

Steuer, Sebastian

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Sebastian Steuer

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Leibniz Institute for Financial Research SAFE
Sustainable Architecture for Finance in Europe

info@safe-frankfurt.de | www.safe-frankfurt.de

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Common Ownership and the (Non-)Transparency of Institutional Shareholdings: An EU-US Comparison

*Sebastian Steuer**

Abstract: This paper compares the extent of common ownership in the US and the EU stock markets, with a particular focus on differences in the applicable ownership transparency requirements. Most empirical research on common ownership to date has focused on US issuers, largely relying on ownership data obtained from institutional investors' 13F filings. This type of data is generally not available for EU issuers. Absent 13F filings, researchers have to use ownership records sourced from mutual funds' periodic reports and blockholder disclosures. Constructing a "reduced dataset" that seeks to capture only ownership information available for both EU and US issuers, I demonstrate that the "extra" ownership information introduced by 13F filings is substantial. However, even when taking differences in the transparency situation into due account, common ownership among listed EU firms is much less pronounced than among listed US firms by any measure. This is true even if the analysis is limited to non-controlled firms.

JEL classification: G23, G34, G38, K22, L10, L41

Keywords: common ownership, profit weights, ownership disclosure, 13F filings, index funds, passive investors, institutional investors, Big Three

* Leibniz Institute for Financial Research SAFE (LIF SAFE), Frankfurt am Main, Germany, steuer@safe-frankfurt.de. This paper builds on a chapter of my doctoral thesis, which was accepted by the Law Department at Goethe University in June 2022. It has greatly benefited from the support of Tobias Tröger, Alex Morell and LIF SAFE as well as comments on earlier drafts from Vlad Druta, Alperen Gözlügöl, Alex Platt and Martin Schmalz.

A. Introduction

The term “common ownership” refers to the observation that more and more publicly traded stocks are being held by highly diversified institutional investors, in particular index fund managers such as BlackRock, Vanguard and State Street (the “Big Three”). A growing number of contributions in law, economics and finance is investigating the implications of common ownership for corporate governance and the broader economy. Some commentators are concerned that the rise of passive investing exacerbates the classical agency conflict between firm management and owners due to the weak monitoring incentives of index fund managers.¹ Others hope that highly diversified owners might push portfolio companies to address climate change and other externalities because these problems threaten the value of the portfolio as a whole in the long run.² Perhaps most controversially, a strand of the literature in industrial organization suggests that common ownership might have anticompetitive effects on product markets, leading to higher prices for consumers.³ The empirical literature investigating the socially desirable and undesirable effects of common ownership has exploded in recent years.⁴ Some legal scholars have advanced far-reaching policy proposals such as stripping the voting rights of passive asset managers⁵ or limiting the maximum size of diversified investors’ portfolio holdings.⁶

¹ See e.g. Lucian A. Bebchuk, Alma Cohen and Scott Hirst, *The Agency Problems of Institutional Investors*, 31 J. Econ. Persp. 89 (2017) (arguing that institutional investors, and in particular index fund managers, have weak incentives to engage in the corporate governance of their portfolio companies); Davidson Heath, Daniele Macciocchi, Roni Michaely and Matthew C Ringgenberg, *Do Index Funds Monitor?*, 35 Rev. Fin. Stud. 91 (2022) (studying differences in voting behavior between active and passive mutual funds).

² See e.g. Madison Condon, *Externalities and the Common Owner*, 95 Wash. L. Rev. 1 (2020) (analyzing the incentives of common owners to internalize within-portfolio externalities); Jeffrey N. Gordon, *Systematic Stewardship*, ECGI Law Working Paper No 566/2021 (2021), <https://papers.ssrn.com/abstract=3782814> (accessed 17 February 2021) (arguing that the stewardship activities of indexed investors should be primarily focused on reducing systematic risk); José Azar, Miguel Duro, Igor Kadach and Gaizka Ormazabal, *The Big Three and corporate carbon emissions around the world*, 142 J. Fin. Econ. 674 (2021) (finding a negative relationship between Big Three holdings and portfolio companies’ carbon emissions).

³ See e.g. José Azar, Martin C. Schmalz and Isabel Tecu, *Anticompetitive Effects of Common Ownership*, 73 J. Fin. 1513 (2018) (studying the relationship between ownership structures and ticket prices in the US airline industry); Miguel Antón, Florian Ederer, Mireia Giné and Martin C. Schmalz, *Common Ownership, Competition, and Top Management Incentives*, ECGI Finance Working Paper No 511/2017 (2021), <http://www.ssrn.com/abstract=2802332> (accessed 22 April 2020) (developing a model of competition under common ownership with explicit consideration of the agency relationship between management and owners); Einer Elhauge, *How Horizontal Shareholding Harms Our Economy - And Why Antitrust Law Can Fix It*, Harv. Bus. L. Rev. 2020, 209 (discussing remedies under US and EU antitrust law); Martin C. Schmalz, *Recent Studies on Common Ownership, Firm Behavior, and Market Outcomes*, 66 Antitrust Bulletin 12 (2021) (reviewing the more recent empirical literature).

⁴ See e.g. Simi Kedia, Shivaram Rajgopal and Xing (Alex) Zhou, *Large shareholders and credit ratings*, 124 J. Fin. Econ. 632 (2017) (investigating the impact of rating agency ownership on rating outcomes); Jihwon Park, Jalal Sani, Nemit Shroff and Hal White, *Disclosure incentives when competing firms have common ownership*, 67 J. Acc. Econ. 387 (2019) (studying the relationship between ownership structure and firms’ disclosure behavior); Xin Dai and Yue Qiu, *Common Ownership and Corporate Social Responsibility*, 10 Rev. Corp. Fin. Stud. 551 (2021) (studying the impact of common ownership on corporate social responsibility).

⁵ Dorothy S. Lund, *The Case Against Passive Shareholder Voting*, 43 J. Corp. L. 493, 523–535 (2018).

⁶ Eric A. Posner, Fiona M. Scott Morton and E. Glen Weyl, *A Proposal to Limit the Anticompetitive Power of Institutional Investors*, Antitrust L.J. 2016, 669.

At the same time, many questions remain as to how much common ownership there actually is in the first place and how exactly it can be measured based on the available data sources. This is true even for the US, where the discussions around common ownership initially started.⁷ The problem is not only that many studies documenting common ownership structures are quite limited in scope, zooming in only on individual industries⁸ or the S&P 500 companies.⁹ A more fundamental issue is that many contributions have relied only on a particular subset of data on institutional holdings, not the entirety of ownership data that can be obtained from the available primary sources.¹⁰

Still, much less is known about common ownership among listed firms in the EU, as broad empirical analyses with a non-US focus remain particularly scarce.¹¹ Naturally, absent a good understanding of the factual institutional ownership structures among EU companies, it is difficult to evaluate whether and to what extent far-reaching reform proposals put forward by US scholars might also be relevant to EU policy discussions. In 2020, the Joint Research Center (JRC) of the European Commission furnished a comprehensive report documenting common ownership among listed companies active in the EU.¹² However, because most of the report's analysis pooled listed EU firms with listed non-EU firms that had at least one EU subsidiary,¹³ it remains unclear how common ownership levels among EU firms compare to those among US firms. More importantly, most existing studies covering EU issuers – including the JRC report – have simply relied on secondary database sources such as *Orbis* or *FactSet* while

⁷ Amir Amel-Zadeh, Fiona Kasperk and Martin Schmalz, *Mavericks, Universal, and Common Owners - The Largest Shareholders of U.S. Public Firms*, unpublished manuscript (2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4059513, 1.

⁸ See e.g. Azar et al., *supra* note 3 (airlines); Matthew Backus, Christopher Conlon and Michael Sinkinson, *Common Ownership and Competition in the Ready-to-Eat Cereal Industry*, NBER Working Paper No 28350 (2021), <https://www.nber.org/papers/w28350> (accessed 18 January 2021) (breakfast cereals).

⁹ See e.g. Matthew Backus, Christopher Conlon and Michael Sinkinson, *Common Ownership in America: 1980–2017*, 13 AEJ:Micro 273 (2021) (assessing common ownership among S&P 500 companies).

¹⁰ Amel-Zadeh et al., *supra* note 7 at 1 (raising concerns about the ignorance of non-institutional blockholdings in studies that rely solely on data obtained from 13F filings).

¹¹ See e.g. German Monopolies Commission, *Common ownership*, Excerpt from Chapter II of the XXII. Biennial Report ("Competition 2018"), https://www.monopolkommission.de/images/HG22/Main_Report_XXII_Common_Ownership.pdf (accessed 6 June 2022) (focusing on selected asset managers and their holdings in selected companies in selected industries); Simona Frazzani et al., *Barriers to Competition through Common Ownership by Institutional Investors*, Study requested by the European Parliament's ECON Committee (2020), PE 652.708 (focusing on very large European banks and considering only holdings of at least 1%, arguing that below such a threshold owners cannot exercise influence, at 28); Alexandra J. Gibbon and Jan Philip Schain, *Rising Markups, Common Ownership, and Technological Capacities*, DICE Discussion Paper No 340 (2021), <https://papers.ssrn.com/abstract=3622912> (accessed 5 November 2020) (focusing on the manufacturing sector).

¹² Nicoletta Rosati et al., *Common Shareholding in Europe*, JRC Technical Report (2020), EUR 30312 EN.

¹³ *Id.* at 40.

paying relatively little attention to the primary sources where the ownership data for listed EU companies actually come from.¹⁴

By far the most important and often also the only primary source of ownership data is mandatory disclosures by the investors themselves. Database providers may compile holdings from relevant filings and make them available in a more convenient format; but they, too, largely depend on mandatory filings as their primary source. While some institutional investors – for example, Norway’s sovereign wealth fund (NBIM)¹⁵ – voluntarily disclose their portfolio holdings to the public, such voluntary efforts are by far the exception, not the rule. Therefore, what market participants, researchers and the broader public may know about the ownership structures of listed companies crucially depends on the applicable disclosure frameworks. As a corollary, ownership statistics should always be interpreted with an eye on the regulatory transparency mechanisms that generate the data. This is particularly important when comparing statistics for different jurisdictions, simply because the underlying transparency mechanisms may vary dramatically.

The objective of this paper is to understand the similarities and differences in the ownership data situation for EU and US issuers and to explore how they affect different measures of common ownership. To do so, I combine a comparative legal discussion of the relevant disclosure rules with a quantitative analysis of the ownership structures of several hundred large and medium-sized US and EU issuers.

My review of ownership-related reporting mechanisms shows that there are generally three important types of mandatory disclosure via which institutional shareholdings may become transparent. First, mutual funds are often required to disclose their entire securities portfolio on a regular basis, regardless of the geographical location of the issuers in whose securities the fund has invested. Aggregating these data over all funds managed by a particular manager provides a meaningful lower-bound estimate of that manager’s holding. This type of data is available for both EU and US issuers, based on the very same primary sources. Second, blockholder disclosure laws generally require the disclosure of all holdings above a certain percentage threshold, including holdings of institutional investors. Notwithstanding some nuances of

¹⁴ See *id.* at 38-39 (justifying use of the *Orbis* database by reference to various studies that assessed coverage and data quality; however, none of the cited studies addressed the specific issue of ownership data for listed companies) and at 239-272 (extensively explaining the structure of *Orbis* but not discussing the primary sources of ownership data); German Monopolies Commission, *supra* note 11 (reporting ownership figures from *Orbis* without further discussion); Jan Fichtner and Eelke M. Heemskerk, *The New Permanent Universal Owners: Index funds, patient capital, and the distinction between feeble and forceful stewardship*, 49 *Economy and Society* 493, 501 (2020) (reporting Big Three ownership data from *Orbis* and acknowledging limitations that stem from “large differences across countries in ownership disclosure requirements,” but not discussing what these differences are in detail and how they do or do not affect measurement outcomes); Azar et al., *supra* note 2 at 678 (relying on *FactSet* data and hinting that data for non-US companies come from other primary sources than those for US companies, but not discussing how divergent data sources might affect the empirical analysis); Schmalz, *supra* note 3 at 38 (highlighting the problem of data scarcity as an obstacle to research, in particular outside the US).

¹⁵ NBIM, Investments, <https://www.nbim.no/en/the-fund/investments/#/> (accessed 15 June 2021).

the applicable legal frameworks, this type of data is generally available for both EU and US issuers. In the US, the lowest reporting threshold is 5%, while in the EU it is 5% or 3% depending on the Member State. The third type of institutional ownership information is data from 13F filings. Under section 13(f) of the Securities Exchange Act, almost all institutional investors have to disclose almost all of their equity holdings among US issuers on a quarterly basis. There is no direct or functional equivalent to 13F filings in the EU. At a conceptual level, the primary ownership data situation for EU and US issuers is thus markedly different: Institutional holdings that are neither holdings of mutual funds nor cross blockholder thresholds are transparent for US issuers, but fly largely under the radar for EU issuers.

In the empirical part of the paper, I compare various measures of institutional and common ownership among the constituents of the Russell 1000 (US) and the Stoxx Europe 600 (excluding Swiss and UK issuers), relying on ownership information from *FactSet*, a database frequently used in empirical research on institutional investors. To account for the different transparency conditions, I not only analyze the “full dataset” which includes all holdings that the database is aware of, but also construct a “reduced dataset” which includes only sum-of-funds holdings and other holdings above 5%. The rationale behind doing so is that this reduced dataset captures only institutional ownership information that is generally available for both EU and US issuers. The purpose of this exercise is twofold.

