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How does private firm disclosure affect demand for public firm equity? Evidence from the global equity market☆

Jinhwan Kim [a,*], Marcel Olbert [b]

[a] Stanford Graduate School of Business, USA
[b] London Business School, UK

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ABSTRACT

We investigate the relationship between private firms' disclosures and the demand for the equity of their publicly traded peers. Using data on the global movement of portfolio investments in public equity, we find that a 10% increase in private firm disclosure transparency – proxied by the number of disclosed private firms' financial statement line items – *reduces* global investors' demand for public equity by 4.3% or $358 million per investee country-industry. These findings are consistent with private firm disclosures generating negative pecuniary externalities – global investors reallocate their capital away from public firms to more transparent private firms – and less consistent with these disclosures creating positive information externalities that would benefit public firms. Consistent with this interpretation, we find that the reduction in demand for public equity is offset by a comparable increase in capital allocation to more transparent private firms. Using a simulated instruments approach and the staggered implementations of electronic business registers in investee countries in Europe as plausibly exogenous shocks to private firm transparency, we conclude that the negative relationship between private firm disclosures and public equity demand is likely causal.

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* Corresponding author.
E-mail addresses: jinhwan@stanford.edu (J. Kim), molbert@london.edu (M. Olbert).

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1. Introduction

We study the effects of private firm disclosure on the demand for public firm equity by global investors. In 2020, over 98% of the 40 million firms that disclosed detailed financial statement information worldwide were privately owned (World Bank (2020); Bureauvan Dijk (2020)). Given their economic importance, the social value (or cost) of regulating private firm disclosures is likely significant, and the extent to which to regulate these disclosures has been a central topic of debate among regulators (Minnis and Shroff (2017); Lisowsky and Minnis (2020)). Key to informing this debate is understanding the potential spillover effects of these disclosures (Leuz and Wysocki (2016)). While emerging research has made progress in investigating both the determinants and firm-level costs and benefits of private firm disclosures, relatively little is known about the spillover effects of these disclosures (Bernard (2016); Breuer (2021)).[1] We extend this literature by examining an important but underexplored spillover effect – whether and how private firm disclosures impact investor demand for equity of their publicly traded peers.

The impact of private firm disclosures on the demand for public firm equity is theoretically ambiguous. It likely depends on assumptions about whether private firm disclosures are primarily idiosyncratic – providing information specifically about private firms themselves (e.g., Bushman et al. (2004); Davila and Korinek (2016)) – or industry wide – generating information incrementally relevant for evaluating public peers in the same industry (e.g., Badertscher et al. (2013); Kim et al. (2020); Bernard et al. (2020); Barrios et al. (2021)). If private firm disclosures are primarily idiosyncratic, they will likely reduce investors' uncertainty specifically about the private firms' value and induce investors to reallocate more of their capital to private firms away from public firms, *ceteris paribus*.[2] On the other hand, if private firm disclosures are more industry wide, the reduction in uncertainty regarding the value of public firms will be greater and may increase demand for public equity. Thus, the effect of private firm disclosures on the demand for public equity will depend on which of these two forces is dominant.

To estimate variation in private firm disclosures, we develop a novel measure applicable to a broad cross-section of countries and industries using Bureau van Dijk's (BvD) Orbis database for the period 2003 to 2017. Specifically, similar in spirit to Chen et al. (2015), we use the natural logarithm of the total number of financial statement line items that private firms disclose in a given investee country-industry-year (investee-industry-year, for short). For example, in 2004 we observe private firms in Japan's manufacturing industry had a private firm disclosure value of 14.22, whereas private firms in Germany's manufacturing industry had a disclosure value of 13.01.[3] Our measure suggests that manufacturing private firms in Japan had more disclosures available for global investors than did Germany in 2004 *ceteris paribus*.

We begin by exploring the relation between private firm disclosures and future demand for public equity using data from the Global Capital Allocation Project (GCAP), which tracks the global movement of public equity across countries. Specifically, the database allows us to observe equity demand of an investor country (investor, for short) for a particular investee-industry-year. For example, we are able to track US investors' demand for equity of publicly traded firms in Japan's versus Germany's manufacturing industries each year. We aggregate equity demand across investors and use investee-industry-year as our unit of analysis because we expect private firm disclosures to have the strongest impact (either negative or positive) on the demand for public equity of peer firms in the same investee-industry-year.[4] In our main tests, we include investee-year and industry-year fixed effects to exploit cross-sectional differences both "across industries" within the same investee-year (e.g., global investors deciding which industry in China to invest in) and "across countries" within the same industry-year (e.g., global investors deciding which country's manufacturing industry to invest in) in response to different levels in private firm financial transparency. This design helps us operationalize the idea that global investors face the decision of *reallocating* funds across different investee countries and industries, while controlling for certain unobserved heterogeneities.

We find a 10% increase in our private firm disclosure measure is linked to a 4.3% or $358 million decrease in average total future equity demand by global investors per investee-industry-year, suggesting that the effect is material.[5] Moreover, we find that the three subcomponents of our disclosure measure – balance sheet items, income statement items, and footnote

[1] Other examples of studies in this area include Ball and Shivakumar (2005) and Minnis (2011) on the usefulness of private firm disclosures; Dedman and Lennox (2009), Bernard et al. (2018), and Gassen and Muhn (2018), Breuer et al. (2020) on the determinants of private firm disclosures; and Baik et al. (2022); Breuer and Breuer (2022); Glaeser and Omartian (2022); Breuer et al. (2022) on outcomes of mandated private firm disclosures.

[2] Another important underlying assumption is that investors are risk averse and have limited capital, inducing them to reallocate their capital to make new investments (Stiglitz (1981); Siriwardane (2019); Choi (2021)). Consistent with this idea, we show our findings are more pronounced in settings where investors are likely capital constrained. Moreover, we implicitly assume investors have access to both public and private equity and consume financial disclosures. We discuss these issues further in Sections 2 and 3.2.2.

[3] To take Japan's case as an example, the log total number of line items disclosed can be decomposed in the following way: $14.22 = \ln(1 + 43{,}674*0.88*39)$, where 43,674 represents the number of private firms in Japan that disclose at least one financial statement item (i.e., the "extensive margin" of private firm disclosure) and 0.88 represents the percentage of disclosed financial statement items relative to the hypothetical full disclosure of 39 line items standardized by Orbis (i.e., the "intensive margin" of private firm disclosure). Therefore, our measure encapsulates both margins of disclosure. We provide further discussion of our measure in Section 3.2.2 and Appendix A.

[4] Another advantage of conducting our analyses by aggregating at the investee-industry-year level is that it is potentially more informative to regulators. A regulator in a given investee country is likely concerned with the total net amount of capital flows across all investors. We thank Matthias Breuer (FARS discussant) for raising this point.

[5] Our results appear comparable to Lang et al. (2020), who document a 12% increase in investment to US cross-listed firms relative to non-US cross-listed firms in the same country around the signing of the Multilateral Memorandum of Understanding (MMoU), a non-binding, information-sharing arrangement between global securities regulators.

disclosures — individually have significant negative relations with future equity demand. These findings suggest global investors likely consume various elements of financial statements, shedding new light on the type of financial information global investors use when reallocating capital (Ferracuti and Stubben (2019)). Taken together, the negative relation is consistent with private firm disclosures being more idiosyncratic, which reduces the demand for public equity.

A *reallocation* of capital from public to private firms is implicitly assumed in the argument that private firm disclosures reduce demand for public firm equity. We address this implied relationship in three steps. First, we expect and find the negative link between private firm disclosures and demand for public equity is more pronounced when investors are constrained in their ability to invest new capital in an investee country. Specifically, following prior research, we use each investor-investee pair's strictness in controlling global capital flows as a proxy for the investor country's constraints in investing new capital in an investee country (Fernández et al. (2016) and Makarov and Schoar (2020)). We document that our capital control proxy is linked to significant additional reductions in public equity demand relative to baseline averages. This is consistent with capital constraints inducing investors to reallocate their existing capital (i.e., public equity) — rather than injecting new capital — to invest in private firms with transparent financial statement disclosures.[6]

Second, we expect and find the negative link between private firm disclosures and demand for public equity is more pronounced when the investor and investee countries are more "distant" from each other in terms of language. This is consistent with private firm disclosures playing a greater role when information frictions are more severe because of greater language barriers between countries (Lang et al. (2020)). Specifically, we use principal component analysis to summarize the various measures of language distance provided by the CEPII data and create composite language distance measures for each investor-investee pair (see Section 4.2). We show that our distance proxy is linked to significant additional reductions in public equity demand. These findings corroborate the inference that investors facing greater informational frictions benefit the most from private firm disclosures, and thus reallocate more capital towards private firms away from public firms.[7]

Third, we find that investee-industries that experience the most significant reduction in public equity demand by global investors are indeed the ones that experience the greatest inflow of global capital into private firms. Specifically, we find that a 10% increase in our private firm disclosure proxy is associated with a 6%–9% increase in private equity (PE) and mergers and acquisitions (M&A) activity by global investors targeting the investee country's private firms. Taken together, the results from these additional tests are difficult to fully explain absent a reallocation effect, raising the bar for omitted factors to be the sole driver of our results.

To further shed light on which private firms — the disclosing private firm versus its private firm peers — specifically benefit from the reallocation of capital, we conduct a firm-level analysis. We find evidence consistent with both the disclosing private firm and its private firm peers benefiting from the reallocation. Specifically, we find a positive link between private firm transparency and the future likelihood of the disclosing firm being either a target of M&A or PE funding by global investors. In economic terms, a 10% increase in our firm-specific measure of private firm disclosure is linked to a 2% higher likelihood of the disclosing private firm being targeted. Moreover, in stark contrast to the documented negative pecuniary externalities of private firm disclosures on public firms, we find evidence consistent with private firm disclosures generating positive information externalities that benefit other private firms who also become more likely M&A/PE targets by global investors. These results are consistent with private firm peers that tend to operate in more opaque environments being more likely to informationally benefit from private firm disclosures compared to public firm peers that operate in higher quality information environments where the incremental benefit of private firm disclosures is likely smaller.

While our collective evidence is consistent with private firm disclosures attracting capital away from public firms, this relationship is not necessarily causal. For example, our findings may be explained by reverse causality if private firms collectively increase disclosures in anticipation of (and therefore to attract) the capital outflows from public equities in their industry. Moreover, omitted factors such as investment opportunity shocks in certain investee-industries might jointly determine greater private firm disclosures and lower public equity investments. Throughout our analyses, we explicitly control for various investee-industry characteristics, use a lead lag model, and exploit cross-sectional variation consistent with an information-driven result for these reasons. To further support a causal interpretation of our findings, we use a simulated instrument approach following Breuer (2021) and the implementation of electronic business registers in Europe as plausibly exogenous shocks to private firm transparency.[8]

In the simulated instruments approach, we create a synthetic industry-specific (i.e., relevant across all investee countries) distribution of firm sizes to "simulate" the proportion of firms that are affected by different size-based disclosure thresholds across European countries. For example, using a synthetically created firm size distribution in the manufacturing industry, we exploit the fact that France and Germany have different size-based disclosure thresholds to compute the simulated proportions of private firms subject to disclosure — also known as the "standardized scope" — in the manufacturing industries of these two countries. These standardized scopes are then used as an instrument to estimate the exogenous component of the actual (but endogenous) proportion of firms subject to the size-based thresholds. Using this approach, we document a 32.8%

[6] In related, complementary tests, we also find that the negative link between private firm disclosures and demand for public equity is more pronounced when investors have access to liquid private equity markets and, as a result, are able to reallocate their funds to private equity more efficiently.

[7] Moreover, these findings are less consistent with an omitted correlated variable explaining our results. We expect an omitted correlated variable to play a weaker role among more distant countries because a common unmodelled shock is less likely to affect countries that are more distant to one another.

[8] We also employ a distributed lag model to alleviate concerns related to reverse causality in Section 4.4.

reduction in public equity demand for each (within-fixed effects) standard deviation increase in the simulation-instrumented proportion of firms above the size-based thresholds.

Similarly, we exploit the implementation of electronic business registers in Europe. The implementation represents European countries' effort to reduce the costs of private firms to comply with accounting regulation, facilitate the dissemination of private firm information (similar to that of the EDGAR implementation that took place in the US), and impose stricter enforcement of private firm disclosure mandates. We document difference-in-differences estimates that suggest a significant decline in the demand for public equity in investee countries that implement the electronic business register compared to investee countries that do not.

This paper contributes to the literature in several ways. First, it extends the emerging literature on the economic consequences of private firm disclosures. While recent studies in this area highlight both the determinants of private firm disclosures and the consequences of disclosing firms, fewer studies have investigated the externality or aggregate effects of private firm disclosures (e.g., Bernard et al. (2021); Breuer (2021)). We contribute to this underexplored area by showing private firm disclosures have significant negative pecuniary externalities on the demand for public firm equity. By doing so, we also contribute to the disclosure spillover literature, which has primarily focused on the informational transfers from public firm disclosures to outside stakeholders, such as other public or private peer firms (Badertscher et al. (2013); Shroff et al. (2017); Bourveau et al. (2020); Barrios et al. (2021); Shi (2021); Kim and Valentine (2022)), but less so on the reverse effect − that private firm disclosures can impact public firm outcomes.

Second, we contribute to the literature that examines the allocation of global capital (e.g., Gabaix and Koijen (2021)). How public equity capital moves around the world is a central issue in international policy, especially since many countries have poor domestic capital markets and rely on global capital flows. An emerging literature suggests factors such as cross-border regulatory cooperation (Lang et al. (2020)), governance quality (Leuz et al. (2009)), home currency bias (Lilley et al., 2022), and exchange rates (Maggiori et al. (2020)) affect the movement of global capital. We add to this literature by showing private firm disclosure is an important determinant for the international flow and allocation of public equity capital. By doing so, our findings also broadly speak to the literature that investigates the effects of transparency on global capital market outcomes (Gelos and Wei (2005); Piotroski and Srinivasan (2008); Lang and Maffett (2011); De Fond et al. (2011); Lang et al. (2012); Maffett (2012); Fang et al. (2015)).

Third, we contribute to the literature on the measurement of corporate transparency (Dechow et al. (2010)). Unlike the numerous firm-level measures available for publicly traded US firms, there is a dearth of available proxies for private firms, particularly in a global setting. By developing an easily implementable yet widely applicable measure of transparency following Chen et al. (2015), we not only uncover new insights on what information global equity investors consume but also offer a useful tool for future researchers interested in examining the determinants and consequences of private firm disclosures in an international setting.

2. Background and hypothesis

Our central goal is to examine the relation between private firm disclosures and global investors' demand for public equity. This relation likely depends on two countervailing forces that yield opposing predictions. On the one hand, private firm disclosures might be primarily idiosyncratic. In this case, global investors may prefer to invest more in private firms either because the idiosyncratic disclosures reduce uncertainty and thereby reduce private firms' cost of capital (Diamond and Verrecchia (1991); French and Poterba (1991); Lang and Maffett (2011); Baik et al. (2022)), or because these disclosures can make investors more aware of private firm investment opportunities, which likely incur non-trivial search costs (Merton (1987); Lagos and Rocheteau (2007); Shi and Delacroix (2018)).[9] As a result, these disclosures will likely generate pecuniary externalities on public firms by encouraging global investors to reallocate their capital away from public firms to more transparent private firms (e.g., Hart (1975); Stiglitz (1982); Davila and Korinek (2016)). The possibility of these scenarios is bolstered by the fact that private firms tend to be small and/or transact with relatively few stakeholders. Thus, their disclosures might not generate useful information for other firms but rather remain more firm-specific in nature (Bushman et al. (2004); Breuer et al. (2020)).

On the other hand, private firms represent a significant part of the aggregate global economy (Minnis and Shroff (2017); World Bank (2020); Lisowsky and Minnis (2020)). Thus, consistent with country-level corporate transparency attracting public equity capital (Gelos and Wei (2005)), aggregate private firm disclosures (i.e., when aggregated at the investee-industry-year level in our case) might generate useful industry-wide signals that will benefit the valuation of the private firms' publicly traded peers (Badertscher et al. (2013); Bernard et al. (2020); Barrios et al. (2021); Kim and Valentine (2021)). In this case, private firms' disclosures will generate positive information externalities, which will facilitate the ability of global investors to learn and accurately value public firms, thereby increasing the demand for public equity.

