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Hennig, Jan C.; Oehmichen, Jana; Steinberg, Philip J.; Heigermoser, Judith

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Determinants of common ownership: Exploring an information-based and a competition-based perspective in a global context

Jan C. Hennig^{a,*}, Jana Oehmichen^{b,c}, Philip J. Steinberg^c, Judith Heigermoser^d

^a Department of Accounting, University of Groningen, Nettelbosje 2, 9747 AE Groningen, The Netherlands

^b Chair of Organization, Human Resources, and Management, University of Mainz, Jakob-Welder-Weg 9, 55128 Mainz, Germany

^c Department of Innovation Management & Strategy, University of Groningen, Nettelbosje 2, 9747 AE Groningen, The Netherlands

^d Chair of Management and Control, Georg-August University of Göttingen, Platz der Göttinger Sieben 3, 37073 Göttingen, Germany

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ABSTRACT

This study explores the determinants of common ownership. Drawing on two explanatory lenses, we suggest an information-based perspective and a competition-based perspective. We theorize on and empirically test both perspectives at the firm, industry, and country levels. Based on 14,372 observations of firms from the MSCI All Country World Index for the years 2008 to 2017, we find evidence supporting the information-based perspective at the firm, industry, and country levels: Access to and the value of private information about rival firms increases common ownership. For the competition-based perspective, we find support at the industry and country levels, specifically uncovering that common ownership is higher in more concentrated industries and in countries with more extensive laws regarding anticompetitive conduct. Our findings contribute to research by stressing the relevance of both perspectives. Overall, our study has broader implications for understanding the emerging phenomenon of common ownership.

1. Introduction

Institutional ownership of corporations has been the subject of many studies to date (Bajo et al., 2020; Gillan & Starks, 2003; Goranova et al., 2010; La Porta et al., 1999). More recently, scholars have begun to investigate the phenomenon of common ownership—i.e., one institutional investor owning a sizeable number of publicly traded shares in two (or more) rival firms (e.g., Azar et al., 2018; Connelly et al., 2019; Schmalz, 2018). Previous research has, for instance, shown that most of the major investors of U.S. airlines also own shares of their competitor companies (Schmalz, 2018). In our sample, institutional investors that own stocks in at least two firms of one industry held about one quarter of all stakes. While previous studies have provided initial insights regarding the implications of common ownership at the firm or dyad levels (Azar et al., 2018; Connelly et al., 2019; He & Huang, 2017) as well as discussed the related potential policy consequences (Coates, 2018; Elhauge, 2016; Posner et al., 2016), there is relatively little empirical research exploring its antecedents. Accordingly, scholars have called for future research to explore the determinants of common ownership (e.g., Gilje et al., 2020).

To answer their call, we analyze the determinants of common ownership on multiple levels and in a global context. We build our analysis of the determinants on the motivation of investors to maximize the financial returns from their investments. In the case of common owners, their aim is to maximize the joint asset value (Goranova et al., 2010; Matvos & Ostrovsky, 2008). Currently, the literature suggests two dominant mechanisms through which common owners can achieve this objective: First, common owners benefit from their superior access to private information about firms (Connelly et al., 2019; Edmans et al., 2019); second, common ownership can result in anti-competitive effects, such as increased prices for consumers (Azar et al., 2018; Elhauge, 2016; Posner et al., 2016). We shed light on how investors' motivation to maximize the joint asset value may affect the prevalence of common ownership within firms. Hence, we go beyond primarily structurally-induced and more passive determinants of common ownership, such as diversified investment strategies and index investments (e.g., Backus et al., 2021), and specifically investigate whether access to private information and the potential for anti-competitive effects also explain the prevalence of common ownership. While acknowledging that these two perspectives may only be partly distinct, we believe that this research

* Corresponding author.

E-mail addresses: j.c.hennig@rug.nl (J.C. Hennig), j.oehmichen@uni-mainz.de (J. Oehmichen), p.j.steinberg@rug.nl (P.J. Steinberg), judith.heigermoser@wiwi.uni-goettingen.de (J. Heigermoser).

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not only informs the greater ownership research but also provides essential insights for practitioners on how to assess common ownership. Insights regarding these two theoretical perspectives can thus serve as a basis for discussions about potential consequences, such as regulatory changes. Specifically, we draw on insights from an information-based perspective, highlighting private information (i.e., the ability of shared principals to gather intimate insights on multiple rival agents), and a competition-based perspective, highlighting anti-competitive effects, which lead to potentially less competition when firms maximize their investors' portfolio value instead of their individual firm value.

Leveraging the above-mentioned information-based and competition-based perspectives, we test both mechanisms from an investor's point of view and consider their explanatory power for common ownership. In our empirical analysis, we focus on three different levels per perspective—the firm, industry, and country levels—as these have been identified as useful analytical categories (Peng et al., 2009). For the information-based perspective, we develop hypotheses for analyst coverage (firm level), industry dynamism (industry level), and disclosure requirements (country level). For the competition-based perspective, we hypothesize on the determinants of the diversity of a firm's competitive repertoire (firm level), industry concentration (industry level), and the strength of competition law (country level).

To test our hypotheses, we compiled a large international dataset. We started with the firms listed in the MSCI All Country World Index between 2008 and 2017, which contains about 2,500 firms from up to 50 developed and emerging countries annually. This index covers about 85% of the free-float adjusted market capitalization in each country. We included every firm listed at least once in the index between 2008 and 2017 and excluded firms headquartered in tax havens (Dharmapala & Hines, 2009). We clustered the firms by industry, calculated the share of common ownership by institutional investors at the firm level, and enriched the dataset with a broad range of financial, governance, and institutional data. Overall, our analyses are based on a sample of 14,372 firm-year observations. We found that all three levels of the information-based perspective explained common ownership according to our argumentation. This suggests that superior access to private information indeed motivates common ownership. With regard to the competition-based perspective, we found support for the hypotheses on anti-competitive potential at the industry level—where we argue that concentrated industries are related to increased common ownership—and at the country-level—where we find evidence that competition laws are related to increased common ownership as an unregulated alternative.

Our study contributes to the literature on common ownership, as we add an important aspect to the nascent discussion on this major phenomenon (e.g., Bajo et al., 2020; He & Huang, 2017; Ramalingegowda et al., 2021; Schmalz, 2018, 2021). By exploring the determinants of common ownership in a systematic and integrated manner, we offer a missing piece of evidence that has sparked calls for clarification (Gilje et al., 2020). Hence, we add to the understanding of common ownership and the mechanisms through which institutional investors seek to maximize their value creation. Moreover, we empirically explore the two main theoretical perspectives used by previous research to motivate common ownership: 1) access to private information (derived from an information-based perspective), where shared principals have preferential access to their rival agents (Connelly et al., 2019), and 2) potential anti-competitive behavior (Rubinstein & Yaari, 1983) (derived from a competition-based perspective). While the two perspectives are distinct in their mechanisms through which common owners can optimize their portfolio investments, our results show that both have explanatory power and determine common ownership. This implies that the two perspectives identify more active determinants of common ownership that need to be considered in addition to rather passive determinants, such as rising index investments and investment diversification (cf.; Backus et al., 2021; Banal-Estañol et al., 2020). Thus, we demonstrate that future analyses of common ownership could benefit from an

integration of both the information-based and the competition-based perspectives.

2. Literature review

In the past few years, the phenomenon of active common ownership has gained the attention of scholars from multiple disciplines, such as management, marketing, finance, and law (Azar et al., 2018; Bajo et al., 2020; Connelly et al., 2019; Lu et al., 2021; Schmalz, 2018). At first, scholars renewed the attention given to the concept of joint asset value as an important principle that guides common owners (e.g., Goranova et al., 2010; Hansen & Lott, 1996). Like any other investor, common owners are interested in maximizing the value of their entire portfolio (Daily et al., 2003; Hansen & Lott, 1996). This could have consequences for the strategic decisions of firms that have common owners, as these firms might no longer maximize their own value but their owners' portfolio value (Rotemberg, 1984; Schmalz, 2018). For instance, previous research has shown that, in M&A deals, common owners seek the highest *aggregate* value, if necessary, at the expense of non-common owners (Goranova et al., 2010; Matvos & Ostrovsky, 2008). Other studies have built on the principle of joint asset value and studied the mechanisms common owners use to maximize it (i.e., the value of private information and the possibility of anti-competitive effects) (Antón et al., 2021; Azar et al., 2018; Connelly et al., 2019).

