutional ownership. This research suggests that the interests of the rising common ownership - the practice whereby two or more firms are partially owned by the same set of investors - differ significantly from those of individual investors (He and Huang (2017), Azar et al. (2018), and Backus et al. (2021)). Common institutional investors generally prefer to shift their single firm perspective to a portfolio firm perspective, because firms' corporate decisions could negatively impact other firms in their portfolios. Therefore, their incentives may not result in the same outcomes as an individual investor, who seeks to maximize the value of a single firm regardless of other firms in the economy.

Serafeim (2018) embraces this portfolio perspective, and theoretically analyzes the notion that common ownership may provide the best opportunity to serve as stewards and to slow environmental degradation and social inequality. Consistent with this view, Condon (2020) and Shekita (2022) find that a portfolio perspective may explain the increasing climate change-related activism of institutional ownership. Coordinated investor activities have, e.g., pressured firms into substantially reducing greenhouse gas emissions. Along the same lines, Coffee (2021) argues that a portfolio perspective can explain why common ownership influences corporate ESG decisions. Exposure to ESG risk overlaps significantly with systematic investment risk, which cannot be mitigated by diversification across firms. Therefore, common investors should focus primarily on their systematic investment risk.

Applying this portfolio perspective view, we define peer groups based on common ownership between firms. We attempt to provide empirical evidence on whether common investor peers affect firms' corporate environmental policy decisions.[1] A recent survey by Krüger et al. (2020) also highlights the importance of climate risk for institutional investor portfolios. We believe managers face noisy and limited information about the optimal level of investing in environmental issues. This makes the observed behavior of institutionally connected peer firms especially relevant for benchmarking.

We build upon Antón and Polk's (2014) common ownership measure to calculate the overlapping ownership structures between two firms. We define a common investor peer group using firms that are plausibly within the focus of focal firm management. Specifically, we rank the focal firm's institutionally connected firms in descending order (from highest to lowest common ownership). We retain those with the 10 percent highest overlapping ownership structures. By focusing on common investor peers, we can identify peer effects in environmental decision-making that are beyond those of the often-used definition of peer groups at an industry level.

Figure 3.1 gives an example of firms' interconnectedness through a common institutional investor. It resembles the connectivity patterns in our institutional investor dataset. The figure shows that the number of common investor peer firms is four times higher than the number of pure industry peer firms.

One of the major challenges in estimating peer effects is the reflection problem (Manski (1993)). This refers to the inability to disentangle the various effects that can affect peer behavior. We attempt to overcome this concern by allowing peer groups to be focal firm-specific. Each firm's peer group is based on a firm-specific set of common investors, and leads to partially overlapping peer groups across firms. Hence, two peer firms must not share an identical set of peers (in contrast

(a) Investor's portfolio

Industry A	Industry B	Industry C
Firm_{A1}	Firm_{B1}	Firm_{C1}
Firm_{A2}	Firm_{B2}	

(b) Common investor overlap

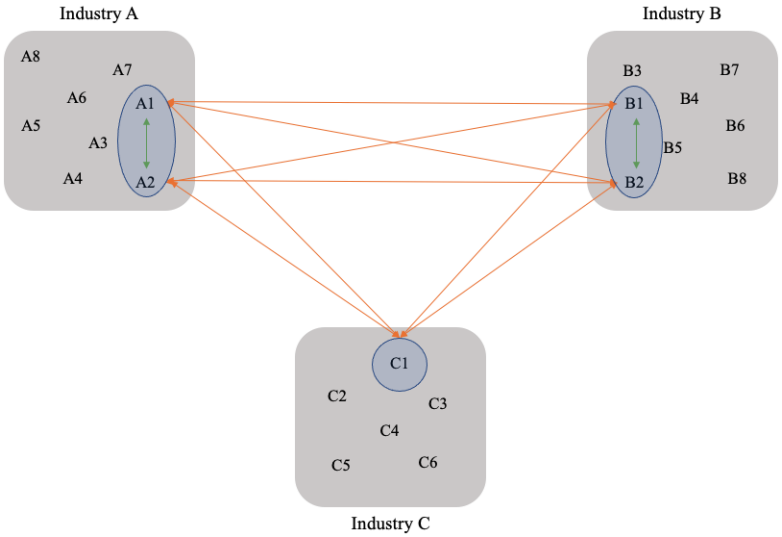

Figure 3.1. An example of overlapping ownership structures. This figure illustrates the difference in overlaps between common investors within and across industries. Figure 3.1a depicts a fictitious portfolio of an institutional investor with five portfolio companies. The five companies operate in three different industries (A, B, and C). The companies in the investor's portfolio are highlighted in blue. Figure 3.1b shows the multiple ways in which the companies are connected, within and across industries. The companies are numbered A1, A2, ..., B1, B2, ..., etc. When looking at within-industry overlap between investors, we consider only the following pairs: A1+A2 and B1+B2. This connection is denoted by a green double arrow. When considering inter-industry with common investors, we extend the potential pairs to the following cases: A1+B1, A1+B2, A1+C1, A2+B1, A2+B2, A2+C2, B1+C1, and B2+C1. This connection is highlighted by an orange double arrow.

to industry peers). As shown by previous research, the use of partially overlapping peer groups completely solves the reflection problem (e.g., Bramoullé et al. (2009), De Giorgi et al. (2010), and Aghamolla and Thakor (2022)).

We find that firms adapt their environmental decisions in response to those of their common investor peer firms. This finding is robust to controlling for focal firm-level determinants of environmental decisions, as well as peer-level characteristics. In economic terms, a 1-standard deviation increase in common investor peer firms' environmental decisions increases a focal firm's environmental score by 15.3% relative to its unconditional mean.[2]

Note that, in settings where peer effects are studied, there is always a concern that the results may be driven by generalized shocks across firms (independent from peer effects). For example, a peer firm's decision to invest in environmental protection could be influenced by industry trends or by geography (local politics). Through a series of additional tests, we find that such concerns do not affect our results. Specifically, we extend our main specification (column (5) of Table 3.2) by adding a set of fixed effects that control for common shocks across firms in different industries, states, and

time periods.

To show that our results allow for causal inference, we conduct a twofold identification strategy. First, we follow a modified version of Kempf et al.'s (2017) investor distraction measure. This enables us to show that the relationship between focal firms' and common investor peer firms' environmental decisions is causal. The measure captures exogenous attention-grabbing shocks to the monitoring capacity of the common investors. Such shocks come from industries unrelated to the focal firm, and are therefore considered orthogonal to the fundamentals of the focal firm. Moreover, by using this measure, we can show that common investor peer effects differ from pure industry peer effects. It allows the link between the focal firm and its investor peers to be interrupted, while the industry links remain intact and unaffected by the shocks.

We document that this exogenous variation shows that focal firms adapt their environmental decisions in response to those of their common investor peers. However, this occurs only when the linking common investors are attentive and thus well positioned to combat a plausible threat of shareholder activism. This finding is consistent with evidence that corporate managers internalize the preferences of attentive common investors (Gilje et al. (2020)).

Second, we apply a two-stage least squares (TSLS) instrumental variable regression based on a quasi-natural experiment. We use natural disasters as an instrument to common investor peers' environmental decision-making. Our instrument satisfies two explicit conditions: 1) the relevance condition, by being statistically significant for both the instrument t-statistic (with $p \leq 0.05$) and the F-statistic (with $p \leq 0.1$), and 2) the exclusion restriction. We assume managers cannot know ahead of time that their firms will be affected by a natural disaster. Thus, they adjust their environmental activities only when affected by an actual event.

Technically, in the first stage of the TSLS, we estimate the predicted values by regressing the endogenous variable (*Peer(Environmental Score)*) on the full set of control variables from the baseline regression (Table 3.2) and the instrument. The instrument is calculated as the proportion of common investor peer firms that experience a natural disaster in their state during the year. Information on natural disasters comes from the National Centers for Environmental Information, and captures droughts, floods, heat waves, hurricanes (including tropical storms), and wildfires. The predicted value from this first-stage regression isolates the exogenous variation in the common investor peer firms' environmental decisions and can be used as an exogenous independent variable in the second stage regression.

In the second stage, we regress each focal firm's environmental decision on the instrumented value of the average environmental decision of its common investor peer firms. We find that natural disasters generate exogenous variation in common investor peer firms' environmental decision-making. This provides evidence of a causal relation.

A battery of validation analyses verify our finding. First, we account for common investor peer firms' heterogeneity. Thus far, we have treated all firms in a common investor peer group as equally important. However, it is possible that some are more important than others in shaping environmental decisions at the focal firm level. We find that peer characteristics are important. For example, larger and more innovative peers that have more environmentally friendly common investors and communicate financial statements in a more transparent way are more relevant as benchmarks

for focal firm management. Such firms exert greater influence over environmental decisions at the focal firm level.

Second, we decompose a firm's environmental scores into its three main pillars (emissions, environmental innovation, and resource use) to test whether any one score is the key driver of the finding. However, this provides consistent support for the observed comovement in the baseline regression, and little support for a specific preference for one of these pillars.

Third, we explore a possible mimicking channel. We build on previous theoretical work by Gao and Zhang (2019), who show that a firm's managers manipulate earnings more when they believe their peers' financial statements are likely to be manipulated. We follow this intuition, and hypothesize that it may be a dominant strategy for a focal firm to follow the environmental decisions of its common investor peers. This effect is likely to be more pronounced in situations with higher capital market pressure (e.g., an upcoming large-scale equity (debt) issue). This is because the focal firm must be more attractive to its common investors and banks than its peers in order to be successful with the issue.

Consistent with our hypothesis, we find a more pronounced effect of common investor peer pressure on firms that engage in large equity (debt) issuances in the subsequent year. This finding suggests that peer pressure is more salient for firms with upcoming competitive capital market events. Moreover, it relates to the literature that examines how firms adopt the behavior of their peers in competitive situations, such as accounting methods (Tse and Tucker (2010)), stock splits (Kaustia and Rantala (2015)), and IPO price ranges (Aghamolla and Thakor (2022)).

Finally, we provide further evidence of a mimicking channel by showing that focal firm managers adopt the climate change sentiments of their common investor peers during corporate communications.[3] We believe this behavior is closely linked to social benchmarking. In line with this notion, a study by Croson and Shang (2008) shows that donors change their pledges in the direction of observed social information. In particular, they increase their pledges when social information is above their previous pledges, and decrease them when social information is below. We therefore expect salient comovements between focal firms' and common investor peer firms' sentiments about climate change.

Collectively, we find that climate change sentiments of common investor peers appear to be relevant for focal firms. However, negative sentiments seem to be somewhat more important as social signals than positive sentiments.

Our finding relates to two strands of the literature. First, our finding contributes to the growing literature on peer effects in capital markets that finds that firm decisions tend to be influenced by peer firms' actions (e.g., accounting (Reppenhagen (2010)), capital structure (Leary and Roberts (2014)), investment (Foucault and Fresard (2014) and Fracassi (2017)), payouts (Grennan (2019)), corporate disclosure (Seo (2021)), and corporate governance (Foroughi et al. (2022)). We also show that peer effects are present in environmental decisions and in corporate climate change communications. We document peer effects among institutionally connected firms, in contrast to the extant literature, which has largely focused on industrial-linked firms or on peer groups based on common analyst coverage or social networks.

Second, we add to the evidence that firm behavior is motivated by portfolio effects. Previous

literature has shown that common ownership can affect the decision-making process of firms. This is because common investors may have a number of other firms in their portfolios and the actions of each firm may affect the value of the other firms in their portfolios, so common investors may tend to encourage firms not to harm other firms in their portfolios. These common investor incentives do not necessarily result in the same outcome as maximizing the value of each individual firm, however.

This is because common owners have an incentive to internalize how each firm's actions will affect the value of the other firms in their portfolios. These common incentives do not necessarily result in the same outcome as maximizing the value of each individual firm, however.

Antón et al. (2022b) provide first empirical evidence on the underlying driver that leads firms to shift their individual firm perspective to a portfolio perspective: performance-based executive compensation. This salary mechanism is entirely indirect, requiring neither communication nor coordination with shareholders or managers.

Other existing literature on common ownership explores its effect on advertising expenditures (Lu et al. (2022)), asset prices (Antón and Polk (2014)), corporate governance mechanisms (Kang et al. (2018), Edmans et al. (2019), and He et al. (2019)), corporate social responsibilities (Dai and Qiu (2021)), information disclosures (Park et al. (2019)), innovations (López and Vives (2019) and Antón et al. (2021)), labor market power (Azar and Vives (2021), Azar et al. (2021), and Goshen and Levit (2021)), market entry barriers (Xie and Gerakos (2020) and Newham et al. (2022)), and mergers and acquisitions (Brooks et al. (2018) and Antón et al. (2022a)). However, despite the burgeoning research on common ownership, much of the academic debate is focused on its potential eroding effect on product market competition (e.g., He and Huang (2017), Azar et al. (2018), Posner (2021), Dennis et al. (2022), and Ederer and Pellegrino (2022)). Less effort has been devoted to date to describing and understanding its effects independent of industries and environmental issues.

Our definition of common investor peers contributes to the literature by showing that they play an important role in shaping corporate environmental decision-making. Managers are likely to evaluate what investors in their other firms tolerate, and to adopt the environmental decisions of their common investor peers in order to preserve the passivity of their common investors, and maintain a "quiet life."

The remainder of this paper is structured as follows. Section 3.2 describes the underlying data, methodology, and empirical framework. Our empirical results are in Section 3.3. Section 3.4 outlines future research issues, and concludes.

3.2 Data and sample construction

3.2.1 Data source

Our initial sample is based on U.S. firms traded on the American Stock Exchange (AMEX), NASDAQ, and New York Stock Exchange (NYSE), and covered by Compustat. Firms' environmental scores come from the ESG scores in Thomson Reuters' Asset4 database. We focus on the "E" pillar (environmental score).[4] Values range from 0 to 100, with 100 as the highest score. We exclude financial firms (Standard Industry Classification (SIC) codes 6000–6999), and remove firm-year observations

that are missing information about firms' environmental scores. To minimize the influence of outliers, we exclude firm-year observations with total assets of less than $1 million, and we winsorize all ratios at the 1% and 99% levels.

Information about institutional holdings come from Thomson Reuters Institutional Managers (13f) Holdings Database. This database contains equity ownership information on all institutional investment managers with at least $100 million in AuM by quarter. We further exclude institutional holdings in invested entities of less than 0.5% to total equity, as it is unlikely they will be able to influence their holdings (Azar et al. (2018)). Our final sample for the baseline regression includes 8,618 firm-level observations from 1,818 firms for the 2001 to 2018 period.

3.2.2 Variable measurement and descriptive statistics

3.2.2.1 Measuring common ownership

Following Antón and Polk (2014), we construct a measure of overlapping ownership between two firms, which we call institutional connectivity. This measure expresses the degree to which a pair of firms have common investors. Formally, we calculate pair-level connectivity as follows:

$$Connectivity_{ij,t} = \Sigma_{f=1}^{F}[\alpha_{i,f,t}(\frac{v_{i,t}}{v_{i,t}+v_{j,t}}) + \alpha_{j,f,t}(\frac{v_{j,t}}{v_{i,t}+v_{j,t}})], \tag{3.1}$$

where $\alpha_{i,f,t}$ is the fraction of firm i held by common investor f in quarter t, and $\alpha_{j,f,t}$ is the fraction of firm j held by the same common investor f in the same quarter t. Firms' market value of equity (v) is computed as the product of total shares outstanding times the corresponding price in quarter t. We construct pair-level common ownership measures by aggregating the connectivity values across all common institutional investors in each firm-pair in our sample.[5] Next, we rank a firm's connected firms in descending order (highest to lowest institutional overlap), and retain the top 10% by overlap. We therefore ensure our analysis concentrates only on common investor peer firms that are plausibly the focus of focal firm management. In untabulated regressions, we change this threshold to the top 3 percent, 2 percent, and 1 percent, and reestimate the baseline regression. Our results remain qualitatively the same.

3.2.2.2 Measuring common investor distraction

To address endogeneity concerns, we use exogenous variation in the ability of common investors to monitor their holdings. Investor distraction arises from attention-grabbing events, so we identify the causal effect of common ownership on firms' corporate environmental decision-making. In particular, our analysis exploits industry shocks to firms of common investors' portfolios that are unrelated to the focal firm itself.

We build on prior work by Kempf et al. (2017), and apply their approach to our sample of common institutional investors.[6] Our distraction measure captures the relative importance of: focal firms in common investor portfolios, shocked industries in their portfolios, and each common investor in the focal firm. Specifically, we calculate our distraction measure in two steps. First, we exploit exogenous shocks to unrelated industries held by common investors (in comparison to the focal

firm) to identify periods when they are likely to be distracted from the focal firm. An industry shock is defined as belonging to the highest or lowest decile of returns across all twelve Fama-French industries in a given quarter. Therefore, we capture the most extreme industry returns (both positive and negative) in a given quarter.[7]

Second, we aggregate the quarterly *Distraction* measure for each common investor at the firm level into a mean *Distraction* measure for each firm in a given quarter. We then average it over the fiscal year to obtain a unique rate of distraction for each firm. Higher distraction (larger value of *Distraction*) indicates a higher level of attention diverted from common investors, and a lower level of monitoring intensity at the focal firm. In other words, *Distraction* takes a higher value if the exogenous shocks occur in unrelated industries, if the shocked industries are important in the common investor portfolios, and if distracted common investors are important to the focal firm.

To ensure that the common investors and the corresponding peer firms are indeed distracted, we divide firms into two groups along the tercile of the common investors' distraction score. A firm's common investor base is classified as attentive if it belongs to the group whose distraction level is below the tercile, and distracted otherwise. This indicator variable enables us to distinguish between distracted and attentive common investors in the focal firm and its peers in a given year.

3.2.2.3 Measuring natural disasters

To further address endogeneity concerns, we also use an instrumental variables strategy. In the first stage, we regress common investor peer firms' environmental decisions on an instrumental variable. This variable is chosen so that it meets the relevance condition (the environmental decisions of common investor peer firms), but does not directly affect the exclusion restriction (the environmental decisions of the focal firm). We rely on the fraction of common investor peers that experience a natural disaster in a given year. The intuition behind this instrument is that managers respond to natural disasters by revising their environmental policies, but only when firms are located close to disaster areas (Huang et al. (2022)).

Our natural disaster data come from the National Centers for Environmental Information (NCEI Accession) maintained by the National Oceanic and Atmospheric Administration (NOAA).[8] The dataset provides county-level information, including property and crop losses, injuries, and fatalities, for various natural hazard types in the U.S. Because we are focused on how managers respond to climate change-related natural disasters, we use the following natural hazard types in the analysis: drought, flooding, heat, hurricanes (including tropical storms), and wildfires. We aggregate the financial damage from these 5 natural hazard types to the county-year level, and include all natural disasters with financial damages of more than $250 million over the 2001 to 2018 period.[9]

In the second stage, we replace the endogenous peer variable with the predicted values from the first stage. Formally, the first- and second-stage regressions are as follows:

$$\begin{aligned} Environmental\,Score_{pt} = {} & \alpha_0 + \alpha_1 Peer(Natural\,Disasters)_{pt} \\ & + \alpha_2 Controls_{it} + \alpha_3 Controls_{pt} \\ & + \phi_{tg} + \delta_{tk} + \epsilon_{it}, \end{aligned} \tag{3.2}$$

$$\begin{aligned} Environmental\,Score_{it} = \alpha_0 + \alpha_1 Peer(\widehat{Environmental\,Score})_{pt} \\ + \alpha_2 Controls_{it} + \alpha_3 Controls_{pt} \\ + \phi_{tg} + \delta_{tk} + \epsilon_{it}. \end{aligned} \tag{3.3}$$

In Equation 3.2, $Environmental\,Score_{pt}$ is the average environmental score of focal firm *i*'s peer firms in year *t*. $Natural\,Disasters_{pt}$ is the instrument, the fraction of common investor peer firms that experienced a natural disaster in their state in year *t*. $Controls_{it}$ is a vector of focal firm-level control variables, $Controls_{pt}$ is a vector of average investor-peer characteristics, α_0 is the intercept, ϕ_{tg} (δ_{tk}) are geography (industry) and time fixed effects, and ϵ_{it} is the error term. Detailed information on the control variables is in Table B1.

In Equation 3.3, $Peer(\widehat{Environmental\,Score})_{pt}$ is the predicted value from the first stage. The estimation is based on exogenous variables, instrument, and the corresponding control variables. Thus, the predicted value isolates the exogenous component of $Environmental\,Score_{pt}$.

Table 3.1 reports descriptive statistics for the regression variables. We winsorize all ratios at the 1st and 99th percentiles. We account for several factors that may affect the focal firm's environmental decision-making that have also been used in prior studies (e.g., Gillan et al. (2010), Borghesi et al. (2014), Di Giuli and Kostovetsky (2014), Huang et al. (2022), Asgharian et al. (2022), and Sautner et al. (2022)).

For example, we include firm size (*Firm Size*), capitalization (*Capitalization Ratio*), efficiency (*Asset Turnover*), financial soundness (*Operating Cashflow*), liquidity (*Quick Ratio*), innovation (*R&D*), profitability (*Profitability*), solvency (*Leverage*), valuation (*Boot-to-Market*), tangibility (*Tangibility*), sales growth (*Sales Growth*), and industry concentration (*CHHI*). Moreover, we note that firms' corporate governance may potentially affect the size of institutional ownership and environmental performance. So we also include a corporate governance score (*Corporate Governance*).

A final set of control variables denotes institutional investors' characteristics, because they can affect environmental preferences and screening abilities (Kim et al. (2019), Krüger et al. (2020), and Bolton and Kacperczyk (2021)). We account for level of institutional ownership (*IO*), institutional investor concentration (*IHHI*), and environmental friendliness of the institutional ownership (*IO(Environmental Score*). Moreover, we account for BlackRock's holdings (*BlackRock*), because it is assuming a pioneering role in the climate-neutral transition of its portfolio firms by tightening management in this area. Detailed variable definitions are in Table B1.