In sum, the net effect of private firm disclosures on the global demand for public equity is theoretically unclear and will depend on whether private firm disclosures are primarily idiosyncratic or industry wide, as stated by our two alternative hypotheses (Ha, Hb):

[9] Notably, Baik et al. (2022) provide evidence consistent with disclosure reducing private firm cost of capital, also in line with our findings in Table 5 discussed further below.

Ha (negative pecuniary externalities hypothesis): Private firm disclosures will have a negative impact on global public equity demand since the disclosures are primarily idiosyncratic in nature, which induces a reallocation of capital from public firms to more transparent private firms.

Hb (positive information externalities hypothesis): Private firm disclosures will have a positive impact on global public equity demand since the disclosures are primarily industry wide, which facilitates the valuation of public firms, thereby increasing the demand for public firm equity.

Both of our stated hypotheses implicitly assume investors have access to (and optimally allocate across) public and private equity. These hypotheses also assume that investors use private firm financial disclosures when allocating capital between public and private equity.[10] While these assumptions may not be applicable to small retail investors, we find these to be plausible for a variety of investors, such as high net worth individuals, institutional investors, and large corporate investors (Investment Company Institute (2020)).[11] For example, prior research shows that high net worth individuals can significantly impact the equilibrium asset demand as they hold a large fraction of a country's net wealth in both public and private equity (Campbell (2006); Preqin (2020)), and that these individuals use financial statements to make capital allocation decisions (Amel-Zadeh et al. (2022)). Similarly, institutional investors like Berkshire Hathaway and large tech firms like Alphabet Inc. hold significant amounts of both public and private equity either through minority holdings or majority takeovers, and these firms likely have the sophistication to use financial statement information efficiently when optimally allocating capital across private and public equity (Kwon et al. (2020); Bernard et al. (2021)).[12,13] Finally, information intermediaries can consume and disseminate private firm disclosures and affect investment decisions. Equity analysts regularly talk about competition from private peers when writing reports on their covered public firms. More private firm disclosures can raise awareness or facilitate the analysis of private firm competition, leading analysts to recommend investors to allocate more capital towards certain private firms.[14]

Nevertheless, there are reasons why we might not observe either of our predicted outcomes. First, the two countervailing forces may cancel each other out on average, in which case we would not be able to detect significant statistical relations between private firm disclosures and demand for public equity. Second, certain investors (e.g., retail) may not have the resources, ability, or intention to consume private firm disclosures when making capital allocation decisions.

3. Data and research design

3.1. Sample selection and data

We construct our sample by combining information on private firm financial disclosures using Bureau van Dijk's (BvD) Orbis database with data on global equity portfolio investment holdings (which we refer to as *GPI*) from the Global Capital Allocation Project (GCAP) database.[15] The GCAP database tracks the global movement of public equity across countries and allows us to construct granular measures of global equity demand observable at the investor-investee-industry-year level from 2005 to 2017.[16] For example, we can track US investors' demand for equity of publicly traded firms in the manufacturing industry of Japan versus that of Germany each year.

We use all investee countries around the world with non-missing GCAP data and merge this data with financial reporting data from BvD's Orbis given at the investee-industry-year level. We retain investee-industries for which firm-level financial data are available, i.e., with non-missing values of our independent variable of interest, *Transp. Log. FS Items (private)*, defined

[10] Another relevant factor to our story is the *timing* of disclosure. That is, disclosures may be more industry-wide (idiosyncratic) if they are disclosed earlier (later) relative to private firm disclosures. For example, Savor and Wilson (2016), in the context of public firm disclosures, show that earnings announcements that are made earlier during earnings seasons contain more industry-wide news whereas announcements made later (i.e., when most industry-wide news are already priced in because of the earlier announcements) contain more idiosyncratic (i.e., firm-specific) news. While we cannot fully test whether (and to what extent) these forces are at play in our setting due to data limitations, we think exploring the determinants (such as timing, content, etc.) of whether disclosures are idiosyncratic vs. industry-wide in general can be an interesting avenue for future research. We thank the referee for raising this point.

[11] On the other hand, we find it institutionally less likely for individual fund managers to allocate capital across public and private equity at the fund level. This is because investment firms are often constrained or even prohibited from reallocating capital between public and private equity within a fund or an ETF (Gabaix and Koijen (2021)). We thank Scott Richardson for providing this institutional insight.

[12] The 2020 10K filings of Berkshire Hathaway Inc. show the diverse equity holdings of Berkshire Hathaway in both public and private firms. Similarly, the 2020 10K filings of Alphabet Inc. show the equity holdings of Alphabet in both public and private firms. Note that GV is Alphabet's subsidiary that focuses on investing in private firms. The chemical conglomerate BASF is another example that invests in public equity of other firms while operating its own venture capital entity that invests in private firms (BASF (2016)).

[13] As another related example, a 2019 report by BlackRock discusses how global institutional investors (the focus of our study) "… showed a desire to further increase allocations to private markets by reducing their allocation to public equities", highlighting that reallocations between public and private equities are likely considered in practice. This report also provides context on why global investors wish to reallocate – i.e., global investors "reallocate their investments from public to private equity … to have exposure to a broader array of industries, geographies, and capital claims."

[14] For example, see Oberhuber (2018). This analyst report discusses how the Swiss food conglomerate Nestlé faces increased competition from its private peers, and makes explicit comparisons that can facilitate the reallocation of capital between public and private firms. This is particularly relevant since even mutual funds that traditionally invest in public equity, are also increasingly interested in investing in private firms (Kwon et al. (2020)).

[15] We obtained these data, which are based on the work in Maggiori et al. (2020) and Coppola et al. (2021), from: www.globalcapitalallocation.com.

[16] Industry is defined as 10 unique NAICS industry sectors as provided by the Global Capital Allocation Project.

below. Requiring non-missing information in control variables yields a final sample of 5648 investee-industry-year observations, which we use in our main tests; and 66,920 investor-investee-industry-year observations, which we use in certain additional tests that exploit information at the investor dimension.[17] Detailed definitions of variables are in Appendix B. Further details on our sample selection procedures are in Table A1 of the Internet Appendix.

3.2. Variables measurement and descriptive statistics

3.2.1. Key dependent variable: global portfolio investment (GPI)

Our measure of global demand for public equity, Log *GPI Equity*, is defined as the log of one plus the total portfolio investment in public equity for each investee-industry-year following Coppola et al. (2021).[18] Specifically, we use the "full nationality" global equity capital measure, which reassigns all investment positions to the investee country of the equity issuer's parent firm, regardless of whether the issuing entity is resident in a tax haven or not. This implicitly assumes that global investors are aware of the equity issuing entity's ultimate parent country. For example, a German investor who invests in Toyota Motors North America, a US-resident company, is assumed to have invested in Japan, the parent company's country. In untabulated robustness tests, we find our results are qualitatively unaffected by using alternative definitions of global equity demand that are not strictly nationality based, also developed by Coppola et al. (2021). Table 1 shows that our sample is comprised of 19 investor countries (Panel A) that invest in 720 potential investee-industries (i.e., 72 investee countries each with 10 NAICS industry sectors) (Panel B) from 2005 to 2017.[19] Table 1 Panel A Column (1) shows that the United States is by far the largest investor country in the global equity market ($2.83 trillion) in 2017. Moreover, Fig. 1 Panel A (Panel B) plots the logged average GPI by investee (industry) sorted in descending order. The United Kingdom, Canada, and Japan are the top three investee countries in terms of GPI investment with a combined total of $2.18 trillion, whereas the top three industries, Manufacturing, Finance, and Agriculture, account for $12.02 trillion in GPI investments in 2017. We aggregate equity demand across investors and use investee-industry-year as our unit of analysis in our main tests described below. Finally, Table 2 Panel A reveals that Log *GPI Equity* has a sample mean of 3.93 across all investee countries with a standard deviation of 4.18.

3.2.2. Key independent variable: private firm disclosures

3.2.2.1. Measurement. Our analysis requires a measure of private firm transparency at the investee-industry-year level. We use the BvD Orbis database to construct our variable of interest, *Transp. FS Items (private)*, defined as the number of non-missing financial statement line items disclosed by private firms in each investee-industry-year. Orbis is the de-facto standard in providing private firm financial information and is used by a wide range of clients around the world, including investment professionals for due diligence and market screening purposes (Business Wire (2020); Bureau van Dijk. (2021)). Thus, we assume the observability of financial statements in Orbis reflects the granularity and extent of disclosures consumed by global investors.

We assume each private firm can disclose up to 39 standardized financial statement items as defined by BvD that categorize raw data from private firm financials into 39 distinct categories (Kalemli-Özcan et al. (2019). That is, if there are 100 private firms in an investee-industry-year, the hypothetical full disclosure is 3900. We provide a more detailed discussion on the construction and decomposition of our measure in Appendix A. Mathematically, *Transp. FS Items (private)* is defined as the following construct:

$$Trans.\ FS\ Items\ (private)_{j,n,t} = \sum_{k=1}^{n} Disclosed\ FS\ Items_{k,j,n,t} \tag{1}$$

for private firm *k,* investee country *j*, industry *n,* year *t. N* denotes the total number of private firms with at least one financial statement item observable in a given investee-industry-year. In our regressions, we take the natural logarithm of the above measure to account for skewness in the data and denote our main variable of interest as *Transp. Log. FS Items (private)* throughout.

[17] Note that we exclude four investee countries – Australia, Israel, New Zealand, and the US – which are countries that we believe have the lowest likelihood of exogenous variation in private firm disclosures. We find that these countries have the lowest average level of private firm line-item disclosures during our sample period, consistent with them having weak private firm disclosure mandates. We thank the referee and Editor for this helpful feedback. As a robustness check, we find our inferences to be unaffected by including these investee countries. We also run a jackknife analysis that suggests our results are unlikely to be driven by the inclusion (or exclusion) of certain countries.

[18] We define global capital allocation following Coppola et al. (2021). This measurement may also capture a fraction of domestic investments in securities. We verify that all inferences remain unchanged when we drop the GPIs that likely capture domestic investments (i.e., when the investee and investor country are the same).

[19] To conserve space, we only tabulate the 42 investee countries with at least 0.01 USD billion average GPI in Table 1 Panel B. Investees with less than 0.01 USD billion average GPI are listed in Table A2 for completeness.

Table 1
Descriptive statistics and determinants test.

Panel A. Investor Countries

	Total GPI Equity in 2017 (USD billion)	Average Total GPI Equity 2005–2017 (USD billion)
	(1)	(2)
United States	2828.12	1660.62
Luxembourg	802.74	573.98
United Kingdom	593.99	409.27
Canada	373.06	276.88
Ireland	306.99	154.58
France	181.93	142.47
Germany	172.96	121.60
Sweden	156.16	115.48
Switzerland	114.72	66.57
Australia	60.66	46.21
Norway	39.62	27.94
Spain	36.58	31.10
Finland	32.46	21.13
Netherlands	30.37	23.05
Italy	29.60	29.32
Denmark	23.82	24.38
Belgium	16.92	24.29
Austria	9.52	8.69
Portugal	1.09	2.32

Panel B. Investee Countries

	Transp. % FS Items (private)	*Log. Disclosing Private Firms*	*Transp. % FS Items (public)*	*Log. Disclosing Public Firms*	*Transp. Log. FS Items (private)*
	(1)	(2)	(3)	(4)	(5)
Greece	0.90	10.36	0.90	6.14	6.04
Cayman Islands	0.88	5.29	0.89	6.97	3.83
Vietnam	0.86	12.43	0.89	7.42	6.92
South Korea	0.85	12.21	0.90	8.55	6.82
Ukraine	0.80	12.73	0.90	6.73	7.02
France	0.80	13.78	0.86	7.37	7.48
Norway	0.79	12.33	0.84	5.82	6.84
Spain	0.77	13.55	0.63	7.85	7.36
Belgium	0.76	12.80	0.86	5.72	7.03
Brazil	0.74	8.47	0.85	5.92	5.14
Portugal	0.74	12.60	0.85	4.89	6.93
Italy	0.72	13.77	0.88	6.39	7.43
Singapore	0.71	9.32	0.83	6.69	5.49
Thailand	0.68	12.03	0.88	6.42	6.65
Estonia	0.67	11.32	0.81	3.37	6.33
Denmark	0.65	12.17	0.82	5.72	6.69
Luxembourg	0.62	9.43	0.84	4.13	5.47
Japan	0.61	12.95	0.89	8.98	7.00
Malaysia	0.60	12.02	0.88	6.70	6.59
Slovenia	0.60	11.10	0.81	3.62	6.19
Hungary	0.60	12.59	0.74	4.19	6.84
Sweden	0.60	12.93	0.85	7.05	6.98
Ireland	0.50	11.68	0.87	4.69	6.36
China	0.50	13.28	0.81	9.04	7.05
Finland	0.49	12.27	0.87	5.66	6.61
United Kingdom	0.49	14.46	0.85	7.69	7.56
Slovak Republic	0.48	11.98	0.83	4.63	6.48
Indonesia	0.44	5.84	0.59	6.77	3.77
Germany	0.42	13.50	0.87	7.26	7.08
Austria	0.40	11.85	0.80	4.88	6.34
Turkey	0.36	10.48	0.84	6.22	5.70
Canada	0.32	8.23	0.79	7.62	4.66
Russia	0.26	14.89	0.84	7.24	7.48
Netherlands	0.25	13.90	0.82	5.31	7.03
Cyprus	0.14	9.04	0.80	4.97	4.68
Poland	0.12	13.34	0.84	7.00	6.47
Lithuania	0.11	11.22	0.80	4.16	5.52
India	0.09	12.54	0.71	8.97	5.99
Hong Kong	0.08	9.94	0.90	5.67	4.79

(*continued on next page*)

Table 1 (*continued*)

Panel B. Investee Countries

	Transp. % FS Items (private)	*Log. Disclosing Private Firms*	*Transp. % FS Items (public)*	*Log. Disclosing Public Firms*	*Transp. Log. FS Items (private)*
	(1)	(2)	(3)	(4)	(5)
Mexico	0.07	10.27	0.80	5.13	4.92
South Africa	0.07	8.76	0.68	5.59	4.25
Switzerland	0.07	12.41	0.86	5.80	5.80

Panel C. Determinants of Private Firm Transparency

	Transp. Log. FS Items (private) (t+1)		
	(1)	(2)	(3)
Regulatory and Information Dissemination Factors			
Post BvD Office (Investee)	0.184***		
	(3.09)		
Post Business Register		0.081**	
		(2.12)	
Log. Reg. Size Threshold Assets			−0.091*
			(-1.72)
Macroeconomic Factors			
Log. Country GDP	0.339***	0.362***	0.393***
	(3.18)	(2.91)	(2.93)
Log. Population	−0.406	−1.431***	−1.428***
	(-0.83)	(-3.32)	(-3.05)
FDI (% of GDP)	0.016**	−0.033	−0.039
	(2.31)	(-0.51)	(-0.60)
Log. GPI (Country)	−0.008	0.006	−0.001
	(-1.03)	(0.45)	(-0.08)
Industry Factors			
Transp. Log. FS Items (public)	0.164***	−0.032	−0.019
	(4.80)	(-0.78)	(-0.44)
Private Firm Proportion	0.018***	0.020	0.020
	(7.77)	(1.57)	(1.51)
Log. Total Assets (private)	0.329***	0.497***	0.488***
	(13.09)	(13.52)	(12.78)
Log. Median Size (Total Assets)	−0.325***	−0.450***	−0.445***
	(-13.75)	(-10.92)	(-10.67)
ROA (private)	0.487	1.212**	1.123*
	(1.45)	(2.00)	(1.74)
ROA (public)	−1.142***	−0.454	−0.218
	(-2.92)	(-0.95)	(-0.45)
Log. Revenue (all)	0.177***	0.150***	0.153***
	(5.99)	(3.19)	(3.20)
Median Stock Return	0.001**	0.001***	0.001***
	(2.45)	(3.49)	(3.22)
Obs.	5657	2805	2663
Adj. R2	0.931	0.887	0.891
Investee FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Notes: This table presents information on our main empirical constructs of interest. In Panel A, we present the GPI holdings by investors domiciled in a given country. Column (1) presents total GPI held across all investee countries and industries in 2017. Column (2) presents the average total holdings per year over the sample period. In Panel B, we present various components of our private and public firm financial transparency measures at the investee country level (averaged over the sample period). In Panel C, we present results from regressions of private firm transparency on lagged investee-country regulatory, macroeconomic, and investee-industry-level factors. The dependent variable of interest *Transp. Log. FS Items (private)* is defined as the number of non-missing financial statement line items disclosed by private firms, measured as of one year after the measurement of explanatory factors. Macroeconomic factors include the set of control variables from Column (1) in Table (3) as well as the outcome variable from our main test (*Log. GPI*) aggregated at the country-level. All specifications include year and investee fixed effects. The t-statistics reported below the coefficient estimates in parentheses are computed based on standard errors clustered by investee-industry. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed). Detailed definitions of all variables are provided in Appendix B.