First, by comparing statistics computed from the full and reduced datasets I can approximately quantify how much “extra” information on institutional shareholdings the 13F data adds for the US issuers. In other words, I can evaluate to what degree the transparency differences identified in the theoretical part of the paper matter for the practical study of ownership structures. Unsurprisingly, the coverage of the full dataset is greater than that of the reduced dataset: For the median Russell 1000 issuer, the full dataset explains about 30 percentage points more of the outstanding common stock, the vast share of which is due to additional data on institutional holdings below the 5% mark. Consistent with the lack of a 13F-type data source, the coverage difference between the full and reduced EU dataset is much smaller for the EU sample (about six percentage points for the median issuer). However, depending on the application, these coverage differences do not always translate to similarly dramatic differences in metrics computed from the data. For example, switching from the reduced to the full dataset impacts the distribution of common ownership profit weights – the workhorse measure in the recent industrial organization literature – only slightly. In the right tail of the distribution, this impact is mostly negative (i.e. among some firm pairs there is *less* common ownership in the full than in the reduced dataset, because the full dataset may also include additional non-common holdings).

Second, the reduced dataset allows for a comparison of US and EU ownership structures that is somewhat more robust to concerns about differences in the underlying transparency mechanisms than comparisons based on the full dataset. My analysis shows that even in the reduced dataset, common ownership among EU listed firms is substantially lower than among US firms

according to virtually every measure. For example, the median ownership stake of the Big Three is only 6.1% in the EU sample compared to 19.6% in the US sample. A similar picture emerges when looking at the holdings of all diversified investors based on a continuous cosine-based diversification measure, and profit weight measures of firm-pairwise common ownership. These differences are not entirely driven by the well-known differences in ownership concentration between Anglo-Saxon and continental European markets; they remain substantial even if the analysis is limited to issuers without a controlling shareholder. For example, the *upper* quartile profit weight among non-controlled EU firms (0.36) still falls short of the *lower* quartile profit weight among non-controlled US firms (0.44). The sum of all index fund holdings – a measure solely based on fund-level ownership data, where primary sources are the same for US and EU issuers – amounts to 8.0% in the median non-controlled EU issuer, compared to 20.2% in the US sample.

The remainder of the paper is structured as follows: Section B discusses the legal frameworks of ownership transparency in the EU and the US; Section C describes the reduced dataset approach in more detail and presents the results of my empirical analysis; and Section D concludes and briefly comments on the policy implications of my findings.

B. The Primary Sources of Ownership Data

This section briefly outlines the most important disclosure mechanisms in EU and US law that generate data which can be leveraged for the analysis of ownership structures. It is useful to distinguish between three different primary sources of ownership data here. The first category – mutual fund holdings data – is available for both US and EU issuers and is a “shared” data source: The data for US and EU issuers come from exactly the same filings (*infra* I). The second category – threshold-based blockholder disclosures – is generally available for both US and EU issuers, although based on different legal provisions with some differences in the details (*infra* II). The third category – institutional investors’ 13F filings – is only available for US issuers (*infra* III). The lack of an analogous filing under EU law marks an important conceptual difference in ownership transparency (*infra* IV). This difference matters mostly where institutional holdings are not also disclosed under at least one of the two other transparency mechanisms (*infra* V, with an illustration based on a hypothetical example).

I. Mutual Fund Holdings

In many jurisdictions, mutual funds are required to disclose their entire securities holdings on a regular basis. For example, under the EU Directive on Undertakings for the Collective Investment in Securities (UCITS),¹⁶ mutual funds have to provide a full list of their securities portfolio as part of their annual and semi-annual reports, including the precise amount of any stock in listed companies.¹⁷ Regulations under the Investment Company Act in the US require mutual

¹⁶ Art. 68 of Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (2009 OJ L 302, 32) (UCITS Directive), last amended by Directive (EU) 2019/2162 (2019 OJ L 328, 29).

¹⁷ UCITS Directive, art. 69(3)-(4), Annex I Schedule B Section IV(a).

funds to disclose their portfolios on a quarterly basis.¹⁸ Index-tracking exchange-traded funds (ETFs) often disclose their portfolio holdings even on a daily basis,¹⁹ although in the EU such daily disclosure is not technically mandated by law.²⁰ Under US investment law, certain regulatory exemptions for ETFs hinge on daily portfolio disclosure.²¹

While not all jurisdictions need to require mutual funds to disclose their portfolios, these ownership data are theoretically available exactly to the same extent for US, EU and other issuers. This is because the mutual funds' portfolio disclosure requirements are not limited to a fund's holdings in issuers of the jurisdiction in which the fund is established and managed. Where mutual funds invest internationally, portfolio disclosure requirements in one jurisdiction therefore create substantial information externalities for stakeholders in other jurisdictions.

Conceptually, the portfolio transparency of mutual funds serves as an investor protection device. Practically, however, it is also one of the main sources of institutional ownership data for non-US issuers. To get an estimate of the overall ownership stake of a particular asset manager in a particular company, one can simply count together the publicly disclosed fund-level holdings over all funds run by all of the subsidiaries of that asset manager. While easy to outline in theory, this "sum of funds" approach is of course quite challenging to implement in practice: For a complete ownership inventory, thousands of reports from different countries, at different reporting dates, in different formats, and in different languages have to be parsed. As of today, sum-of-funds data are not freely or conveniently available to the broader public. Professional databases, however, offer market participants and researchers access to such data.

Notably, a disclosure requirement similar to the portfolio disclosures of mutual funds applies to private US pension plans under the Employee Retirement Income Security Act (ERISA), which are obliged to disclose their holdings as part of their annual report on Form 5500.²² In practice, however, these disclosures do not contribute to the understanding of listed firms' ownership structures to the same extent. First, plan assets are often invested in mutual funds or collective investment trusts. In these cases, the disclosures usually only report the shares in these

¹⁸ See the "schedule of investments in securities of unaffiliated issuers" under Regulation S-X, 17 C.F.R. 210.12-12. This schedule has to be disclosed by investment companies as part of their Form N-CSR for the second and fourth quarters (17 C.F.R. § 249.331; CSR here stands for Certified Shareholder Report, not Corporate Social Responsibility), and as part of their portfolio reporting on Form N-PORT for the first and third quarters (17 C.F.R. § 274.150). Form N-PORT was introduced relatively recently through a major reform of mutual fund reporting; prior to that, first- and third-quarter portfolio holdings were reported on Form N-Q; for details see SEC, Investment Company Reporting Modernization (Final rule), Release Nos 33-10234, 34-79095, IC-32314 (2016), 81 F.R. 81870, 81875, 81906.

¹⁹ See Martin Lettau and Ananth Madhavan, *Exchange-Traded Funds 101 for Economists*, 32 J. Econ. Persp. 135, 140 (2018).

²⁰ See ESMA, Guidelines on ETFs and other UCITS issues, ESMA/2014/937 EN, section VII.

²¹ 17 C.F.R. § 270.6c-11(b)-(c)(1)(i).

²² 29 U.S.C. § 1023(b)(3)(C); 29 C.F.R. §§ 2520.103-10(b)(1), 2520.103-11 (Form 5500 Schedule H Line 4i); Alexander I. Platt, *Beyond "Market Transparency": Investor Disclosure and Corporate Governance*, unpublished manuscript (2021) (Stan. L. Rev. forthcoming), <https://papers.ssrn.com/abstract=3906360> (accessed 13 October 2021), 17. The reports are available to the public at <https://www.efast.dol.gov/5500Search/> (accessed 16 June 2022).

collective vehicles. Second, even where the reports include holdings in individual issuers, these holdings tend to be very small and are not always included in the common databases.

II. Blockholder Disclosures

Both US and EU securities law requires the public disclosure of any investor's holding in a listed company once that holding crosses a certain percentage threshold.

In the US, any natural or legal person becoming the beneficial owner of at least 5% of a US issuer's equity is obliged to file a beneficial ownership report on Schedule 13D within 10 days of the acquisition.²³ Schedule 13D has to be updated upon every material increase or decrease in the percentage holding, including any change of one percentage point or more.²⁴ Institutional investors may file an abbreviated report (Schedule 13G) with different deadlines, provided that the acquisition occurred in the ordinary course of their business and the purpose of the acquisition is not to influence the control of the issuer.²⁵ In most cases, Schedule 13G requires only one annual update.²⁶ Under a recent SEC proposal however, updates would be required within five days of the end of every month in which a material change occurred.²⁷

In the EU, blockholder disclosures are governed by Member States' implementation of the Transparency Directive at the national level.²⁸ A disclosure is due when an investor's voting rights in an issuer exceed or fall below certain thresholds.²⁹ The Directive sets the relevant thresholds at 5%, 10%, 15%, 20%, 25%, 30%, 50% and 75%.³⁰ Member States may, however, introduce additional thresholds, including below the 5% mark.³¹ The most rigorous implementation can be found in Ireland, where thresholds are set at 3% and every 1% thereafter up to 100%.³² Germany, Italy, the Netherlands and Spain have introduced an additional lower threshold at 3%.³³ Most other Member States do not require notifications below the 5% threshold, although some have set several additional thresholds between 30% and 100%.³⁴

²³ 15 U.S.C. § 78m(d); 17 C.F.R. § 240.13d-1(a), § 240.13d-101.

²⁴ 17 C.F.R. § 240.13d-2.

²⁵ 15 U.S.C. § 78m(g); 17 C.F.R. § 240.13d-1(b)-(g), § 240.13d-102; for a discussion of the non-trivial implications of this requirement for the stewardship activities of large institutional investors *see e.g.* John D. Morley, *Too Big to Be Activist*, 92 Southern Cal. L. Rev. 1407, 1423–1430 (2018).

²⁶ 17 C.F.R. § 240.13d-2(b).

²⁷ SEC, Modernization of Beneficial Ownership Reporting (Proposed rule), Release Nos. 33-11030; 34-94211 (2022), 87 F.R. 13846, 13848.

²⁸ Directive 2004/109/EC of the European Parliament and of the Council of 15 December 2004 on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market and amending Directive 2001/34/EC (2004 OJ L 390, 38), last amended by Regulation (EU) 2021/337 (2021 OJ L 68, 1).

²⁹ Transparency Directive, art. 9, 12.

³⁰ Transparency Directive, art. 9(1)[1].

³¹ Transparency Directive, art. 3(1a)[4].

³² For an overview of the reporting thresholds in all Member States, *see* ESMA, Practical Guide on notifications of major holdings under the Transparency Directive (2019), ESMA31-67-635, 80.

³³ *Id.*

³⁴ *Id.*

In both the EU and the US, attribution rules aim to ensure that the threshold is evaluated at the consolidated level (i.e. holdings of subsidiaries are attributed to their ultimate parents).³⁵ Moreover, attribution rules usually require a consolidation of holdings from different business lines. For example, an asset manager will have to consolidate holdings from their (or their subsidiaries') mutual funds business with holdings from individual portfolio management services executed for institutional clients. The practical relevance of the latter consolidation should not be underestimated. For some large asset managers, including BlackRock, the institutional business accounts for a substantial share of the assets under management.³⁶ As a result, BlackRock's consolidated holdings reported under the Transparency Directive are often noticeably higher than the sum of holdings of the funds managed by all of its subsidiaries.³⁷

III. 13F Transparency

In the US, section 13(f) of the Securities Exchange Act sets out an additional transparency framework which is specifically designed to shed light on the holdings of institutional investors more broadly.³⁸ Under section 13(f), "institutional investment managers" have to report all their holdings in "13(f) securities" to the SEC on a quarterly basis. The provision was adopted in 1975 following discussions about the growing influence of institutional investors within the US stock market.³⁹ Its main purpose then was simply to provide the public with better information about institutional investors' securities holdings.⁴⁰ Today, Form 13F essentially takes the form of a simple machine-readable table, which the SEC subsequently makes available to the public in the EDGAR database.⁴¹

Every quarter, the SEC publishes a binding list of all of the securities that qualify as 13(f) securities.⁴² Among other things, the 13(f) securities include all equity securities registered for trading at US exchanges under the Securities Exchange Act.⁴³ Shares of European and other – from the perspective of the US – foreign companies only qualify as 13(f) securities where

³⁵ Transparency Directive, art. 10; 17 C.F.R. § 240.13d-3.

³⁶ See BlackRock, 2020 Annual Report, <https://www.blackrock.com/corporate/literature/annual-report/blackrock-2020-annual-report.pdf> (accessed 15 June 2022), Form 10-K at 43 (reporting USD 1.9bn equity assets under management in *iShares* ETFs and USD 2.0bn indexed equity assets under management in the institutional segment).

³⁷ See also *infra* C.I and C.III.

³⁸ 15 U.S.C. § 78m(f).

³⁹ See Office of the Inspector General (OIG), Review of the SEC's Section 13(f) Reporting Requirements, Report No. 480 (2010), 1 (citing Report of Senate Comm. on Banking, Housing and Urban Affairs, S. Rep. No. 94-75 at 78 (1975), reprinted in 1975 U.S.C.C.A.N. 179, 261);

⁴⁰ See SEC, Filing and Reporting Requirements Relating to Institutional Investment Managers, Exchange Act Release No. 14852 (1978), 43 F.R. 26700, 26701 (conjecturing that the data to be reported under section 13(f) would "facilitate consideration of the influence and impact of institutional investment managers on the securities markets and the public policy implications of that influence").

⁴¹ 15 U.S.C. § 78m(f)(4) sent. 3.

⁴² 15 U.S.C. § 78m(f)(4); available at <https://www.sec.gov/divisions/investment/13flists.htm> (accessed 16 June 2022).

