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REPORTING REGULATION AND CORPORATE INNOVATION

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ABSTRACT

We investigate the impact of reporting regulation on corporate innovation. Exploiting thresholds in Europe's regulation, we find that forcing firms to publicly disclose financial statements reduces their innovation activities but does not reduce industry-wide innovation spending. Our findings suggest that reporting regulation imposes proprietary costs on innovative firms, especially smaller ones, thereby discouraging their innovation activity. By extending disclosure requirements to smaller firms, the EU regulation also provides positive information spillovers to other firms (e.g., competitors, suppliers, and customers), especially larger ones, resulting in a concentration of innovation activity. We corroborate these results with an analysis of reporting changes due to a German enforcement reform. In sum, we show financial reporting regulation has aggregate and distributional effects on corporate innovation that are important for policy makers to consider.

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1. Introduction

Disclosure and financial reporting mandates are ubiquitous. They typically aim to improve the functioning of capital markets and to protect firms' investors and other stakeholders. Despite substantial evidence of capital-market benefits from corporate disclosures (Healy & Palepu 2001), firms frequently oppose disclosure and reporting regulation arguing that it forces them to reveal proprietary information (e.g., about profitable markets), which dissipates their gains from innovation and hurts their incentives to innovate (Arrow 1962; Zingales 2009). How serious this concern is, however, remains unclear. For one, firms could point to proprietary costs to disguise that they oppose transparency for ulterior reasons (Berger & Hann 2007). Moreover, even if a mandate forces firms to reveal proprietary information, other firms could benefit through spillovers (Badertscher *et al.* 2013). This redistribution across firms could leave aggregate innovation unchanged or even enhance it, if mandatory reporting speeds up the adoption of novel products and processes, or if it generates substantial follow-on innovation by other firms. Thus, the aggregate and distributional effects of reporting regulation on corporate innovation are far from clear.

In this study, we investigate such innovation effects of reporting regulation. We focus on corporate innovation because it is key to productivity and economic growth (Solow 1957) and, at the same time, an activity for which the potential proprietary costs of reporting mandates are pertinent. To capture potentially heterogeneous innovation effects of reporting regulation, including spillovers, we perform the analysis at the industry level and use various innovation measures, distinct subsets of firms (e.g., small vs. large; treated vs. other firms), and different forms of aggregation (e.g., average firm in an industry vs. industry-wide total). In combination, our analyses provide estimates for the aggregate (i.e., industry-wide) effects of reporting regulation on innovation but also allow us to uncover potential distributional effects, resulting from firms' heterogeneous responses.

Our main measures of innovation stem from Eurostat's Community Innovation Survey (CIS). The CIS is the world's largest innovation survey (Arundel & Smith 2013). It defines an innovation as

"the introduction of a new or significantly improved product, process, organisational method, or marketing method" by a firm. According to this definition, an innovation must be "new or significantly improved" *relative* to the firm's existing products and processes, but not necessarily new to other firms, the market, or the world. This broad definition, and in particular the reference to the firm itself, is consistent with the Oslo Manual (OECD & Eurostat 2018) and is also used by the U.S. Census Bureau in its Business R&D and Innovation Survey (BRDIS). One advantage of such a broad definition for our aggregate analysis is that it captures the effects of reporting regulation on corporate innovation comprehensively, including the extent to which new ideas are adopted and implemented by firms throughout the economy, which is crucial for aggregate economic growth (Romer 1986, 1987). Moreover, it is less susceptible to changes in innovation types or to shifts in the way firms protect innovations (e.g., from secrecy to patents). However, a broad, survey-based innovation measure also has drawbacks. For one, it could capture fairly incremental innovations that are of low value (e.g., imitations). To address this drawback, we complement our analysis of the broad innovation measure (focused on new-to-the-firm) with more specific measures from the CIS, indicating distinct types of innovations, different degrees of novelty, and changes in innovation efficiency. We also perform analyses using corporate patents, a non-survey-based measure of innovation (protection), which among other things mitigates concerns about the quality of survey-based measurement.

To identify the effects of reporting regulation on corporate innovation, we exploit salient features of reporting regulation in Europe. This regulation, set forth in the Accounting Directives of the European Union (EU), stipulates that all limited-liability firms—private and public ones—must disclose their financial statements, including notes and a management report discussing business risks, R&D activities, and firm strategy. However, countries can grant exemptions to smaller private firms, leading to size-based thresholds that vary by country. Exempted firms must typically provide only an abridged balance sheet with abbreviated notes, allowing them to withhold substantial information that otherwise would have to be disclosed, including the income statement, or the management report.

Despite these exemptions, the reporting mandates have contributed significantly to corporate transparency in Europe (Kalemli-Ozcan *et al.* 2015; Breuer 2021). An important exception, however, was Germany. In contrast to other European countries, it had failed to enforce its reporting mandate until 2007, when mounting pressure by the EU triggered a substantial enforcement reform (e.g., Bernard 2016; Breuer 2021; Vanhaverbeke *et al.* 2024).

The European setting exhibits several desirable features when investigating the effect of reporting regulation on innovation. First, the size-based thresholds across EU countries and the German enforcement reform generate substantial, plausibly exogenous variation in the amount of financial information that otherwise opaque private firms are required to provide. Second, the EU regulation and the German enforcement reform pertain to *all* limited-liability firms, which account for the vast majority of aggregate economic activity and play an important role for innovation.[1] Last but not least, the CIS provides detailed innovation input and output data for European and German firms, including various innovation types, allowing us to measure innovation effects both granularly and comprehensively. Importantly, these innovation data are confidentially reported to national statistical offices or research centers, allaying concerns that financial reporting requirements or firms' strategic disclosure incentives distort the innovation measurement.

We employ two alternative research designs to identify the effect of reporting regulation on innovation. In the first design, we exploit that EU countries' distinct exemption thresholds generate variation in the share of firms facing mandatory reporting across industries (Breuer 2021). For example, industries with innately greater needs for fixed assets exhibit a larger fraction of firms that exceed the asset-based exemption thresholds. The same applies for labor-intensive industries and the employee-based exemption thresholds. We use this country-industry-level variation in regulatory *intensity* and employ a *cross-sectional* difference-in-differences design. This design does not rely on

[1] Over 80% of the 24 million active firms in Europe are private limited-liability companies (EU 2019b), whereas less than 1% are publicly listed (Breuer 2021). The many private limited-liability firms account for a substantial share of total corporate innovation (e.g., Acs & Audretsch 1988; EU 2019a).

changes in countries' thresholds over time, but instead compares differences in innovation for industries with different size distributions in countries with different exemption thresholds. To ensure that potentially endogenous differences in firm sizes across countries or changes over time do not confound our measure of regulatory intensity, we follow the simulated instruments approach (Currie & Gruber 1996; Mahoney 2015). We construct a time-invariant firm-size distribution for each industry in Europe and then calculate our intensity measure as the hypothetical share of firms that would face the mandate if a given country's exemption thresholds were applied to this European firm-size distribution. By using this intensity treatment, which is a variant of the Bartik instrument (Goldsmith-Pinkham *et al.* 2020; Breuer 2022), we ensure that the treatment variable varies only due to differences in the exemption thresholds across countries as well as systematic differences in firm sizes across industries. This approach alleviates concerns about endogenous firm-size differences, be it because of reverse causality (e.g., technology shocks causing firms in certain industries to grow above the thresholds), or omitted factors correlated with firm sizes in certain countries (e.g., industrial policies).

In the second design, we exploit that Germany's enforcement reform pertained to limited-liability firms, but not unlimited-liability firms. Thus, the enforcement reform treats local markets (defined at the county-industry level) differently, depending on the pre-existing shares of limited-liability firms among all firms in the local markets. We use this county-industry-level variation in treatment *intensity* due to the enforcement change in a *time-series* difference-in-differences design, which essentially compares changes in innovation activity across local markets.

The two designs exhibit complementary strengths and weaknesses. The main strength of the European analysis is that we capture direct and indirect effects of reporting regulation at a high level of aggregation (country-industry). Thus, we are more likely to estimate the net effect of mandatory reporting on corporate innovation. In addition, the European analysis essentially compares different country-industry *equilibria* and thus measures the reporting effects after long-run adjustments along all margins, including potential financing benefits spurred by greater industry-wide transparency. In this

sense, our estimates from the European analysis represent the *net-net* effect of reporting regulation on innovation at the country-industry level. However, the high level of aggregation in this analysis comes at the cost of statistical power because it limits observations to the country-industry level. Moreover, aggregation can mask heterogeneity in the effects. We therefore present various decompositions of the aggregate effect on innovation to aid the interpretation of the results. The German analysis, in turn, contributes different experimental variation, treating all limited-liability firms at a point in time, which is useful to corroborate our European analysis. In addition, the German analysis has more power, statistically because it harnesses variation in enforcement at the more granular *county*-industry level and economically because the more local aggregation neglects potentially offsetting indirect effects (e.g., positive information spillovers to other firms), which makes it easier to see the direct effects of forcing firms to report (e.g., proprietary costs or capital-market benefits). In this sense, the two designs and analyses are complementary.

We supplement the CIS innovation data with financial data on firms in Europe from Bureau van Dijk's Orbis Historical database and patent data for European firms from Bureau van Dijk's Orbis Intellectual Property database and the European Patent Office's PATSTAT database. The European sample covers millions of firms in up to 26 countries from 2000 to 2018. The German sample is centered around the enforcement reform covering more than 20,000 firms from 2002 to 2013.

In the European analysis, we find that mandatory financial reporting is negatively associated with the total number of innovating firms at the country-industry level. In terms of economic magnitude, our results suggest that requiring an additional 10% of firms in an industry to report is associated with a 5% decrease of the share of innovating firms, relative to its mean. This decrease suggests that, even after accounting for positive financing benefits and information spillovers from other firms' reporting at the industry level, there are more firms that stop rather than start innovating. Consistent with firms, on average, incurring proprietary costs that hurt their willingness to innovate, innovation spending of the average firm in the industry declines significantly (in percentage terms).

Importantly, however, we do not find that total innovation spending declines at the industry level. The diverging results for average vis-à-vis total spending imply that a few high-spending, likely larger firms increase their spending, which in turn offsets the decline of innovation spending by many, likely smaller firms (dominating the average). The diverging results across innovation outcomes and ways to aggregate suggest that there is substantial heterogeneity in firms' responses to reporting regulation. To unpack this heterogeneity and the resulting redistribution, we perform two decompositions. In the first one, we find that the direct effect on regulated firms' innovation activity is negative, while the indirect effect on other firms (e.g., spillovers to competitors, customers, and suppliers) is positive. In the second decomposition, we find that larger firms are more positively (or less negatively) affected than smaller firms, suggesting a redistribution of innovative activity from smaller to larger firms.

In the German analysis, we find that forcing firms to provide financial reports is negatively associated with the number of innovating firms in local markets and with average innovation spending, consistent with the results in the European analysis. But here, we even find that reporting mandates are negatively associated with total innovation spending at the local level. This decline in spending at the local level appears to be driven by many sparsely populated niche markets. These markets are typically made up by just one or two, mostly smaller firms. These "local monopolists" appear to be particularly affected by the reporting mandate. This finding closely aligns with our heterogeneity results in the European analysis in that the specifics of the German setting (i.e., lack of other firms that could provide positive spillovers in many local markets; selection on smaller firms) likely explain why we see negative effects on corporate innovation in this analysis.

In supplemental tests, we explore the impact of reporting regulation on firms' returns to innovation, their access to financing, and their types of innovations, including patents. We find that reporting regulation is negatively associated with firms' profit margins and sales from new-to-market innovations. These results support the notion that the regulation imposes proprietary costs on firms by revealing the financial returns to competitors and contracting partners. We next find that reporting

regulation is negatively associated with firms' financial constraints. This evidence is in line with a vast literature suggesting that mandatory reporting provides capital-market benefits (e.g., Leuz & Wysocki 2016). These benefits, however, appear limited for the mostly private firms in our setting. They cannot offset the negative effect of the mandate on corporate innovation due to the loss of proprietary information. Lastly, we find that reporting regulation is negatively associated with firms' innovation activity across all types of innovations (i.e., product and process innovation) and levels of novelty (new-to-firm and new-to-market). We also find that it is negatively associated with self-developed innovations, but not with imitations. These results, based on various survey-based measures, support the notion that reporting regulation can deter meaningful corporate innovation. In line with this notion, we find in the German setting that the number of patents by local monopolists declines. At the industry level in the European setting, however, we observe that some firms, especially larger ones, are more likely to use patenting to protect their innovations. This evidence aligns with our earlier findings that larger firms appear to benefit from the reporting mandate in Europe.