We note that our measure captures the aggregate level of private firm disclosure which is driven by both i) the number of financial statement items disclosed by a given disclosing firm (i.e., the "intensive margin" of disclosure) and ii) the total number of private firms disclosing some financial reporting information (i.e., the "extensive margin" of disclosure). We expect both margins to affect investors' capital allocation decisions in important ways. For example, as discussed in Section 2, the extensive margin can be particularly useful in increasing investor awareness on viable private firm investment opportunities, whereas the intensive margin can be more relevant in assessing the financial projections of an investment

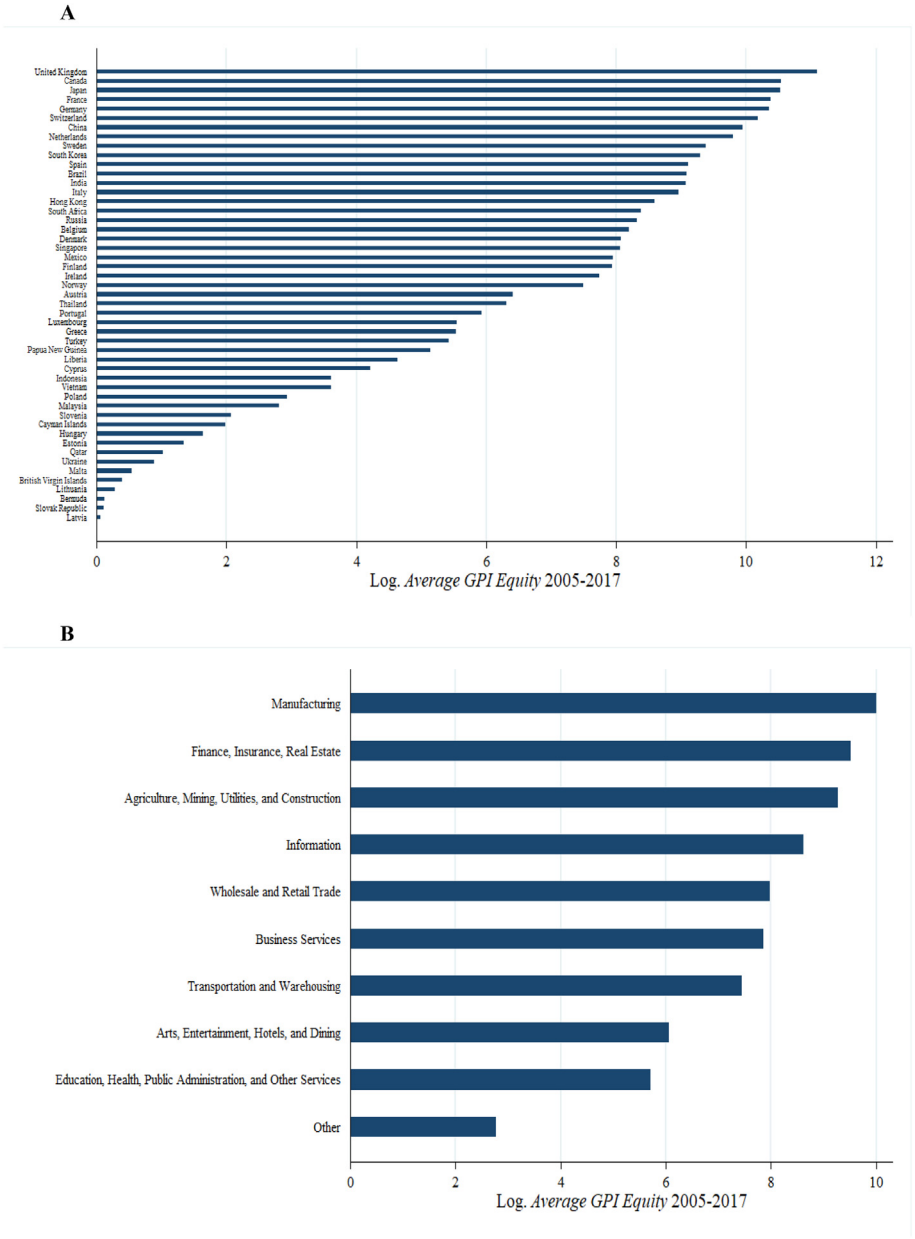

Fig. 1. Global Portfolio Investment in Public Equity. Panel A. Average Global Portfolio Investment in Public Equity by Investee Country, Panel B. Average Global Portfolio Investment in Public Equity by Industry, **Notes:** The figure illustrates the variation in our dependent variable across investee countries and industries. In Panel A, we depict the average natural logarithm of total global portfolio investment stock in an investee country's public firms held by global investors in our sample period. In Panel B, we depict the average natural logarithm of total global portfolio investment stock in a given industry held by global investors in our sample period.

(by accessing more granular line items) conditional on investors having identified potential investment targets. Consistent with these discussions, in Section 4.5 discussed further below, we find that both margins appear to have incremental effects on public equity demand.

In Table 1 Panel B we present the intensive margin component (i.e., the average number of line items disclosed conditional on firms disclosing) denoted as *Transp. % FS Items (private)*, in Column (1) and the extensive margin component (i.e., the number of firms that disclose some financial statement information) denoted as *Log. Disclosing Private Firms*, in Column (2) across our sample countries. For comparison, in Columns (3) and (4), we present the intensive and extensive margin components of *public firm* disclosures, respectively. Variable definitions are in Appendix B. These results show that countries with

Table 2
Summary statistics and correlations.

Panel A. Summary Statistics

	Obs.	Mean	SD	P1	P25	Median	P75	P99
Dependent Variables								
Log. GPI Equity	5648	3.93	4.18	0.00	0.00	2.56	8.00	11.89
Log. M&A Total Assets	5648	10.31	9.55	0.00	0.00	14.75	19.17	24.65
Log. M&A Equity	5648	9.07	9.10	0.00	0.00	9.67	17.95	23.41
Log. M&A Mean Total Assets	5648	9.25	8.52	0.00	0.00	13.92	17.04	22.48
Log. PE Total Assets	5648	7.14	9.18	0.00	0.00	0.00	17.72	23.42
Log. PE Equity	5648	6.33	8.57	0.00	0.00	0.00	16.45	21.91
Log. PE Mean Total Assets	5648	6.64	8.50	0.00	0.00	0.00	16.70	21.94
Independent Variables								
Transp. Log. FS Items (private)	5648	10.75	3.08	3.74	8.16	11.52	13.20	15.71
Transp. Log. FS Items (public)	5648	6.67	1.65	3.47	5.55	6.59	7.69	11.07
Transp. Log. BS Items (private)	5648	10.32	3.16	3.14	7.70	11.11	12.85	15.38
Transp. Log. PL Items (private)	5648	9.14	3.01	2.40	6.69	9.82	11.58	14.05
Transp. Log. Footnote Items (private)	5648	8.08	3.12	1.61	5.56	8.75	10.70	13.26
Private Firm Proportion	5648	89.06	22.11	8.77	92.31	99.35	99.90	100.00
Log. Total Assets (private)	5648	24.26	2.37	17.76	22.85	24.35	25.78	29.29
Log. Median Size (Total Assets)	5648	14.19	2.78	8.53	12.30	13.58	16.05	20.83
ROA (private)	5648	0.03	0.05	−0.15	0.01	0.02	0.05	0.25
ROA (public)	5648	0.04	0.05	−0.12	0.01	0.04	0.07	0.22
Log. Revenue (all)	5648	24.46	2.09	19.04	23.09	24.48	25.97	28.95
Median Stock Return	5648	6.17	36.10	−65.77	−10.25	3.18	18.18	128.36
Scope (Simulated)	3306	15.97	23.02	0.90	3.19	6.89	16.98	100.00
Cross-sectional Variables								
Capital Control	67,061	0.19	0.16	0.00	0.05	0.15	0.28	0.65
PE Mean Size	67,061	181.21	230.90	0.00	26.00	107.00	239.00	1087.00
Language Distance	67,061	−0.01	1.41	−4.02	−0.80	−0.02	1.13	2.20
Business Register	66,360	0.41	0.49	0.00	0.00	0.00	1.00	1.00
Investor Exposure	66,360	1.49	2.76	0.00	0.09	0.44	1.65	15.11

Panel B. Pearson and Spearman Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log. GPI Equity	(1)	1	0.278***	0.477***	0.009	0.570***	0.090***	−0.029***	0.094***	0.619***	−0.002	0.449***	0.449***
Transp Log. FS Items (private)	(2)	0.281***	1	0.316***	0.807***	0.669***	−0.739***	−0.028**	−0.110***	0.593***	−0.011	0.645***	0.541***
Transp Log. FS Items (public)	(3)	0.534***	0.296***	1	−0.204***	0.560***	0.119***	−0.085***	−0.038***	0.678***	−0.044***	0.420***	0.407***
Private Firm Proportion	(4)	0.134***	0.663***	−0.126***	1	0.359***	−0.761***	0.021*	−0.090***	0.250***	0.010	0.398***	0.301***
Log. Total Assets (private)	(5)	0.590***	0.674***	0.550***	0.341***	1	−0.162***	−0.097***	−0.032***	0.893***	−0.037***	0.668***	0.579***
Log. Median Size (Total Assets)	(6)	0.114***	−0.737***	0.131***	−0.591***	−0.169***	1	−0.029***	0.079***	−0.046***	−0.018	−0.300***	−0.224***
ROA (private)	(7)	−0.052***	−0.042***	−0.101***	0.029**	−0.099***	−0.008	1	0.291***	−0.029**	0.027**	−0.022**	−0.030***
ROA (public)	(8)	0.074***	−0.087***	−0.022*	−0.056***	−0.033***	0.062***	0.207***	1	0.036***	0.014	−0.046***	−0.022*
Log. Revenue (all)	(9)	0.652***	0.568***	0.671***	0.192***	0.843***	−0.046***	−0.021	0.052***	1	−0.037***	0.637***	0.570***
Median Stock Return	(10)	−0.036***	−0.033***	−0.058***	0.006	−0.070***	−0.019	0.014	−0.003	−0.069***	1	−0.018	−0.009
Log. M&A Total Assets	(11)	0.419***	0.631***	0.365***	0.317***	0.610***	−0.329***	−0.035***	−0.050***	0.563***	−0.041***	1	0.667***
Log. PE Total Assets	(12)	0.446***	0.528***	0.403***	0.228***	0.553***	−0.237***	−0.055***	−0.028**	0.544***	−0.031**	0.633***	1

Notes: This table presents descriptive statistics for the main regression sample. The unit of observation is at the investee country, investee industry, and year level. The sample period is 2005−2017. Panel A presents summary statistics on the variables used in the regression analyses. Panel B presents Pearson (below the diagonal) and Spearman (above the diagonal) correlations between the main outcome variables of interest, private firm transparency, and a set of control variables. Detailed definitions of all variables are in Appendix B.

relatively strong regulatory disclosure mandates of private firms, like Greece or South Korea, have high transparency values, whereas certain countries, like South Africa or India, exhibit lower values of private firm disclosure in both margins, demonstrating significant heterogeneity in the cross-section of our sample countries.

By contrast, we find that public firm transparency exhibits significantly lower heterogeneity in disclosure transparency in both margins, consistent with public firms facing similar reporting and disclosure requirements across the globe due to the convergence of reporting standards and global oversight bodies (e.g., Barth et al. (2008)). Finally, Column (5) presents the average values of our aggregate transparency measure, *Transp. Log. FS Items (private)*, for each investee country, which combines the intensive and extensive margins of disclosure.

3.2.2.2. Discussion. Before we proceed, we note that variation in our aggregated disclosure measure, *Transp. Log. FS Items (private)*, could be driven by factors both exogenous and endogenous to the demand for public firm equity. In our context, the standardized private firm disclosures provided by Orbis (the basis by which we compute *Transp. Log. FS Items (private)*) are likely driven by a) regulatory and information dissemination factors, b) macroeconomic factors including foreign investment, and c) industry factors such as growth and voluntary disclosure choices.

We expect variation in disclosure regulation such as the size-based thresholds, the implementation of central business registers, and the enforcement of private firm disclosure mandates in Europe to be relatively orthogonal to global portfolio investment decisions and likely generate plausibly exogenous variation in *Transp. Log. FS Items (private)*. However, endogenous factors such as voluntary disclosure choices can also impact our transparency measure.

Consistent with our expectations, results of a determinants test in Table 1 Panel C reveal that variation in regulation and the dissemination of information intuitively correlates with our disclosure proxy after controlling for a host of characteristics. Specifically, Column (1) shows that the opening of a BvD global office (the data provider of the Orbis disclosure data) in an investee country results in an 18% increase in our transparency measure according to the coefficient estimate on *Post BvD Office*. This is consistent with the notion that investors observe higher levels of private firm transparency when data vendors such as Orbis collect and disseminate information. Further, Column (2) shows the introduction of electronic business registers in Europe, which is known as the "EDGAR database" for private firms in Europe, is associated with an 8% increase in our transparency measure according to the coefficient estimate on *Post Business Register*. Finally, Column (3) shows that European countries with higher size-based disclosure exemption thresholds (i.e., those that have fewer regulated firms) have lower values in our transparency measure according to the coefficient estimate on *Log. Reg. Size Threshold Assets*. Specifically, when a country doubles its reporting size threshold, the number of observable financial statement disclosures by private firms increases by approximately 4.5%.

Moreover, Figure A1 in the Internet Appendix provides visual evidence that our measure responds to important regulatory changes at the country level. For example, we observe a notable increase in private firm disclosures in Germany after 2006 when a major regulatory reform and the implementation of the electronic business register took place (Bernard (2016); Breuer (2021)). By contrast, in France we observe a sharp decrease in private firm disclosures after the reporting size threshold was increased in 2014 from €1 million to €4 million in total assets, which exempted a greater number of firms from having to disclose a full set of financial statement items. We also observe evidence consistent with regulation driving private firm transparency in countries outside of Europe. In 2014, China implemented its Interim Regulations on the Public Disclosure of Enterprise Information, leading to a strong increase in private firm financial statement transparency.[20] Finally, in 2013, we observe that the opening of a BvD global office in Brazil coincides with an increase in the availability of private firm financial statement information, consistent with Orbis helping with the dissemination of private firm disclosures in certain countries.

Collectively, the determinants test and visual responses of our disclosure measure to regulatory factors provide additional assurance for the construct validity of our measure. However, we note that an investee-industry's private firms' size, public and private firms' performance, and country-wide factors are also correlated with aggregate private firm disclosures and likely impact global investors' demand for public equity. Therefore, we take several steps to isolate the relationship between private firm disclosures and the demand for public peer firms' equity. Specifically, in our main tests we use a dense fixed effect structure (i.e., investee-year and industry-year), use a lead-lag design, and control for observable endogenous determinants of private firm disclosures and equity market outcomes. We discuss these design choices in greater detail in Section 3.3 below. Moreover, in additional tests described in Section 4.4, we use a set of narrower, but plausibly exogenous settings to further support a causal interpretation.

Notwithstanding the issues and considerations of causality, an important appeal to our measure is that it is easily implementable and broadly applicable in many settings. These features are in line with one of the goals of this study, which is to provide a reasonable private firm transparency measure that future researchers can utilize in various global settings beyond just European countries, which locale has been the focus in prior research (e.g., Bernard (2016); Breuer et al. (2020); Baik et al. (2022); Glaeser and Omartian (2022)).

[20] The reform aimed at supporting the enhancement of the company registration system in China, including the establishment of an annual reporting system and the requirement for firms to submit audited financial statements (Shan (2014)).