⁴³ 17 C.F.R. § 240.13f-1(c). The term "equity securities" is defined broadly to include not only stock, but also "similar securities," securities convertible into stock, and certain derivatives, 15 U.S.C. § 78c(a)(11).

those companies have listed their stock at a US exchange. Unlike the portfolio disclosures of US mutual funds, which require the disclosure of global portfolio holdings, section 13(f) does therefore not create substantial information externalities for the rest of the world. Where section 13(f) applies, only limited exemptions are available to investors to avoid disclosure. First, an investor may choose to exclude very small holdings from the report if a holding comprises fewer than 10,000 shares with an aggregate market value lower than USD 200,000.⁴⁴ Second, in accordance with the trade secrets exemption under the Freedom of Information Act, an investment manager may apply for confidential treatment of the reported information on a case-by-case basis.⁴⁵ The holdings are then reported to the SEC, but not disclosed to the public.

The term “institutional investment manager” is defined broadly as “any person, other than a natural person, investing in or buying and selling securities for its own account, and any person exercising investment discretion with respect to the account of any other person.”⁴⁶ To justify federal jurisdiction, section 13(f) further requires that the institutional investment manager “uses the mails, or any means or instrumentality of interstate commerce in the course of its business.”⁴⁷ There is no blanket exception for university endowments or other non-profit organizations.⁴⁸ However, to be subject to the reporting requirements, a manager’s total investments in 13(f) securities must exceed a *de minimis* threshold. Since the adoption of the provision in 1975, this threshold has always been USD 100 million.⁴⁹ For group structures and other cases of beneficial ownership, the regulations do not set out a sophisticated rule-based attribution regime, but rely on the high-level principles of investment discretion and control.⁵⁰

Provided that the general jurisdictional requirement is fulfilled, section 13(f) also applies to foreign investment managers, even where they manage their investments outside the US and for foreign accounts.⁵¹ When adopting the first rules under section 13(f), the SEC reasoned that for institutional investments to have an impact on the securities markets, the nature or location of the investor was largely irrelevant so long as the investor had a sufficiently large sum invested in the US stock market.⁵² Whether the jurisdictional requirement amounts to a meaningful constraint on the extraterritorial application of section 13(f) is not entirely clear.

⁴⁴ Instruction 10 to Form 13F (17 C.F.R. § 240.13f-1(a)(1); § 249.325 – Form 13F). The blank form is available at <https://www.sec.gov/fast-answers/answers-form13fhtm.html> (accessed 16 June 2022).

⁴⁵ See 15 U.S.C. § 78m(f)(4); 5 U.S.C. § 552(b)(4); 17 C.F.R. § 240.24b-2.

⁴⁶ 15 U.S.C. § 78m(f)(6).

⁴⁷ 15 U.S.C. § 78m(f)(1).

⁴⁸ Thomas P. Lemke and Gerald T. Lins, *Disclosure of Equity Holdings by Institutional Investment Managers: An Analysis of Section 13(f) of the Securities Exchange Act of 1934*, 43 Bus. Law. 93, 102–103 (1987).

⁴⁹ 15 U.S.C. § 78m(f)(1); 17 C.F.R. § 240.13f-1(c).

⁵⁰ 17 C.F.R. § 240.13f-1(b); 15 U.S.C. § 78c(a)(35).

⁵¹ *Id.*; SEC, Frequently Asked Questions about Form 13F as of 24 February 2020, <https://www.sec.gov/divisions/investment/13faq.htm> (accessed 15 June 2022), Question 4.

⁵² SEC, *supra* note 40 at 26703-04.

In other contexts, the threshold for the use of a “means or instrumentality of interstate commerce” by foreign nationals is relatively low, mainly because the internet can also be a channel of interstate commerce.⁵³ For example, courts have deemed it sufficient if a foreign entity made electronic filings with the SEC via the EDGAR portal.⁵⁴ In a case concerning the Foreign Corrupt Practices Act, the SEC even argued that the mere sending or receiving of e-mails which are routed through the US may suffice to establish US jurisdiction.⁵⁵

Today, 13F filings are broadly believed to form the core pillar of listed firms’ ownership transparency in the US.⁵⁶ As of 31 December 2018, more than 5,000 investment managers exceeding the reporting threshold filed 13F forms, reporting holdings with an aggregate market value of more than USD 25 trillion.⁵⁷ These filings also bring to light those institutional holdings that are not held by mutual funds and which fall below the 5% reporting thresholds for blockholder disclosures.⁵⁸ In the summer of 2020, the great practical importance of 13F transparency was vividly illustrated by the overwhelmingly negative reactions to an SEC rulemaking proposal that would have raised the 13F reporting threshold to USD 3.5 billion and would thus have reduced the reporting population to about 500 investors.⁵⁹ The SEC argued that due to inflation and growth in market capitalization, an increasing number of smaller managers were subject to the reporting requirements, for whom the regulatory burden was excessively high.⁶⁰ Apparently even to the SEC’s surprise,⁶¹ the vast majority of stakeholders, including not only researchers but also issuers and institutional investors themselves, heavily criticized the proposal for its chilling effect on ownership transparency.⁶² Some commentators noted that, if anything, the Commission should shorten the 45-day reporting deadline to provide for more

⁵³ See *e.g.* *United States v. Konn*, 634 F. App’x 818 (2d Cir. 2015) („there can be no question that the Internet is a channel and instrumentality of interstate commerce”).

⁵⁴ See *e.g.* *SEC v. Straub*, No. 11 Civ 9645 (RJS) (S.D.N.Y. 2016), at 14 (collecting cases).

⁵⁵ *Id.* at 13.

⁵⁶ For a policy-oriented discussion of the reporting framework see Platt, *supra* note 22.

⁵⁷ SEC, Reporting Threshold for Institutional Investment Managers, Exchange Act Release No. 34-89290 (31 July 2020) (“13F Reform Proposal”), 85 F.R. 46016, 46020-46021.

⁵⁸ See *infra* C.II.

⁵⁹ *Id.* at 46032 and *passim*.

⁶⁰ *Id.* at 46021.

⁶¹ See Benjamin Bain and Robert Schmidt, Hedge Funds’ Shot at Keeping Stock Investments Secret Fades, BLOOMBERG (27 October 2020), <https://www.bloomberg.com/news/articles/2020-10-27/hedge-funds-shot-at-stock-secrecy-fades-as-sec-shelves-revamp?sref=nPhh5shT> (accessed 15 June 2022).

⁶² Hundreds of comments were submitted to the SEC, available at <https://www.sec.gov/comments/s7-08-20/s70820.htm>; see *e.g.* Ralph S.J. Koijen and Motohiro Yogo, Comment Letter to 13F Reform Proposal signed by 406 research economists, <https://www.sec.gov/comments/s7-08-20/s70820-222300.pdf> (accessed 15 June 2022) (“13(f) filings are widely used in academic research and have been essential to study questions related to market liquidity and transparency, the crowdedness of trades, the impact of global capital flows on US financial markets, and the measurement of systemic risks, among many other applications. These studies have been highly valuable to market participants and regulators”).

timely disclosures.⁶³ In a revised proposal, the SEC limited itself to changes of a more technical nature.⁶⁴

While 13F filings are frequently used in both academic research and market practice, it should not be overlooked that ownership data derived from these filings also come with some problems. An important issue here is that the very same holding may be accounted for twice by different filers. In a world where complex group and fund structures are the rule and not the exception, double reporting can occur easily, for example when several advisers or managers share control over the same securities,⁶⁵ or where one 13F filer lends securities to another.⁶⁶ For external observers, it is often far from clear when and where exactly the double counting occurs, and if and how it can be resolved. Another obstacle to the reliability of 13F data is the lack of meaningful supervision and enforcement. In 2010, the SEC was publicly criticized for failing to monitor the completeness and accuracy of the ownership information disclosed under section 13(f).⁶⁷ In response to this criticism, the SEC added a somewhat cynical disclaimer at the top of Form 13F, advising readers they “should not assume that the information is accurate and complete.”⁶⁸ The results of a recent study suggest that some hedge funds strategically use restatements as an “alternative” to confidential treatment requests in an effort to conceal sensitive positions.⁶⁹ Absent clear guidance, filers may also interpret the high-level attribution principles and the jurisdictional requirement differently, resulting in additional discrepancies, double-counts or non-counts.⁷⁰

⁶³ See e.g. Adam O. Emmerich, David M. Silk and Sabastian V. Niles, *Going Dark: SEC Proposes Amendments to Form 13F*, Harvard Law School Forum on Corporate Governance (19 July 2020), <https://corpgov.law.harvard.edu/2020/07/19/going-dark-sec-proposes-amendments-to-form-13f/> (accessed 15 June 2022).

⁶⁴ SEC, *Electronic Submission of Applications for Orders Under the Advisers Act and the Investment Company Act, Confidential Treatment Requests for Filings on Form 13F, and Form ADV-NR; Amendments to Form 13F*, Release Nos. 34-93518, IA-5903, IC-34415 (2021), 86 F.R. 64839, 64841 (“The Commission is not re-proposing the amendments to raise the reporting thresholds for Form 13F [...]”).

⁶⁵ See SEC, *Memorandum Re Share Ownership and Holding Period Patterns in 13F data* (24 November 2009), <https://www.sec.gov/files/s71009-576.pdf> (accessed 15 June 2022).

⁶⁶ See Matthew Backus, Christopher Conlon and Michael Sinkinson, *The Common Ownership Hypothesis: Theory and Evidence*, Economic Studies at Brookings (2019), https://www.brookings.edu/wp-content/uploads/2019/02/ES_20190205_Common-Ownership.pdf (accessed 15 June 2022, 10).

⁶⁷ See OIG, *supra* note 39 at 9-13.

⁶⁸ See also Anne M. Anderson and Paul Brockman, *Form 13F (Mis)Filings*, unpublished manuscript (2016), <https://papers.ssrn.com/abstract=2809128> (accessed 5 March 2021), 4–5 (observing that since the OIG report there has been “no evidence of significant improvements in the accuracy or usefulness of Form 13F filings”). Based on a sample of 13F filings, the authors also provide evidence of a frequent irregularity, where the securities prices implied by the number of shares and their total value as reported are inconsistent with actual closing prices, *id.* at 14-17.

⁶⁹ Sean Cao, Zhi Da, Daniel Jiang and Baozhong Yang, *The Strategic Use of 13F Restatements by Hedge Funds*, unpublished manuscript (2021), <https://papers.ssrn.com/abstract=3907560> (accessed 4 October 2021) (finding that restated holdings are not randomly distributed, but associated with positions that generated significant abnormal returns).

⁷⁰ See Barbara Novick, *“The Goldilocks Dilemma”: A Response to Lucian Bebchuk and Scott Hirst*, 120 Colum. L. Rev. Forum 80, 83 (2020).

IV. No Equivalent to 13F Data in the EU

At the EU level, there is no direct equivalent to section 13(f). Moreover, the Transparency Directive effectively prohibits Member States from introducing more stringent ownership reporting requirements than those contemplated by the Directive.⁷¹ As I will briefly outline below, there are also hardly any other public disclosure requirements that could serve as a substitute for 13F filings by generating at least some additional ownership data that could be leveraged for the analysis of listed firms' ownership structures. As a result, institutional holdings in EU issuers that are not covered by mutual fund disclosures and stay below reporting thresholds usually remain undisclosed.

Private funds which are not marketed to the broader public often face much laxer portfolio disclosure requirements than mutual funds. For example, the EU framework for Alternative Investment Funds (AIFs), including hedge funds, only requires that the fund manager makes an annual report available to its investors, not to the general public.⁷² Moreover, unlike in the case of mutual funds, there is no requirement in supranational law that this annual report has to detail the entire securities portfolio on an instrument-by-instrument basis.⁷³ Even the more stringent reporting obligations vis-à-vis competent authorities only require AIFs to list the five most important instruments in which they trade.⁷⁴ Also in the US, the portfolio transparency requirements under the Investment Company Act are generally not applicable to private funds.⁷⁵

Where institutional investors are required to disclose financial reports, their securities holdings are usually only reported on an aggregated basis.⁷⁶ The International Financial Reporting Standards (IFRS), for example, do not require an extensive breakdown of equity securities, but emphasize the need to strike a balance between detail and materiality.⁷⁷ Reporting vis-à-

⁷¹ Transparency Directive, art. 3(1a)[4].

⁷² Art. 22 of Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010 (2011 OJ L 174, 1) (AIFM Directive), last amended by Directive (EU) 2019/2034 (2019 OJ L 314, 64); *see also* Dirk Zetzsche, David Eckner and Miko Yeboah-Smith, *Investor Information and Reporting*, in: Dirk Zetzsche (ed.), *The Alternative Fund Managers Directive* (Wolters Kluwer 3rd ed. 2020), 397, 401. Depending on the legal form of an AIF, public disclosure of the annual report might still be required under the applicable Member State laws.

⁷³ *See* AIFM Directive, art 22(2)-(3) Directive 2011/61/EU; art. 104 of Commission Delegated Regulation (EU) No 231/2013 of 19 December 2012 supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision (2013 OJ L 83, 1) (AIFM Level 2 Regulation), last amended by Commission Delegated Regulation (EU) 2018/1618 (2018 OJ L 271, 1).

⁷⁴ *See* AIFM Directive, art. 24(1); AIFM Level 2 Regulation, art. 110 and Annex IV (Third Table, Row 11).