The average focal firm has an environmental score of 22.80, institutional ownership of nearly 60%, and is connected to 71.9 other firms through common institutional investors (although the values vary substantially across firms). For the sake of brevity, we only report the summary statistics for the focal firm. But we follow Leary and Roberts (2014), and define peer firm controls for the regression variables by considering all connected firms except the focal firm itself.

Table 3.1
Descriptive statistics

This table reports the summary statistics of the main variables of the focal firm characteristics used in the analysis. For each variable, we present its number of non-missing observations, means, standard deviations, and 1st, 25th, 50th, 75th, and 99th percentiles. The sample period is 2001 through 2018. Detailed variable definitions are in Table B1.

	Obs.	Mean	SD	p1	p25	p50	p75	p99
Environmental Score	8,618	22.804	25.960	0.000	0.000	11.728	40.840	87.332
Emission Score	8,019	23.912	30.365	0.000	0.000	7.377	44.521	96.939
Environmental Innovation Score	7,448	16.834	26.968	0.000	0.000	0.000	33.333	92.953
Resource Use Score	8,039	24.882	31.109	0.000	0.000	7.273	47.674	97.000
Firm Size	8,618	7.853	1.731	2.545	6.959	7.919	8.889	11.715
Capitalization Ratio	8,618	0.341	0.235	0.000	0.150	0.339	0.501	0.923
Asset Turnover	8,618	0.906	0.644	0.052	0.470	0.761	1.123	3.619
Operating CF	8,618	0.218	0.359	−1.553	0.101	0.174	0.300	1.562
Quick Ratio (Acid test)	8,618	1.858	1.712	0.277	0.936	1.336	2.065	10.770
R&D	8,618	0.152	0.724	0.000	0.000	0.004	0.064	6.256
Profitability	8,618	0.124	0.124	−0.482	0.088	0.131	0.180	0.403
Leverage	8,618	0.545	0.196	0.102	0.412	0.561	0.688	0.948
Book-to-Market	8,618	0.471	0.346	0.035	0.221	0.380	0.627	1.808
Tangibility	8,618	0.281	0.245	0.010	0.087	0.188	0.426	0.897
Sales Growth	8,618	0.117	0.295	−0.481	−0.003	0.070	0.168	1.861
Corporate Governance	8,618	46.414	22.435	4.532	28.170	46.073	64.434	91.781
CHHI	8,618	0.109	0.090	0.021	0.064	0.087	0.121	0.621
IO	8,618	0.592	0.168	0.135	0.483	0.605	0.713	0.938
IHHI	8,618	0.032	0.029	0.003	0.018	0.027	0.039	0.212
Blackrock	8,618	0.052	0.042	0.000	0.000	0.056	0.077	0.152
IO(Environmental Score)	8,618	25.955	6.736	12.237	21.513	25.671	31.467	38.306
Distraction	8,618	0.047	0.051	0.000	0.000	0.000	0.092	0.161
Natural Disaster Indicator (Peer-Level)	7,599	0.651	0.165	0.231	0.563	0.689	0.765	0.919
Net Equity Issuances	8,272	−0.013	0.082	−0.269	−0.036	−0.004	0.002	0.445
Equity Issuance Indicator	8,272	0.501	0.500	0.000	0.000	1.000	1.000	1.000
Net Debt Issuances	8,618	0.108	0.180	0.000	0.000	0.032	0.136	0.989
Debt Issuance Indicator	8,618	0.502	0.500	0.000	0.000	1.000	1.000	1.000
BOG Index	8,126	88.094	7.522	71.000	83.000	88.000	92.000	109.000
CC Sentiment (Positive) (x100)	7,711	0.043	0.088	0.000	0.000	0.013	0.041	0.562
CC Sentiment (Negative) (x100)	7,711	−0.020	0.041	−0.242	−0.020	0.000	0.000	0.000
# of Peers	8,618	71.90	38.39	20	42	45	115	120

3.3 Empirical results

3.3.1 Baseline regressions

We run regressions over the 2001 to 2018 period to analyze whether focal firms are influenced by their common investor peer firms in their environmental decision-making. Formally, we estimate the following fixed effects panel regression model:

$$\begin{aligned} Environmental\,Score_{it} = {} & \alpha_0 + \alpha_1 Peer(Environmental\,Score)_{pt} \\ & + \alpha_3 Controls_{it} + + \alpha_5 Controls_{pt} \\ & + \phi_{tg} + \delta_{tk} + \epsilon_{it}, \end{aligned} \tag{3.4}$$

where $Environmental\,Score_{it}$ denotes focal firm *i*'s level of environmental score in year *t*; $Peer-(Environmental\,Score)_{pt}$ is the corresponding environmental score at the peer level; $Controls_{it}$ contains a set of focal firm-level environmental decision control variables at the focal firm level (*Firm Size*, *Capitalization Ratio*, *Asset Turnover*, *Operating CF*, *Quick Ratio*, *R&D*, *Profitability*, *Leverage*, *Book-to-Market*, *Tangibility*, *Sales Growth*, *Corporate Governance*, and *CHHI*, and controls for ownership structure (*IO*, *IHHI*, *BlackRock*, and *IO(Environmental Score)*); $Controls_{pt}$ contains a set of peer firm–level environmental decision control variables at the peer firm level (*Firm Size*, *Capitalization Ratio*, *Asset Turnover*, *Operating CF*, *Quick Ratio*, *R&D*, *Profitability*, *Leverage*, *Book-to-Market*, *Tangibility*, *Sales Growth*, *Corporate Governance*, and *CHHI*). α_0 is the intercept. By adding geography and time (ϕ_{tg}), and industry and year (δ_{tk}) fixed effects, to our baseline regressions (column (5)), we isolate the influence of aggregate time series trends. We can also control for all time-invariant geography and industry characteristics. ϵ_{it} is the error term. We account for serial correlation by allowing double clustering of the error term's standard errors at the focal firm level and year.

Table 3.2 reports the estimated coefficients obtained from the specification in Equation 4.11. Columns (1) to (6) reveal that firms' environmental decisions are strongly influenced by their common investor peers. As we move from columns (1) to (5), by including additional control variables, the estimation coefficient on *Peer(Environmental Score)* decreases somewhat, but remains statistically significant ($p \leq 0.01$). The effect of institutional ownership on focal firms' environmental decisions is negative across the columns. This is consistent with the view that environmental improvements are costly for shareholders, and may not fully reflect investor preferences (Gillan et al. (2010) and Borghesi et al. (2014)).

This holds for column (5), which includes all of our control sets, and thus serves as our benchmark specification. The positive sign on *Peer(Environmental Score)* indicates that a higher level of environmental scores for the common investor peers is also associated with a higher level of environmental scores at the focal firm. In column (6), we reestimate the baseline specification (column 5) with standardized coefficients to evaluate the importance of peers' environmental decisions relative to other variables. Comparing common investor peer pressure with the other focal firm characteristics, we observe that the impact of *Peer(Environmental Score)* on the focal firm is also relatively important, but less important than firm size or corporate governance score. In economic terms, the mean of focal firms' environmental scores is 22,804. Consequently, a 1-standard deviation increase would increase focal firms' environmental scores by 15.3% (= 3.497/22.804) relative to its unconditional mean (22.804).

To alleviate reverse causality concerns, we use lagged explanatory variables as in columns (7) to (10). We observe a similar pattern in focal firms' environmental decisions. They show strong co-movements with their common investor peer firms' environmental decisions. In economic terms, a 1-standard deviation increase in peer firms' environmental scores during the preceding year (column (10)) increases focal firms' environmental scores by 17.3% (= 3.939/22.804) relative to its sample mean (22.804).

Table 3.2
Baseline regressions

This table reports the estimation results of our main focal firm's climate policy proxy (environmental score) on common investor peer firms' average climate policy proxy ($Peer(EnvironmentalScore)$). We successively add control variables on climate policy decisions (*Firm Size*, *Capitalization Ratio*, *Asset Turnover*, *Operating CF*, *Quick Ratio*, *R&D*, *Profitability*, *Leverage*, *Book-to-Market*, *Tangibility*, *Sales Growth*, *Corporate Governance*, and *CHHI*, control variables on focal firm investor characteristics (*IO*, *IHHI*, *BlackRock*, and *IO(Environmental Score)*), and peer firm controls. Our common investor peer controls include those that relate to climate policy. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. Specifications (5) and (6) represent our baseline model. Industries are defined by the Fama-French 49 industry classifications, and geographic location is determined by headquarters state. The unit of observation is at the focal-firm-year level. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018. Standard errors are adjusted for heteroskedasticity, and double-clustered at the focal firm level and the fiscal year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Contemporaneous						Lagged			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Peer(Environmental Score)	1.527***	0.505***	0.368***	0.363***	0.348***	3.497***	0.388***	0.330***	0.391***	3.936***
	(0.000)	(0.000)	(0.000)	(0.005)	(0.008)	(0.008)	(0.000)	(0.006)	(0.006)	(0.006)
Focal Firm Characteristics										
Firm Size		7.797***	7.234***	7.600***	7.768***	13.449***	7.743***	8.011***	7.978***	13.813***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capitalization Ratio		−6.755*	−6.279	−5.703	−6.035	−1.421	−8.466*	−7.865*	−8.521*	−2.006*
		(0.093)	(0.132)	(0.165)	(0.119)	(0.119)	(0.076)	(0.095)	(0.059)	(0.059)
Asset Turnover		−6.435***	−5.941***	−6.407***	−4.042***	−2.603***	−6.433***	−6.832***	−4.024***	−2.591***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)
Operating CF		−6.051***	−5.662***	−5.707***	−4.701***	−1.687***	−6.498***	−6.524***	−5.186***	−1.861***
		(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.006)
Quick Ratio		0.468	0.493*	0.474*	0.390	0.667	0.550	0.559	0.339	0.580
		(0.107)	(0.079)	(0.091)	(0.165)	(0.165)	(0.109)	(0.104)	(0.276)	(0.276)
R&D		4.221***	4.118***	4.221***	4.468***	3.237***	4.350***	4.447***	4.661***	3.376***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Profitability		9.492**	7.085*	7.123*	4.649	0.579	9.169	8.919	7.300	0.909
		(0.030)	(0.095)	(0.092)	(0.274)	(0.274)	(0.111)	(0.127)	(0.227)	(0.227)

(*continued*)

Table 3.2 — *continued*

Leverage		0.518	1.400	−0.004	3.797	0.744	4.774	3.932	7.419	1.454
		(0.924)	(0.802)	(0.999)	(0.459)	(0.459)	(0.456)	(0.538)	(0.225)	(0.225)
Book-to-Market		−5.872***	−5.769***	−7.266***	−3.297**	−1.140**	−7.144***	−8.466***	−2.168	−0.750
		(0.001)	(0.001)	(0.000)	(0.019)	(0.019)	(0.001)	(0.000)	(0.232)	(0.232)
Tangibility		7.572***	6.492***	6.870***	13.944***	3.412***	7.070**	7.465***	15.036***	3.680***
		(0.003)	(0.008)	(0.005)	(0.002)	(0.002)	(0.014)	(0.009)	(0.006)	(0.006)
Sales Growth		−4.753***	−3.699***	−3.314***	−2.766***	−0.817***	−3.857***	−3.480***	−2.740***	−0.809***
		(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.004)	(0.004)
Corporate Governance		0.262***	0.251***	0.248***	0.235***	5.281***	0.236***	0.233***	0.228***	5.122***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CHHI		8.878*	8.879*	8.140*	0.000	0.000	11.325*	10.331*	−9.072	−0.813
		(0.090)	(0.071)	(0.096)	(1.000)	(1.000)	(0.058)	(0.079)	(0.640)	(0.640)
Institutional Investor Characteristics										
IO			−12.976***	−11.404***	−9.649***	−1.624***	−10.694**	−8.504**	−7.460**	−1.256**
			(0.001)	(0.003)	(0.005)	(0.005)	(0.012)	(0.047)	(0.028)	(0.028)
IHHI			21.320	15.648	19.785*	0.580*	7.881	1.800	6.759	0.198
			(0.133)	(0.259)	(0.095)	(0.095)	(0.683)	(0.929)	(0.673)	(0.673)
Blackrock			31.548**	12.695	−1.412	−0.059	38.385*	17.427	2.831	0.118
			(0.039)	(0.426)	(0.914)	(0.914)	(0.062)	(0.413)	(0.869)	(0.869)
IO(Environmental Score)			1.142***	1.187***	0.999***	6.730***	1.085***	1.139***	0.940***	6.331***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Year FE	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
Geography-Year FE	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Industry-Year FE	No	No	No	No	Yes	Yes	No	No	Yes	Yes
Peer controls	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Standardized coefficients	No	No	No	No	No	Yes	No	No	No	Yes
Observations	8,618	8,148	8,148	8,148	7,923	7,923	5,880	5,880	5,651	5,651
Adj. R-squared	0.292	0.494	0.503	0.505	0.554	0.554	0.502	0.504	0.562	0.562

3.3.2 Distracted investor peer connections and natural disasters

We begin establishing causality by exploring an exogenous shock to common investors' attention capacity. We confirm that firms internalize common investors' preferences, but only if they can effectively monitor them. Prior research has shown that investor distraction reduces monitoring and weakens managers' incentives to take actions that benefit shareholders (Kempf et al. (2017), Abramova et al. (2020), Gilje et al. (2020), Liu et al. (2020), and Garel et al. (2021)).

We use a modified version of Kempf et al.'s (2017) investor distraction measure to show that the link between common investor peer firms' and focal firms' environmental decisions is causal. We reestimate our baseline regression for subgroups with only attentive common investors, and wih only distracted common investors (see Section 3.2.2.2 for details). The results are in Table 3.3.

Columns (1) and (2) show that the level of environmental scores at the focal firm are positively related to those at common investor peer firms. However, the estimated coefficient on *Peer(Environmental Score)* is statistically significant (with $p \leq 0.01$) only for firms with attentive common investors. To ease the interpretation of magnitudes, we scale all coefficients by the corresponding variable's standard deviation. As a result, the effect is nearly five times higher for focal firms with attentive common investors (column (1)) than for firms with distracted common investors (column (2)). Moreover, we test the difference for both coefficients, and find it is also statistically significant (with $p \leq 0.01$), as indicated by the Chow test p-value at the bottom of the table.

To quantify the importance of common investor attention in environmental decision-making, we observe that a 1-standard deviation increase in common investor peer firms' environmental decisions is associated with a 28.9% increase in focal firm's environmental scores relative to its sample mean (22.8).[10] Comparing common investor peer pressure with the other model variables, we note the impact of *Peer(Environmental Score)* on the focal firm is large, and second only to the average focal firm's size. We emphasize that this analysis only allows common investor distraction to break the link between the focal firm and its common investor peer firms. The industry links remain intact, and are unaffected by the attention-grabbing shocks. Therefore, our results indicate they are not simply driven by peer firms within the same industry, and that common investor peers exert an independent effect on the focal firm.

In a second step, we reestimate our baseline model, and apply a TSLS instrumental variables regression based on a quasi-natural experiment. In the first stage, for each focal firm, we regress the average environmental decisions of its common investor peer group on an instrument and a full set of control variables. The instrument captures the proportion of common investor peer firms that experienced a natural disaster in their state during the year. The predicted value from this first-stage regression isolates the exogenous variation in common investor peer firms' environmental decisions, and can be used as an exogenous independent variable in the second-stage regression.

In the second stage, we regress each focal firm's environmental decision on the instrumented proxy value for the average environmental decision of its common investor peer firms. We identify natural disasters using the NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters. It captures droughts, floods, heat waves, hurricanes (including tropical storms), and wildfires. The first- and second-stage regressions are specified in

Table 3.3
Distracted investor peer connections and natural disasters

This table reports results from our two identification strategies. We first reestimate our baseline model (see column (5) of Table 3.2) among attentive investors only (column (1)), or distracted investors only (column (2)). We follow Kempf et al.'s (2017) approach to capture time periods when the common investors of the focal firm and the corresponding peer firms are distracted. In each fiscal year, we divide firms into two groups along the tercile investor distraction score. A firm's common investor base is considered attentive if it belongs to the group whose distraction level is below the tercile, and distracted otherwise. Second, we reestimate our baseline model, and apply a TSLS instrumental variables regression based on a quasi-natural experiment. In the first stage, for each focal firm, we regress the average environmental decisions of its peer group on an instrument (the proportion of peer firms that experienced a natural disaster in their state during the year), and on the full set of control variables. The predicted value from this first-stage regression isolates the exogenous variation in peer firms' environmental decisions, and can be used as an exogenous independent variable in the second-stage regression. In the second stage, we regress each focal firm's environmental decision on the instrumented proxy value for the average environmental decision of its peer firms. We identify natural disasters with information from the National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters. It captures droughts, floods, heat waves, hurricanes (including tropical storms), and wildfires. All specifications include industry- and geography-year fixed effects. Industries are defined by the Fama-French 49 industry classifications, and geographic location is determined by headquarters state. Columns (1) to (2) show standardized coefficients. The unit of observation is at the focal-firm-year level. The common investor peer controls include the same controls as for the focal firm related to the corresponding climate policy. The peer measures for the dependent and control variables are calculated across all connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018.The Chow test p-value indicates whether the coefficient estimates of the stated variable differ statistically between the two subsamples. Standard errors are adjusted for heteroskedasticity, and are double-clustered at the focal firm level and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Common Investor Distraction		Natural Disasters
	Low	High	TSLS
	(1)	(2)	(3)
Peer(Environmental Score)	6.586***	1.420	2.319**
	(0.000)	(0.517)	(0.040)
Focal Firm Characteristics			
Firm Size	12.364***	15.079***	7.347***
	(0.000)	(0.000)	(0.000)
Capitalization Ratio	−0.384	−1.823	−4.505
	(0.678)	(0.114)	(0.259)
Asset Turnover	−2.589***	−2.606***	−3.448***
	(0.005)	(0.001)	(0.004)
Operating CF	−1.347***	−1.741*	−3.575***
	(0.007)	(0.052)	(0.006)
Quick Ratio	0.284	1.147	0.351
	(0.509)	(0.157)	(0.224)
R&D	2.886***	5.040***	4.354***
	(0.000)	(0.002)	(0.000)
Profitability	0.343	0.989	4.288
	(0.495)	(0.247)	(0.342)
Leverage	0.344	0.755	4.673
	(0.747)	(0.555)	(0.360)
Book-to-Market	−1.106*	−1.420**	−2.540*
	(0.099)	(0.013)	(0.058)
Tangibility	2.110*	3.493***	12.203***
	(0.073)	(0.001)	(0.004)

(*continued*)

Table 3.3 — *continued*

Sales Growth	−0.823***	−0.757	−2.435***
	(0.000)	(0.241)	(0.003)
Corporate Governance	5.085***	5.458***	0.232***
	(0.000)	(0.000)	(0.000)
Institutional Investor Characteristics			
IO	−1.507**	−2.002***	−8.054**
	(0.032)	(0.006)	(0.029)
IHHI	−0.012	1.209**	15.713
	(0.974)	(0.010)	(0.197)
Blackrock	0.502	−0.439	2.255
	(0.489)	(0.546)	(0.877)
IO(Environmental Score)	4.633**	8.416***	0.950***
	(0.017)	(0.000)	(0.000)
First-stage instrument			
Peer(Natural Disaster Indicator)			−2.567**
			(0.048)
Geography-Year FE	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes
Standardized coefficients	Yes	Yes	Yes
Observations	3,888	3,714	7,384
Adj. R-squared	0.585	0.534	0.426
Chow test p-value: (1) - (2)	0.000		
Kleibergen-Paap rk LM statistic			3.30
P-value			0.0695
Kleibergen-Paap Wald F statistic			3.92
P-value			0.0653

Section 3.2.2.3. Moreover, our instrument satisfies the two explicit conditions: 1) the relevance condition, by being statistically significant for both the instrument t-statistic (with $p \leq 0.05$) and the F-statistic (with $p \leq 0.1$), and 2) the exclusion restriction, since managers do not know ahead of time that their firms will be affected by a natural disaster in a given year. Thus, they cannot adjust their environmental policy decisions in advance. Our instrument appears to be orthogonal to the error term, and to focal firms' environmental policy decisions.

Column (3) gives the results of the TSLS. The coefficients on the instrument from the first-stage regressions are shown at the bottom of the table. The result of the first stage shows that the fraction of common investor peers experiencing natural disasters is significantly negatively correlated with their environmental decisions (with $p \leq 0.05$). We believe managers respond to natural disasters by accumulating liquidity in response to the shock, and ceasing investment activity, such as expenditures for environmental improvements. In the same vein, Dessaint and Matray (2017) show that managers respond by temporarily increasing their cash holdings in order to ensure they have sufficient liquidity cushions.

The second-stage result quantifies the causality of common investor peer effects in environmental decision-making. We find a positive relationship between the environmental decisions of common investor peer firms and focal firms, with an effect of 2.319 (with $p \leq 0.05$). This reinforces our baseline result by showing a similar result for common investor peer pressure in environmental decisions. However, we emphasize that a precise interpretation of the economic magnitude of

this coefficient is difficult. This is because it represents a composition of the underlying structural parameters of the TSLS approach.

Taken together, we find that common investor peer effects play a significant role in shaping focal firms' corporate environmental decisions. This observed peer pressure is driven by common ownership, and is independent of any industry-related peer effects.

3.3.3 Decomposing environmental scores

To determine whether the peer effect signifies a general influence on the environmental decision making of focal firms, or is driven instead by a different factor, we reestimate our baseline regression (see column (5) of Table 3.2). We decompose focal firms' environmental scores into their three core dimensions (emissions, green innovation, resource use). We tabulate the results in Table 3.4.