3.3. Research design

We estimate the following empirical model using OLS:

$$Log.\ GPI\ Equity_{j,n,t} = \beta_1 Transp.\ Log.\ FS\ Items(private)_{j,n,t-2} + \beta_k \overline{X_{j,n,t-2}} + \delta_{j,t} + \gamma_{n,t} + \varepsilon_{j,n,t} \quad (2)$$

The unit of observation is at the investee country *j,* industry *n*, and year *t* level. We cluster standard errors at the investee-industry and the investee-year level to account for potential arbitrary dependence over time in an investee-industry and across industries within an investee-year.[21] *Log. GPI Equity* is the annual global investor demand for public equity, as discussed in Section 3.2.1. *Transp. Log. FS Items (private)* is our transparency measure of interest as discussed in Section 3.2.2. We measure *Transp. Log. FS Items (private)* in year *t*-2 (where *t* is the year *Log. GPI Equity* is measured). This choice accounts for the typical one-year lag between the fiscal year end and the publication date of financial statements by private firms, as well as the additional time commercial database providers like BvD take to collect, standardize, and disseminate data to professional investors around the world (e.g., Moody's (2018, 2021); Kalemli-Özcan et al. (2019); Breuer et al. (2020)). Our coefficient of interest, β_1, captures the elasticity of demand for public equity with respect to private firm transparency. That is, the log-on-log specification allows us to interpret the coefficient as the percentage increase in global investor demand for public equity associated with a 1-percent increase in our private firm transparency measure.

To ensure that our results are not unduly driven by the impact of investee-industry observations with economically small global capital (i.e., as a result of "equal-weighting" the economic effects of smaller vs. larger economies), we also estimate our results, whenever appropriate, using weighted regressions, and provide economic magnitudes based on estimates of both weighted and unweighted regressions throughout the manuscript. Specifically, we weight observations by the logged maximum global portfolio capital received in the sample period to ensure that our results account for the observations' economic activity.

Our choice of fixed effects and control variables in Equation (2) aims to address three concerns. First, there are macro-economic factors at the country-level that could drive both private firm disclosures and global investments in public firm equity (e.g., economic downturns inducing private firms to increase disclosures to attract more capital while discouraging global investors to allocate capital to public firms in the same country). Second, industry-wide trends might affect private firm disclosures and global capital allocation to public firms in the same industry (e.g., growth or technological changes). Third, confounding factors may vary over time at the investee country-industry level. For example, the aggregate size of private firms could be driven by certain performance trends of both public and private firms.

To address these issues of correlated investee country- and industry-wide trends, we include investee-year ($\delta_{j,t}$) and industry-year ($\gamma_{n,t}$) fixed effects. This approach exploits cross-sectional differences both "across industries" within the same investee-year (e.g., investors deciding which industry in China to invest in) and "across countries" within the same industry-year (e.g., investors deciding which country's manufacturing industry to invest in) in response to different levels in private firm financial transparency. Conceptually, consistent with our research question, this empirical design helps us model the idea that global investors face the decision of *reallocating* their funds across different investee countries and industries in a given year. Empirically, the design helps with controlling for differences in trends across investee countries (e.g., political, cultural, or economic developments) and industries (e.g., technological disruptions) which could correlate with public equity market outcomes.[22]

To account for correlated factors that vary over time at the investee-industry level, we include an extensive set of controls, captured in the vector $\overline{X_{j,n,t-2}}$. We control for time-varying changes in levels of publicly available reports due to firm size and macroeconomic factors by including *Log. Total Assets (private)*, *Log. Median Size (Total Assets)*. Further, the inclusion of performance characteristics and consumer market size (*ROA (private), ROA (public)*), and *Log. Revenue*) mitigates the concern that greater investment opportunities and higher returns on investment for public of private firms induce private firms to disclose more while simultaneously determining capital allocation decisions. Finally, we control for capital market size and the corresponding levels of financial transparency associated with the listed firms' publicly available and mandated disclosures by including *public* firm transparency (*Transp. Log. FS Items (public))* and the median public firm stock returns in a given investee-industry-year (*Median Stock Return*). The latter helps to mitigate the concern that our design merely picks up movements in market values rather than actual capital allocation decisions correlated with changes in private firm disclosure.

In sum, our design estimates β_1 by exploiting cross-sectional variation in treatment intensities (i.e., the degree of private firm transparency) within the same investee-year while controlling for industry trends and time-varying factors like aggregate firm performance, market size, and capital market conditions. With this fixed effect structure, likely an important (remaining) exogenous source of within-investee-year variation (i.e., across industries) is the industries' differential

[21] This level of standard error clustering specifically addresses correlated capital allocation decisions to an investee-industry and correlated disclosure characteristics due to sticky regulation in an investee country. See also Breuer (2021) on clustering standard errors at the country-industry and country-year levels in related contexts.

[22] In contrast to a traditional time-series D-i-D design, we do not exploit changes within an investee-industry from one year to another. More technically, the resulting cross-sectional coefficient estimates can be interpreted as long-run effects and overcome several limitations of estimates based on time-series variation as discussed in Breuer (2021).

exposures to reporting regulation and mandates. For example, the expansion in reporting mandates in China, Turkey, or South Africa might have a greater effect on firms in industries of higher public interest (e.g., the utilities sector) compared to those that are less so (e.g., the entertainment sector). Also, size-based regulatory thresholds in Europe (which we exploit in later tests) are known to affect industries differentially in the cross-section.

Nonetheless, we note that our strategy does not address all confounding factors. For example, there might be omitted factors that differentially impact equity demand across investee-industries (e.g., a supply chain shock specific to the retail industry in India but not in other countries) and, in turn, their private firm disclosures. Moreover, to the extent that private firms can anticipate future capital inflows/demand and increase disclosures (collectively at the industry level) in response to this in anticipation, our estimates might reflect reverse causality. To further corroborate the inference that our main findings are driven by disclosure, we perform a series of additional tests that help rule out other plausible interpretations of our results. Specifically, we first test for the dynamics of our documented effects to address reverse causality concerns. We then employ a simulated scope approach following Breuer (2021) that uses variation stemming from the differential impact of European country-level regulation across industries and accounts for firms' endogenous size management and disclosure decisions. Finally, we exploit investor's differential exposure to the business registers implementations, which are unlikely correlated with potential outcomes in global portfolio investments. We discuss these tests in more detail in Section 4.4.

4. Results

4.1. The impact of private firm disclosures on public equity demand

We predict a negative link ($\beta_1 < 0$ in Eq.(2)) between private firm disclosures and global demand for public equity if private firm disclosures are primarily idiosyncratic and induce a reallocation of capital from public firms to more transparent private firms (i.e., disclosures generate negative pecuniary externalities). On the other hand, we predict a positive link ($\beta_1 > 0$ in Eq.(2)) between private firm disclosures and global demand for public equity if private firm disclosures generate positive information externalities that benefit public firm valuations.

In Fig. 2 and Table 3 we regress *Log. GPI Equity* on *Transp. Log. FS Items (private)* with a set of relevant controls and fixed effects as defined in Equation (2). Fig. 2 provides a visual impression of the relationship between *Log. GPI Equity* and *Transp. Log. FS Items (private)* through binned scatter plots, where the bins are based on the percentile values of *Transp. Log. FS Items (private)*. To control for confounding effects when plotting this relationship, we estimate the residuals from a regression of *Log. GPI Equity* on investee-year and industry-year fixed effects and the control variables. Both the scattered mean values within bins (blue dots) and the fitted linear regression line (red line) indicate a significantly negative relationship (slope coefficient of −0.46, p value < 0.01) between private firm transparency and future global demand for public equity.

Consistent with the visual evidence in Fig. 2, Table 3 Panel A demonstrates a significant negative link between *Transp. Log. FS Items (private)* and *Log. GPI Equity* in a regression framework. Column (1) contains results excluding fixed effects but includes our set of controls as discussed in Section 3.3, plus macroeconomic controls holding constant an investee-country's economic size, population, and foreign direct investment. Column (2) contains results based on our preferred specification with investee-year and industry-year fixed effects and controls. Column (3) is based on the same specification, but uses a

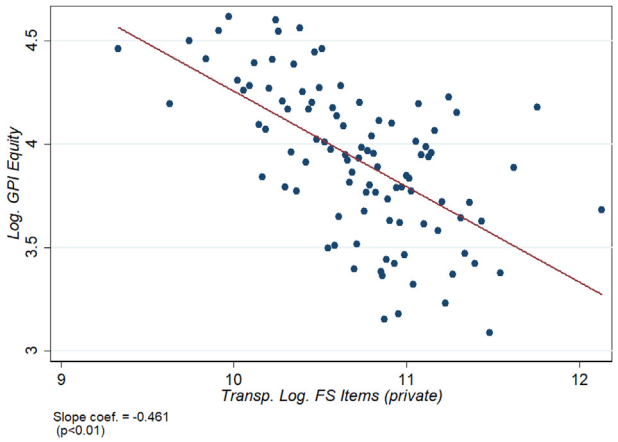

Fig. 2. Private Firm Transparency and Global Portfolio Investment in Public Equity: Graphical Evidence. **Notes:** This figure shows binned scatterplots that illustrate the relationship between global portfolio investment in public equity, *Log. GPI Equity*, and private firm financial transparency, *Transp. Log. FS Items (private)*. Observations are sorted into percentile bins based on their value of *Transp. Log. FS Items (private)*, measured using financial statement information in fiscal year t-2. To filter out confounding effects when plotting the relationship between *Log. GPI Equity* and *Transp. Log. FS Items (private)*, we residualize these variables against investee-year and industry-year fixed effects and a set of control variables as discussed in Section 3.3. Detailed definitions of all variables are provided in Appendix B.

Table 3
Private firm transparency and global portfolio investment in public equity: Regression results.

Panel A. Entire Private Firm F/S

	Log. GPI Equity				
	(1)	(2)	(3)	(4)	(5)
Transp. Log. FS Items (private)	−0.543***	−0.461***	−0.399***	−0.260**	−0.237**
	(-4.86)	(-3.50)	(-3.19)	(-2.46)	(-2.32)
Transp. Log. FS Items (public)	0.685***	0.531***	0.557***	0.356***	0.403***
	(6.59)	(4.17)	(4.32)	(4.15)	(4.32)
Private Firm Proportion	0.036***	0.021**	0.017*	0.011	0.012
	(4.65)	(1.99)	(1.71)	(1.35)	(1.65)
Log. Total Assets (Private)	0.397***	0.119	−0.045	−0.022	−0.086
	(4.41)	(1.50)	(-0.55)	(-0.32)	(-1.11)
Log. Median Size (Total Assets)	−0.088	−0.140*	−0.054	−0.073	−0.014
	(-1.04)	(-1.77)	(-0.59)	(-1.01)	(-0.16)
ROA (private)	−1.644	−1.476	−1.323	−0.446	−0.686
	(-1.27)	(-1.46)	(-1.24)	(-0.70)	(-0.94)
ROA (public)	4.719***	5.451***	7.541***	2.875***	4.125***
	(3.13)	(3.65)	(4.38)	(2.92)	(3.48)
Log. Revenue (all)	0.363***	0.216*	0.332**	0.187**	0.241**
	(3.54)	(1.76)	(2.58)	(2.19)	(2.55)
Median Stock Return	0.004***	0.003***	0.005***	0.002***	0.004***
	(2.65)	(2.74)	(2.80)	(2.77)	(2.81)
Log. Country GDP	1.927***				
	(10.53)				
Log. Population	−0.950***				
	(-7.23)				
FDI (% of GDP)	−0.005				
	(-0.08)				
Obs.	5670	5648	5648	66,920	66,920
Adj. R2	0.581	0.763	0.774	0.556	0.576
Unit of Observation	*Investee-industry-year*	*Investee-industry-year*	*Investee-industry-year*	*Investor-investee-industry-year*	*Investor-investee-industry-year*
Regression Type	*OLS*	*OLS*	*WLS*	*OLS*	*WLS*
Industry-Year FE	No	Yes	Yes	Yes	Yes
Investee-Year FE	No	Yes	Yes	No	No
Investee-Investor-Year FE	–	–	–	Yes	Yes

Panel B. By Private Firm F/S Type

	Log. GPI Equity		
	(1)	(2)	(3)
Transp. Log. BS Items (private)	−0.447***		
	(-3.54)		
Transp. Log. PL Items (private)		−0.391***	
		(-3.17)	
Transp. Log. Footnote Items (private)			−0.420***
			(-3.20)
Transp. Log. Total FS Items (public)	0.531***	0.519***	0.520***
	(4.17)	(4.11)	(4.11)
Private Firm Proportion	0.019*	0.019*	0.021**
	(1.82)	(1.86)	(1.97)
Log. Total Assets (Private)	0.130	0.093	0.076
	(1.61)	(1.17)	(0.96)
Log. Median Size (Total Assets)	−0.151*	−0.114	−0.095
	(-1.89)	(-1.43)	(-1.19)
ROA (private)	−1.557	−1.406	−1.380
	(-1.54)	(-1.39)	(-1.36)
ROA (public)	5.487***	5.444***	5.350***
	(3.68)	(3.66)	(3.56)
Log. Revenue (all)	0.204*	0.213*	0.225*
	(1.67)	(1.73)	(1.81)
Median Stock Return	0.003***	0.003***	0.003***
	(2.75)	(2.81)	(2.78)

Table 3 (*continued*)

Panel B. By Private Firm F/S Type			
	Log. GPI Equity		
	(1)	(2)	(3)
Obs.	5648	5648	5648
Adj. R2	0.763	0.762	0.762
Industry-Year FE	Yes	Yes	Yes
Investee-Year FE	Yes	Yes	Yes

Notes: This table presents the results from regressing global portfolio investment in public equity on private firm transparency. The dependent variable *Log. GPI Equity* is the natural logarithm of one plus the portfolio investment in public equity of an investee-industry-year held by global investors. In Panel A, the independent variable of interest *Transp. Log. FS Items (private)* is the natural logarithm of the number of non-missing financial statement line items disclosed by private firms. Columns (1) to (3) include industry-year and investee-year fixed effects. Columns (4) and (5) present results using the global capital allocation data from Coppola et al. (2021) at the disaggregated level where the unit of observation is at the investor-investee-industry-year level. In these specifications, we include investee-investor-year fixed effects. In Columns (3) and (5), we re-estimate the specifications from Columns (2) and (4), respectively, using weighted regressions. Specifically, we weight observations by the logged maximum global portfolio capital received in the sample period to ensure that our results account for the observations' economic activity. In Panel B, *Transp. Log. FS Items (private)* is dissected into the categories balance sheet (Columns (1)) profit and loss statement (Column (2)), and Footnotes (Column (3)). Results for Columns (1) through (3) in Panel B imply a 4.5%, 3.9%, and 4.2% (3.68%, 3.28%, and 3.47%) decrease in demand for public equity for a 10% increase in private transparency based on OLS (untabulated WLS) estimates, respectively. The t-statistics reported in parentheses are based on standard errors clustered by investee-industry and investee-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed).

weighted regression as discussed in Section 3.3. In Columns (4) and (5), we re-estimate results after disaggregating the global capital allocation data to the investor-investee country pair level using OLS and weighted regression, respectively. We run these tests to show that our main results hold when examining the demand for public equity by each investor separately, and to provide a benchmark estimate for our later tests in Sections 4.2 and 4.4 where we exploit bilateral characteristics at the investor-investee pair level.

The coefficient stability across the three main specifications (Columns (1) through (3)) offers assurance that our results are not sensitive to model specifications and certain omitted factors (coef. = −0.534, t-stat = −4.86 in Column (1); coef. = −0.461, t-stat = −3.50 in Column (2); coef. = −0.399, t-stat = −3.19 in Column (3)). In economic terms, Column (2) suggests that a 10% increase in private firm transparency is associated with a 4.3% or $358 million decrease in future equity demand by global investors per investee-industry-year, suggesting that the effect is material.[23] In Column (3), we document similar but slightly weaker effects when we weight observations by dollar activity. Specifically, a 10% change in private firm disclosures is associated with a 3.73%, or $310 million decrease in demand for public equity.

In Table 3 Panel B, we dissect our private firm disclosure measure into three subcomponents – balance sheet items (*Transp. Log. BS Items (private)*), income statement items (*Transp. Log. PL Items (private*)), and footnote items (*Transp. Log. Footnote Items (private)*). We find that all three subcomponents have strong negative links to future public equity demand. Specifically, Columns (1), (2), and (3) reveal that a 10% increase in balance sheet items, income statement items, and footnote items is associated with a 4.5%, 3.9%, and 4.2% decrease in public equity demand, respectively. The statistically significant effects across all specifications suggest that global investors find various elements of the financial statements useful when reallocating capital.[24] These results broadly speak to the call by Ferracuti and Stubben (2019) for more analyses that identify the specific types of information financial statement users consume when making economic decisions such as capital allocation.