More generally, our evidence from two designs and various analyses provides a consistent message: Mandatory reporting discourages the innovation activity of firms forced to report, especially when those firms are smaller and operate in local niche markets. At the country-industry level, this effect leads to fewer innovating firms but not less total innovation spending. A few, mostly larger firms expand their innovation spending, offsetting the decline observed for smaller firms in niche markets. This redistribution of innovation spending is consistent with reporting regulation imposing proprietary costs on smaller firms by revealing their profitable niche markets to their larger competitors operating nationally or even internationally. This redistribution concentrates innovation activity among a few large firms, which increasingly rely on patents (instead of secrecy) to protect their innovations. We submit that such concentration of innovation activity could have important ramifications for market structure, dynamism, and the type of innovations pursued in the economy (e.g., Acs & Audretsch 1987, 1988; Holmstrom 1989; Rossi-Hansberg *et al.* 2021).

The result that comes through clearly in our analyses is that reporting regulation has heterogeneous effects on firms' innovation activities along several dimensions. This insight suggests caution in extrapolating firm-level evidence from select samples and supports the use of aggregate designs to learn about the net effect of reporting regulation. Our analysis, however, also comes with important limitations. First, the aggregate and welfare effects of reporting regulation remain unclear. One reason is that innovation and welfare, while closely related, do not always go hand in hand (Yang 2023). Another reason is that our analysis aggregates up only to the country-industry level and hence ignores cross-industry and cross-country spillovers. Second, our results are not always consistent across measures. Measurement of innovation is difficult, and each of our measures has weaknesses. Our main measure, for example, is survey-based and does not capture the value of corporate innovation. Other measures, i.e., patents capture only particular innovations (and firms' protection strategies). Third, the forces underlying the documented redistribution from smaller to larger firms remain unclear. Such redistribution would align with evidence on size differences in firms' voluntary disclosure decisions as well as their relative competitive positions (e.g., Bernard 2016; Breuer *et al.* 2020). But it could also be driven by institutional features of the European reporting regulation (e.g., the fact that the reporting exemptions vary primarily among smaller firms). Accordingly, it remains to be seen whether the redistribution along the firm size dimension is a general feature of reporting regulation or a consequence of size-based reporting regulation, such as the one we study.

Our study contributes to the literature on the real effects of financial reporting regulation (e.g., Leuz & Wysocki 2016; Roychowdhury *et al.* 2019). We provide novel evidence on the aggregate and distributional effects of reporting regulation on corporate innovation, a real activity that is central to economic growth. Specifically, we document a negative direct effect on regulated firms' innovation incentives and positive spillover effects for related firms' incentives to innovate. The deterrent effect is particularly pronounced among smaller firms, resulting in a concentration of innovation activity among a few larger firms in our setting. These innovation consequences provide an explanation for

why reporting regulation does not appear to foster aggregate growth in Europe (Breuer 2021).

Our study adds to recent work on the innovation consequences of mandatory disclosures (e.g., Simpson & Tamayo 2020; Glaeser & Lang 2023). Kim and Valentine (2020) and Hegde *et al.* (2022) document proprietary costs and spillovers arising from mandatory patent disclosures. With respect to mandatory financial disclosures, Allen *et al.* (2022) provide evidence suggesting that the Sarbanes-Oxley Act hurt smaller firms' innovation activity due to preparation and compliance costs. By contrast, we focus on regulations in Europe that do not vary the preparation of financial statements but change their public disclosure. In this regard, our study is more closely related to Berger *et al.* (2024). They document that mandatory disaggregation of firms' income statement information can hurt firms' innovation incentives. Similarly, Dambra *et al.* (2024) show that U.S. firms reduce their innovation spending and patenting in response to a broader dissemination of financial statements through EDGAR, whereas Chawla (2023) provides evidence in the same setting that the total number of patents increases industry-wide.[2] Our study offers a more comprehensive assessment of innovation effects using various innovation measures and aggregation levels to explore the heterogeneity in firms' responses, which comprise the resulting aggregate effects of reporting regulation.

Our study also relates to the literature on proprietary costs of financial reporting. Survey evidence shows that firms frequently point to concerns about proprietary information when asked to justify secrecy or when opposing demands for greater transparency (e.g., Graham *et al.* 2005; Minnis & Shroff 2017). As these claims could have ulterior reasons (e.g., agency issues), it is important but also challenging to quantify firms' proprietary costs of disclosure (e.g., Berger 2011; Lang & Sul 2014). Several recent studies have made progress in this regard. Bernard (2016), Breuer (2021), and Glaeser and Omartian (2022), for example, show that reporting mandates impose proprietary costs on firms. Li *et al.* (2017), Glaeser (2018), and Gassen and Muhn (2024), in turn, find that concerns about

[2] Our study provides a way to reconcile these seemingly conflicting results, as they could stem from different outcomes (spending vs. patents) and a focus on the average treated firm vs. the total number of patents. See Section 6.4.3.

proprietary costs motivate firms to reduce their disclosures.[3] Bernard *et al.* (2018) show that some firms even engage in costly size management to avoid a mandate. Adding to these studies, our paper provides evidence that proprietary costs manifest in firms' innovation activities because mandatory reporting hurts firms' returns to innovation and thereby harms their innovation incentives.

2. Conceptual Underpinnings

Although the regulation of firms' financial reporting is ubiquitous, the need for such regulation and its impact on the real economy are still debated (e.g., Leuz 2010; Kurlat & Veldkamp 2015; Minnis & Shroff 2017). The merits of reporting regulation are unclear because it can have countervailing effects on firms' financial positions and real decisions. Prior studies documenting firm-level effects, for example, frequently provide evidence of capital-market benefits of reporting regulation (e.g., improved access to financing; Leuz & Wysocki 2016; Brown & Martinsson 2019). With respect to real decisions, prior work documents evidence of investment-efficiency benefits (e.g., due to reduced agency costs; Greenstone *et al.* 2006; Biddle *et al.* 2009; Zhong 2018; Roychowdhury *et al.* 2019) but also evidence of efficiency costs (e.g., due to proprietary costs; Bernard 2016; Bernard *et al.* 2018; Kim & Valentine 2020). In addition, the literature finds evidence of spillovers to other firms, including information spillovers (e.g., Badertscher *et al.* 2013) and general equilibrium effects (e.g., Choi 2021; Kim & Olbert 2022; Yang 2023). Given these countervailing forces, the net effect of reporting regulation on the real economy is difficult to discern from extant firm-level evidence.

Reporting regulation could affect the real economy through its impact on corporate innovation (e.g., Zingales 2009; Breuer 2021). Corporate innovation is an important real activity which is key for long-run economic growth (e.g., Solow 1957; Arrow 1962; Romer 1986). The invention or adoption of new or improved products and processes helps firms to increase their output and/or to lower their costs. Such innovative activity is particularly beneficial for aggregate productivity and social welfare

[3] Aside from these studies with causal evidence, there is a large, earlier literature documenting associations between proxies for proprietary costs and firms' disclosure choices (e.g., Harris 1998; Leuz 2004; Verrecchia & Weber 2006; Berger & Hann 2007; Dedman & Lennox 2009; Bens *et al.* 2011).

if it is not mainly stealing business from competitors (e.g., Garcia-Macia *et al.* 2019) and if it is widely dispersed throughout the economy (e.g., Romer 1990; Jones 2023). Thus, the answer to whether reporting regulation helps or hurts the real economy is closely related to the impact that reporting regulation has on economy-wide innovation incentives.

Reporting regulation requires mandated firms to disclose their financial reports. These reports contain various pieces of proprietary information that, upon disclosure, can be used by competitors and contracting partners to the detriment of the disclosing firm.[4] Information on firms' segment profitability and financial stability, for example, could be used by competitors to identify profitable markets to enter (Barrios *et al.* 2021; Glaeser & Omartian 2022) or vulnerable firms to prey on (Bernard 2016).[5] Competitors could also use information on firms' intangible assets (e.g., capitalized development costs), investment and R&D activities, or their strategic plans to learn about firms' innovative activities. This information could spur and direct search for relevant supplementary information (e.g., details from trade fairs; patent disclosures; or product reverse engineering) as well as facilitate the imitation of firms' innovative activities (Wyatt & Abernethy 2008; Kim & Valentine 2023). In addition, customers and suppliers could use information in financial reports to their benefit and the disclosing firms' detriment. For example, they could use information on disclosing firms' cost structures and profit margins to search for outside options (e.g., lower-cost producers) or negotiate better terms (Stigler 1961; Arya *et al.* 2019; Berger *et al.* 2024).

The revelation of proprietary information in financial reports is expected to hurt firms' incentives to innovate because it reduces the ex-post returns to innovation activities (Arrow 1962;

[4] Survey evidence supports the notion that public disclosure of financial statements reveals proprietary information to competitors and contracting partners (Graham *et al.* 2005; Max-Planck-Institute 2009; Minnis & Shroff 2017). Among the European private firms surveyed in Minnis and Shroff (2017), 61% are concerned that competitors download and view their financial statements if they are publicly available. Consistent with this concern, 48% of surveyed firms state that they downloaded financial statements of one of their competitors in the past. Similarly, 46% (37%) state that they downloaded financial statements of their customers (suppliers).

[5] Regarding the proprietary nature of firms' profitability, the ICAEW (2013, p. 33) states: "A firm's knowledge of what is profitable and what is not is a form of intellectual capital—akin to an invention, but often much more transient. If this information is disclosed, then the firm's competitors benefit as they learn which fields to move into and which to avoid, without having to incur the costs of being first movers. In this situation, the winners from disclosure are the imitators, and the losers are the pioneers."

Schmutzler 2010). This expectation applies to all three proprietary-cost channels described above: increased competition, easier imitation, and decreased bargaining power. In all these cases, reporting regulation facilitates the dissipation of returns to successful innovation by revealing proprietary information, primarily with respect to past innovation activities and/or their economic benefits (e.g., segment profits or growth). The dissipation of ex-post returns to innovation, in turn, hurts firms' incentives to engage in innovation activities ex ante.[6]

Despite the clear directional prediction at the firm level, whether the revelation of proprietary information due to mandatory reporting hurts *aggregate* innovation activity is still an open question. For one, the extent to which firms' financial reports reveal material amounts of proprietary information, especially about their innovation activities, is unclear. For another, firms tend to have flexibility in their reporting, allowing them to muddy the informativeness of their reports, for instance, by strategically classifying and aggregating line items (Bens *et al.* 2011) or by providing boilerplate narrative disclosures (Lang & Stice-Lawrence 2015).[7] And even if reporting regulation imposes proprietary information losses on firms mandated to disclose, other firms (e.g., competitors, customers, and suppliers) tend to benefit from these disclosures because they can use it for imitations or follow-on innovations. These information spillovers offset and possibly even overcompensate the negative effects due to proprietary costs. Finally, reporting regulation has important capital-market benefits. These benefits could swamp any negative effects due to proprietary costs. Given this heterogeneity in the effects, the net impact of reporting regulation on corporate innovation is an

[6] The relation between competition and innovation is ambiguous. Schmutzler (2010) documents that the relation depends on the type of competition. Competition for ex-post rents from innovation unambiguously reduces firms' innovation incentives ex ante. This insight motivates patent policies protecting rents after successful innovation. By contrast, ex-ante competition, which lowers firms' profits before innovation (but leaves ex-post innovation returns unaffected), increases firms' incentives to innovate (e.g., to escape competition). We expect reporting regulation to primarily foster ex-post competition because it reveals the profitability of firms' markets and investments after the fact. As a result, whether competition increases or not is *conditional* on the reported information. Firms revealing successful innovations and profitable markets must fear entry; those revealing unprofitable markets do not (e.g., Burks *et al.* 2018; Tomy 2019).

[7] Glaum (2020) provides anecdotal evidence that firms try to minimize proprietary costs through discretionary disclosure choices, but are constrained by explicit legal content requirements, litigation risk, and auditors. They are also constrained by the fact that audiences other than competitors (e.g., capital providers) rely on or demand public disclosures too (Farrell & Gibbons 1989; Newman & Sansing 1993; Burks *et al.* 2018). In this vein, Ahci and Joos (2023) document that mandatory narrative disclosures in annual reports contain information on firms' innovations and predict future sales growth.

empirical question.

Irrespective of the net effect, the costs and benefits of reporting mandates to individual firms likely depend on their competitive position and size (e.g., Max-Planck-Institute 2009; Bernard 2016; Bernard *et al.* 2018). The proprietary costs of a mandate, for example, are likely higher for a local monopolist than a firm operating in a competitive market (Cheynel & Ziv 2021). Absent the reporting mandate, the local monopolist can protect its rents by hiding its profitability from its competitors and contracting partners. A firm in a competitive market, by contrast, earns limited rents irrespective of whether it must report or not. Similarly, a small firm should be hit harder by a mandate than a large one. Absent the reporting mandate, a small firm can minimize proprietary costs by communicating privately with its narrow stakeholder base. A large firm, by contrast, is more likely to communicate via public disclosures with its broad set of stakeholders (e.g., Buzby 1975; Breuer *et al.* 2020) and, hence, incurs some proprietary costs, even without a mandate. At the same time, a large firm likely benefits more from the spillovers caused by forcing other firms to report, as compared to a small firm (e.g., Max-Planck-Institute 2009). A large firm, for example, can leverage its more ample resources and bargaining power to extract a share of the other firms' rents (e.g., Bernard 2016). A small firm, by contrast, finds it more difficult to take advantage of investment opportunities in new markets or to bargain with its contracting partners for better terms by threatening to switch to other suppliers or customers. This discussion highlights that reporting regulation potentially has important distributional consequences that are worth studying.