⁷⁵ Private funds are usually exempt from registration as an investment company under 15 U.S.C. § 80a-3(c)(1) and (7). The substitute filing required by the regulations under the Dodd-Frank Act, Form PF, is not disclosed to the public, *see* CFTC/SEC, Adopting Release Form PF, Release No. IA-3308 (2011), 76 FR 71127, 71155-56.

⁷⁶ *See e.g.* art. 6 (Assets Item C.III.1) of Council Directive 91/674/EEC of 19 December 1991 on the annual accounts and consolidated accounts of insurance undertakings (1991 OJ L 374, 7), last amended by Directive 2006/46/EC (2006 OJ L 224, 1).

⁷⁷ *Cf.* IFRS 7.6 and IFRS 7.B3.

vis supervisory authorities may go further in some cases. European insurance companies, for example, must periodically report their entire securities portfolio to their supervisors.⁷⁸ However, these supervisory reports are confidential and thus remain undisclosed to the public.

Many institutional securities holdings are also reported to the Eurosystem to supply the data underpinning the Securities Holdings Statistics (SHS). The complex details of the reporting system are spelled out in the SHS Regulation.⁷⁹ In simplified terms, euro area financial institutions subject to EU regulatory law report their holdings to their national central banks, and data on other holdings are reported by custodians. The SHS are collected every quarter on an ISIN-by-ISIN basis. National central banks aggregate the data and forward them to the ECB. However, the ECB only makes a tiny fraction of these data available to the public, at very high levels of aggregation.⁸⁰ Among other things, the publicly available time series are restricted to the holdings of investors resident in the euro area (and aggregated across all countries), and securities are aggregated by type (debt securities, quoted shares, and mutual fund shares) and country.

In theory, ownership dynamics might also be inferred to some extent from trading data available to brokers and exchange operators. Public post-trade transparency, however, is limited to information on price and volume.⁸¹ Meanwhile, the clients on whose behalf a trade was executed are only identified in brokers' confidential reports to the market supervisor.⁸² Some institutional investors feed their trading data into specialized private databases, for purposes such as transaction cost analysis and optimization.⁸³ While these data can be useful with respect to research questions specifically related to the trading process, they are not commonly used as an additional source of ownership information.⁸⁴

In the past, even EU issuers often faced difficulty in identifying their shareholders. To remedy this problem, the revised Shareholder Rights Directive (SRD II) of 2017 requires that Member States give listed companies the right to obtain information about their shareholders from

⁷⁸ See art. 6(1) lit. e, 23(1) lit. e (Forms S.06.02.01 and S.06.02.04) of Commission Implementing Regulation (EU) 2015/2450 (2015 OJ L 347, 1) (Solvency II Reporting ITS), last amended by Commission Implementing Regulation (EU) 2020/657 (2020 OJ L 155, 1).

⁷⁹ Regulation (EU) 1011/2012 of the European Central Bank of 17 October 2012 concerning statistics on holdings of securities (ECB/2012/24) (2012 OJ L 305, 6) (SHS Regulation), last amended by Regulation 2018/318 (ECB/2018/7) (2018 OJ L 62, 4). For a non-technical overview, see ECB, Economic Bulletin 2/2015, 72.

⁸⁰ Retrievable via the ECB's Statistical Data Warehouse, <https://sdw.ecb.europa.eu/browse.do?node=9691130> (accessed 15 June 2022).

⁸¹ See art. 6, 20 of Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 (2014 OJ L 173, 84) (MiFIR), last amended by Regulation (EU) 2021/23 (2021 OJ L 22, 1).

⁸² MiFIR, art. 26(3).

⁸³ For a discussion of the ANcerno/Abel Noser database and its use in empirical research see Gang Hu, Koren M. Jo, Yi Alex Wang and Jing Xie, *Institutional trading and Abel Noser data*, 52 J. Corp. Fin. 143 (2018).

⁸⁴ See e.g. Nickolay Gantchev and Chotibhak Jotikasthira, *Institutional Trading and Hedge Fund Activism*, 64 Management Science 2930, 2933 (2018) (studying the relationship between institutional trading activity and hedge fund activism while relying on ownership information from a conventional archival dataset).

intermediaries, namely the custodians for the relevant securities.⁸⁵ The information to be furnished by intermediaries includes, among other things, identity and contact information for each individual shareholder known to the intermediary and the amount of shares held by that shareholder.⁸⁶ Member States can limit the identification requirement to larger shareholdings and introduce a percentage threshold of up to 0.5% in terms of shares or voting rights,⁸⁷ although only a few Member States, including Italy and the Netherlands, have done so.⁸⁸ However, the SRD II shareholder identification system is primarily designed as an information tool for issuers with bearer shares to facilitate shareholder engagement,⁸⁹ not as a mandatory disclosure mechanism for institutional holdings. A shareholder listed in the custodian's record need not beneficially own the shares and need not have the ultimate authority to exercise the voting rights associated with them. There are also no rules for the aggregation of holders that are part of the same corporate group. The Directive neither requires nor encourages issuers to disclose the information gained through the identification process to third parties or the public. Even for issuers themselves, using the identification framework is optional.⁹⁰ As of today, it should therefore not be expected that the shareholder identification framework will significantly change the ownership (non-)transparency landscape in Europe.

V. Synthesis and Illustration

The previous subsections have provided an overview of the transparency requirements from which ownership data on EU and US issuers can be sourced. Table 1 illustrates the chief similarities and differences by way of a simple example.⁹¹ The first three columns show a set of hypothetical investors and their "actual" holdings; the holdings of asset managers may consist of mutual fund holdings and other holdings. The last two columns indicate to what extent these holdings would be transparent if the issuer in question was an EU or US issuer.

[Table 1 about here]

⁸⁵ Art. 3a(1) of Directive 2007/36/EC of the European Parliament and of the Council of 11 July 2007 on the exercise of certain rights of shareholders in listed companies (2007 OJ L 184, 17) (SRD), last amended by Directive (EU) 2017/828 (2017 OJ L 132, 1) (SRD II).

⁸⁶ Art. 3(2) and Annex Table 2 Panel C of Commission Implementing Regulation (EU) 2018/1212 of 3 September 2018 laying down minimum requirements implementing the provisions of Directive 2007/36/EC of the European Parliament and of the Council as regards shareholder identification, the transmission of information and the facilitation of the exercise of shareholders rights (2018 OJ L 223, 1).

⁸⁷ SRD, art. 3a(1).

⁸⁸ See ESMA, National thresholds for shareholder identification under the revised SRD (2020), ESMA32-380-143.

⁸⁹ SRD II, recital 4.

⁹⁰ In Germany, however, under a recent controversial amendment of the tax laws, issuers will be obliged, from 2025 onwards, to exercise their identification rights to assist in the enforcement of dividend withholding taxes, see section 45b(9) of the Income Tax Act (*Einkommensteuergesetz*).

⁹¹ The purpose of this stylized case study is solely to exemplify the conceptual differences and similarities that the previous subsections have outlined and which I will further explore and exploit in the next section. In practice, the same holding might well be reported at least slightly differently for US and EU issuers due to subtle differences in attribution rules and different frequencies and deadlines of the relevant disclosures. The example also assumes that all mutual fund holdings are disclosed under the laws of the jurisdictions in which the funds are established, and that these holdings are aggregated correctly and consistently by a researcher or information intermediary.

The transparency of the holdings of non-asset managers (first four rows) is easy to grasp: The founder's holding would be transparent regardless of whether it concerns an EU or US issuer thanks to the respective blockholder disclosure requirements. The hedge fund's holding would be transparent in the US thanks to the 13F transparency; in the EU, transparency depends on whether the Member State has lowered the reporting threshold to 3%. The holdings of individual retail investors are not transparent in either jurisdiction.

The 5.4% holding of asset manager 1 becomes transparent in the US via section 13(d) or 13(g) and via Form 13F, in the EU via the Transparency Directive. Besides the total holding, the mere sum of funds would *also* be transparent. Asset manager 2 has no non-mutual fund business. Therefore, its total holdings reported in the US under section 13(f) would equate to the sum of holdings reported at the fund level. The transparency outcome would be no different in the case of an EU issuer, but the figure of 4.3% could only be obtained via sum-of-funds data unless the respective Member States has introduced a lower threshold. Asset manager 3 has a moderate holding (0.5%) via mutual funds which would be transparent in any case. The additional holding of 2.3% (which might be due to portfolio management services for individual clients or the management of non-mutual funds) would count towards the holding being disclosed under section 13(f), but it would remain non-transparent in the EU. Unlike in the case of asset manager 1, the holding of asset manager 3 does not cross the blockholder reporting threshold even in those Member States that have lowered it to 3%. Importantly, in the absence of any other disclosures, databases will generally (and quite sensibly) report the sum of funds also as the *total* holding of asset manager 3. Without knowledge about the *actual* ownership structures, it is difficult to tell from such a database entry whether the total holding is just that (as in the case of asset manager 2) or if it should be expected to be higher (as in the case of asset manager 3).

C. Comparing US and EU ownership structures

Section B outlined the main similarities and differences in the transparency of listed firms' ownership structures in the EU and the US. In this section, I compute and compare various ownership statistics for a set of US and EU issuers and explore to what degree any differences might be driven by differences in data availability. Starting from ownership records obtained from the popular *FactSet* database (infra I), I construct a "reduced dataset" that seeks to capture only holdings that are generally transparent for both EU and US issuers (infra II). I then use this dataset to compare ownership concentration (III), the holdings of the Big Three, index funds and diversified investors more generally (IV), and common ownership profit weights (V). Throughout the section, metrics computed from the "reduced dataset" are contrasted with the same metrics computed from the "full dataset," which includes all ownership information available in *FactSet* but might be less suitable for comparisons between EU and US issuers due to the differences in the applicable transparency regimes.

I. Database

Despite the frequent reliance on databases in ownership-related research, there is no guarantee that such databases *correctly* reflect *all* ownership information that is theoretically publicly available. Besides simple omissions and parsing errors, problems can especially occur when different filings of different scope and/or as of different dates are available. As a result, information on individual positions need not always be consistent with public filings, with information reported in other databases, or – in case of aggregation issues – even the same database. When the ownership structures of many firms are described at a high level, such errors and inconsistencies often have no substantial impact on measurement outcomes. Information on the holdings of individual owners or the ownership structures of individual companies, however, may well be distorted due to missing or incorrect values, or database-specific aggregation problems. A working knowledge of the underlying regulatory transparency mechanisms can often help to identify and remedy such problems.

There are several database options among which prospective ownership data analysts can choose. Recent empirical studies investigating the role of institutional investors on a global scale have most frequently relied on the *FactSet* database,⁹² whereas research with a focus on European firms, including the JRC report on common ownership, has often relied on the *Orbis* database or its sibling, the *Amadeus* database.⁹³ Although used less frequently in academic research, *Refinitiv Eikon*, *S&P Capital IQ* and *Bloomberg* also offer access to ownership data for both EU and US issuers.

For the empirical analysis in this section, I opted for *FactSet* as the main data source. While *Orbis* and *Amadeus* provide unparalleled access to the ownership structures of private companies and subsidiaries (where the data can often be obtained from public registrars), *FactSet* offers several advantages when it comes to the ownership data of listed companies. In fact, the majority of ownership data for European issuers in *Orbis* and *Amadeus* are themselves sourced from *FactSet*. Unlike in *Orbis* and *Amadeus*, ownership information in *FactSet* is also available for small holdings below 0.1%. Moreover, and importantly for my purposes, ownership data in *FactSet* are also available at different aggregation levels. First, *FactSet* reports ownership at the fund level, showing the holdings of individual mutual funds sourced from

⁹² See e.g. Miguel A. Ferreira and Pedro Matos, *The colors of investors' money: The role of institutional investors around the world*, 88 J. Fin. Econ. 499, 502–504 (2008); Reena Aggarwal, Isil Erel, Miguel Ferreira and Pedro Matos, *Does governance travel around the world? Evidence from institutional investors*, 100 J. Fin. Econ. 154, 159 (2011); Jan Bena, Miguel A. Ferreira, Pedro Matos and Pedro Pires, *Are foreign investors locusts? The long-term effects of foreign institutional ownership*, 126 J. Fin. Econ. 122, 128 (2017); Alexander Dyck, Karl V. Lins, Lukas Roth and Hannes F. Wagner, *Do institutional investors drive corporate social responsibility? International evidence*, 131 J. Fin. Econ. 693, 696 (2019); Adriana De la Cruz, Alejandra Medina and Yun Tang, *Owners of the World's Listed Companies*, OECD Capital Market Series (2019), <https://www.oecd.org/corporate/ca/Owners-of-the-Worlds-Listed-Companies.pdf> (accessed 15 June 2022), 34; Azar et al., *supra* note 2 at 678; Emirhan İlhan, Philipp Krueger, Zacharias Sautner and Laura T. Starks, *Climate Risk Disclosure and Institutional Investors*, ECGI Finance Working Paper No 661/2020 (2021), <https://papers.ssrn.com/abstract=3437178> (accessed 1 December 2020), 19–20.