4.2. Corroborating the reallocation interpretation of the decline in public equity demand

A reallocation of capital from public equity to investment in private firms is implicitly assumed in the argument that private firm disclosures reduce demand for public firm equity. We address this implied relationship in four steps by exploiting

[23] Our log-log specification allows us to interpret the coefficients as elasticities of the demand for public equity to changes in private firm disclosures. Throughout, we consider a 10% change in private firm disclosures when interpreting magnitudes, which is equivalent to a 0.94 within-fixed effect standard deviation increase for the average investee-industry. That is, ln(*Transp. FS Items (private)**1.1) = 0.94ln(*Transp. FS Items (private)* + one within-fixed effect standard deviation increase in *Transp. FS Items (private)*). The coefficient of −0.461 in Column (2) suggests that a 10% increase in private firm transparency is associated with a 4.3% decrease in demand for public equity ($e^{(--0.461*\ln(1.1))} - 1 = -0.043$).

[24] While our tests suggest that each of the three subcomponents are useful signals to global investors, we caution the reader that this does not necessarily imply that they are *incrementally* useful. Incremental usefulness is hard to assess in an OLS design due to the high collinearity between the three components (i.e., they have pair-wise correlations that range from 0.92 to 0.96). In untabulated tests, we use LASSO (least absolute shrinkage and selection operator) to assess whether the three components likely have incremental usefulness. LASSO uses a built-in variable selection to handle multicollinearity across a multitude of predictor variables without sacrificing interpretability (Hastie et al. (2015)). We run a LASSO inferential estimation method for each of the three financial statement components, including all other financial statement line-items as controls. We find that all three financial statement components have comparable, statistically significant, negative association with *Log. GPI* even after including all other financial statement line-items in the model. We believe more closely examining the incremental usefulness (and heterogeneity) of individual line items to be another interesting extension to our work.

Table 4
Validating the reallocation mechanism: Evidence from bilateral capital constraints, private capital liquidity, and investor-investee distances.

Friction Proxies:	*Log. GPI Equity*		
	Capital Constraints	Private Capital Liquidity	Distance
	Capital Control	*PE Mean Size*	*Language Distance*
	(1)	(2)	(3)
*Transp Log. FS Items (private) * Friction*	−0.090**	−0.432**	−0.150**
	(-2.57)	(-2.35)	(-2.26)
Transp Log. FS Items (private)	−0.239**	−0.165	−0.228**
	(-2.30)	(-1.65)	(-2.19)
Transp Log. FS Items (public)	0.348***	0.268***	0.337***
	(4.19)	(3.14)	(3.91)
Private Firm Proportion	0.009	0.006	0.010
	(1.18)	(0.79)	(1.36)
Log. Total Assets (Private)	−0.016	−0.015	−0.020
	(-0.23)	(-0.23)	(-0.30)
Log. Median Size (Total Assets)	−0.068	−0.109	−0.073
	(-0.96)	(-1.65)	(-1.04)
ROA (private)	−0.389	−0.213	−0.151
	(-0.61)	(-0.33)	(-0.24)
ROA (public)	2.859***	2.525**	2.743***
	(3.00)	(2.47)	(2.76)
Log. Revenue (all)	0.163*	0.159*	0.177**
	(1.95)	(1.92)	(2.10)
Median Stock Return	0.002***	0.003***	0.003***
	(2.72)	(3.32)	(3.02)
Obs.	67,061	67,061	67,061
Adj. R2	0.672	0.683	0.672
Industry-Year FE	Yes	Yes	Yes
Investee-Investor-Year FE	Yes	Yes	Yes
Controls*Friction	Yes	Yes	Yes
Year FE*Friction	Yes	Yes	Yes

N**otes:** This table presents the results from regressing global portfolio investment in public equity on private firm transparency, conditional on investors facing capital constraints, private equity market liquidity, and distance to investee countries when investing in a given investee country. The dependent variable *Log. GPI Equity* is the natural logarithm of one plus the portfolio investment stock in public equity of an investee country-industry held by global investors each year. The independent variable of interest *Transp. Log. FS Items (private)* is the natural logarithm of the number of non-missing financial statement line items disclosed by private firms. The binary *Friction* proxies in Columns (1), (2), and (3) are *Capital Control, PE Mean Size,* and *Language Distance,* respectively. *Capital Control* is an indicator variable equal to 1 if the product of investor country's capital control index and investee country's capital control index — as developed by Fernández et al. (2016) - is in the top quartile within each investor, and 0, otherwise. *PE Mean Size* is an indicator variable equal to 1 if the mean private equity fund size in a given investee-year is in the top quartile in a given year, and 0, otherwise. *Language Distance* is an indicator variable equal to 1 if the language distance index is in the top quartile within each investee subsample, and 0, otherwise. The unit of observation is at the investor-investee-industry-year level. All columns include industry-year and investee-investor-year and fixed effects. The cross-sectional friction proxies are interacted with all control variables and year fixed effects. Results for Columns (1) through (3) imply a 0.9%, 4.3%, and 1.5% (0.8%, 3.1%, and 0.7%) additional decrease in demand for public equity for a 10% increase in private transparency if the *Friction* indicator is equal to one based on OLS (untabulated WLS) estimates, respectively. The t-statistics reported below the coefficient estimates in parentheses are computed based on standard errors clustered by investee-industry, investee-year, and investor-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed). Detailed definitions of all variables are in Appendix B.

investor-investee country pair characteristics and examining global capital flows to private firms in our sample investee countries.

4.2.1. Capital constraints inducing reallocation of capital

We expect and find the negative link between *Transp. Log. FS Items (private)* and *Log. GPI Equity* is more pronounced when investors are constrained in their ability to invest new capital in an investee country, consistent with the reallocation of capital driving our results. We leverage the idea that constrained global investors are more likely to reallocate their existing capital (i.e., public equity), rather than invest new capital, to make new investments to transparent private firms (Stiglitz (1981); Siriwardane (2019)).

Empirically, we exploit the bilateral nature of our data and measure the strictness in controlling global capital flows between investor-investee pairs to capture the constraints faced by global investors in investing new capital in an investee country. Specifically, we define *Capital Control* to equal 1 if "investor's capital control*investee's capital control" is in the top quartile, and 0 otherwise. The capital control index is a score-based measures based on 10 categories that represent a country's strictness in controlling global capital where higher values indicate greater strictness in the flow of capital based on Fernández et al. (2016) and Makarov and Schoar (2020).

Table 4 Column (1) documents a significant negative link between *Log. GPI Equity* and the interaction term *Transp. Log. FS Items (private)*Capital Control* (coef. = −0.09, t-stat = −2.37). To allow for a differential mapping of controls as well as year

trends into the demand for public equity for constrained versus unconstrained investor-investee-years, we also interact our control variables and fixed effects with *Capital Control*. In economic terms, being in the top quartile investor-investee pair in *Capital Control* results in a 0.9% additional reduction in public equity demand relative to baseline averages (i.e., for each 10% increase in private firm disclosure).

4.2.2. Private capital liquidity

We expect and find the negative link between *Transp. Log. FS Items (private)* and *Log. GPI Equity* is more pronounced when there is greater liquidity in the investee countries' private equity markets. This is consistent with the idea that investors respond (i.e., reallocate their portfolio more towards private assets) to new information most effectively if there is a sufficiently large market conducive to private equity investment (e.g., Amiram and Frank (2016)).

To proxy for an investee's size of the private equity market, we obtain annual data on private equity fundraising from Preqin, a leading investment data provider for alternative asset classes. We define *PE Mean Size* to equal 1 if an investee's mean PE fund size is in the top quartile in a given year, and 0 otherwise. Table 4 Column (2) documents a significant negative link between *Log. GPI Equity* and the interaction term *Transp. Log. FS Items (private)***PE Mean Size* (coef. = −0.432, t-stat = −2.37). In economic terms, being in the top quartile investee in *PE Mean Size* results in a 4.3% additional reduction in public equity demand relative to baseline averages.

4.2.3. Distance between investor and investee countries

We expect and find the negative link between *Transp. Log. FS Items (private)* and *Log. GPI Equity* is more pronounced when the investor and investee countries are more "distant" from each other in terms of language. This is consistent with private firm disclosures playing a greater role when information frictions are more severe because of language barriers between countries (Lang et al. (2020)). Specifically, we summarize the various measures of language distance between investor and investee countries provided by the CEPII database by computing the principal component of these measures.[25] We then define *Language Distance* to equal 1 if the first principal component of these measures is in the top quartile and to equal 0, otherwise.

Table 4 Column (3) demonstrates a significant negative link between *Log. GPI Equity* and the interaction term *Transp. Log. FS Items (private)***Language Distance* (coef. = −0.150, t-stat = −2.18). In economic terms, investor-investee pairs in the top quartile of language distance yield a 1.5% additional reduction in public equity demand relative to baseline averages.

4.2.4. Capital being reallocated to private firms

We expect and find that investee countries that experience the most significant reduction in public equity are indeed the ones that experience the greatest inflow of global capital into private firms, consistent with reallocation of capital driving our results. We show this in two ways using data on investments in M&A and PE (see Table A3 in the Internet Appendix for further details).

First, we relate the predicted demand for public equity based on the fitted values using Equation (2) ("*Predicted Log. GPI Equity*") with our proxy for global investors' demand for *private* firm equity – *Log. M&A Total Assets (private)*. Using a binned scatter plot, Fig. 3 Panel A reveals a statistically significant negative relationship between *Predicted Log. GPI Equity* and *Log. M&A Total Assets (private)*. The slope coefficient is estimated to be −0.473 with a p-value less than 0.01. Recalling that higher private firm financial transparency predicts lower GPI, this finding supports the conclusion that a decrease in global investors' demand in public firm equity (as induced by increases in private firm transparency) is associated with an increase in demand for private firm equity (via increased M&A demand) in the same investee, industry, and year.

Second, Fig. 3 Panel B shows the direct relationship between global investors' demand for private firm equity and private firm financial transparency (*Transp. Log. FS Items (private)*). Consistent with capital being reallocated to private firms, we find a significant positive link between private firm financial transparency and domestic M&A activity of global investors (*Log. M&A Total Assets (private)*). The slope coefficient is 1.022 with a p-value less than 0.01.

Table 5 Columns (1), (2), and (3) confirm the visual evidence in Fig. 3 Panel B and suggest that higher private firm financial transparency is associated with a greater allocation of capital into private firm equity via various proxies for private firm M&A activity, as defined in Appendix B. In economic terms, Column (1) suggests that a 10% increase in private firm transparency increases total M&A investment in private firm targets (in total asset size) by global investors by 10.2%. Similarly, in Columns (2) and (3), we document that a 10% increase in private firm transparency is linked to 9.5% and 8.6% more global capital being used to acquire private firms in terms of the total equity size and average asset size of the private target firms, respectively.

Table 5 Columns (4), (5), and (6) display the result from running analogous regressions using PE transactions – as opposed to the M&As of typically more mature private firms. Consistent with Baik et al. (2022) who relate the likelihood of PE transactions to higher financial statement availability due to regulation, our results suggest that a 10% increase in private firm transparency increases global private equity investments by 6.2%, 6.2%, and 5.7% in terms of private equity target firms' total assets, equity, and average total assets, respectively.

[25] The measures provided by CEPII include non-common official language, general language differences using the Tree method, and general language differences using the ASJP methods. CEPII provides proximity measures, which are reversed to represent them as distance measures. See Mayer and Zignago (2011) and Melitz and Toubal (2014) for more details. Moreover, see Baker and Wurgler (2006) and Johnson et al. (2020) for recent examples of using principal component analysis to compute a composite proxy such as *Language Distance*.

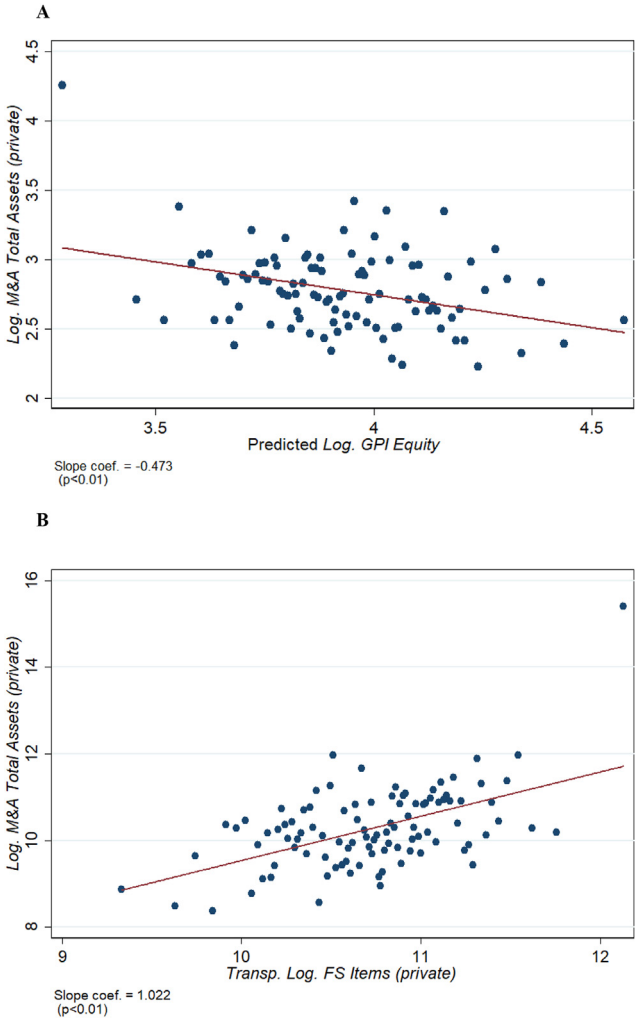

Fig. 3. Private Firm Transparency and Global Investment in Private Firms: Graphical Evidence. Panel A. Predicted Global Portfolio Investments (GPI) in Public Equity and Private Firm M&A Investments. Panel B. Private Firm Transparency and Private Firm M&A Investments, **Notes:** This figure shows binned scatterplots that illustrate the relationship between private firm transparency and global investment in private firms. Panel A plots the relationship between predicted global portfolio investment in public equity (*Predicted Log. GPI)* and M&A transactions with private target firms (*Log. M&A Total Assets*). Observations are sorted into percentile bins based on their value of *Predicted Log. GPI*, measured using the fitted values from the regression results using equation (1). Panel B plots the relationship between private firm financial transparency (*Transp. Log. FS Items (private)*) and M&A investments of global investors into private target firms' equity defined as the sum of private target firms' total assets (*Log. M&A Total Assets*). Observations are sorted into percentile bins based on their value of *Transp. Log. FS Items (private)* measured using financial statement information in fiscal year t-2. To filter out confounding effects when plotting the relationship between the independent and dependent variables, we residualize these variables against investee-year and industry-year fixed effects, and a set of control variables as discussed in Section 3.3. Detailed definitions of all variables are provided in Appendix B.

4.3. Which private firms benefit from greater transparency?

The findings in Section 4.2 demonstrate that private firm disclosures induce a reallocation of capital from public equity to investment in private firms. To further shed light on which private firms – the disclosing private firm versus its private firm peers – specifically benefit from the reallocation of capital, we conduct a firm-level analysis. To do so, we create a firm-level measure of our private firm transparency, *Firm Transp. Log. FS Items (private),* defined as the logged number of non-missing financial statement line items disclosed by the individual private target firm in year *t*-2, where *t* is when our dependent variable is measured. We then construct our dependent variable of interest, *Private Firm M&A/PE Acquisition (0/1)*, to be an indicator taking on the value of 1 in the year a private firm is acquired or funded in a PE transaction by global investors. Our firm-year sample includes private firms that eventually get acquired or funded in a PE transaction during our sample period (19,375 M&A and 7223 PE deals as described in Table A3), where target firm-year observations are removed after the M&A or PE deal. This results in a sample of 79,244 target firm-year observations.

Table 5
Validating the reallocation mechanism: Evidence from capital allocation to private firms.