3. Institutional Background

3.1. Reporting Regulation in Europe

The EU Accounting Directives regulate firms' financial reporting in Europe since the 1980s. The EU regulation aims to protect firms' various stakeholders (e.g., investors, customers, and suppliers) through transparency. The regulation applies to limited-liability firms because those firms offer limited recourse to stakeholders in bankruptcy or after corporate misconduct due to their legal form.

It requires that limited-liability firms prepare and publicly disclose a full set of financial statements. Typically, these financial statements include a balance sheet, an income statement, detailed notes, and a management report discussing the competitive position and strategy, key products and services, business risks, investment and financing plans, as well as activities in the field of research and development. Among limited-liability firms, the regulation focuses on larger firms, which are deemed of public interest by virtue of the extent of their business dealings and the breadth of their affected stakeholders. To focus on firms of public interest, and reduce the regulatory burden for smaller firms, the EU regulation allows private limited-liability firms below certain size thresholds—related to total assets, sales, and employees—to report less. The EU sets the maximum exemption thresholds that countries can use. However, countries may elect to lower the thresholds, subjecting more firms to the full reporting requirements. This regulatory design has resulted in considerable variation in the relevant thresholds and hence the reporting requirements across EU countries.[8]

The reporting exemptions allow a substantial fraction of firms to reduce markedly what information they must provide publicly. In many countries, exempted firms must disclose only an abbreviated balance sheet with abridged notes.[9] Although these firms still have to prepare a full set of financial statements for internal purposes and private reporting to shareholders, the exemptions allow them to hide proprietary information about (i) their innovation inputs (e.g., R&D expenses) or innovation outcomes (e.g., profit margins, cost structure, sales growth) that otherwise would be revealed in the income statements as well as (ii) their R&D activities and future actions (e.g., investments, financing, and strategy) that otherwise would have to be discussed in the management report. In the Online Appendix, we provide an example of exempted and full reporting by a German

[8] The respective maximum thresholds set by the EU were around 4 million Euros in total assets, 8 million Euros in sales, and 50 employees during much of our sample period. For country-specific threshold variation, see, for example, Cna Interpreta (2011), Minnis and Shroff (2017), Bernard *et al.* (2018), and Accountancy Europe (2019). Similar variation exists for auditing requirements. Those requirements overlap with the reporting requirements in some but not all countries.

[9] There is variation in what firms must provide or they are exempt from. In several countries, exempted firms do not have to report an income statement. In others, they must report an income statement, but only in abridged (i.e., highly aggregated) form. Thus, the estimated reporting mandate effect in the EU setting reflects the average reporting format, exemption, and enforcement level across our sample countries, industries, and years.

health technology firm.

3.2. Enforcement Reform in Germany

Germany, as a member state of the EU, transposed the EU Accounting Directives into national law in the 1980s. Hence, German firms have been subject to EU reporting regulation for a long time. However, the regulation was weakly enforced until a sweeping reform in 2007 (Bernard 2016). Before the reform, limited-liability firms were required to file their financial statements with local courts and to publish their statements in local newspapers. The courts were not tasked to ensure compliance or engage in proactive enforcement, and monetary sanctions for non-compliance were low. As a result, the share of limited-liability firms complying with the reporting regulation was as low as 5-10%.

In 2007, Germany reformed its enforcement of the reporting regulation via the Bill on the Electronic Registers for Commerce, Companies and Associations (EHUG), effective for financial statements with fiscal years ending in December 2006 or later. Germany's reform efforts were a direct response to mounting pressure from the European Commission and the transposition deadline for the Company Law Disclosures Directive (EU Directive 2003/58/EC), which required the implementation of a central electronic publication register by 2007. The reform created a central electronic publication register in charge of the dissemination of limited-liability firms' financial statements, instituted centralized and proactive enforcement of the mandate by the Ministry of Justice, and introduced escalating fines for non-compliant firms. Following the reform, the share of limited-liability firms providing the required financial reports increased to over 90%. The increased compliance substantially enhanced corporate transparency in Germany as it meant that financial statements of more than 900,000 firms became available to the public for the first time.

4. Data and Level of Aggregation

We combine financial and innovation data for limited-liability firms in Europe from several sources. For the European sample, we obtain financial information from Bureau van Dijk's Orbis Historical database and firm-patent links from Bureau van Dijk's Orbis Intellectual Property database. We use

patent data from the European Patent Office's PATSTAT database and detailed information on corporate innovation activity across Europe from Eurostat's CIS.[10]

The CIS is administered by dedicated teams of statisticians specializing in innovation research and working at independent research institutes or national statistical offices in Europe. The survey is the result of decades-long deliberations between innovation researchers, national statistical offices, and policy makers about the measurement of policy-relevant, economy-wide innovation indicators. The CIS defines an innovation as "the introduction of a new or significantly improved product, process, organisational method, or marketing method" by a firm. This broad definition encompasses various types of innovation (e.g., product and process innovation), degrees of novelty (e.g., new-to-firm or new-to-market), and origins of the innovation (e.g., self-developed or imitated).[11] Importantly, an innovation is defined *relative* to the firm's existing products and processes. This reference to the firm as the relevant bar for an innovation is consistent with the Oslo Manual (OECD & Eurostat 2018) and the U.S. Census' BRDIS. As discussed in the introduction, this broad definition comes with pros and cons.

An advantage of the CIS is that it allows us to measure corporate innovation fairly comprehensively, which is important for our aggregate analysis. Compared to more narrow innovation measures such as firms' patents, it reduces the possibility that changes in aggregate innovation activity are confounded by shifts between different types of innovations or forms of protection (e.g., innovations protected via patenting vs. secrecy). A drawback of the CIS definition is that it sets the bar for what counts as innovation fairly low. However, the CIS also collects information

[10] We access the confidential micro-level data (called secure-use files) at Eurostat's Safe Centre in Luxembourg for all available survey waves over our sample period (2000, 2004, 2006, 2008, 2010, 2012, 2014, 2016, and 2018). The waves include EU member states and European Statistical System members. The survey questions are harmonized across countries, and cognitive tests are regularly conducted to assure that the questions elicit the desired information. Member states are required to provide innovation statistics to the EU, and almost all member states *require* firms to answer.

[11] The surveys provide examples of innovations falling within their definition to help respondents identify appropriate innovations. As examples of major innovations, the Community Innovation Survey (2014a) lists the "iPhone, ABS braking systems, new anti-cancer drugs." Examples of more marginal innovations include "[i]ntroducing new or improved components in existing product lines (cameras in mobile telephones, fastening systems in clothing, hybrid technologies in cars, etc)." Examples of modifications and upgrades that do not qualify as innovations include, e.g., routine modifications, seasonal updates, and client customizations of products.

on distinct types of innovations, their degree of novelty, and their origins, allowing us to unpack the broad innovation measure. Importantly, the CIS collects information about firms' innovation activity irrespective of their requirements under the financial reporting mandate and permits strictly confidential access to anonymized firm-level data only to accredited researchers. These features ensure that our innovation measures are not influenced by firms' financial reporting choices, and mute firms' incentives to strategically distort responses to the survey due to concerns about information leakage (Koh & Reeb 2015). In the Online Appendix, we provide further details on the innovation definition, methodology, and data quality of the CIS.

We collect information on the reporting exemption thresholds in various European countries (Table OA1). The resulting sample covers up to 26 countries over the years 2000 to 2018. Within each country, we aggregate firm-level financial and patent data to the two-digit NACE industry level to create a country-industry-year level dataset. In aggregating the innovation-survey responses, we use relative weights provided by the CIS so that our outcomes are representative for the population of firms in the industry and country, which is important for our estimation of aggregate effects.[12]

In choosing the level of aggregation, we face a tradeoff between accommodating spillovers and statistical power. A higher level of aggregation naturally accounts for more spillovers but in the extreme one can no longer assess statistical significance. Our country-industry aggregation in the European analysis includes any and all redistribution effects across firms, including positive spillover effects from customers, suppliers, and competitors, within the same coarse two-digit industry in a country. To illustrate, the average two-digit industry in Germany comprises more than 30,000 firms operating in more than 14 distinct five-digit subindustries. While we acknowledge that spillovers could

[12] The base population of the CIS comprises all firms recorded in national business registers with 10 or more employees. Based on this population, stratified random sampling is used to ensure the surveyed sample is representative of the base population. The stratification of the sample is based on the economic activity of the enterprise (NACE Rev.2 classification), its size, and in some countries also its location in a geographical region (NUTS-2 level). Along with firms' responses, the CIS provides sampling weights to adjust for sampling design and unit non-response biases. The weights ensure that the aggregates are representative for the industry and country (excluding micro firms). To focus on responses of firms operating in common and comparable industries, we keep only industries that are covered by five or more countries.

go beyond these broad industry boundaries as well as countries, we note that information spillovers tend to be strongest within industries and local markets (e.g., Engelberg *et al.* 2018), and the typical firm in our sample operates in local markets. According to the CIS, 80% of our sample firms indicate that their largest market is at the local level or the national market. Consistent with this response, the average firm's sales to customers outside of its own country amount to only 2%. These statistics and considerations support the chosen level of aggregation and suggest that our design likely captures most spillovers.

For the German sample, we obtain financial information on both limited- and unlimited-liability firms from the Mannheim Enterprise Panel (MEP). The MEP is based on the firm-level data collected by Creditreform, the dominant credit bureau in Germany.[13] It is the most comprehensive firm-level database in Germany outside the confidential business register maintained by the Federal Statistical Office of Germany. The MEP database includes unique-patent identifiers, allowing us to link our sample firms with all patents available in the PATSTAT database to construct patent indicators (ZEW 2019a). We augment this data with detailed information on innovation inputs and outputs from the Mannheim Innovation Panel (MIP), which is based on successive issues of the CIS.

The German sample covers more than 20,000 unique firms over the years 2002 to 2013. The firm-level panel, however, is unbalanced as the innovation surveys do not ask all questions every year and firms do not always respond to all questions. Moreover, there is substantial churn due to the limited survival of especially smaller firms. The panel is replenished to account for churn and adjusted for response bias via representative re-sampling, but firm-level data are sparse, nevertheless. We therefore aggregate data to the market level using two-digit industries and, in this case, counties as the relevant regional level of aggregation.[14] Aggregating at the county-industry level mitigates the limitations and sparsity of the firm-level panel data. With this aggregation and the MEP's

[13] See Bersch *et al.* (2014) for more details about the construction of the MEP database.
[14] In line with prior research (e.g., Huber 2018; Breuer 2021), we choose counties as a relevant regional aggregation level. German counties represent an intermediate administrative level between municipalities and German states. They are comparable to U.S. counties (NUTS-3 level).

representative sampling, it is not important that the same firm answers the same question over time or around the enforcement reform in Germany. The market-level aggregation also reduces biases arising from potential information spillovers to closely related, but less regulated firms in the same region, at least in comparison to standard firm-level designs that would view such firms as unaffected controls. However, we emphasize that the lower *county*-industry aggregation in the German setting, by construction, misses spillovers that we capture in the country-industry aggregation in the European analysis, which is why the former is more likely to capture direct effects on mandated firms.

5. Research Design

We exploit the threshold-based mandates in Europe and the enforcement reform in Germany to empirically investigate the effect of mandatory financial reporting on corporate innovation. Both settings allow us to use difference-in-differences designs, which purge our estimates from various confounding differences across countries (e.g., tax policies), industries (e.g., capital intensities), or over time (e.g., crisis times). The two settings have complementary strengths and weaknesses and allow us to provide estimates from a cross-sectional design and a time-series design.

5.1. Exemption Thresholds in Europe

A central feature of the threshold-based regulation in Europe is that a given country's exemption thresholds affect industries in different and, importantly, predictable ways. For example, a regulation that exempts firms below 50 employees from full reporting affects labor-intensive industries more strongly than capital-intensive industries. Analogous arguments can be made for a threshold based on total assets, which likely affects capital-intensive industries more strongly. Thus, the same threshold implies heterogeneous regulatory intensities across industries.