Private information can be useful for common owners in several ways. Edmans et al. (2019) developed a theoretical model where common owners utilize superior insights on their firms to make a more informed decision about which stakes to hold and which to sell. He et al. (2019) found that common ownership increases monitoring efficiency and reduces externalities, as owners have access to information from multiple sources to hold the management accountable. Moreover, common ownership also mitigates earnings management (Ramalingegowda et al., 2021): Since common owners possess detailed information about more than one firm per industry, their knowledge helps them realistically calibrate financial results and investment opportunities across multiple firms (Ramalingegowda et al., 2021). In addition, common owners may provide their firms with such key information, serving as informational bridges between them (Massa & Žaldokas, 2017). Building on these insights, Connelly et al. (2019) argued that, by serving as informational bridges, common owners help their firms engage in indirect competition by employing different competitive repertoires, while the firms can retain their overall competitive aggressiveness.

Another body of theoretical and empirical studies on common ownership analyzes whether the phenomenon is associated with anti-competitive effects (for an overview of this research, see, e.g., Schmalz, 2021) and, hence, potential costs for the customer. Some law scholars (e.g., Coates, 2018) have even begun discussing the adequacy of antitrust regulations against common ownership. He and Huang (2017) argue that common owners encourage coordination between their firms via alliances, acquisitions, and board interlocks, with these measures resulting in increased market shares for firms with common owners. Azar et al. (2018) analyzed the airline industry in the U.S., in which common ownership is prevalent and has steadily increased. They found increased ticket prices, which confirms their assumption that common ownership can result in anti-competitive behavior. Shekita (2020) built on this study and identified specific forms of common owners' interventions, such as private engagements with CEOs, adjusted CEO compensation arrangements, and specific voting behavior during shareholder meetings. More recently, Anton et al. (2021) highlighted that common ownership may affect firm behavior even without direct communication—i.e., by affecting managerial incentives via tolerating managerial productivity inefficiency in their portfolio firms. However, in contrast, other research has not found evidence for any anti-competitive effects of common ownership on industry profitability, output prices, or nonprice competition (Koch et al., 2021; Lewellen &

Lowry, 2021). López and Vives (2019), who scrutinized the effects of common ownership on social welfare, found that the socially optimal extent of overlapping ownership is determined by, for instance, industry concentration and demand conditions.

3. Hypothesis development

Recent literature discussing the outcomes of common ownership has assumed two perspectives that could guide the choices of investors: First, an information-based perspective that stresses the access to and value of private information for common owners (Connelly et al., 2019; Edmans et al., 2019); second, a competition-based perspective in which common owners are motivated by the possibility of anti-competitive effects (Elhauge, 2016; Posner et al., 2016). Research about determinants of common ownership, however, primarily focused on rather passive determinants, such as index investing or diversification (e.g., Backus et al., 2021). We expect the information-based perspective and competition-based perspective will lead to additional insights on the determinants of common ownership at the three aforementioned analysis levels (e.g., the firm, industry, and country levels).

3.1. Potential for information advantages from common ownership

Agency theory is one perspective the literature has used to analyze common ownership (Connelly et al., 2019). To prevent agency conflicts, principals look for as much information as possible about their firms. Information is also a crucial factor in ownership competence, which in turn is important in terms of value creation (Foss et al., 2020) and the impact on firms' strategy (Oehmichen et al., 2021). In the case of common ownership, principals have access to private information of two or more firms from the same industry. Investors' portfolios have been shown to be biased towards familiar industries, as investors utilize their information advantage (Fedenia et al., 2013). Thus, in the subsequent sections, we hypothesize that common ownership is more pronounced in contexts where institutional investors can specifically benefit from their superior access to private information. Private information is especially valuable if access to public information is restricted. We test this perspective at the firm, industry, and country levels.

Firm-level – Analyst coverage. Institutional investors benefit from economies of scale when gathering and processing large amounts of information on their investment objects (Schnatterly et al., 2008). Many of them employ in-house analysts to cover a specific industry to compile data and knowledge. While institutional investors usually keep the most valuable information private, they also publish business insights and investment recommendations. In fact, Bradley et al. (2017) state that analysts “are among the most important information agents in capital markets” (p. 751). The number of analysts who follow a firm can serve as a proxy for the amount of publicly available information, as analyst coverage reduces the information asymmetry between investors and companies (Roulstone, 2003).

Institutional investors, however, are interested in generating competitive information advantages. Owners receive preferred access to private insights on their firms, which is more beneficial if analyst coverage—and, hence, information for the more general public—is scarce. Common owners are able to obtain intimate knowledge of two or more firms within one industry. Hence, becoming a common owner is attractive if there is a high possibility of possessing an information advantage due to a lack of analyst coverage. In line, Brooks et al. (2018) found that common owners increase the chances of long-term positive outcomes in M&A deals when analyst coverage is low and, hence, the information asymmetry between the acquirer and target is high. In summary, we hypothesize that common ownership is more pronounced in cases where there is a lack of publicly available information:

Hypothesis (H1a). *The number of analysts covering a firm is negatively related to common ownership.*

Industry-level – Dynamism. Industry dynamism captures the extent to which the industry's firms are exposed to difficult-to-predict change and, in turn, uncertainty (Dess & Beard, 1984; Miles et al., 1974; Nadkarni & Chen, 2014). In industries with volatile environments and turbulence, it is difficult for firms to forecast the future developments of the industry or the performance of single players and, accordingly, to organize and plan (Aldrich, 1979). Moreover, with increased uncertainty, firms will have to acquire and process more information in order to achieve sustained performance (Galbraith, 1973). Hence, every additional piece of information is useful for firms. As such, informational advantage is especially beneficial for firms operating in industries that are not strongly linked to general macroeconomic developments or those experiencing abnormal operational situations (Hutton et al., 2012).

Institutional investors often have superior access to private knowledge about their firms (Bushee & Goodman, 2007). As we have established above, this can be especially relevant in terms of firm performance within dynamic industries. Consequentially, we expect that institutional investors are motivated to gather as many insights as possible in such an environment. Investors with common ownership of various rival firms within an industry possess private information on not only one but at least two firms within that industry. Since uncertainty within an industry often originates from firms' interconnectedness and the unintended consequences of one firm's actions on the other firms within that industry (Pfeffer & Salancik, 1978), common owners' access to such information is especially valuable to the owned firms. In a volatile and dynamic environment, investors can use this superior information to make more accurate forecasts about the industry, guide their firms by serving as informational bridges (Connelly et al., 2019; Massa & Žaldokas, 2017), and react more quickly to suddenly appearing challenges. This information can increase the owned firm's performance and, in turn, the common owner's returns from their portfolio investment. We test this argument using the following hypothesis:

Hypothesis (H1b). *Industry dynamism is positively related to common ownership.*

Country-level – Disclosure requirements. In our development of H1a, we hypothesize that a lack of publicly available information fosters common ownership. At the country level, disclosure requirements are designed exactly for that purpose: to reduce the information asymmetry between firms and their (potential) owners. Firms benefit if investors exhibit some amount of transparency about their business model, their operations, and their finances, which all decrease their cost of capital: Extensive disclosure requirements facilitate a larger stock market and mitigate agency conflicts (La Porta et al., 2006). Similarly, Shroff et al. (2014) described transparent external information environments in the form of increased media coverage to also reduce agency problems. It is more difficult—and, hence, more costly—to gather insights on industries and single firms if the disclosure requirements are lax. Consequentially, institutional investors could be deterred from investment opportunities. However, once an investor has invested in a firm, they experience easier access to private information. Possessing insights on one firm in a specific industry allows the owners to contextualize potentially rare or vague information about another firm. The costs associated with collecting additional information for evaluating firms decrease with each acquisition and expands investment opportunities when compared with investors without private insights. Hence, we suggest that the information advantage of common ownership is less pronounced in countries with strong disclosure requirements, as indicated in the following hypothesis:

Hypothesis (H1c). *Strong national disclosure requirements are negatively related to common ownership.*

3.2. Potential for anti-competitive effects of common ownership

In addition to the information-based perspective, we employ a competition-based perspective to examine whether the potential for anti-competitive effects is a determinant of common ownership. Policy proposals calling for a regulation of common ownership—e.g., by limiting ownership stakes (Posner et al., 2016)—are grounded in the assumption that common ownership can result in anti-competitive effects. Generally, common owners look to maximize the joint asset value, and this joint value is jeopardized if their firms compete too aggressively and cannibalize themselves. Hence, it is assumed that common ownership leads to potential anti-competitive effects within industries. Indeed, common owners have been found to prioritize the joint asset value in M&A deals (Goranova et al., 2010)—even if it means accepting a sub-optimal outcome for one of their two firms. Despite potential benefits, such as economies of scale and synergy effects on a micro-economic level, M&A deals are not always allowed, as in the case of already concentrated industries or antitrust legislation, to ensure a macro-economic balance. Thus, in the following, we theorize that common ownership—which is only interested in the micro-economic benefits increasing the asset value—could be used by institutional investors as a tool to silently engage in anti-competitive behavior. Once again, we test this perspective at the firm, industry, and country levels.

Firm-level – Repertoire diversity. Connelly et al. (2017) found that firms are more successful in the long term if they use a complex set of competitive actions. Connelly et al. (2019) apply this concept in a common ownership context and show that common owners are not interested in having their firms compete less but in avoiding direct competition. Common owners need their firms to stay on top of potential third-party competitors to maximize their portfolio value and, hence, incentivize aggressive competition. However, it is crucial that the commonly owned firms stay out of each other's way by utilizing differing sets of competitive actions (i.e., competitive dissimilarity). Establishing competitive dissimilarity between two firms is easier if the firms have demonstrated their ability to employ a diverse portfolio of competitive actions. Hence, we hypothesize that common owners seek to invest in firms with a broad range of competitive actions:

Hypothesis (H2a). *The diversity of a firm's competitive repertoire is positively related to common ownership.*

Industry-level – Concentration. Stillman (1983) states that “horizontal mergers have the clearest anticompetitive potential” (p. 226). Antitrust legislation aims to protect consumers from welfare-decreasing effects stemming from anti-competitive conduct and the abuse of dominant competitive positions. Competition is intense in industries with many participants who share the sales relatively evenly among each other, and it is unlikely that one firm alone can successfully engage in a behavior harmful to customers, such as high prices (Stonehouse & Snowdon, 2007). Consumers have too many available choices and can easily opt to buy products or services from other firms. When a competitive industry is entering the maturity and decline phases of its lifecycle and the market shares have been distributed, M&A activity becomes especially desirable for firms looking for economies of scale (Bauer et al., 2017). However, antitrust authorities are less inclined to allow M&A deals in the case of already concentrated industries. Consequentially, from the owners' point of view, common ownership could serve as a vehicle for “hidden mergers”. Accordingly, we hypothesize:

Hypothesis (H2b). *Industry concentration is positively related to common ownership.*

Country-level – Competition laws. The regulation of competition at the country level is common around the globe (Bradford & Chilton, 2018). Competition law is an important policy instrument that allows countries to promote or inhibit competition (Hylton & Deng, 2007; Koske et al., 2015). Essentially, pro-competition regulation aims at

Table 1
Framework

Overarching goal of common owners: increase joint asset value				
Level	Information-based perspective		Competition-based perspective	
	Argument	Measure	Argument	Measure
Firm	Broad analyst coverage minimizes the benefits of private knowledge	Analyst coverage (-)	Common owners want to avoid cannibalization - easier with diverse repertoires	Repertoire diversity (+)
Industry	Collecting information on & influencing multiple firms is beneficial in volatile industries	Industry dynamism (+)	M&A less likely approved in concentrated industries - leads to “hidden mergers”	Industry concentration (+)
Country	Broad disclosure requirements minimize the benefit of private knowledge	Disclosure requirements (-)	Strong antitrust laws lead to “hidden mergers” or “tacit collusion”	Competition law index (+)

Note: (-) means expected negative relationship between variable and common ownership; (+) positive

reducing anti-competitive conduct, reducing state involvement in business sectors, and facilitating market entry (Bradford & Chilton, 2018; Koske et al., 2015). Hence, the efficacy of such legislation is contingent on an adequate definition of anti-competitive behavior—such as excessive M&A, unfair pricing, or collusion—and its enforcement. Nonetheless, competition law has so far been confined to regulating anti-competitive activities of firms—not of common owners.

Institutional investors have the resources and capabilities to process large amounts of information (Schnatterly et al., 2008). Thus, they should be able to analyze the business models and industry developments, in accordance with the legislative environment and adapt their investment choices accordingly. La Porta et al. (1998) presented an example of investors adjusting their choices to legislation: If investor protection is weak, investors guard themselves by owning larger stakes of one single company, which leads to more concentrated ownership structures. Moreover, strong anti-competitive legislation hinders firms and their owners to openly pursue anti-competitive conduct, such as price-fixing or M&A deals in concentrated industries, investors could choose to resort to unregulated common ownership in the form of “hidden mergers” or “tacit collusion”. We, thus, hypothesize:

Hypothesis (H2c). *Strong competition law is positively related to common ownership.*

We summarize all the hypotheses in Table 1. In the following section, we describe our strategy for testing the developed hypotheses.

4. Research design

4.1. Data and sample

To test our hypotheses at the different levels (i.e., firm, industry, and country), we aimed to compile a broad international dataset of firms and their owners. Hence, to construct our initial sample, we used an index with around 2,500 firms from up to 50 countries worldwide that also covers 85% of the free-float adjusted market capitalization per country: the MSCI All Country World Index. We included every firm included in the index at least once between 2008 and 2017 and not headquartered in

Table 2
Sample distribution

Country	# of firms-years	% of firms-years	Mean Common Ownership
Argentina	2	0.01	0.06
Australia	353	2.46	0.12
Austria	23	0.16	0.07
Belgium	72	0.5	0.09
Brazil	236	1.64	0.15
Canada	724	5.04	0.20
Chile	47	0.33	0.05
China	316	2.2	0.15
Colombia	25	0.17	0.13
Czech Republic	10	0.07	0.06
Denmark	122	0.85	0.10
Egypt	10	0.07	0.17
Finland	98	0.68	0.08
France	443	3.08	0.08
Germany	310	2.16	0.13
Greece	34	0.24	0.09
Hungary	10	0.07	0.20
India	661	4.6	0.14
Indonesia	77	0.54	0.13
Ireland	152	1.06	0.28
Israel	72	0.5	0.13
Italy	180	1.25	0.07
Japan	1,279	8.9	0.13
Luxembourg	15	0.1	0.21
Malaysia	162	1.13	0.13
Malta	3	0.02	0.12
Mexico	92	0.64	0.07
Morocco	14	0.1	0.18
Netherlands	230	1.6	0.16
New Zealand	33	0.23	0.08
Norway	31	0.22	0.07
Pakistan	3	0.02	0.10
Panama	10	0.07	0.22
Peru	3	0.02	0.03
Philippines	59	0.41	0.05
Poland	168	1.17	0.12
Portugal	30	0.21	0.12
Qatar	5	0.03	0.19
Russia	14	0.1	0.02
Singapore	161	1.12	0.22
South Africa	415	2.89	0.20
South Korea	288	2	0.13
Spain	199	1.38	0.11
Sweden	155	1.08	0.14
Switzerland	312	2.17	0.14
Thailand	27	0.19	0.11
Turkey	87	0.61	0.06
United Arab Emirates	47	0.33	0.38
United Kingdom	984	6.85	0.21
United States	5,569	38.75	0.32
Total	14,372	100.0	0.22

a tax haven (Dharmapala & Hines, 2009). Next, we utilized ownership data from the Thomson Reuters Institutional Holdings Database to build our dependent variable. Following prior research (Tihanyi et al., 2003), we restricted our data to institutional owners with an equity stake of at least 1%. Next, we excluded observations with missing control variables. This left us with a potential sample of 14,372 firm-year observations of 1,796 firms from 50 countries for which we had data on the dependent variable and control variables. Since our explanatory variables are on different levels (i.e., firm, industry, and country), the sample sizes varied across the tests and are noted in the tables. Table 2 shows the distribution of our sample over countries.