In column (1), we observe that common investor peer firms' environmental decisions are positively correlated with focal firms' emissions decision making. This relation is statistically significant (with $p \leq 0.1$). In economic terms, we find that a 1-standard deviation increase in common investor peer firms' environmental decisions is associated with a 12.4% increase in firms' environmental scores (= 2.958/23.912), relative to the sample mean of focal firms' emission scores (23.912). In column (2), we note that common investor peer firms' environmental decisions are also positively associated with focal firms' environmental innovation scores. This relation is also statistically significant (with $p \leq 0.05$), which implies that a 1-standard deviation increase in common investor peer firms' environmental decisions is associated with a 19.4% increase in firm i's environmental scores (= 3.273/16.834), relative to the corresponding sample mean. Finally, column (3) reveals that common investor peer firms' environmental decisions are positively correlated with focal firms' resource usage decisions. This relation is statistically significant (with $p \leq 0.1$) and economically meaningful. A 1-standard deviation increase in common investor peer firms' environmental decisions is associated with a 12.4% increase in firms' resource use scores (= 3.093/24.882).

Collectively, we find that the positive relationship between common investor peer firms and focal firms' environmental decision-making is not limited to a specific dimension of the environmental score. Moreover, the relative importance of common investor peer pressure in environmental decisions is larger than pure institutional ownership across all environmental dimensions.

3.3.4 Peer pressure in future equity and debt financing

Previous work has shown that the capital market response to firms' environmentally friendly behavior is somewhat mixed (e.g., Flammer (2013), Borghesi et al. (2014), Krüger (2015), and Fernando et al. (2017), among others). The optimal level of environmental activities remains unknown. Thus, we believe it may be a dominant strategy for a focal firm in a competitive financing market to mimic the environmental decisions of its common investor peers, in order to mitigate any deviations from the tolerable levels of the common investors. We reestimate our baseline regression (see column (5) of Table 3.2) by splitting the sample into different subgroups based on significant equity or debt issuance activities. We consider the activity significant for a given firm if its equity (debt) issuance is greater than the median in a given year, and not otherwise. We tabulate the results in Table 3.5.

Table 3.4
Decomposing environmental scores

This table reports the reestimation of our baseline model (see column (5) of Table 3.2). We decompose focal firms' environmental scores into their three dimensions (emissions, green innovation, resource use). Industries are defined by the Fama-French 49 industry classifications, and geographic location is determined by headquarters state. The unit of observation is at the focal-firm-year level. All columns show standardized coefficients. The common investor peer controls include the same controls as for the focal firm related to the corresponding climate policy. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018. Standard errors are adjusted for heteroskedasticity, and double-clustered at the focal firm level and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Emission	Innovation	Resource Use
	(1)	(2)	(3)
Peer(Environmental Score)	2.958*	3.273**	3.093*
	(0.071)	(0.028)	(0.062)
Focal Firm Characteristics			
Firm Size	15.732***	8.469***	16.683***
	(0.000)	(0.000)	(0.000)
Capitalization Ratio	−2.503**	−1.590	−1.931*
	(0.017)	(0.170)	(0.093)
Asset Turnover	−3.650***	−0.923	−4.081***
	(0.000)	(0.213)	(0.000)
Operating CF	−1.863***	−0.588	−1.618***
	(0.002)	(0.377)	(0.003)
Quick Ratio	1.450**	0.350	0.741
	(0.029)	(0.587)	(0.165)
R&D	3.728***	1.883*	4.435***
	(0.000)	(0.077)	(0.000)
Profitability	0.833	−0.746	0.832
	(0.234)	(0.323)	(0.207)
Leverage	2.248*	0.602	1.282
	(0.054)	(0.617)	(0.305)
Book-to-Market	−1.688***	−1.001	−1.620**
	(0.005)	(0.109)	(0.020)
Tangibility	4.349***	2.436**	3.504***
	(0.000)	(0.031)	(0.006)
Sales Growth	−1.129***	0.361	−1.204***
	(0.000)	(0.382)	(0.000)
Corporate Governance	6.197***	2.784***	6.321***
	(0.000)	(0.000)	(0.000)
Institutional Investor Characteristics			
IO	−1.895***	−1.715**	−1.823***
	(0.008)	(0.012)	(0.009)
IHHI	0.695	0.958**	0.800
	(0.148)	(0.037)	(0.104)
Blackrock	−0.136	−0.130	0.626
	(0.837)	(0.870)	(0.375)

(*continued*)

Table 3.4 — *continued*

IO(Environmental Score)	6.529***	6.614***	8.128***
	(0.001)	(0.001)	(0.000)
Year FE	No	No	No
Geography-Year FE	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes
Peer firm controls	Yes	Yes	Yes
Observations	7,503	6,906	7,497
Adj. R-squared	0.527	0.320	0.499

In columns (1) and (2), we distinguish between focal firms that make significant equity issuances in the subsequent year, and those that do not. In columns (4) and (5), we distinguish between focal firms that make significant debt issuances in the subsequent year, and those that do not. In both cases, we find that focal firms that face a competitive financing market the next year have significant comovements with their common investor peer firms in environmental decision making. To quantify the economic significance, we find that a 1-standard deviation increase in common investor peer firms' environmental decisions is associated with a 16.8% increase in firms' environmental scores (= 3.833/22.804). This is relative to the sample mean of focal firms' environmental scores (22.804) in the case of equity issuance. In the case of debt issuance, the effect is associated with a 22.9% increase in firms' environmental scores (= 5.225/22.804). The latter seems to be more beneficial to management, as green bonds often offer superior lending conditions (Flammer (2021)).

In sum, our findings in Table 3.5 contribute to the theoretical work by Gao and Zhang (2019). We show that managers follow their common investor peers when they face significant competition (for equity or debt financing the subsequent year) in order to avoid unfavorable capital market reactions.[11]

3.3.5 Peer effects in corporate climate change communications

To reinforce our previous findings on common investor peer pressure in environmental decision making, we take a deeper look at sentiments on climate change during earnings calls. The intuition here is that earnings calls may offer managers key information about investor preferences for environmental decisions. They may use these observed sentiments to meet their common investors' expectations. Building on Sautner et al. (2022), we use the relative frequency of bigrams related to climate change, mentioned together with positive (negative) tone words in the transcripts of analyst conference calls.[12]

The results are in Table 3.6. Columns (1) to (3) reveal that firms seem to adopt a positive sentiment about climate change from their common investor peers (*Peer(CC Sentiment Positive)*) during earnings calls. However, as we move to column (4), by including the same set of control variables and fixed effects as in the baseline specification (column (5) of Table 3.2), we note the estimated coefficient on *Peer(CC Sentiment Positive)* turns statistically insignificant ($p > 0.1$). Columns (5) to (8) show that firms are strongly influenced by their peers in the case of a negative sentiment about climate change. The estimated coefficient on *Peer(CC Sentiment Negative)* remains statistically significant even in the baseline specifications ($p \leq 0.05$).

Table 3.5
Peer pressure in future equity and debt financing

This table reports the reestimation of our baseline model (see column (5) of Table 3.2) among different subgroups. In each fiscal year, the equity (debt) issuance activity of a focal firm is significant if its equity (debt) issuance is greater than that of the median, and not otherwise. In columns (1) and (2), we distinguish between focal firms that make significant equity issuances in the subsequent year, and those that do not. In columns (4) and (5), we distinguish between focal firms that make significant debt issuances in the subsequent year, and those that do not. Industries are defined by the Fama-French 49 industry classifications, and geographic location is determined by headquarters state. The unit of observation is at the focal-firm-year level. All columns show standardized coefficients. The common investor peer controls include the same controls as for the focal firm related to the corresponding climate policy. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018. Standard errors are adjusted for heteroskedasticity, and double-clustered at the focal firm level and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Next Year Equity Issuance		Next Year Debt Issuance	
	No	Yes	No	Yes
	(1)	(2)	(3)	(4)
Peer(Environmental Score)	2.164	3.833**	1.925	5.225***
	(0.417)	(0.022)	(0.174)	(0.009)
Focal Firm Characteristics				
Firm Size	17.582***	10.628***	12.064***	14.038***
	(0.000)	(0.000)	(0.000)	(0.000)
Capitalization Ratio	−0.965	−2.076*	−0.822	−2.804
	(0.457)	(0.096)	(0.470)	(0.117)
Asset Turnover	−3.261***	−2.626***	−2.642***	−2.906***
	(0.004)	(0.004)	(0.003)	(0.005)
Operating CF	−2.358*	−1.121*	−1.717**	−2.685***
	(0.072)	(0.052)	(0.035)	(0.002)
Quick Ratio	0.658	0.433	−0.498	2.370**
	(0.360)	(0.450)	(0.310)	(0.010)
R&D	8.418***	2.773***	3.743***	1.875**
	(0.004)	(0.000)	(0.000)	(0.022)
Profitability	3.397**	−0.347	1.771**	0.384
	(0.039)	(0.626)	(0.046)	(0.687)
Leverage	0.587	1.783	0.240	2.280
	(0.704)	(0.234)	(0.841)	(0.219)
Book-to-Market	−2.157**	−0.418	−0.566	−1.494*
	(0.049)	(0.633)	(0.423)	(0.054)
Tangibility	4.572**	0.460	1.840	3.736***
	(0.011)	(0.611)	(0.229)	(0.002)
Sales Growth	−3.023***	−0.675**	−1.105***	−0.793*
	(0.001)	(0.035)	(0.001)	(0.067)
Corporate Governance	4.950***	5.585***	5.072***	5.928***
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Investor Characteristics				
IO	−2.088**	−0.631	−0.409	−2.305***
	(0.028)	(0.372)	(0.484)	(0.009)
IHHI	−0.088	0.372	−0.674	1.412***
	(0.916)	(0.452)	(0.234)	(0.008)

(*continued*)

Table 3.5 — *continued*

Blackrock	−1.197	0.434	0.377	−0.081
	(0.218)	(0.613)	(0.633)	(0.953)
IO(Environmental Score)	7.264***	5.262***	4.361**	7.609***
	(0.000)	(0.009)	(0.018)	(0.001)
Geography-Year FE	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Standardized coefficients	Yes	Yes	Yes	Yes
Observations	2,652	2,417	2,589	2,675
Adj. R-squared	0.580	0.545	0.577	0.543

The results are in line with those in the baseline regressions. Focal firms express sentiments about climate change in response to their common investor peer firms' sentiments. In particular, we document a more pronounced effect of common investor peer pressure on firms that have a more negative sentiment on climate change in their earnings calls. A 1-standard deviation increase in common investor peer firms' negative sentiment increases the focal firm's negative sentiment on climate change by 10% (0.002/0.02), relative to the sample mean of focal firms' negative sentiment on climate change (0.02).

3.3.6 Role of peer heterogeneity

Thus far, we have treated all firms in a common investor peer group as equally important. However, it is conceivable that some members are more important than others in shaping focal firms' environmental decisions. For example, peers that are larger, more innovative, and have more environmentally friendly common investors and more easily accessible disclosures may be a more relevant or salient benchmark. This could lead to stronger mimicking incentives, as firms follow the behavior of their most salient peers. In related work, Leary and Roberts (2014) show that accounting for peer heterogeneity (in their case, industry peers) is important. They show that firms have stronger incentives to follow the financial policy decisions of their industry leaders than vice versa.

We reestimate our baseline regression (see column (5) of Table 3.2) for heterogeneous common investor peer groups. We tabulate the results in Table 3.7. Specifically, we test whether common investor peer firms' heterogeneity matters for focal firms' environmental decision-making. In each fiscal year, we split a firm's common investor peer group into subgroups along the peer group's median of their common investors' environmental scores (column (1)), median peer firms' total assets (column (2)), median peer firms' innovation score (column (3)), and median peer firms' transparency scores, as proxied for the by BOG index (column (4)).[13]

Column (1) of Table 3.7 shows that common investor peer firms with a more environmentally friendly common investor base are more important to focal firms' environmental decision making (with $p \leq 0.01$). Column (2) reports that larger common investor peer firms are a more salient benchmark for focal firms (with $p \leq 0.01$), while column (3) illustrates that more innovative common investor peer firms are more important (with $p \leq 0.05$). Column (4) reports that common investor peer firms with more accessible information (more transparency) are more important (with $p \leq 0.1$).

Overall, our results confirm that heterogeneity matters for common investor peer pressure. Com-

Table 3.6
Peer effects in corporate climate change communications

This table reports the estimation results of focal firms' positive (negative) sentiments on climate change on those of common investor peer firms. Building on Sautner et al. (2022), we use the relative frequency of bigrams related to climate change, mentioned together with positive (negative) tone words in the transcripts of analyst conference calls. Industries are defined by the Fama-French 49 industry classifications, and geographic location is determined by headquarters state. The unit of observation is at the focal-firm-year level. All columns show standardized coefficients. We control for common drivers of climate policy decisions by including (*Firm Size*, *Capitalization Ratio*, *Asset Turnover*, *Operating CF*, *Quick Ratio*, *R&D*, *Profitability*, *Leverage*, *Book-to-Market*, *Tangibility*, *Sales Growth*, *Corporate Governance*, and *CHHI*, control variables on focal firms' investor characteristics (*IO*, *IHHI*, *BlackRock*, and *IO(Environmental Score)*), and peer firm controls. The common investor peer controls include the same controls as for the focal firm related to the corresponding climate policy. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018. Standard errors are adjusted for heteroskedasticity, and double-clustered at the focal firm level and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Climate Change Sent. Pos				Climate Change Sent. Neg			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Peer(CC Sentiment Positive)	0.015***	0.014***	0.004*	0.003				
	(0.000)	(0.000)	(0.058)	(0.140)				
Peer(CC Sentiment Negative)					0.007***	0.007***	0.002**	0.002**
					(0.000)	(0.000)	(0.012)	(0.015)
Focal Firm Characteristics								
Firm Size	0.001	0.004	0.000	0.000	−0.001	−0.002	−0.001	−0.002
	(0.707)	(0.289)	(0.878)	(0.986)	(0.679)	(0.203)	(0.345)	(0.263)
Capitalization Ratio	−0.011***	−0.009***	−0.003	−0.002	0.006***	0.005***	0.003*	0.002
	(0.002)	(0.007)	(0.309)	(0.467)	(0.002)	(0.004)	(0.096)	(0.117)
Asset Turnover	−0.008***	−0.009***	0.000	−0.002	0.004***	0.004***	0.001	0.001
	(0.000)	(0.000)	(0.900)	(0.220)	(0.000)	(0.000)	(0.257)	(0.154)
Operating CF	0.001	0.000	0.002	0.001	0.000	0.000	0.000	0.000
	(0.780)	(0.989)	(0.295)	(0.454)	(0.986)	(0.579)	(0.899)	(0.629)
Quick Ratio	0.003*	0.003*	0.002	0.001	−0.002***	−0.002**	−0.002***	−0.002**
	(0.076)	(0.078)	(0.216)	(0.329)	(0.009)	(0.012)	(0.006)	(0.011)
R&D	−0.002*	−0.003**	0.000	−0.001	0.001**	0.002***	0.001*	0.001**
	(0.086)	(0.031)	(0.736)	(0.220)	(0.014)	(0.005)	(0.071)	(0.012)
Profitability	0.000	−0.001	−0.001	−0.002	0.001	0.001	0.000	0.000
	(0.889)	(0.465)	(0.682)	(0.326)	(0.508)	(0.380)	(0.568)	(0.548)

(*continued*)

Table 3.6 — *continued*

Leverage	0.018***	0.015***	0.005	0.004	−0.010***	−0.008***	−0.003*	−0.002
	(0.000)	(0.001)	(0.189)	(0.303)	(0.000)	(0.000)	(0.081)	(0.120)
Book-to-Market	0.012**	0.011***	0.009**	0.008***	−0.007***	−0.006***	−0.004***	−0.003***
	(0.012)	(0.009)	(0.011)	(0.008)	(0.003)	(0.002)	(0.005)	(0.004)
Tangibility	0.015***	0.020***	0.006**	0.008***	−0.009***	−0.011***	−0.004***	−0.005***
	(0.000)	(0.000)	(0.034)	(0.004)	(0.000)	(0.000)	(0.004)	(0.000)
Sales Growth	−0.002	−0.001	0.000	0.000	0.001*	0.001	0.000	0.000
	(0.135)	(0.290)	(1.000)	(0.956)	(0.065)	(0.149)	(0.538)	(0.536)
Corporate Governance	0.009***	0.008***	0.004***	0.004**	−0.004***	−0.004***	−0.002***	−0.001**
	(0.000)	(0.000)	(0.005)	(0.012)	(0.000)	(0.000)	(0.004)	(0.040)
CHHI	−0.006***	−0.007***			0.003***	0.004***		
	(0.006)	(0.003)			(0.002)	(0.001)		
Institutional Investor Characteristics								
IO	−0.011***	−0.009***	−0.001	−0.001	0.005***	0.004***	0.000	0.000
	(0.002)	(0.005)	(0.593)	(0.782)	(0.004)	(0.006)	(0.838)	(0.728)
IHHI	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
	(0.974)	(0.569)	(0.734)	(0.710)	(0.686)	(0.836)	(0.548)	(0.839)
Blackrock	0.010**	0.009**	−0.001	0.000	−0.005***	−0.004***	0.000	0.001
	(0.010)	(0.012)	(0.826)	(0.959)	(0.003)	(0.005)	(0.673)	(0.664)
IO(Environmental Score)	0.013***	0.009**	0.000	−0.003	−0.003	−0.002	0.003*	0.002
	(0.007)	(0.041)	(0.953)	(0.444)	(0.202)	(0.270)	(0.065)	(0.168)
Year FE	Yes	No	No	No	Yes	No	No	No
Geography-Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Industry-Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standardized coefficients	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,710	7,577	7,616	7,478	7,710	7,577	7,616	7,478
Adj. R-squared	0.163	0.175	0.387	0.399	0.217	0.226	0.435	0.440

Table 3.7
Role of peer heterogeneity

This table reports the reestimation of our baseline model (see column (5) of Table 3.2) among different peer subgroups. For each fiscal year, we split a firm's common investor peer group into subgroups along the peer group's median of their common investors' environmental scores (column (1)), median peer firms' total assets (column (2)), median peer firms' innovation rate (column (3)), and median peer firms' transparency scores, as proxied for by the BOG index (column (4)). Industries are defined by Fama-French 49 industry classifications. The unit of observation is at the focal-firm-year level. The common investor peer controls include the same controls as for the focal firm related to the corresponding climate policy. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 2001 to 2018. Standard errors are adjusted for heteroskedasticity, and double-clustered at the focal firm level and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table B1.

	Common Investor's environmental score (High score = Friendly) (1)	Peer firm's size (High size = Big) (2)	Peer firm's innovation rate (High rate = Innovative) (3)	Peer firm's transparency score (High score = transparent) (4)
Friendly × Peer(Environmental Score)	3.224***			
	(0.001)			
Big × Peer(Environmental Score)		3.387***		
		(0.001)		
Innovative × Peer(Environmental Score)			1.777**	
			(0.023)	
Transparent × Peer(Environmental Score)				0.912*
				(0.079)
Geography-Year FE	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Focal firm characteristics	Yes	Yes	Yes	Yes
Institutional investor characteristics	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Standardized coefficients	Yes	Yes	Yes	Yes
Observations	7,900	7,923	7,923	7,574
Adj. R-squared	0.557	0.555	0.555	0.553

mon investor peer firms that are linked to the focal firm by more environmentally friendly common investors, and that are larger, more innovative, and disclose corporate information in a more transparent manner, exhibit a larger influence on environmental decision making at the focal firm level.

3.4 Conclusion

This study examines the effects of common investor peer firms on firms' environmental decision making. We have shown that firms do not make their environmental decisions in isolation. In fact, corporate environmental decision making is strongly influenced by the behavior of common investor peers. This type of indirect common ownership pressure exerts a remarkably robust and large effect on focal firms, larger on average than that of many other observable determinants.

An interesting implication of these findings is the presence of capital market pressure. This shows that we can significantly amplify the impact of investor peer effects on firms' environmental decisions. Our cross-sectional findings, while rather suggestive, point to benchmarking concerns as a potential motive for these common investor peer effects. Mimicking behavior is concentrated among firms that are associated with greener common investors, are larger and more innovative, and disclose corporate information more transparently. Similarly, our results are not limited to environmental policy decisions, but may extend to more informal contexts, such as pure sentiment on climate change.

We hope this study will encourage future research to better understand the mechanisms that are responsible for the strong similarities between common investor peers and focal firms. In addition, we believe that the results of this study will shift the direction of research on peer effects toward models that explicitly account for interactions between firms that are institutionally connected. Finally, an open empirical question is whether these similarities create sustainable value for the firms and what level of similarity is optimal for value creation. In addition, we believe that the results of this study will shift the direction of research on peer effects toward models that explicitly account for interactions between firms that are institutionally connected.

Endnotes

[1] To clarify, we use the terms common investor peer firms or institutionally connected peer firms interchangeably throughout to denote common ownership.

[2] The unconditional mean is 22.804 (Table 3.1), and the estimated coefficient of the common investor peer effects on the focal firm is 3.497 (Table 3.2). Therefore, the economic effect is 15.3% = 3.497/22.804.

[3] Building on data provided by Sautner et al. (2022), we use the relative frequency of "bigrams" (consecutive terms) related to climate change that are mentioned with positive (negative) tone words in the transcripts of analyst conference calls.

[4] The "E" pillar is an aggregate score that captures three environmental dimensions: emissions (e.g., emissions, waste, biodiversity, environmental management systems); innovation (e.g., product innovation, green revenue, green R&D, green investment); and resource use (e.g., water, energy, sustainable packaging, green supply chain).

[5] To guarantee that we only include common institutional investors who have the ability to exercise influence, we consider their shareholdings at the two quarter-ends before and after the end of firm *i*'s and firm *j*'s fiscal years *t*.

[6] Formally, we calculate common investor distraction for focal firms by using Equations (1) (distraction) and (2) (weighting factor) from (Kempf et al., 2017, pp. 1668–1669). But we switch from an individual firm perspective to the focal firm and peer firm perspective to capture the occasions when common investors are distracted.