We exploit this country-industry-level heterogeneity in regulatory intensity in the following cross-sectional difference-in-differences design:

$$Y_{c,i,t} = \beta Reporting_{c,i,t-1} + \alpha_{c,t} + \delta_{i,t} + \varepsilon_{c,i,t},$$

where $Y_{c,i,t}$ is the dependent variable (e.g., the share of innovating firms) in a given country c, industry

i, and year t; $Reporting_{c,i,t-1}$ captures the regulatory intensity measured as the share of firms above country c's reporting-exemption thresholds in industry i and year $t-1$; $\alpha_{c,t}$ is a country-year fixed effect and $\delta_{i,t}$ is an industry-year fixed effect.[15]

To ensure that our regulatory intensity measure is not confounded by endogenous differences or changes in firm sizes across countries and over time (e.g., due to technology shocks or firm growth), we use a simulated instruments approach following Currie and Gruber (1996) and Mahoney (2015). Instead of using the actual share of firms exceeding a given country's exemption thresholds in a country-industry-year, we use a standardized share of firms as our intensity measure (i.e., our simulated instrument). To construct the standardized share, we calculate the hypothetical share of firms that would exceed a given country's exemption thresholds if its thresholds were applied to a Europe-wide firm-size distribution. We construct the European distribution by pooling all firms in a given industry across countries and years.[16] The resulting distribution is not only representative for the typical firm-size distribution in this industry in Europe, but also does not vary across countries (e.g., due to industrial policies) or over time (e.g., due to technology shocks). By using this distribution, we obtain a standardized measure of regulatory intensity that varies only due to differences in exemption thresholds across countries and *systematic* differences in firm-size distributions across industries (see **Error! Reference source not found.** illustrating this variation). This approach addresses concerns a bout reverse causality (e.g., technology shocks causing firms to grow above a threshold), and omitted variables correlated with firm-size differences (e.g., countries' industrial policies).

Using the standardized share of mandated firms, our *cross-sectional* difference-in-differences design compares corporate innovation in more versus less intensively regulated industries in the same

[15] The reporting intensities are measured with a one-year lag. For the 2018 CIS outcomes, for example, we use the 2017 thresholds in calculating the relevant reporting intensities. We make one exception from this rule. In order to include the outcomes of the first CIS wave, measured in 2000, we use the contemporaneous 2000 thresholds, as those are the earliest thresholds available to us. Given the cross-sectional nature of our design and the persistence of the thresholds, this exception should be innocuous.

[16] We follow the approach described in Breuer (2021) in constructing the standardized firm-size distributions.

year using (1) the difference in the shares of mandated firms in a given country *across* industries (due to their distinct size distributions) and (2) the difference in the shares of mandated firms in a given industry *across* countries (due to their distinct exemption thresholds). By using a within-country-year design, we control for any confounding cross-country differences as well as any changes over time, observed or unobserved. This feature addresses important concerns about tax and other public policies that could affect corporate R&D and innovation (e.g., Berger 1993; Chen *et al.* 2022). It also addresses concerns about the endogeneity of countries' thresholds at a given point in time (e.g., Ball 1980). Thus, our design offers several advantages over the usual time-based difference-in-differences design that exploits a regulatory change in a given country as treatment.

Our identifying assumption is that there are no omitted factors correlated with corporate innovation *and* our intensity measure at the country-industry level. A typical concern with this assumption is that a multitude of country-industry-level factors could be correlated with corporate innovation (e.g., growth opportunities or technology shocks). However, Breuer (2021) shows for several candidate factors that they no longer correlate with the standardized intensity measure due to its (simulated) construction. A remaining concern with the identifying assumption is that countries endogenously set their thresholds at the country-industry level. The institutional details of our setting suggest this is unlikely to be the case. Within a given country, the thresholds are set uniformly across industries. The thresholds appear to be motivated by a desire to reduce the regulatory burden for smaller firms (in all industries), which arises among other things from the fixed costs of reporting requirements.[17] If the EU or specific countries really intended to treat industries differently, they could have set at least some industry-specific exemption thresholds, but they chose not to do this. It is therefore unlikely that the uniform reporting thresholds are the result of some deliberate tailoring of the thresholds to individual industries. And even if a country tailored its country-level thresholds to

[17] Fixed costs depress the profit margin more, the lower a firm's sales. This scale effect is not specific to a particular industry and one reason why the EU prescribes a uniform sales-based exemption threshold for all industries (e.g., European Commission 2019).

one or a few specific industries (e.g., its most important ones), then this country-industry-specific choice would make the chosen thresholds plausibly exogenous for all other industries, except the specifically targeted one(s), and presumably these other industries would dominate the analysis.

5.2. Enforcement Reform in Germany

In the second design, we exploit the enforcement reform in Germany as a major shift in the effective regulation of limited-liability firms' reporting over time using the following temporal difference-in-differences analysis with a continuous treatment variable:

$$Y_{d,i,t} = \beta LimitedShare_{d,i} \times Post_t + \alpha_{d,t} + \delta_{i,t} + \phi_{d,i} + \varepsilon_{d,i,t},$$

where $Y_{d,i,t}$ is the dependent variable (e.g., the share of innovating firms) in a given county (or district) d, industry i, and year t; $LimitedShare_{d,i}$ captures cross-sectional variation in the intensity of the reporting regulation at the county-industry level, measured as the average share of limited-liability firms among all (limited- and unlimited-liability) firms in a given county d and industry i in the pre-enforcement period (2002 to 2006); $Post_t$ is an indicator taking the value of one for all years after the enforcement reform (2008 to 2013); $\alpha_{i,t}$ is a county-year fixed effect, $\delta_{i,t}$ is an industry-year fixed effect, and $\phi_{d,i}$ is a county-industry fixed effect.[18]

The basic idea behind this market-level difference-in-differences design is that industries in counties with a greater share of limited-liability firms should be more affected by the heightened enforcement of limited-liability firms' reporting mandate. This county-industry "exposure" should explain changes in innovative activities at the county-industry level around the reform, if there are any. The key identifying assumption of this design is that, absent the enforcement reform, time-series changes in county-industries' innovation activity are unrelated to the (pre-existing) county-industries'

[18] We measure the share of limited-liability firms in the population covered by the MEP. Aside from the confidential German census data, this panel is the most comprehensive database, spanning various types of firms, including sole-proprietorships, partnerships (e.g., OHG and KG), and corporations (e.g., GmbH and AG). Inclusion in the MEP is widely independent of the reporting mandate and the share is not computed based on survey responses, but the actual share in the MEP population.

shares of limited-liability firms, which is essentially a parallel-trends assumption.

An important assumption for all our difference-in-differences designs to provide unbiased estimates is that there are no spillovers from treated to control units (or vice versa). This assumption is most plausible in our aggregate design for the European setting (e.g., for which the unit of observation is at the country-industry level). A violation of the no-spillover assumption biases our estimates upward (in case of negative spillovers) or downward (in case of positive spillovers). Despite these potential biases, we complement the aggregate European analysis with the more local German analysis because estimates from a more local design can be informative about the heterogeneity in the effects of reporting regulation, especially when interpreted in conjunction with the aggregate estimates. For example, *county*-industry-level estimates allow us to discern whether a potential null result at the *country*-industry level is due to the absence of a treatment effect or due to a one-for-one redistribution of innovative activity between counties with more versus less treated firms.

6. Results

6.1. Descriptive Statistics

Table 1 presents descriptive statistics for our treatment and outcome variables. (For a list of variable definitions, refer to the Variable Appendix.) In the European analysis (Panels A and B), our main variable of interest is "Reporting," which captures the share of firms subject to full reporting requirements in a country and two-digit industry. The distribution of this reporting intensity measure has several notable features. The average (median) intensity for two-digit industries is 28% (17%). The intensity measure spans almost the full range from 0% to 100%, with half of the values falling between 9% and 32%, which means that typically the largest 9 to 32% of the firms in an industry must report fully. In this sense, the treatment variable primarily captures variation in mandatory reporting among the *larger* firms in an industry. These firms are likely of substantial importance for market- or industry-level outcomes. However, the intensity variable also extends to relatively small firms in many industries, allowing us to capture an average effect over a meaningful range of firm sizes. We provide

extensive distributional information on the reporting intensities in the Online Appendix (Figure OA1).

In the German analysis (Table 1, Panel C), the main variable of interest is the share of limited firms ("Limited Share"). This share is calculated for all firms in a given *county* and industry in the broad MEP data. It captures the exposure of local county-industries to the enforcement reform. The average (median) share is 59% (60%) across all markets. The share ranges from 0% to 100%, which means that our treatment variation includes not only partially treated but also (directly) untreated and fully treated markets. The extremes, untreated and fully treated markets, are quite frequent given that most local markets (i.e., defined as a county-industry) are sparsely populated. This sparsity follows from the fact that economic activity tends to be concentrated in a few, often metropolitan or industrial regions (Rosenthal & Strange 2020).

With respect to innovation outcomes, the descriptive statistics for the European sample (Panel A) indicate that 38% (36%) of the firms in the average (median) two-digit industry are innovating according to the broad CIS definition, i.e., they introduce products, processes, or services that are at least new to the firm. According to the CIS responses, a little less than half of these innovations (16% on average) are not only new to the firm but also new to the market, and close to 12% are new to the country. By contrast, the share of patenting firms is only 6% (2%) in the average (median) industry in the CIS, highlighting that patenting captures only a small share of corporate innovation. These statistics also suggest that innovative activities are widespread in the economy; that is, performed by a relatively large share of firms.

In the German sample, we find very similar patterns, although the German sample is slightly more tilted toward innovative firms. In the average county and industry, 55% of firms are innovating in a given year, but again only 8% of firms apply for patents in a given year (Panel B). In sum, the German sample also exhibits a substantial share of innovating firms.

6.2. Reporting Regulation in Europe

6.2.1. Net Effects on Innovation

We begin our analysis by investigating the industry-wide (net) impact of reporting regulation on innovation in the European sample. Table 2 presents country-industry-level regressions of two broad measures of innovation activity—the number of innovating firms and the amount of innovation spending—on reporting intensity. Innovation activity is measured at the two-digit industry level using population-weighted survey responses from the CIS. The weighting ensures that the survey-based innovation measures are representative for the respective industry and country.

We first examine the impact of reporting regulation on firms' propensity to introduce new or significantly improved products, processes, or services. This measure constitutes the broadest measure of innovation *output* available in the CIS data. In column 1, we find that mandatory reporting is significantly negatively associated with the share of innovating firms in the industry. In column 2, we similarly find that mandatory reporting is significantly negatively associated with the total number of innovating firms in the industry. Together, the results suggest that reporting regulation reduces firms' propensity to innovate, on average.

In terms of economic magnitude, our estimates imply that increasing the share of limited-liability firms that are subject to mandatory reporting by, for instance, 10 percentage points decreases the share of innovating firms by 1.8 percentage points (column 1). Considering the range of reporting intensities (e.g., 10 percentage points is roughly the difference in intensities between the German and Belgian manufacturing industries specialized in chemical products), this effect is economically meaningful (but also plausible). It amounts to a 4.7% decline compared to the average share of innovating firms across Europe. Importantly, this estimate represents the *net* effect at the two-digit industry level. It is net of any redistribution across firms including positive spillovers among customers, suppliers, and competitors within the same industry. Moreover, it is net of any potential financing benefits as well as any long-run changes in the industries (e.g., due to greater entry) spurred

by the greater industry-wide transparency.

Next, we examine the impact of reporting regulation on firms' innovation spending. We use an all-in measure of spending on (internal and external) R&D activities as well as any machinery, equipment, software, and personnel costs incurred in inventing or adopting innovations, which is the broadest measure of innovation *input* available in the CIS data.[19] In column 3, we find that reporting intensity is significantly negatively associated with innovation spending of the average firm in the industry. The economic magnitude of the association implies a 15% decrease in spending in response to a 10 percentage points increase in reporting intensity. The finding of a negative spending effect for the average firm in the industry aligns with our earlier result showing an, on average, decline in innovation propensity. By contrast, in column 4, we do not find that a significantly negative association for innovation spending at the industry level. If anything, we observe a small, positive association. The difference between the average and total spending results is remarkable and indicates that, although the average firm reduces its innovating activities as reporting intensity increases, a few other firms in the industry seem to increase their spending, so as to offset the spending declines of many firms reflected in the average. Thus, the results in Table 2 are consistent with a concentration of innovation activity within industries. The idea is that many firms, with limited innovation spending, appear to reduce or even stop their innovating activities in response to the reporting regulation, while a few firms, with extensive innovation spending, expand their innovating activities.

Collectively, the results in Table 2 imply that the effect of reporting regulation on innovation activity overall is unclear. The declines in the average firm's innovation propensity and spending are consistent with the idea that reporting regulation can impose proprietary costs on firms, hurting their innovation incentives. This firm-level decline, however, does not translate into a decline in innovation

[19] We calculate average and total innovation spending within country-industries. Average spending is measured as the average of the logarithm of firms' innovation spending plus one, whereas total spending is measured as the logarithm of the total market-level spending plus one. In untabulated tests, we corroborate that our inferences are robust to defining the logarithmic values without the plus one (Chen & Roth 2024).

spending at the industry level. This absence of an industry-wide decline in total spending indicates that reporting regulation has heterogeneous effects across firms. This treatment-effect heterogeneity complicates extrapolating firm-level results and implies that we need aggregate analyses to learn about the net impact of reporting regulation. But it also suggests that we need to better understand the redistribution of innovation activity within industries.