For our explanatory variables, we drew on a range of data sources. We used IBES data to operationalize analyst coverage; RavenPack News Analytics for information on firms' competitive actions (Connelly et al., 2019); data compiled by the World Bank on disclosure requirements; and the product market regulation index by the OECD. Financial data was extracted from Thomson Financial Datastream and governance data from BoardEx. Macroeconomic data on the gross domestic product (GDP) per capita is reported by the World Bank. The data on investor

protection was pulled from *The Global Competitiveness Report 2013* by the World Economic Forum. Table A1 in the Appendix provides a detailed description of all the regression variables.

4.2. Dependent variable – Common ownership

In line with prior research, we define common ownership as institutional investors holding a substantial amount of shares in more than one firm in the same industry at a given point in time (Cheng, Wang, & Wang, 2021; Connelly, Lee, Tihanyi, Certo, & Johnson, 2019).¹ We followed prior research to determine common ownership at the firm

¹ Prior studies on institutional ownership have used different thresholds to capture meaningful equity positions. In our main analysis, we excluded institutional investors holding less than 1% of firms' equity (e.g., Connelly et al., 2019; Tihanyi et al., 2003). The results (available upon request) remained similar when we used 5% as an alternative threshold (Cheng et al., 2021; He & Huang, 2017).

level by conducting the following steps (Cheng et al., 2021; He & Huang, 2017). We start with extracting ownership data from the Thomson Reuters Institutional Holdings Database. We next mark common owners by determining whether investors hold at least 1% in two firms within the same four-digit SIC industry in the same year. We then sum up all ownership stakes per firm held by institutional investors that have been identified as common owners. Finally, we scale the sum of common ownership from the previous step by all institutional ownership of free-floating stock to obtain a ratio. This measure captures the extent to which the focal firm is held by common owners. The calculation is represented by the following formula:

$$\text{Common Ownership}_{i,t} = \frac{\sum_k^{C_{i,t}} COH_k}{\sum_k^{C_{i,t}} COH_k + \sum_k^{D_{i,t}} DOH_t}$$

where $C_{i,t}$ is the number of common owners of the focal firm i as defined above in year t . $D_{i,t}$ is the number of institutional owners of the focal firm i in year t who are non-common institutional owners. COH and DOH denote the holdings (in USD) of common and non-common owners of the focal firm, respectively.

4.3. Independent variables and moderators

Firm-level – Analyst coverage. We operationalized this variable using the logarithm of 1 plus the number of analysts covering a given firm per year as reported by IBES.

Industry-level – Dynamism. This variable is defined as the unpredictability of change in the industry (measured as four-digit SIC codes). We followed the literature (e.g., Bergh & Lawless, 1998; Lien et al., 2021; Nadkarni & Chen, 2014) to construct the variable: (1) we regressed the total values of industry sales over five years (i.e., the sum of firms’ individual sales winsorized at the 5% and 95% levels for each industry) against time, and (2) we took the standard error of the regression coefficient related to a time dummy variable and (3) divided it by the average value of the industry’s sales, with a higher value indicating higher dynamism in an industry.²

Country-level – Disclosure requirements. We used annual data on countries’ disclosure requirements from the World Bank’s business extent of disclosure index (Kim & Song, 2017; Parsley & Popper, 2020; Uras, 2020). The disclosure index captures to what extent investors are protected through the disclosure of financial and ownership information. The index ranges from 0 to 10. The higher the value of the variable, the stricter the requirements on firm disclosures.³

Firm-level – Repertoire diversity. A competitive repertoire consists of one or more externally directed and observable competitive actions that a firm implements to stay ahead of competition (Ferrier et al., 1999). To measure a firm’s competitive repertoire, we followed Connelly et al. (2017) and downloaded data from RavenPack News Analytics. This database covers more than 40,000 listed companies globally and uses an algorithm to scan over 19,000 international media outlets

² In unreported tests, we found that our results (available upon request) held when we used the yearly change in industry sales as an alternative proxy. While the yearly change reflects the rate of change, our measure was designed to capture the unpredictability of change, which better suits our arguments in the hypothesis development.

³ Higher disclosure requirements might also be an indicator of better developed capital markets, where a higher number of investors and listed firms could dilute ownership. To attenuate concerns that our results are driven by this relation, we used alternative proxies for the level of public information at the country level and included the number of listed firms per country as a control variable. For the level of public information at the country level, we used the number of articles per country calculated based on the news database, Ravenpack, and the country values for freedom of press from Reporters Without Borders, respectively. The results (available upon request) were consistent with our main analyses.

for reports. Furthermore, they group the obtained information into different categories. First, we defined seven different action categories (Product, Capacity, Pricing, and Marketing Action as well as Acquisitions, Strategic Alliances, and Market Expansions), which were comprised of a total of 329,216 underlying and first-reported actions. The focus on reported actions, the choice of categories, and the mean of 10.6 actions per year and firm are all in line with prior studies (Chen & Miller, 2012; Connelly et al., 2017, 2019). Second, we operationalized the variable *repertoire diversity* as a standardized Shannon index.

$$S_{k,t} = - \sum_{i=1}^A p_{i,k,t} \ln p_{i,k,t}$$

This method captures how many actions from the seven different categories one firm (k) employs in any given year (t) (Connelly et al., 2017). We calculated the Shannon index by adding up the product of the proportion of actions per category, i (out of A), and the natural log of the proportion per category. The index approaches zero if a competitive repertoire is skewed in one specific direction. If a firm uses a more equally distributed range of actions, the index reaches the maximum of $\ln(A)$.

Industry-level – Concentration. We used the Herfindahl-Hirschman index (HHI) of firms’ sales to measure the industry concentration. A high HHI value means that an industry is concentrated, which thus increases the power of the remaining firms and likely limits competition. We again used a four-digit SIC-level to cluster the industries (Connelly et al., 2019). We used all available sales data from Datastream across the countries and winsorized at the 5% and 95% level to obtain the market shares per firm for each industry and year. The HHI is calculated as the squared sum of the market shares (Haw et al., 2015).

Country-level – Competition laws. We captured competition law using the OECD product market regulation indicator (Koske et al., 2015). It comprehensively measures the degree to which countries’ policies promote or inhibit competition and has been frequently applied in the literature (e.g., Aghion et al., 2020; Diana & Giaccaria, 2018; Felbermayr et al., 2018; Pierre, 2015). The indicator is based on surveys conducted by the OECD, which were sent to national governments and aggregates their responses to over 700 questions (Koske et al., 2015). Within our sample period, the OECD conducted a first wave of surveys in 2008 and a second wave in 2013. Thus, we used the values from 2008 for the years 2008–2012 and the values from 2013 for the years 2013–2017.⁴

4.4. Control variables

We used a comprehensive set of control variables for our model. *Firm size* (calculated as the natural logarithm of the total assets) accounts for such differences in our sample; the return on assets (ROA), *free cash flow* (divided by sales), and *leverage ratio* serve as indicators of firm performance as well as the ability to support operations and meet financial obligations. *Board size* and *time in roles* for board members approximate the influence that the board of directors is able to exert. Furthermore, we included dummy variables to control for *year* and *industry* effects. For the latter, we employed the standard industry classification at the one-digit level. We also controlled for the natural log of *GDP per capita* to account for country-specific effects. Since La Porta et al. (1998, 2002) have argued that *investor protection* takes on an important role for investors, we added the relevant control variable. We also controlled for year and industry fixed effects to account for temporal- and sector-related trends in common ownership.⁵ To attenuate the impact of

⁴ In the robustness section, we conducted tests using alternative proxies and found that our results held.