[7] Our results are robust to alternative industry specifications, such as 3-digit SIC industries.

[8] Data on natural disasters are publicly available at: "https://www.ncei.noaa.gov/access/billions/".

[9] We obtain the addresses of our sample firms' headquarters from Compustat in order to identify which firms are located in states where a natural disaster has occurred.

[10] 28.9% = 6,586/22,804

[11] Gao and Zhang (2019) show that managers manipulate corporate earnings in response to their peers if they believe their peers' financial statements are more likely to be manipulated as well.

[12] Data on Sautner et al.'s (2022) sentiment on climate change are publicly available at: "https://osf.io/fd6jq/".

[13] Index scores are based on data from Bonsall et al. (2017).

Appendix

See next page for Table B1.

Table B1
Variables descriptions and data sources

This table shows the descriptions of the variables used in the paper. Data are available from Compustat, Thomson Reuters Institutional Holdings (13F), and Thomson Reuters/Refinitiv ESG Data. Sample period is from 2001 to 2018.

Variable	Description	Source(s)
Environmental Score	Aggregated environmental Score, which captures three dimensions. First, emissions (i.e., emissions, waste, biodiversity, and environmental management systems); second, innovation (i.e., product innovation, green revenue, green R&D, and green investment); and third, resource use (i.e., water, energy, sustainable packaging, green supply chain)	Thomson Reuters/Refinitiv ESG Data
Emission Score	Aggregated emission score, which captures total emissions, waste, biodiversity, and environmental management systems	As above
Environmental Innovation Score	Aggregated innovation score, which captures firm's environmental product innovation, green revenue, green R&D, and green investments	As above
Resource Use Score	Aggregated emission score, which captures the use of water, energy, sustainable packaging, green supply chain	As above
Firm size	Natural logarithm of sales	Compustat
Capitalization ratio	Long-term debt scaled by the sum of long-term debt, common/ordinary equity and preferred stock	Compustat
Asset turnover	Sales scaled by total assets	Compustat
Operating CF	Operating cash flow scaled by current liabilities	Compustat
Quick ratio	Current assets net of inventories scaled by fraction of current liabilities	Compustat
R&D	Research and development expenses scaled by sales	Compustat
Profitability	Operating income before depreciation scaled by average total assets	Compustat
Leverage	Total debt scaled by total assets	Compustat
Book-to-Market	Book value of equity scaled by market value of equity	Compustat
Tangibility	Net property, plant and equipment scaled by total assets	Compustat
Sales growth	Difference in current and last year sales scaled by last year's sales	Compustat
Governance score	Aggregated governance Score, which captures three dimensions. First, CSR strategy (i.e., CSR strategy, ESG reporting and transparency); Second, management (i.e., structure, compensation); Third, shareholder (i.e., shareholder rights, takeover defenses)	Thomson Reuters/Refinitiv ESG Data
CHHI	Product market competition (Fama French 49 industries) by squaring the market share of each firm competing in a market (Herfindahl-Hirschman Index)	Compustat
IO	Institutional investor ownership expressed as a percentage of a firm's total shares outstanding	13f Holdings
IHHI	Concentration of firm's institutional investors Computed as the Herfindahl-Hirschman Index of the holdings of firm's institutional investors	13f Holdings
Blackrock	Blackrock's ownership expressed as a percentage of a firm's total shares outstanding	13f Holdings

(*continued*)

Table B1 — *continued*

IO(Environmental Score)	The average environmental score value of all investors' portfolios in a given firm	Thomson Reuters/Refinitiv ESG Data & 13f Holdings
Distraction	A measure of common institutional investor distraction, analogous to Kempf et al. (2017)	13f Holdings & Compustat
Net Debt Issuance	Book leverage (dltt+dlc) less lagged book leverage to lagged total assets (at)	Compustat
Debt Issuance Indicator	Dummy variable that equals one if net debt issuances greater than the median; and zero otherwise	Compustat
Net Equity Issuance	Sales of equity (sstk) minus purchases of equity (prstkc) to lagged total assets (at)	Compustat
Equity Issuance Indicator	Dummy variable that equals one if net equity issuances greater than the median; and zero otherwise	Compustat
CC Sentiment (Positive)	Relative frequency of bigrams related to climate change are mentioned together with positive tone words in the transcripts of analyst conference calls	Authors' calculations based on Sautner et al. (2022) data
CC Sentiment (Negative)	Relative frequency of bigrams related to climate change are mentioned together with negative tone words in the transcripts of analyst conference calls	Authors' calculations based on Sautner et al. (2022) data
BOG Index	Index scores are based on Bonsall et al. (2017) data. The index measures readability by capturing the plain English attributes of firm's disclosure (e.g., active voice, fewer hidden verbs, etc.)	Authors' calculations based on Bonsall et al. (2017) data
Natural Disasters Indicator	Dummy variable that equals one if the firm has its headquarter in a state in which a natural disaster has occurred in the given year; and zero otherwise. We consider all disasters costing more than $250 million and include droughts, floods, heat waves, hurricanes (including tropical storms), and wildfires	National Centers for Environmental Information (NCEI Accession) maintained by the National Oceanic and Atmospheric Administration

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CHAPTER 4

Investor peers matter: Empirical evidence from corporate earnings management

WITH

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Abstract

Using a comprehensive set of U.S. firms over the 1990-2019 period, we examine the relation between firms' earnings management decisions and the corporate earnings management decisions of their common investor peer firms. We denote a firm as belonging to the peer group if it shares a common institutional investor base with the focal firm in a given year. We find that firms are strongly influenced by their common investor peers in earnings management decisions. This result is robust to sample composition, alternative earnings management measures, and endogeneity concerns. However, investor peer firms matter only when the common institutional investors are not distracted. Moreover and consistent with a mimicking explanation, peers are more important if they are geographically closer to the focal firm, and are dominated by long-term investors. This is because managers tend to follow decisions from their closest peers rather than from their more distant counterparts. Capital market pressure seems to be another mechanism through which investor peer firms influence focal firm behavior.

4.1 Introduction

Traditional corporate finance research assumes that corporate decisions are made independently of the behavior of peer firms, such as natural competitors and comparable firms. However, recent empirical work documents that firms tend to follow industry peers when making capital structure (Leary and Roberts (2014)), investment (Foucault and Fresard (2014)), earnings management (Kedia et al. (2015)), corporate disclosure (Seo (2021)), and IPO (Aghamolla and Thakor (2022)) decisions. Ongoing surveys provide evidence that a sizable number of managers assess the decisions of their peer firms in their own financial decision making (Graham and Harvey (2001) and Graham et al. (2005)). In contrast to previous studies that define peers as industry rivals, in this paper, we focus on peers linked through common institutional investors. Our setup enables us to examine the impact of peer pressure beyond any industry-specific effects.

Figure 4.1 provides an example of connections through a common institutional investor.[1] It illustrates that our approach can capture firm connectivity in a much more comprehensive way than relying merely on industry affiliation. In this example, which is similar to the connectivity patterns in our institutional investor dataset, the number of common investor peer firms is four times higher than the number of industry peer firms.[2]

(a) Investor portfolio

Industry A	Industry B	Industry C
Firm_{A1}	Firm_{B1}	Firm_{C1}
Firm_{A2}	Firm_{B2}	

(b) Common investor overlap

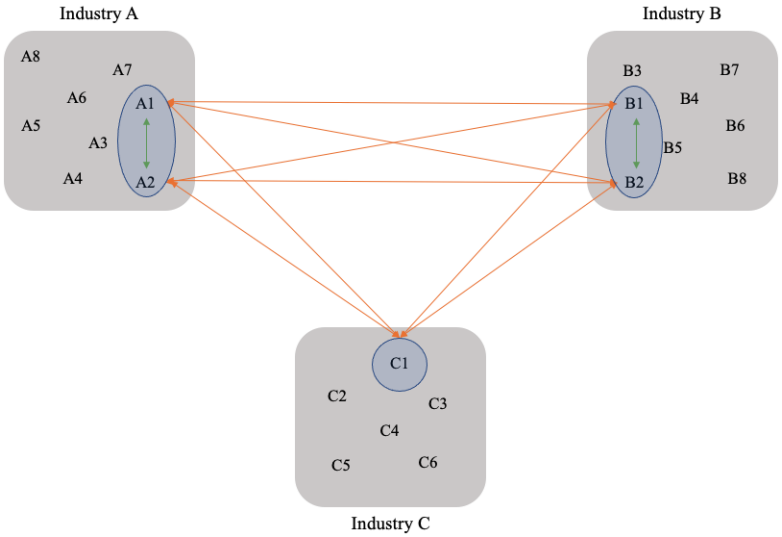

Figure 4.1. Illustration of common institutional investor overlap. This figure shows the difference between overlaps in common investors within and across industries. Figure 4.1a illustrates a fictitious portfolio of an institutional investor with five portfolio firms operating in three different industries (A, B, and C). The firms in the portfolio are highlighted in blue. Figure 4.1b shows the different types of firm connections within and across industries. Firms are numbered A1, A2, ..., B1, B2,..., etc. In the intra-industry common investor overlap view, we consider only the following pairs of firms: A1+A2 and B1+B2. This link is highlighted with a green double arrow. In contrast, in the inter-industry common investor overlap view, we expand the possible firm-pairs to the following cases: A1+B1, A1+B2, A1+C1, A2+B1, A2+B2, A2+C2, B1+C1, and B2+C1. That link is highlighted with an orange double arrow.

Academics and practitioners generally agree that common institutional investor ownership is on the rise among U.S. firms (Azar et al. (2018), Coates (2019), Boller and Morton (2020), Gilje et al. (2020), Backus et al. (2021), and Hemphill and Kahan (2022)). The intuition behind this literature is that firms with common ownership have more incentives to coordinate their activities, which seems to lead to greater similarity in corporate policy decisions among investee firms. One reason for this pattern could be the joint activities by the coordinating groups of connected investors (Enriques and Romano (2019) and Crane et al. (2019)). However, a recent study by Antón et al. (2022) suggests that altering the compensation structure of firms - from single firm orientation to investor portfolio orientation - could be another (and silent) mechanism through which common ownership influences corporate policy decisions.

Despite the growing research on peer effects and common ownership, there is a lack of empirical evidence about whether firms' earnings management decisions are influenced by their common institutional investor peer firms. We aim to fill this research gap by examining U.S. corporate financial data covering 1990 through 2019. We build on prior accounting literature on earnings management

(e.g., Bartov et al. (2000), Hribar and Collins (2002), Kothari et al. (2005), and Hazarika et al. (2012)). We construct our main earnings management proxy by applying a modified Jones (1991) model, as further modified by Dechow et al. (1995), and incorporating contemporaneous return on assets (ROA) to avoid any misspecifications from ignoring firm profitability (Kothari et al. (2005)).

To capture firms' common ownership and define peer groups, we follow Antón and Polk (2014), and create a firm-pair-level measure of overlapping ownership structures between two firms, referred to as institutional connectivity. We rank firms' connected peer firms in descending order (from the highest institutional overlap to the lowest), and we retain only the firms in the top decile. In this way, we ensure our analysis concentrates only on peer firms that may plausibly be the focus of focal firm management. Robustness tests show that our common ownership effect strengthens with higher thresholds for institutional overlap between firms.

We find that firms' earnings management decisions are largely influenced by their common investor peers. This finding is robust after controlling for firm-level determinants of earnings management, a large set of industry and firm effects, other known peer characteristics, and industry, firm, and time fixed effects. We also include general level of institutional ownership and ownership concentration to control for the monitoring ability and incentives of institutional investors. In economic terms, a 1-standard deviation increase in an investor peer's earnings management decision increases the focal firm's performance-adjusted discretionary accruals by nearly 1.8 percentage points (= 1 × 0.092 × 0.191). This implies a further 11% increase from the incremental impact on the focal firm's performance-adjusted discretionary accruals relative to its unconditional mean (0.018/0.162 = 11.1, where 0.162 is the sample mean of Kothari et al.'s (2005) performance-adjusted earnings management proxy).

Establishing causality between the earnings management activities of a focal firm and common investor peer firms can be economically challenging. This is because of the reflection problem, described in Manski (1993). Given the endogenous choices of peers and/or common economic shocks (e.g., new accounting rules), a problem may arise if correlation is driven by unobserved firm characteristics. We attempt to overcome this issue by allowing peer groups to be focal firm-specific. Each firm's peer group is thus based on a firm-specific set of common investors, which leads to the presence of partially overlapping peer groups across firms. Hence, two peer firms cannot share an identical set of peers (in contrast to industry peers). As shown by previous work, the use of partially overlapping peer groups fully resolves the reflection problem (Bramoullé et al. (2009), De Giorgi et al. (2010), and Aghamolla and Thakor (2022)).

In addition to providing further evidence on causality between focal firms and common investor peers, we exploit a plausibly exogenous variation in the focal firm's incentive to focus on its peers. Specifically, we rely on Kempf et al.'s (2017) approach to measure common investors' level of distraction. By construction, this measure captures common investors' attention-grabbing shocks in unrelated industries that are orthogonal to focal firm fundamentals. We find strong evidence that common investor peer firms matter only when investors are fully attentive (i.e., not distracted). We emphasize that our results are not driven merely by peer firms within the same industry, rather, the peer effects are independent. This is because we only allow common investor distraction to break the link between the focal firm and its common investor peer firms. All industry links remain intact,

and are unaffected by attention-grabbing shocks.

To ensure our results are not spurious (e.g., they are driven by our ability to correctly capture cases when firms deliberately manipulate earnings), we also conduct tests on "suspect" firms. These are firms that are likely to manage their earnings (Graham et al. (2005), Roychowdhury (2006), and Cohen et al. (2008)). As expected, we find that firms follow the decisions of their common investor peers more often when they have incentives to meet or exceed certain earnings benchmarks.

Our approach allows us to exploit two potential mechanisms through which common investor peers influence focal firm decision making: mimicking, and capital market pressure. First, using heterogeneity within common investor peer groups, we find that peers are more important if they are geographically closer to the focal firm, and are dominated by long-term investors. These findings are consistent with recent literature on comovements in corporate financial decisions that are driven by firms' proximity along various dimensions (Dougal et al. (2015), Fisman et al. (2017), Parsons et al. (2018), and Dechow and Tan (2021)). This research suggests that focal firm managers mimic the decisions of their closest peers more than those of their counterparts.

Second, we document that peer pressure has a significant effect on firms that make large equity issues in the next period. The peer effect is most pronounced if the firm's peers also conduct large equity issues in the subsequent period. This suggests that peer pressure is more salient for firms with a more competitive situation in the market for external equity finance. Moreover, we find that firms with higher managerial entrenchment, and higher managerial opacity in written presentations during conference calls (based on the Fog index), exhibit lower orientation toward their investor peers. This suggests that entrenched managers, as well as those possessing less transparent corporate information, feel less pressure from capital markets to follow their common investor peers. This finding is consistent with Di Meo et al. (2017), who demonstrate that managers are often forced by capital market pressure to adopt earnings management practices to meet specific benchmarks. Entrenched managers, in contrast, feel less market pressure due to their lower career concerns (Stein (1989)).

We conduct a battery of robustness tests to validate that common investor peer earnings management decisions have a robust influence on shaping focal firms' earnings decisions. First, we use alternative accrual-based earnings management proxies. Second, we extend our analysis to real earnings management. Third, we reestimate our baseline model by including firm fixed effects in order to rule out concerns that our inference is biased by omitted variables at the focal firm level. Fourth, we modify the peer group threshold from the top 10% to the top 3%, 2%, and 1%. The results indicate a positive correlation between threshold and peer pressure on focal firms' earnings management decisions.

Our findings contribute to two strands of the literature. First, we extend existing literature analyzing peer influence on firms' decision-making processes. In particular, the theoretical foundation of peer pressure for accounting manipulation comes from Gao and Zhang (2019). They provide evidence that managers mimic peer firms' accounting policies because they are incentivized to do so. For example, peer pressure can arise out of managerial compensation concerns. A survey by Dichev et al. (2016) highlights that CFOs face internal and external pressure to manipulate earnings in order to protect their own career and compensation benefits. They may face adverse consequences if

earnings benchmarks are missed, or earnings are too volatile.

Other empirical works by Leary and Roberts (2014), Foucault and Fresard (2014), Cao et al. (2019), Grennan (2019), Seo (2021), Grieser et al. (2022), and Aghamolla and Thakor (2022) show that industry peer firms play an important role in determining corporate capital structures and financial policy decisions. With respect to earnings management, Kedia et al. (2015), Bratten et al. (2016), and Charles et al. (2018) find that firms respond strategically to the earnings management activities of their industry peer firms. Ramalingegowda et al. (2021) show that common institutional ownership within an industry mitigates earnings management by improving institutional investors' monitoring efficiency.

In contrast to these studies, our approach is novel. We allow firms to be linked by an investor regardless of industry affiliation. This enables us to examine the general impact of common ownership beyond any industry-specific effects. Other studies document peer effects due to shared analysts, directors, or socially connected executives in firms' corporate policy decisions. Kaustia and Rantala (2015) and Gomes et al. (2022) show that firms connected through common analysts exhibit more excess comovements in corporate capital structure decisions. This suggests that firms rely on analysts' experience and expertise in assessing industry- and peer-level information. Bouwman (2011) and Foroughi et al. (2022) find that firms with shared directors have similar corporate governance practices, while Chiu et al. (2013) show they have similar earnings management activities. Consistent with this line of reasoning, Fracassi (2017) shows that firms with socially connected executives exhibit high comovements in corporate policy decisions.

Our novel approach contributes to these findings by showing that common investor peer firms play an important role in shaping corporate earnings management decisions. Managers are likely to observe what their investors tolerate in other firms, and to adopt those decisions in order to mitigate the risk of shareholder activism in their own firms.

Second, we extend the literature on firm behavior motivated by portfolio effects. Di Giuli et al. (2021) show that the dividend policies of firms that are newly added to an investor's portfolio move toward the dividend policies of existing firms in that portfolio. Similarly, He and Huang (2017), Azar et al. (2018), and Antón et al. (2021) show that common ownership can influence firms' decision making because common owners have an incentive to evaluate each firm from a portfolio perspective. This incentive arises from the fact that the actions of one firm may harm another firm in the portfolio of common investors. However, these common incentives are unlikely to result in the same outcome as maximizing the value of each single firm, however.

Antón et al. (2022) find that higher common institutional ownership in a given firm leads to lower performance-sensitive incentives for the CEO. They conclude that executive compensation serves to connect common ownership to lower competition. Building on the notion that common ownership can alter firms' behavior, we assume that a focal firm's managers manipulate earnings in response to the earnings management decisions of their common investor peer firms.

The remainder of this paper is organized as follows. Section 4.2 outlines our methodology and the dataset used in the empirical study. Our main results are in Section 4.3, while Section 4.4 describes several robustness tests. Section 4.5 concludes.

4.2 Data description

4.2.1 Sample

Our initial sample is based on U.S. firms traded on the American Stock Exchange (AMEX), NASDAQ, and New York Stock Exchange (NYSE), and covered by Compustat from 1988 to 2019. We exclude utilities (Standard Industry Classification codes (SICs) 4900-4999) and financial firms (SICs 6000-6999), because these industries are heavily regulated. This affects their accounting rules and the accrual generation process (Fang et al. (2016)). To minimize the influence of outliers, we remove firm-year observations with total assets of less than $1 million, and we winsorize all ratios at the 1% and 99% levels.

Institutional holdings data come from the Thomson Reuters Institutional Managers (13f) Holdings Database. This database contains equity ownership information on all institutional investment managers with at least $100 million in assets under management by quarter. We exclude institutional holdings in invested entities of less than 0.5% to total equity, as it is unlikely they will be able to influence holdings (Azar et al. (2018)). We complement the data using fiscal year-end consensus analysts' earnings per share (EPS) forecasts, and actual EPS from Institutional Brokers Estimate System (I/B/E/S). Our final sample for the baseline regression includes 53,984 firm-level observations from 6,483 firms for the 1990 to 2019 period.

4.2.2 Variables and descriptive statistics

4.2.2.1 Measuring accrual-based earnings management proxies and income smoothing

Prior literature shows that managers engage in accruals management before seeking real activities management (Badertscher (2011)). Similarly, Kothari et al. (2016) note that manipulating real activities entails altering normal operations to meet certain earnings targets, which is costlier for the firm. Managers will thus attempt to accomplish earnings management with accrual-based instruments before engaging in real earnings management. Against this backdrop, in our analysis, we focus primarily on whether focal firms' accrual-based earnings management decisions respond to common investor peer pressure. In robustness tests, we also show a positive relation between common investor peer pressure and real earnings management activities.

In our empirical analysis, the main dependent variable is a performance-adjusted accrual-based measure of firms' earnings management. A firm's total accruals denote the accounting correction for differences between earnings and cash flows. Therefore, measures of earnings management aim to capture the fraction of total accruals that are not explained by shifts in a firm's economic environment or discretionary accruals. Building on prior work on earnings management (Bartov et al. (2000), Hribar and Collins (2002), Kothari et al. (2005), Hazarika et al. (2012)), we construct our proxy by using the modified Jones (1991) model, as further modified by Dechow et al. (1995). We incorporate contemporaneous ROA to avoid potential misspecifications from ignoring firms' profitability (Kothari et al. (2005)). This measure is a commonly applied proxy in the literature, and is used in our baseline model.