In the following, we decompose the industry-wide impact on our broad innovation measures to shed light on this underlying heterogeneity and to clarify the interpretation of our industry-wide results. In our decompositions, we focus on three key dimensions: the type of innovation (e.g., self-developed vs. imitated), the type of treatment (direct vs. indirect), and the type of firm (small vs. large).

6.2.2. Effects on Distinct Types of Innovation

We first unpack the negative effect of reporting regulation on firms' innovation propensity by decomposing it into separate effects on distinct types of innovation, all of which are subsets of our broad, new-to-firm measure of firms' innovation propensity. This decomposition helps with concerns discussed earlier (e.g., that the new-to-firm measure captures low-value innovations) as it allows us to shed light on whether reporting regulation also discourages innovations with higher levels of novelty (e.g., new to market or new to the country) or merely low-cost imitations.

Table 3 presents country-industry-level regressions of various innovation measures—differing in the type, novelty, and origin of firms' innovations—on reporting intensity. In columns 1 and 2, we find that reporting regulation is negatively and significantly associated with both product and process innovations. In columns 3 and 4, we document that reporting regulation is negatively associated with new-to-the-market and new-to-the-country innovations.[20] Finally, in columns 5 and 6, we find that reporting regulation is negatively and significantly associated with self-developed innovations but not with imitations or adoptions of innovations developed by other firms.

[20] The lower coefficient magnitudes and significance levels in columns 4 and 5, as compared to column 1 in Table 2, reflect that there are fewer innovations of greater novelty. When put in relation to the mean share of new-to-market or new-to-country innovations, the coefficient estimates imply that, forcing an additional 10% of all firms to disclose, reduces the number of firms with new-to-market innovations by 6% and those with new-to-country innovations by 10%.

Collectively, the results in Table 3 suggest that the negative impact of reporting regulation on the number of innovating firms reflects reductions for a wide range of meaningful innovations (see also Section 6.4.3 for further evidence using patent data).

6.2.3. Direct versus Indirect Effects

We further unpack the net effect of reporting regulation by decomposing it into the direct effect due to firms' *own* mandatory reporting and the indirect spillover effects that these firms receive from *other* firms (e.g., competitors, suppliers, and customers). Thus, this decomposition allows us to examine whether reporting regulation has countervailing effects on firms that are mandated to report (e.g., proprietary costs) vis-à-vis other firms that potentially benefit from these required disclosures (e.g., information spillovers). Such potentially offsetting, direct and indirect effects are a form of redistribution of innovation activity across firms, but they would be masked by the net effects reported in Table 2.

To disentangle the direct and indirect effects, we construct an additional reporting intensity measure which captures the extent to which other related firms are also subject to reporting mandates. This measure allows us to explicitly estimate and control for spillovers from requiring other related firms' reporting. We identify such related firms using input-output tables at the two-digit (or coarser) level (Remond-Tiedrez & Rueda-Cantuche 2019). Specifically, for each focal industry, we construct reporting intensities for all input-linked and output-linked industries. We then weight those intensities with their respective shares of inputs delivered to and outputs consumed from the respective focal industry. As many but not all related firms (i.e., competitors, customers, and suppliers) operate in the same two-digit industry as the firms in the focal industry, the resulting measure for the reporting intensity of *other* firms does not perfectly overlap with the focal industry's reporting intensity. This feature allows us to separately identify the mandate's direct effect on firms in the focal industry and its indirect effects on these firms, which arises because other firms operating in economically linked industries must also report.

Table 4 presents the estimates from country-industry-level regressions of innovation activity on the reporting intensity of firms in the focal industry and the reporting intensity of other, related firms. Controlling for the reporting intensity of others, we continue to find that more extensive mandatory reporting in a given industry is negatively associated with the share and number of innovation firms (columns 1 and 2), consistent with our results in Table 2. It is noteworthy and makes sense that these negative associations are more pronounced than those reported in Table 2 because we now explicitly control for offsetting spillovers from related firms facing reporting mandates. Hence, such spillovers are separately estimated and no longer in the main reporting coefficient. Consistent with the notion of positive spillovers, we find that the reporting intensity of other, related firms is positively and significantly associated with the share and number of innovating firms in the focal industry. With respect to innovation spending, we find qualitatively similar results (columns 3 and 4), suggesting that the insignificant total spending effect in Table 2 masks the underlying redistribution across firms, which we now unpack in Table 4.

In terms of economic magnitude, our estimates imply that an increase in the share of firms subject to mandatory reporting by 10 percentage points decreases the share of innovating firms by 2.2 percentage points (or 5.8% relative to the mean innovating firm share), before allowing for offsetting spillovers from or to competitors, customers, and suppliers (column 1 of Table 4). The same increase in the reporting share resulted in only a 1.8 percentage point decrease (or 4.7% relative decrease) after allowing for such spillovers (column 1 of Table 2).[21] These comparisons illustrate the positive spillovers resulting from mandatory reporting.

The results in Table 4 suggest the industry-level net effect of reporting regulation combines negative direct effects with positive indirect effects on corporate innovation. They are consistent with the notion that reporting mandates redistribute firms' gains from innovation to other, related firms

[21] In untabulated tests, we document that the increase in the coefficient on the focal industry's own reporting intensity from Table 2 to Table 4 is robust to using a constant sample across both specifications.

along the lines of our discussion in Section 2.

6.2.4. Heterogeneous Effects Across Firm Sizes

To further explore the redistributive forces of reporting regulation and to provide a potential explanation for the apparent concentration of innovation activity implied by the results across variables in Table 2, we examine whether reporting regulation affects the many smaller firms in an industry more negatively than the few larger ones.

Toward this end, we subdivide the country-industry-level innovation outcomes into three distinct firm-size groups: small firms with less than 50 employees, medium-sized firms with 50 to just below 250 employees, and large firms with 250 or more employees. As a result, our country-industry-*size*-level regression sample increases (about) threefold compared to the previous country-industry-level regression sample. To differentiate between the distinct groups' innovation outcomes, we include indicators for the medium- and large-firm groups and corresponding interactions with our reporting intensity measure. By setting up the analysis in this way, we continue to exploit the (exogenous) variation in reporting thresholds but decompose the treatment effect by size group. The interactions capture any differential effects of reporting regulation on medium-sized or large firms, respectively, compared to small firms.

Table 5 presents the estimates from our expanded country-industry-*size*-level regressions of innovation activity on the reporting intensity and its interactions with the medium- and large-firm indicators. Across all four columns, the size interactions exhibit positive and mostly (but not always) significant coefficients. This pattern suggests that medium-sized and large firms experience less negative or more positive effects of reporting regulation than small firms. Interestingly, the coefficient magnitudes of the large-firm interactions are systematically larger than the ones of the medium-firm interactions. This pattern holds for both firms' propensity to innovate and their innovation spending, which further supports the notion of redistribution, especially towards larger firms, which are less negatively (or even positively) affected by the reporting regulation.

Collectively, the results in Table 5 document substantial heterogeneity in the effect of reporting regulation on firms of differing sizes. In our setting, reporting regulation appears to hurt especially smaller firms' innovation incentives and concentrate innovation activity among fewer, mostly larger firms. The heterogeneous responses across firms of different sizes can reflect differences in economic incentives (e.g., for voluntary disclosure) and competitive positions of smaller vis-à-vis larger firms, as discussed in Section 2. Importantly, however, these results could also reflect the institutional fact that the largest firms must always report under the EU's reporting regulation. Accordingly, the largest firms may primarily be affected by positive spillovers arising from variation in the regulatory intensities among smaller firms, not by the negative direct effects of this regulatory variation, resulting in size heterogeneity.[22] We are not able to differentiate these two explanations with our analyses and leave this issue for future research. Irrespective of the reasons for the documented firm-size heterogeneity in mandatory reporting effects, its existence aligns well with our main results in Table 2. It provides an explanation for why mandatory reporting reduces the number of innovating firms but not total innovation spending in the industry.

6.3. Enforcement Reform in Germany

6.3.1. Local Effects on Innovation

We now turn to a single-country analysis, exploiting the German enforcement reform. In this analysis, we can no longer aggregate at the country level and must define markets more narrowly at the regional level. We therefore aggregate at the county and two-digit-industry level. In return, we have a more powerful analysis to investigate the direct impact of mandatory reporting on affected firms. The German analysis has more power, statistically, because it harnesses finer local variation in the reporting mandate and, economically, because the more local aggregation neglects potentially *offsetting* indirect effects. For Germany, we also have more detailed outcomes (e.g., firms' returns to innovation). These

[22] Our definition of the medium- and large-firm groups does *not* correspond to the "medium" and "large" firm categories prescribed by the reporting regulation, which is based on multiple thresholds and varies across countries. Thus, our size groups do not necessarily capture differences in regulatory requirements.

features allow us to shed more light on the channels through which reporting regulation affects corporate innovation in the aggregate. In addition, the German analysis contributes different experimental variation, treating *all* limited liability firms at a point in time, irrespective of their size, which is useful to corroborate our inferences from the size-based European regulation.

Table 6 presents the estimates from *county*-industry-level regressions of innovation activities on the interaction of the share of limited firms and a post-enforcement indicator. This interaction essentially captures the increase in the effective strength of the reporting mandate at the local market level. That is, the enforcement reform had a larger effect in markets with a higher share of limited firms, which after the reform face a more stringent enforcement of their reporting mandate.[23]

In column 1, we find that the increased enforcement of the reporting mandate is negatively and significantly associated with the share of innovating firms in local markets. We obtain a similar result for the total number of innovating firms in a local market (column 2). In column 3, we also find that the enforcement increase is negatively and significantly associated with average innovation spending in the local market. In column 4, we even find that the enforcement increase is negatively and significantly associated with total innovation spending in the local market.

In Figure 1, we map out the effect of the enforcement reform on market-wide innovation spending over time. The figure plots the effect by year, relative to 2007 as the base year. Consistent with the parallel-trends assumption underlying our difference-in-differences design, we do not observe a differential trend between markets with higher vis-à-vis lower shares of limited firms in the pre-enforcement period. After the reform, innovation spending declines, starting in 2008 and stabilizing at a significantly lower level over the rest of the sample period (2009-2013).[24] We obtain similar results

[23] For evidence that county-industries with greater limited-liability-firm shares exhibit larger increases in public financial reporting after the enforcement reform than county-industries with lower shares, see Breuer (2021).

[24] The enforcement regime became effective for fiscal years ending December 31, 2006, and later. Given an up to 12-months lag between the fiscal-year end and the publication date, there were only 123,446 financial statements available between December 31, 2006 and December 31, 2007. In the following year (2008), 1,079,235 financial statements were publicly available, covering nearly all limited-liability firms in Germany (Bundesanzeiger 2019). Given that the timing of the reform overlaps with the 2007 financial crisis and the ensuing great recession, we corroborate in Section 6.4.2 that our results are not confounded by worsened access to external financing (see also Vanhaverbeke *et al.* 2024).

for the innovation output measures (e.g., the share of innovating firms) in untabulated tests. The onset of the enforcement effect aligns with the fact that, given a 12-month reporting lag, the enforcement reform resulted in a substantial increase in the availability of financial reports by early to mid-2008. Notably, the short lag between the availability of firms' financial information and the reduction of firms' innovation activities is consistent with firms scaling back both ongoing and future innovation activities, likely in response to lower realized returns to past innovations and revised expectations about future innovation returns. We explore this explanation further in Section 6.4.1.

Collectively, the results in Table 6 and Figure 1 suggest that more stringent mandatory reporting reduces innovation activity in the average local market. These results are consistent with and corroborate the earlier findings in the European analysis. The negative impact of mandatory reporting is estimated with greater statistical power at the local level, compared to the European analysis, as evidenced by higher statistical significance levels. As noted earlier, this increase in power is plausibly due to the lower level of aggregation, which implies (i) a larger number of observations; and (ii) fewer offsetting spillovers. The lower level of aggregation also implies that the sample comprises many markets that are populated by just a few, mostly smaller firms. Hence, the local market results primarily reflect the *direct* impact of the mandate on innovation, not the net impact including across-region spillovers. This feature could explain why we find a negative effect on *total* innovation spending in the German analysis, but do not find one in the more aggregated European analysis. To explore this explanation, we next examine whether the impact of the mandate on local markets depends on the number of firms in that market that could provide offsetting spillovers.

6.3.2. Heterogeneous Effects Across Markets

In this section, we estimate separate effects for the enforcement reform in local markets with many firms (more competitive) and few firms (more monopolistic). Table 7 provides estimates from county-industry-level regressions of innovation on the strength of the mandate, separately for local markets with an above-median number of firms ("high") and markets with a below-median number of firms

("low"). We find that mandatory reporting is more negatively associated with the number of innovating firms and innovation spending in markets with few firms, i.e., in local monopolies. Notably, the decline in spending in markets with few firms appears to be driven by local monopolists stopping innovation activities altogether, as suggested by the extensive margin estimates (column 6).

