Uneven Regulation and Economic Reallocation: Evidence from Transparency Regulation

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Abstract

We investigate the impact of uneven transparency regulation across countries and industries on the location of economic activity. Using two distinct sources of regulatory variation—the varying extent of financial-reporting requirements and the staggered introduction of electronic business registers in Europe—, we consistently document that direct exposure to transparency regulation is negatively associated with the focal industry's economic activity in terms of inputs (e.g., employment) and outputs (e.g., production). By contrast, we find that indirect exposure to supplier and customer industries' transparency regulation is positively associated with the focal industry's economic activity. Our evidence suggests uneven transparency regulation can reallocate economic activity from regulated toward unregulated countries and industries, distorting the location of economic activity.

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1. Introduction

The regulation of economic activity varies across the globe (e.g., Nicoletti & Scarpetta 2014). An important concern with such uneven regulation is that it creates a wedge between regulated and unregulated firms (e.g., in the cost of doing business), possibly putting regulated firms at a competitive disadvantage. As a result, uneven regulation can reallocate economic activity from more toward less regulated countries and industries, distorting the location of economic activity and undermining the effectiveness of regulation (e.g., Besley & Burgess 2004; Crépon *et al.* 2013; Rotemberg 2019).

The concern about a possible reallocation of economic activity away from regulated countries and industries is particularly pertinent for uneven transparency regulation (e.g., McLeay 1999; ICAEW 2013). Transparency regulation, which requires the publication or dissemination of financial information, is frequently imposed on firms to level the informational playing field vis-à-vis their stakeholders (e.g., investors; La Porta *et al.* 2006). Its extent, however, varies substantially across countries and industries, creating an uneven regulatory playing field (e.g., Leuz 2010). Importantly, compared to other regulations (e.g., taxation), the uneven regulatory playing field created by transparency regulation can be expected to create a widened wedge between regulated and unregulated firms, because transparency regulation may not only hurt regulated firms by imposing costs of transparency (e.g., loss of proprietary information), but also benefit unregulated firms by providing them with relevant information (e.g., through information spillovers).[1]

In this paper, we empirically investigate the impact of uneven transparency regulation across countries and industries on the location of economic activity. We proceed in two steps. We first

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[1] Firms frequently voice concerns about competitive disadvantages vis-à-vis peers located in less regulated countries and industries. In response to a major reform of the enforcement of corporate disclosures, German firms, for example, lament the loss of proprietary information to their competitors, employees, suppliers, and customers in an article of the business newspaper *Handelsblatt*. The firms explicitly worry about a competitive disadvantage vis-à-vis other firms operating in countries with laxer disclosure enforcement (Handelsblatt 2010). For more anecdotal evidence, see Section 3.3.

decompose the impact of transparency regulation on firms' economic activity (e.g., production and employment) into the direct effect of being regulated and the indirect effect of information spillovers from other, related firms' being regulated. Equipped with these conceptually distinct effects, we can, in a second step, examine the implications of observed differences in transparency regulation across countries and industries for the location of economic activity. A re-allocative effect of uneven transparency regulation would manifest in reduced economic activity in more regulated countries and industries (i.e., a negative direct effect) and increased activity in less regulated, but related countries and industries (i.e., a positive indirect effect).

As our empirical testing ground, we focus on the varying extent and timing of financial-reporting regulations in Europe. Since the 1980s, the EU Accounting Directives require limited-liability firms to publicly disclose a full set of financial statements comprising a balance sheet, an income statement, and a management report. To reduce the regulatory burden for smaller private firms, the directives grant exemptions from full reporting requirements for firms below firm-size thresholds related to total assets, sales, and the number of employees, allowing these firms to markedly reduce their public disclosure. While the EU sets maximum exemption thresholds to prevent countries from fully exempting all firms, EU countries can elect to implement lower thresholds, exempting fewer firms than maximally allowed by the EU. This option has led to notable variation in the level of exemption thresholds across countries (Minnis & Shroff 2017; Bernard *et al.* 2018). Similar variation also exists in countries' implementation of centralized electronic business registers, which facilitate the dissemination of firms' financial statements. While the EU required its member countries to implement such electronic registers by January 1st of 2007 at the latest, the actual introduction dates vary substantially across countries. Some countries already had pre-existing registers in place before the effective dates of the EU directive, while others only started their registers at or after the

implementation deadline (e.g., due to slow political and organizational processes or late EU accession) (similar to Christensen *et al.* 2016).

We exploit the variation in exemption thresholds and business registers to identify the re-allocative impact of uneven transparency regulation on economic activity. To assess both the direct and indirect effect of these sources of regulatory variation, we construct two measures of regulatory exposure: the exposure of firms in a given country-industry combination (hereafter referred to as the focal industry) and the exposure of related firms. Equipped with these two exposure measures, we can simultaneously investigate both the direct and indirect effects of uneven transparency regulation, which is crucial for examining its re-allocative effects. Controlling for the related firms' exposure, the focal industry firms' own exposure captures the direct impact of regulating the focal industry, excluding offsetting spillovers from related firms. The related firms' exposure, by contrast, captures the indirect effect of regulating related firms on the focal industry's firms.

We construct direct and indirect exposure measures for our two sources of regulatory variation. Using the exemption-threshold variation, we calculate a focal industry's direct exposure as the share of firms subject to full reporting requirements (i.e., exceeding the exemption thresholds) in the respective country-industry.[2] To obtain the indirect exposure of the focal industry's related firms, we exploit input ("supplier") and output ("customer") linkages, following Smarzynska Javorcik (2004). Using global input-output matrices, we calculate a focal industry's supplier (customer) exposure by summing up the shares of firms subject to full reporting requirements in all countries and industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry. We proceed similarly with the business-register variation. We calculate a focal industry's direct exposure

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[2] Following the approach in Breuer (2021), we use one Europe-wide firm-size distribution per industry in calculating the shares of firms subject to full reporting requirements. This approach is a variant of the popular Bartik approach (Goldsmith-Pinkham *et al.* 2020; Breuer 2022). It reduces concerns about endogenous differences and change in firm sizes (e.g., due to industrial policies) confounding our regulatory exposures. For more detail, refer to Section 4.1.

as a dummy variable indicating whether the focal industry's country operates a business register in a given year. To obtain the focal industry's indirect supplier (customer) exposure, we sum up the dummy variables of all country-industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry.

Using the threshold-based regulatory exposures, we find that direct exposure to transparency regulation (i.e., the share of firms subject to full reporting requirements in the focal industry) is negatively associated with the focal industry's economic activity in terms of inputs (employment, capital formation) and outputs (value added, production). By contrast, we find that indirect exposure to supplier or customer industries' transparency regulation is positively associated with the focal industry's economic activity. To unpack the indirect spillover impact, we split the supplier and customer exposures into separate exposure measures for domestic vis-à-vis foreign supplier and customer industries. Equipped with these separate exposure measures, we find some evidence that transparency regulation levied on foreign supplier industries is positively associated with the focal industry's economic activity. In addition, we find evidence that transparency regulation levied on customer industries, both domestic and foreign, is positively associated with a focal industry's economic activity. The effect is strongest for domestic customer industries though, consistent with predominantly local output markets of focal industries.

Using the business-register exposures, we find similar results. Operating a centralized electronic business register in a focal industry's country is negatively associated with the focal industry's economic activity. By contrast, the operation of such registers in a focal industry's supplier and customer industries is positively associated with a focal industry's economic activity.

Across both sources of regulatory variation, our main results show evidence consistent with notable re-allocative effects of uneven transparency regulation. Transparency regulation levied on a

focal industry appears to reduce the focal industry's economic activity in terms of inputs and outputs. By contrast, transparency regulation levied on a focal industry's customer and supplier industries appears to increase the focal industry's economic activity. The reallocation along the supply chain appears strongest within industries and countries. Still, we not only find evidence of reallocation within regulated industries, but also across industries and countries.

Cross-sectional tests suggest that the re-allocative effect varies with the type of goods and services produced in a given industry and the geographical and linguistic distance to other countries. In particular, we find that the reallocation of economic activity away from regulated industries is strongest for industries producing tradable and homogeneous goods. We also find that the reallocation toward other countries is strongest for countries that are geographically closer and use similar languages. These cross-sectional results support the notion that uneven transparency regulation reallocates economic activity by allowing suppliers, customers, and competitors to learn about profitable markets and compete in them (e.g., via exporting tradable goods).

Collectively, our results are consistent with concerns raised by firms, regulators, and academics that uneven transparency regulation creates winners and losers (e.g., McLeay 1999; Handelsblatt 2010; ICAEW 2013; De Fontenay 2017). While the resulting reallocation appears to be strongest among firms in the same industry and country, it also appears to spill across country boundaries, especially in the case of tradable industries. As a result, uneven transparency can distort the location of economic activity in Europe. To gauge the extent of such distortions, we map out the impact of transparency regulation on economic activity for each European country in our sample. To this end, we combine each country's relative regulatory strictness with our coefficient estimates to quantify the impact, as implied by our estimates. This back-of-the-envelope quantification shows several winners (e.g., Germany) and losers (e.g., France). Notably, the winners gain at the expense of the losers because they impose *lower* transparency standards and free-ride on other countries' higher standards. This

uneven incidence of the costs and benefits of countries' transparency regulation creates incentives for national regulators to lower transparency standards, spurring a race to the bottom. Hence, regulatory coordination across countries may be necessary to sustain minimum levels of transparency (see also De Fontenay 2017). The EU's regulatory framework with its maximum exemption thresholds can be viewed as one such coordination attempt, albeit an imperfect one.

Our aggregate results summarize the many possible channels through which the reallocation of economic activity may work at the firm level. Thus, they provide a quantification of regulatory reallocation which is arguably most relevant for regulators. At the same time, the aggregate results necessarily mask the various concrete actions firms take in response to regulation. Importantly however, our aggregate results align well with recent firm-level evidence on firms' specific reactions to their own or other firms' transparency regulation. Consistent with a negative direct effect, Bernard (2016), Bernard *et al.* (2018), and Laschewski and Nasev (2018), among others, show that regulated firms lose market share and try to avoid transparency regulation by managing their size around the regulatory thresholds or shifting to less regulated markets (e.g., switching legal forms). In addition, Badertscher *et al.* (2013), Shroff *et al.* (2017), Yang (2019), Barrios *et al.* (2021), Bernard *et al.* (2020), Breuer (2021), and Glaeser and Omartian (2022), among others, document that other firms' transparency regulation helps peer firms' financing, investment, export, and entry decisions, consistent with a positive indirect effect.

Our study contributes to the literature on the economic consequences of transparency regulation (e.g., Ben-Shahar & Schneider 2014; Loewenstein *et al.* 2014; Leuz & Wysocki 2016). Prior studies examine the differential impact of transparency regulation on regulated *relative* to unregulated firms (e.g., Christensen *et al.* 2013; Bernard 2016; Breuer *et al.* 2018; Granja 2018) or the aggregate impact on both regulated *and* unregulated firms (e.g., Breuer 2021). In the presence of spillovers, the regulatory effects in these studies comingle the direct impact and the indirect impact of transparency

6

regulation (Glaeser & Guay 2017). By contrast, we explicitly disentangle the two distinct impacts, following recent guidance for handling spillovers in research designs (Berg *et al.* 2021). We find evidence of a negative direct effect and a positive indirect effect. These countervailing forces suggest that transparency regulation does not unambiguously help or hurt aggregate economic activity but primarily reallocates economic activity, in line with the muted aggregate effect in Breuer (2021).

Our study also contributes to the burgeoning literature on spillovers from peer firms' reporting (e.g., Badertscher *et al.* 2013; Shroff *et al.* 2017; Barrios *et al.* 2021; Glaeser & Omartian 2022). The literature shows ample evidence of benefits enjoyed by other firms, such as private firms and foreign competitors, because of U.S. public firms' regulated reporting. Those third-party benefits are often taken to suggest that transparency regulation may be called for. Our study cautions against this interpretation. By jointly examining the direct and indirect effects of transparency regulation, we not only show the existence of spillover benefits but also identify their origin. Our evidence suggests the indirect benefits primarily represent a transfer from the directly regulated firms, not a costless externality resulting in Pareto improvements. In this vein, our study uncovers a close connection between one firm's proprietary cost of reporting and another firm's information spillover benefit.

Our study complements recent studies on the re-allocative effects of transparency regulation. Breuer *et al.* (2021a), Rauter (2020), and Breuer *et al.* (2021b), for example, show that such regulation can re-allocate disclosure, investment, and innovation activities across firms.[3] Our study extends this nascent stream of the literature in several ways. First, it comprehensively investigates economic reallocation by examining first-order measures of aggregate economic activity such as employment,

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[3] Recent evidence in Kim and Olbert (2022) suggests that private-firm transparency can reallocate financial capital from public toward private firms. Our evidence suggests that these financing benefits appear to fall short of regulated firms' costs of transparency, resulting in a (net) negative direct effect on real quantities (e.g., production and tangible capital). This interpretation aligns with evidence in Breuer *et al.* (2021b) showing that regulated private firms experience financing benefits but nevertheless reduce their innovation activity.

capital formation, and production. Second, it considers domestic, but also cross-border reallocation. Lastly, it emphasizes the importance of reallocation of economic activity along the supply chain due to spillovers to and from economically linked suppliers and customers, not just competitors.

2. Conceptual Underpinnings

Corporate transparency can impact economic activity through various channels (Bushman & Smith 2001). It can help economic activity by reducing adverse selection concerns, which hamper the allocation of resources in input and output markets (Akerlof 1970; Fuchs *et al.* 2016). Similarly, it can speed up economic activity by resolving uncertainty, which holds back irreversible investments (Dixit & Pindyck 1994; Ferracuti & Stubben 2019; Roychowdhury *et al.* 2019). It can further improve the efficiency of economic activity by alleviating agency issues (Greenstone *et al.* 2006; Hope & Thomas 2008). Corporate transparency, however, can also hurt economic activity through the loss of proprietary information to firms' business partners (e.g., customers and suppliers) and competitors, which discourages investments and innovation (Breuer *et al.* 2021b).

In choosing their transparency level, firms trade off the private benefits (e.g., better financing) and costs (e.g., proprietary costs) of transparency (Beyer *et al.* 2010). Firms with high external financing needs, for example, tend to adopt high levels of transparency, allowing them to obtain competitive funding from a dispersed set of capital providers. By contrast, firms with high proprietary costs tend to adopt lower levels of transparency, resorting to private channels and relationships to bridge information frictions and obtain financing.

Firms' transparency can also benefit other firms. It, for example, can help other firms obtain cheaper financing (e.g., Garmaise & Natividad 2016; Shroff *et al.* 2017) and spot better investment opportunities (e.g., Badertscher *et al.* 2013). The existence of such information spillovers is often offered up as a justification for transparency regulation. Such regulation typically requires that firms'

transparency level meets or exceeds a given minimum level. It aims to prevent firms from privately choosing transparency levels that fall short of the social optimum due to neglected market-wide benefits (Dye 1990; Admati & Pfleiderer 2000; Leuz & Wysocki 2016).

The presence of information spillovers not only motivates transparency regulation but also complicates its analysis. Due to spillovers, the impact of transparency regulation on a given firm is a function of both, the regulation's direct effect on the firm and its indirect effect resulting from other regulated firms' information spillovers. Following Berg *et al.* (2021), we can express the net impact as:

$$\beta_i = \beta_{1i} T_i + \sum_{j \neq i}^{N-1} \beta_{2ij} T_j \,,$$

where β_i denotes the firm-level net impact on firm i; β_{1i} is the direct impact of the regulation; T_i is an indicator taking the value of one if firm i is regulated; β_{2ij} is the indirect impact of firm j on firm i; T_j is an indicator taking the value of one if firm j is regulated; and N is the number of firms in the economy.