Specifically, we use cash flow statements to define total accruals (TA) for firm i in year t as earnings before extraordinary items. We also use discontinued operations minus operating cash flows, scaled by lagged total assets, in order to mitigate heteroskedasticity in the residuals. We focus on operating accruals because their shift has a significant effect on reported earnings.[3] Formally, we calculate a firm's discretionary accruals as the idiosyncratic part (residual) of subsequent annual cross-sectional regressions for each 2-digit SIC industry year pair with more than fifteen observations:

$$TA_{it} = \alpha_1 \frac{1}{Asset_{it-1}} + \alpha_2 \frac{\Delta Sales_{it} - \Delta AR_{it}}{Asset_{it-1}} + \alpha_3 \frac{PPE_{it}}{Asset_{it-1}} + \alpha_4 \frac{NI_{it}}{Asset_{it-1}} + \epsilon_{it}, \tag{4.1}$$

where $\Delta Sales_{it}$ is change in sales in year *t-1*; ΔAR_{it} is change in accounts receivable in year t from the previous year (*t-1*); PPE_{it} is gross property, plant, and equipment in year t; NI_{it} is net income in year t; $Asset_{it-1}$ is lagged total assets; and ϵ_{it} is the regression residual used to capture the discretionary accruals.

We define our main measure of accrual-based earnings management, *AbsDa_KLW*, as the absolute residuals from these industry year regressions. Therefore, a higher value of *AbsDa_KLW* indicates a higher level of earnings management. Note that the normal residual is a signed value, so positive (negative) values represent income-increasing (-decreasing) discretionary accruals. However, we focus on its absolute value, because earnings management can involve both income-increasing and -decreasing accruals (Healy and Wahlen (1999), Klein (2002), Myers et al. (2003), Cohen et al. (2008), Gul et al. (2009), and Hazarika et al. (2012)).

For our robustness tests, we also use alternative discretionary accruals models. First, we follow Owens et al. (2017), who note that accrual-building firm processes differ across industries. This is because changes in regulations cause idiosyncratic shocks that affect firms differently. We thus use the same model as in Equation 4.1, but further incorporate a proxy for idiosyncratic shock as an additional explanatory variable:

$$TA_{it} = \alpha_1 \frac{1}{Asset_{it-1}} + \alpha_2 \frac{\Delta Sales_{it} - \Delta AR_{it}}{Asset_{it-1}} + \alpha_3 \frac{PPE_{it}}{Asset_{it-1}} + \alpha_4 \frac{NI_{it}}{Asset_{it-1}} + \alpha_5 IS_{it} + \epsilon_{it}, \tag{4.2}$$

where IS_{it} is the mean squared error from regressing firm returns on industry and market returns with data from years *t-1* to t at a monthly frequency, and ϵ_{it} is an error term used to capture discretionary accruals. We capture the measure of this accrual-based earnings management, *AbsDa_OWZ*, as the absolute residuals from industry year regressions. A higher value of *AbsDa_OWZ* indicates a higher level of earnings management.

Second, we follow McNichols (2002), and modify Equation 4.1 with another set of controls suggested by Dechow and Dichev (2002). Specifically, we regress total accruals on the lead, contemporaneous, and lagged cash flows from operations, scaled by lagged total assets, in the following annual cross-sectional regressions:

$$\Delta WC_{it} = \alpha_0 + \alpha_1 CF_{it-1} + \alpha_2 CF_{it} + \alpha_3 CF_{it+1} + \alpha_4 \Delta Sales_{it} + \alpha_5 PPE_{it} + \epsilon_{it}, \tag{4.3}$$

where ΔWC_{it} is firm *i*'s change in working capital in year *t* from year *t-1*, measured as the change in accounts receivable in year *t* from year *t-1*, plus the change in inventory in year *t* from year *t-1*, minus the change in accounts payable in year *t* from year *t-1*, minus the change in tax payable in year *t* from year *t-1*, plus the change in other net assets net of liabilities in year *t* from year *t-1*, all scaled by average assets. CF_{it-1} is cash flow from operations in year *t-1*, and ϵ_{it} is the residual used to capture discretionary accruals. As before, we focus only on the absolute values of this error term, which indicate that a higher value of *AbsDa_McN* signifies a higher level of earnings management.

Third, we rely on a measure for income smoothing based on Tucker and Zarowin (2006). Their approach assumes managers use discretionary accruals to maximize smoothness in reported earnings. More volatile earnings may be detrimental for capital markets because they generally convey higher risk and/or lower growth (Graham et al. (2005)). We define *Income_TZ* as a negative correlation coefficient between changes in discretionary accruals (measured over the current year) and changes in prediscretionary income (measured over the past four years) for each firm. Higher negative correlation coefficients indicate more income smoothing.

4.2.2.2 Measuring real earnings management proxies

We acknowledge that earnings management is not limited to manipulating accruals. Thus, we follow prior literature (Dechow et al. (1998); Roychowdhury (2006); Cohen and Zarowin (2010); Kothari et al. (2016); Kim et al. (2017)), and measure real earnings management with abnormal production costs, abnormal discretionary expenses, and abnormal operating cash flow. Specifically, we use the model developed by Dechow et al. (1998) and adjusted by Roychowdhury (2006). First, we estimate abnormal production costs for each 2-digit SIC code industry in each year. We require each industry year to have at least fifteen observations in the following annual cross-sectional regressions:

$$\frac{PROD_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{SALES_{it}}{TA_{it-1}} + \alpha_3 \frac{\Delta SALES_{it}}{TA_{it-1}} + \alpha_3 \frac{\Delta SALES_{it-1}}{TA_{it-1}} + \epsilon_{it}, \tag{4.4}$$

where abnormal production costs ($ABPROD_{it}$) are captured in the residuals, and production costs ($PROD_{it}$) are cost of goods sold plus change in inventories. Overproduction refers to producing more goods than necessary to increase earnings. A higher value of $ABPROD_{it}$ indicates more real earnings management.

Second, using the same annual cross-sectional regressions setting as in Equation 4.4, we estimate abnormal discretionary expenses as follows:[4]

$$\frac{DISPEXP_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{SALES_{it}}{TA_{it-1}} + \epsilon_{it}, \tag{4.5}$$

where abnormal discretionary expenses ($ABEXP_{it}$) are captured in the residuals, and discretionary expenses ($DISPEXP_{it}$) are R&D plus selling, general, and administrative expenses. The other variables are defined as in Equation 4.4. Managers usually have discretion to cut R&D, advertising, and SG&A expenses to increase reported earnings. A higher value of *ABEXP* indicates less real earnings management. We multiply it by -1 so that higher values indicate more real earnings management activities.

Third, we estimate abnormal operating cash flows as follows:

$$\frac{CFO_{it}}{TA_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{TA_{it-1}} + \alpha_2 \frac{SALES_{it}}{TA_{it-1}} + \alpha_3 \frac{\Delta SALES_{it}}{TA_{it-1}} + \epsilon_{it}, \tag{4.6}$$

where abnormal operating cash flows ($ABCASH_{it}$) are captured in the residuals, and CFO_{it} is firms' operating cash flow. All other variables are defined as in Equation 4.4. *ABCASH* indicates sales manipulation, where managers attempt to boost short-term sales by offering more price discounts or more lenient credit terms. A higher value of *ABCASH* indicates less real earnings management. We multiply it by -1, where a higher value signals more real earnings management.

Finally, we follow Roychowdhury (2006) and aggregate the three real earnings management proxies as follows:

$$REM\_R_{it} = ABPROD_{it} + ABCASH_{it} + ABEXP_{it}. \tag{4.7}$$

We also follow Cohen and Zarowin (2010), and compute two alternative measures of real earnings management as follows:

$$REM\_CZ1_{it} = ABPROD_{it} + ABEXP_{it}, \tag{4.8}$$

$$REM\_CZ2_{it} = ABEXP_{it} + ABCASH_{it}. \tag{4.9}$$

In robustness tests, we follow Kim et al. (2017), and use abnormal cash flows *ABCASH* from Equation 4.4 as an additional proxy for real earnings management activities based on abnormal cash flows from operations, *REM_KKZ*.

4.2.2.3 Measuring common ownership

We create a firm-pair-level measure of overlapping ownership structures between two firms, which we refer to as institutional connectivity. As Antón and Polk (2014) state, common ownership represents the extent to which an investor owns multiple shares in a pair of firms. Formally, we compute the pair-level connectivity measure as follows:

$$Connectivity_{ijt} = \Sigma_{f=1}^{F} [\alpha_{i,f,t}(\frac{v_{i,t}}{v_{i,t}+v_{j,t}}) + \alpha_{j,f,t}(\frac{v_{j,t}}{v_{i,t}+v_{j,t}})], \tag{4.10}$$

where $\alpha_{i,f,t}$ is the fraction of firm i held by common investor f in quarter t, and $\alpha_{j,f,t}$ is the fraction of firm j held by the same common investor f in the same quarter t. The firm's market value of equity (v) is computed as the product of total shares outstanding times the corresponding price in quarter t. We construct pair-level common ownership measures by aggregating the connectivity values across all common institutional investors in each firm-pair in our sample.[5]

Next, for each quarter t, we rank firm i's connected firms in descending order of *Connectivity* (i.e., from the highest to the lowest institutional overlap). We retain those in the top decile. We can thus concentrate on the firms most likely to be the focus of focal firm management. For robustness,

we change this threshold to the top 3rd, 2nd, and 1st percentiles. Our results remain qualitatively similar, although the peer effect becomes more pronounced with higher thresholds.

4.2.2.4 Measuring common investor distraction

To address concerns about endogeneity, we use exogenous increases in common investors' distraction that reduce their ability to monitor firms. Investor distraction arises from attention-grabbing events. This variable allows us to identify the causal effect of common investor peer effects on firms' corporate earnings management decision making. In particular, our analysis exploits industry shocks to unrelated firms of common investor portfolios.

We next apply Kempf et al.'s (2017) methodology to our sample of common institutional investors.[6] By design, our distraction measure captures the relative importance of the two firms in the common investor portfolios, of the shocked industries in their portfolios, and of each common investor in both firms. We construct our distraction measure in three steps.

First, we identify exogenous shocks to unrelated industries (relative to the firm-pair) in the common investor's portfolio to capture times when the investors are likely to be distracted from the firm-pair. We calculate an industry shock as the highest or lowest decile of returns across all twelve Fama-French industries in a given quarter. Thus, we capture the most extreme industry returns (positive and negative) in a given quarter.[7]

Second, we convert the quarterly distraction measure (*DIST*) for each common investor at the firm-pair level into an average *DIST* value in a given quarter. We then average this value over the entire fiscal year to obtain a unique value for each firm-pair. Larger values of *DIST* indicate lower monitoring intensity at the focal firm. In other words, we find that *DIST* has a higher value when the exogenous shocks occur in unrelated industries, when the shocked industries are important in the portfolio of the common investor, and when common investors are important in the firm-pair.

Third, we assign firms to two groups based on common investor distraction score. We classify a firm's common investor as attentive (distracted) if it belongs to the group with a distraction level in the top (bottom) tercile. In this way, we can distinguish between distracted and attentive common investors in the focal firm and its peers in a given year.

4.2.2.5 Identifying suspect firms

To ensure we can properly identify firms' earnings management activities, we also analyze suspect firms. Suspect firms are those most prone to managing their earnings to meet analyst consensus forecasts. Survey evidence by Graham et al. (2005) shows that firm managers are generally keen to meet or beat analyst consensus forecasts because they fear retribution from the capital market. For example, they may face lower management credibility, declining share prices, and spend significant time explaining why they missed benchmarks. Previous studies have found that they are likely to manipulate earnings to meet their goals because the consequences are so severe (see, e.g., Degeorge et al. (1999), Brown (2001), Roychowdhury (2006), and Cohen et al. (2008)).

Consistent with Cohen et al. (2008), we examine the accrual-based management activities of firms that we posit may have managed their earnings prior to the announcement date. To this end, we

obtain annual analyst forecasts from I/B/E/S, and consider only forecasts made and/or revised after the beginning of the fiscal year. We define forecast error as the difference between actual earnings per share (EPS) and the consensus forecast of EPS. Moreover, we create an indicator variable that equals 1 for firms that have a positive forecast error of $0.01 per share or less (suspect firm), and 0 otherwise (non-suspect firm).

4.2.2.6 Control variables

We include a set of firm-level control variables following prior work (Dechow (1994), Dechow and Dichev (2002), Burgstahler et al. (2006), Hribar and Nichols (2007), and Chaney et al. (2011)). Definitions and sources for all variables used are in Table C1. We include the natural logarithm of total assets in millions of U.S. dollars (*FSIZE*), operating cycle (*OPCY*), cash flow volatility (*CFVOL*), sales volatility (*SAVOL*), and sales growth volatility (*SGRVOL*). We also follow Gopalan and Jayaraman (2012), and control for the average of days in accounts payable (*DPAY*), and whether the firm incurred a loss in the current fiscal year (*LOSS*). Sales growth (*SGR*) is included to control for growth opportunities, ROA (*ROA*) to control for profitability, and long-term debt (*LEV*) because the default costs imposed by creditors provide incentives for earnings management (Francis and Yu (2009), Chaney et al. (2011), Attig et al. (2020), Attig et al. (2021), and El Ghoul et al. (2021)). We include an indicator variable for whether the firm is audited by a Big Four auditor (BIG4) (Becker et al. (1998) and Francis and Wang (2008)). Finally, we control for the level of institutional ownership (*IO*) and the concentration of institutional holdings in a given firm, computed as the Herfindahl-Hirschman index (*IHHI*) (Ajinkya et al. (2005), Velury and Jenkins (2006), Burns et al. (2010), Ayers et al. (2011), Ramalingegowda and Yu (2012), and Ramalingegowda et al. (2021)).

4.2.2.7 Descriptive statistics

Table 4.1 gives the descriptive statistics for the regression variables. Focal firm characteristics are reported in Panels A (dependent variables) and B (control variables). Panel C gives the common investor peer averages of the dependent variables. Following Leary and Roberts (2014), we calculate the peer variables for the dependent and control variables by taking the average of the focal firm's peers (excluding the focal firm itself).

We note that mean discretionary accruals from the Kothari et al. (2005) model, *AbsDa_KLW*, account for 16.2% of total assets. Discretionary accruals based on Owens et al. (2017), *AbsDa_OWZ*, are 7.1%, while those calculated following McNichols (2002), *AbsDa_McN*, fall in between, at 10.8%. These numbers are similar to those found in prior studies of earnings management (Cohen et al. (2008), Attig et al. (2021), and Choudhary et al. (2021)).

Turning next to fundamentals, the average firm in our sample is relatively large (*FSIZE* = 5.8; $2.3 billion before logarithmic transformation) and profitable (*ROA* = 8.5%), with moderate long-term debt to assets (*LEV* = 17.4%) and considerable sales growth (*SGR* = 12.5%). The remaining controls for the summary statistics are comparable to those reported in related studies (e.g., Guedhami et al. (2013), Attig et al. (2020), Attig et al. (2021), and El Ghoul et al. (2021)).

Table 4.1
Descriptive statistics

This table reports the summary statistics of the main variables of the focal firm characteristics (Panels A and B). In Panel C, we report the common investor peer averages for the dependent variables, which are calculated across all firms in the peer group except the focal firm itself. For each variable, we show number of non-missing observations, mean, standard deviation, and 1st, 25th, 50th, 75th, and 99th percentiles. The sample period is 1990 through 2019. Detailed variable definitions are in Table C1.

	Obs.	Mean	SD	p1	p25	p50	p75	p99
Panel A: Earnings management proxies - focal firm								
AbsDA_KLW	53,984	0.162	0.282	0.001	0.031	0.073	0.166	1.764
AbsDA_OWZ	49,532	0.071	0.080	0.001	0.021	0.047	0.090	0.449
AbsDA_McN	49,002	0.108	0.197	0.001	0.018	0.045	0.108	1.203
Income_TZ	41,173	−0.001	0.542	−0.961	−0.459	0.007	0.453	0.958
REM_KKZ	51,058	−0.597	2.448	−14.021	−0.898	−0.358	−0.001	7.715
REM_CZ1	51,058	−0.662	2.416	−13.613	−0.966	−0.399	−0.017	7.372
REM_CZ2	51,310	−0.483	2.126	−10.865	−0.727	−0.278	−0.020	7.903
REM_R	53,984	0.224	0.428	0.002	0.043	0.097	0.211	2.761
Panel B: Controls - focal firm								
FSIZE	53,984	5.774	1.997	1.854	4.276	5.651	7.152	10.707
OPCY	53,984	0.013	0.105	0.000	0.004	0.005	0.007	0.094
CFVOL	53,984	0.101	0.144	0.009	0.036	0.063	0.111	0.650
SAVOL	53,984	0.200	0.201	0.018	0.079	0.140	0.245	1.067
SGR	53,984	0.125	0.354	−0.541	−0.023	0.070	0.194	1.728
SGRVOL	53,984	1.081	35.308	0.018	0.080	0.151	0.286	6.074
LEV	53,984	0.174	0.181	0.000	0.005	0.130	0.283	0.735
LOSS	53,984	0.151	0.358	0.000	0.000	0.000	0.000	1.000
ROA	53,984	0.085	0.192	−0.719	0.058	0.117	0.171	0.379
DPAY	53,984	0.067	0.989	0.000	0.000	0.000	0.001	0.776
BIG4	53,984	0.822	0.383	0.000	1.000	1.000	1.000	1.000
IO	53,984	0.388	0.245	0.008	0.171	0.381	0.584	0.900
IHHI	53,984	0.023	0.025	0.000	0.006	0.017	0.031	0.145
DIST	25,346	0.057	0.020	0.018	0.043	0.054	0.069	0.114
DEBTISS	53,984	0.101	0.207	0.000	0.000	0.002	0.107	1.257
EQUITYISS	53,984	0.035	0.103	0.000	0.000	0.004	0.015	0.661
E-Index	15,262	3.257	1.452	0.000	2.000	4.000	4.000	6.000
Fog-Index	17,394	15.324	1.619	11.261	14.323	15.341	16.364	19.070
# of peers (Top 10%)	53,988	156.687	44.971	2.000	140.000	163.000	189.000	217.000
# of peers (Top 3%)	53,916	62.910	17.102	2.000	56.000	65.000	75.000	86.000
# of peers (Top 2%)	53,714	47.231	12.522	2.000	42.000	49.000	56.000	65.000
# of peers (Top 1%)	53,450	31.494	8.073	2.000	28.000	32.000	37.000	43.000
Panel C: Earnings management proxies - peer group averages								
AbsDA_KLW	53,984	0.146	0.092	0.053	0.080	0.118	0.184	0.441
AbsDA_OWZ	49,521	0.059	0.015	0.038	0.052	0.058	0.064	0.101
AbsDA_McN	48,963	0.095	0.051	0.031	0.054	0.090	0.120	0.254
Income_TZ	41,128	−0.031	0.093	−0.203	−0.084	−0.032	0.020	0.163
REM_KKZ	51,043	−0.516	0.614	−1.897	−0.739	−0.462	−0.279	0.718
REM_CZ1	51,043	−0.608	0.618	−2.030	−0.878	−0.532	−0.337	0.713
REM_CZ2	51,296	−0.442	0.558	−1.792	−0.663	−0.405	−0.231	0.972
REM_R	53,984	0.194	0.127	0.071	0.113	0.152	0.234	0.575

4.3 Empirical results

We begin by estimating the impact of common investor peers' earnings management decisions on the focal firm's decisions. Our evidence suggests this relation is causal. Next, we document the

importance of common investor peers that are geographically closer to the focal firm, and are dominated by long-term investors. This suggests that managers mimic decisions of their closest peers more than those of more distant peers. Finally, we find that competitive rivalry may be an alternative mechanism through which common investor peer firms influence focal firm behavior.

4.3.1 Investor peer pressure and earnings management

4.3.1.1 Baseline results

To test the relation between firms' earnings management decisions and corporate earnings management in common investor peer firms, we run regressions using our main measure of accrual-based earnings management, *AbsDa_KLW* (see Section 4.2.2.1). Because earnings management can involve both income-increasing and -decreasing accruals (Healy and Wahlen (1999)), we use the absolute value of discretionary accruals. Here, higher values indicate higher levels of earnings management. Moreover, we calculate common investor peer averages for each dependent variable and all control variables across all connected firms, except the focal firm itself. We denote a firm as belonging to the common investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year.

Formally, we estimate the following fixed effects panel regression model:

$$\begin{aligned} EM_{it} = &\alpha_0 + \alpha_1 PEER\_EM_{pt} + \alpha_3 FControls_{it} \\ &+ \alpha_4 IControls_{it} + \alpha_5 PControls_{pt} + \phi_t + \delta_k + \epsilon_{it}, \end{aligned} \tag{4.11}$$

where EM_{it} is focal firm *i*'s measure of earnings management in year *t*; $PEER\_EM_{pt}$ is the corresponding earnings management at the common investor peer firm level; $FControls_{it}$ contains a set of focal firm-level control variables (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGVOL*, *LEV*, *SGR*, *DPAY*, *LOSS*, *ROA*, and *BIG4*); $IControls_{it}$ control for the focal firm's ownership structure (*IO* and *IHHI*); and $PControls_{pt}$ contains a set of common investor peer firm-level control variables (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGVOL*, *LEV*, *SGR*, *DPAY*, *LOSS*, *ROA*, and *BIG4*). By adding year (ϕ_t) and industry (δ_k) fixed effects to all regressions (except those in column (1)), we can isolate the influence of aggregate time series trends, and control for all time-invariant industry characteristics. We cluster standard errors at the focal firm level.