The results in Table 7 provide an explanation for why we observe negative spending effects in the local market design in Germany, yet do not observe a decline in the more aggregated European analysis. In the local market design, the average market only includes few, mostly smaller firms. In those markets, our results suggest that local monopolists stop innovating, so spending goes down in the local market. At the country-industry level, the spending declines of those local monopolists are less relevant and/or offset by the shift in innovation activities to other, typically larger firms in the economy, as suggested by our results in Table 2 and Table 5 in the European analysis.

Collectively, the results in Table 7 suggest that mandatory reporting discourages innovation activity of local monopolists. This finding makes sense considering that local monopolists tend to be smaller than competitors operating in broader (e.g., national or even international) or in crowded markets (e.g., metropolitan areas). In addition, local monopolists, by definition, cannot benefit from offsetting information spillovers from local peers, whereas firms in crowded markets at least benefit from mandatory reporting of their peers. Put differently, a mandate is less costly to firms if they can reciprocally exploit or benefit from each other's disclosures. The results in Table 7 are further consistent with the idea that, absent any reporting mandate, local monopolists can protect their rents from innovation via secrecy. Firms in more crowded markets, by contrast, are less likely to earn substantial rents to begin with and cannot easily hide their rents given the proximity of their peers, which facilitates the dissipation of proprietary information even absent reporting mandates (e.g., via employee poaching) (Li *et al.* 2017; Glaeser 2018).

6.4. Channels, Alternative Explanations, and Intellectual Property Protection

6.4.1. Returns to Innovation and Innovation Efficiency

Our results are consistent with reporting regulation having a negative direct effect on corporate innovation because reporting dissipates firms' gains from innovation. Many firms rely on secrecy to protect their intellectual property. As discussed in Section 2, financial reporting could reveal profitable markets or innovative activities and trigger search by competing firms, resulting in lower realized returns to past innovations and revised expectations about future innovation returns. However, such information and search could also avoid duplicate innovation efforts, leading to improved innovation efficiency. To distinguish between these potential explanations for our findings, we investigate several survey measures that reflect the economic returns to innovation. In doing so, we shed light on the importance of proprietary costs for our innovation effects. We expect to observe lower returns if mandatory reporting dissipates gains from innovation, whereas returns should be unchanged or even higher if it enhances innovation efficiency.

Table 8 presents the estimates from county-industry-level regressions of various measures of returns to innovation on the strength of the German reporting mandate.[25] We find that the enforcement reform is negatively associated with firms' profit margins, the share of sales from new-to-market innovations, as well as cost reductions from process improvements. The associations are negative for both averages and totals and statistically significant in five out of six specifications.

In sum, there is little evidence that the returns to innovation improved after the enforcement reform. The results in Table 8 are consistent with the interpretation that proprietary costs of reporting are the channel for the effect of reporting mandates on innovation.[26] They do not support the alternative interpretation that the decline in innovation activity reflects higher innovation efficiency. The results in our European analyses showing declines in measures indicating more novel innovation

[25] We acknowledge that the measures of innovation return, while specific to innovation, are likely noisy. That said, the CIS has strived to improve these measures over time and achieved a high response rate.

[26] In untabulated tests, we document that the decline in the return to innovation is concentrated in local markets with few firms, in line with our results in Section 6.3.2.

outputs (e.g., new-to-market and self-developed innovations) further support this conclusion.

6.4.2. Financing Benefits and Frictions

Another potential channel through which reporting regulation could affect innovation is through its impact on firms' ability to finance new investments (e.g., Brown *et al.* 2009; Kerr & Nanda 2015; Park 2018; Brown & Martinsson 2019). Our results suggest that this channel is insufficient to over-compensate the decline in industry-wide innovation due to proprietary costs. This outcome may not be particularly surprising in our European setting. The capital-market benefits from public reporting are likely limited for most private firms in our sample because they obtain financing from a small number of capital providers (e.g., owner-managers and relationship banks) with whom they tend to communicate privately. The private communication allows firms to inform their main capital providers, thereby reducing financing frictions while avoiding the leakage of proprietary information (e.g., Leuz & Wüstemann 2004). Moreover, firms that, on net, benefit from more disclosure can provide it voluntarily. As a result, a mandate primarily expands the reporting of firms for which the capital-market benefits of voluntary reporting do *not* outweigh the corresponding costs.

Having said that, mandatory reporting could still have financing and other benefits for some firms in the industry or the market as a whole, for example, due to spillovers, cost savings from standardization, or commitment (e.g., Easterbrook & Fischel 1984; Leuz & Wysocki 2016; Minnis & Shroff 2017). Consistent with the existence of financing benefits, Table 9 documents that firms report fewer financing constraints as a barrier to innovation after the enforcement reform strengthened the reporting mandate in Germany. However, our earlier results imply that these benefits are not large enough to produce a positive net effect with respect to market-wide innovation.

Importantly, the evidence in Table 9 together with Figure 1 also allays concerns that the negative impact on innovation in the German analysis reflects confounding influences from the 2008 financial crisis, which occurred in the post-period of the enforcement reform. The reported reduction in financing constraints is inconsistent with the explanation that the financial crisis hit limited-liability

firms harder than unlimited-liability firms (e.g., because of limited collateral), which in turn spuriously results in a negative innovation effect. Note further that our analysis includes fixed effects at the county-year level, which should absorb much of the crisis impact on innovation. We nevertheless gauge if there is any residual impact of the crisis on our results by controlling for firms' exposures to the distress of a major German bank (Commerzbank) during the financial crisis (Huber 2018) and find that inferences are unaffected (Table OA2).[27]

6.4.3. Intellectual Property Protection

Our results suggest that reporting regulation complicates the protection of firms' innovation. Most firms rely on secrecy to protect their innovations (Arundel 2001). An alternative means to protect innovations is patenting. This alternative comes with the requirement to disclose specifics about the innovation but, in return, grants explicit legal protections of the returns to innovation. This form of protection is common in some industries (e.g., pharma), but only applicable to a subset of innovations, and primarily used by larger firms (Arundel & Kabla 1998; Arundel 2001). Still, this strategy may become (relatively) more prevalent when reporting regulation forces firms to reveal information about their investments in and financial returns to innovation and hence makes secrecy harder to sustain. Accordingly, we examine the impact of reporting regulation on firms' patenting behavior. We note that the effect on patenting is ex ante unclear because firms' patents capture both their innovation output as well as their intellectual property (IP) protection strategy (e.g., Reeb & Zhao 2020). These two aspects can be differentially affected by reporting regulation (e.g., firms may decrease their innovation activity but increase their use of patenting to protect remaining innovations).

In Panel A of Table 10, we present results for the impact of reporting regulation on firms' patenting behavior in the European analysis. We find that reporting regulation is not significantly associated with the patenting propensity of the average firm in an industry. This result obtains for

[27] It is worth noting that our German results are consistent with the European setting and that, in the latter, we do not exploit changes over time but instead rely on a cross-sectional identification strategy. Thus, it is unlikely that the financial crisis or other major shocks during our sample period drive our results.

both measures of patenting propensity: a measure based on firms' CIS survey responses (column 1) and a measure based on firms' actual patenting behavior obtained from PATSTAT (column 2). Considering our earlier finding that the average innovation propensity declines (Table 2), the absence of a significant decline in the average patenting propensity may indicate that those firms that continue innovating resort to patenting as a means to protect their innovations more frequently, resulting in an insignificant association overall. In columns 3 and 4, we further find that reporting regulation is positively but statistically insignificantly associated with the average firm's (log) number of patents and the industry-wide (log) number of patents. The insignificant aggregate result, however, masks significant effects on the few industries and firms with high patent propensities. In Table OA3, we, for example, find that, among the select industries that rely on patenting, the total patent portfolio increases significantly. Additionally, in column 5 (Table 10, Panel A), we find that larger firms, which are generally more likely to rely on patenting, expand their patent portfolios significantly. Taken together, these findings are consistent with both a shift of innovation activity toward larger firms, in line with our earlier results, and a shift in IP protection strategies toward patenting.

In Panel B of Table 10, we present the results for the impact of reporting regulation on firms' patenting in the German analysis. In this more local setting, we observe that reporting regulation is negatively associated with patenting propensity and the number of patents of firms operating in the average local market. These local-market results contrast with the insignificant and, if anything, positive industry-wide patenting activity in the European analysis. They, however, closely align with our earlier CIS-based finding that directly affected firms in local markets often stop innovating in response to reporting regulation (Table 7). As a result, these firms also stop filing patents. This alignment between the survey and patenting data results corroborates our earlier findings based on CIS survey responses and highlights that reporting regulation can deter meaningful innovation. It also reinforces the idea that reporting regulation has heterogeneous impacts on the innovation activities and IP protection strategies of firms of differing sizes and competitive positions.

Collectively, our patenting results are consistent with the idea that reporting regulation hurts some firms' innovation activities while it helps other firms' activities. The aggregate impact on corporate innovation remains unclear though. Our earlier findings show an insignificant impact on industry-wide innovation spending. Our industry-wide patenting results broadly agree with those findings. They appear sensitive to research design choices, though, due to the sparsity of patents and their select use by larger firms and specific industries.[28] What comes through again is a shift of innovation activity toward larger firms. This shift toward firms with a greater patenting propensity and the potentially increasing appeal of patenting as an IP protection strategy suggest caution when using patents as the only measure innovation activity in studies of reporting regulation.[29]

7. Conclusion

In this study, we examine the effects of financial reporting regulation on corporate innovation. We analyze two different settings: threshold-based reporting mandates in the EU and an enforcement reform in Germany, both of which give rise to plausibly exogenous differences in the intensity with which European and German firms face reporting mandates. The two settings have different advantages and drawbacks but provide broadly consistent findings and conclusions.

We find that reporting regulation can hurt firms' innovation activities, essentially by imposing proprietary costs. This adverse impact is observed for firms' innovation propensity, innovation spending, and patenting. It appears concentrated among smaller firms and local monopolists. Without reporting regulation, these firms could hide their financial performance and innovation activities from competitors and contracting partners. By revealing firms' financial performance and other information, reporting regulation appears to dissipate firms' returns to innovation. In response, many firms reduce their innovation spending or even stop innovating altogether. However, with these

[28] Such sensitivities can arise from count data with many zeros, which can cause specification issues in linear models (Cohn *et al.* 2022). Consistent with this concern, we observe evidence of a significantly positive association with the raw number of patents in linear models but an insignificantly negative association using Poisson models (Table OA3).

[29] This explanation could also help reconcile seemingly conflicting results in recent studies examining the innovation spending and patenting impacts of the EDGAR introduction in the U.S. (Chawla 2023; Dambra *et al.* 2024).

information effects, reporting regulation also produces information spillovers on other firms, which is why we conduct the analysis at an aggregate level.

At the country-industry level, we find that reporting regulation reduces the number of innovating firms but leaves total innovation spending unchanged and may even increase the number of patents, at least in select, patent-reliant industries. These diverging results for distinct innovation measures render the overall, industry-wide impact on corporate innovation uncertain. They highlight that reporting regulation has heterogeneous effects on firms' innovation activities and IP strategies (e.g., secrecy vs. patenting). Consistent with such heterogeneity, we observe that reporting regulation hurts innovation activities by firms facing the mandate, yet helps other firms (e.g., competitors, customers, and suppliers), which can take advantage of firms' reports and expand their innovation activities. Larger firms appear to be the main beneficiaries. Their expanded innovation spending offsets the decline in spending by the many smaller firms that reduce or even stop their innovation activities. Larger firms also appear to be primarily responsible for the observed increase in the number of patents in patent-reliant industries. Thus, we observe a pattern of larger firms, which rely more on patenting as a means of IP protection than smaller firms, expanding their innovation and patenting activities in response to reporting regulation in our setting.

Our findings highlight that reporting regulation can have important aggregate and distributional effects on corporate innovation. In our setting, reporting regulation appears to concentrate innovation activity among fewer, mostly larger firms. This concentration could occur because larger firms are less adversely affected by their own mandatory reporting than smaller firms, which often operate in local niche markets and hence incur larger proprietary costs, or because larger firms are better positioned to take advantage of other firms' mandatory reporting (e.g., due to superior resources). It may also reflect that the European regulation primarily varies among small, not larger firms. In any case, such concentration of market power and innovation activity among larger firms is consistent with recent trends (Rammer & Schubert 2018; EU 2019a; Cunningham *et al.* 2021; De

Loecker & Eeckhout 2021). Our paper suggests that reporting regulation may contribute to those trends by disseminating firms' financial information (e.g., similar to other information technologies; Begenau *et al.* 2018; Farboodi *et al.* 2019). These trends and distributional effects can have important ramifications for the extent and type of corporate innovation (e.g., Acs & Audretsch 1987, 1988; Holmstrom 1989; Rajan 2012).