Summing over all firms, we obtain the impact of transparency regulation at the aggregate level:

$$\sum_{i=1}^{N} \beta_i = \sum_{i=1}^{N} \left(\beta_{1i} T_i + \sum_{j \neq i}^{N-1} \beta_{2ij} T_j \right) \Rightarrow \beta = \beta_1 \overline{T_i} + \beta_2 \overline{T_j} \,,$$

where β denotes the aggregate net impact; β_1 is the aggregate direct impact of the regulation; $\overline{T_i}$ is the share of regulated firms; β_2 is the indirect impact of all other regulated firms; $\overline{T_j}$ is the share of other regulated firms. These aggregate impacts conveniently combine firms' heterogeneous responses, resulting in a meaningful quantification of the aggregate direct and indirect impacts.[4]

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[4] Assuming, for simplicity, that all firms exhibit the same direct ($\beta_{1i} = \overline{\beta}_1$) and the same indirect effects ($\beta_{2ij} = \overline{\beta}_2$), we obtain: $N\overline{\beta} = N\overline{\beta}_1 \frac{1}{N} \sum_{i=1}^{N} T_i + N(N-1)\overline{\beta}_2 \frac{1}{N(N-1)} \sum_{i=1}^{N} \sum_{j \neq i}^{N-1} T_j$. This simplification permits an intuitive interpretation of

We expect the aggregate direct impact of transparency regulation to be negative ($\beta_1 < 0$) because the regulation directly affects only those firms that are regulated *and* not already voluntarily transparent. Those tend to be firms with low external financing needs or high proprietary costs. By revealed preference, they view the private benefits of additional transparency as falling short of the corresponding costs. The aggregate direct impact could, of course, also be positive. The literature, for example, suggests transparency regulation can improve firms' access to financing due to the commitment value of mandated disclosures (Leuz 2010; Cheng *et al.* 2013). It further suggests transparency regulation can enhance firms' efficiency (e.g., value added) by reducing agency issues (Bushman & Smith 2001; Greenstone *et al.* 2006). These justifications for regulation require though that private disclosure and governance mechanism are less effective than transparency regulation in reducing information and agency frictions.

In contrast to the direct impact, we expect the aggregate indirect impact of transparency regulation to be positive ($\beta_2 > 0$) because the literature provides several examples of positive information spillovers (e.g., Foster 1981; Badertscher *et al.* 2013; Kim 2020). The indirect impact could, however, also be negative. Spillovers could, for example, lead to a diversion of scarce resources from other firms toward regulated firms (Fishman & Hagerty 1989) or mislead firms' investment decisions (Beatty *et al.* 2013). Accordingly, the signs and magnitudes of both the aggregate direct and indirect impacts of transparency regulation are ultimately empirical matters.

The relative signs of the direct and indirect impacts are key to understanding the consequences and desirability of transparency regulation (Figure 1) (Roychowdhury *et al.* 2019). If both, the direct and indirect effects were (weakly) positive, regulation would result in a Pareto improvement. It would

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the aggregate direct and indirect impact as the sums of the average direct impact ($\beta_1 = N\bar{\beta}_1$) and the average indirect impact ($\beta_2 = N(N-1)\bar{\beta}_2$), respectively.

either directly help regulated firms or indirectly help other firms through spillovers, or both at the same time. By contrast, if the direct impact were negative and the indirect impact were positive, as we expect, regulation would primarily reallocate economic activity instead of clearly benefit it. It would suggest that spillovers, often offered up as an important justification for regulation, do not come for free. They would primarily represent a reallocation of economic activity from regulated to other firms instead of an additional benefit, which firms neglect in their private transparency decision.

The potentially opposing effects of transparency regulation on directly regulated and indirectly affected firms raise concerns about distortive effects of uneven transparency regulation (Max-Planck-Institute 2009). Notably, transparency regulations are frequently uneven in that they directly affect only a select group of firms. Transparency regulations, for example, differ starkly across firm sizes (e.g., small versus large firms), legal forms (limited vs. unlimited firms), capital-market orientation (private vs. public firms), industries, and countries. These differences can lead to economically similar firms facing substantially different regulatory impacts: regulated firms may lose, whereas unregulated firms may gain (ICAEW 2013). Regulated firms, for example, incur preparation and proprietary costs. Unregulated firms, by contrast, can not only save on the regulatory costs, but also benefit from the regulated firms' transparency (e.g., free-riding on spillovers of regulated firms). The opposing incidence of uneven transparency regulation, accordingly, could result in a notable reallocation of economic activity across firms, industries, and even countries.

3. Institutional Background

3.1. Threshold-based Reporting

Since the 1980s, the Fourth and Seventh Directives, called the EU Accounting Directives, regulate firms' financial reporting in Europe (Haller 2002). They aim at fostering economic activity in the European internal market by ensuring the availability of comparable financial information across

the European countries (Van Hulle 1992; McLeay 1999). They require public and private limited-liability firms to publicly disclose a full set of financial statements comprising a balance sheet, an income statement, and a management report. To reduce the regulatory burden for smaller firms, substantial exemptions from the full reporting requirement are granted to private firms below firm-size thresholds related to total assets, sales, and number of employees. Smaller firms are typically those not exceeding two or more of the three size criteria, where the typical thresholds are about 4 million Euros in total assets, 8 million Euros in sales, and 50 employees. The reporting exemptions allow the smaller firms to markedly reduce the public disclosure of their financial information. Typically, they must publicly disclose only highly abbreviated financial statements without a management report. In some countries (e.g., United Kingdom (UK)), smaller firms can also omit income statements from their public disclosure. Figure 2 provides an illustrative example for a UK firm, which was only required to file abbreviated financial statements in 2014, whereas it was required to file full financial statements in 2015. It shows a stark difference in the amount of financial information available to the public.

While the EU sets maximum exemption thresholds to prevent countries from fully exempting all firms from full reporting requirements, EU countries can elect to implement lower thresholds, exempting fewer firms than maximally allowed by the EU. This option has led to notable variation in the level of exemption thresholds across countries (Minnis & Shroff 2017). We exploit this exemption-threshold variation as one source of variation in transparency regulations in Europe.

3.2. Electronic Business Registers

To further harmonize the information environment across the European countries, the EU introduced Directive 2003/58/EC in 2003, which requires that each EU member state implements a centralized electronic business register (European Parliament 2003). These business registers should ease the electronic filing of limited-liability firms' mandated financial statement disclosures and their

dissemination to the interested public (e.g., creditors, suppliers, customers, employees, and competitors) (in the spirit of Djankov *et al.* 2007). The electronic one-stop access provides a stark improvement over prior practices in several countries. In Germany, for example, limited-liability firms filed hard-copies of their financial statements with local courts and published them in paper-based newspapers, limiting the interested public's ease and speed of information access.

The EU required its member countries to implement the electronic registers by January 1st of 2007 at the latest. The actual introduction dates vary substantially across countries though. Some countries already had pre-existing electronic registers in place before the ratification or effective dates of the directive, while others only started their registers at or after the implementation deadline (e.g., due to slower political and organizational processes or late EU accession). We use this business-register variation as our second source of variation in transparency regulations in Europe.

3.3. Concerns about Regulation and Reallocation

The uneven regulation of transparency across EU member states concerns firms, regulators, and academics alike (e.g., Max-Planck-Institute 2009; ICAEW 2013). In *Accounting Regulation in Europe* (McLeay 1999), a comprehensive book taking stock of the EU's accounting directives and the member states' particular implementations, Professor John Fowler, of the Centre for Research in European Accounting, for example, argues that the uneven regulation of firms' financial reporting can distort the location of economic activity (p. 16):

> "If companies resident in one member state were to be permitted to get away with publishing uninformative accounts, they would have an unfair advantage over companies in other member states. Since, in a common market, there should be no restrictions on where companies may establish themselves, there would be a tendency for companies to set themselves up in the member state that offered the most favourable financial reporting regime."

Such distortion of the location of economic activity, he worries, would in turn result in a race to the bottom, reducing the effectiveness of transparency regulation (p. 16):

13

"Since, in general, governments are in favour of companies establishing themselves on their territory (they provide employment and pay taxes), they would be reluctant to see companies enticed away by incentives offered by other countries. The result would be a form of auction in which governments vied with each other in offering the most favourable financial reporting regime for companies which are able to avoid the discipline of the financial market, and would provide an illustration of "Gresham's law" of accounting: poor financial reporting drives out good financial reporting."

This concern motivates the EU's attempt to harmonize the regulation of financial reporting across its member states via a common framework and mandatory minimum standards. Despite these harmonization efforts, countries' financial-reporting regulations remain uneven (see, e.g., the variation in exemption thresholds and register implementation dates) (e.g., Haller 2002). In Denmark, for example, the regulation of financial reporting used to be comparably lax to protect its many small and internationally operating firms from foreign competitors (McLeay 1999). Similarly, the financial-reporting requirements in Germany used to be poorly enforced until a major reform brought about by mounting pressure from the EU (Bernard 2016). In response to this reform, several small and medium-sized firms complained in an article published in the Handelsblatt (2010), a leading German business newspaper, that the heightened enforcement revealed proprietary information, which employees, customers, suppliers, and competitors could use to the firms' detriment. The firms also complained that they were put at a competitive disadvantage relative to their Italian competitors, for example, for which financial reporting information remained hard to access (Handelsblatt 2010). In line with these complaints, recent survey evidence documents that European firms dislike their own reporting requirements (e.g., due to fear of losing information to customers, suppliers, and competitors), but at the same time value the ability to access other firms' required reporting (Minnis

& Shroff 2017). These complaints and concerns suggest that uneven transparency regulation could plausibly have an important impact on the location of economic activity.[5]

4. Research Design

We exploit the varying extent and timing of transparency regulations in Europe to examine the re-allocative impact of uneven transparency regulations on first-order measures of aggregate economic activity (e.g., production and employment). We investigate both the direct and indirect impact of transparency regulation simultaneous, following the decomposition of the aggregate impact developed in our conceptual-underpinnings section:

$$\beta = \beta_1 \bar{T}_i + \beta_2 \bar{T}_j .$$

To empirically operationalize this decomposition, we focus on the impact of uneven transparency regulation on the economic activity of a given country-industry combination (hereafter referred to as the focal industry). We decompose this impact using a direct exposure measure, capturing the extent of regulation in the focal industry (e.g., the share of regulated firms) ($\bar{T}_i$), and an indirect exposure measure, capturing the extent of regulation among other firms related to the focal industry ($\bar{T}_j$). To capture the regulatory exposure of related firms, we calculate the extent of regulation in the focal industry's supplier or customer industries. These industries, identified by input-output linkages, comprise all firms with immediate economic links to the focal industry (i.e., the relevant subset of other firms). This approach provides us with separate variation in the direct regulatory exposure ($\bar{T}_i$) and the indirect regulatory exposure ($\bar{T}_j$), allowing us to empirically disentangle the distinct effects. Notably, while we label the indirect exposure measures supplier and customer

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[5] This concern is not limited to the EU. De Fontenay (2017), for example, worries that the strict regulation of transparency of U.S. public firms relative to U.S. private firms and other firms in the world hurts U.S. public companies. Glaeser and Omartian (2022) provide evidence in support of this concern.

exposures, they also include competitors operating in the same industry domestically and in input or output related countries. As such, our indirect exposure measures are more comprehensive than within-industry competition measures, but also capture this important dimension.

4.1. Regulatory Exposure Measures

We construct the direct and indirect exposure measures for our two sources of regulatory variation. For the exemption-threshold variation, we exploit the fact that the exemption thresholds not only introduce variation at the country level but also at the industry level, because of differences in firm-size distributions. For example, labor-intensive industries are more likely than other industries to have a high share of firms that exceed employee-based exemption thresholds. We calculate a focal industry's direct exposure as the share of firms subject to full reporting requirements (i.e., exceeding the exemption thresholds) in the given country-industry. To obtain the indirect exposure of the focal industry to its supplier (customer) industries' regulatory exposure, we sum up the shares of firms subject to full reporting requirements in all countries and industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry, using global input-output matrices (Smarzynska Javorcik 2004).[6] (We provide an illustrative example of the indirect exposure calculation in the Appendix.)

For the business-register variation, we calculate a focal industry's direct exposure as a dummy variable indicating whether the focal industry's country operates a business register in a given year. To construct the focal industry's indirect exposure to its supplier (customer) industries' regulatory

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[6] Within the same industry level, the share of regulated firms and the share of other regulated firms are almost perfectly collinear. Accordingly, to obtain a measure of indirect exposure that is distinct from the focal industry's direct exposure, we use both the share of other regulated firms in the focal industry and the share of other regulated firms in input/output-related industries. By doing so, our indirect exposure measure implicitly aggregates over more firms than those operating in the focal industry. Accordingly, in comparing the coefficient magnitudes of the direct and indirect exposures, we need to rescale the indirect exposure coefficient to adjust for the difference in number of regulated firms (see Section 6.2.2).

exposure, we sum up the dummy variables of all country-industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry.

In calculating the indirect regulatory exposure measures for our two sources of our regulatory variation, we fix the input- and output-share weights across all years (reference year: 2010). This approach alleviates concerns that changes related to the relevance of certain supplier (customer) industries for the focal industry, rather than the varying exposures to transparency regulations in Europe, drive our reported results.

In our specifications (detailed below), we jointly assess the focal industry's direct regulatory exposure and the focal industry's indirect exposure to its supplier or customer industries' regulatory exposure. Controlling for the indirect exposure, the focal industry's direct exposure captures the direct impact of regulating transparency in the focal industry, excluding offsetting spillovers from regulated suppliers or customers. The focal industry's indirect exposure to its supplier and customer exposures, by contrast, captures the effect of regulating customers or suppliers on the focal industry.

4.2. Exemption-Threshold Variation

Using the exemption-threshold variation, we estimate the following specification:

$$Y_{c,i,t} = \beta_1 Reporting_{c,i,t-1} + \beta_2 Supplier(Customer)Reporting_{c,i,t-1} + \alpha_{c,t} + \delta_{i,t} + \varepsilon_{c,i,t},$$

where $Y_{c,i,t}$ is the logarithm of a measure of economic activity (e.g., production) in country c, industry i (two-digit NACE industry classification or coarser), and year t; $Reporting_{c,i,t-1}$ is the focal industry's direct exposure to transparency regulation ($\bar{T}_i$), measured as the share of firms exceeding reporting-exemption thresholds in country c, industry i, and year $t-1$; $Supplier(Customer)Reporting_{c,i,t-1}$ is the focal industry's indirect exposure to its supplier (customer) industries' transparency regulations ($\bar{T}_j$), measured as the sum of the shares of firms exceeding

reporting-exemption thresholds in all countries and industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry; $\alpha_{c,t}$ denotes country-year fixed effects; and $\delta_{i,t}$ denotes industry-year fixed effects.

We construct the threshold-based regulatory exposure measures using the simulated instruments approach in Breuer (2021).[7] We calculate the exposure measures as the hypothetical share of firms that would exceed a given country's exemption thresholds had the thresholds been applied to a *standardized* Europe-wide and time-invariant industry-level firm-size distribution. The standardized distribution is obtained by pooling all firms operating in a given industry in Europe across countries and years. By using one standardized distribution per industry across all countries, instead of each country's actual country-industry-specific distribution, our standardized exposure measures only vary across countries and over time because of differences and changes in exemption thresholds, not because of differences or changes in firm sizes across countries. This approach reduces concerns that our exposure measures capture factors other than the regulation (e.g., endogenous firm-size differences). It is akin to a Bartik approach (Goldsmith-Pinkham *et al.* 2020; Breuer 2022).