⁹³ See e.g. Mara Faccio and Larry H. P. Lang, *The ultimate ownership of Western European corporations*, 65 J. Fin. Econ. 365, 3606–3607 (2002); Gibbon, Schain, *supra* note 11 at 8–9; Rosati et al., *supra* note 12 at 38–39, 239–272; Fichtner, Heemskerck, *supra* note 14 at 501.

mutual fund filings. Second, ownership is reported at the non-consolidated entity level, showing the holdings attributable to individual legal entities and natural persons. For institutional holdings in US issuers, these data are mostly sourced from 13F filings; for EU issuers, they are mostly computed as sum-of-funds holdings. Third, for each fund and non-consolidated entity holding, *FactSet* identifies an “ultimate parent,” allowing the group-wide consolidation of ownership data where institutional investors have different subsidiaries.⁹⁴

One noteworthy problem of the *FactSet* database is that it tends to underreport the holdings of BlackRock among large EU issuers. The holdings of the group’s ultimate parent (*BlackRock, Inc.*) are computed as the sum of all of the group’s entity-level holdings (e.g. *BlackRock Fund Advisors* and *BlackRock Advisors (UK) Ltd.*). For EU issuers, *FactSet* computes these entity-level holdings as the sum-of-funds holdings of the individual entities. As discussed in the previous section, however, *BlackRock, Inc.*’s blockholder disclosures under the Transparency Directive may also include information about non-mutual fund holdings. This additional ownership information about the BlackRock group’s holdings is most often not reflected in the *FactSet* data for EU issuers. Researchers interested in these holdings or the total “Big Three” holdings among EU issuers therefore have to exercise caution when relying on *FactSet* data. For the analysis below, I manually collect an additional data series on BlackRock holdings at the ultimate parent level, relying on *Bloomberg* (where this particular problem does not occur), annual reports and, for German issuers, BaFin’s informal voting rights database.⁹⁵

Beyond BlackRock’s non-US holdings, the impact of this type of aggregation problem appears to be limited. No other asset manager with a substantial non-mutual fund business crosses the lowest reporting threshold (3% or 5% depending on the Member State) as frequently as BlackRock.⁹⁶ Moreover, for other relevant investors, *FactSet* often correctly recognizes the EU blockholder disclosure information already at the entity level (e.g. in the case of *Allianz Global Investors GmbH*). For US issuers, BlackRock holdings at the non-consolidated entity level come from 13F filings, which already capture the additional holdings from non-mutual fund businesses.

II. Full and reduced datasets

For the empirical analysis in this section, I obtained fund-level and non-consolidated entity-level records from *FactSet* as of 31 December 2020 for all issuers that were part of the Russell 1000 and Stoxx Europe 600 indices. I exclude issuers with multi-class equity structures and issuers for which coverage in *FactSet* does not exceed 15% of the common stock outstanding

⁹⁴ For the avoidance of doubt, an entity can also be its own ultimate parent (i.e. data consolidated at the ultimate parent level include the holdings of all investors from the non-consolidated level, not only holdings of those investors where consolidation is necessary).

⁹⁵ Available at <https://portal.mvp.bafin.de/database/AnteileInfo/> (bulk export as of 31 December 2020).

⁹⁶ See also *infra* C.IV with Table 3 Panel 1: Vanguard’s holdings are almost entirely explained by mutual fund holdings. State Street also has a sizable non-mutual fund business, but its holdings among EU issuers are not nearly as high as BlackRock’s.

(CSO). From the Stoxx Europe 600 population, I also exclude Swiss and UK issuers.⁹⁷ This leaves me with a sample of 874 US issuers (“US sample”) and 335 EU issuers (“EU sample”). While the Russell 1000 has more constituents and includes mega-cap stocks such as Apple, Amazon and Tesla, the samples are roughly comparable in terms of median market capitalization (EUR 10.5bn for the US issuers, and EUR 9.7bn for the EU issuers).

To construct what I will below refer to as the “full dataset,” I aggregate the non-consolidated entity-level records to the level of each entity’s ultimate parent. This dataset combines all ownership data available in *FactSet* and reflects holdings at the level of *Black Rock, Inc.*, the *Government of Germany* and *Jeff Bezos* among others. To address the consolidation problem described above, I overwrite the holdings of *BlackRock, Inc.* among EU issuers where holdings in my manually collected data series are higher. At the risk of repetition, it is important to appreciate that the “full dataset” is not “complete” in the sense that it captures all “actual” holdings, and that the “full data” for EU and US issuers are not readily comparable, because US data might include information about institutional holdings from 13F filings which are unavailable for EU issuers.

Evidently, the counterfactual of what the ownership data for EU issuers would look like under a transparency framework akin to that of the US is unobservable. However, based on the available data, it is possible to construct a “reduced dataset” that, at least approximately, includes only such information which can be expected to be transparent regardless of whether the issuer in question is a US or an EU issuer. This reduced dataset sacrifices some of the factually available ownership information in return for better comparability across jurisdictions. At the same time, this approach promises some insight into how much additional primary sources – namely information from 13F filings for US issuers – actually matter.

My approach to constructing the reduced dataset is as follows: As a first step, I build a dataset that is made up entirely of sum-of-funds holdings. I compute this dataset from the fund-level ownership information alone, relying on the information of a fund’s (or rather, its advisor’s) ultimate parent that *FactSet* supplies for each individual fund holding. Again, at the risk of repetition, but central to my analysis, these fund-level ownership data for EU and US issuers should be more comparable than the (consolidated or non-consolidated) entity-level records, because after all they come from the very same primary sources. As a second step, I construct a blockholder dataset. To do so, I filter from the full dataset all holdings that are larger than 5%. These holdings can be expected to be transparent for EU issuers due to blockholder disclosures under the Transparency Directive, and for US issuers due to 13F filings and/or blockholder disclosures on Schedules 13D or 13G. As a third step, I merge the sum-of-funds holdings dataset and the blockholder dataset into the final reduced dataset.

[Table 2 about here]

⁹⁷ Since most relevant EU legislation applies in the entire European Economic Area (EEA), I do not exclude Norwegian issuers; technically, all references to the EU sample, EU issuers, etc. should therefore be read as references to the EU/EEA sample, EU/EEA issuers, etc.

Table 2 reports, separately for EU and US issuers, how the datasets and sub-datasets so constructed differ in coverage. For the median US issuer, the full dataset explains more than 30 percentage points more of the equity ownership (in terms of common stock outstanding) than the reduced dataset. This difference is overwhelmingly attributable to the additional data on the holdings of institutional investors. The total number of investors with at least one holding is about eight times higher in the full dataset. This large difference is not only due to holdings of additional institutions that are not already included in the reduced dataset, but also due to natural persons who have disclosed insider stakes. However, the holdings of these additional non-institutional investors contribute not nearly as much to the coverage in terms of %CSO as the additional information on institutional holdings.⁹⁸ Holdings below the 5% threshold that belong to investors which *FactSet* labels as “individual” amount to only 0.71% in the median issuer.⁹⁹

For the EU issuers, the coverage of the full dataset also goes beyond the reduced dataset; however, the difference in terms of %CSO is only about six percentage points for the median issuer. An important driver behind this difference is the fact that the full dataset includes a number of holdings between 3% and 5% in issuers from those Member States that have set the lowest reporting threshold to 3%. If the reduced dataset is constructed based on a 3% threshold for the blockholder sub-dataset, the coverage difference shrinks to 2.7 percentage points. In addition, the full dataset includes some ownership data from other primary sources, such as disclosures of insider stakes in annual reports, voluntary disclosures or, in the case of issuers who are also listed on a US exchange, 13F filings. Regardless of these additional data sources, the coverage difference between the full and the reduced datasets remains much smaller for the EU issuers than for the US issuers, consistent with the differences in the underlying transparency regimes.

Taken together, these observations show that researchers need to be wary when analyzing ownership statistics for US and EU issuers or interpreting such statistics furnished by others. The differences in the underlying transparency mechanisms result in considerable coverage differences that impede the comparability of the data. Datasets obtained from common databases likely understate the extent of institutional ownership among EU issuers due to the lack of 13F filings. How much these differences affect empirical outcomes is difficult to say in the abstract though. As the forthcoming results will show, this can well depend on the application.

III. Ownership concentration

It is a well-established observation in the law and finance literature that large blockholdings, including controlling stakes, are more common among listed firms in continental Europe than among US firms.¹⁰⁰ Panel 1 of Figure 1 confirms that this is also true for the firm populations

⁹⁸ See also Amel-Zadeh et al., *supra* note 7 at Appendix Figure A.2 (parsing data from US insider disclosures and reporting low aggregate ownership fractions relative to 13F filers).

⁹⁹ This value has been computed based on the non-consolidated entity-level dataset, since *FactSet* only supplies holder type information at the entity level (see also the notes below Table 2).

¹⁰⁰ See e.g. Gur Aminadav and Elias Papaioannou, *Corporate Control around the World*, 75 J. Fin. 1191 (2020).

analyzed here (based on the reduced dataset). For 39% (50%) of the issuers in the EU sample, the largest holding exceeds 25% (20%) of the common stock outstanding, compared to only 6% (8%) in the US sample. Notably, this observation “flips” at lower thresholds. In 96% (100%) of the issuers in the US sample, the largest shareholder holds a stake of more than 8% (6%), compared to 78% (90%) in the EU sample.

[Figure 1 about here]

The size of the largest holding is of course a very blunt measure of ownership concentration. For example, the ownership structure of a firm where the top five shareholders all hold about 10% is arguably more concentrated than that of a firm where one shareholder holds 11% but the next four shareholders only hold 3% each. Concentration measures that take into account information about all holdings and not only the top holding are more robust against concerns of this kind. One such concentration measure is the Investor Herfindahl Hirschman Index (IHHI).¹⁰¹ The IHHI is simply the sum of all squared holdings, i.e.

$$IHHI_f = \sum_s \beta_{fs}^2,$$

where β_{fs} is the percentage holding of shareholder s in firm f . This concentration measure can take values from 0 (all shareholders hold infinitesimally small stakes) to 10 000 (one shareholder owns the entire company). Panel 2 of Figure 1 shows for what share of issuers in the samples the IHHI exceeds certain values (with IHHIs being computed from the reduced dataset). Qualitatively, a similar picture as in Panel 1 emerges: Listed firms with highly concentrated ownership are more common in Europe (simply driven by the greater prevalence of very large holdings), but the ownership base of the least concentrated EU firms is *more dispersed* than that of the least concentrated US firms. For about one-third of each sample, IHHIs are below 270 (i.e. here the red and the blue lines in Panel 2 intersect). Within these subsamples, the median IHHI of US issuers is about 216 compared to about 128 for EU issuers. The difference of about 88 corresponds to one additional holding of about 9.38%, three additional holdings of about 5.42%, or 10 additional holdings of about 2.97%.

Because IHHIs make use of all available ownership data, they might in principle be more affected by differences between US and EU transparency frameworks than concentration comparisons solely based on the size of the largest holding. Data on additional holdings mechanically increase IHHIs; on the other hand, larger holdings contribute to IHHIs disproportionately more than smaller holdings. Accordingly, computing IHHIs from the full dataset instead of the reduced dataset results in moderate but far from spectacular differences. The median difference between IHHIs computed from the full versus reduced datasets is about 12 for the EU issuers and 46 for the US issuers. Qualitatively, all observations from Panel 2 of Figure 1 remain unchanged.

¹⁰¹ Backus et al., *supra* note 9 at 280; generally on the origin of indices of that kind Albert O. Hirschman, *The Paternity of an Index*, 54 Am. Econ. Rev. 761 (1964).

IV. Diversified Investors

Several recent debates in law, finance and industrial organization have rested on the observation that sizable fractions of listed companies' stock are owned by investors with highly diversified portfolios.¹⁰² However, there are no universally agreed-upon criteria by which investors can be bucketed into groups of "common owners" and more traditional institutional owners with moderate degrees of diversification that does not nearly amount to strict indexing. This subsection compares summary statistics of diversified investors' holdings among EU and US issuers under different classification approaches.

[Table 3 about here]

Panel 1 of Table 3 summarizes the collective holdings of the Big Three, which are frequently recognized as the prototypes of "common" or even "universal" owners. Big Three holdings among US issuers are substantially larger than among EU issuers, including when one only looks at holdings among companies without a controlling shareholder (using a 25% control threshold). In the reduced dataset, the Big Three collectively hold 19.2% of the median US issuer's common stock, compared to only 4.8% in the EU sample. The median holding among EU issuers without a controlling shareholder is slightly higher (6.1%), consistent with the frequent exclusion of non-institutional blockholdings from the (free float) market capitalization on which index weights are based. Table 3 Panel 1 illustrates again that Big Three holdings are, to a notable extent, also driven by holdings from business lines other than mutual fund management: the median holding among US issuers based on mutual fund holdings alone is 15.4%, compared to 20.9% in the full dataset. Due to the non-trivial contribution of non-mutual fund holdings, even the numbers from the reduced dataset are not perfectly comparable. For 88% (18%) of the US issuers in the sample, BlackRock's (State Street's) holding exceeds the cutoff threshold of the blockholder sub-dataset (5%), whereas in the EU sample this is only the case for 26% (1%) of the issuers. For the US issuers, the reduced dataset therefore likely captures more information about BlackRock's and State Street's non-mutual business than for the EU issuers. Yet still, even when looking only at mutual fund holdings, Big Three holdings in the US remain larger than in the EU, by more than a factor of three in the median issuer.

A similar picture emerges when one only looks at the holdings of index funds. Panel 2 of Table 3 aggregates all holdings of mutual funds whose investment style *FactSet* classifies as "Index" based on the non-consolidated fund-level dataset. Even among non-controlled companies, the equity collectively held by index funds is substantially lower in the EU than in the US (8% versus 20.2% in the median issuer). Since the ownership data underlying these figures are not based on 13F filings but mutual fund portfolio records, they are unlikely to be driven by fundamental differences in transparency levels. Further inspection shows that Big Three index funds in general account for a large share of total index fund holdings. However, this share is not constant across firms and regions. In the mean US issuer, 74% of index fund

¹⁰² See *supra* notes 1 through 4 and accompanying text.

holdings are attributable to Big Three index funds (standard deviation of 5.3%), compared to 63% in the EU sample (standard deviation of 8.9%).