⁵ In our analyses on the industry level in H1b and H2b, we excluded industry fixed effects, as our arguments leading to our hypotheses mostly build on the variation between industries. However, the results (available upon request) still held when we included industry fixed effects.

Table 3
Descriptive statistics and correlations

	Obs.	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Common ownership	1	14,372	0.22	0.01	1.00															
Analyst coverage ^b	2	13,760	2.85	0.69	4.06	0.09														
Industry dynamism	3	10,499	0.03	0.00	0.77	0.01	0.02													
Disclosure requirements	4	10,993	7.30	1.85	10.00	0.08	-0.02	0.01												
Repertoire diversity	5	13,760	0.28	1.00	2.51	0.08	0.31	-0.01	0.04											
Industry concentration	6	10,499	0.04	0.05	1.00	-0.09	0.03	0.03	-0.01	0.04										
Competition laws	7	10,993	1.57	0.62	3.40	-0.24	0.06	0.04	-0.03	-0.18	-0.14									
Firm size ^b	8	14,372	16.11	1.58	21.93	-0.06	0.33	0.06	-0.03	0.33	-0.14	-0.06								
Leverage ratio ^a	9	14,372	0.26	0.18	0.80	0.03	-0.03	0.02	0.01	-0.01	0.04	0.00	0.02							
ROA ^a	10	14,372	0.05	0.08	0.37	-0.05	0.04	0.01	-0.01	0.02	0.12	0.06	-0.22	-0.18						
Free cash flow ^a	11	14,372	0.18	0.21	0.93	0.13	0.07	0.02	0.02	-0.06	-0.08	-0.08	0.07	0.01	0.12					
Board size	12	14,372	8.43	3.09	31.00	0.08	0.20	-0.02	-0.01	0.27	0.00	0.01	0.35	0.05	-0.03	0.03				
Directors' time in role	13	14,372	5.38	2.84	14.44	0.25	0.03	0.00	-0.04	0.08	0.09	-0.10	0.00	0.00	0.08	0.06	0.21			
GDP per capita	14	14,372	10.39	0.94	6.91	11.69	0.24	-0.02	-0.04	0.18	0.13	-0.59	0.11	0.02	-0.05	0.08	0.02	0.10		
Investor protection	15	14,372	7.07	1.35	9.70	0.37	-0.09	-0.15	0.53	0.12	0.09	-0.38	-0.12	0.01	0.03	0.06	0.09	0.21	0.26	

Notes: This table presents the descriptive statistics and correlations for all regression variables. a: winsorized at the 1st and 99th percentile; b: logarithmized. All correlations greater than or equal to 0.017 are significant at the 5 percent level.

Table 4
Results of hypotheses testing

Method	Model 1 GEE	Model 2 GEE	Model 3 GEE
<i>Dependent variable</i>			
Analyst coverage	-0.332*** [0.000]		
Industry dynamism		2.652*** [0.002]	
Disclosure requirements			-0.196*** [0.000]
Repertoire diversity	-0.017 [0.296]		
Industry competition		6.023*** [0.000]	
Competition law			3.771*** [0.000]
<i>Control variables</i>			
Firm size	0.266*** [0.000]	0.178*** [0.000]	0.178*** [0.000]
Leverage ratio	-0.422** [0.034]	-0.619*** [0.003]	-0.394 [0.131]
Return on assets	-0.337 [0.117]	-0.589*** [0.009]	-0.551* [0.058]
Free cash flow	0.051 [0.454]	0.012 [0.896]	0.091 [0.304]
Board size	-0.010 [0.380]	0.001 [0.909]	0.011 [0.455]
Directors' time in role	-0.056*** [0.000]	-0.059*** [0.000]	-0.078*** [0.000]
GDP per capita	-1.243*** [0.000]	-1.530*** [0.000]	1.152*** [0.000]
Investor protection	-0.191*** [0.000]	-0.313*** [0.000]	-0.479*** [0.000]
Constant	16.324*** [0.000]	20.869*** [0.000]	-13.399*** [0.000]
Year effects	Yes	Yes	Yes
Industry effects	Yes	No	Yes
# of observations	13,760	10,499	10,993

Notes: All tests are two-tailed. P values in parentheses below coefficients. Standard errors are clustered at the firm level. *, **, and *** denote significance at the 0.1, 0.05, and 0.01 level, respectively.

outliers, we winsorized all continuous financial variables at the 1st and 99th percentiles.

4.5. Method

Our sample is a longitudinal panel where each firm exists at least once and ten times (i.e., in every year of the sample) at maximum. We repeatedly measured the same variables and were interested in inter-firm differences caused by both time-variant and time-invariant predictors. It is possible that firm-year observations were correlated, since factors that we did not incorporate in our analysis (e.g., management) could have remained constant across the years (Ndofor et al., 2011). Furthermore, institutional ownership is highly “sticky” and usually does not change on a large scale from one year to another. The Wooldridge test confirmed these arguments and suggests the presence of serial correlation. Another important feature of our data is that the distribution of our dependent variable was skewed to the right, as small common ownership made up a smaller proportion of investments in the sample firms.

To adequately account for the structure of our data, we used the generalized estimating equation (GEE) approach as our analytical method. GEE is an extension of the generalized linear model (GLM) and allows for the modeling of within-subject correlation in longitudinal data analysis (Liang & Zeger, 1986). As such, GEE has been highlighted for its clear advantages over other models, such as fixed- or random-effect models, because of its more consistent and robust parameter estimations when autocorrelation due to nonindependence is present and the dependent variable is not normally distributed (Liang & Zeger, 1986; Ndofor et al., 2011). Unlike other techniques, GEE allows for

Table 5
Results of robustness checks

Method	Model 1 GEE	Model 2 GEE
<i>Common ownership</i>		
<i>Dependent variable</i>		
Analyst coverage	-0.258*** [0.004]	
Industry dynamism	4.311*** [0.001]	
Disclosure requirements	-0.216*** [0.000]	-11.033*** [0.000]
Repertoire diversity	-0.002 [0.906]	
Industry competition	12.818*** [0.000]	
Competition law	3.454*** [0.000]	0.850* [0.090]
<i>Control variables</i>		
Firm size	0.241*** [0.000]	0.140*** [0.001]
Leverage ratio	-0.506** [0.040]	-0.305 [0.116]
Return on assets	-0.556** [0.037]	-0.369* [0.095]
Free cash flow	-0.004 [0.969]	0.068 [0.371]
Board size	0.003 [0.817]	0.014 [0.224]
Directors' time in role	-0.054*** [0.000]	-0.032*** [0.003]
GDP per capita	0.806*** [0.001]	-0.659*** [0.000]
Investor protection	-0.642*** [0.000]	-0.023 [0.597]
Constant	-9.991*** [0.001]	18.906*** [0.000]
Year effects	Yes	Yes
Industry effects	Yes	Yes
# of observations	7,994	13,760

Notes: All tests are two-tailed. P values in parentheses below coefficients. Standard errors are clustered at the firm level. *, **, and *** denote significance at the 0.1, 0.05, and 0.01 level, respectively. Model 1 reports the full model. Model 2 reports results using alternative country-level variables: the disclosure requirement index by La Porta et al. (2006) and the competition law index by Bradford and Chilton (2018).

specifying the distribution of the dependent variable, the link function, and accounting for interdependent observations (Ballinger, 2004). GEE first assumes a correlation structure within the sample (reflecting the within-subject correlation) and estimates the regression parameters as a second step (Ballinger, 2004). In line with our data structure, we implemented GEE regressions using a gamma distribution of the dependent variable with a reciprocal link and an autoregressive correlation structure of the first order (ar1). Thus, GEE assumes interdependence between the values for the year *t* and the year *t-1*.