Our specification resembles a cross-sectional difference-in-differences design. Using country-year and industry-year fixed effects, it isolates comparably clean variation in the regulatory exposures arising solely due to the differential effect of countries' exemption thresholds across industries due to different firm-size distributions. A regulation requiring firms above 50 employees to be more transparent, for example, affects labor-intensive industries more than other industries. This country-industry-level regulatory variation allows us to purge confounding factors at the country-year level, addressing concerns about countries' endogenous threshold choices. Our design also purges

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[7] The data on countries' thresholds and the simulated exposures are publicly available: https://research.chicagobooth.edu/arc/journal-of-accounting-research/online-supplements/volume-59

confounding factors at the industry-year level, alleviating concerns about industries' endogenous differences in economic activity. (We provide an illustration of the design in the Online Appendix.)

4.3. Business-Register Variation

Using the business-register variation, we estimate the following specification:

$$Y_{c,i,t} = \beta_1 Register_{c,t-1} + \beta_2 Supplier(Customer)Register_{c,i,t-1} + \alpha_c + \delta_i + \gamma_t + \varepsilon_{c,i,t},$$

where $Y_{c,i,t}$ is the logarithm of a measure of economic activity in country c, industry i, and year t; $Register_{c,t-1}$ is the focal industry's direct exposure to transparency regulation $(\bar{T}_i)$, measured as an indicator taking the value of one if the focal industry's country operates a business register in year $t-1$; $Supplier(Customer)Register_{c,i,t-1}$ is the focal industry's indirect exposure to its supplier (customer) industries' transparency regulations $(\bar{T}_j)$, measured as the sum of the register indicators of all country-industries weighted by their share of inputs delivered to (outputs consumed from) the focal industry; α_c denotes country effects; δ_i denotes industry effects; and γ_t denotes year effects.

This specification resembles a familiar time-series difference-in-differences design for the direct exposure measure. It isolates the differential impact of direct exposure around the staggered introduction of business registers on treated and not-yet-treated countries. With respect to the indirect exposure measures, the specification uses both time-series variation due to other countries adopting registers and substantial cross-sectional variation due to differences in the share of suppliers or customers in countries with or without registers. The fixed effects structure purges confounding differences in economic activity across countries (e.g., common vs. code law countries), industries (e.g., labor- vs. capital-intensive industries), and time (e.g., pre vs. post financial crisis).

5. Data

We obtain input (labor and capital) and output (value added and production) measures of economic activity at the country-industry level from the OECD. The sample covers the period from 2000 to 2015. We supplement the data with information on our regulatory exposure measures for the given country-industry combinations. For the exemption-threshold-based measures, we combine information on (lagged) exemption thresholds for 26 European countries between 2001 and 2015 from Breuer (2021) and two-digit industry-level firm-size distributions from Bureau van Dijk's *Amadeus* database.[8] For the business-register-based measures, we collect country-specific dates of electronic business register implementations through reviewing legal documents and administering a questionnaire to a knowledgeable party in each country (e.g., national regulators and registry administrators). The data sources and variable definitions are provided in the Appendix.

In this study, we rely on country-industry-level data instead of firm-level data for three important reasons.[9] First, the country-industry-level data allow examining first-order measures of economic activity (e.g., production and employment) of interest to regulators. At the firm level, by contrast, similar measures (e.g., sales) are often only available for select firms (e.g., larger or transparent firms), limiting the relevance and generalizability of estimates from a firm-level analysis. Second, our treatment of interest, uneven transparency regulation across countries and industries, naturally varies at the country-industry level, not the firm level. Third, input-output matrices conveniently and comprehensively summarize the relatedness of industries, facilitating the construction of indirect exposure measures. At the firm level, by contrast, information about economic links between firms tends to be scarce and incomplete.

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[8] The final sample for the exemption-threshold (register) variation starts in year 2001 (2000).
[9] Another benefit of the data is that they are publicly available, facilitating replications and extensions of our study.

6. Results

6.1. Descriptive Statistics

Our combined data span 34 industries in 26 countries in the OECD (Table A1 and Table A2).[10] Besides most European countries, the data also include the United States, which are not directly, but possibly indirectly affected by the transparency regulation in Europe.

The exposures to transparency regulation vary substantially in our data, consistent with uneven transparency regulation across countries and industries in Europe and beyond. The average share of firms subject to full reporting requirements in our sample is about 25% (Panel A of Table 1). It ranges from a low 3% for the 10th percentile to 63% at the 90th percentile. Similar values are observed for the share of supplier or customer firms subject to full reporting requirements. These indirect exposure measures exhibit a slightly lower range though, given that they are the result of averaging across various related countries and industries.

The exposure to business registers also varies substantially across the country-industries in our sample. On average, firms in about 58% of our country-industry observations are covered by a business register. The indirect exposure to supplier (customer) business registers ranges from a low 2% (1%) at the 10th percentile to a high 100% (100%) at the 90th percentile.

Across our two sources of variation in transparency regulation, we observe that the average direct and indirect exposures are of similar magnitude and highly correlated (typically above 90%). This alignment suggests a focal industries' typical supplier and customer industries face similar transparency regulations as the focal industry itself, consistent with predominantly local input and output markets of focal industries. The alignment is not perfect though, which gives rise to uneven

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[10] We map the exemption-threshold-based reporting exposure variables, calculated for two-digit NACE industries, to the coarser industry definitions in the OECD data by averaging the exposures within the coarser industry definitions.

transparency regulation and allows us to disentangle the direct and the indirect impact of transparency regulation. (See Table A3 for a summary of the direct and indirect exposure measures by country, including information on the dates of the business-register introductions.)

A view to our outcome measures suggests that they capture a substantial amount of economic activity. About 380 thousand employees are working in the average country-industry combination, for example, and the average production value amounts to several billions in local currency. Obviously, some of the variation in production value (and the other monetary outcome measures) across country-industries is driven by currency differences, though most countries in our sample are part of the Euro currency system. The currency differences are accounted for by country and country-year fixed effects in our empirical designs. The logarithmic transformation of the economic activity measures further ensures a comparable interpretation of our results as semi-elasticities (i.e., percentage changes in response to a unit change in our exposure measures).

6.2. Exemption-Threshold Variation

6.2.1. Validation of Standardized Exposures

We first examine the associations of our standardized threshold-based exposure measures with the actual share of firms above countries' reporting thresholds to validate our standardized measures. Column 1 of Table 2 documents that the focal industry's exposure is significantly positively associated with the actually observed share of regulated firms. By contrast, the supplier industry's exposure is not significantly associated with the focal industry's observed share of regulated firms. Column 2 shows the reverse pattern. The focal industry's exposure is not significantly associated with the actual share of regulated firms in the supplier industries. Instead, our standardized supplier exposure measure is significantly positively associated with the actual share of regulated firms in the supplier industries. Columns 3 and 4 show the same patterns for our standardized customer exposures.

Collectively, the results support the validity of our standardized measures of a focal industry's and its customer/supplier industries' regulatory exposures, respectively. Notably, the coefficients in Table 2 suggest that a 10 percentage-points increase in the share of firms that would hypothetically be subject to transparency regulation (had the country's thresholds been applied to the Europe-wide firm-size distribution) only translates into an about 6 to 8 percentage-points increase in the actual share of regulated firms. This attenuated relationship already hints at the possibility of reallocation away from regulation. The attenuation could, for example, reflect firms' avoidance of regulation through size management, legal form switches, or cross-country reallocation. It could also reflect that regulated firms are at a competitive disadvantage, hence, exit or shrink more than expected based on the Europe-wide benchmark distribution. To prevent conflating our exposure measures with such endogenous variation in the firm-size distribution in response to regulation, we use our standardized exposures measures in the following analysis. Their use allows us to estimate intent-to-treat effects that are arguably most relevant to regulators as they capture the effective regulatory impact after allowing for endogenous avoidance and reallocation.

6.2.2. Impact on Economic Output

We now examine the impact of our standardized regulatory exposures on measures of economic output. Column 1 of Table 3 documents a negative, though economically small and statistically insignificant association between a focal industry's direct exposure to transparency regulation and value added. This negative association turns economically significant when controlling for the focal industry's indirect exposure to the transparency regulation of its supplier (customer) industries in column 2 (3). By contrast, the association between the focal industry's indirect exposure and value added is positive and significant (both economically and statistically). These patterns are also observed for production levels as an alternative measure of economic output (columns 4-6).

The results in Table 3 suggest transparency regulation has an unclear and, at best, limited net impact on economic output (columns 1 and 4), echoing earlier evidence in Breuer (2021). Notably, this limited net impact appears to mask a substantial re-allocative effect (columns 2, 3, 5, and 6): firms in a given industry lose output if they are regulated, while they gain output if economically-related firms are regulated.[11] In terms of economic magnitude, the estimates in column 2 imply that a 10 percentage-points increase in the share of firms subject to reporting requirements in the focal industry is associated with an about 14 percent decrease of value added in the focal industry (before any offsetting supplier-related spillovers). By contrast, a 10 percentage-points increase in the share of all supplier firms subject to reporting requirements is associated with an about 20 percent increase in value added in the focal industry. The asymmetry in these estimates (direct: -14 percent, indirect: 20 percent) does not imply that the net impact should be positive. It rather reflects the fact that regulating 10 percent of firms in a given country's focal industry affects fewer firms than regulating 10 percent of all firms in (input-linked) supplier industries across Europe. Based on EUROSTAT data, the average focal industry contains around 11 thousand establishments, whereas there are 23 (22) thousand establishments in the average supplier (customer) industries (i.e., about twice as many firms). To get to a meaningful per-firm comparison, we can thus divide the indirect effect by two. If we do so, the direct effect (-14 percent) slightly dominates the indirect effect (+10 percent) on a per-firm basis. This slight shortfall is highly consistent with the limited and insignificant, but typically negative net impact of transparency regulation at the industry level (column 1).[12]

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[11] The coefficient on the direct exposure is always economically significant after controlling for the indirect exposure, though not always statistically significant. The direct effect must be economically significant to explain the limited net effect in the presence of an economically and statistically significant indirect effect. The statistical significance of the direct effect, however, is often tenuous because the direct exposure overlaps substantially with the indirect exposure (which includes the focal industry's exposure and related industries' exposures). As a result, the variance of the direct exposure's coefficient estimate is inflated. Hence, we use a "Bayesian" approach to inference, focusing more on the consistency of the direct effect's coefficient sizes than its statistical significance levels across various outcomes and specifications (e.g., Glaeser & Guay 2017; McShane *et al.* 2019; Imbens 2021).

[12] An implicit assumption underlying our approach is that the indirect effect of regulating firms in the focal industry or other related industries is the same *if* the regulated firms exhibit the same economic link (e.g., input share) to the focal

6.2.3. Impact on Economic Inputs

We next examine the impact of exemption-threshold exposures on measures of economic inputs. In Table 4 and Table 5, we document the associations of our regulatory exposure measures with measures of input quantities/stocks (number of employees, capital stock) and prices/flows (labor compensation, capital compensation), respectively. The associations closely resemble the patterns observed for economic outputs: limited evidence of a significant net impact (columns 1 and 4), but notable evidence of an economically significant re-allocative effect (columns 2, 3, 5 and 6). Interestingly, the re-allocative effect appears to be more pronounced (in terms of economic magnitude) for capital than labor inputs. The estimates in Table 4 columns 2 and 5, for example, imply that a 10 percentage-points increase in the direct (indirect) regulatory exposure of the focal industry is associated with an about 11 percent decrease (15 percent increase) of the number of employees in the focal industry, whereas it is associated with an about 28 percent decrease (23 percent increase) of fixed capital formation. This differential response is consistent with both greater mobility (e.g., across countries) and irreversibility of capital compared to labor inputs.[13]

In combination with the output results, the results in Table 4 and Table 5 suggest that transparency regulation appears to re-allocate *real* economic activity in terms of both outputs and inputs across firms, industries, and countries. Notably, the input results refute a (more) benign interpretation of the output results: transparency regulation could merely re-allocate regulated firms'

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industry. We regard this assumption as plausible as the weighting by economic linkages accounts for differences in the importance of firms in other industries (e.g., due to their distance). The quantification of the direct and indirect effects above supports this notion. The direct and indirect effects (adjusted for the number of regulated firms) appear to closely map into the economically small and statistically insignificant negative net effect in the focal industry, which captures the direct effect of regulating firms in the focal industry less the indirect effect of regulating other firms in the focal industry.

[13] The mobility of capital facilitates its reallocation across countries, for example. The irreversibility of capital makes regulated firms, which face lower rents and a more volatile economic environment due to heightened competition, more cautious to invest in capital. By contrast, reduced uncertainty faced by other firms, due to information spillovers from regulated firms, increases other firms' investment incentives (e.g., Ferracuti & Stubben 2019; Roychowdhury *et al.* 2019).

output *prices* (i.e., rents) without affecting these firms' local investments in capital and labor.[14] Our input results suggest, however, that transparency regulation also hurts regulated firms' incentives to invest in capital and labor. This finding aligns with recent evidence on transparency regulation's impact on regulated firms' innovation activities (Kim & Valentine 2020; Breuer *et al.* 2021b) and productivity growth (Breuer 2021). Consistent with a real impact on economic activity, we also document that the number of establishments decreases in focal industries with greater regulatory exposures and increases in related supplier and customer industries (Table A4). These establishment-reallocation effects are in line with the concerns expressed in McLeay (1999).

6.2.4. Impact on Location of Economic Activity

Finally, we explore the impact of uneven regulatory exposures on the location of economic activity. To this end, we present results from two modifications of our main specification. In the first modification, we combine the direct and indirect measures of regulatory exposure to create a measure of "uneven regulation," capturing the difference between the direct and indirect exposures. This combined measure allows investigating the effect of regulating a focal industry *more* than other related industries. In the second modification, we decompose the indirect measures of regulatory exposure into separate measures for domestic vis-à-vis foreign suppliers or customers. This decomposition allows investigating whether economic activity is reallocated to less regulated industries in the focal industry's country or even to less regulated industries in other countries.

Table 6 documents evidence on the impact of uneven regulation. Using the difference between a focal industry's own exposure and its suppliers' exposure, Panel A presents evidence of a statistically and economically significant negative impact of uneven regulation across all outcomes of

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[14] Output prices may fall, for example, because greater transparency allows customers to search for cheaper outside options and bargain for better deals. This shift in bargaining power could reallocate welfare from producers to consumers without imposing a negative impact on local capital investments and employment opportunities.

economic activity. It suggests that regulating a focal industry more than its related industries reduces economic activity in the focal industry relative to the other industries, consistent with our prior results. The economic magnitude of this negative impact is sizeable. Our estimates, for example, suggest that forcing transparency on an additional 10 percent of all firms in the focal industry (compared to its related industries) reduces value added by 19 percent, relative to other industries. Similar results are obtained for economic inputs. Among the inputs, the negative impact of uneven regulation is stronger for capital than for labor inputs, as before. The same patterns emerge when using customer instead of supplier exposures in defining the uneven regulation measures (Panel B).

Table 7 documents evidence on the split between domestic versus foreign reallocation. Panel A of Table 7 provides some weak evidence that both the exposure of domestic and foreign supplier industries are associated with economic activity. While the coefficients on both the domestic and foreign exposure measures are mostly economically large and positive, they are widely statistically insignificant. The lack of statistical significance is particularly acute for the coefficients on the domestic exposure. The low power on the domestic exposure coefficients is likely due to the high collinearity between the focal industry's own exposure measure and the exposure measure of its domestic suppliers, which tend to operate in the same coarse two-digit industry.

Panel B of Table 7 provides evidence that both the exposures of domestic and foreign customer industries are significantly associated with economic activity. Notably, the coefficient on the domestic customer exposure is larger in economic magnitude than the one on the foreign customer exposure. This pattern is consistent with primarily local input and output markets. Still, the customer exposure results, just like the supplier exposure results, also document that the reallocation of economic activity is not limited to industries within the same country.