Results are in Table 4.2. Columns (1) to (4) reveal that firms' earnings management decisions are strongly influenced by their common investor peers. As we include additional control variables, the coefficient on PEER_EM decreases somewhat, but remains statistically significant ($p \leq 0.01$). This holds for column (4), which includes all of our controls, and therefore serves as our benchmark specification. The positive sign on PEER_EM indicates that a higher level of earnings management for common investor peers is associated with a higher level of earnings management at the focal firm. In economic terms, a 1–standard deviation increase in investor peers' earnings management decisions increases focal firms' performance-adjusted discretionary accruals by 11% (= $1 \times 0.092 \times 0.191/0.162$) relative to its unconditional mean (0.162).[8]

Table 4.2
Baseline regressions

Dependent variable	AbsDA_KLW						
					Standardized	DA<0	DA>0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PEER_EM	0.910***	0.296***	0.206***	0.191***	0.062***	0.137**	0.173**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.015)	(0.021)
FSIZE		−0.003**	−0.002*	−0.005***	−0.033***	−0.006***	−0.002
		(0.030)	(0.083)	(0.002)	(0.002)	(0.001)	(0.424)
OPCY		0.054	−0.141**	−0.143***	−0.053***	−0.211***	−0.009
		(0.465)	(0.010)	(0.010)	(0.010)	(0.005)	(0.806)
CFVOL		0.198***	0.146***	0.145***	0.074***	0.126***	0.156***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SAVOL		−0.010	0.036***	0.036***	0.026***	0.035***	0.045***
		(0.211)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
SGR		0.055***	0.042***	0.039***	0.049***	0.048***	0.035***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGRVOL		0.000	0.000**	0.000*	0.008*	0.000***	0.000
		(0.121)	(0.048)	(0.055)	(0.055)	(0.000)	(0.597)
LEV		−0.058***	−0.010	−0.007	−0.005	−0.004	0.002
		(0.000)	(0.232)	(0.408)	(0.408)	(0.736)	(0.892)
LOSS		0.007	−0.017***	−0.019***	−0.024***	0.009	−0.007
		(0.248)	(0.004)	(0.002)	(0.002)	(0.242)	(0.398)

(*continued*)

Table 4.2 — *continued*

ROA		−0.044**	−0.039**	−0.042***	−0.029***	0.145***	−0.182***
		(0.010)	(0.015)	(0.008)	(0.008)	(0.000)	(0.000)
DPAY		0.001	0.020***	0.020***	0.070***	0.032***	0.002
		(0.905)	(0.001)	(0.001)	(0.001)	(0.001)	(0.673)
BIG4		0.001	−0.002	−0.002	−0.003	−0.001	−0.010*
		(0.887)	(0.684)	(0.656)	(0.656)	(0.827)	(0.086)
IO		0.001	−0.019*	−0.024**	−0.021**	−0.044***	0.003
		(0.922)	(0.081)	(0.029)	(0.029)	(0.001)	(0.854)
IHHI		−0.338***	−0.091	−0.042	−0.004	−0.033	0.045
		(0.000)	(0.217)	(0.573)	(0.573)	(0.721)	(0.658)
Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes	Yes	Yes	Yes
Peer controls	No	No	No	Yes	Yes	Yes	Yes
Observations	53,984	53,984	53,756	53,756	53,756	34,950	18,798
Adj. R-squared	0.088	0.127	0.217	0.217	0.217	0.234	0.295

In column (5), we reestimate the baseline specification (column (4)) using standardized coefficients. This allows us to evaluate the importance of common investor peers' earnings management decisions relative to other variables. We find that a 1–standard deviation increase in common investor peers' earnings management is associated with, on average, a 0.062-standard deviation increase in the focal firm's discretionary accruals. Comparing common investor peer pressure with the other model variables, we observe that the impact of *PEER_EM* on earnings management is large, behind only cash flow volatility (*CFVOL*) and average number of days in accounts payable (*DPAY*).

Finally, the last two columns of Table 4.2 decompose focal firm earnings management into income-decreasing (DA < 0) or -increasing (DA > 0) decisions. When we reestimate our baseline specification, both columns (6) and (7) show that earnings management in the focal firm is positively related to earnings management in common investor peers. The effect from income-decreasing and -increasing earnings management appears to be statistically similar ($p \leq 0.05$). We conclude that focal firm managers follow their common investor peers in both income-decreasing and -increasing earnings management decisions.

4.3.1.2 Distracted investor peer connections

To establish causality, we consider an exogenous shock to common investors' monitoring ability. We confirm that firms follow their common investor peers only if their connecting investors are able to provide effective monitoring. Prior research shows that investor distraction reduces monitoring, and may weaken managers' incentives to benefit shareholders (Kempf et al. (2017), Abramova et al. (2020), Gilje et al. (2020), Liu et al. (2020), and Garel et al. (2021)). We use a modified version of Kempf et al.'s (2017) investor distraction measure to show that the link between the earnings management of common investor peers and focal firms is causal. In particular, we reestimate our baseline regression for two distinct subgroups: one with attentive common investors, and the other with distracted common investors (see Section 4.2.2.4 for details).

The results are in Table 4.3. Columns (1) and (3) reveal that the level of earnings management at the focal firm is positively related to the level of earnings management at its common investor peer firms. However, the estimated coefficient on *PEER_EM* is only statistically significant (with $p \leq 0.01$) for firms with attentive common investors. Columns (3) and (4) reinforce our finding by adding firm fixed effects, rather than industry fixed effects, to the regressions. Moreover, the *PEER_EM* estimate is significantly higher for focal firms with attentive common investors (columns (1) and (3)) than for those with distracted common investors (columns (2) and (4)). This is illustrated by the Chow test p-value at the bottom of the table.

Overall, the results support our prediction. The positive effect of earnings management at the common investor peer level on focal firm earnings management matters only when common investors are attentive and thus well positioned to exert their influence via monitoring. We emphasize that our identification only allows common investor distraction to break the link between the focal firm and its peer firms. All other industry links remain intact, and are unaffected by attention-grabbing shocks. Therefore, our results are not simply driven by common investor peer firms within

Table 4.3
Distracted common investors

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) among attentive (column (1) or distracted column (2) investors. We follow the approach of Kempf et al. (2017), and capture time periods when the common investors of the focal firm and the corresponding peer firms are distracted. For each fiscal year, we divide firms into two groups along the tercile investor distraction score. A firm's common investor base is considered attentive if it belongs to the group below the tercile, and distracted otherwise. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, *BIG4*) and control variables on the focal firm's investor base (*IO*, *IHHI*). All specifications include industry and year fixed effects. Industries are defined by four-digit SIC codes. The unit of observation is at the focal firm year level. Common investor peer controls include the same controls as for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW		AbsDA_KLW	
	Attentive	Distracted	Attentive	Distracted
	(1)	(2)	(3)	(4)
PEER_EM	0.683***	0.214	0.625***	−0.020
	(0.000)	(0.348)	(0.004)	(0.936)
FSIZE	−0.009***	−0.006	−0.012	−0.009
	(0.005)	(0.138)	(0.229)	(0.439)
OPCY	−0.050*	−3.083**	0.052***	0.070
	(0.073)	(0.030)	(0.000)	(0.980)
CFVOL	0.050**	0.053	0.070	0.110
	(0.046)	(0.256)	(0.128)	(0.137)
SAVOL	0.034**	0.022	0.045	0.009
	(0.038)	(0.287)	(0.125)	(0.803)
SGR	0.034***	0.022	0.051***	0.031
	(0.001)	(0.165)	(0.000)	(0.211)
SGRVOL	0.000	0.000	0.000***	0.000
	(0.592)	(0.722)	(0.000)	(0.810)
LEV	0.021	−0.018	0.028	−0.024
	(0.268)	(0.414)	(0.487)	(0.562)
LOSS	0.002	0.025	0.017	0.021
	(0.913)	(0.157)	(0.404)	(0.376)
ROA	−0.003	0.084*	0.112**	0.077
	(0.928)	(0.067)	(0.034)	(0.303)
DPAY	0.022**	0.311**	−0.025**	−0.015
	(0.030)	(0.029)	(0.013)	(0.957)
BIG4	−0.001	0.005	−0.012	−0.041
	(0.896)	(0.690)	(0.547)	(0.143)
IO	0.034	−0.070***	0.055	−0.066
	(0.133)	(0.009)	(0.122)	(0.168)
IHHI	−0.341***	0.067	−0.191	0.019
	(0.003)	(0.742)	(0.442)	(0.943)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No
Firm FE	No	No	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Observations	8,420	8,420	7,299	7,589
Adj. R-squared	0.212	0.248	0.258	0.284
Chow test p(PEER_EM (1) ≠ PEER_EM (2)) = 0.000				
Chow test p(PEER_EM (3) ≠ PEER_EM (4)) = 0.003				

the same industry. Common investor peers exert an independent effect.

In economic terms, with attentive common investors, a 1-standard deviation increase in the level of peers' earnings management leads to a 36% positive effect on focal firms' performance-adjusted discretionary accruals (= 1 × 0.085 × 0.683/0.162) in column (1). In contrast, the effect is 16.2% for the sample mean of focal firms' earnings management. Similarly, in column (3), we observe a positive common investor peer effect of 33% (= 1 × 0.086 × 0.625/0.162) relative to the sample mean of focal firms' earnings management.

4.3.1.3 Suspect firms

To confirm that our tests are effectively capturing accrual-based earnings manipulation activities, we now focus on suspect firms, which are more likely to manage earnings. We expect common investor peer pressure to play a stronger role in the level of earnings management in suspect focal firms. Therefore, we reestimate our baseline model for two subgroups: non-suspect focal firms, and suspect focal firms (see Section 4.2.2.5 for details).

The results are in Table 4.4. Column (1) reports the estimates for non-suspect firms; column (3) reports estimates for the suspect firms. The corresponding standardized coefficients are in columns (2) and (4), respectively. The level of common investor peers' earnings management, *PEER_EM*, is positively associated with focal firms' earnings management. Comparing columns (1) and (3), we observe that the peer effect is statistically significant in both columns (with $p \leq 0.01$). However, the coefficients differ significantly from each other, as indicated by the Chow test at the bottom of the table (with $p \leq 0.01$). A 1-standard deviation increase in common investor peer firms' abnormal accruals increases those at suspect focal firms by 36% (= 1 × 0.095 × 0.622/0.162) in column (3), but at non-suspect firms by only 9.6% (= 1 × 0.091 × 0.171/0.162) in column (1). This is relative to the sample mean of focal firms' earnings management (16.2%). Finally, comparing standardized coefficients in columns (2) and (4), we find that the level of earnings management at common investor peers is nearly four times higher in suspect than non-suspect firms (0.202 vs. 0.056).

Taken together, these findings suggest that firms are indeed more likely to engage in earnings management and follow their common investor peers if they are under extreme pressure to meet or exceed certain earnings targets.

4.3.2 When does investor peer pressure matter?

We have, thus far, treated all firms in a common investor peer group as equally important. However, it is conceivable that some members are more influential than others in shaping earnings management decisions at focal firms. For example, more valuable firms, geographically close firms, and firms with more long-term institutional ownership may be more relevant or salient as benchmarks.[9] When the optimal level of tolerable earnings management is unknown, firms may opt to follow the observed actions of those from their closest peer group. Previous literature has documented this kind of mimicking behavior as an informational cascade (Banerjee (1992), Bikhchandani et al. (1992)). To illuminate this mechanism further, we posit that some peers exert more influence on focal firm decision-making in corporate earnings management. The estimation results are

Table 4.4
Suspect firms

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) among different peer subgroups. In each fiscal year, we denote a firm as suspect (column (3), and with standardized coefficients (4)), if it meets or beats its consensus analyst forecast by $0.01 per share, and non-suspect otherwise (column (1) and with standardized coefficients (column (2)). We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, *BIG4*) and control variables on the focal firm's investor base (*IO*, *IHHI*). All specifications include industry and year fixed effects. Industries are defined by 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for focal firms related to earnings management. The peer measures for the dependent and control variables are calculated across all connected firms, except the focal firm itself. We denote a firm as belonging to the investor peer group if it it is the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW			
	Non suspect firm		Suspect firm	
		Standardized		Standardized
	(1)	(2)	(3)	(4)
PEER_EM	0.171***	0.056***	0.622***	0.202***
	(0.000)	(0.000)	(0.004)	(0.004)
FSIZE	−0.004***	−0.030***	−0.010***	−0.068***
	(0.006)	(0.006)	(0.003)	(0.003)
OPCY	−0.143**	−0.053**	−1.004	−0.372
	(0.013)	(0.013)	(0.220)	(0.220)
CFVOL	0.147***	0.075***	0.114**	0.058**
	(0.000)	(0.000)	(0.012)	(0.012)
SAVOL	0.041***	0.029***	−0.004	−0.003
	(0.000)	(0.000)	(0.839)	(0.839)
SGR	0.040***	0.050***	0.036**	0.045**
	(0.000)	(0.000)	(0.030)	(0.030)
SGRVOL	0.000*	0.008*	0.000*	0.011*
	(0.074)	(0.074)	(0.090)	(0.090)
LEV	−0.014	−0.009	0.048**	0.031**
	(0.140)	(0.140)	(0.045)	(0.045)
LOSS	−0.021***	−0.026***	0.005	0.006
	(0.001)	(0.001)	(0.825)	(0.825)
ROA	−0.049***	−0.033***	0.050	0.034
	(0.003)	(0.003)	(0.271)	(0.271)
DPAY	0.020***	0.069***	0.117	0.410
	(0.002)	(0.002)	(0.176)	(0.176)
BIG4	−0.002	−0.003	−0.003	−0.004
	(0.648)	(0.648)	(0.826)	(0.826)
IO	−0.019	−0.016	−0.034	−0.029
	(0.121)	(0.121)	(0.141)	(0.141)
IHHI	−0.068	−0.006	0.134	0.012
	(0.390)	(0.390)	(0.424)	(0.424)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Observations	45,456	45,456	8,277	8,277
Adj. R-squared	0.217	0.217	0.218	0.218
Chow test p(PEER_EM (1) ≠ PEER_EM (3)) = 0.000				

shown in Table 4.5.

Technically, for each fiscal year, we split a focal firm's common investor peer group into subgroups along median Tobin's q (column (1)), median geographic distance to focal firm headquarters (column (2)), and long- or short-term-dominated peer firms (column (3)). Following Eckel et al. (2011), we compute geographic distance between focal firms' headquarters based on their five-digit zip codes. Moreover, to measure investment horizons, we follow Gaspar et al. (2005), and divide institutional investors into terciles based on their churn ratios for each fiscal year. We classify investors in the top (bottom) tercile as short term (long term). A focal firm is dominated by long-term investors when its percentage of long-term institutional ownership is higher than that of its short-term institutional ownership in a given year. When we reestimate our baseline model adding these peer firm classifications, it is assumed that closer peers are more relevant for a focal firm's earnings management activities.

Column (1) of Table 4.5 shows that the distinction between more or less valuable peers is not as important. The Wald test at the bottom of the table confirms this result. The difference between the impact of high Tobin's q peer firms *(EM_PEER_HIGH)* and low Tobin's q peer firms *(EM_PEER_LOW)* on focal firms' earnings management is not statistically different from 0 (p-value = 0.416).

In contrast, column (2) shows that geographically closer peers are more important to the focal firm than peers that are further away. The main effect for the subgroup of geographically closer common investor peer firms, *EM_PEER_CLOSE*, is statistically significant (with $p \leq 0.01$), while that for *EM_PEER_AWAY* is only slightly significant (with $p \leq 0.1$). The difference, as indicated by the coefficients on *EM_PEER_CLOSE* and *EM_PEER_AWAY*, is statistically significant (with $p \leq 0.05$) and economically significant. In particular, a 1–standard deviation increase in geographically closer common investor peers' earnings management increases the focal firm's discretionary accruals by 2 percentage points on average ($= 1 \times 0.098 \times 0.208$). The number for further away peer firms is only 0.7 percentage points. Therefore, a 1–standard deviation increase in the level of geographically closer peers' earnings management increases focal firms' earnings management by approximately 12% ($= 0.02/0.162$). This compares to 16.2% relative to the sample mean of focal firms' earnings management, and only 4% ($= 0.007/0.162$) for the case of geographically more distant peers.

Finally, the results in column (3) suggest that long-term investor-dominated common investor peer firms are more influential for focal firm earnings management decisions than their short-term-dominated peers. In this case, the coefficient of interest for the subgroup of long-term-dominated peer firms, *EM_PEER_LONG*, is statistically significant (with $p \leq 0.01$), while that for *EM_PEER_SHORT* is only slightly significant (with $p \leq 0.1$). This result is consistent with previous studies showing that institutional investors with longer investment horizons have stronger incentives to engage with the focal management of their portfolio firms. This is because they typically hold the equities long enough to realize the benefits of intervention, and to recoup monitoring costs (e.g., Gaspar et al. (2005), Chen et al. (2007), Koh (2007), Attig et al. (2013), McCahery et al. (2016), and Harford et al. (2018)).

Overall, our results confirm that peer characteristics are important. Peer firms that are geographically closer to the focal firm, and are dominated by long-term common investors, exert more influence on earnings management decisions at the focal firm level. In line with the literature on

Table 4.5
When does investor peer pressure matter?

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) among different peer subgroups. In each fiscal year, we split a firm's investor peer group into subgroups along median Tobin's q (column (1)), median geographic distance to focal firm headquarters (column (2)), and long- and short-term-dominated peer firms (column (3)). We follow the approach of Gaspar et al. (2005) to calculate the investment horizons of institutional investors. A focal firm is dominated by long-term investors when its level of long-term institutional ownership is higher than that of its short-term institutional ownership in a given year. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and on focal firm's investor base (*IO*, *IHHI*). All specifications include industry and year fixed effects. Industries are defined by 4-digit SIC codes. The unit of observation is at the focal firm year level. Common investor peer controls are the same as for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all connected firms, except the focal firm itself. We denote a firm as belonging to the investor peer group if it belongs to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW		
	Value	Geography	Horizon
	(1)	(2)	(3)
EM_PEER_HIGH	0.168***		
	(0.000)		
EM_PEER_LOW	0.114**		
	(0.018)		
EM_PEER_CLOSE		0.208***	
		(0.000)	
EM_PEER_AWAY		0.077*	
		(0.074)	
EM_PEER_LONG			0.115***
			(0.007)
EM_PEER_SHORT			0.027*
			(0.095)
FSIZE	−0.005***	−0.005***	−0.005***
	(0.001)	(0.000)	(0.002)
OPCY	−0.129**	−0.121**	−0.142***
	(0.019)	(0.027)	(0.010)
CFVOL	0.151***	0.153***	0.146***
	(0.000)	(0.000)	(0.000)
SAVOL	0.035***	0.035***	0.036***
	(0.000)	(0.000)	(0.000)
SGR	0.038***	0.039***	0.039***
	(0.000)	(0.000)	(0.000)
SGRVOL	0.000*	0.000*	0.000*
	(0.055)	(0.055)	(0.055)
LEV	−0.007	−0.007	−0.007
	(0.463)	(0.440)	(0.434)
LOSS	−0.017***	−0.018***	−0.019***
	(0.004)	(0.003)	(0.002)
ROA	−0.035**	−0.035**	−0.041***
	(0.027)	(0.028)	(0.009)
DPAY	0.018***	0.018***	0.020***
	(0.002)	(0.003)	(0.001)
BIG4	−0.002	−0.003	−0.003
	(0.616)	(0.545)	(0.597)

(*continued*)

Table 4.5 — *continued*

IO	−0.024**	−0.025**	−0.028**
	(0.031)	(0.032)	(0.014)
IHHI	−0.044	−0.028	−0.042
	(0.550)	(0.717)	(0.570)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes
Observations	53,420	51,096	53,756
Adj. R-squared	0.218	0.216	0.217
Wald test p-value	0.416	0.032	0.067

herding behavior (Scharfstein and Stein (1990), Banerjee (1992), and Hong et al. (2005)), and information cascades (Bikhchandani et al. (1992)), we assume that uncertainty about the optimal level of earnings manipulation may prompt firms to mimic their common investor peer firms' decisions in corporate earnings management. In line with this notion, Kedia et al. (2015) find that firms' earnings management decisions are highly sensitive to those of other firms headquartered nearby, even after controlling for industry clusters.

Dougal et al. (2015) document strong similarities in investment decisions among neighboring firms. This suggests that geography may act as a moderating factor for peer pressure. A growing literature further shows that proximity between firms, along dimensions such as geographic and cultural closeness, also leads to spillover effects in certain corporate finance decisions (Fisman et al. (2017), Parsons et al. (2018), and Dechow and Tan (2021)).

4.3.3 Economic outcomes of investor peer pressure in earnings management decisions

Gao and Zhang's (2019) theoretical model provides evidence that peer pressure for accounting manipulation arises from the strategic decision to mimic earnings management of the peer group. Specifically, the authors show that a firm's managers may manipulate earnings more when they believe that their peers' financial statements are more likely to be manipulated. We posit that managers' incentives to manipulate earnings are higher in more competitive situations, such as new equity or debt issuances. They may act as a type of capital market pressure, and amplify common investor peer pressure.

To provide empirical support for this argument, we posit further that it may be a dominant strategy for a focal firm in a competitive market for external equity or debt to follow the decisions of its common investor peers. In this way, the focal firm may become more attractive to investors.