5. Results

5.1. Descriptive statistics

Table 3 reports the means, standard deviations, and correlations for all variables in our analysis. The mean for common ownership was 22% for our sample. Similar to Cheng et al. (2021), we found *Common ownership* to be negatively correlated with *Firm size* and *ROA* and positively correlated with *Free cash flow* or cash holdings, respectively. Moreover, as expected, we found a positive and slightly higher

correlation between *Firm size* and *Board size* as well as between *Firm size* and *GDP* (Barkema & Vermeulen, 1998). Of the country-level variables, we found *Investor protection* to be positively correlated with *Disclosure requirements* and negatively correlated with *Competition law*, while *GDP* was negatively correlated with *Competition law*.⁶ The share of common ownership across the countries was in line with assumptions about capital- vs. bank-based economies (Fainshmidt et al., 2016): The share of common ownership is higher in liberal market economies, such as the United States (32%) or the United Kingdom (21%) and lower in coordinated market economies, such as Germany and Japan (both 13%). Overall, the descriptive statistics are generally consistent with prior literature.

5.2. Hypothesis testing

We present the results of our GEE model in Table 4. In total, we tested six hypotheses: three in relation to shared principals having an information advantage and three testing the anti-competitive behavior of common owners—each at the firm, industry, and country level. Due to the source of variation in our hypothesis-specific variables, we conducted the firm-, industry-, and country-level analyses together in one regression, respectively. Thus, in Model 1, we tested the hypotheses at the firm-level (H1a and H2a). In Model 2, we tested the hypotheses at the industry-level (H1b and H2b), and, in Model 3, we tested the hypotheses at the country-level (H1c and H2c).

In Hypothesis 1a, we suggest that large amounts of publicly available information—due to analyst coverage—minimize the benefits of private knowledge and are thus negatively correlated with common ownership. Model 1 confirmed this hypothesis, as the coefficient of *Analyst coverage* was negative and statistically significant ($\beta = -0.332, p = 0.000$). To assess the economic effect, we examined marginal effects and focused on a 1 SD-increase from the mean in the independent variables. We found that common ownership was 3.73% lower for firms with higher *Analyst coverage* (mean + 1 SD). In Hypothesis 1b, we posit that common ownership could be beneficial in volatile industries. Consistent with this hypothesis, we found a positive and significant coefficient for *Industry dynamism* ($\beta = 2.625, p = 0.002$) in Model 2. To put this result in perspective, a 1 SD-increase from the mean in *Industry dynamism* was associated with an increase of 1.82% in common ownership. Hypothesis 1c, which examines the information-based perspective at the country level, states that broad disclosure requirements decrease the importance of private information—similar to analyst coverage at the firm level (see Hypothesis 1a). Model 3 supported this hypothesis, as we found a negative and significant coefficient for *Disclosure requirements* ($\beta = -0.196, p = 0.000$). The result indicates that, for firms with higher *Disclosure requirements* (mean + 1 SD), common ownership is 6.89% lower than on average.

For our second block of hypotheses, we employed a competition-based perspective of common ownership. First, as mentioned in the argumentation leading up to Hypothesis 2a, common owners look to avoid cannibalization between their firms. Since this endeavor is easier if the firms have a more diverse competitive repertoire to start with, we expected a positive relationship between repertoire diversity and common ownership. However, our analysis in Model 1 revealed a negative and non-significant coefficient of *Repertoire diversity* ($\beta = -0.017, p = 0.296$). Second, we hypothesized that common ownership could serve as “hidden mergers”, especially when industries are already concentrated and conventional mergers are less likely to be approved by authorities. Our empirical results in Model 2 support Hypothesis 2b in the form of a positive and significant coefficient of *Industry competition* ($\beta = 6.023, p$

⁶ We found that our results (available upon request) held when (1) we excluded the country-level control variables, (2) we included them as they are, and (3) we orthogonalized them. In the main results, we orthogonalized the variables for Model 3 when they were included at the same time.

= 0.000). In terms of economic significance, an increase of 1 SD from the mean in *Industry competition* was found to be associated with an increase of 6.04% in common ownership. Finally, we suggest in Hypothesis 2c that stronger competition laws could increase common ownership in a similar way. In Model 3, we found a positive and highly significant relationship ($\beta = 3.771$, $p = 0.000$), in line with our expectation. The marginal effect suggests that common ownership is 26.92% higher for firms in countries with a more pronounced *Competition laws* (mean + 1 SD) compared to firms underlying the average level of *Competition laws*. This large economic effect is clearly driven by levels and not changes in the explanatory country-level variable. Moreover, as firms do not change countries, we observe a mere association.

5.3. Robustness of results and endogeneity

5.3.1. Sensitivity tests

We conducted a battery of tests to validate our results. First, we examined the firm, industry, and country levels together by running a full model to account for potential impacts among the different levels. Model 1 of Table 5 reports the results, which are qualitatively similar to the main results and also highly significant. Second, we used alternative proxies for the determinants at the country level. While the country-level proxies in the main analysis very well reflect the institutional contexts at the time of the analysis, there are also good arguments for other widely applied proxies. For the disclosure requirements, we applied the index put forward by La Porta et al. (2006), which is the mean of six dummy variables—each of which reflects a specific disclosure requirement (e.g., the publication of compensation for directors and officers). For the competition laws, we exploited the indicator developed by Bradford and Chilton (2018), which captures the extent to which countries curtail competition using law. In Model 2 of Table 5, we find that our results are consistent with our hypotheses and thus support our main findings. Third, as neither our main measure nor our alternative measure for competition law are available for all years of our sample, we varied the procedure to extrapolate the values for the remaining years. All possible specifications, such as using the average over all years, using data from the closest available year, or holding the value of the last available year constant, for both the main and alternative variable yielded consistent and highly significant results in line with our main findings.⁷ Fourth, we repeated our main tests using a sample without firms from the two most represented countries in our sample: the US and Japan. Again, we found that our results hold. Fifth, we reran our main analysis using an exchangeable correlation structure. This GEE option does not require a one-year lag and thus enabled us to expand our number of observations. At the same time, our estimates are likely to become less efficient. The results strongly support our main findings.

5.3.2. Endogeneity

Ownership is an endogenous choice, and, thus, unobserved factors could drive ownership and other firm characteristics at the same time. Besides such omitted variable concerns, we cannot rule out the potential for reverse causality, as common ownership could also drive some of the examined determinants of common ownership. To this end, we performed a number of methodological procedures to attenuate these concerns.^{8,9}

⁷ The results of the sensitivity tests are not reported unless stated otherwise, but they are available from the authors upon request.

⁸ The results of the endogeneity tests are not reported, but are available from the authors upon request.

⁹ We consider the potential for endogeneity issues to be larger at the firm level, while we expect it to be less of an issue at the more exogenous industry and country levels. Thus, we focus the tests in this section mostly on the determinants at the firm level.

Selection concerns. We followed Shaver (1998) to control for potential selection bias by including a correction factor in the second-stage regressions of our firm-level analysis (Busenbark et al., 2017; Certo et al., 2016). For the firm-level analyses, we derived correction factors from first-stage probit models estimating the likelihood of selecting a firm with high analyst coverage or high repertoire diversity (above the median). As exclusion criteria, we used the industry averages of analyst coverage and repertoire diversity (Certo et al., 2016). We then repeated our GEE regressions, including the *inverse mills ratios* from the first-stage regressions as additional control variables. The results remained unchanged. Additionally, in all our analyses, we controlled for the likelihood to be included in the MSCI All Country World Index by again adding an *inverse mills ratio*. Specifically, we ran a first-stage regression to derive the *inverse mills ratio* with all firm years in Datastream, in which we used the index inclusion as our dependent variable, the firm-level control variables, and a firm's free float as the exclusion criterion. Again, the results held, suggesting that our results are not likely to be driven by a selection bias.