Given the cross-border spillovers, uneven transparency regulation can distort the location of economic activity across countries. To illustrate the distortions implied by our estimates, we map out the relative increase or decrease of economic activity experienced by our European sample countries due to their relative regulatory strictness. We calculate the impact on a given country's industry by combining each focal industry's uneven regulation measure, defined as its own exposure less its foreign supplier (customer) exposures, with the coefficient estimates obtained from regressions of economic activity on this modified uneven regulation measure. The regressions are akin to those shown in Table 6. The main difference is that we exclude exposures of supplier (customer) industries in the same country from the supplier (customer) exposure measures. In our prior analysis, the intra-industry/country exposures are included in the supplier (customer) exposure measures because we are interested in cleanly differentiating between the direct effect of transparency regulation, absent any spillovers (even spillovers from other firms in the same country-industry), and its indirect spillover effect (including spillovers from the most relevant firms; i.e., those in the same country-industry). By contrast, in our back-of-the-envelope quantification of the country-level distortions, we want to gauge the effect of imposing greater regulation on a given country's industry (including offsetting within country spillovers) relative to its supplier (customer) industries in other countries.

Figure 3 maps the average impact of uneven regulation on industry-level economic activity for each of our European sample countries.[15] We observe that several countries, especially many of those located in the center of Europe, appear to win at the expense of others. Germany, for example, appears to be a net beneficiary, whereas France is a net benefactor. Those differences reflect that Germany requires less transparency than France. As a case in point, Germany has a history of corporate opacity.[16] It systematically imposes some of the highest exemption thresholds and content

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[15] Similar results obtain when aggregating the industry-level effects to country-level aggregates using a value-weighted average across all industries in a given country.

[16] Corporate financial information was historically viewed as a trade secret in Germany (Max-Planck-Institute 2009).

exemptions allowed under the EU's regulatory framework. It even, for a long while, effectively failed to enforce its corporate transparency requirements. Only upon pressure from the EU did it eventually reform its enforcement (Bernard 2016). Germany's preference for opacity may be related to the importance of its "hidden" champions, small and medium-sized private firms operating in tradable sectors with a strong export orientation (Simon 1990). Relatively loose transparency regulations allow those firms to remain hidden while they can learn about their foreign peers and profitable markets in more transparent countries (e.g., France).

While the map shows notable distortions in the location of economic activity, we caution that it is based on a simple extrapolation of our regression results. It neglects heterogeneous responses across countries of different sizes, geographical location, or industrial structure. Those differences can be expected to matter. We investigate their influence in greater detail in Section 7.1. The map also uses the full variation in countries' transparency regulation, not just the more limited within-country-year variation exploited in our regressions. This extrapolation can be problematic if the relation between our regulatory exposures and economic activity differs between the narrow variation and the full variation.[17] In any case, we provide this back-of-the-envelope quantification as a convenient way to explicitly illustrate the location distortions implied by our regression results for readers comfortable with generalizing our results to the country level.

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[17] Prior studies provide little evidence to suggest that regulatory effects vary significantly across countries with high vis-à-vis low exemption thresholds (Breuer 2021; Breuer *et al.* 2021b). Still, they show some evidence that it is especially smaller firms that are hurt by regulatory exposure. Accordingly, countries with particularly low thresholds, which force transparency even on the smallest firms, may experience particularly negative re-allocative effects. Their regulatory effects could plausibly be larger than the average effects identified in our regressions, which focus on the narrower cross-industry variation in regulatory exposures within the many countries with relatively high thresholds. As a result, we may expect that our regression estimates understate the re-allocative effect when extrapolated to the cross-country variation (e.g., to countries with particularly low thresholds).

6.3. Business-Register Variation

We re-examine the impact of transparency regulation on the reallocation of economic activity using the staggered business-register variation. Panel A of Table 8 documents evidence consistent with notable reallocation. The coefficients on the focal industry's direct regulatory exposure (i.e., its business register implementation) are negative and economically sizable. By contrast, the coefficients on the focal industry's indirect exposure to its supplier industries' transparency regulation are positive and economically significant. We observe similar results in Panel B, using a focal industry's indirect exposure to its customer instead of its supplier industries' regulation. In Panels C and D, we further observe that the supplier and customer results are robust to controlling for any changes in the focal industries' country or industry over time.

In terms of magnitude, the implementation of a business register is associated with a 32 percent decrease in the number of employees in the focal industry (excluding offsetting spillovers from customers), for example (column 3 Panel B of Table 8). The implementation of business registers in all customer industries, by contrast, is associated with a 41 percent increase in the number of employees in the focal industry. While these magnitudes are large, they do not seem implausible. To gauge the plausibility of the magnitudes, it is important to note that the direct effect in the business register regressions captures the hypothetical scenario of implementing a register for a given industry in a given country only (i.e., without any offsetting benefits from regulating other industries). In practice, business registers, however, are implemented for all industries in a given country at the same time. Accordingly, the industries are both directly *and* indirectly affected by the implementation of a business register, resulting in a muted net impact (e.g., on employment).

We can further put the magnitudes into perspective by using a 10 percentage-points increase in the register exposure, just as we did in the exemption-thresholds setting. Such increase in the register setting can be interpreted as an increase of the coverage of mandatorily reporting firms in the

register by 10 percentage points. On a per-firm basis, this increase in register coverage results in a negative direct effect on the number of employees in the focal industry of 3 (31/10) percent and a positive indirect effect of 2 (41/10/2) percent. These effect sizes are smaller than those in the exemption-thresholds setting. The smaller magnitudes make sense given that the exemption-thresholds exposures capture the effect of forcing a greater share of all firms to report publicly, whereas the register exposures only capture the effect of facilitating the dissemination of a greater share of mandatorily reporting firms' information. Together, the two moderate and offsetting effects (direct: -3 percent; indirect: 2 percent) translate into a rather small net impact at the industry level, comporting with our prior results and expectations.

7. Supplemental Results

7.1. Cross-Sections

To shed light on the mechanisms underlying our main results, we examine cross-sectional variation in the strength of the re-allocative effect of transparency regulation. We consider four cross-sections. The first two cross-sections examine differences across industries with distinct types of goods and services (e.g., tradable vs. non-tradable). The last two cross-sections examine differences across countries with close vis-à-vis distant neighbors (e.g., in terms of language).

Panel A of Table 9 reports results from cross-sectional tests splitting the direct and indirect exposures to transparency regulation into separate exposures for industries producing tradable goods and those producing non-tradable goods (Mano & Castillo 2015). We expect the re-allocative effect of transparency regulation to be stronger in industries producing tradable goods than those producing non-tradable goods, because tradable goods do not need to be produced in local markets. Accordingly, firms in regulated industries producing tradable goods can relocate their production to less regulated countries. In addition, firms in other countries can export their tradable goods to the

local market of the regulated industry, increasing price pressure in the local market of the regulated industry through import competition. Consistent with this expectation, we observe that both the direct and, especially, the indirect impact of transparency regulation is strongest in industries producing tradable goods.

Panel B of Table 9 shows results from cross-sectional tests splitting the direct and indirect exposures into separate exposures for industries producing homogeneous goods and those producing differentiated goods (Rauch 1999; Barrot & Sauvagnat 2016). We expect the re-allocative effect of transparency regulation to be stronger in industries producing homogeneous goods than those producing differentiated goods, because homogeneous goods can more easily be imitated and supplied by foreign customers, suppliers, and competitors. Accordingly, firms in regulated industries producing homogeneous goods face increased international competition. Consistent with this expectation, we observe that both the direct and, especially, the indirect impact of transparency regulation is strongest in industries producing homogeneous goods.

Panel C of Table 9 reports results from cross-sectional tests splitting the indirect exposure to transparency regulation into separate exposures for geographically near countries and distant ones (Disdier & Head 2008). We expect the indirect effect of transparency regulation to be stronger in countries located closer to the regulated industry, because firms in regulated industries can more easily relocate their business to neighboring countries. Similarly, competitors in neighboring countries are more likely to start competing in the local market of the regulated industry than potential competitors located in distant countries (e.g., due to transportation costs). Consistent with this expectation, we observe that the indirect impact of transparency regulation is strongest in countries located in close proximity to the regulated industry.

Finally, Panel D of Table 9 shows results from cross-sectional tests splitting the indirect exposure to transparency regulation into separate exposures for linguistically near countries and distant ones (Bakker *et al.* 2009). We expect the indirect effect of transparency regulation to be stronger in countries using a language similar to the one used in the regulated industry, because customers, suppliers, and competitors in those countries can more easily understand the information provided by firms in the regulated industry. Consistent with this expectation, we observe that the indirect impact of transparency regulation is strongest in countries using a language that is more like the one used by firms operating in the regulated industry.

Collectively, our cross-sectional results are consistent with uneven transparency regulation reallocating economic activity by fostering cross-border competition through information spillovers. They suggest that uneven transparency regulation distorts the location of economic activity especially in industries with limited barriers to (foreign) competition (i.e., industries producing tradable and homogeneous goods). This distortion appears to relocate economic activity especially to countries closely connected to the country of the regulated industry (i.e., countries that are geographically close and use a similar language).

7.2. Exogeneity of Regulation

An important concern with the empirical evaluation of aggregate effects of transparency regulation is that its extent and timing is chosen by countries rather than randomly assigned. We exploit two institutional features to obtain plausibly exogenous variation in transparency regulation.

In the exemption-threshold design, we exploit that a country's size-based exemption thresholds, while chosen uniformly at the country level, differentially affect its industries (e.g., labor- vs. capital-intensive industries). This feature allows us to flexibly account for any concerns about the endogeneity of levels and changes of exemption thresholds at the country level by focusing on

regulatory variation in the same country at the same point in time (via country-year fixed effects). Table A5, for example, documents that various country-level factors are correlated with countries' threshold levels (column 1) and changes (column 2).[18] Such factors, observed and unobserved, are controlled for by our within-country-year design. The remaining within-country-year variation in regulatory exposure is unlikely to be driven by countries' industry-specific targeting, given the country-wide uniformity of the thresholds.

The within-country-year variation in regulatory exposure may, however, be driven by endogenous differences in firm-size distributions across countries' industries. Table A6 documents that such differences give raise to important omitted variable and reverse causality concerns. We observe that, within a given country-year, the actual share of regulated firms is strongly positively associated with economic activity (columns 1, 3, 5, and 7). This strong relationship is unlikely to reflect the causal effect of regulatory exposure on economic activity. It can rather be expected to reflect correlated omitted variables and reverse causality. Industries with greater production and more capital inputs tend to exhibit more large firms, for example, translating into a greater share of regulated firms (i.e., firms above the thresholds). To address this issue, we use one standardized Europe-wide firm-size distribution per industry across all countries to calculate our exposure measures. We observe that, consistent with our results on the ambiguous net effect of transparency regulation, there is no strong relation between the standardized share of regulated firms and aggregate economic activity (columns 2, 4, 6, and 8). These results provide some comfort that the institutional feature of threshold uniformity at the country level, in combination with our research design choices (within-country-year design with simulated instrument), yields plausibly exogenous variation in regulatory exposure.

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[18] The reporting exposure is widely uncorrelated with the register exposure, supporting our claim that these two settings provide distinct sources of variation.

In the business-register design, we exploit that countries started operating electronic business registers at different times (Table A7). The timing is, at least in part, driven by the EU's transposition deadline of its business-register directive. Prior literature documents that such deadlines often lead to plausibly exogenous variation in countries' implementation timing due to differences in their legislative systems and speed (e.g., Christensen *et al.* 2016). This institutional feature reduces concerns about the endogeneity of countries' register operations. Still, we ultimately rely on the identifying assumption that the relative timing of the introductions across countries is plausibly exogenous.

To assess the plausibility of this assumption, we investigate whether countries with and without concurrent register introductions exhibit similar trends in economic activity leading up to the introductions. Figure 4 plots the direct impact of the business registers on the number of employees in the focal industry in event time, controlling for the indirect impact of customers' business registers. It does not show any evidence of differential trends between countries with and without concurrent register introductions. Only upon register introduction, countries with newly introduced registers appear to experience a negative direct impact compared to other countries without a concurrent register introduction. This differential impact remains stable after the register introduction.[19] The dynamics of the direct register impact support the identifying assumption underlying the business-register design.[20]

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[19] For capital inputs and aggregate output, we tend to observe a statistically significant, though economically small pre-trend in the year before the register introduction. This pre-trend may suggest that there is some reallocation in anticipation of the register introduction, especially for mobile inputs such as capital. This anticipation reduces our estimates in Table 8, especially for capital inputs and aggregate output.

[20] Following recent best practices regarding the use of staggered difference-in-differences designs (e.g., Barrios 2021; Goodman-Bacon 2021; Baker *et al.* 2022), we assess the robustness of our results to alternative control group definitions in untabulated tests and provide diagnostics regarding the staggering of the register introductions in Table A7 in the Online Appendix. Consistent with the relatively timely and constant treatment impact documented in Figure 4, the staggered-timing of the register adoption appears to help alleviate concerns about concurrent events rather than raise concerns about bias from changing or trending control groups.

We further examine whether economic differences predict the relative timing of countries' business-register introductions (in the spirit of Kroszner & Strahan 1999; Christensen *et al.* 2016; Hombert & Matray 2016). In Table A8, using a log-linear model and a Weibull proportional hazard model of the introduction timing, we do not find evidence to suggest that differences in legal systems or economic positions importantly predict countries' register-introduction timing. These results, while not definite, again support the exogeneity of the business-register timing.

7.3. Robustness of Inferences

Our inferences are robust to a variety of sample and research design choices. We briefly summarize the most important robustness checks below. (For a detailed discussion, refer to the Online Appendix.) First, our inferences are unchanged when using alternative data sources for the economic-activity outcomes and the input-output linkages. Second, our exemption-threshold exposure results are robust to dropping individual countries or industries from our sample. Thus, our results are not driven by any particular country or industry. Third, consistent with our main results, we continue to find evidence of a positive indirect effect of supplier (customer) transparency when excluding the direct exposures. This simplified (spillover) design expands our sample to countries with missing information on their direct exposures (e.g., the United States) and aligns with the approach taken in most spillover studies. Fourth, we find evidence consistent with reallocation even when excluding intra-(country-)industry links from our supplier (customer) exposures. This finding suggests that the re-allocative effects not only occur within the focal industry itself, but also across industries. Fifth, our inferences remain unchanged when restricting our measure of related firms' exposure to the exposure of firms operating in the same industry (across countries) instead of the exposure of firms operating in all supplier (customer) industries. This approach corresponds to the standard approach to defining peer firms in the literature. Lastly, we find that our inferences are

robust to truncating the outcome and regulatory exposure variables at the 1st and 99th percentile of their respective residual distributions (after accounting for fixed effects).

8. Discussion and Conclusion

We investigate how uneven transparency regulation across countries and industries affects the location of economic activity. To this end, we not only investigate the direct impact of forcing transparency on firms in a given country and industry, but also the indirect spillover effect of forcing transparency on related firms operating in supplier and customer countries and industries.

Exploiting differences in the extent and timing of financial-reporting regulations in Europe, we find evidence consistent with notable re-allocative effects along the supply chain. We find that a focal industry's direct regulatory exposure, excluding offsetting spillovers from regulated suppliers or customers, is negatively associated with the focal industry's economic activity. By contrast, a focal industry's indirect exposure to regulated suppliers or customers is positively associated with the focal industry's economic activity. These re-allocative patterns occur within but also across countries.