The results are in Table 4.6. We document a more pronounced effect of peer pressure on firms that engage in large equity issuances in the subsequent period. This suggests that peer pressure is more salient for firms with emerging competitiveness in the equity financing market.[10] The Chow test at the bottom of the table for columns (1) and (2) confirms this finding: The difference between the impact of common investor peer earnings management on focal firms that significantly raise equity in the next period, and those that do not, is statistically different from 0 (p-value = 0.01). Specifically, a 1-standard deviation increase in common investor peers' earnings management increases the focal firm's discretionary accruals (with significant equity issuance in the next period) by

Table 4.6
Future equity and debt financing

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) among different peer subgroups. In each fiscal year, the equity (debt) issuance activity of a focal firm is only significant if its equity (debt) issuance is greater than the median. Investor peer firms also have significant equity (debt) issuance activities the following year if their average value is greater than 0. This table shows the estimation results of focal firms' earnings management (*AbsDA_KLW*) on peer firms' proxy for future equity (debt) issuance activities. In columns (1) and (2), we distinguish between focal firms that make significant equity issuances the following year, and those that do not. Column (3) reports the effect if both the focal firm and its investor peers make significant equity issues the following year. In columns (4) and (5), we distinguish between focal firms that make significant debt issuances the next year, and those that do not. Column (6) reports the effect if both the focal firm and its investor peers make significant debt issues the following year. We include control variables on ROA (*FSIZE*, *SGR*, *CAPX*, *TANG*, *PROFIT*, *CASH*, *LEV*, *R&D*, *A&D*, *IO*). All specifications include industry and year fixed effects. Industries are defined by 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW					
	Next Year Equity Issuance			Next Year Debt Issuance		
	Focal Firm		Focal Firm and Peers	Focal Firm		Focal Firm and Peers
	No	Yes	Yes	No	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
PEER_EM	0.177***	0.269***	0.280***	0.329***	0.194***	0.196***
	(0.010)	(0.009)	(0.008)	(0.000)	(0.006)	(0.006)
FSIZE	−0.006***	−0.001	−0.001	−0.003	−0.005**	−0.005**
	(0.007)	(0.676)	(0.633)	(0.148)	(0.011)	(0.011)
OPCY	−0.605	0.017	0.028	−0.691**	0.060	0.060
	(0.223)	(0.832)	(0.730)	(0.036)	(0.432)	(0.437)
CFVOL	0.074**	0.193***	0.197***	0.165***	0.140***	0.140***
	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SAVOL	0.048***	0.039***	0.040***	0.037**	0.046***	0.046***
	(0.000)	(0.004)	(0.003)	(0.010)	(0.000)	(0.000)
SGR	0.038***	0.031***	0.031***	0.036***	0.036***	0.036***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGRVOL	0.000	0.000**	0.000**	0.000	0.000**	0.000**
	(0.645)	(0.011)	(0.011)	(0.922)	(0.018)	(0.017)
LEV	−0.019	0.000	0.000	−0.014	−0.012	−0.013
	(0.128)	(0.985)	(0.996)	(0.348)	(0.295)	(0.291)

(*continued*)

Table 4.6 — *continued*

LOSS	0.018*	−0.024**	−0.024**	−0.027***	0.001	0.001
	(0.069)	(0.014)	(0.015)	(0.002)	(0.952)	(0.952)
ROA	0.088**	−0.047**	−0.043*	−0.031	0.002	0.003
	(0.012)	(0.036)	(0.053)	(0.219)	(0.923)	(0.912)
DPAY	0.067	0.006	0.005	0.081**	−0.003	−0.003
	(0.167)	(0.502)	(0.592)	(0.018)	(0.739)	(0.743)
BIG4	0.009	−0.018**	−0.019**	−0.014*	0.004	0.004
	(0.169)	(0.017)	(0.015)	(0.092)	(0.504)	(0.499)
IO	−0.032*	−0.028*	−0.028*	−0.029	−0.032**	−0.033**
	(0.072)	(0.072)	(0.067)	(0.130)	(0.014)	(0.014)
IHHI	0.030	−0.154	−0.180	0.006	−0.074	−0.078
	(0.737)	(0.244)	(0.157)	(0.961)	(0.429)	(0.408)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,475	22,990	22,933	15,417	31,043	31,010
Adj. R-squared	0.225	0.223	0.223	0.235	0.228	0.228
Chow test p(PEER_EM (1) ≠ PEER_EM (2)) = 0.010						
Chow test p(PEER_EM (4) ≠ PEER_EM (5)) = 0.000						

2.5 percentage points (= 1 x 0.092 x 0.269), and by 1.6 points (1 x 0.091 x 0.177) (with no significant equity issuance in the next period). This translates to a roughly 15.4% (= 0.025/0.162) increase in the level of common investor peers' earnings management for the former, compared to the sample mean (16.2%), and to a 9.8% increase (= 0.016/0.162) for the latter.

However, we do not find the same pattern for subsequent competition in the debt financing market. This suggests that borrowers (e.g., banks) are less sensitive to earnings management activities. One potential explanation is that not engaging in earnings management when peers do so could be a credible signal of a firm's commitment to truthful reporting. This would reduce the likelihood of covenant violations.

To provide further evidence of the moderating effect of capital market pressure on peer effects, we turn next to firms' managerial entrenchment and their transparency in corporate information disclosures. Specifically, we examine previous work that shows entrenched managers are less prone to engage in earnings management than their less entrenched counterparts because they experience less pressure from the capital market (Di Meo et al. (2017)). Moreover, we believe that greater transparency in corporate disclosures leads to fewer opportunities to engage in accounting manipulations. This therefore leads to higher capital market pressure.

To empirically test these predictions, we reestimate our baseline specification (see column (4) of Table 4.2) for only entrenched (non-entrenched) managers (column (1)) (column (2)), and firm disclosures with a low (high) Fog index (column (3)) (column (4)). Specifically, we expect firms with less entrenched managers and higher information transparency on conference calls to be influenced more by their common investor peers than those with entrenched managers and less transparent firm disclosures.[11] The results are in Table 4.7.

Columns (1) and (2) show that the level of earnings management at the focal firm is positively related to that at their common investor peer firms. However, the estimated coefficient on *Peer_EM* is only statistically significant (with $p \leq 0.01$) for firms with less entrenched managers (as indicated by a low E-score). Columns (3) and (4) reinforce our finding by showing that *Peer_EM* is only statically significant for firms with more transparency during conference calls (as indicated by a low Fog score). Moreover, the *Peer_EM* estimate is significantly higher for focal firms with less entrenched managers (column (1) vs. column (2)), and for those with more transparent firm disclosures (column (3) vs. column (4)). This is indicated by the Chow test p-values at the bottom of the table.

Taken together, these results support our notion of a capital market pressure mechanism. The positive effect of earnings management at the common investor peer level on the earnings management of the focal firm only appears when focal firm management is less entrenched, and provides more transparency to the market.

4.4 Robustness tests

In this section, we conduct several tests to confirm the robustness of our findings. In particular, we use alternative earnings management proxies, examine real earnings management activities, address the problem of omitted variables bias, and apply alternative common investor peer group definitions.

Table 4.7
Managerial entrenchment and transparency in firm disclosures

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) only among (non-) entrenched managers (column (1)) (column (2)) and firm disclosures with a (low) high Fog index (column (3)) (column (4)). The E-Index scores come from Bebchuk et al. (2009). We follow the approach of Bushee et al. (2018) to measure linguistic complexity (the Fog index based on Gunning (1952)) in the scripted presentations of management during conference calls. In each fiscal year, we divide firms into two groups along the median E-index (Fog index) score. Firms are denoted low E-index (Fog index) if their level is below median, and high otherwise. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and control variables on the focal firm's investor base (*IO*, *IHHI*). All specifications include industry and year fixed effects. Industries are defined by their 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW		AbsDA_KLW	
	Low E-Index	High E-Index	Low Fog Score	High Fog Score
	(1)	(2)	(3)	(4)
PEER_EM	0.739***	0.376	0.316*	0.169
	(0.000)	(0.239)	(0.058)	(0.115)
FSIZE	−0.005	−0.006	0.001	−0.009**
	(0.125)	(0.580)	(0.728)	(0.015)
OPCY	−2.245***	0.260	−5.739***	0.276
	(0.001)	(0.888)	(0.000)	(0.872)
CFVOL	0.120***	0.101	0.278***	0.111***
	(0.002)	(0.297)	(0.000)	(0.003)
SAVOL	0.027	0.050	0.032	0.026
	(0.122)	(0.249)	(0.174)	(0.159)
SGR	0.033**	0.010	0.013	0.038***
	(0.012)	(0.779)	(0.433)	(0.002)
SGRVOL	0.000	0.000	0.000	0.000
	(0.996)	(0.804)	(0.953)	(0.530)
LEV	−0.003	−0.056	−0.011	−0.018
	(0.866)	(0.212)	(0.632)	(0.390)
LOSS	0.021	−0.001	0.001	−0.064***
	(0.261)	(0.988)	(0.962)	(0.000)
ROA	0.143*	0.177*	0.082	−0.036
	(0.057)	(0.080)	(0.222)	(0.324)
DPAY	0.444***	−1.461	0.624***	−0.019
	(0.000)	(0.210)	(0.000)	(0.912)
BIG4	−0.002	−0.028	−0.006	0.004
	(0.870)	(0.195)	(0.645)	(0.757)
IO	−0.031	−0.086*	−0.058**	0.026
	(0.123)	(0.084)	(0.027)	(0.306)
IHHI	0.005	0.220	−0.065	−0.312*
	(0.966)	(0.478)	(0.712)	(0.076)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Observations	12,201	2,972	8,659	8,637
Adj. R-squared	0.297	0.385	0.294	0.294
Chow test p(PEER_EM (1) ≠ PEER_EM (2)) = 0.060				
Chow test p(PEER_EM (3) ≠ PEER_EM (4)) = 0.068				

Table 4.8
Alternative accrual-based earnings management proxies and income smoothing

This table shows the estimation results of focal firm earnings management proxies (*AbsDA_OWZ*, *AbsDA_McN*, and *Income_TZ*) on investor peer firms' average earnings management proxies (*Peer_EM*), respectively. The dependent variables are in the header line. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and control variables on focal firms' investor base (*IO*, *IHHI*). All specifications include industry and year fixed effects. Industries are defined by their 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_OWZ	AbsDA_McN	Income_TZ
	(1)	(2)	(3)
PEER_EM	0.255***	0.189***	0.101**
	(0.000)	(0.001)	(0.013)
FSIZE	−0.005***	−0.003***	−0.028***
	(0.000)	(0.008)	(0.000)
OPCY	0.018	−0.006	−0.089
	(0.240)	(0.868)	(0.218)
CFVOL	0.086***	0.089***	−0.191***
	(0.000)	(0.000)	(0.000)
SAVOL	0.028***	0.038***	−0.001
	(0.000)	(0.000)	(0.974)
SGR	0.030***	0.038***	0.041***
	(0.000)	(0.000)	(0.000)
SGRVOL	0.000***	0.000	0.000***
	(0.000)	(0.638)	(0.000)
LEV	−0.008***	0.005	−0.090***
	(0.005)	(0.500)	(0.002)
LOSS	0.004*	0.007	−0.015
	(0.072)	(0.134)	(0.301)
ROA	−0.023***	−0.019*	0.033
	(0.000)	(0.083)	(0.307)
DPAY	0.000	0.003	0.009
	(0.952)	(0.486)	(0.318)
BIG4	−0.001	−0.012***	−0.005
	(0.510)	(0.001)	(0.709)
IO	−0.009***	−0.031***	−0.073**
	(0.006)	(0.000)	(0.031)
IHHI	−0.023	0.023	−0.209
	(0.302)	(0.674)	(0.437)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes
Observations	49,345	48,762	40,991
Adj. R-squared	0.200	0.156	0.065

4.4.1 Alternative accrual-based earnings management proxies and income smoothing

In our baseline analysis, we use the Jones (1991) model, as modified by Dechow et al. (1995) and adjusted for performance by Kothari et al. (2005). Although this model is widely used in the accounting literature, we also consider alternative proxies for discretionary accruals and income smoothing. This ensures our findings are not driven by our choice of model. We reestimate our baseline model, using discretionary accruals calculated based on Owens et al. (2017), McNichols (2002), and Tucker and Zarowin (2006) as the dependent variable. These measures are labeled *AbsDA_OWZ*, *AbsDA_McN*, and *Income_TZ*, respectively (see Section 4.2.2.1 for details). The results are in Table 4.8.

The estimated coefficient on the peer earnings management proxy, PEER_EM, is positive and statistically significant in all three regressions (in columns (1) and (2) with $p \leq 0.01$, and in column (3) with $p \leq 0.05$). It varies between 0.101 and 0.255, versus 0.191 in our baseline model. These results provide assurance that our findings are not sensitive to the use of alternative discretionary accruals models.

4.4.2 Real earnings management activities

Next, we examine real earnings management activities using four proxies. We reestimate our baseline model with these proxies as the dependent variable. They are calculated based on Kim et al. (2017), Cohen and Zarowin (2010), and Roychowdhury (2006), and labeled as *REM_KKZ*, *REM_CZ1*, *REM_CZ2*, and *REM_R*, respectively (see Section 4.2.2.2 for details). The results are in Table 4.9.

As expected, the correlation between the level of real earnings management in peer firms (*PEER_EM*) and focal firms is positive and statistically significant in all regression models (with $p \leq 0.01$). Therefore, our results show that comovements in accrual-based earnings management in peer firms and focal firms also extend to real earnings management.

4.4.3 Omitted variables bias

Note that our results show a consistently positive association between common investor peer firms and focal firms' earnings management decision-making. However, it is possible that the relationship is determined by other variables that are omitted from the regression. To alleviate this concern, we reestimate our baseline model including firm fixed effects, instead of industry fixed effects, in all regressions. Moreover, as the dependent variable, we use all measures of accrual-based earnings management decisions (Jones (1991), Dechow et al. (1995), McNichols (2002), Kothari et al. (2005), and Owens et al. (2017)), and all measures for real earnings management (Roychowdhury (2006), Cohen and Zarowin (2010), and Kim et al. (2017)). The results are in Table 4.10.

The association between common investor peer firms' earnings management (*PEER_EM*) and focal firms' earnings management is positive and statistically significant in all regression models (with at least $p \leq 0.05$). Most importantly, the peer effect remains stable and comparable to the baseline model when we substitute industry fixed effects. We conclude that our baseline results are not likely to be driven by omitted focal firm characteristics.

Table 4.9
Real earnings management proxies

This table shows the estimation results of focal firm real earnings management proxies (*REM_KKZ*, *REM_CZ1*, *REM_CZ2*, and *REM_R*) on investor peer firms' average earnings management proxy, (*PEER_EM*), respectively. Dependent variables are shown in the header line. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and control variables on focal firms' investor base (*IO, IHHI*). All specifications include industry and year fixed effects. Industries are defined by their 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	REM_KKZ	REM_CZ1	REM_CZ2	REM_R
	(1)	(2)	(3)	(4)
PEER_EM	0.178***	0.188***	0.209***	0.269***
	(0.004)	(0.002)	(0.000)	(0.000)
FSIZE	0.076***	0.080***	0.048***	−0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
OPCY	1.495**	1.299	0.942	−0.193***
	(0.020)	(0.115)	(0.116)	(0.004)
CFVOL	−0.355**	−0.253*	−0.183	0.188***
	(0.011)	(0.080)	(0.110)	(0.000)
SAVOL	−0.072	−0.104	−0.136**	0.114***
	(0.365)	(0.190)	(0.028)	(0.000)
SGR	−0.185***	−0.306***	−0.314***	0.093***
	(0.000)	(0.000)	(0.000)	(0.000)
SGRVOL	0.000***	0.000***	0.000**	0.000
	(0.000)	(0.001)	(0.017)	(0.311)
LEV	0.080	0.129*	0.031	−0.054***
	(0.263)	(0.067)	(0.572)	(0.000)
LOSS	0.059	0.115**	0.089**	−0.035***
	(0.216)	(0.016)	(0.027)	(0.000)
ROA	−0.352***	−0.962***	−0.528***	−0.126***
	(0.002)	(0.000)	(0.000)	(0.000)
DPAY	−0.150**	−0.125	−0.083	0.021***
	(0.025)	(0.144)	(0.183)	(0.004)
BIG4	−0.061	−0.044	−0.008	−0.008
	(0.150)	(0.282)	(0.799)	(0.232)
IO	−0.020	−0.051	−0.059	0.002
	(0.811)	(0.543)	(0.367)	(0.865)
IHHI	0.537	0.798	0.895*	−0.216**
	(0.353)	(0.160)	(0.059)	(0.041)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes
Observations	50,945	50,945	51,198	53,756
Adj. R-squared	0.133	0.143	0.127	0.188

Table 4.10
Omitted variables

This table shows the estimation results of focal firms' (real) accrual-based earnings management proxies *AbsDA_KLW AbsDA_OWZ*, and *AbsDA_McN* (*REM_KKZ*, *REM_CZ1*, *REM_CZ2*, *REM_R*) on investor peer firms' average earnings management proxies (*Peer_EM*), respectively. In the first two columns ((6) and (7)), we use signed values of discretionary accruals (DA) to divide the sample into income-decreasing (DA > 0) and -increasing earnings management (DA < 0). The dependent variables are shown in the header line. In each column, we substitute firm fixed effects instead of industry fixed effects to account for time-invariant firm characteristics. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and control variables on focal firms' investor base (*IO*, *IHHI*). The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW	AbsDA_OWZ	AbsDA_McN	AbsDA_KKZ	AbsDA_CZ1	AbsDA_CZ2	AbsDA_R
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PEER_EM	0.171**	0.220***	0.206**	0.191***	0.199***	0.227***	0.278***
	(0.014)	(0.000)	(0.019)	(0.000)	(0.000)	(0.000)	(0.002)
FSIZE	−0.005	−0.004**	−0.002	0.144***	0.120***	0.054*	−0.025***
	(0.479)	(0.018)	(0.586)	(0.001)	(0.006)	(0.084)	(0.000)
OPCY	−0.121	−0.001	0.000	0.219	0.083	−0.174	−0.057
	(0.142)	(0.957)	(0.999)	(0.655)	(0.873)	(0.654)	(0.482)
CFVOL	0.125***	0.078***	0.077***	0.027	0.015	0.021	0.119***
	(0.001)	(0.000)	(0.000)	(0.881)	(0.930)	(0.897)	(0.001)
SAVOL	0.046***	0.019***	0.027***	0.139	0.142	0.101	0.054**
	(0.005)	(0.000)	(0.005)	(0.217)	(0.198)	(0.273)	(0.017)
SGR	0.043***	0.028***	0.031***	−0.235***	−0.366***	−0.336***	0.096***
	(0.004)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
SGRVOL	0.000	0.000***	0.000	0.000	0.000	0.000	0.000
	(0.180)	(0.005)	(0.366)	(0.316)	(0.669)	(0.950)	(0.177)
LEV	−0.015	−0.009**	0.006	−0.138	−0.086	−0.103	−0.049***
	(0.284)	(0.044)	(0.565)	(0.289)	(0.466)	(0.333)	(0.003)

(*continued*)

Table 4.10 — *continued*

LOSS	0.003	0.003	0.008	0.086**	0.168***	0.134***	−0.003
	(0.779)	(0.153)	(0.159)	(0.037)	(0.000)	(0.001)	(0.816)
ROA	0.016	−0.002	0.036**	−0.509***	−0.965***	−0.526***	0.003
	(0.460)	(0.852)	(0.050)	(0.003)	(0.000)	(0.001)	(0.929)
DPAY	0.016	0.002	0.000	−0.007	0.002	0.029	0.007
	(0.102)	(0.572)	(0.969)	(0.895)	(0.964)	(0.503)	(0.409)
BIG4	−0.006	0.000	−0.016**	0.130	0.140	0.181**	−0.021
	(0.444)	(0.912)	(0.018)	(0.234)	(0.181)	(0.048)	(0.183)
IO	0.010	−0.001	−0.024*	0.103	0.068	0.063	0.027
	(0.413)	(0.919)	(0.080)	(0.471)	(0.621)	(0.598)	(0.370)
IHHI	−0.116	−0.038	0.056	0.885	0.976	1.189**	−0.384**
	(0.181)	(0.280)	(0.471)	(0.167)	(0.122)	(0.042)	(0.016)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,098	48,676	48,078	50,210	50,210	50,452	53,098
Adj. R-squared	0.274	0.293	0.208	0.159	0.170	0.124	0.212

4.4.4 Alternative investor peer group definitions

In a final step, we address potential concerns about the common investor peer group definition used in our previous models. In our baseline analysis, we include all common investor peer firms that belong to the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. We reestimate the baseline model, but shift the common investor peer group definition from the top decile to the top 3rd, 2nd, and 1st percentiles. The results are in Table 4.11.

For all three alternative common investor peer group definitions, the estimated coefficient of interest, *PEER_EM*, remains positive and statistically significant (with $p \leq 0.01$). As we move from the top 3rd to the top 1st percentile classification, the estimate increases in magnitude (both absolute and relative). These results suggest a positive correlation between the institutional connections of peer and focal firms, and the signal that reported earnings at the peer level send to the management of the focal firm.

4.5 Conclusions

Using a comprehensive set of U.S. firms over the 1990–2019 period, we examine the relation between earnings management decisions in focal firms and their common institutional investor peer firms. We find that focal firms' earnings management decisions are largely influenced by those of their common investor peers. Our results are robust to sample composition, alternative estimation methods, and endogeneity concerns. We document that the level of focal firms' earnings management is positively associated with both accrual-based earnings management and real earnings management in common investor peer firms. We conclude that peer pressure in earnings management arises from mimicking behavior of the focal firm, which may adopt the observed/tolerated level of accounting manipulation from its common investor peer firms.

To verify the causality of our results, we show that common investor peer firms matter only when the connecting common investors are not distracted. Moreover, they appear to be more important if they are geographically closer to the focal firm, and are dominated by long-term common investors. These findings indicate that focal firm managers follow their closest peers more than their more distant counterparts. Finally, we document that capital market pressure may act as a moderating mechanism through which common investor peer firms influence focal firm behavior. Taken together, we believe our study is the first to show that common institutional ownership has a strong impact on accounting information quality in the context of peer pressure.

The results of this study should appeal to both practitioners and academics. For academics, they suggest future avenues for theoretical and empirical research on the implications of rising institutional common ownership between firms on other dimensions of accounting practices. We note that common ownership is increasingly an international phenomenon, due to ongoing consolidation in the asset management industry. For practitioners and policymakers, our findings can help explain how common ownership affects financial reporting quality across industries.