	(1)	(2)	(3)	(4)	(5)	(6)
	Global M&A Investments in Private Firms			*Global PE Investments in Private Firms*		
	Log. M&A Total Assets	*Log. M&A Equity*	*Log. M&A Mean Total Assets*	*Log. PE Total Assets*	*Log. PE Equity*	*Log. PE Mean Total Assets*
Transp. Log. FS Items (private)	1.022***	0.954***	0.857***	0.621**	0.618**	0.565**
	(4.04)	(4.05)	(3.50)	(2.37)	(2.52)	(2.31)
Transp. Log. FS Items (public)	0.399**	0.567***	0.257	0.758***	0.659***	0.608***
	(2.15)	(3.09)	(1.47)	(3.10)	(2.67)	(2.65)
Private Firm Proportion	−0.034*	−0.026	−0.029*	−0.012	−0.016	−0.011
	(-1.83)	(-1.41)	(-1.65)	(-0.79)	(-1.09)	(-0.75)
Log. Total Assets (private)	0.435***	0.326**	0.405***	0.221	0.182	0.191
	(2.92)	(2.36)	(2.82)	(1.28)	(1.20)	(1.16)
Log. Median Size (Total Assets)	−0.137	−0.022	−0.153	−0.152	−0.155	−0.152
	(-0.75)	(-0.12)	(-0.87)	(-0.95)	(-1.08)	(-1.00)
ROA (private)	3.203*	2.539	3.616*	−4.918**	−4.685**	−4.096*
	(1.65)	(1.26)	(1.96)	(-2.23)	(-2.34)	(-1.92)
ROA (public)	0.295	−1.095	−0.201	0.827	0.689	0.713
	(0.14)	(-0.55)	(-0.10)	(0.36)	(0.32)	(0.32)
Log. Revenue (all)	0.251	0.357*	0.227	0.340*	0.330*	0.330*
	(1.23)	(1.88)	(1.18)	(1.77)	(1.82)	(1.85)
Median Stock Return	−0.001	−0.001	−0.001	0.004	0.004	0.003
	(-0.31)	(-0.51)	(-0.39)	(1.12)	(1.22)	(1.02)
Obs.	5648	5648	5648	5648	5648	5648
Adj. R2	0.709	0.632	0.656	0.592	0.561	0.553
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Investee-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from regressing global investment in private firm equity on private firm transparency. In Columns (1) through (3), the dependent variables proxy for direct investments by global investors through M&A deals that involve private target firms in the investee-industry-year. *Log. M&A Total Assets* is the natural log of the sum of total assets of the acquired private target firms. *Log. M&A Equity* is the natural log of the sum of book equity of the acquired private target firms. *Log. M&A Mean Total Assets* is the natural log of the average of total assets of the acquired private target firms. In Columns (4) through (6), the dependent variables are constructed analogously for private equity transactions that involve deals with global investors and private target firms. The independent variable of interest *Transp. Log. FS Items (private)* is the natural logarithm of the number of non-missing financial statement line items disclosed by private firms. All Columns include industry-year and investee-year fixed effects. Results for Columns (1) through (6) in Panel B imply a 10.2%, 9.5%, 8.6%, 6.2%, 6.2%, and 5.7% (8.9%, 8.6%, 6.8%, 6.0%, 6.2%, and 5.2%) increase in demand for private firm equity for a 10% increase in private transparency based on OLS (untabulated WLS) estimates, respectively. The t-statistics reported in parentheses are based on standard errors clustered by investee-industry and investee-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed).

Table 6 Columns (1) and (2) show a statistically significant positive relation between *Firm Transp. Log. FS Items (private)* and *Private Firm M&A/PE Acquisition (0/1)* (coef. = 0.030, t-stat = 3.76 in Column (1)). Specifically, Column (1) suggests a 10% increase in *Firm Transp. Log. FS Items (private)* is associated with a 2% incrementally higher likelihood of being targeted by a global investor. This is consistent with the reallocation of public equity benefiting the disclosing private firm. In Column (2), we include our investee-industry wide measure of disclosure, *Transp. Log. FS Items (private),* to assess the externality effects of private firm disclosures on other private firm peers. We find a statistically significant positive relation between our industry-wide measure, *Transp. Log. FS Items (private),* and *Private Firm M&A/PE Acquisition (0/1)* (coef. = 0.012, t-stat = 2.30). In stark contrast to the negative pecuniary externalities of private firm disclosures on public firms, this finding suggests that private firm disclosures generate positive information externalities to other private firms.[26] Taken together, we find evidence consistent with capital reallocation of public equity benefiting both the disclosing private firm and its private firm peers.

4.4. Distributed lag model, simulated regulatory scope, and exposure to business registers

If greater private firm transparency is related to unobserved factors that determine the demand for public equity by global investors, our results may be biased. We address this issue in three ways. First, we use a distributed lag model, a technique adopted from the economics literature on the dynamics of corporate investment (e.g., Suarez and Zidar (2016)), to assess the cumulative effects of private firm disclosures on public equity demand over different time horizons. Second, following Breuer (2021), we use a simulated measure of private firm transparency that addresses potential endogeneity issues that our fixed

[26] These results are consistent with the idiosyncratic effect of private firm disclosures playing a more significant role against public firms that operate in higher quality information environments. That is, the incremental informational benefits of private firm disclosures are likely smaller than the idiosyncratic negative pecuniary externalities. On the other hand, private firm peers that tend to be in more opaque environments are more likely to benefit from private firm disclosures. Table 1 Panel B provides empirical support for this argument. While the mean value of private firm transparency conditional on firms disclosing (*Transp. % FS Items (private)*) is 0.51 with a standard deviation of 0.26, public firm transparency has a much higher mean of 0.82 with significantly lower standard deviation of 0.07, suggesting that public firms are significantly more transparent, and also consistently so, around the world.

Table 6
Who benefits from private firm disclosures? A firm level analysis.

	Private Firm M&A/PE Acquisition (0/1)	
	(1)	(2)
Firm Transp. Log. FS Items (private)	0.030***	0.030***
	(3.76)	(3.76)
Firm Log. Total Assets	−0.009***	−0.009***
	(-3.69)	(-3.54)
Transp. Log. FS Items (private)		0.012**
		(2.30)
Transp. Log. FS Items (public)	0.003	0.003
	(0.50)	(0.41)
Private Firm Proportion	0.003	0.003
	(0.95)	(0.92)
Log. Total Assets (private)	0.000	−0.000
	(0.03)	(-0.07)
Log. Median Size (Total Assets)	−0.010	−0.005
	(-1.49)	(-0.67)
ROA (private)	0.051	0.051
	(0.78)	(0.71)
ROA (public)	0.012	0.013
	(0.54)	(0.54)
Log. Revenue (all)	−0.003	−0.004
	(-0.34)	(-0.44)
Median Stock Return	−0.000	−0.000
	(-0.97)	(-0.95)
Obs.	79,244	79,244
Adj. R2	0.347	0.347
Industry-Year FE	Yes	Yes
Investee-Year FE	Yes	Yes
Firm FE	Yes	Yes

Notes: This table presents the results from regressing global M&A and PE investment in private firm equity on private firm transparency. The unit of observation is the individual target firm-year. The sample consists of all private firms that get acquired through an M&A or PE deal in our investee countries in the period 2005–2017 and that are observable in the Orbis database for our sample of investee countries. The dependent variable *Private Firm M&A/PE Acquisition (0/1)* is an indicator taking on the value of 1 in the year a private firm is acquired in an M&A transaction or funded in a PE transaction by global investors. Target firm-year observations are removed after the M&A or PE deal. Thus, the regression estimates the incremental likelihood of a private firm being acquired by a global investor through an M&A or PE deal in a given year. The independent variable of interest *Firm Transp. Log. FS Items (private)* is defined as the natural logarithm of the number of non-missing financial statement line items disclosed by an individual private target firm in a given year. *Transp. Log. FS Items (private)* is defined as in the previous tests (the natural logarithm of the number of non-missing financial statement line items disclosed by private firms in an investee-industry). All columns include industry-year, investee-year, and firm fixed effects. The t-statistics reported below the coefficient estimates in parentheses are computed based on standard errors clustered by firm-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed). Definitions of all variables are in Appendix B.

effect structure might not fully assuage. Third, we use the staggered introduction of electronic business registers in Europe and exploit investors' exposures to these country-level shocks to transparency in difference-in-differences analyses.

4.4.1. Distributed lag model

Fig. 4 plots the results of estimating a distributed lag model. To do so, we first compute the dynamic point estimates by regressing *Log. GPI Equity* on the contemporaneous as well as several lead and lag values of *Transp. Log. FS Items (private)* with controls, investee-year and industry-year fixed effects. We then plot the cumulative sum of the point estimates for each relative point in time for the period until and the period after the year in which we measure *Log. GPI Equity*. The years on the x-axis represent the year in which *Log. GPI Equity* is observed relative to the year in which *Transp. Log. FS Items (private)* is observed. For example, year $t = -2$ means that we are relating the two-year *future* values of *Transp. Log. FS Items (private)* to *Log. GPI Equity.* Each subsequent year (i.e., $t = -2$ through $+2$, and $t = +2$ through $+5$) cumulates the annual coefficient estimates. For example, the coefficient plotted in year $t = 0$ (i.e., 0.26, t-stat = 1.16) is the sum of the coefficients estimated across the years $t = -2$, $t = -1$, and $t = 0$.

We find a statistically insignificant cumulative effect leading up to the year in which *Transp. Log. FS Items (private)* is measured at $t = +2$ (i.e., p-value = 0.75). This suggests that there is no evidence of changing trends in the demand for public equity leading up to the measurement year of our private firm disclosure measure, which alleviates concerns related to reverse causality. On the other hand, we find a statistically significant effect after the year *Transp. Log. FS Items (private)* is measured in years $t = +2$ through $t = +5$ (p-value < 0.01). These dynamic patterns suggest private firm disclosures disseminate to investors with some lag, consistent with the views of our paper.

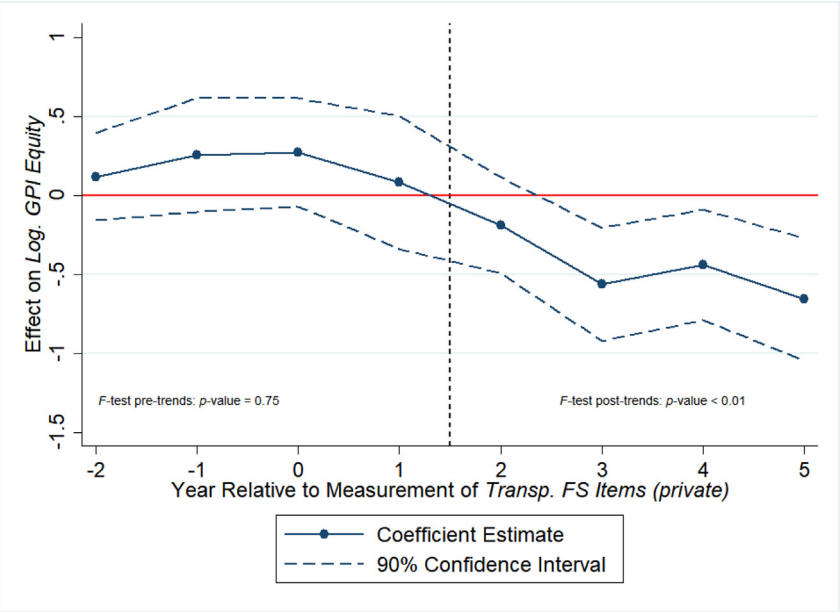

Fig. 4. Cumulative Dynamic Effects of Private Firm Transparency on *Log. GPI Equity*. **Notes:** This figure shows the cumulative dynamic effects of private firm financial transparency, *Transp. Log. FS Items (private)*, on global portfolio investment in public equity, *Log. GPI Equity*. The figure plots the results from estimating a distributed lag model. On the x-axis, the figure shows the sum of the point estimates of *Transp. Log. FS Items (private)* measured at different points in time relative to the year in which the outcome variable, *Log. GPI,* is measured, separately for the period until t = 2 and beginning in t = 2. 90% confidence intervals for the estimates are reported by the dashed lines. For example, the cumulative point estimate of 0.02 together with the confidence band overlapping the dashed line in the relative event year t = 1 imply that the sum of the effects of private firm transparency as of fiscal years 2012−2015 did not have a statistically significant effect on global portfolio investment in public equity in 2014. The graphs also report the p-values for the F tests that the cumulative effects leading up to the year in which *Transp. Log. FS Items (private)* is measured at t = 2 are jointly equal to zero and that the cumulative effects from t = 2 through t = 5 are jointly equal to zero. Point estimates are derived from a regression including control variables, investee-year fixed effects, and industry-year fixed effects. Detailed definitions of all variables are provided in Appendix B.

4.4.2. Simulated instruments approach to measure the share of regulated private firms

We follow Breuer (2021) and use a simulated instruments approach to study the differential impact of size-based reporting mandates in Europe. This approach addresses omitted variables that specifically vary by investee-industry-year. For example, factors that are specific to Germany's manufacturing industry in a certain year (but less relevant to the manufacturing industries of other countries) may endogenously affect Germany's firm size distribution (but not that of other countries), and thus uniquely influence the propensity of German private manufacturing firms to fall under disclosure mandates in Europe.

To implement this approach, we create a synthetic industry-specific (i.e., relevant across all countries) distribution of firm sizes to "simulate" the proportion of firms that are affected by different size-based disclosure thresholds across European countries.[27] For example, using a synthetically created firm size distribution in the manufacturing industry, we exploit the fact that France and Germany have different size-based disclosure thresholds to compute the simulated proportions of private firms subject to disclosure — also known as the "standardized scope" — in the manufacturing industries of these two countries. These standardized scopes (for each investee-industry-year) are then used as an instrument to estimate the exogenous component of the actual (but endogenous) proportion of firms that are subject to the size-based thresholds.

We denote *Scope (simulated)* as the simulation-instrumented proportion of firms subject to financial reporting mandates in each European investee-industry. This measure helps with reconciling potentially omitted differences across investee-industries (e.g., shocks unique to the German manufacturing industry) by "forcing" all investee-industries to use a common (simulated) set of firm size distribution, such that the proportion of regulated firms varies only by each country's size-based thresholds, and not by omitted factors across investee-industries.

[27] On a more technical note, we obtain the synthetic firm-size distributions by randomly drawing from actual firm data on total assets, sales, and employees and use them to simulate 100,000 synthetic firms (and thus synthetically created size distributions) for each NAICS industry. We refer interested readers to Mahoney (2015) and Breuer (2021) for further details on how to implement this approach. We thank Matthias Breuer for generously providing the code and information on countries' regulatory size thresholds.

Table 7
Additional settings for causal inference.

Panel A. Breuer (2021)'s Simulated Disclosure Measure

	(1)	(2)	(3)	(4)	(5)
	Reduced Form	First Stage		2SLS	
	Log. GPI Equity	*Actual Scope*	*Transp. Log. FS Items (private)*	*Log. GPI Equity*	
Scope (simulated)	−0.176***	0.403***	0.021**		
	(-3.43)	(3.59)	(2.59)		
Scope (simulated) IV				−0.436***	
				(-3.43)	
Transp. Log. FS Items (private) IV					−0.397***
					(-3.43)
Obs.	3306	3306	3306	3306	3306
Adj. R2	0.689	0.906	0.936	0.689	0.689
Industry-Year FE	Yes	Yes	Yes	Yes	Yes
Investee-Year FE	Yes	Yes	Yes	Yes	Yes

Panel B. Business Register Implementations in Europe

	(1)	(2)	(3)	(4)
	Log. GPI Equity			
*Post Business Register * Investor Exposure*	−0.267***	−0.111***		
	(-4.46)	(-3.05)		
Post Business Register			−0.106***	−0.081**
			(-2.59)	(-2.15)
Transp. Log. FS Items (public)	0.339***	0.318***	0.026	0.200***
	(9.49)	(11.18)	(0.78)	(7.11)
Private Firm Proportion	0.076***	0.006**	−0.008*	−0.000
	(9.44)	(2.16)	(-1.74)	(-0.00)
Log. Private Firms Assets	−0.097**	−0.078***	−0.019	−0.050***
	(-2.05)	(-3.39)	(-0.77)	(-3.74)
Log. Median Size (Total Assets)	−0.117**	−0.023	0.020	0.048***
	(-2.16)	(-0.98)	(1.18)	(4.99)
ROA (private)	−0.747	−0.386	0.530*	−0.236*
	(-1.40)	(-1.54)	(1.90)	(-1.65)
ROA (public)	2.708***	2.935***	0.742***	0.981***
	(7.03)	(9.17)	(5.59)	(7.85)
Log. Revenue (all)	0.562***	0.165***	−0.111***	0.007
	(11.19)	(5.74)	(-3.71)	(0.46)
Median Stock Return	0.003***	0.003***	−0.000	0.001***
	(7.39)	(9.65)	(-0.11)	(8.93)
Obs.	36,874	66,360	36,874	66,360
Adj. R2	0.680	0.673	0.875	0.859
Sample	Europe	Full	Europe	Full
Industry-Year FE	Yes	Yes	Yes	Yes
Investee-Investor-Year FE	Yes	Yes	No	No
Investee-Investor-Industry FE	No	No	Yes	Yes

Notes: This table presents the results from regressing *Log. GPI Equity* on simulated instruments and regulatory shocks for private firm disclosure. In Panel A, *Scope (simulated)* is defined as the simulation-instrumented proportion of firms subject to reporting mandates, respectively, in each European investee-industry. In Panel B, *Post Business Register* is an indicator variable equal to one for years after the electronic business register starts to operate in a given investee-year and zero otherwise. *Investor Exposure* is the ratio of investor equity in an industry to the total equity invested across all industries multiplied by the ratio of private firms in an investee-industry to the total number of private firms across all industries in the investee country. In Panel B (investor-investee-industry-year unit of analysis), Columns (1) and (3) include only European investee countries. Columns (2) and (4) uses the full list of investee countries. Results for Columns (1) and (2) in Panel B imply a 12.0% and 24.2% (13.9% and 23.2%) greater reduction in demand for public equity for a (within-fixed effect) standard deviation increase in *Investor Exposure* after the implementation based on OLS (untabulated WLS) estimates, respectively. Results for Columns (3) and (4) in Panel B imply an 8.1% and 10.6% (10.2% and 10.9%) reduction in demand for public equity after the implementation based on OLS (untabulated WLS) estimates, respectively. The t-stats reported below the coefficient estimates in parentheses are computed based on standard errors clustered by investee-industry (investor-investee-industry in Panel B) and investee-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed). Definitions of all variables are in Appendix B.