Our evidence is consistent with transparency regulation creating winners and losers: directly affected firms lose, whereas indirectly affected firms gain (consistent with the conjecture in ICAEW 2013). It implies that transparency regulation can contribute to a displacement of regulated firms by unregulated firms (e.g., Besley & Burgess 2004; Crépon *et al.* 2013; Rotemberg 2019). Notably, this displacement is amplified in the case of transparency regulation, compared to other regulations (e.g., taxation or labor market regulation), because transparency regulation not only burdens regulated firms with costs, but also benefits unregulated firms through information spillovers. This wedge between regulated and unregulated firms, created by uneven regulation of transparency, can lead to a significant reallocation of economic activity from more toward less regulated firms, industries, or even countries.

Our evidence captures the direct and indirect impacts of transparency regulation on aggregate economic activity. These aggregate impacts are particularly informative for at least three reasons. First, they allow us to investigate first-order economic outcomes (e.g., production and employment) of concern to regulators. Second, they allow us to explore spillovers and reallocations not only within industries, but also across industries and even across countries. Third, they allow us to capture the various channels through which firms are affected by the regulation and adjust to the regulation (e.g., business reduction, relocation, and termination).

In line with our aggregate results, the literature provides examples of specific channels through which economic activity can be reallocated across firms, industries, and countries. With respect to the direct impact of transparency regulation, Bernard (2016) and Breuer *et al.* (2021b), for example, document that the EU's transparency regulation hurts regulated firms' market shares, profits, and investment incentives. In addition, Bernard *et al.* (2018) and Laschewski and Nasev (2018) show that firms reduce their size or switch legal form to avoid the EU's transparency regulation. Breuer (2021) even documents that the regulation leads some firms to file for bankruptcy.

With respect to the indirect impact of transparency regulation, Granja (2018), Barrios *et al.* (2021), Breuer (2021), for example, document that peer firms' transparency regulation informs potential competitors and facilitates entry (e.g., of large competitors' subsidiaries) in regulated markets. In this vein, Glaeser and Omartian (2022) and Yang (2019) even show that peer firms' transparency regulation can inform foreign competitors, increasing import competition in regulated markets. Besides competitors, Max-Planck-Institute (2009), Minnis and Shroff (2017), and Breuer *et al.* (2021b) document that customers and suppliers may benefit from other firms' transparency regulation, as it strengthens their bargaining position (e.g., allows observing the contracting partners' profitability and facilitates the search for other partners). Apart from these competitive benefits, several studies document that peer firms' transparency regulation can benefit other firms by reducing their need to

incur the costs of transparency themselves (Baginski & Hinson 2016; Breuer *et al.* 2021a); reducing their cost of capital (Garmaise & Natividad 2016; Shroff *et al.* 2017); and helping their identification of investment opportunities (Badertscher *et al.* 2013; Chiu *et al.* 2019; Kim 2020).

Our evidence suggests several of the above channels combine to result in substantial re-allocative effects. These effects are particularly worrisome if economically linked firms operate in industries or countries with substantially different transparency regulations (e.g., De Fontenay 2017; Glaeser & Omartian 2022). In such cases, uneven regulation creates winners and losers, fueling a race to the bottom in terms of transparency standards across industries or countries. To avoid such race, regulatory coordination may be called for (e.g., McLeay 1999). These regulatory insights are particularly relevant and timely given current deliberations by the U.S. Securities and Exchange Commission to extend its transparency regulation to private firms (Kiernan 2022) and a broader push toward transparency regulation by national regulators around the world to tackle environmental, social, and governance issues (Christensen *et al.* 2021; Hodgson 2021).

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Appendix

VARIABLE DEFINITIONS		
Panel A: Exemption-Threshold Variation		
Treatment	Source	Description
Reporting	Amadeus	Share of firms above country-level reporting threshold calculated using a standardized firm-size distribution per industry
Supplier Reporting	Amadeus/Eurostat	Reporting share of supplier industries (calculated by weighting reporting shares with input shares from Eurostat's FIGARO input-output table)
Supplier Reporting×Domestic	Amadeus/Eurostat	Reporting share of domestic supplier industries (calculated by weighting reporting shares with domestic input shares from Eurostat's FIGARO input-output table)
Supplier Reporting×Foreign	Amadeus/Eurostat	Reporting share of foreign supplier industries (calculated by weighting reporting shares with foreign input shares from Eurostat's FIGARO input-output table)
Customer Reporting	Amadeus/Eurostat	Reporting share of customer industries (calculated by weighting reporting shares with output shares from Eurostat's FIGARO input-output table)
Customer Reporting×Domestic	Amadeus/Eurostat	Reporting share of domestic customer industries (calculated by weighting reporting shares with domestic output shares from Eurostat's FIGARO input-output table)
Customer Reporting×Foreign	Amadeus/Eurostat	Reporting share of foreign customer industries (calculated by weighting reporting shares with foreign output shares from Eurostat's FIGARO input-output table)
Uneven Regulation	Amadeus/Eurostat	Difference between focal industry's reporting share and its supplier or customer reporting share
Panel B: Business-Register Variation		
Treatment	Source	Description
Register		Indicator variable taking the value of one for years after the electronic business register starts to operate in a given country and year; otherwise zero

Supplier Register	Eurostat	Register indicator of supplier industries (calculated by weighting register indicators with input shares from Eurostat's FIGARO input-output table)
Customer Register	Eurostat	Register indicator of customer industries (calculated by weighting register indicators with output shares from Eurostat's FIGARO input-output table)

Panel C: Outcomes

Outcomes	Source	Description
Value Added	OECD STAN Database (ISIC Rev. 4)	Value added at current prices (millions of national currency)
Production	OECD STAN Database (ISIC Rev. 4)	Production (gross output) at current prices (millions of national currency)
Number of Employees	OECD STAN Database (ISIC Rev. 4)	Number of employees (thousands)
Gross Fixed Capital Formation	OECD STAN Database (ISIC Rev. 4)	Gross fixed capital formation at current prices (millions of national currency)
Labor Compensation	OECD STAN Database (ISIC Rev. 4)	Labor costs (compensation of employees) (millions of national currency)
Consumption of Fixed Capital	OECD STAN Database (ISIC Rev. 4)	Consumption of fixed capital (millions of national currency)

Panel D: Cross-Sections

Indicator	Source	Description
Tradable	Mano & Castillo (2015)	Indicator taking the value of one for industries with tradable goods, and zero otherwise
Non-Tradable	Mano & Castillo (2015)	Indicator taking the value of one for industries with non-tradable goods, and zero otherwise
Homogeneous	Rauch (1999)	Indicator taking the value of one for industries with homogeneous goods, and zero otherwise
Differentiated	Rauch (1999)	Indicator taking the value of one for industries with non-homogeneous goods, and zero otherwise
Near (Geography)	OpenCage Geo Data	Indicator taking the value of one for country pairs with below median bilateral geographic distance, and zero otherwise
Distant (Geography)	OpenCage Geo Data	Indicator taking the value of one for country pairs with above median bilateral geographic distance, and zero otherwise
Near (Language)	Bakker *et al.* (2009)	Indicator taking the value of one for country pairs with below median bilateral linguistic distance, and zero otherwise

| Distant (Language) | Bakker *et al.* (2009) | Indicator taking the value of one for country pairs with above median bilateral linguistic distance, and zero otherwise |

Indirect Exposure: An Illustrative Example

The indirect exposure measures, $\bar{T}_j$ (e.g., "Supplier Reporting"), are calculated as follows:

$$\bar{T}_j = \sum_i w_{ij}\bar{T}_i \text{ with } w_{ij} = x_{ij}\Big/\sum_i x_{ij} \,,$$

where w_{ij} is the share of inputs (x_{ij}) sourced from industry j among all inputs sourced by focal industry i (or, likewise, the share of outputs consumed by industry j among all outputs produced by focal industry i); and $\bar{T}_i$ is the direct exposure in the focal industry. We calculate the share of inputs and outputs among all other country-industries with non-missing information about their direct exposure.

We can illustrate our approach with a stylized example featuring two countries (A and B) and two industries (1 and 2). The direct exposures for the focal industries (country-industry combinations) are given by:

DIRECT EXPOSURE		
Country	Industry	Direct Exposure
A	1	50%
A	2	75%
B	1	25%
B	2	50%

In this example, country A imposes a higher transparency regulation than country B. In addition, the transparency regulation in both countries affects industry 2 more than industry 1.

The input-output linkages between the country-industries are as follows:

INPUT-OUTPUT MATRIX						
		Output				
		A1	A2	B1	B2	Total Output
	A1	5	5	0	0	10
	A2	5	10	5	0	20
Input	B1	0	0	10	5	15
	B2	10	0	10	20	40
	Total Input	20	15	25	25	85

The linkages can be used to calculate the share of inputs used by a focal industry (given in the columns) from various supplier country-industry combinations (given in the rows). The share of inputs used by focal industry A1 supplied by country-industry B2 is 10/20 = 50%. Equipped with such input shares (calculated by column), we can calculate the indirect exposure to the focal industry's supplier regulation by summing the direct exposures of all country-industry combinations weighted with the respective input shares. For focal industry A1, we, for example, calculate the (rounded) supplier exposure as follows: 5/20*50% + 5/20*75% + 0/20*25% + 10/20*50% ≈ 56%. Likewise, we can calculate the focal industry's (rounded) customer exposure by using its output shares (calculated by row). For focal industry A1, we, for example, calculate the (rounded) customer exposure as follows: 5/10*50% + 5/10*75% + 0/10*25% + 0/10*50% ≈ 63%.

We note that the customer exposure of focal industry A1 (63%) is larger than its supplier exposure (56%). This difference occurs because its customers are exclusively located in country A, which exhibits the highest transparency regulation, whereas its suppliers come from both country A and B. In addition, both the supplier and customer exposures of focal industry A1 are larger than its direct exposure (50%). This difference arises because the industries and countries of its customers and suppliers are subject to higher transparency regulations than the focal industry itself. This variation in transparency regulations across countries and industries allows us to disentangle the direct and indirect impact of uneven transparency regulation.

The table below summarizes the (rounded) supplier and customer exposures for each focal industry in our example:

| INDIRECT EXPOSURE | | | |
Country	Industry	Supplier Exposure	Customer Exposure
A	1	56%	63%
A	2	67%	56%
B	1	45%	33%
B	2	45%	44%

Tables & Figures

Figure 1

		Direct (β_1)	
		+	−
Indirect (β_2)	+	Aggregate improvement	Reallocation away from regulation
	−	Reallocation toward regulation	Aggregate decline

Notes: The figure presents the expected net impact of transparency regulation on aggregate economic activity for the distinct sign combinations of the regulation's direct and indirect impacts. The quadrant shaded in gray corresponds to our expectation.

Figure 2

Notes: The figure presents excerpts of the title pages and tables of contents from mandatory financial reports provided to the official publication platform (*Companies House*) in the United Kingdom by a firm exempted from full reporting requirements in fiscal year 2014 (left side) and non-exempted from full reporting requirements in fiscal year 2015 (right side). In 2014, the firm states in its financial report: "These accounts have been prepared in accordance with the provisions applicable to companies subject to the small companies regime." Taking advantage of the exemptions, the firm only provides an abbreviated balance sheet with abbreviated notes in 2014. After exceeding the exemption thresholds, the firm provides a full set of financial statements including extensive notes and a management report (here: strategic report) in 2015.

Figure 3

Panel A
Activity relative to Foreign Supplier Industries

Panel B
Activity relative to Foreign Customer Industries
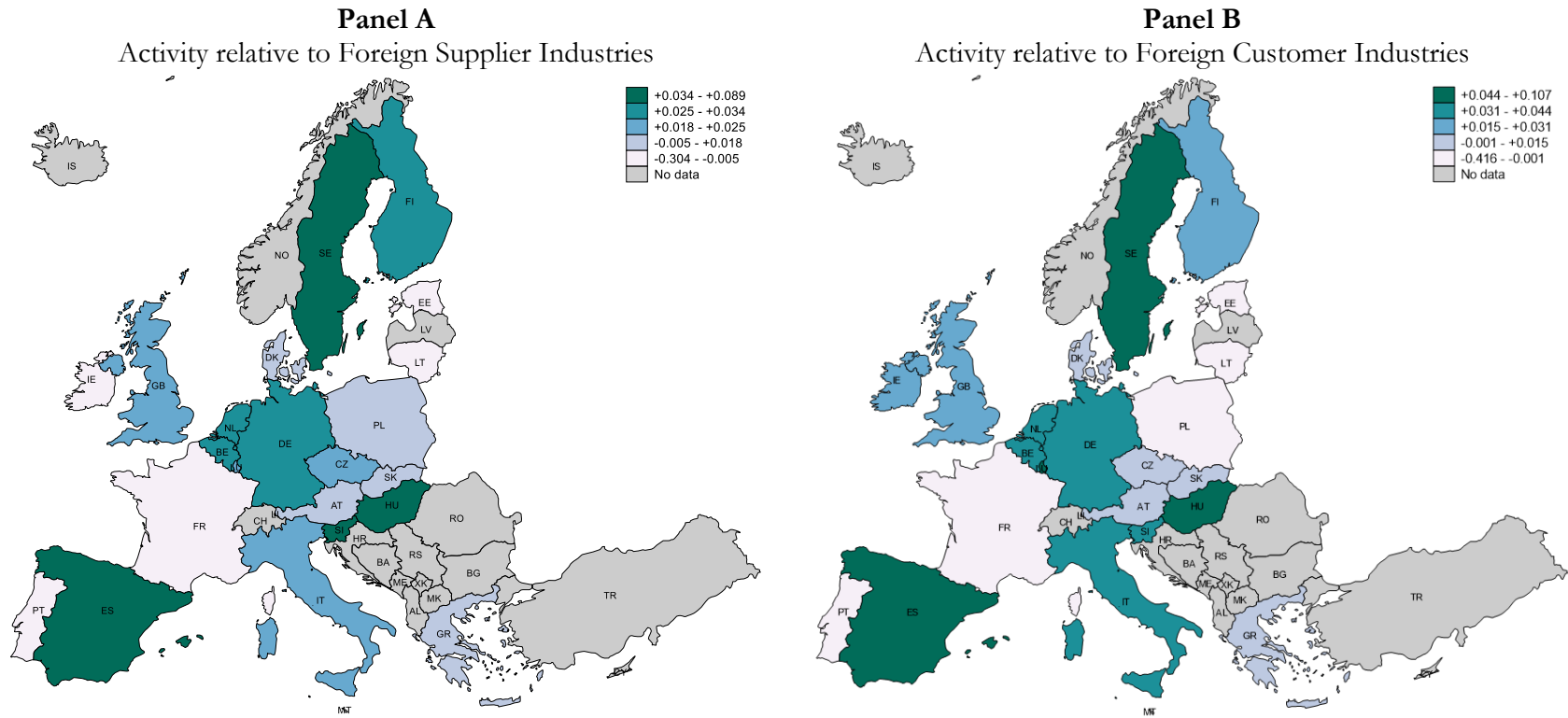
Notes: The figure presents the average (relative) impact of uneven transparency regulation on industry-level economic activity at the country level. In Panel A (B), we calculate the impact on a given country's industry by combining each focal industry's uneven regulation measure, defined as its own exposure less its foreign supplier (customer) exposures, with the coefficient estimates obtained from regressions of economic activity on this modified uneven regulation measure.