Our findings come with several important limitations. First, the regulatory and welfare implications of the changing corporate innovation activities remain unclear. We focus on corporate innovation because it is an important, observable outcome that is relevant for regulators as it is closely linked to economic growth and welfare (e.g., Zingales 2009; Basu *et al.* 2010; Ball 2024). Still, corporate innovation and welfare do not always go together (Yang 2023). Second, and relatedly, our analysis is only aggregated up to the country-industry level and hence the economy-wide effect of reporting regulation on innovation remains uncertain. Third, we rely on various empirical proxies for corporate innovation, all of which come with drawbacks (e.g., broad survey-based vs. narrow patent measures). Therefore, the findings need to be interpreted with caution as the various proxies may miss or mis-measure relevant dimensions of total corporate innovation. Lastly, we highlight that we cannot identify the mechanism underlying the redistribution of innovation activity from smaller toward larger firms. As noted above, this redistribution could reflect economic differences across the firms (e.g., in terms of voluntary disclosure incentives and competitive positions; Bernard 2016; Breuer *et al.* 2020, 2021). It could, however, also reflect institutional features of the European reporting regulation. The largest firms in Europe must always report their financial statements, irrespective of the exemption thresholds that we exploit in our threshold design. Accordingly, our exemption-threshold variation may not directly affect the larger firms and instead provide them with indirect benefits stemming from greater reporting of other, mostly smaller firms. In this case, our results would primarily speak to the impact of extending reporting regulation to smaller firms. We leave the distinction between these explanations to future research.

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Variable Appendix

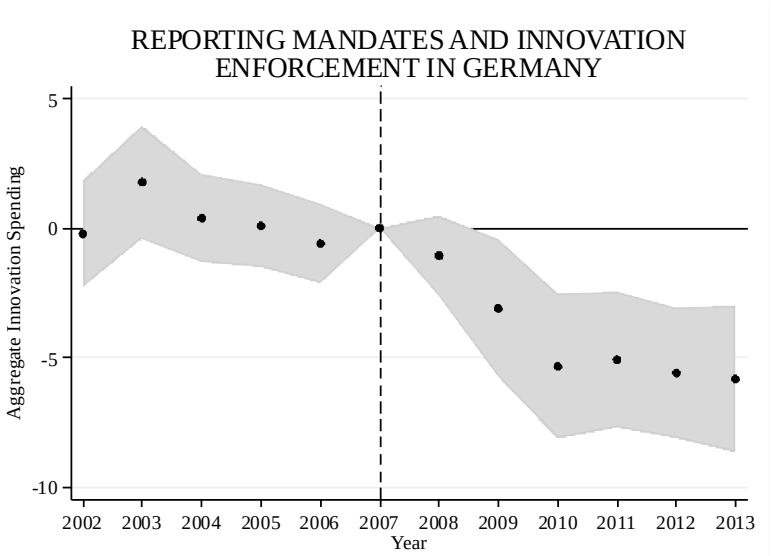
VARIABLE DEFINITIONS		
Panel A: Exemptions in Europe		
Treatment	Source	Description
Reporting	Amadeus	Share of firms above country-level reporting thresholds calculated using a standardized firm-size distribution per industry
Other Firms' Reporting	Amadeus/Eurostat	Reporting share of firms operating in related industries (calculated by weighting reporting shares with input and output shares for a given focal industry using Eurostat's FIGARO input-output table)
Outcomes	Source	Description
Innovating Firm	Eurostat	Indicator taking the value of one for firms that introduce new or significantly improved products, processes, or services
Innovation Spending	Eurostat	Log of total innovation spending (includes in-house and external R&D, acquisition of external knowledge, equipment, machinery or software for innovation purposes, product design and professional development of innovation activities and marketing of innovation) plus one
Product Innovation	Eurostat	Indicator taking the value of one for firms that introduce new or significantly improved products
Process Innovation	Eurostat	Indicator taking the value of one for firms that introduce new or significantly improved services
New-To-Market Innovation	Eurostat	Indicator taking the value of one for firms that introduce new-to-the-market innovations (the firm was the first one to market these products/services in its self-defined market)
New-To-Country Innovation	Eurostat	Indicator taking the value of one for firms that introduce new-to-the-country innovations (the firm was the first one to market these products/services in its country)
Self-Developed Innovation	Eurostat	Indicator taking the value of one for firms that introduce new or significantly improved products, processes, or services that they developed themselves or together with other firms or organizations
Imitation and Adaptation	Eurostat	Indicator taking the value of one for firms that introduce new or significantly improved

		products, processes, or services that they imitated or adapted / modified based on products, processes, or services originally developed by other firms or organizations
Dominated by Established Firms	Eurostat	Importance of dominance by established firms as a barrier to innovation (scale: 0 to 3)
Lack of Information on Market	Eurostat	Importance of lack of information on markets as a barrier to innovation (scale: 0 to 3)
Lack of Information on Technology	Eurostat	Importance of lack of information on technology as a barrier to innovation (scale: 0 to 3)
Patenting Firm	Eurostat, PATSTAT	Indicator taking the value of one for firms that apply for a patent
Patents	PATSTAT	Log (plus 1) of total number of patents applied for
Panel B: Enforcement Reform in Germany		
Treatment	Source	Description
Limited Share	Creditreform	Share of limited-liability firms among firms in county, industry, and year
Post	Creditreform	Indicator taking the value of one for years after 2007, and zero before
Outcomes	Source	Description
Innovating Firm	MIP	Indicator taking the value of one for firms that introduce new or significantly improved products, processes, or services
Innovation Spending	MIP	Log (plus 1) of total innovation spending (includes in-house and external R&D, acquisition of external knowledge, equipment, machinery or software for innovation purposes, product design and professional development of innovation activities and marketing of innovation)
Innovation Spending (Extensive)	MIP	Indicator taking the value of one for firms with positive total innovation spending, and zero for firms with zero spending
Profit Margin	MIP	Level of profit margin (scale: 1 to 9)
Share of Sales from New-to-Market Innovations	MIP	Share of sales attributable to new-to-market innovations
Cost Reduction from Process Improvements	MIP	Indicator taking the value of one for firms with a cost reduction due to process improvements

External Financing Constraint	MIP	Indicator taking the value of one for firms for which external financing constitutes a constraint to innovation
Internal Financing Constraint	MIP	Indicator taking the value of one for firms for which internal financing constitutes a constraint to innovation
Patenting Firm	PATSTAT	Indicator taking the value of one for firms that apply for a patent
Patents	PATSTAT	Log (plus 1) of total number of patents applied for

Figures & Tables

Figure 1



Notes: The figure presents the relation between innovation spending and the intensity of the enforcement of reporting mandates over time. The black dots represent difference-in-differences coefficients for each year (with 2007 as the base year) from a regression of aggregate innovation spending at the county, industry, and year level on the share of affected (limited) firms in the pre-enforcement period interacted with individual year indicators. The gray area represents a pointwise 90% confidence interval.

Table 1

DESCRIPTIVE STATISTICS

Panel A: Exemptions in Europe (Country-Industry Level)

Variable	Market Level	N	Mean	SD	p1	p25	p50	p75	p99
Reporting		7,106	0.281	0.296	0.015	0.090	0.171	0.322	1.000
Other Firms' Reporting		6,418	0.255	0.224	0.070	0.127	0.173	0.251	0.950
Innovating Firm	Simple Average	7,106	0.383	0.220	0.000	0.217	0.363	0.523	1.000
Innovating Firm	Total	7,106	238.750	717.735	0.000	13.000	46.000	158.805	3,936.373
Innovation Spending	Simple Average	6,763	4.042	2.896	0.000	1.890	3.481	5.558	13.525
Innovation Spending	Total	6,763	16.430	3.493	0.000	15.097	16.821	18.459	22.169
Product Innovation	Simple Average	7,106	0.277	0.201	0.000	0.121	0.243	0.398	1.000
Process Innovation	Simple Average	7,076	0.292	0.191	0.000	0.154	0.268	0.398	1.000
New-To-Market Innovation	Simple Average	6,965	0.156	0.131	0.000	0.051	0.125	0.235	0.511
New-To-Country Innovation	Simple Average	2,773	0.115	0.110	0.000	0.023	0.083	0.178	0.434
Self-Developed Innovation	Simple Average	6,956	0.345	0.219	0.000	0.179	0.319	0.485	1.000
Imitation and Adaptation	Simple Average	6,956	0.099	0.108	0.000	0.024	0.069	0.143	0.500
Patenting Firm (CIS)	Simple Average	4,018	0.055	0.102	0.000	0.000	0.018	0.060	0.482
Patenting Firm (PATSTAT)	Simple Average	38,539	0.010	0.038	0.000	0.000	0.000	0.004	0.148
Patents	Simple Average	38,539	0.020	0.091	0.000	0.000	0.000	0.006	0.347
Patents	Total	38,539	1.486	2.072	0.000	0.000	0.000	2.639	7.590

Panel B: Exemptions in Europe (Country-Industry-Size Level)

		Full Sample		Small Firms (Emp < 50)		Medium Firms (50 ≤ Emp < 250)		Large Firms (Emp ≥ 250)	
Variable	**Market Level**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**	**N**	**Mean**
Innovating Firm	Simple Average	21,892	0.467	7,590	0.320	7,453	0.463	6,849	0.633
Innovating Firm	Total	21,892	80.578	7,590	167.857	7,453	51.545	6,849	15.450
Innovation Spending	Simple Average	20,151	5.507	6,940	3.118	6,914	5.191	6,297	8.487
Innovation Spending	Total	20,151	14.632	6,940	14.015	6,914	14.562	6,297	15.391
Patents	Simple Average	98,940	0.065	36,389	0.008	33,049	0.034	29,484	0.168
Patents	Total	98,940	0.835	36,389	0.747	33,049	0.696	29,484	1.102

Panel C: Enforcement Reform in Germany (County-Industry Level)									
Variable	**Market Level**	**N**	**Mean**	**SD**	**p1**	**p25**	**p50**	**p75**	**p99**
Limited Share		56,929	0.589	0.231	0.000	0.436	0.596	0.764	1.000
Post		56,929	0.371	0.483	0.000	0.000	0.000	1.000	1.000
Innovating Firm	Simple Average	49,466	0.551	0.445	0.000	0.000	0.600	1.000	1.000
Innovating Firm	Total	49,466	1.090	1.890	0.000	0.000	1.000	1.000	7.000
Innovation Spending	Simple Average	29,702	6.642	6.042	0.000	0.000	7.200	12.206	17.217
Innovation Spending	Total	29,702	7.648	6.540	0.000	0.000	10.597	13.142	17.943
Innovation Spending (Extensive)	Simple Average	29,702	0.531	0.467	0.000	0.000	0.500	1.000	1.000
Profit Margin	Simple Average	26,851	3.605	1.724	1.000	2.000	3.500	5.000	7.000
Profit Margin	Total	26,851	5.302	6.747	1.000	2.000	4.000	6.000	26.000
Share of Sales from New-to-Market Innovation	Simple Average	26,293	0.037	0.103	0.000	0.000	0.000	0.025	0.500
Share of Sales from New-to-Market Innovation	Weighted Average	26,219	0.037	0.106	0.000	0.000	0.000	0.020	0.510
Cost Reduction from Process Improvements	Simple Average	24,168	0.265	0.415	0.000	0.000	0.000	0.500	1.000
Cost Reduction from Process Improvements	Total	24,168	0.364	0.613	0.000	0.000	0.000	1.000	2.000
External Financing Constraint	Simple Average	24,562	0.329	0.440	0.000	0.000	0.000	1.000	1.000
External Financing Constraint	Total	24,562	0.489	0.832	0.000	0.000	0.000	1.000	3.000
Internal Financing Constraint	Simple Average	24,451	0.369	0.452	0.000	0.000	0.000	1.000	1.000
Internal Financing Constraint	Total	24,451	0.551	0.903	0.000	0.000	0.000	1.000	3.000
Patenting Firm	Simple Average	56,929	0.077	0.229	0.000	0.000	0.000	0.000	1.000
Patenting Firm	Total	56,929	0.165	0.474	0.000	0.000	0.000	0.000	2.000
Patents	Simple Average	56,929	0.110	0.405	0.000	0.000	0.000	0.000	2.030
Patents	Total	56,929	0.210	0.667	0.000	0.000	0.000	0.000	3.367

Notes: The table presents descriptive statistics for treatment and outcome variables. Corresponding variable definitions can be found in the "Variable Appendix" table. Panel A provides the statistics for the country-industry (two-digit NACE) analysis in the European setting. Panel B provides the statistics for the country-industry-size analysis in the European setting. Panel C provides the statistics for the county-industry (two-digit NACE) analysis in the German setting. Simple averages are the unweighted averages of variables within a given country, industry, and year. Weighted averages are computed as the market-share-weighted sums of variables (where the market share is calculated using sales) within a given country, industry, and year. Totals are the sums of variables within a given country, industry, and year. Logarithm (plus 1) transformations are applied to the innovation spending variables. For average spending, the transformations are applied before calculating averages within a given count(r)y, industry, and year. For totals spending, the transformations are applied after calculating totals within a given count(r)y, industry, and year.