Neither Big Three nor index fund holdings are an ideal measure of diversified ownership within a given firm population. The Big Three are not the only asset managers in the world, and also other institutions pursue passive or quasi-passive investment strategies on behalf of their clients. Not all index-tracking funds necessarily seek broad diversification (e.g. thematic ETFs), and even where they do, they might track different indices with varying overlap (e.g. S&P 500, Russell 1000 and MSCI World). As an alternative approach, one might label investors as diversified based on the number of their holdings in a given firm population;¹⁰³ however, such measures are also problematic because they do not take the relative size of the holdings into account.

Another approach is to measure diversification based on a continuous similarity metric that compares every investor's portfolio with a well-diversified benchmark portfolio. In that spirit, Figure 2 and Figure 3 use a cosine similarity measure to compare the structure of each investor's portfolio with a hypothetical portfolio that includes a uniform percentage holding in every constituent of the respective firm population.¹⁰⁴ Any investor's portfolio among a population of n firms can be represented as a vector in n -dimensional space, where each dimension represents one issuer, and the value in this dimension represents the investor's percentage holding in that issuer. The more similar the portfolios are, the smaller the angle is between those vectors, and hence the closer the cosine of that angle is to one. The benchmark portfolio of uniform percentage holdings¹⁰⁵ is exactly the portfolio that an index fund would hold if the index weights were computed solely based on market capitalizations without any adjustments.¹⁰⁶ Cosine values close to one are indicative of a high degree of diversification. By way of example, for a population of n firms (where n is divisible by six), a portfolio that holds 1% in one-sixth of the issuers, 3.5% in another one-sixth, and 0% in the other two-thirds would have a cosine similarity of 0.5 with the uniform benchmark portfolio; a cosine similarity of 0.8 could be achieved, for example, with a portfolio that holds 0.7% in one-third of the issuers, 1% in another one-third, and 0% in the rest.

[Figure 2 about here]

¹⁰³ See e.g. Amel-Zadeh et al., *supra* note 7 at 11 with Figure 3 (classifying as "diversified" all investors with more than one holding, and as "universal" all investors with holdings among at least 95% of the sample companies).

¹⁰⁴ A similar approach has been used by Backus et al., *supra* note 9 at 279–80, 288–90 (explaining how cosine similarity can be used to compare either the similarity of owners between two firms, or the similarity of portfolios between two investors). The approach suggested here is more simplistic: It does not require the construction of a market portfolio based on the observed holdings, but simply imputes a uniform distribution of portfolio weights.

¹⁰⁵ Only the distribution of the percentage holdings matters, not the absolute percentage of those holdings; geometrically speaking, the angle between two portfolio vectors only depends on their directions, not their absolute or relative lengths.

¹⁰⁶ Consider for example a hypothetical index including only two issuers, one with a market cap of 90 bn EUR and one with a market cap of 10 bn EUR. The market cap-based index weights are 90% and 10%. If an index fund invests 1 bn EUR in this index, it allocates 0.9 bn EUR to the large issuer and 0.1 bn EUR to the small issuer. The fund then owns 1% of the stock of both issuers, notwithstanding the large difference in size.

Figure 2 illustrates the distribution of cosine similarity and median holding size for all investors with at least one holding in the reduced and full dataset, respectively. In both jurisdictions, only relatively few investors have very broadly diversified portfolios, but some of these investors hold sizable stakes. In the full dataset, the distribution of cosine similarity is more skewed to the left than in the reduced dataset, due to the plethora of additional investors with only one or very few – often very small – holdings.¹⁰⁷ At the same time, Figure 2 shows that transparency differences do matter in the identification of investors with high cosine similarity. In the reduced dataset, four (24) investors have cosines higher than 0.8 (0.6) in the EU sample, compared to five (26) investors in the US sample. When moving to the full dataset, these numbers drop for the EU sample (three investors with cosine > 0.8, 17 with cosine > 0.6) but increase for the US sample (21 investors with cosine > 0.8, 70 with cosine > 0.6). One interesting example is State Street: Its cosine similarity in the US and EU sample is roughly similar when computed from the reduced dataset (0.74 versus 0.72), but much more different when computed from the full dataset (0.90 versus 0.56). The drop in the EU sample happens because in the full dataset a small number of holdings is substantially higher than in the reduced dataset (due to additional data from 13F filings in the case of cross-listed companies or 3%-blockholder disclosures in certain Member States). For the US companies, this information on additional holdings is available for all issuers, resulting in more uniform percentage holdings than in the reduced dataset.

[Figure 3 about here]

Figure 3 shows what stakes “diversified owners” hold on aggregate when the collective of diversified owners is defined as all investors whose cosine similarity with the uniform benchmark portfolio exceeds a certain threshold. Consistent with the previous results, holdings of diversified owners are substantially higher in the US for essentially all thresholds, including in the reduced dataset, and regardless of whether one looks at all issuers or only at non-controlled issuers. For higher cosine values, the top EU quartile is not even close to intersecting with the bottom US quartile. In other words, even in those EU companies where diversified ownership is relatively high compared to other EU companies, the collective stake of diversified owners is considerably smaller than among US issuers where diversified ownership is relatively low compared to other US companies.

V. Common ownership profit weights

The most popular measure of common ownership in the recent empirical industrial organization literature has been the so-called profit weight, often denoted by the Greek letter kappa (κ).¹⁰⁸ It quantifies the incentives of a firm f to internalize the profits realized in a distinct firm

¹⁰⁷ The lowest possible value of cosine similarity in the present application is not zero, but depends on the firm population. An investor with one single holding has a cosine similarity of 0.0338 in the US sample and 0.0546 in the EU sample.

¹⁰⁸ See e.g. the empirical analyses in Backus et al., *supra* note 9; Antón et al., *supra* note 3; Amel-Zadeh et al., *supra* note 7; Lysle Boller and Fiona Scott Morton, *Testing the Theory of Common Stock Ownership*, NBER Working Paper No 27515 (2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3649879 (accessed 15 June 2022).

g where there are overlapping ownership structures.¹⁰⁹ For example, a $\kappa_{fg} = 0.5$ means that for firm f , the profit of firm g is 0.5 times as valuable as its own profits. Importantly, profit weights are a directional measure: Firm g might have different incentives to internalize the profits of firm f than firm f has incentives to internalize the profits of firm g . Conceptually, profit weights take a different perspective than the metrics analyzed in the previous subsection: The units of analysis are not investors and their portfolio diversification, but individual firm pairs. In principle, profit weights can also be greater than one, implying that a firm would place more weight on its competitor's profit than on its own.

In the most frequently used specification, the profit weight from the perspective of firm f with respect to firm g is solely a function of the firms' ownership structures:

$$\kappa_{fg} = \frac{\sum_{vs} \beta_{fs} \beta_{gs}}{\sum_{vs} \beta_{fs}^2},$$

where β_{fs} and β_{gs} denote the holding of owner s in firms f and g , respectively. This expression can be decomposed to the product

$$\kappa_{fg} = \cos(\boldsymbol{\beta}_f, \boldsymbol{\beta}_g) \times \sqrt{\frac{IHHI_g}{IHHI_f}}.$$

The first factor is the cosine similarity of the firms' ownership vectors. This cosine similarity measure is distinct from the one in the previous subsection in two respects. First, it does not compare the structure of investors' portfolios, but rather firms' ownership structures.¹¹⁰ Second, it does not compare the ownership structure of firm f with a hypothetical (uniform) benchmark ownership structure, but rather with the actual ownership structure of firm g . The cosine similarity factor will always be the same for both firms regardless of their relative ownership concentration. However, cosine similarity will generally be lower between a non-controlled and a controlled firm than between two non-controlled firms, because the controlling stake substantially affects the direction of the controlled firm's ownership vector. The second factor is usually referred to as the "relative investor concentration." The IHHIs have the same definition as in subsection C.III. The relative concentration factor is responsible for the directionality of the kappa measure. For example, when firm g has a large non-common blockholder, but firm f does not, $IHHI_g$ will be much higher than $IHHI_f$, therefore the relative concentration factor will be high from the perspective of firm f but not from that of firm g , and thus κ_{fg} will be higher than κ_{gf} . Firm f has greater incentives to take the common owners' interests in firm g into account than firm g has incentives to take the common owners' interests in firm f into account, because in firm g , the common owners' interests also compete with the interests of the non-common blockholder.

¹⁰⁹ The following exposition is based on the theory section in Backus et al., *supra* note 9 at 277–282.

¹¹⁰ The ownership structure in a firm population can be represented as a matrix, with every column representing a firm and every row representing an investor. The cosine similarity measure in the previous subsection takes the rows of that matrix as input, while the present one takes the columns.

Profit weights are derived from a relatively simplistic model of the objective function of firms under common ownership.¹¹¹ The crucial assumption of that model is that firms do not strictly maximize their own profits, but rather a weighted average of the portfolio-wide profits of their shareholders. The merits of this “blended shareholder assumption” have become one of the key points of contention in the common ownership debate.¹¹² Whether and why one should expect firms to unilaterally orient their behavior toward their common owners’ portfolios interests is not *ex ante* obvious; such an assumption is particularly questionable from the standpoint of corporate governance, which provides a myriad of mechanisms that try to align manager incentives with the objective of firm value maximization.¹¹³

Notwithstanding these theoretical concerns, profit weights are a useful tool to quantify the horizontal entanglement of firms within a given population. Unlike many intuitive measures, such as binary measures that evaluate whether there is an investor who holds shares above a certain threshold in both companies, profit weights use all available ownership information and compress them into an interpretable metric. Computing and analyzing profit weights does not necessarily mean buying into the common ownership narrative. Rather, profit weights can also be viewed as one way – though not necessarily the only or “right” way¹¹⁴ – to track common ownership levels over time or, for the purposes of this paper, to compare them between different jurisdictions.

[Figure 4 and Table 4 about here]

Figure 4 shows the distributions of profit weights for all (directional) firm pairs based on the different datasets, while Table 4 reports the summary statistics. The difference between the US and EU samples is again striking. Even among dispersed companies, EU profit weights are substantially lower than US profit weights for the median firm pair, including in the reduced dataset (0.16 versus 0.61). Profit weights close to zero are the exception among US firm pairs, whereas they are very common among EU firm pairs. Panels 2 and 3 of Table 4 indicate that

¹¹¹ The basic modelling approach goes back to Julio Rotemberg, *Financial transaction costs and industrial performance*, MIT Sloan Working Paper No 1554–84 (1984), <https://dspace.mit.edu/bitstream/handle/1721.1/47993/financialtransac00rote.pdf>, 8; the objective function from which profit weights are derived forms also the basis of the competition model from which the Modified Herfindahl Hirschman Index (MHHI) is derived; see Daniel P. O’Brien and Steven C. Salop, *Competitive Effects of Partial Ownership: Financial Interest and Corporate Control*, Antitrust L. J. 2000, 559, Appendix C.

¹¹² For a comprehensive critique see Merritt B. Fox and Menesh S. Patel, *Common Ownership: Do Managers Really Compete Less?*, 39 Yale J. on Reg. 136 (2022); along similar lines the critique of the universal ownership narrative by Marcel Kahan and Edward B. Rock, *Systemic Stewardship with Tradeoffs*, NYU Law and Economics Research Paper No 22–01 (2022), <https://papers.ssrn.com/abstract=3974697> (accessed 25 June 2022).

¹¹³ Fox and Patel, *supra* note 112 at 167–185; in a sense, this caveat was already flagged by Rotemberg, *supra* note 112 at 33 (“[T]he model presented here assumes managers doggedly pursue shareholders’ interests. [...] The best possible contract with managers may not produce the most desired outcomes from the point of view of shareholders.”); importantly, the model of Antón et al., *supra* note 3 shows that anticompetitive effects of common ownership can also be motivated theoretically without assumptions about firms pursuing the portfolio interests of their owners.

¹¹⁴ Schmalz, *supra* note 3 at 27 (noting that “there cannot be such a thing as a single ‘right’ measure of common ownership,” while also cautioning “[t]here can be bad measures, though”).

the difference between EU and US profit weights is not only driven by differences pertaining to investor concentrations (relative IHHIs), but that firm-pairwise cosine similarities are also much lower compared to the US (i.e. the shareholder structures of two EU issuers tend to be less similar than those of two US issuers).

The very different shapes of profit weight distributions, however, should not divert attention from the fact that at least for some EU firm pairs, the profit weights reach notable absolute levels. Considerable profit weights are particularly common among large dispersed firms which are typically represented in many indices. For example, if the analysis is limited to the top quartile of the non-controlled EU firms in terms of market capitalization, the median profit weight rises to 0.34 (0.12 for the bottom quartile). Yet still, even profit weights among large dispersed EU issuers tend to be much lower than those among small dispersed US issuers; for the bottom quartile of non-controlled US issuers in terms of market capitalization, the median profit amounts to 0.52 (0.72 for the top quartile).