Investor characteristics. We also conducted tests in which we specifically accounted for characteristics of firms' investors that might drive our results. First, we considered that common ownership could be the result of increasing index investing (e.g., ETFs) and excluded all holdings from the dominating index investment firms BlackRock, Vanguard, and State Street to calculate our common ownership variable anew. Second, we accounted for the influence of investors' global portfolio diversification strategy by adding the aggregated (weighted) Herfindahl index of all investors of one firm. Third, to distinguish common ownership from block ownership, we controlled for the existence, extent, and number of block holders in the firm, respectively. All tests supported our main findings.

Propensity-score matching. We next performed a propensity score matching analysis for the firm-level determinants, where firm characteristics are similar and the observations only vary in the respective determinants (e.g., analyst coverage, repertoire diversity) to remove the effect of other firm characteristics in the relation between the determinants and common ownership. Due to the high similarity in observable characteristics, observations are also assumed to be similar when it comes to unobservable characteristics that may be linked to these observable characteristics (Chang et al., 2013; Chen et al., 2015). We began with estimating the propensity score to be in our treatment group (e.g., high analyst coverage, high repertoire diversity) based on all our controls using a probit regression. Next, each treated firm year was matched to a firm-year from the control group with the closest propensity score using a conservative cut-off distance of 5% (caliper). We then reran our main regression at the firm-level—once with the matched sample for analyst coverage and once with the matched sample for repertoire diversity. We found results consistent with our main findings.

Generalized method of moments (GMM). We also ran GMM regressions for our firm-level determinants, as GMM has several advantages over other methods, such as the instrumental variable approach or fixed-effects regressions. First, GMM accounts for reverse causality by using instrumental variable estimates that are retrieved from the lagged values, thereby eliminating the need for strictly external instruments (Roodman, 2009; Wintoki et al., 2012). Second, GMM accounts for unobservable heterogeneity by including firm-fixed effects, which can also be assessed even when they are constant over time (Ullah et al., 2018; Wintoki et al., 2012). Hence, compared to fixed-effects models, GMM could provide more valid estimates in the presence of autocorrelation. Third, GMM considers the dynamic relationship between our firm-level determinants (i.e., analyst coverage and repertoire diversity) and common ownership by allowing for the inclusion of the lagged common ownership values, further tackling reverse causality (Girod & Whittington, 2016; Ullah et al., 2018). The results using GMM models again supported our main findings.

Sensitivity of results to bias and omitted variables. We aimed to mitigate endogeneity concerns by running a battery of tests. However,

we lack clear exogenous variations and cannot completely rule out that an omitted variable drives both the independent variables and the dependent variable. To assess the sensitivity of our results to bias and omitted variables, we ran two tests frequently applied in recent studies (e.g., Ege, Glenn, & Robinson, 2020; Graffin, Hubbard, Christensen, & Lee, 2020; Quigley, Hubbard, Ward, & Graffin, 2020; Busenbark, Yoon, Gamache, & Withers, 2022) for all determinants of common ownership. First, we calculated the percent bias to invalidate the inference for all our findings (Frank et al., 2021). The results showed that, to invalidate our inferences in the firm-level analysis regarding analyst coverage, 64% of the sample (8,806 cases) would have to be replaced with observations for which the effect of analyst coverage on common ownership was zero. In the industry-level analysis, 47.9% of the sample (5,030 cases) regarding industry dynamism and 91.9% (9,650 cases) regarding industry concentration would have to be replaced with cases for which there was an effect of zero to invalidate the inferences. In the country-level analysis, 55.8% of the sample (6,132 cases) regarding disclosure requirement and 83.9% of the sample (9,226 cases) regarding competition law would need to be replaced with cases for which the effect of the determinant of common ownership was zero to invalidate the inferences. Second, we calculated the extent to which a confounding variable would need to be correlated with both factors—the determinant and common ownership—to alter our results by using the impact threshold of a confounding variable (ITCV) (Frank, 2000; Busenbark et al., 2022). We followed Larcker and Rusticus (2010) and compared the ITCV with the impact of our control variables. The results suggest that a potential omitted variable would have to be correlated more strongly with both the determinants and common ownership than any of the firm control variables in all regressions tested. For all our hypotheses, for example, the omitted variable would have to be correlated with the predictor and the outcome at a higher level than with firm size, which is considered to be an important benchmark (e.g., Ege et al., 2020).¹⁰ Overall, this demonstrates that our results are not likely biased by omitted variables.

6. Discussion and conclusion

With this study, we explore the determinants of common ownership. We draw on two different perspectives: first, an information-based perspective, highlighting that common owners seek and get access to superior, private information and, second, a competition-based perspective, highlighting the potential for anti-competitive effects by common ownership.

We theorize on and empirically test each perspective on a firm-, industry-, and country-level. For the information-based perspective, we find evidence that common ownership is negatively related to analyst coverage, as private information becomes less valuable for heavily covered firms. Common ownership increases with industry dynamism, where having private information on more than one firm is particularly valuable, since fast and informed decision-making is critical in these environments. Last, common ownership decreases with vast disclosure requirements, which lessen the value of private information. When it comes to the competition-based perspective, we find support for two of our three hypotheses. Our findings show that common ownership has a significant positive relationship with both industry concentration and the presence of competition laws within a country. In contrast, we do not find support for our argument at the firm level that common owners invest in firms with existing diverse competitive action portfolios to

build dissimilar competitive strategies. The diversity of a firm's portfolio of competitive actions does not seem to be a selection criterion for investors when it comes to common ownership. At first glance, this might be surprising, as firms' competitive portfolios can be means for common owners to prevent direct competition between their commonly owned firms (Connelly et al., 2019). However, analyzing each potential target firm in detail to generate insights on the firm's competitive action portfolio might be too resource-intensive for an investor and thus not efficient. It is likely more costly for investors to generate relevant information on anti-competitive potential at the firm level than on the industry or country levels. Still, this does not mean that the competition-related perspective at the firm level is not relevant at all. Future research might investigate further competition-related determinants of common ownership at the firm level to help contextualize our related findings.

6.1. Implications for common ownership research and policymakers

We contribute to the literature by adding to the current discussion on the highly relevant phenomenon of common ownership, which has been increasingly gaining attention the attention of scholars (e.g., Bajo et al., 2020; He & Huang, 2017; Ramalingegowda et al., 2021; Schmalz, 2018, 2021). Specifically, we explore the determinants of common ownership, as called for in the literature (Gilje et al., 2020), by using a large, international sample covering over 1,000 of the largest firms from different industries and up to 50 countries. We systematically disentangle two separate theoretical perspectives on common ownership previously highlighted in the literature: access to private information (Connelly et al., 2019) and the potential for anti-competitive effects (e.g., Antón et al., 2021; Azar et al., 2018). We theorize and empirically test whether and how these two perspectives explain the prevalence of common ownership. By analyzing potential antecedents of common ownership from both perspectives at three different levels (i.e., firm, industry, and country), we add to the understanding of how institutional investors may actively pursue common ownership to optimize their portfolio investments. Hence, our results do not only help identify specific antecedents, but they also add to recent literature, which has rather focused on the rise of index investments and investment diversification as indirect drivers of common ownership (cf.; Backus et al., 2021; Banal-Estañol et al., 2020). The influence of index investments on common ownership requires less active strategic involvement by investors, as the investments simply replicate a benchmark index. However, the information- and competition-based determinants that we uncover in our study suggest that investors, at least partly, also actively pursue common ownership in firms. While index investments intend to create value through value increases and hedging effects in entire indices, the value of information- and competition-driven investor strategies could reside in the active influence on firm behavior. Thus, we provide further tentative indications that the increase in common ownership may be driven by passive and active determinants on the investor side in parallel.