Table 7 Panel A Column (1) shows a significantly negative relation between *Scope (simulated)* and *Log. GPI Equity* using a reduced-form regression (coefficient = −0.176; t-stat = −3.43).[28] We provide complementary results based on a two-stage least squares (2SLS) model using *Scope (simulated)* as an instrument. Specifically, Columns (2) and (3) provide first-stage estimates of regressing the actual scope of regulated firms, *Actual Scope*, on *Scope (simulated)* and regressing our private

[28] We follow the recommendation in deHaan (2021) and find that a one within-fixed effects standard deviation increase in *Scope (simulated)* (2.26) is associated with a reduction in demand for public equity of 32.8%. This effect size is comparable to Breuer and Breuer (2022) that document effects of 20% and 28% in the contexts of value-added and fixed capital formation, respectively.

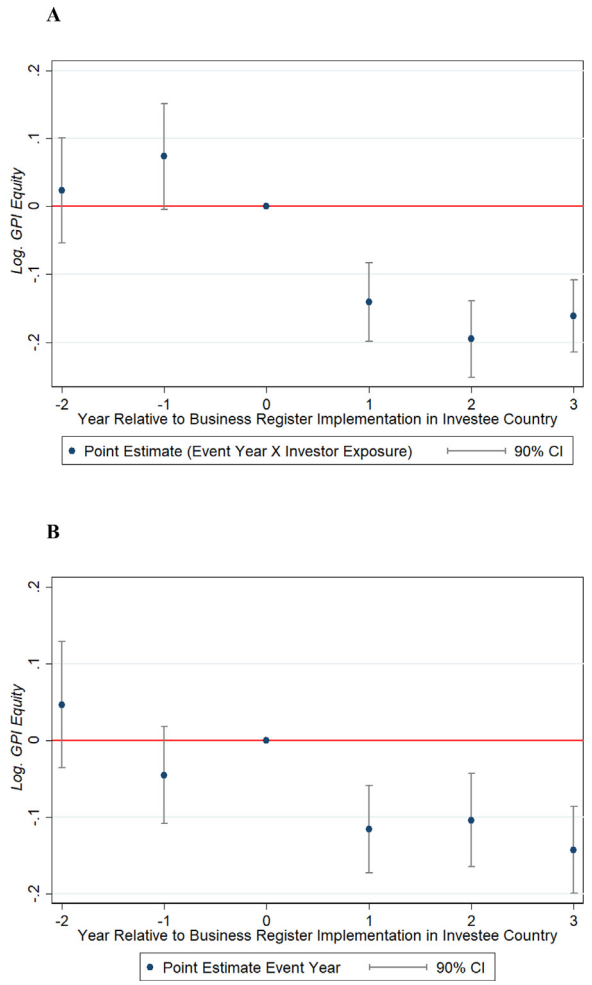

Fig. 5. Staggered Electronic Business Register Implementation. Panel A. Business Registration and Investor Exposure (Estimates based on Table 7 Panel B Column (2)), Panel B. Business Registration Implementation (Estimates based on Table 7 Panel B Column (4)), **Notes:** Panel A shows the event-time coefficient estimates of the treatment effect of the implementation of electronic business registers in a given investee country accounting for investors' exposure to an investee-industry (*Investor Exposure*) based on estimates in Table 7 Panel B Column (1). The unit of observation is at the investor-investee-industry-year level. An observation is treated in years after the implementation of electronic business registers in the investee country in a year (See Table A4 in the Internet Appendix). Panel B shows changes in global portfolio investment in public equity, *Log. GPI Equity*, measured by difference-in-differences coefficients from the staggered implementation of electronic business registers in investee countries (based on estimates in Table 7 Panel B Column (3)). We plot coefficients measuring these changes relative to the year of implementations for the two years prior to and three years after the implementation of business registers in a given investee country relative to the year of implementation. The coefficient estimates (blue circles) and their 90% confidence intervals depict values in *Log. GPI* in a year relative to the year of the business register implementation.

firm disclosure proxy on *Scope (simulated)*, respectively. We find a significant positive relation in both cases with an estimated coefficient of 0.403 (t-stat = 3.59) in Column (2) and 0.021 (t-stat = 2.59) in Column (3).[29] In Columns (4) and (5), we provide 2SLS estimates based on the first stage estimates in Columns (2) and (3) and find a significantly negative relation (coef. = −0.436; t-stat = −3.43 in Column (4); coef. = −0.397; t-stat = −3.43 in Column (5)), consistent with the main findings of this paper.[30]

4.4.3. Investors' Exposure to business register implementations

We exploit global investors' exposure to the implementation of electronic business registers in Europe to further help establish a causal link between private firm transparency and global investor demand for public equity. The implementation of these business registers represents European countries' efforts to reduce the costs of private firms to comply with accounting regulation, to facilitate the dissemination of private firm information (similar to that of the EDGAR implementation

[29] We find F-stats of 73.38 for Column (2) and 35.08 for Column (3), indicating that the instrument is strong.
[30] We scale the 2SLS estimates by their within-fixed effects standard deviation in Column (5) for dispositional purposes.

Table 8
Robustness tests.

	(1)	(2)	(3)	(4)	(5)
	Log. GPI Equity				
Transp Log. FS Items (private)	−0.433***	−0.447***	−0.626**		
	(-3.29)	(-2.92)	(-2.42)		
Transp Log. FS Items weighted (private)				−0.240***	
				(-2.95)	
Transp % FS Items					−0.064***
					(-5.33)
Log. Disclosing Private Firms					−0.101***
					(-3.69)
Obs.	5648	4241	2800	5648	5648
Adj. R2	0.753	0.733	0.768	0.761	0.763
Sample	No Domestic	Non-Zero Investee GPI	EU	Full	Full
Regression type	OLS	OLS	OLS	OLS	LASSO
Controls	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes
Investee-Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table presents the results from several robustness tests. Global portfolio investment in public equity is regressed on private firm transparency using different subsamples and different definitions of our independent variable of interest (*Transp Log. FS Items (private)*). In Column (1), we restrict the sample to foreign investor countries only. Column (2) keeps the investee-industries that receive non-zero equity investments during the sample period. Column (3) uses the sample with EU countries as investees. In Column (4), we weight our private firm transparency measure by size using disclosing firms' total assets, sales, and number of employees. In Column (5), we use the "intensive" (*Transp % FS Items*) and "extensive" (*Log. Disclosing Private Firms*) margin components of private firm transparency as the independent variables as discussed in Section 3.2.2. Column (5) is based on an inferential LASSO regression to assess the incremental importance of each variable of interest conditional on other covariates. For comparability, we scale both disclosure measures in Column (5) by their within-fixed effects standard deviation. The unit of observation is at the investee-industry-year level. All regressions include industry-year and investee-year fixed effects. The t-statistics reported below the coefficient estimates in parentheses are computed based on standard errors clustered by investee-industry and investee-year. ***, ***, * indicates statistical significance at 1%, 5%, and 10%, respectively (two-tailed). Detailed definitions of all variables are provided in Appendix B.

in the US), and to impose stricter enforcement of private firm disclosure mandates. Breuer and Breuer (2022) argue that the timing differences in register implementations across European countries are exogenous, lending support to the validity of identifying assumptions in a DiD design. Table A4 in the Internet Appendix provides details on the staggered implementation across the affected European countries.

We run two complementary tests using this setting. First, we estimate the following regression:

$$Log.\ GPI\ Equity_{i,j,n,t} = \mu_1 PostBusinessRegister_{j,t} * \ Investor\ Exposure_{i,j,n} + \beta_k \overline{X_{j,n,t-2}} + \delta_{i,j,t} + \gamma_{n,t} + \varepsilon_{i,j,n,t} \quad (3)$$

The unit of observation is at the investor country *i*, investee country *j*, investee industry *n*, and year *t* level. The indicator variable *PostBusinessRegister* equals to one in the years following the start of the operation of an electronic business register in given investee country *j* and year *t*. *Investor Exposure* is defined as the ratio of investor equity in an industry to the total equity invested across all industries multiplied by the ratio of private firms in an investee-industry to the total number of private firms across all industries in the investee country. This measure ranges from 0 to 100% and captures the idea that investors from investor country *i*, are differentially exposed to certain investee-industries *j,n* more than others, which should affect the extent to which the disclosure shock of an investee affects investors. Our coefficient of interest, μ_1, captures the differential change in global investor demand for public equity as a result of the electronic business register implementation in a European investee country for different levels of investors' exposure to this investee-industry. $\overline{X_{j,n,t-2}}$ is a vector of controls as described in Equation (1) of Section 3.3. As we use the investor-investee country pair dimension in our data to exploit investors' differential exposure to changes in private firm transparency, we can include investor-investee-year ($\delta_{i,j,t}$) and industry-year fixed effects ($\gamma_{n,t}$) as in our main tests.

Second, we run a complementary test using a standard difference-in-differences approach to capture the average effect of the implementation of electronic business registers on the demand for public equity in a given investee-industry. In these tests, the coefficient of interest captures the difference-in-differences estimate of the global investor demand for public equity as a result of the electronic business register implementation in a European investee country. Note that we do not use investee-year fixed effects in these tests because it would absorb our main coefficient of interest, *PostBusinessRegister*, which is defined at the investee-year level.

Table 7 Panel B show a significant negative relation between the interaction *Post Business Register*Investor Exposure* and *Log. GPI Equity* with an estimated coefficient of −0.267 (t-stat = −4.46) in Column (1) based on the sample of European investee countries and a coefficient of −0.111 (t-stat = −3.05) in Column (2) using the full sample of countries, including those that are outside of Europe as benchmark. These estimates imply an 11%–26% greater reduction in demand for public equity for

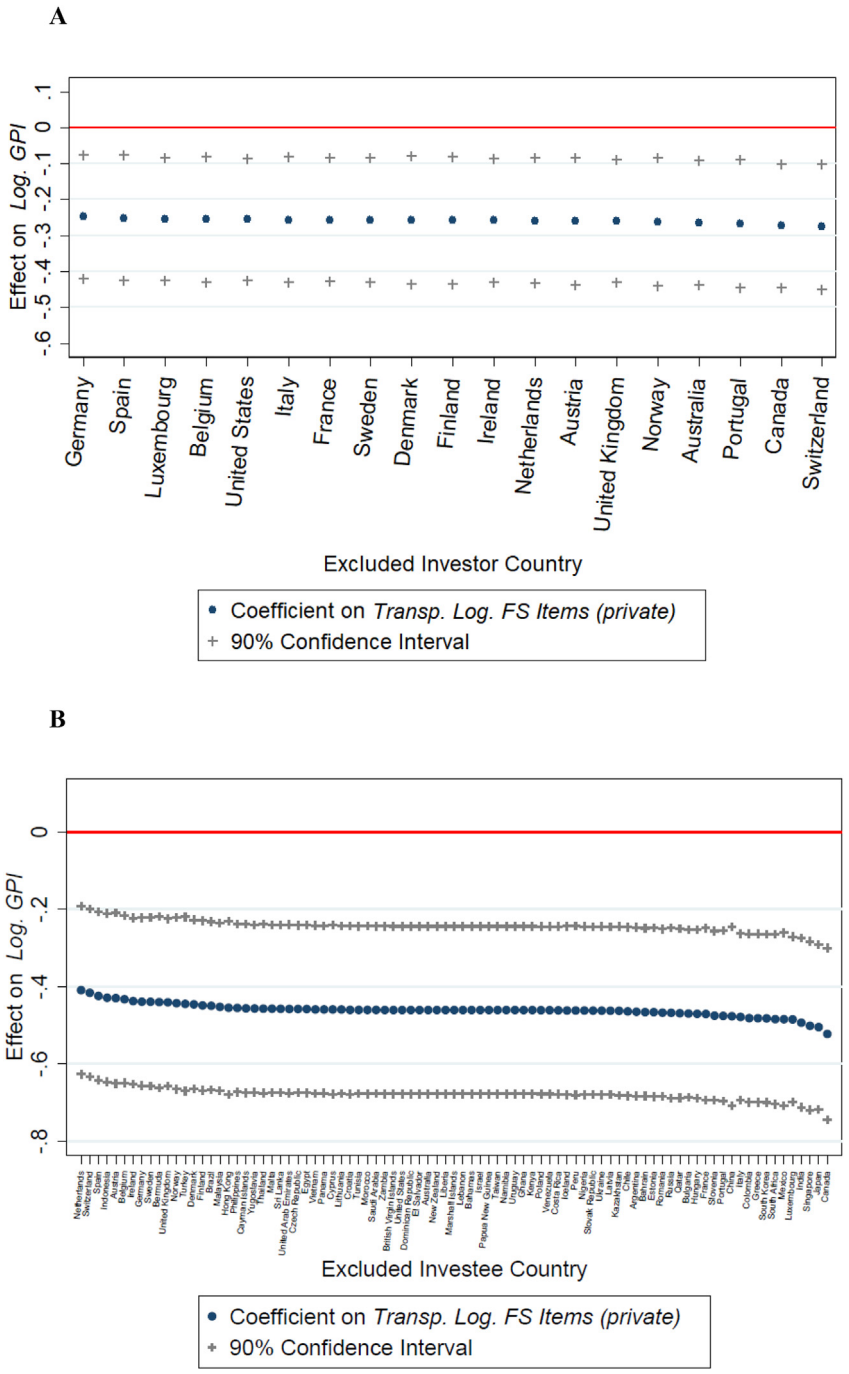

Fig. 6. Jackknife Robustness Tests, Panel A. Investor Countries, Panel B. Investee Countries, Notes: This figure shows the coefficient estimates and 90% confidence intervals from regressing global portfolio investment in public equity, *Log. GPI Equity*, on private firm transparency, *Transp. Log. FS Items (private)*, when excluding one investor or investee country from the analysis each time. Panel A plots the regression estimates when the investor country corresponding to the x-axis label is excluded from the sample. Point estimates are derived from a regression including control variables, investee-year and industry-year fixed effects, and the two-tailed 90% confidence intervals are based on standard errors clustered at the investee-industry-year and investee-year level. Panel B plots the regression estimates when the investee country corresponding to the x-axis label is excluded from the sample. Point estimates are derived from a regression including control variables, investee-year (investor-investee-year for Panel A) and industry-year fixed effects, and the two-tailed 90% confidence intervals are based on standard errors clustered at the investee-industry and investee-year level. Detailed definitions of all variables are provided in Appendix B.

a (within-fixed effect) standard deviation increase in *Investor Exposure* after the implementation of a business register.[31] The documented magnitudes seem reasonable when compared to Breuer and Breuer (2022) who show a 32% effect on employment using this setting. Similarly, Column (3) shows qualitatively similar effects using a standard difference-in-differences capturing the average effect of the shock.