Table 4.11
Different investor peer group specifications

This table reports the reestimation of our baseline model (see column (4) of Table 4.2) among different investor peer group classifications. In columns (1)-(6), we use continuously higher thresholds of our investor peer group definition. We denote a firm as part of the focal firm's investor peer group if it is among the top 3%, 2%, or 1% (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. The first column of each threshold shows the regression estimations, while the second column shows the corresponding standardized coefficients. We include control variables on earnings management (*FSIZE*, *OPCY*, *CFVOL*, *SAVOL*, *SGR*, *SGVOL*, *LEV*, *LOSS*, *ROA*, *DPAY*, and *BIG4*), and control variables on focal firms' investor base (*IO*, *IHHI*). Industries are defined by their 4-digit SIC codes. The unit of observation is at the focal firm year level. The common investor peer controls are the same as those for the focal firm related to earnings management. The peer measures for the dependent and control variables are calculated across all the connected firms except the focal firm itself. We denote a firm as belonging to the investor peer group if it is in the top decile (highest common investor overlap) of firms that share a common investor base with the focal firm in a given year. A constant is included, but not reported, in all specifications. The sample period is 1990 to 2019. Standard errors are adjusted for heteroskedasticity, and clustered at the focal firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, and *p-values* are in parentheses. Detailed variable definitions are in Table C1.

Dependent variable	AbsDA_KLW					
	Top 3%		Top 2%		Top 1%	
		Standardized		Standardized		Standardized
	(1)	(2)	(3)	(4)	(5)	(6)
PEER_EM	0.206***	0.070***	0.216***	0.073***	0.247***	0.086***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FSIZE	−0.005***	−0.037***	−0.005***	−0.037***	−0.006***	−0.039***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
OPCY	−0.131**	−0.045**	−0.129**	−0.044**	−0.144**	−0.047**
	(0.019)	(0.019)	(0.024)	(0.024)	(0.016)	(0.016)
CFVOL	0.154***	0.077***	0.155***	0.077***	0.155***	0.076***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SAVOL	0.035***	0.025***	0.035***	0.025***	0.036***	0.025***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGR	0.039***	0.048***	0.038***	0.047***	0.038***	0.048***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGRVOL	0.000*	0.007*	0.000*	0.007*	0.000*	0.007*
	(0.064)	(0.064)	(0.064)	(0.064)	(0.062)	(0.062)
LEV	−0.005	−0.003	−0.005	−0.004	−0.002	−0.002
	(0.584)	(0.584)	(0.538)	(0.538)	(0.788)	(0.788)

(*continued*)

Table 4.11 — *continued*

LOSS	−0.018***	−0.023***	−0.018***	−0.022***	−0.017***	−0.021***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
ROA	−0.035**	−0.024**	−0.033**	−0.022**	−0.032*	−0.021*
	(0.027)	(0.027)	(0.037)	(0.037)	(0.051)	(0.051)
DPAY	0.019***	0.062***	0.019***	0.062***	0.021***	0.065***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
BIG4	−0.002	−0.003	−0.002	−0.003	−0.001	−0.002
	(0.622)	(0.622)	(0.644)	(0.644)	(0.803)	(0.803)
IO	−0.022*	−0.019*	−0.021*	−0.018*	−0.020*	−0.017*
	(0.054)	(0.054)	(0.062)	(0.062)	(0.083)	(0.083)
IHHI	−0.046	−0.004	−0.042	−0.004	−0.054	−0.005
	(0.537)	(0.537)	(0.575)	(0.575)	(0.471)	(0.471)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Peer controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,292	53,292	53,088	53,088	52,824	52,824
Adj. R-squared	0.219	0.219	0.219	0.219	0.220	0.220

Endnotes

[1] Figure 4.1 illustrates the difference between investor overlaps within one industry and across several industries. Specifically, we consider a fictitious portfolio of an institutional investor with five portfolio firms (Figure 4.1a). The five firms operate in three different industries (A, B, and C). Firms in the investor portfolio are highlighted in blue. Figure 4.1b depicts the types of connections between firms within and across industries.

[2] In this study, we use the terms "common investor peer firms," "institutional connectivity," and "common ownership" interchangeably.

[3] See Larson et al. (2018) for a comprehensive overview of the manipulation of accruals and deferrals.

[4] We follow Cohen and Zarowin (2010) here, and replace R&D, advertising, and selling, general, and administrative (SG&A) expenses with zero if they are missing and SG&A are available.

[5] To ensure that we are including only common institutional investors who have the ability to exert influence, we consider their shareholdings at the two quarter ends before and after the end of firm *i*'s and firm *j*'s fiscal years.

[6] Formally, we calculate common investor distraction for each firm-pair by using Equation (1) (distraction) and Equation (2) (weighting factor) from (Kempf et al., 2017, pp. 1668–1669). We change from a single firm to a firm-pair level in order to capture cases where the common investors are distracted.

[7] Our results are also robust to other industry specifications, such as 3-digit SIC industries.

[8] Untabulated correlation analyses show that all correlations between explanatory variables are low (economically and statistically). This indicates that each explanatory variable incorporates its own set of information, reducing concerns that multicollinearity may be driving our regression results.

[9] In a related context, Leary and Roberts (2014) show that less successful firms tend to mimic the capital structure decisions of more successful peers.

[10] We define a focal firm's equity (debt) issuance activity as large if its equity (debt) issuance activity is greater than the median.

[11] To measure managerial entrenchment, we use the Bebchuk et al. (2009) E-index. This index ranks four constitutional restrictions on shareholder voting rights on a scale of 0 to 6: staggered boards, restrictions on shareholder amendments to bylaws, majority requirements for mergers, and majority requirements for bylaw amendments. It also features two hostile bid provisions (poison pills and golden parachutes). We use the Fog index based on Gunning (1952) and Bushee et al. (2018) to measure managerial linguistic complexity during conference calls.

Appendix

See next page for Table C1.

Table C1
Variable descriptions and data sources

This table describes the variables used in the paper. Data come from Compustat, Institutional Brokers Estimate System (I/B/E/S), and Thomson Reuters Institutional Managers (13f) Holdings. The sample period is 1990 to 2019.

Variable	Description	Source(s)
	Dependent variables	
AbsDA_KLW	Absolute value of abnormal accruals estimated based on the modified Jones model Jones (1991), modified by Dechow et al. (1995), adjusted for performance as in Kothari et al. (2005). A detailed description is provided in Section 4.2.2.1	Authors' calculations based on Compustat
AbsDA_OWZ	Absolute value of abnormal accruals estimated based on the modified Jones model Jones (1991), modified by Dechow et al. (1995), adjusted for performance as in Kothari et al. (2005) and idiosyncratic industry related shocks as used by Owens et al. (2017). A detailed description is provided in Section 4.2.2.1	As above
AbsDA_McN	Accruals quality measure estimated based on the model of Dechow and Dichev (2002) and modified by McNichols (2002). A detailed description is provided in Section 4.2.2.1	As above
Income_TZ	Measure of income smoothing based on Tucker and Zarowin (2006).A detailed description is provided in Section 4.2.2.1	As above
REM_KKZ	Absolute value of abnormal abnormal cash flows to proxy real earnings management based on Kim et al. (2017).A detailed description is provided in Section 4.2.2.2	As above
REM_CZ1	Measure of real earnings management that combine abnormal production costs and abnormal discretionary expenses based on Cohen and Zarowin (2010). A detailed description is provided in Section Section 4.2.2.2	As above
REM_CZ2	Measure of real earnings management that combine abnormal discretionary expenses and abnormal operating cash flow based on Cohen and Zarowin (2010). A detailed description is provided in Section 4.2.2.2.	As above
REM_R	Aggregate measure of real earnings management based on Roychowdhury (2006) and that combine abnormal cash flow, abnormal discretionary expenses, and abnormal production costs. A detailed description is provided in Section 4.2.2.2	As above
	Independent variables	
FSIZE	Natural logarithm of total assets	Compustat
OPCY	Natural logarithm of the firm's sum of days in receivable and days in inventory	Compustat
CFVOL	Standard deviation of the cash flow over the last five years	Compustat
SAVOL	Standard deviation of the sales scaled by lagged total assets over the last five years	Compustat
SGR	Sales growth, defined as the sales at year *t* minus sales at year *t-1* divided by sales at year *t-1*	Compustat
SGRVOL	Standard deviation of the sales growth over the last five years	Compustat
LEV	Long-term debt divided by total assets	Compustat
LOSS	Takes the value of one for firms that report a net loss (negative net income) for a given year, and zero otherwise	Compustat
ROA	Net income scaled by total assets	Compustat
DPAY	360 divided by the ratio of the average accounts payable to cost of goods sold	Compustat
BIG4	Takes the value of one for firms that have been audited by one of the big four auditing companies (and their predecessors) in a given year, and zero otherwise	Compustat

(*continued*)

Table C1 — *continued*

IO	Institutional investor ownership expressed as a percentage of a firm's total shares outstanding	13f Holdings
IHHI	Concentration of firm's institutional investors. Computed as the Herfindahl-Hirschman Index of the holdings of firm's institutional investors	13f Holdings
DIST	A measure of common institutional investor distraction, analogous to Kempf et al. (2017)	13f Holdings & Compustat
Geographical distance	For each firm pair, we compute the distance between headquarter locations based on the geographical coordinates of the five digit zip code by accounting for the curvature of the earth	Compustat
Tobin's q	Total assets, stockholders' equity, common shares outstanding, and price close at the end of fiscal scaled by total assets	Compustat
Horizon	Following Gaspar et al. (2005), we divide the institutional investors into terciles based on their churn ratios for each fiscal year and call investors in the top (bottom) tercile as short-term (long-term)	13f Holdings
EQUITYISS	Equity issuances scaled by total assets	Compustat
DEBTISS	Debt issuances scaled by total assets	Compustat
E-Index	Index scores are based on Bebchuk et al. (2009) and have a score for each firm ranging from 0 to 6 provisions. In particular, the E-index captures four constitutional restrictions on shareholder voting rights (staggered boards, restrictions on shareholder amendments to bylaws, majority requirements for mergers, and majority requirements for bylaw amendments) and two hostile bid provisions (poison pills and golden parachutes)	Authors' calculations based on Bebchuk et al. (2009) data
Fog Index	Index scores are based on Gunning (1952) and Bushee et al. (2018) and represents the Fog-index of managers' language complexity during the conference call presentation. Lower values of Fog-index correspond to less linguistic complex presentations	Authors' calculations based on Bushee et al. (2018) data
Suspect firm	Indicator variable that takes the value of one for firms that have a positive forecast error of one cent per share or less (suspect firm), and zero (nonsuspect firm) otherwise	I/B/E/S

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Declarations

Pursuant to § 6 Abs. 4 and § 6 Abs. 6 of the doctoral degree regulations of the Faculty of Business Administration at the University of Hamburg (dated July 9, 2014), the following sections provide declarations supplemental to the single research projects cumulated in the dissertation. Specifically, declarations include abstracts in German and English language for each research project as well as a listing of publications originated from parts of this dissertation (separately for each chapter). The three key parts of this monograph are Chapters 2 to 4 (see § 6 Abs. 2b of the doctoral degree regulations dated July 9, 2014). All chapters are based on self-contained research projects.

Research project 1:
Connected firms: Common ownership and corporate financial policy decisions

Abstract (English):

Using a comprehensive dataset of U.S. firms for the 1988 to 2018 period, we document that firms connected through common institutional investor holdings exhibit a substantially higher degree of similarity in their financial policies than their unconnected counterparts. This common ownership effect is both statistically and economically significant. Quantile regressions confirm its presence across subsamples, with varying levels of financial policy similarity. Furthermore, a battery of robustness tests validate that the common ownership effect shapes financial policies. We use the 2003 mutual fund scandal as a source of exogenous variation in firms' overlapping ownership structures. We exploit the heterogeneity in institutional investor attention (distraction) across time in order to address concerns that the common ownership effect may be endogenous, and to establish causality. Our results indicate that the documented common ownership effect is causal.

Abstract (German):

Auf der Grundlage eines umfassenden Datensatzes von US-Firmen in dem Zeitraum 1988 bis 2018 zeigen wir, dass Unternehmen, die durch gemeinsame institutioneller Investoren (Common Ownership) verbunden sind, einen wesentlich höheren Grad an Gleichheit in ihrer Finanzpolitik aufweisen als nicht verbundene Unternehmen. Dieser Common Ownership Effekt ist sowohl statistisch als auch ökonomisch signifikant. Quantilsregressionen zeigen auf, dass der Effekt auch über verschiedene Stichproben mit variierendem Grad an finanzpolitischer Gleichheit bestehen bleibt. Darüber hinaus bestätigt eine Reihe von Robustheitstests, dass der Effekt konstant und signifikant die Finanzpolitik der Unternehmen beeinflusst. Wir verwenden einen Investmentfonds Skandal aus dem Jahre 2003 als Quelle exogener Variationen auf die Eigentumsstrukturen von Unternehmen und nutzen zusätzlich die Aufmerksamkeitsschwankungen von institutioneller Investoren (Ablenkung) im Zeitverlauf aus, um nachzuweisen, dass der Common Ownership Effekt einen kausalen Zusammenhang mit der Finanzpolitik der betroffenen Unternehmen aufweist.

Publication status of the project:

The version documented in Chapter 2 of this dissertation has currently working paper status.

Self-declaration of personal contribution (§ 6 Abs. 2b and § 6 Abs. 4 of the doctoral degree regulations dated July 9, 2014):

Co-authors of this project are Wolfgang Drobetz (University of Hamburg), Sadok El Ghoul (University of Alberta), Omrane Guedhami (University of South Carolina), and Henning Schröder (University of Hamburg). My personal contributions to this research project involve in particular the design of the conceptual and empirical framework, the data management and the execution of the statistical analyses using Stata, the economic interpretation of the empirical results, as well as the preparation of the initial draft. The version of the manuscript included in this dissertation originated from several revisions of the initial draft. During the entire revision process, my contributions include, but are not limited to, the entire updating of the empirical analyses considering received comments from other scientists and seminar participants, the incorporation of new findings following consultations with my co-authors, and the revision of the manuscript.

Research project 2:

Investor peer pressure in corporate environmental policy decision making

Abstract (English):

Using a comprehensive dataset of U.S. firms for the period 2001 to 2018, we study the effect of common ownership on firms' environmental policy decision-making. Specifically, we define peer groups based on overlapping ownership structures between firms, so-called common institutional investor peer firms. We denote a firm as belonging to the common investor peer group if it shares a common institutional investor base with the focal firm in a given year. We find that firms seem to adapt their environmental policy decisions to those of their common investor peer firms. This finding remains robust after controlling for focal firm-level determinants of environmental decisions, as well as various peer-level characteristics. Our finding is also robust to sample composition, alternative environmental proxies, and endogeneity concerns. We believe that mimicking behavior is the key mechanism behind the observed comovements between common investor peer firms and focal firms. Further evidence suggests that mimicking behavior is more prominent for firms with "greener" common investors, those that are larger and more innovative, and those that disclose corporate information more transparently. We also posit that common investor peer effects on focal firms' corporate environmental decisions increase in importance in the presence of capital market pressures. In general, our findings are not limited to environmental policy decisions, and can be extended to more informal environmental contexts, such as the pure managerial "sentiment on climate change."

Abstract (German):

Anhand eines umfassenden Datensatzes von US-Firmen über den Zeitraum 2001 bis 2018 untersuchen wir die Auswirkungen von gemeinsamen institutionellen Investoren auf die umweltpolitischen Entscheidungen von Unternehmen. Um den Zusammenhang empirisch zu analysieren, definieren wir Vergleichsgruppen, basierend auf sich überschneidenden Eigentumsstrukturen zwischen Unternehmen, sogenannte gemeinsame institutionelle Investoren-Peer-Firmen. Wir bezeichnen ein Unternehmen als zur Peer-Gruppe der gemeinsamen Investoren gehörend, wenn es in einem bestimmten Jahr eine gemeinsame institutionelle Investorenbasis mit dem Zielunternehmen teilt. Wir stellen fest, dass die Unternehmen ihre umweltpolitischen Entscheidungen an die ihrer Peer-Firmen anpassen. Dieses Ergebnis bleibt auch nach Kontrolle verschiedener Einflussfaktoren auf die umweltpolitischen Entscheidungen des Zielunternehmens sowie verschiedener Einflussfaktoren auf der Vergleichsgruppen-Ebene stabil. Unser Ergebnis ist auch robust gegenüber variierenden Stichproben, alternativen Umweltkennzahlen und Endogenitätsproblemen. Wir gehen davon aus, dass der Nachahmungseffekt der Grund des beobachteten Trends für gleiche Entscheidungen ist. Weitere Analysen deuten darauf hin, dass der Nachahmungseffekt bei Unternehmen mit "grüneren" gemeinsamen Investoren, bei größeren und innovativeren Unternehmen und bei solchen, die Informationen transparenter offenlegen, stärker ausgeprägt ist. Wir gehen auch davon aus, dass der Einfluss von gemeinsamen Investorengruppen auf die individuellen Umweltentscheidungen von Unternehmen unter dem Druck der Kapitalmärkte an Bedeutung gewinnt. Im Allgemeinen sind unsere Ergebnisse nicht auf umweltpolitische Entscheidungen beschränkt und können auch auf informellere Umweltkontexte, wie z. B. die "Bedeutung des Klimawandels" auf der Management-Ebene, ausgedehnt werden.

Publication status of the project:

The version documented in Chapter 3 of this dissertation has currently working paper status.

Self-declaration of personal contribution (§ 6 Abs. 2b and § 6 Abs. 4 of the doctoral degree regulations dated July 9, 2014):

Co-authors of this project are Wolfgang Drobetz (University of Hamburg) and Henning Schröder (University of Hamburg). My personal contributions to this research project involve in particular the design of the conceptual and empirical framework, the data management and the execution of the statistical analyses using Stata, the economic interpretation of the empirical results, as well as the preparation of the initial draft. The version of the manuscript included in this dissertation originated from several revisions of the initial draft. During the entire revision process, my contributions include, but are not limited to, the entire updating of the empirical analyses considering received comments from other scientists, the incorporation of new findings following consultations with my co-authors, and the revision of the manuscript.

Research project 3:

Investor peers matter: Empirical evidence from corporate earnings management

Abstract (English):

Using a comprehensive set of U.S. firms over the 1990-2019 period, we examine the relation between firms' earnings management decisions and the corporate earnings management decisions of their common investor peer firms. We denote a firm as belonging to the peer group if it shares a common institutional investor base with the focal firm in a given year. We find that firms are strongly influenced by their common investor peers in earnings management decisions. This result is robust to sample composition, alternative earnings management measures, and endogeneity concerns. However, investor peer firms matter only when the common institutional investors are not distracted. Moreover and consistent with a mimicking explanation, peers are more important if they are geographically closer to the focal firm, and are dominated by long-term investors. This is because managers tend to follow decisions from their closest peers rather than from their more distant counterparts. Capital market pressure seems to be another mechanism through which investor peer firms influence focal firm behavior.

Abstract (German):

Auf der Grundlage eines umfassenden Datensatzes von US-Firmen in dem Zeitraum 1990-2019, untersuchen wir die Beziehung zwischen den Earnings-Management-Entscheidungen von Firmen und den Earnings-Management-Entscheidungen ihrer Peer-Firmen mit derselben Investorenbasis. Wir bezeichnen ein Unternehmen als zur Peer-Gruppe der gemeinsamen Investoren gehörend, wenn es in einem bestimmten Jahr eine gemeinsame institutionelle Investorenbasis mit dem Zielunternehmen teilt. Wir stellen fest, dass die Unternehmen bei ihren Entscheidungen zum Earnings-Management stark von ihrer Peer-Gruppe beeinflusst werden. Dieses Ergebnis ist robust gegenüber alternativen Zusammensetzungen der verwendeten Stichprobe, alternativen Maßstäben für das Earnings-Management und Endogenitätsproblemen. Weitere Analysen zeigen auf, dass der Einfluss der Peer-Gruppe jedoch nur dann von Bedeutung ist, wenn die gemeinsamen institutionellen Investoren nicht abgelenkt werden. Wir gehen davon aus, dass die Nachahmungseffekte ausgeprägter sind, wenn die Peer-Gruppen geografisch näher am Zielunternehmen liegen und von langfristigen Investoren dominiert werden. Eine mögliche Erklärung dafür wäre, dass Manager dazu neigen, die Entscheidungen der ihnen am näher stehenden Unternehmen eher im Fokus haben, als die von weiter entfernten Unternehmen. Der Druck des Kapitalmarktes scheint ein weiterer Mechanismus zu sein, durch den Peer-Gruppen das Verhalten des Zielunternehmens beeinflussen können.

Publication status of the project:

The version documented in Chapter 4 of this dissertation has currently working paper status. The project was presented at the at the 2022 Financial Management Association (FMA) European Conference in Lyon and at the 2022 European Financial Management (EFMA) Annual Meeting in Rome.

Self-declaration of personal contribution (§ 6 Abs. 2b and § 6 Abs. 4 of the doctoral degree regulations dated July 9, 2014):

Co-authors of this project are Wolfgang Drobetz (University of Hamburg), Sadok El Ghoul (University of Alberta), Omrane Guedhami (University of South Carolina), and Henning Schröder (University of Hamburg). My personal contributions to this research project involve in particular the design of the conceptual and empirical framework, the data management and the execution of the statistical analyses using Stata, the economic interpretation of the empirical results, as well as the preparation of the initial draft. The version of the manuscript included in this dissertation originated from several revisions of the initial draft. During the entire revision process, my contributions include, but are not limited to, the entire updating of the empirical analyses considering received comments from discussants and conference participants, the incorporation of new findings following consultations with my co-authors, and the revision of the manuscript. Besides these textual contributions, I presented the paper at several international research conferences.

Affidavit

I hereby declare, Hans Christian Nostiz, in lieu of an oath, that I have written the dissertation entitled

„Empirical essays on common ownership“

autonomously - and if in cooperation with other scientists as described in the attached statement according to § 6 Abs. 4 of the doctoral regulations of the Faculty of Business Administration dated July 9, 2014 and that I did not use any other aids than those I indicated herein. The parts taken literally or by sense from other works than mine are marked as such. I assure that I did not take advantage of any commercial doctoral consultation nor was my work accepted or judged insufficient in an earlier doctoral procedure at home or abroad.

Düsseldorf, April 14, 2023

Hans Christian Nostiz