Interestingly, compared to most of the analyses in this section, the impact of the underlying transparency frameworks firms appears less dramatic when it comes to profit weights. Summary statistics vary only slightly between the full and the reduced datasets (Table 4). However, as Panel 2 of Figure 4 shows, profit weights for individual firm pairs may still vary between the reduced and full datasets. Consistent with the transparency mechanics, such differences occur more frequently in the US sample. Importantly, however, more ownership data only then translate to higher levels of common ownership at the firm-pair level when the additional information concerns holdings of investors with positions in both companies which are large enough to have a meaningful effect on cosine similarities and relative IHHIs. Conversely, where the additional data mostly reveal another position of meaningful size in one company but not the other, profit weights will be lower. Indeed, in the US sample the largest absolute profit weight differences between the full and reduced datasets have a negative sign (i.e. individual profit weights are more often substantially lower than substantially higher when computed from the full instead of the reduced dataset). These large negative deviations mostly occur in the right tail of the distribution (i.e. where profit weights in the reduced dataset are very high).

D. Conclusion

Researchers dealing with ownership information for publicly listed firms need to be mindful of the primary sources that generate these data. The frequent reliance on established databases should not draw attention away from the fact that ownership data do not fall from the sky, but actually come from mandatory disclosures. The scope of these disclosures may vary from jurisdiction to jurisdiction. Comparing ownership statistics for different regions therefore runs the risk of comparing apples and oranges when important differences in the relevant disclosure frameworks are not taken into account. My comparative legal review shows that one of the most important primary sources of institutional ownership data – 13F filings – is only available for US issuers and not for EU issuers; blockholder disclosures and mutual fund portfolio

records, however, are available in both cases. My quantitative analysis shows that the availability of 13F data has a substantial impact on the data coverage in one of the most frequently used ownership databases, although the impact on concrete metrics computed from these data depends on the application. Relying on a reduced dataset that trades off some coverage for better comparability, I show that substantial differences in the ownership structures of EU and US issuers remain even if one “controls” for the different transparency conditions. Ultimately, there appears to be much less common ownership among EU issuers than among US issuers.

My analysis exposes potential limitations of prior empirical studies that have relied on databases such as *FactSet* or *Orbis* to obtain ownership data for both EU and US issuers without explicitly taking into account differences in primary sources. The use of reduced datasets constructed along the lines of my approach in Section C might serve as a useful robustness check to address concerns relating to those differences. However, even such workarounds can of course not address more fundamental concerns about the reliance on ownership data from secondary sources instead of ownership data obtained directly from regulatory filings. Databases provide convenient access to large ownership datasets, but researchers also yield control about the data gathering process, including not only the collection and parsing of relevant filings, but also the aggregation methodology. If the coverage and quality of non-13F data in the database are better for US than for EU issuers, or vice versa, even metrics computed from a reduced dataset are less comparable than the construction methodology promises.

For US issuers, researchers have recently started to parse ownership data directly from 13F, 13D and 13G filings in the EDGAR system, in some cases documenting notable differences to archival datasets.¹¹⁵ In the EU, most regulatory disclosures are not (yet¹¹⁶) stored in a central database, and formats are often less standardized than in the US. Without universal access points and data structures, machine-assisted parsing of ownership data from primary sources is much more challenging (if it is possible at all), in particular with respect to sum-of-funds data which form the backbone of institutional ownership transparency outside the US. In the absence of large-scale collection efforts by data scientists or governments, databases such as *FactSet* seem to be the only viable option for analyzing EU ownership structures in their breadth and depth.

Policy-wise, the question suggests itself whether EU lawmakers should take action to improve the transparency of institutional stock ownership. An obvious option here would be to introduce a dedicated disclosure framework akin to the 13F filings in the US. A more incremental measure could be to expand the threshold-based disclosure system under the Transparency Directive (e.g. by setting the lowest reporting threshold to 1% and providing for additional thresholds at every percentage point increment thereafter). Alternatively, issuers could be

¹¹⁵ Backus et al., *supra* note 9; Amel-Zadeh et al., *supra* note 7.

¹¹⁶ See European Commission, Proposal for a Regulation of the European Parliament and of the Council establishing a European single access point providing centralised access to publicly available information of relevance to financial services, capital markets and sustainability of 25 November 2021, COM(2021) 723 final.

required to disclose their institutional ownership structure on a regular basis, based on the information obtained via the know-your-shareholder mechanism under the SRD II. Evidently, the analysis in this paper does not in itself provide a sufficient basis for a viable evaluation of these options, which would require a more careful consideration of the costs and benefits of ownership-related disclosures as well as the technical pros and cons of the individual options, in particular as they pertain to double counting problems and enforceability vis-à-vis investors from third countries.

My empirical findings in Section C also have implications for the broader discussion about the promises and perils of index investing and common ownership, and potential policy responses. The data show that the real-world phenomenon motivating these debates is much more pronounced in the US – where the debate originally started – than in the EU: Index funds, the Big Three and other diversified institutional investors tend to have much bigger holdings, and common ownership levels as measured by profit weights are higher – even when one considers only non-controlled companies, and even when one takes into account that some institutional holdings are only transparent for US issuers. Any future EU initiatives in this area should recognize these differences; not all of the drastic remedies that have been suggested by US scholars are necessarily appropriate considering the differences in the actual ownership structures. On the other hand, my findings also show that the issues around common ownership are not completely irrelevant from a European perspective: While not as high as in the US, various measures of common ownership reach meaningful levels at least among the largest issuers with no controlling shareholders.

Tables

Table 1 – Illustration of Differences in Reporting Frameworks

Investor	Actual Holding: Total	Actual Holding: Mutual Funds	Reporting: US Issuer	Reporting: EU Issuer
Founder	7.9		7.9	7.9
Hedge Fund	4.6		4.6	n.a. / 4.6
Insurance Company	1.5		1.5	n.a.
Small Retail Investor	0.0001		n.a.	n.a.
Asset Manager 1	5.4	3.4	5.4 [3.4]	5.4 [3.4]
Asset Manager 2	4.3	4.3	4.3 [4.3]	4.3 [4.3]
Asset Manager 3	2.8	0.5	2.8 [0.5]	0.5 [0.5]

Table 1 illustrates how different holdings of various investors (left-hand side) would be reported similarly or differently if the issuer in question was an EU or US issuer (right-hand side). The details are discussed in the text.

Table 2 – Coverage of Different Datasets

Median $\Sigma\%CSO$	R1000	SX600-EU
sum-of-funds dataset	48.1%	29.9%
blockholdings dataset	31.6%	32.1%
reduced dataset	59.5%	59.4%
full dataset	91.8%	65.8%
Median holding of institutional investors		
sum-of-funds dataset	48.1%	29.9%
blockholdings dataset	28.3%	7.2%
reduced dataset	56.0%	38.6%
full dataset	87.3%	41.9%
Total # investors		
sum-of-funds dataset	2118	1804
blockholdings dataset	410	342
reduced dataset	2416	2069
full dataset	20569	4691
Median # non-zero holdings		
sum-of-funds dataset	209	216
blockholdings dataset	3	2
reduced dataset	210	218
full dataset	489	228

Table 2 reports the coverage of differently constructed datasets.

Median $\Sigma\%CSO$ indicates how much of the ownership – in terms of the percentage of the common stock outstanding ($\%CSO$) – the different datasets explain for the median issuer.

Median holding of institutional investors is the median aggregate ownership of institutional investors. *FactSet* supplies holder type information at the non-consolidated level. Investors were classified as “institutional” if at least one of their subsidiaries (in the non-consolidated dataset) had one of the following holder types: "Investment Adviser," "Mutual Fund Manager," "Hedge Fund Manager," "Private Banking/Wealth Mgmt," "Mutual Fd-Open End," "Hedge Fund," "Fund of Funds Manager," "Fund of Hedge Funds Manager," "Insurance Company," "Pension Fund," "Pension Fund Manager," "Bank Investment Division," "Broker," or "Family Office."

Total # investors is the total number of investors in a dataset with a one non-zero holding in at least one issuer.

Median # non-zero holdings is the number of holdings that the dataset includes for the median issuer.

Table 3 – Big Three and Index Funds**Panel 1 – Big Three Holdings**

R1000	dataset	Mean	Std	Min	25%	50%	75%	Max
all	sum-of-funds	15.1	4.5	0.3	13	15.4	17.8	29.5
	reduced	18.9	6.1	0.3	16.3	19.2	22.2	37.3
	full	20.4	5.8	0.6	18	20.9	23.7	37.3
dispersed	sum-of-funds	15.7	3.8	0.4	13.5	15.7	18	29.5
	reduced	19.7	5.1	0.4	16.9	19.6	22.3	37.3
	full	21.2	4.7	0.6	18.7	21.2	23.8	37.3
SX600-EU								
all	sum-of-funds	5	2.2	0.4	3.6	4.7	6.3	14.6
	reduced	5.6	2.8	0.4	3.6	4.8	7.5	16.4
	full	6	2.9	0.4	3.9	5.8	7.8	18.3
dispersed	sum-of-funds	6	2.1	0.4	4.6	5.9	7	14.6
	reduced	6.8	2.8	0.4	4.7	6.1	8.5	16.4
	full	7.3	2.7	0.4	5.3	7.5	8.6	18.3

Panel 2 – Index Fund Holdings

R1000	Mean	Std	Min	25%	50%	75%	Max
all	19.2	5.8	0.3	16.5	19.9	22.4	40.9
dispersed	19.9	4.9	0.3	17	20.2	22.5	40.9
SX600-EU							
all	6.9	2.9	0.3	4.9	6.5	8.6	19.8
dispersed	8.1	2.8	0.3	6.2	8	10	19.8

Panel 1 summarizes the sum of the holdings of *BlackRock, Inc.*, *The Vanguard Group, Inc.* and *State Street Corp.* in different datasets.

Panel 2 summarizes the holdings of the collective of funds whose "holder style" attribute in *FactSet* is "index," based on the non-consolidated fund-level data.

"Dispersed" companies are those where the holding of the largest shareholder does not exceed 25%.

Table 4 – Profit Weight Summary Statistics**Panel 1 – Profit Weights (Kappas)**

R1000		Mean	Std	Min	25%	50%	75%	Max
all	reduced	0.56	0.3	0	0.36	0.57	0.76	3.36
	full	0.55	0.27	0	0.38	0.56	0.72	2.79
dispersed	reduced	0.62	0.27	0	0.44	0.61	0.79	2.17
	full	0.6	0.23	0	0.45	0.59	0.75	2.07
SX600-EU		Mean	Std	Min	25%	50%	75%	Max
all	reduced	0.15	0.25	0	0.01	0.05	0.18	8.78
	full	0.14	0.23	0	0.01	0.05	0.18	4.95
dispersed	reduced	0.26	0.27	0	0.07	0.16	0.36	3.67
	full	0.25	0.24	0	0.08	0.17	0.36	2.2

Panel 2 – Cosine Similarities

R1000		Mean	Std	Min	25%	50%	75%	Max
all	reduced	0.54	0.25	0	0.39	0.59	0.74	0.99
	full	0.53	0.23	0	0.4	0.57	0.7	0.98
dispersed	reduced	0.6	0.2	0	0.47	0.62	0.75	0.99
	full	0.59	0.18	0	0.47	0.61	0.72	0.98
SX600-EU		Mean	Std	Min	25%	50%	75%	Max
all	reduced	0.11	0.15	0	0.02	0.05	0.13	1
	full	0.11	0.15	0	0.02	0.05	0.14	1
dispersed	reduced	0.23	0.18	0	0.09	0.17	0.31	0.95
	full	0.22	0.17	0	0.1	0.18	0.31	0.9

Panel 3 – Relative IHHIs

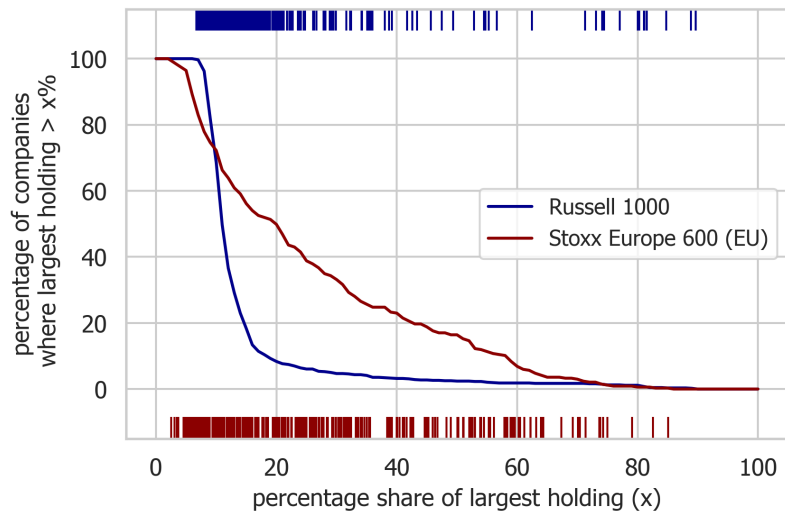
R1000		Mean	Std	Min	25%	50%	75%	Max
all	reduced	1.12	0.65	0.1	0.8	1	1.25	9.96
	full	1.1	0.58	0.11	0.82	1	1.22	9.25
dispersed	reduced	1.04	0.31	0.27	0.82	1	1.21	3.73
	full	1.03	0.27	0.29	0.84	1	1.18	3.49
SX600-EU		Mean	Std	Min	25%	50%	75%	Max
all	reduced	1.54	1.61	0.04	0.51	1	1.96	23.05
	full	1.46	1.41	0.05	0.53	1	1.88	20.32
dispersed	reduced	1.2	0.78	0.1	0.66	1	1.52	10.41
	full	1.16	0.67	0.11	0.69	1	1.46	9.23

Table 4 reports summary statistics for profit weights and their components for all (directional) firm pairs in the respective datasets.