Figure 4

UNEVEN REGULATION AND ECONOMIC REALLOCATION:
REGISTER DYNAMICS
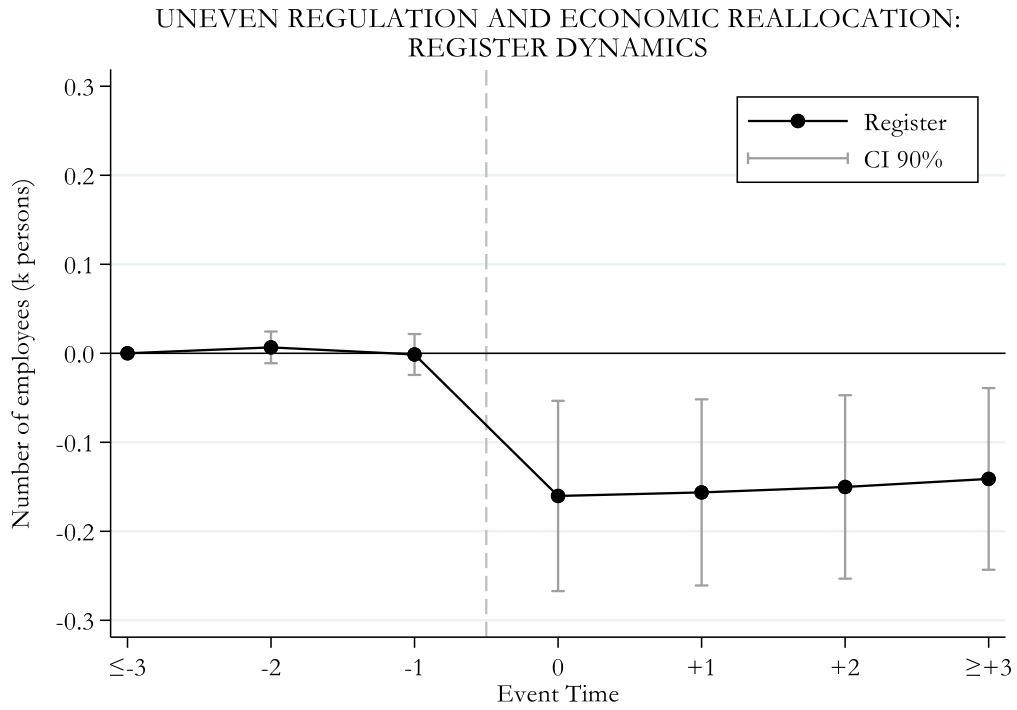
Notes: The figure presents the impact of the direct register exposure on the number of employees in the OECD sample in event time, controlling for the indirect customer register exposure. The black dots capture the direct impact relative to the average number of employees in the three years or more before the register introduction. The event time is zero in the first year of the register operations. The gray whiskers indicate the 90% confidence interval based on standard errors clustered at the country-industry level.

Table 1

			DESCRIPTIVE STATISTICS					
			Exemption-Threshold Variation					
Variable	N	Mean	SD	p10	p25	p50	p75	p90
Reporting	10,746	0.253	0.271	0.034	0.080	0.163	0.306	0.629
Supplier Reporting	8,951	0.237	0.198	0.086	0.127	0.184	0.252	0.440
Supplier Reporting×Domestic	8,151	0.232	0.266	0.045	0.098	0.152	0.213	0.530
Supplier Reporting×Foreign	8,951	0.245	0.075	0.154	0.197	0.241	0.289	0.339
Customer Reporting	8,951	0.242	0.201	0.084	0.132	0.192	0.262	0.425
Customer Reporting×Domestic	8,151	0.244	0.267	0.047	0.102	0.165	0.234	0.619
Customer Reporting×Foreign	8,951	0.238	0.085	0.147	0.183	0.227	0.280	0.337
Uneven Regulation (Supplier)	8,117	0.027	0.105	-0.075	-0.040	0.003	0.067	0.160
Uneven Regulation (Customer)	8,117	0.021	0.122	-0.084	-0.048	-0.002	0.053	0.143
			Business-Register Variation					
Variable	N	Mean	SD	p10	p25	p50	p75	p90
Register	11,316	0.580	0.494	0.000	0.000	1.000	1.000	1.000
Supplier Register	9,541	0.571	0.423	0.022	0.078	0.818	0.980	0.995
Customer Register	9,541	0.581	0.424	0.015	0.080	0.831	0.984	0.998
			Economic Activity					
Variable	N	Mean	SD	p10	p25	p50	p75	p90
Value Added	12,518	64,773	215,520	182	927	6,355	33,390	136,324
Production	12,461	139,965	439,971	469	2,405	17,057	81,479	278,639
Labor Compensation	12,422	34,386	124,768	94	447	3,083	16,524	69,226
Consumption of Fixed Capital	11,390	13,054	48,300	21	150	990	6,461	24,870
Number of Employees	12,443	385	1,505	4	16	56	221	753
Gross Fixed Capital Formation	11,949	15,513	63,027	31	210	1,207	7,155	26,758
Number of Establishments	3,523	11,486	34,592	140	470	1,805	6,572	26,290
			Economic Activity (Logarithmic Transformation)					
Variable	N	Mean	SD	p10	p25	p50	p75	p90
Value Added	12,370	8.636	2.535	5.369	6.899	8.803	10.442	11.836
Production	12,322	9.548	2.479	6.315	7.849	9.780	11.333	12.546
Labor Compensation	12,277	7.946	2.512	4.709	6.180	8.097	9.739	11.154
Consumption of Fixed Capital	10,956	6.992	2.535	3.686	5.235	7.062	8.866	10.178

Number of Employees	12,268	4.052	2.031	1.504	2.833	4.073	5.435	6.652
Gross Fixed Capital Formation	11,469	7.223	2.442	4.006	5.574	7.245	8.948	10.245
Number of Establishments	3,523	7.490	2.053	4.942	6.153	7.498	8.791	10.177

Table 2

	FIRST STAGE			
Outcome	Actual Reporting	Actual Supplier Reporting	Actual Reporting	Actual Customer Reporting
Column	(1)	(2)	(3)	(4)
Reporting	0.617***	0.021	0.601***	-0.020
	(6.05)	(0.67)	(6.25)	(-0.49)
Supplier Reporting	-0.073	0.778***		
	(-0.98)	(29.23)		
Customer Reporting			-0.043	0.804***
			(-0.85)	(36.37)
Country-Year FE	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Observations	8,117	8,117	8,117	8,117
Clusters (Country-Industry)	551	551	551	551
Adjusted R²	0.909	0.981	0.908	0.958

Notes: The table presents estimates from regressions of a focal industry's and its supplier and customer industries' actual reporting scope on a focal industry's and its supplier and customer industries' standardized reporting scopes. "Actual Reporting" is the share of firms exceeding reporting-related exemption thresholds in a given country, industry, and year. "Actual Supplier Reporting" is the input-share-weighted actual reporting share in the supplier industries of a given country, industry, and year. "Actual Customer Reporting" is the output-share-weighted actual reporting share in the customer industries of a given country, industry, and year. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted standardized reporting share in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted standardized reporting share in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 3

	UNEVEN REGULATION AND ECONOMIC REALLOCATION: OUTPUT					
Outcome	Value Added (current prices, national currency)			Production (gross output, current prices, national currency)		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.139	-1.444**	-1.027	0.158	-0.909	-0.643
	(-0.20)	(-2.23)	(-1.59)	(0.22)	(-1.11)	(-0.85)
Supplier Reporting		1.985***			1.625**	
		(3.27)			(2.26)	
Customer Reporting			1.314***			1.185***
			(3.94)			(2.91)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,873	7,873	7,877	7,877	7,877
Clusters (Country-Industry)	530	530	530	530	530	530
Adjusted R²	0.934	0.936	0.936	0.919	0.920	0.920

Notes: The table presents estimates from regressions of economic activity outcome measures on a focal industry's and its supplier and customer industries' standardized reporting scopes. The outcome variables are provided by OECD data for a given country, industry, and year. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted intensity of reporting mandates in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted intensity of reporting mandates in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 4

UNEVEN REGULATION AND ECONOMIC REALLOCATION:
INPUT QUANTITY

Outcome	Number of Employees			Gross Fixed Capital Formation (national currency)		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.129	-1.129*	-0.949	-1.966**	-2.805***	-2.457***
	(-0.18)	(-1.74)	(-1.41)	(-2.56)	(-3.24)	(-3.22)
Supplier Reporting		1.478**			2.266***	
		(2.17)			(2.74)	
Customer Reporting			1.123***			2.244***
			(2.93)			(3.96)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,844	7,844	7,844	7,638	7,638	7,638
Clusters (Country-Industry)	528	528	528	515	515	515
Adjusted R²	0.913	0.915	0.915	0.897	0.899	0.899

Notes: The table presents estimates from regressions of input-quantity measures on a focal industry's and its supplier and customer industries' standardized reporting scopes. The outcome variables are provided by OECD data for a given country, industry, and year. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted intensity of reporting mandates in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted intensity of reporting mandates in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 5

	UNEVEN REGULATION AND ECONOMIC REALLOCATION: INPUT PRICE					
Outcome	Labor Compensation (national currency)			Consumption of Fixed Capital (national currency)		
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	0.296	-0.803	-0.507	1.083	-0.663	-0.156
	(0.47)	(-1.34)	(-0.86)	(1.36)	(-0.86)	(-0.21)
Supplier Reporting		1.673***			2.620***	
		(2.96)			(4.38)	
Customer Reporting			1.187***			1.816***
			(3.63)			(5.75)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,877	7,877	7,877	7,397	7,397	7,397
Clusters (Country-Industry)	530	530	530	498	498	498
Adjusted R²	0.945	0.946	0.946	0.926	0.929	0.929

Notes: The table presents estimates from regressions of input-price measures on a focal industry's and its supplier and customer industries' standardized reporting scopes. The outcome variables are provided by OECD data for a given country, industry, and year. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted intensity of reporting mandates in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted intensity of reporting mandates in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 6

UNEVEN REGULATION AND ECONOMIC REALLOCATION						
Panel A: Supplier Reporting						
Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Uneven Regulation	-1.882***	-1.488**	-1.415**	-1.506***	-2.532***	-2.268***
	(-3.43)	(-2.19)	(-2.36)	(-2.97)	(-3.35)	(-3.86)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,877	7,844	7,877	7,638	7,397
Clusters (Country-Industry)	530	530	528	530	515	498
Adjusted R²	0.936	0.920	0.915	0.946	0.899	0.928
Panel B: Customer Reporting						
Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Uneven Regulation	-1.286***	-1.132***	-1.109***	-1.121***	-2.327***	-1.662***
	(-4.09)	(-2.83)	(-3.06)	(-3.70)	(-4.34)	(-5.31)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,877	7,844	7,877	7,638	7,397
Clusters (Country-Industry)	530	530	528	530	515	498
Adjusted R²	0.936	0.920	0.915	0.946	0.899	0.928

Notes: The table presents estimates from regressions of economic activity measures on a focal industry's uneven reporting regulation. The outcome variables are provided by OECD data for a given country, industry, and year. In Panel A, "Uneven Regulation" is the difference between a focal industry's reporting share ("Reporting") and its supplier industries' reporting share ("Supplier Reporting"). In Panel B, "Uneven Regulation" is the difference between a focal industry's reporting share ("Reporting") and its customer industries' reporting share ("Customer Reporting"). The components of these differences are defined as follows: "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted intensity of reporting mandates in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted intensity of reporting mandates in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 7

<table>
<tr><td colspan="7" align="center">UNEVEN REGULATION AND ECONOMIC REALLOCATION:
DOMESTIC VS FOREIGN</td></tr>
<tr><td colspan="7">Panel A: Supplier Reporting</td></tr>
<tr><td>Outcome</td><td>Value Added</td><td>Production</td><td>Number of Employees</td><td>Labor Compensation</td><td>Gross Fixed Capital Formation</td><td>Consumption of Fixed Capital</td></tr>
<tr><td>Column</td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td><td>(5)</td><td>(6)</td></tr>
<tr><td>Reporting</td><td>-0.592</td><td>-0.720</td><td>-0.219</td><td>-0.345</td><td>-2.320**</td><td>0.814</td></tr>
<tr><td></td><td>(-0.60)</td><td>(-0.65)</td><td>(-0.26)</td><td>(-0.40)</td><td>(-2.19)</td><td>(0.71)</td></tr>
<tr><td>Supplier Reporting×Domestic</td><td>1.177</td><td>2.322</td><td>0.061</td><td>1.555</td><td>0.784</td><td>0.422</td></tr>
<tr><td></td><td>(0.57)</td><td>(0.94)</td><td>(0.05)</td><td>(0.86)</td><td>(0.37)</td><td>(0.18)</td></tr>
<tr><td>Supplier Reporting×Foreign</td><td>0.598</td><td>0.925</td><td>1.274*</td><td>1.545*</td><td>1.827*</td><td>2.344**</td></tr>
<tr><td></td><td>(0.64)</td><td>(0.90)</td><td>(1.71)</td><td>(1.85)</td><td>(1.65)</td><td>(2.14)</td></tr>
<tr><td>Country-Year FE</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Industry-Year FE</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td>Observations</td><td>7,873</td><td>7,877</td><td>7,844</td><td>7,877</td><td>7,638</td><td>7,397</td></tr>
<tr><td>Clusters (Country-Industry)</td><td>530</td><td>530</td><td>528</td><td>530</td><td>515</td><td>498</td></tr>
<tr><td>Adjusted R²</td><td>0.934</td><td>0.920</td><td>0.913</td><td>0.945</td><td>0.898</td><td>0.927</td></tr>
</table>

Panel B: Customer Reporting

Column	Value Added (1)	Production (2)	Number of Employees (3)	Labor Compensation (4)	Gross Fixed Capital Formation (5)	Consumption of Fixed Capital (6)
Reporting	-2.369***	-2.367***	-1.929**	-1.694**	-4.381***	-1.046
	(-2.80)	(-2.61)	(-2.27)	(-2.24)	(-4.55)	(-1.07)
Customer Reporting×Domestic	5.728***	6.449***	4.519***	5.139***	6.332***	5.980***
	(4.53)	(4.74)	(4.30)	(4.87)	(3.88)	(4.33)
Customer Reporting×Foreign	0.572**	0.548*	0.687**	0.606*	1.159***	1.264***
	(2.14)	(1.90)	(2.10)	(1.70)	(3.19)	(3.64)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,877	7,844	7,877	7,638	7,397
Clusters (Country-Industry)	530	530	528	530	515	498
Adjusted R²	0.938	0.924	0.917	0.948	0.903	0.930

Notes: The table presents estimates from regressions of economic activity output and input measures on a focal industry's and its domestic and foreign supplier and customer industries' standardized reporting scopes. The outcome variables are provided by OECD data for a given country, industry, and year. In Panel A (B), we present the supplier (customer) industry results. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting×Domestic" is the input-share-weighted intensity of reporting mandates in domestic supplier industries of a given country, industry, and year. "Supplier Reporting×Foreign" is the input-share-weighted intensity of reporting mandates in foreign supplier industries of a given country, industry, and year. "Customer Reporting×Domestic" is the output-share-weighted intensity of reporting mandates in domestic customer industries of a given country, industry, and year. "Customer Reporting×Foreign" is the output-share-weighted intensity of reporting mandates in foreign customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 8

			UNEVEN REGULATION AND ECONOMIC REALLOCATION: REGISTERS			

Panel A: Supplier Register

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Register	-0.285	-0.391*	-0.407**	-0.360*	-0.269	-0.549**
	(-1.32)	(-1.81)	(-2.19)	(-1.82)	(-1.11)	(-2.07)
Supplier Register	0.283	0.438	0.513**	0.385	0.298	0.659*
	(1.02)	(1.56)	(2.10)	(1.50)	(0.95)	(1.90)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,089	8,092	8,050	8,092	7,835	7,580
Clusters (Country-Industry)	506	506	504	506	491	474
Adjusted R²	0.935	0.923	0.915	0.946	0.902	0.930

Panel B: Customer Register

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.213	-0.302**	-0.323**	-0.259*	-0.175	-0.307*
	(-1.50)	(-1.97)	(-2.45)	(-1.95)	(-1.01)	(-1.81)
Customer Register	0.191	0.326	0.410**	0.256	0.178	0.346
	(1.04)	(1.65)	(2.36)	(1.50)	(0.79)	(1.55)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,089	8,092	8,050	8,092	7,835	7,580
Clusters (Country-Industry)	506	506	504	506	491	474
Adjusted R²	0.935	0.923	0.915	0.946	0.902	0.930