Our study also provides insights for policymakers on the one hand and practitioners (e.g., investment managers) on the other. Some scholars have called for the regulation of common ownership, such as limiting the allowed stake per firm in concentrated industries or a curtailment of voting rights (Coates, 2018; Elhauge, 2016; Posner et al., 2016). Our results suggest that the potential for anti-competitive effects indeed might drive some cases of common ownership. Nevertheless, our study does not focus on the outcomes of common ownership. Thus, we do not know whether the costs of anti-competitive effects outweigh welfare effects (for an insightful reflection on this, see the discussion of Azar et al., 2018, or Schmalz, 2018). Therefore, we agree with previous research that potential antitrust regulating policies have to be decided based on the specific context of the case (e.g., López & Vives, 2019). Consequently, institutional investors that are common owners could examine their engagements and business model preemptively while following new policy developments.

¹⁰ These tests were complemented by the approach of Oster (2019), which showed that the coefficients of the determinants vary only slightly despite the addition or removal of a substantial amount of control variables. The results indicate that the omitted variable bias is limited. In line with endogeneity being more likely on the firm level, we find that the stability of the coefficients is the strongest at the industry and country levels.

6.2. Limitations and future research

Our study is not free from limitations. In this section, we outline limitations that translate into opportunities for future research. First, we disentangle the information-based and competition-based perspectives in our study to empirically test their distinct relevance and also highlight partly distinct mechanisms for both perspectives through which common owners can optimize their portfolio investments. Nevertheless, with respect to their effect on the portfolio maximization of investors, the two perspectives should not be seen as separate silos. While the performance implications are not within the scope of our determinants study, the literature suggests that the two perspectives can overlap and that inputs from one perspective can be critical to the other. For example, information-based advantages (cf.; Massa & Žaldokas, 2017) may be used to avoid cannibalization (i.e., strong competition) between commonly owned firms (cf.; Connelly et al., 2019). Thus, information-based advantages and competition-based advantages likely go hand-in-hand and even reinforce each other to potentially maximize investors’ portfolio value. Future research might want to investigate this in further detail by asking how these two perspectives function together in affecting investors’ outcomes and commonly owned firms’ behavior.

Second, our data allows us to explore the determinants of common ownership using a large international sample and among different levels of analysis, increasing the generalizability of our findings. However, at the same time, it prevents us from deep-diving into the important aspects of common ownership. For example, a country-specific deep dive on common owners’ motives and related outcomes would eliminate variation in terms of the institutional environment, while case studies of commonly owned firms or the portfolio of an investor with rival firms would generate detailed insights. We also do not distinguish between different types of institutional investors. Still, the landscape of common owners is diverse, with actors ranging from hedge- and sovereign wealth funds to large family offices. Different types of institutional investors do not only have diverse interests (Kavadis & Castañer, 2015), but they could also use different levels of dedication (Bushee, 1998; Goranova & Ryan, 2014; Hadani et al., 2011; McNulty & Nordberg, 2016; Oehmichen et al., 2021). Both of these characteristics could translate into different determinants and outcomes of common ownership.

Third, as with any study that lacks a strictly exogenous shock, our findings provide evidence of an association—not causation. As we cannot rule out the issue of endogeneity in the investigated relationships, specifically regarding our firm-level determinants, the results should be interpreted with caution. Nevertheless, the battery of different methodological specifications, especially the sensitivity tests (e.g., the use of percent bias to invalidate the inference and ITCV), suggest that our results are not likely biased by endogeneity. However, given that our analyses were exploratory in nature, future research could further challenge the causality of our findings, for example, by identifying and employing suitable instrument variables for our study’s antecedents of common ownership—specifically those at the firm level. In conclusion, more empirical studies will advance our understanding of common ownership and help in making informed policy decisions about this growing and important phenomenon.

CRedit authorship contribution statement

Jan C. Hennig: Formal analysis, Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Jana Oehmichen:** Formal analysis, Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Philip Julian Steinberg:** Writing – original draft, Conceptualization, Investigation, Methodology, Writing – review & editing. **Judith Heigermoser:** Data curation, Formal analysis, Investigation, Methodology, Writing – original draft.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A

See Table A1.

Table A1
Variable overview.

Variable	Description/Calculation	Data source
<i>Dependent variable</i>		
Common ownership	The percentage of a firm’s equity that is held by investors that hold at least 1% in two or more firms in the same four-digit SIC industry.	Thomson Reuters Institutional Holdings Database
<i>Independent variables</i>		
Analyst coverage	Natural logarithm of one plus the number of analysts covering a given firm per year.	IBES
Industry dynamism	We regress industry values of sales over 5 years against time and use the standard error of the regression coefficient related to a time dummy variable divided by the average value of industry’s sales.	Thomson Financial Datastream
Disclosure requirements	The disclosure index measures the extent to which investors are protected through the disclosure of ownership and financial information. The index ranges from 0 to 10, with higher values indicating more disclosure. The disclosure index is part of the World Bank’s Doing Business project (business extent of disclosure index). Data for the project was gathered with a standardized survey that used a simple business case to ensure comparability across economies and over time. Surveys were administered to more than 9,000 local experts, including lawyers, government officials, and other professionals who routinely administer or advise on legal and regulatory requirements.	World Bank
Repertoire diversity	Standardized Shannon index based on the number of strategic actions within the seven different action categories defined by Connelly et al. (2017) per firm and year.	Ravenpack
Industry concentration	The Herfindahl-Hirschman index of firms’ sales within firms’ four-digit SIC industry.	Thomson Financial Datastream
Competition laws	The OECD’s product market regulation indicator is the average of its three pillar scores: state control, barriers to entrepreneurship, and barriers to trade and investment. Each of these pillars is again divided into several subsections. “State control”,	OECD

(continued on next page)

Table A1 (continued)

Variable	Description/Calculation	Data source
	for example, is divided into “involvement in business organizations” (with subsections “price control” and “use of commands and control regulation”) and “public ownership” (which in turn is divided into “scope of public enterprises”, “government involvement in network sectors”, and “direct control over business enterprises”). For more detailed information, see the OECD paper by Koske et al. (2015).	
Control variables		
Firm size	Natural log of the firm’s total assets. Winsorized at the 1st and 99th percentiles.	Thomson Financial Datastream
Leverage ratio	Short-term debt and current portion of long-term debt divided by total assets. Winsorized at the 1st and 99th percentiles.	Thomson Financial Datastream
Return on assets	Calculated as the firm’s net income divided by total assets. Winsorized at the 1st and 99th percentiles.	Thomson Financial Datastream
Free cash flow	Free cash flow divided by sales. Winsorized at the 1st and 99th percentiles.	Thomson Financial Datastream
Board size	The number of directors on the board.	BoardEx
Directors’ time in role	The average tenure of the directors on the board.	BoardEx
GDP per capita	Natural logarithm of the gross domestic product per capita.	World Bank
Investor protection	This indicator is the average of the extent of disclosure index (transparency of transactions), the extent of director liability index (liability for self-dealing), and the ease of shareholder suit index (shareholders’ ability to sue officers and directors for misconduct).	World Economic Forum

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Jan C. Hennig is an Assistant Professor at the Department of Accounting at the University of Groningen. His work has been published in the *European Accounting Review* and the *Controlling & Management Review*. His main interests are international corporate governance, corporate strategy, and corporate control.

Jana Oehmichen is a Full Professor of Organization, Human Resources, and Management Studies at the University of Mainz. Her work has been published in journals such as the *Strategic Management Journal*, *Global Strategy Journal*, and the *Journal of Management Studies*. Her research is focused on international corporate governance, corporate incentive structures, and digital strategy & leadership.

Philip J. Steinberg is an Assistant Professor at the Department of Innovation Management and Strategy at the University of Groningen. His work has been published in journals such as *Research Policy*, the *Journal of International Management*, the *Journal of Economic Psychology* and the *Journal of Business Research*. His research interests lie at the intersections of innovation management, international management, and corporate strategy.

Judith Heigermoser is a strategy consultant. She has a doctoral degree in management from the University of Goettingen. Her major research areas are ownership structures, corporate strategy, and international corporate governance.