In Fig. 5 Panels A and B, we plot the estimations in event-time to validate the parallel trends assumption and to test for effect dynamics (Barrios (2021)). Specifically, the graph in Panel A plots point estimates on the interaction term *Post Business Register*Investor Exposure* for the period from two years prior to the implementation of electronic business registers (t = -2) up to three years after the implementation (t = +3) with 90% confidence intervals. The graph shows evidence of no differential development in *Log. GPI* for different levels of *Investor Exposure* leading up to the year of the business register implementation and a consistent and significant response of *Log. GPI* to the business register implementation for more exposed investors, consistent with the regression results in Columns (1) of Table 7 Panel B. The graph in Panel B plots difference-in-differences point estimates for the period from two years prior to the implementation of electronic business registers (t = −2) up to three years after the implementation (t = +3) with 90% confidence intervals. Consistent with the staggered implementation of business registers being unrelated to trends in private firm transparency, we document insignificant effects around zero before t = 0. Taken together, we conclude that the negative relation between *Transp. % FS Items (private)* and *Log. GPI Equity* is unlikely to be spurious.

4.5. Robustness

We conduct several tests to validate the robustness of our results. Table 8 Column (1) shows that we continue to document a strong negative relation between private firm transparency and public equity demand using a sample exclusively based on demand of foreign investors, suggesting that results are not driven by domestic investors.[32] Column (2) shows that our results are robust to using a sample that excludes investee-industries that do not receive (or does not have data available for) global equity investment during our sample period. Column (3) shows that our results are qualitatively unchanged and economically more pronounced when using only EU investee countries which share a relatively homogenous regulatory environment. Column (4) demonstrates our results are statistically significant and economically somewhat less pronounced when weighting our transparency measure by firm size, suggesting that the totality of private firm disclosures, and not predominantly those of large firms, are relevant for global capital allocation decisions. In Column (5), we disentangle our aggregate private firm transparency measure into "intensive" and "extensive" margin components (see Section 3.2 and Appendix A). We find that both margins have incremental effects on public equity demand, with the extensive margin having somewhat stronger effects.[33] Finally, to assess whether our findings are driven by an undue influence of a single country (e.g., due to lower data quality or a disproportionate influence of certain countries) we conduct a jackknife analysis excluding each investor and investee country one at a time and re-running our main tests. Fig. 6 shows that our findings in Table 3 are robust to excluding investors (Panel A) and investees (Panel B) one at a time.

5. Conclusion

We study the effects of private firm disclosure on the demand for public firm equity. Using data on the global movement of public equity, we find that a one standard deviation increase in private firm disclosure transparency – proxied by the number of disclosed private firms' financial statement line items – *reduces* global investors' demand for public equity by 4.3% or $358 million in dollar terms at the investee-industry. Our results are consistent with private firm disclosures generating negative pecuniary externalities – global investors reallocate their capital away from public firms to more transparent private firms – and less consistent with these disclosures creating positive information externalities that would benefit public firms. Consistent with this interpretation, we find that the reduction in demand for public equity is offset by a comparable increase in capital allocation to more transparent private firms.

Our paper contributes to the emerging literature on private firm transparency by highlighting an important but underexplored externality of private firm disclosures on public firms' equity demand. By doing so, we extend the disclosure externality literature that has primarily focused on public firm disclosures, but less so on private firm disclosures, to date. Further, we contribute to the literature that examines the allocation of global capital by showing private firm disclosure is an

[31] Note that this design helps us compare the demand for public equity across investors but within the same investee country in a given year, while controlling for overall industry trends. These results, therefore, further alleviate concerns related to omitted correlated factors driving our results.

[32] It is potentially surprising that the estimated coefficient based on global portfolio investment by only foreign investors (i.e., −0.433) is slightly smaller than that of our full sample in Table 3 Column (2) (i.e., −0.461) that includes domestic investors because foreign investors are more likely informationally constrained given their "distance" to the investee country (see Section 4.2.3). In untabulated analyses we find a coefficient estimate of −0.660 examining portfolio investment of domestic investors only. However, domestic investors only comprise 15% of our sample and likely differ systematically from foreign investors in terms of sophistication and portfolio strategy. Moreover, the difference in coefficients between foreign and domestic investors is not statistically significant at conventional levels (p-value = 0.22).

[33] To estimate the incremental informativeness of the two components, we run an inferential LASSO regression including both components of disclosure. When we run a standard OLS, we find similar economic magnitudes but with weaker statistical significance for the intensive margin component in an untabulated test.

important determinant for global capital movements. Last, our private firm transparency proxy is broadly applicable and can be used in various international settings by future researchers.

Our findings, however, should be interpreted with a few caveats in mind. First, while our findings are suggestive, they are not conclusive evidence of investors *reallocating* public equity capital to private firms. While reallocation is an important part of our proposed narrative, the capital allocation decisions at the investor or transaction level are unobservable to us. Second, while our fixed effect structures, simulation, and difference-in-differences tests help us to conclude that the documented relation between private firm disclosures and public equity is not spurious, we cannot fully rule out the possibility that our proxy for private firm transparency is related to unobservable omitted correlated factors. Third, while it is reasonable to assume that a reduction in the demand for equity capital has a negative impact on public firms (and a positive impact on private firms who attract more capital) our findings cannot fully speak to the welfare implications of private firm disclosures without studying the impact on other stakeholders.

As a final thought, we think the idea that certain disclosures (e.g., private firm disclosures) can generate pecuniary externalities and reallocation effects is an underexplored, but potentially important, concept in the disclosure literature (e.g., Rauter (2020); Breuer (2021)). Exploring the existence of pecuniary externalities, in other settings of disclosure can be an interesting extension to our study, and may have significant implications for optimal disclosure policy and welfare analysis. An explicit structural estimation of the idiosyncratic vs. systematic effects of disclosure also might be a fruitful way to extend our paper. Relatedly, understanding the strategic disclosure responses by the public firms most severely affected by the negative pecuniary externalities can also extend our findings. We leave these considerations for future research.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jacceco.2022.101545.

Appendix A. Measurement of Private Firm Transparency

We define private firm financial reporting transparency based on the granularity of disclosed financial statement information following the intuition in Chen et al. (2015). BvD collects financial statement information on public and private firms from their publicly available disclosures which are predominantly available through domestic business registers (Kalemli-Özcan et al. (2019); Breuer (2021)). BvD then organizes the data in a standard financial statement format with consistent financial statement items labeled in English, following the most common financial reporting formats used in the European Union (Kalemli-Özcan et al. (2019); Pinto Ribeiro et al. (2010)) We rely on this standardized global financial statement format to measure the granularity of private firms' financial statements at the aggregate investee-industry-year level. Standardization is extremely useful in our context since it facilitates comparison of financial statement transparencies across investee countries that may have different formatting requirements of financial statement disclosures. There are 39 unique standardized financial statement items, 22 of which belong to the balance sheet, 10 of which belong to the income statement, and 7 of which are considered footnote disclosures.[34] The 39 line items are presented at the end of this section.

We note that our disclosure proxy is driven by two factors: i) the total number of private firms disclosing any type of financial statement information ("extensive" margin of disclosure) and ii) the average number of financial statement items disclosed by a private firm conditional on this firm disclosing financial reporting information ("intensive" margin of disclosure). Specifically, our disclosure measure (see also Section 3.2.2) can be decomposed as follows:

$$Trans.\ FS\ Items\ (private)_{j,n,t} = \sum_{k=1}^{N} Disclosed\ FS\ Items_{k,j,n,t} = \frac{\sum_{k=1}^{N} Disclosed\ FS\ Items_{k,j,n,t}}{39N} * \mathrm{N} * 39$$

where $\frac{\sum_{k=1}^{N} Disclosed\ FS\ Items_{k,j,n,t}}{39N}$ represents the "intensive margin" effect of disclosure, N represents the "extensive margin" effect of disclosure (i.e., the number firms that disclose at least one financial statement item), and "39" the maximum number of line items a firm can disclose. In this sense, our disclosure proxy (also as discussed in Section 3) captures both the intensive and extensive margin effects of disclosure, which we argue are likely to be both important in influencing global investor behavior.

We also note that BvD is the industry leader in collecting, standardizing, and disseminating company information, in particular of private firms around to world, including developing countries and tax havens (De Simone and Olbert (2022); Hoopes et al. (2022)). BvD's dominance in the business of providing data to investors mean that it likely closely mimics the information availability for investors. Specifically, BvD regularly wins awards for providing the "best entity data solution" through its Orbis database in particular. The Orbis database is recognized with this award because it enables its commercial clients to make "faster decisions (…) amid the continuing economic uncertainty" (https://www.businesswire.com/news/home/20201210005488/en/). Because BvD is the industry leader with its Orbis database, Moody's Analytics decided to acquire BvD in 2017 for more than USD $3.5 billion (https://www.ft.com/content/e0a39012-395c-11e7-ac89-b01cc67cfeec).

[34] There are more than 39 variables available in the Orbis database. However, these variables are constructed by BvD based on the information of the collected data that were classified according to the 39 financial statement items (for instance, the *EBITDA* variable is EBIT plus depreciation, or the *Cash Flow* variable is EBT plus depreciation).

When justifying the purchase price and describing their newly acquired business, Moody's stated in their 2017 annual report that “Bureau van Dijk aggregates, standardizes and distributes one of the world's most extensive private company datasets. We are very pleased to be able to add this successful and highly complementary business, which builds on Moody's role as a global provider of credit risk measures and analytical insight.”

The 39 Standardized Financial Statement Items Observable in Orbis.

Balance Sheet Items	
Fixed Assets	Equity Funds
Fixed Assets: Intangibles	Equity Capital
Fixed Assets: Tangibles	Equity Funds Other
Fixed Assets: Other	Noncurrent Liabilities
Current Assets	Noncurrent Liabilities: Long-term Debt
Current Assets: Stock	Noncurrent Liabilities: Other
Current Assets: Receivables	Current Liabilities
Current Assets: Other	Current Liabilities: Loans
Cash	Current Liabilities: Creditors
Total Assets	Current Liabilities: Other
	Provisions
	Total Equity and Liabilities
Income Statement (P&L) Items	***Footnote Disclosure Items***
Revenue	Number Employees
Costs of Goods Sold (COGS)	Export Revenue
Gross Profit	Labor Expenses
Operating Expenses	Material Expenses
Earnings Before Interest and Taxes (EBIT)	Depreciation & Amortization
Financial Revenue	Interest Expense
Financial Expenses	R&D Expense
Earnings Before Taxes (EBT)	
Tax Expense	
Net Income	

Appendix B. Variables Definitions

Name	Definition	Source
Dependent Variables		
Log. GPI Equity	Natural logarithm of one plus global portfolio investments in equity (i.e., GPI Equity). GPI Equity is defined as investment positions in public equity of firms in a given investee-industry-year held by investors from around the world as developed by Coppola et al. (2021). Positions are in USD millions at the end of December.	GCAP
Log. M&A Total Assets	Natural logarithm of the sum of total assets of private target firms of M&A transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Log. M&A Equity	Natural logarithm of the sum of book equity of private target firms of M&A transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Log. M&A Mean Total Assets	Natural logarithm of the average total assets of private target firms of M&A transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Log. PE Total Assets	Natural logarithm of the sum of total assets of private target firms of private equity transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Log. PE Equity	Natural logarithm of the sum of book equity of private target firms of private equity transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Log. PE Mean Total Assets	Natural logarithm of the average total assets of private target firms of private equity transactions in a given investee-industry-year acquired by investors from around the world.	BvD Zephyr & Orbis
Private Firm M&A/PE Acquisition (0/1)		BvD Zephyr

(*continued*)

Name	Definition	Source
	An indicator taking on the value of 1 in the year a private firm is acquired in an M&A transaction or funded in a PE transaction by global investors.	
Independent Variables		
Transp. Log. FS Items (private)	Private firm financial transparency defined as the natural logarithm of the number of non-missing financial statement line items disclosed by private firms in each investee-industry-year.	BvD Orbis
Transp. % FS Items (private)	Intensive margin of private firm financial transparency defined as the number of non-missing financial statement line items disclosed by private firms in each investee-industry-year, divided by the total number of line items that these private firms can hypothetically disclose conditional on each private firm preparing and publishing financial statements (as proxied by the observability of at least one financial statement item). The hypothetical full disclosure is based on 39 standardized financial statement items.	BvD Orbis
Log. Disclosing Private Firms	Extensive margin of private firm transparency defined as the natural logarithm of the total number of private firms with at least one financial statement item observable in a given investee-industry-year.	BvD Orbis
Transp. Log. BS Items (private)	Natural logarithm of the number of non-missing balance sheet line items disclosed by private firms in each investee-industry-year.	BvD Orbis
Transp. Log. PL Items (private)	Natural logarithm of the number of non-missing profit and loss statement (i.e., income statement) line items disclosed by private firms in each investee-industry-year.	BvD Orbis
Transp. Log. Footnote Items (private)	Natural logarithm of the number of non-missing numerical footnote items disclosed by private firms in each investee-industry-year.	BvD Orbis
Transp. Log. Total FS Items weighted (private)	Same as *Transp. Log. FS Items (private)* but weighted by total assets, sales, and the number of employees of disclosing private firms (where total assets, sales, and the number of employees contribute 1/3 of the weight, respectively).	BvD Orbis
Firm Transp. Log. FS Items (private)	A firm-specific version of our private firm transparency measure. It is defined as the natural logarithm of the number of non-missing financial statement line items disclosed by an individual private target firm in a given year.	BvD Orbis
Firm Log. Total Assets (private)	Natural logarithm of the individual firm's total assets.	BvD Orbis
Private Firm Proportion	Ratio of private firms with observable financial statements in Orbis to all (public and private) firms with observable financial statements in Orbis.	BvD Orbis
Log. Total Assets (private)	Natural logarithm of the sum of total assets of private firms in each investee-industry-year.	BvD Orbis
Log. Median Size (Total Assets)	Natural logarithm of an investee-industry-year's median private firm's total assets.	
ROA (private)	Aggregate return on assets (ROA) of *private* firms of a given investee country-year defined as the sum of *private* firms' net income over the same firms' total assets.	BvD Orbis
ROA (public)	Aggregate return on assets (ROA) of public firms of a given investee country-year defined as the sum of public firms' net income over the same firms' total assets.	BvD Orbis
Log. Revenue (all)	Logarithm of the sum of revenues of all firms (public and private) in a given investee-industry-year.	BvD Orbis
Median Stock Return	The median public firm stock return in a given investee-industry-year.	Worldscope
Scope (Simulated)	The share of simulation-instrumented firms exceeding the regulatory size thresholds for mandated financial reporting of a given investee country-year.	BvD Orbis, Breuer (2021)

(*continued on next page*)

(*continued*)

Name	Definition	Source
Cross-sectional Variables		
Capital Control	An indicator variable equal to 1 if the product of investor country's capital control index and investee country's capital control index – as developed by Fernández et al. (2016) - is in the top quartile for each investee, and 0, otherwise. The index is based on 10 categories that include the strictness in controlling global equity, financial credits, direct investments, among others. To compute a country's strictness, we follow Fernández et al. (2016) and average across the scores (that range from 0 to 1) assigned to each category.	Fernández et al. (2016).
PE Mean Size	An indicator variable equal to 1 if the mean private equity fund size in an investee-year is in the top quartile and 0 otherwise. Private equity fund size is the average size of PE funds (in $ million).	Preqin
Language Distance	An indicator variable equal to 1 if the first principal component of non-common official language and general language difference indices (bilateral between investor and investee countries) based on the natural logarithm specification and level specification – as developed by Mayer and Zignago (2011) and Melitz and Toubal (2014) – is in the top quartile for each investee, and 0 otherwise.	CEPII
Post Business Register	An indicator variable equal to 1 for years after the electronic business register starts to operate in a given investee country in a given year and 0 otherwise.	Breuer and Breuer (2021)
Post BvD Office (Investee)	An indicator variable equal to 1 for years after the BvD opened an office in a given investee country.	Hand collection
Log. Reg. Asset Size Threshold Assets	Natural logarithm of the regulatory financial disclosure thresholds in EU countries in terms of total asset size.	Breuer (2021) and hand-collection
Investor Exposure	The ratio of investor equity in an industry to the total equity invested across all industries multiplied by the ratio of private firms in an investee-industry to the total number of private firms across all industries in the investee country.	GCAP & BvD Orbis
Macro Variables		
FDI (% of GDP)	Net foreign direct investment inflow divided by the gross domestic product in a given investee country and year.	World Bank
Log. Country GDP	Natural logarithm of the gross domestic product in a given investee country and year.	World Bank
Log. Population	Natural logarithm of the total population in a given investee country and year.	World Bank

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