Panel C: Supplier Register

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Supplier Register	0.229	0.329	0.464	0.367	0.537	0.805**
	(0.65)	(0.89)	(1.58)	(1.18)	(1.44)	(2.11)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,286	9,292	9,249	9,291	8,880	8,774
Clusters (Country-Industry)	581	581	579	581	561	549
Adjusted R²	0.937	0.923	0.921	0.947	0.903	0.929

Panel D: Customer Register

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Customer Register	0.441*	0.597**	0.598***	0.502**	0.501*	0.558**
	(1.71)	(2.17)	(2.83)	(2.17)	(1.83)	(2.11)
Country-Year FE	Yes	Yes		Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,286	9,292	9,249	9,291	8,880	8,774
Clusters (Country-Industry)	581	581	579	581	561	549
Adjusted R²	0.937	0.923	0.921	0.948	0.903	0.929

Notes: The table presents estimates from regressions of economic activity output and input measures on countries' electronic business register operations. The outcome variables are provided by OECD data for a given country, industry, and year. "Register" is an indicator taking the value of one for years after the electronic business register starts to operate in a given country and year; otherwise zero. "Supplier Register" is the input-share-weighted indicator of register operations in the supplier industries of a given country, industry, and year. "Customer Register" is the output-share-weighted indicator of register operations in the customer industries of a given country, industry, and year. In Panels A and B, the regressions include country, industry, and year fixed effects. In Panels C and D, the regressions include country-year and industry-year fixed effects (subsuming the "Register" variation). *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 9

		UNEVEN REGULATION AND ECONOMIC REALLOCATION: CROSS-SECTIONS				

Panel A: Tradable vs. Non-Tradable Industries

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting×Tradable	-1.202*	-0.979	-1.045	-0.648	-2.619***	-0.430
	(-1.65)	(-1.33)	(-1.47)	(-0.99)	(-3.33)	(-0.53)
Reporting×Non-Tradable	-0.936	-0.433	-0.708	-0.470	-2.074***	0.067
	(-1.47)	(-0.64)	(-1.12)	(-0.83)	(-2.85)	(0.10)
Customer Reporting×Tradable	2.109***	2.420***	2.326***	2.148***	2.920***	2.687***
	(4.27)	(4.13)	(4.37)	(4.36)	(3.75)	(5.44)
Customer Reporting×Non-Tradable	0.983*	0.520	0.643	0.951*	1.503**	1.225**
	(1.76)	(0.85)	(1.18)	(1.94)	(2.44)	(2.50)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,877	7,844	7,877	7,638	7,397
Clusters (Country-Industry)	530	530	528	530	515	498
Adjusted R²	0.936	0.922	0.917	0.947	0.900	0.929

Panel B: Homogeneous vs. Differentiated Industries

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting×Homogeneous	-0.511	0.173	-0.584	-0.157	-2.175**	0.359
	(-0.65)	(0.18)	(-0.82)	(-0.22)	(-2.11)	(0.36)
Reporting×Differentiated	-0.044	0.422	-0.226	0.323	-1.908**	0.822
	(-0.06)	(0.45)	(-0.27)	(0.45)	(-2.18)	(0.87)
Customer Reporting×Homogeneous	2.547***	2.019**	2.382***	2.359***	2.779***	3.136***
	(3.34)	(2.13)	(2.87)	(3.49)	(2.84)	(3.59)
Customer Reporting×Differentiated	0.537	0.503	0.663	0.476	1.773***	0.947**
	(1.52)	(1.09)	(1.53)	(1.37)	(2.78)	(2.58)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,623	5,627	5,595	5,627	5,404	5,252
Clusters (Country-Industry)	378	378	376	378	364	353
Adjusted R^2	0.922	0.909	0.898	0.938	0.871	0.914

Panel C: Near vs. Distant Countries (Geography)

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.883	-0.548	-0.850	-0.346	-2.241***	0.073
	(-1.35)	(-0.71)	(-1.26)	(-0.58)	(-2.87)	(0.09)
Customer Reporting×Near	1.352***	1.207***	1.172***	1.215***	2.348***	1.846***
	(3.98)	(2.81)	(2.95)	(3.63)	(3.46)	(5.69)
Customer Reporting×Distant	0.728**	0.435	0.796**	0.794**	1.302***	1.090***
	(2.37)	(1.33)	(2.52)	(2.24)	(3.24)	(2.92)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,873	7,877	7,844	7,877	7,638	7,397
Clusters (Country-Industry)	530	530	528	530	515	498
Adjusted R²	0.936	0.921	0.916	0.946	0.900	0.929

Panel D: Near vs. Distant Countries (Language)

Outcome	Value Added	Production	Number of Employees	Labor Compensation	Gross Fixed Capital Formation	Consumption of Fixed Capital
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.826	-0.463	-0.772	-0.260	-2.902***	0.012
	(-1.08)	(-0.54)	(-0.91)	(-0.38)	(-3.40)	(0.01)
Customer Reporting×Near	1.178***	1.050**	1.004**	1.035***	2.603***	1.752***
	(3.56)	(2.46)	(2.38)	(3.15)	(3.78)	(5.42)
Customer Reporting×Distant	0.638	0.659	0.394	0.716*	0.892*	0.741
	(1.45)	(1.33)	(1.02)	(1.74)	(1.68)	(1.44)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,828	7,832	7,799	7,832	7,593	7,352
Clusters (Country-Industry)	527	527	525	527	512	495
Adjusted R²	0.935	0.92	0.914	0.946	0.899	0.928

Notes: The table presents estimates from cross-sections. The cross-sections split the direct exposure and/or indirect exposures to transparency regulation by industry and country characteristics. The outcome variables are provided by OECD data for a given country, industry, and year. In Panel A, we present the results for a split of the focal industry and customer industries into industries with tradable goods and those with non-tradable goods. In Panel B, we present results for a split of the focal industry and customer industries into industries with homogeneous goods and those with differentiated goods. In Panel C, we present results for a split of customer countries into countries located near the focal industry and those located at a greater distance from the focal industry. In Panel D, we present results for a split of customer countries into countries using a language similar to the focal industry and those using a language dissimilar to the focal industry. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Reporting×Tradable" ("Reporting×Non-Tradable") is the share of regulated firms in an industry with (non-)tradable goods (Mano & Castillo 2015). "Customer Reporting×Tradable" ("Customer Reporting×Non-Tradable") is the output-share-weighted share of regulated firms in customer industries with (non-)tradable goods. "Reporting×Homogeneous" ("Reporting×Differentiated") is the share of regulated firms in an industry with homogeneous (differentiated) goods (Rauch 1999; Barrot & Sauvagnat 2016). "Customer Reporting×Homogeneous" ("Customer Reporting×Differentiated") is the output-share-weighted share of regulated firms in customer industries with homogeneous (differentiated) goods. "Customer Reporting×Near" ("Customer Reporting×Distant") is the output-share-weighted share of regulated firms in customer industries located near to (distant from) the focal industry using a median split of bilateral distance between the focal industry's country and each customer country in Panel C. In Panel D, "Customer Reporting×Near" ("Customer Reporting×Distant") is the output-share-weighted share of regulated firms in customer industries located in countries using a language (dis)similar to the focal industry's language using a median split of the bilateral language distance between the language of the focal industry's country and the language of each costumer country (Bakker *et al.* 2009). The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

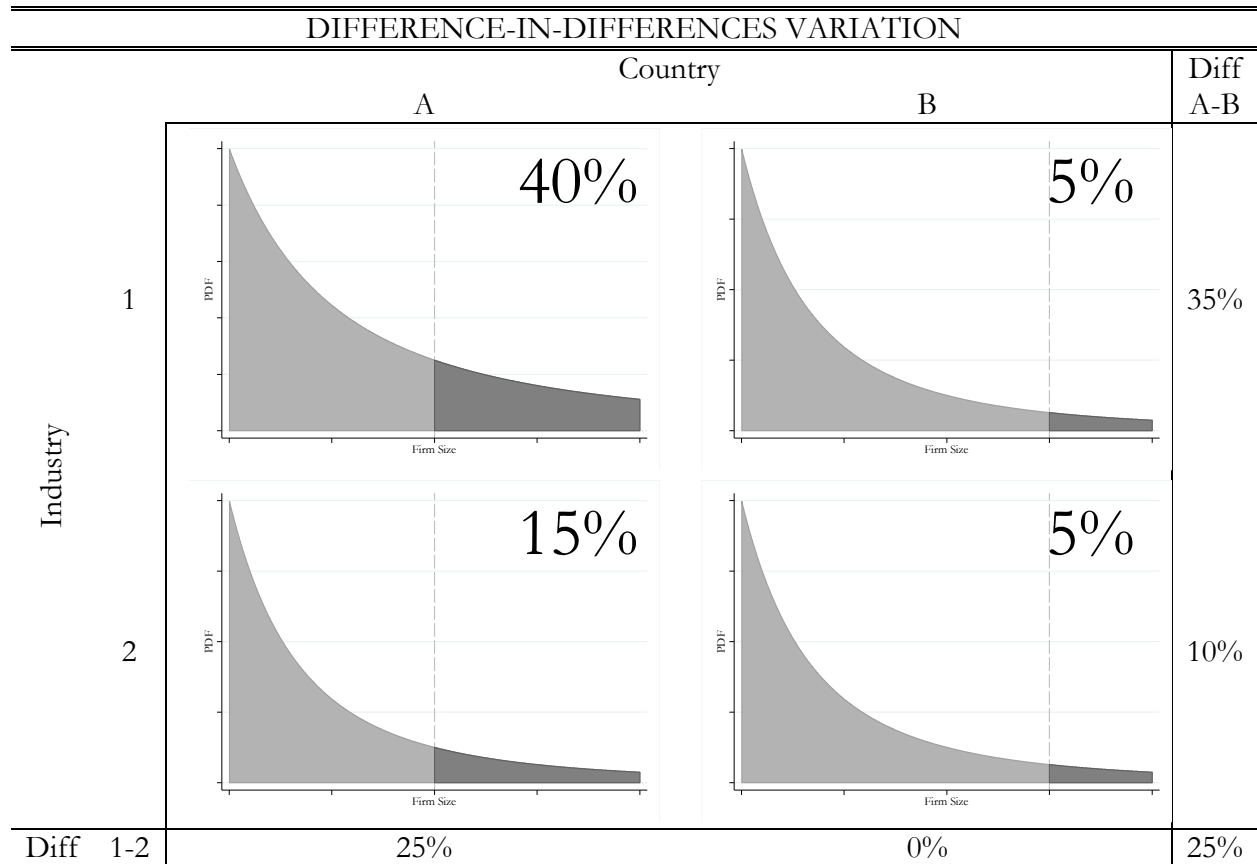**Online Appendix**

(for online publication only)

Uneven Regulation and Economic Reallocation: Evidence from Transparency Regulation

Table of Contents

Illustration of Exemption-Threshold Design

We briefly illustrate the cross-sectional difference-in-differences design, which we use to exploit the exemption-threshold variation. The first difference we exploit is the difference in the share of regulated firms within a given country across industries. In country A, for example, industry 1 exhibits a share of regulated firms of 40%, whereas industry 2 exhibits only a share of 15%. The difference in the regulatory shares across industries arises because, despite a common country-level threshold, industries naturally vary in their firm-size distributions and, hence, their regulatory exposure. A 50-employees threshold, for example, results in a greater share of regulated firms in labor-intensive industries (e.g., industry 1) than in other industries (e.g., industry 2).

DIFFERENCE-IN-DIFFERENCES VARIATION

| | | Country | | Diff |
		A	B	A-B
Industry	1	40%	5%	35%
	2	15%	5%	10%
Diff	1-2	25%	0%	25%

The second difference we exploit is the difference in the shares of regulated firms within a given industry across countries. In industry 1, for example, country A exhibits a share of regulated firms of 40%, whereas country B exhibits only a share of 5%. This difference arises because country

A sets a lower threshold than country B. It, however, also arises because the firm-size distribution of industry 1 in country B exhibits fewer large firms than the distribution in the same industry in country A. This country-industry-level difference in the firm-size distribution could be due to a host of factors (e.g., differences in barriers to entry). These factors threaten to confound the identification of the effects of transparency regulation. They, for example, would result in variation in the share of regulated firms even absent regulatory differences (e.g., if both countries imposed the same threshold).

DIFFERENCE-IN-DIFFERENCES VARIATION WITH SIMULATED INSTRUMENT		Diff
	Country	A-B
	A	B	

Industry			
1	40%	20%	20%
2	15%	5%	10%
Diff 1-2	25%	15%	10%

We circumvent the issue of confounding country-industry-level differences in firm-size distributions by using a simulated instrument approach. Following this approach, we do not use the actual firm-size distribution observed for each country's industry, but rather use one common firm-size distribution per industry across all countries in calculating the (hypothetical) share of regulated firms. In our research design, we use Europe-wide firm-size distributions (instead of country-industry-level distributions). In this illustrative example, we achieve the same effect by simply using one of the

country's industry-level distribution as the benchmark distribution to compare the regulatory extent (i.e., thresholds) across countries. Here, we use country A's distributions as the benchmark. Using country A's distribution for industry 1, we observe that country B's threshold would result in a share of regulated firms of 20% (not 5% anymore) had it been applied to the benchmark distribution. The difference in the shares in industry 1 now only reflects differences in the countries' thresholds, not any other factors manifesting in firm-size differences (e.g., entry barriers).

Using the simulated instrument, the difference-in-differences variation (10%) then only captures that, relative to industry 2, industry 1 is more strongly regulated in country A than in country B. This variation arises because country A imposes a lower (employees) threshold *and* industry 1 is more labor intensive than industry 2. This differential country-industry-level variation allows us to purge country-level differences (e.g., country A being more developed than country B) and industry-level differences (e.g., industry 1 being more labor intensive than industry 2). It also, by construction, does not vary with possibly endogenous differences in firm sizes varying at the identifying country-industry level, because we use our simulated instrument instead of countries' actual shares of regulated firms in the respective industries. In our example, this means that our difference-in-differences variation is purged of the additional variation (15% = 25%-10%) that is due to endogenous differences between firm sizes in industry 1 across countries A and B.

Robustness Tests

Our inferences are robust to seven noteworthy research design choices. First, our inferences are unchanged when using WIOD data (Timmer *et al.* 2015) instead of OECD data. The data sources differ in terms of selection of countries, definitions of industries, coverage of years, and their variable definitions. The OECD sample covers 34 industries in 26 countries over the period from 2000 to 2015, whereas the WIOD sample covers 56 industries in 30 countries over the period from 2000 to 2014. Despite these differences, we find highly consistent results in terms of signs and magnitudes across the two data sources.

Second, our exemption-threshold design exploits cross-sectional differences in the share of regulated firms generated by differences in countries' thresholds and industries' firm-size distributions, using a simulated instrument approach (Currie & Gruber 1996; Mahoney 2015). This approach, which is akin to a Bartik instrument approach, can be biased if a given threshold or firm-size distribution dominates the variation (Goldsmith-Pinkham *et al.* 2020). To assess the sensitivity of our estimates to individual countries and industries, in untabulated tests, we rerun our exemption-threshold tests dropping one country or industry at a time. Our inferences remain unchanged, suggesting that no individual country's thresholds or industry's size distribution has an undue influence on our estimates.