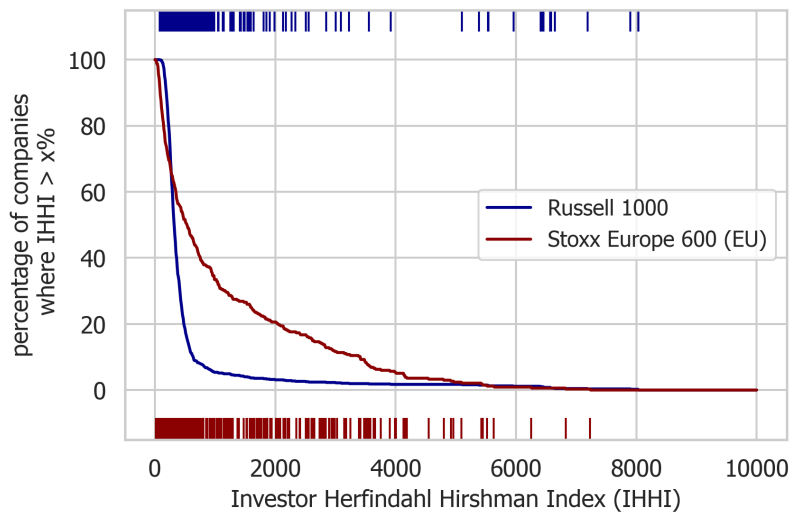
Figures

Figure 1 – Comparison of Ownership Concentration

Panel 1: Ownership concentration per size of largest holding

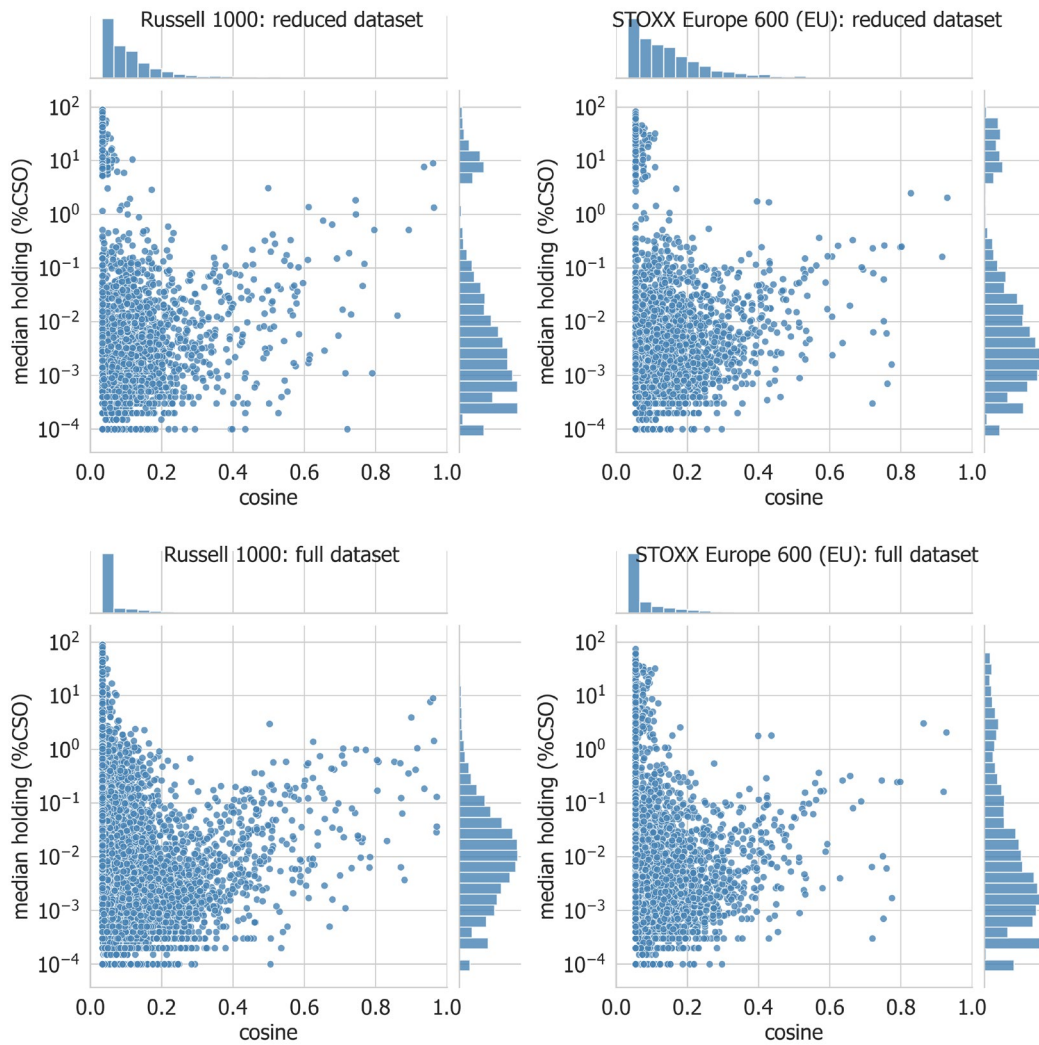


Panel 2: Ownership concentration per IHHI



The panels comprising Figure 1, computed from the reduced dataset, visualize differences in ownership concentration between large US and EU issuers by showing the percentage share of companies (vertical dimension) that cross a certain concentration threshold (horizontal dimension). Bars at the top and bottom represent the individual company-level concentration metrics.

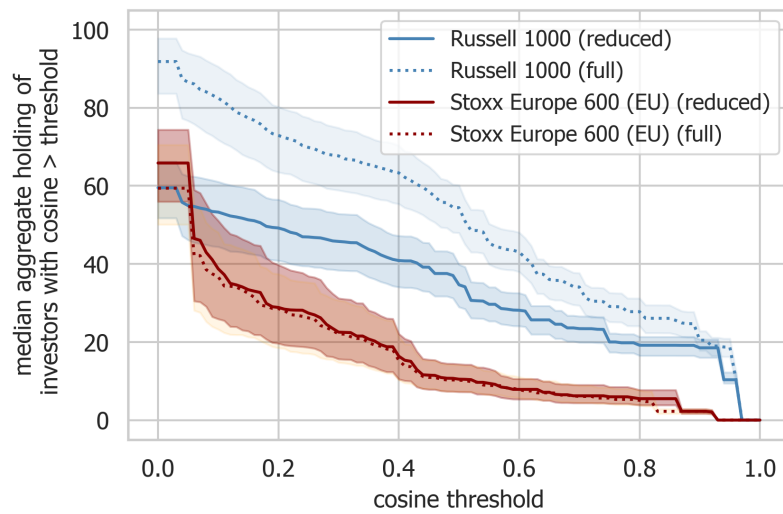
Figure 2 – Ownership Structures by Diversification and Median Holding Size



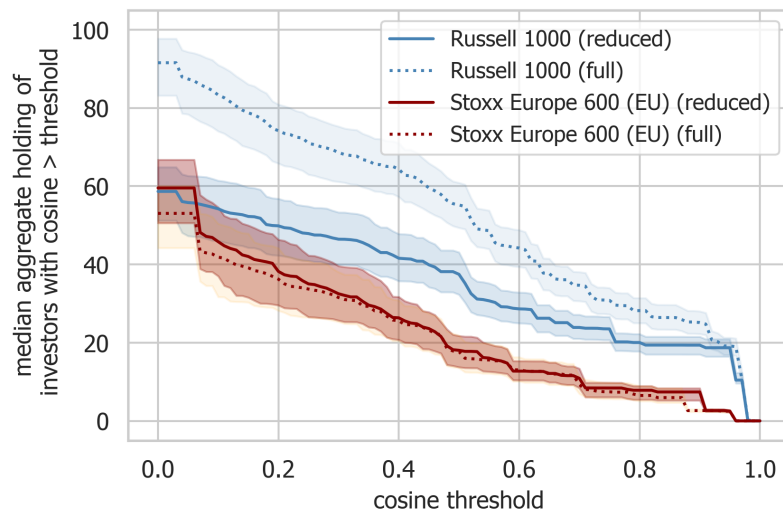
Each data point represents one investor. The horizontal dimension shows the investor's degree of diversification, quantified by the cosine similarity of this investor's holdings with a uniform distribution of holdings. The vertical dimension indicates the median percentage share owned by the investor (among the companies where the investor has a holding). Marginal histograms at the top and to the right show the one-dimensional distribution in the horizontal and vertical dimension, respectively.

Figure 3 – Diversified Ownership by Cosine Threshold

Panel 1: All issuers



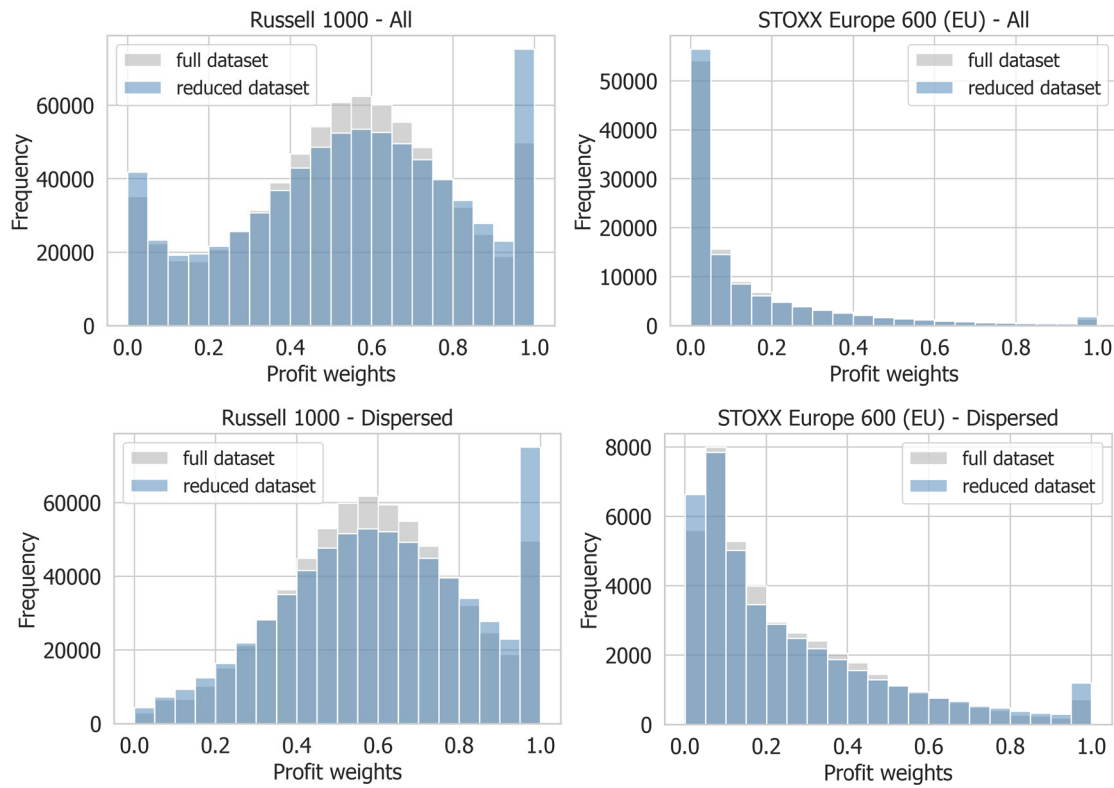
Panel 2: Excluding controlled issuers



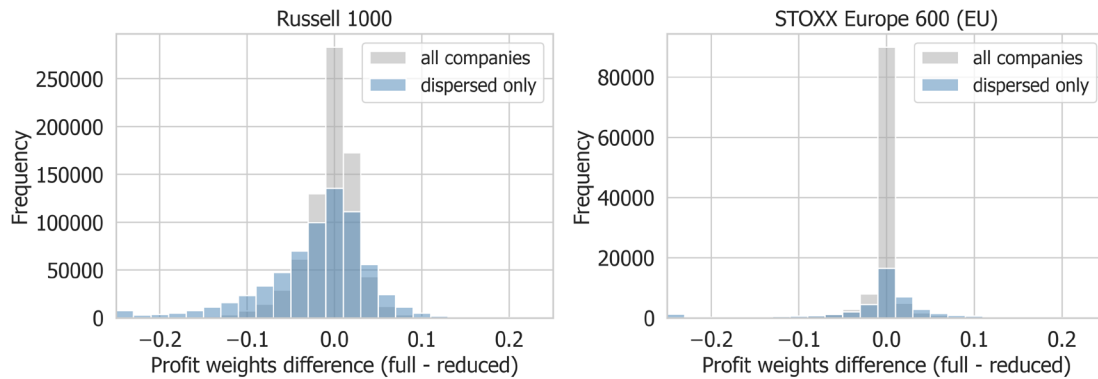
For each threshold between 0 and 1 (at intervals of 0.01), the holdings of all investors whose cosine similarity with the uniform benchmark portfolio exceed that threshold are aggregated for each issuer. The diagrams show, for each threshold, the median and interquartile range of the so-computed collective ownership stakes. Panel 2 considers only holdings among non-controlled companies; for this purpose, cosine similarities were computed based on the reduced firm population.

Figure 4 - Profit Weight Distributions

Panel 1 – Distribution of absolute profit weights



Panel 2 – Profit weight differences between full and reduced datasets



The histograms in Panel 1 show the distribution of profit weights for all (directional) firm pairs for the respective samples and datasets. Profit weights greater than one were set to one.

The histograms show the distribution of the difference in profit weights between the full and the reduced datasets. Differences smaller (greater) than -0.25 (+0.25) were set to -0.25 (+0.25).

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