Third, in our reported tests, we primarily focus on regressions including both the direct and indirect exposures to decompose the aggregate net impact. The benefit of this approach is that it allows us to uncover evidence of reallocation by not only documenting a positive indirect impact (Badertscher *et al.* 2013), but also a negative direct impact. The drawback is that it limits our regression sample to countries which are not only indirectly, but also directly affected. In untabulated robustness tests, we re-run our regressions excluding the direct exposure variable, which expands our sample to countries without information on their own reporting requirements and business register implementation (e.g., the United States). Consistent with our main results, we continue to find

evidence of a positive indirect impact. This impact, however, is lower in magnitude than in our main results. The reduced magnitude is likely due to at least two reasons. For one, without controlling for the direct exposures, the indirect exposure captures some of the offsetting negative direct impact. For another, countries without information on their direct exposure are primarily those outside of Europe. These more distant countries should not be expected to reap the same amount of indirect benefits as geographically closer countries.

Fourth, we calculate a focal industry's supplier and customer exposures using input-output linkages to other industries and countries, but also to itself. This choice is motivated by the fact that a substantial share of inputs are sourced and outputs are consumed within the very same domestic two-digit industry. The benefit of including the intra-industry link is that it allows us to control for both within- *and* across-industry reallocation, permitting a more comprehensive assessment of the direct and indirect impacts. Consistent with this benefit, in untabulated robustness tests, we document that excluding a focal industry' intra-industry link from the indirect exposure calculation weakens the negative direct and the positive indirect impact. This weakening echoes our earlier finding that indirect effects are strongest in domestic industries. Despite the weakening, we still find evidence consistent with reallocation, even after excluding the intra-industry links. This robustness of our inferences to excluding intra-industry linkages documents that the reallocation of economic activity not only occurs within the focal industry itself, but also across industries.

Fifth, we rely on Eurostat's FIGARO input-output matrix to define supplier and customer industries. The benefit of this matrix is that it is specifically developed for European countries, making it particularly relevant for our European sample. The drawback of the FIGARO matrix is that it does not perfectly align with the countries and industries covered in the OECD and the WIOD data. In untabulated robustness tests, we find that using OECD- and WIOD-specific input-output matrices, respectively, leaves our inferences unchanged. Notably, the use of these alternative matrices increases

the number of covered countries, extending our evidence even to other countries outside of Europe. The effect sizes, however, naturally decline when including more distant countries. This pattern is again consistent with our finding that any indirect impact is strongest for domestic industries.

Sixth, we use input and output links to define related industries. The benefit of this approach is twofold. For one, it provides a comprehensive measure of linked industries. For another, it provides a measure which varies at the country-industry level, allowing us to account for confounding differences and trends at the country and industry levels. Prior literature, by contrast, often primarily focuses exclusively on competitors in the same industry. In untabulated robustness tests, we find similar results restricting our measure of related industries to the same industry (using industry-wide production weights instead of country-industry-specific input or output weights). These results are weaker though given that we only use a subset of all related industries and cannot control for confounding industry-level trends (as the indirect competitor exposure measure is defined at the industry-year level).

Lastly, we choose not to truncate the outcome and regulatory exposure variables in our reported tests. We abstain from truncating the outcome variables, because they are directly taken from official statistics, reducing concerns about outliers due to data errors. The outcomes may include several influential observations though. We account for these observations by using a logarithmic transformation of the outcome variables and an extensive set of fixed effects, which re-center the variables within units (e.g., countries). We abstain from truncating the regulatory exposure variables, because they naturally range from zero to one. These arguments notwithstanding, we examine the robustness of our inferences to truncating the outcome and regulatory exposure variables at the 1st and 99th percentile of their respective residual distributions (after accounting for fixed effects). In untabulated robustness tests, we find that such truncation leaves our inferences unchanged.

Tables

Table A1

COVERAGE OF COUNTRIES	
Country	Country
Austria	Lithuania
Belgium	Luxembourg
Czech Republic	Netherlands
Denmark	Norway
Estonia	Poland
Finland	Portugal
France	Romania
Germany	Slovakia
Greece	Slovenia
Hungary	Spain
Ireland	Sweden
Italy	United Kingdom
Latvia	United States*
Total	26

Notes: The United States (*) are only included in supplemental tests which focus on the indirect exposure measure only, relaxing the requirements to have a non-missing direct exposure measure.

Table A2

Code	Industry
	COVERAGE OF INDUSTRIES
D01T03	Agriculture, forestry and fishing
D05T06	Mining and extraction of energy producing products
D07T08	Mining and quarrying of non-energy producing products
D09	Mining support service activities
D10T12	Food products, beverages and tobacco
D13T15	Textiles, wearing apparel, leather and related products
D16	Wood and products of wood and cork
D19	Coke and refined petroleum products
D20T21	Chemicals and pharmaceutical products
D22	Rubber and plastic products
D23	Other non-metallic mineral products
D24	Basic metals
D25	Fabricated metal products
D26	Computer, electronic and optical products
D27	Electrical equipment
D28	Machinery and equipment, nec
D29	Motor vehicles, trailers and semi-trailers
D30	Other transport equipment
D31T33	Other manufacturing; repair and installation of machinery and equipment
D35T39	Electricity, gas, water supply, sewerage, waste and remediation services
D41T43	Construction
D45T47	Wholesale and retail trade; repair of motor vehicles
D49T53	Transportation and storage
D55T56	Accommodation and food services
D58T60	Publishing, audiovisual and broadcasting activities
D61	Telecommunications
D62T63	IT and other information services
D64T66	Financial and insurance activities
D68	Real estate activities
D69T82	Other business sector services
D84	Public admin. and defence; compulsory social security
D85	Education
D86T88	Human health and social work
D97T98	Private households with employed persons
Total	34

Table A3

	UNEVEN TRANSPARENCY REGULATION						
	Exemption-Threshold Variation			Business-Register Variation			
Country	Reporting	Supplier Reporting	Customer Reporting	Year	Register	Supplier Register	Customer Register
Austria	0.167	0.162	0.167	2001	0.875	0.779	0.778
Belgium	0.173	0.188	0.196	2008	0.457	0.488	0.494
Bulgaria				2008			
Croatia				2008			
Czech Republic	0.190	0.193	0.195	2007	0.500	0.492	0.496
Denmark	0.196	0.191	0.188	1999	1.000	0.905	0.924
Estonia	0.996	0.729	0.688	2000	0.940	0.784	0.792
Finland	0.183	0.181	0.182	2010	0.313	0.373	0.377
France	0.436	0.359	0.374	2001	0.875	0.828	0.820
Germany	0.161	0.156	0.177	2007	0.523	0.514	0.516
Greece	0.220	0.187	0.207	2011	0.259	0.286	0.284
Hungary	0.027	0.105	0.103	2009	0.392	0.423	0.429
Ireland	0.209	0.175	0.202	2004	0.702	0.643	0.646
Italy	0.175	0.174	0.182			0.624	0.640
Latvia		0.318	0.306			0.535	0.625
Lithuania	0.345	0.304	0.292	2006	0.578	0.546	0.568
Luxembourg	0.127	0.140	0.156	2007	0.519	0.532	0.538
Netherlands	0.167	0.157	0.170	2006	0.563	0.561	0.567
Norway	0.073			2007	0.500		
Poland	0.225	0.210	0.206	2018	0.000	0.111	0.121
Portugal	0.629	0.560	0.587	2007	0.514	0.552	0.526
Romania	0.407	0.338	0.318	2010	0.395	0.430	0.467
Slovakia	0.193	0.166	0.187	2014	0.063	0.172	0.221
Slovenia	0.124	0.155	0.164	2003	0.762	0.713	0.695
Spain	0.194	0.202	0.209	1999	1.000	0.946	0.949
Sweden	0.121	0.134	0.137	2000	0.941	0.858	0.865
United Kingdom	0.189	0.177	0.179	2007	0.500	0.523	0.521
United States		0.236	0.240			0.611	0.614

Notes: The table presents average direct and indirect measures of exposure to transparency regulation at the country level. The years indicate the introduction of electronic business registers.

Table A4

	UNEVEN REGULATION AND ECONOMIC REALLOCATION: NUMBER OF ESTABLISHMENTS		
Outcome	Number of Establishments	Number of Establishments	Number of Establishments
Column	(1)	(2)	(3)
Reporting	-0.180	-0.684	-0.559
	(-0.28)	(-1.00)	(-0.85)
Supplier Reporting		0.960**	
		(2.49)	
Customer Reporting			0.662***
			(2.64)
Country-Year FE	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes
Observations	3,523	3,523	3,523
Clusters (Country-Industry)	440	440	440
Adjusted R²	0.939	0.940	0.940

Notes: The table presents estimates from regressions of economic activity on a focal industry's and its supplier and customer industries' standardized reporting scopes. The outcome variable is provided by EUROSTAT data for a given country, industry, and year. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Supplier Reporting" is the input-share-weighted intensity of reporting mandates in the supplier industries of a given country, industry, and year. "Customer Reporting" is the output-share-weighted intensity of reporting mandates in the customer industries of a given country, industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table A5

	Reporting	
Outcome		
Column	(1)	(2)
Register	0.039	-0.046
	(0.51)	(-0.78)
Population	0.133	2.071***
	(1.37)	(3.38)
GDP	-0.241**	-0.350
	(-2.29)	(-1.01)
Industry share	-0.076*	-0.039
	(-1.97)	(-0.84)
Gross capital formation share	0.061**	0.012
	(2.23)	(0.56)
Time required to start a business	-0.079**	-0.036
	(-2.42)	(-1.10)
Tax revenue share	-0.070	0.021
	(-1.39)	(0.80)
Domestic credit share	0.056	-0.095
	(1.16)	(-1.57)
Export share	-0.060	0.079
	(-1.40)	(1.18)
Year	Yes	Yes
Country	No	Yes
Observations	343	343
Clusters (Country)	23	23
Within R^2	0.380	0.188
R^2	0.424	0.741

DETERMINANTS OF COUNTRY-LEVEL REPORTING EXPOSURE

Notes: The table presents determinants of countries' direct reporting exposure (i.e., exemption thresholds). It reports estimates from regressions of countries' average direct reporting exposure in a given year ("Reporting") on time-varying country-level factors. "Reporting" is country-year-level average of the shares of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Register" is an indicator taking the value of one for years after the electronic business register starts to operate in a given country and year; otherwise zero. "Population" is the logarithm of (one plus) the population of the country. "GDP" is the logarithm of (one plus) the gross domestic product (GDP) in current US dollars. "Industry share" is the logarithm of (one plus) the percentage share of industry value added relative to total GDP. "Gross capital formation share" is the logarithm of (one plus) the percentage share of gross capital formation relative to total GDP. "Time required to start a business" is the logarithm of (one plus) the days required to start a business. "Tax revenue share" is the logarithm of (one plus) the percentage share of tax revenues relative to total GDP. "Domestic credit share" is the logarithm of (one plus) the percentage share of domestic credit provided by financial sector relative to total GDP. "Export share" is the logarithm of (one plus) the percentage share of exports of goods and services relative to total GDP. The determinants other than "Register" are taken from the World Bank Indicators. The regression in column 1 include year fixed effects. The regression in column 2 includes year and country fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table A6

SIZE-RELATED CONFOUNDERS OF REPORTING EXPOSURE								
Outcome	Value Added		Production		Number of Employees		Gross Fixed Capital Formation	
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Actual Reporting	1.599***		1.992***		1.565***		1.723***	
	(4.39)		(5.18)		(6.15)		(4.33)	
Reporting		-0.027		0.229		-0.268		-1.217*
		(-0.04)		(0.35)		(-0.42)		(-1.71)
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,865	10,853	10,815	10,803	10,751	10,739	10,397	10,397
Clusters (Country-Industry)	752	751	746	745	748	747	717	717
Within R²	0.039	0.000	0.057	0.000	0.048	0.000	0.034	0.003
R²	0.917	0.915	0.911	0.906	0.902	0.898	0.892	0.888

Notes: The table presents estimates from regressions of economic activity measures on a focal industry's actual and standardized reporting scopes. "Actual Reporting" is the share of firms exceeding reporting-related exemption thresholds in a given country, industry, and year using the country-industry's actual (endogenous) firm-size distribution. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. The regressions include industry-year fixed effects and country-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table A7

	Countries		Observations		
Register Treatment	Number	Share	Number	Share	Treatment Share
Always-treated	2	10%	798	10%	100%
Never-treated	1	5%	400	5%	-
2001	2	10%	784	10%	94%
2002	2	10%	800	10%	88%
2003	0	0%	0	0%	-
2004	1	5%	400	5%	75%
2005	1	5%	348	4%	69%
2006	0	0%	0	0%	-
2007	2	10%	783	10%	56%
2008	5	24%	1,776	22%	50%
2009	1	5%	400	5%	44%
2010	1	5%	400	5%	38%
2011	1	5%	400	5%	31%
2012	1	5%	400	5%	25%
2013	0	0%	0	0%	-
2014	0	0%	0	0%	-
2015	1	5%	400	5%	6%

The table header "STAGGERED BUSINESS-REGISTER VARIATION" spans the full width above the Countries/Observations columns.

Notes: The table presents the staggered business-register variation, following Goodman-Bacon (2021) and Barrios (2021). It lists the number of countries and observations by treatment cohort, the share of countries and observations per treatment cohort, and the share of sample periods for which a given cohort is treated. The table is based on the OECD data with non-missing value-added information. Compared to the register introduction dates listed in Table A3, the register treatment indicator is lagged by one year (i.e., Sweden is part of the 2001 cohort because of its register introduction in 2000). Consistent with the EU directives implementation deadline, the largest cohort enters in 2008 (i.e., with a one year lag relative to the 2007 deadline). Despite this larger cohort, there is still substantial staggering in the register introduction timing, with one to two countries introducing a register almost every year.

Table A8

	DETERMINANTS OF REGISTER TIMING	
Outcome	Relative Register Timing	Register
Column	(1)	(2)
Reporting	-1.120	1.246
	(-1.37)	(0.41)
Relative MAD timing	0.138	0.964
	(0.43)	(-0.21)
Relative TPD timing	-0.261	1.425**
	(-1.22)	(2.00)
Bicameral	0.200	1.245
	(0.39)	(0.30)
Formal notices	0.022	1.094
	(0.11)	(0.74)
GDP	-0.329	0.682
	(-1.21)	(-1.07)
Observations	21	102
Clusters (Country)	21	23
R^2 / Chi^2	0.204	14.89**

Notes: The table presents determinants of countries' relative timing of their business-register introductions. Column 1 reports the estimates from a country-level regression of countries' relative timing of their register introduction on country-level factors. Column 2 reports the estimates from a country-year-level Weibull proportional hazard model of countries' register timing on country-year-level factors. "Relative Register timing" is the logarithm of (one plus) the difference between a country's register-introduction year and the earliest country's register-introduction year. "Register" is an indicator taking the value of one for years after the electronic business register starts to operate in a given country and year; otherwise zero. "Reporting" is the share of (simulated) firms exceeding reporting-related exemption thresholds in a given country, industry, and year using a standardized firm-size distribution per industry across all countries and years. "Relative MAD timing" is the logarithm of (one plus) the difference between a country's Market Abuse Directive (MAD) implementation date and the earliest country's MAD implementation date (Christensen *et al.* 2016). "Relative TPD timing" is the logarithm of (one plus) the difference between a country's Transparency Directive (TPD) implementation date and the earliest country's TPD implementation date (Christensen *et al.* 2016). "Bicameral" is an indicator for countries with a bicameral legislative process (Christensen *et al.* 2016). "Formal notices" is the median number of formal notices issued by the EU commission for each country (Christensen *et al.* 2016). "GDP" is the logarithm of (one plus) the gross domestic product in current US dollars as provided by the World Bank Indicators. In column 1, all time-varying determinants are fixed at their 2001 values. *t*-statistics (in parentheses) are based on standard errors clustered at the country level. In column 2, *z*-statistics (in parentheses) are based on standard errors clustered at the country level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.