Table 2

NET EFFFECT ON INNOVATION				
Outcome	Innovating Firm		Innovation Spending	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Reporting	-0.179***	-306.336**	-1.619*	0.325
	(-2.94)	(-2.19)	(-1.95)	(0.34)
Country-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	6,964	6,963	6,629	6,627
Clusters (Country-Industry)	935	933	935	931
Clusters (Country-Year)	160	160	154	154
Adj. R^2	0.706	0.581	0.720	0.695

Notes: The table presents estimates from regressions of innovation measures on the share of firms subject to full reporting requirements in the European setting. The innovation measures are simple averages and totals calculated for a given country, industry, and year. The average spending outcome is the average of the logarithm of firms' innovation spending (plus one), whereas the total spending outcome is the logarithm of the total market-level spending (plus one). For more details on the variable definitions, see Variable Appendix. We use CIS sampling weights to adjust for sampling design and unit non-response biases. The weights ensure that the averages and aggregates are representative for the industry and country (excluding micro firms). "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. We truncate the outcomes at the 1st and 99th percentile of their distributions, after introducing the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 3

EFFECTS ON DISTINCT TYPES OF INNOVATION						
Variation in Innovation	Type		Novelty		Origin	
Outcome	Product Innovation	Process Innovation	New-to-the-Market Innovation	New-to-the-Country Innovation	Self-Developed Innovation	Imitation and Adaptation
Market Level	Simple Average	Simple Average	Simple Average	Simple Average	Simple Average	Simple Average
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	-0.143**	-0.165***	-0.093*	-0.120*	-0.229***	0.004
	(-2.35)	(-2.74)	(-1.94)	(-1.79)	(-3.55)	(0.13)
Country-Year FE	X	X	X	X	X	X
Industry-Year FE	X	X	X	X	X	X
Observations	6,964	6,936	6,827	2,719	6,818	6,818
Clusters (Country-Industry)	935	935	934	860	935	935
Clusters (Country-Year)	160	159	160	60	157	157
Adj. R^2	0.687	0.648	0.660	0.676	0.703	0.560

Notes: The table presents estimates from regressions of various types of innovation measures on the share of firms subject to full reporting requirements in the European setting. The innovation measures are simple averages calculated for a given country, industry, and year. We use CIS sampling weights to adjust for sampling design and unit non-response biases. The weights ensure that the averages are representative for the industry and country (excluding micro firms). "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. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 4

DIRECT VERSUS INDIRECT EFFECTS				
Outcome	Innovating Firm		Innovation Spending	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Reporting	-0.224***	-465.321***	-2.690***	-0.311
	(-3.05)	(-2.82)	(-2.66)	(-0.32)
Other Firms' Reporting	0.125***	126.896	2.044***	1.149*
	(2.91)	(1.54)	(3.57)	(1.82)
Country-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	6,290	6,289	6,001	5,999
Clusters (Country-Industry)	843	841	842	839
Clusters (Country-Year)	152	152	147	147
Adj. R^2	0.714	0.575	0.729	0.709

Notes: The table presents estimates from regressions of innovation measures on the share of firms in a focal industry subject to full reporting requirements and the share of firms operating in economically linked industries subject to full reporting requirements in the European setting. The innovation measures are simple averages and totals calculated for a given country, industry, and year. The average spending outcome is the average of the logarithm of firms' innovation spending (plus one), whereas the total spending outcome is the logarithm of the total market-level spending (plus one). For more details on the variable definitions, see Variable Appendix. We use CIS sampling weights to adjust for sampling design and unit non-response biases. The weights ensure that the averages and aggregates are representative for the industry and country (excluding micro firms). "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. "Other Firms' Reporting" is the output/input-share-weighted intensity of reporting mandates in economically linked output/input industries of a given country, (two-digit or coarser) industry, and year. The regressions include industry-year fixed effects and country-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 5

HETEROGENEOUS EFFECTS ACROSS FIRM SIZES				
Outcome	Innovating Firm		Innovation Spending	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Reporting	-0.136**	-131.430***	-1.265*	1.074
	(-2.57)	(-3.46)	(-1.75)	(0.96)
Reporting × Medium Firms	0.056***	70.197***	0.198	1.099***
	(3.84)	(5.16)	(0.98)	(4.99)
Reporting × Large Firms	0.112***	105.021***	0.745*	2.113***
	(4.89)	(5.22)	(1.86)	(4.90)
Size-Group FE	X	X	X	X
Country-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	21,456	21,456	19,749	19,748
Clusters (Country-Industry)	1,144	1,144	1,143	1,142
Clusters (Country-Year)	169	169	163	163
Adj. R^2	0.616	0.442	0.687	0.554

Notes: The table presents estimates from regressions of innovation measures on the share of firms subject to full reporting requirements in the European setting. The innovation measures are simple averages and totals calculated for a given country, industry, size-class, and year. The average spending outcome is the average of the logarithm of firms' innovation spending (plus one), whereas the total spending outcome is the logarithm of the total market-level spending (plus one). For more details on the variable definitions, see Variable Appendix. We use CIS sampling weights to adjust for sampling design and unit non-response biases. The weights ensure that the averages and aggregates are representative for the industry, country and size-class (excluding micro firms). "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. "Medium Firms" is an indicator taking the value of one for the size group comprising firms with 50 or more employees but less than 250 employees. "Large Firms" is an indicator taking the value of one for the size group comprising firms with 250 or more employees. The regressions include size-group fixed effects, industry-year fixed effects, and country-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 6

LOCAL EFFECTS ON INNOVATION				
Outcome	Innovating Firm		Innovation Spending	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Limited Share × Post	-0.132***	-0.510***	-2.305***	-3.050***
	(-3.46)	(-6.09)	(-3.32)	(-4.02)
County-Industry FE	X	X	X	X
County-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	47,283	47,279	26,778	26,778
Clusters (County-Industry)	8,193	8,178	5,859	5,861
Adj. R^2	0.393	0.561	0.533	0.528

Notes: The table presents estimates from regressions of innovation measures on the intensity of enforcement of reporting mandates in the German setting. The innovation measures are simple averages and totals calculated for a given county, industry, and year. The average spending outcome is the average of the logarithm of firms' innovation spending (plus one), whereas the total spending outcome is the logarithm of the total market-level spending (plus one). For more details on the variable definitions, see Variable Appendix. The enforcement intensity is captured by the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 7

HETEROGENEOUS EFFECTS ACROSS MARKETS						
Outcome	Innovating Firm		Innovation Spending		Innovation Spending (Extensive)	
Market Level	Simple Average		Simple Average		Simple Average	
Number of Firms	High	Low	High	Low	High	Low
Column	(1)	(2)	(3)	(4)	(5)	(6)
Limited Share × Post	-0.100	-0.132***	-2.043	-4.067***	-0.005	-0.313***
	(-1.09)	(-2.83)	(-1.19)	(-4.62)	(-0.03)	(-4.52)
County-Industry FE	X	X	X	X	X	X
County-Year FE	X	X	X	X	X	X
Industry-Year FE	X	X	X	X	X	X
Observations	22,825	23,234	12,298	12,648	12,307	12,642
Clusters (County-Industry)	3,640	4,446	2,471	3,107	2,474	3,108
Adj. R^2	0.363	0.403	0.493	0.551	0.449	0.508

Notes: The table presents estimates from regressions of innovation measures on the intensity of enforcement of reporting mandates for county-industries with a high vis-à-vis low number of firms in the pre-enforcement period (median split) in the German setting. The innovation measures are simple averages calculated for a given county, industry, and year. The average spending outcome is the average of the logarithm of firms' innovation spending (plus one). For more details on the variable definitions, see Variable Appendix. The enforcement intensity is captured by the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 8

ECONOMIC RETURNS TO INNOVATION						
Outcome	Profit Margin		Share of Sales from New-To-Market Innovations		Cost Reduction from Process Improvements	
Market Level	Simple Average	Total	Simple Average	Weighted Average	Simple Average	Total
Column	(1)	(2)	(3)	(4)	(5)	(6)
Limited Share × Post	-0.356*	-1.112**	-0.017*	-0.021**	-0.085	-0.145*
	(-1.69)	(-2.40)	(-1.84)	(-2.13)	(-1.54)	(-1.89)
County-Industry FE	X	X	X	X	X	X
County-Year FE	X	X	X	X	X	X
Industry-Year FE	X	X	X	X	X	X
Observations	24,768	24,767	23,088	23,016	20,846	20,850
Clusters (County-Industry)	5,787	5,778	5,329	5,323	5,086	5,087
Adj. R^2	0.535	0.576	0.403	0.415	0.433	0.352

Notes: The table presents estimates from regressions of profitability measures on the intensity of enforcement of reporting mandates in the German setting. The innovation measures are simple averages or totals calculated for a given county, industry, and year. We calculate the aggregate percent of sales from new-to-market innovations (column 4) by weighting the reported percentages with available sales data. For more details on the variable definitions, see Variable Appendix. The enforcement intensity is captured by the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively

Table 9

FINANCING FRICTIONS				
Outcome	External Financing Constraint		Internal Financing Constraint	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Limited Share × Post	-0.123*	-0.403***	-0.033	-0.393***
	(-1.78)	(-3.68)	(-0.48)	(-3.49)
County-Industry FE	X	X	X	X
County-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	22,528	22,535	22,418	22,420
Clusters (County-Industry)	5,199	5,197	5,191	5,184
Adj. R^2	0.666	0.580	0.663	0.573

Notes: The table presents estimates from regressions of financing constraints on the intensity of enforcement of reporting mandates in the German setting. The financial constraints measures are simple averages or totals calculated at the county, industry, and year. For more details on the variable definitions, see Variable Appendix. The enforcement intensity is captured by the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table 10

INTELLECTUAL PROPERTY PROTECTION					
Panel A: Exemptions in Europe (Country-Industry(-Size) Level)					
Outcome	Patenting Firm		Patents		
Source	CIS	PATSTAT	PATSTAT	PATSTAT	PATSTAT
Market Level	Simple Average	Simple Average	Simple Average	Total	Total
Column	(1)	(2)	(3)	(4)	(5)
Reporting	-0.020	0.007	0.017	0.367	0.544
	(-0.55)	(1.00)	(1.19)	(0.71)	(1.14)
Reporting × Medium Firms					0.211***
					(4.20)
Reporting × Large Firms					0.289***
					(2.83)
Country-Year FE	X	X	X	X	X
Industry-Year FE	X	X	X	X	X
Size-Group FE					X
Observations	3,938	37,767	37,769	37,769	96,963
Clusters (Country-Industry)	923	2,204	2,204	2,203	2,192
Clusters (Country-Year)	93	466	466	466	466
Adj. R^2	0.623	0.525	0.503	0.684	0.520

Panel B: Enforcement Reform in Germany (County-Industry Level)

Outcome	Patenting Firm		Patents	
Source	PATSTAT	PATSTAT	PATSTAT	PATSTAT
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Limited Share × Post	-0.028**	-0.045*	-0.031*	-0.076**
	(-2.14)	(-1.85)	(-1.91)	(-2.48)
County-Industry FE	X	X	X	X
County-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	54,939	54,966	54,939	54,955
Clusters (County-Industry)	8,572	8,592	8,557	8,571
Adj. R^2	0.561	0.479	0.659	0.645

Notes: The table presents estimates from regressions of patenting measures on variation in reporting mandates. In Panel A, the patent measures are simple averages and totals calculated for a given country, industry, and year in the European setting using Eurostat and PATSTAT data. The average patents outcome is the average of the logarithm of firms' patent applications (plus one), whereas the total patents outcome is the logarithm of the total market-level patent applications (plus one). For more details on the variable definitions, see Variable Appendix. The treatment variation, "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. "Medium Firms" is an indicator taking the value of one for the size group comprising firms with 50 or more employees but less than 250 employees. "Large Firms" is an indicator taking the value of one for the size group comprising firms with 250 or more employees. The regressions in columns 1 to 4 include industry-year and country-year fixed effects. The regression in column 5 additionally includes group-size fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. In Panel B, the patent measures are simple averages and totals calculated for a given county, industry, and year in the German setting using PATSTAT data. The average patents outcome is the average of the logarithm of firms' patent applications (plus one), whereas the total patents outcome is the logarithm of the total market-level patent applications (plus one). For more details on the variable definitions, see Variable Appendix. The treatment variation is the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. In all panels, we truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the firm level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Online Appendix

(for online publication only)

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Community Innovation Survey

Definition of Innovation

The following description is provided on the first page of the 2014 Community Innovation Survey questionnaire (Community Innovation Survey 2014a):

> An innovation is the introduction of a new or significantly improved product, process, organisational method, or marketing method by your enterprise.
>
> An innovation must have characteristics or intended uses that are new or which provide a significant improvement over what was previously used or sold by your enterprise. However, an innovation can fail or take time to prove itself.
>
> An innovation need only be new or significantly improved for your enterprise. It could have been originally developed or used by other enterprises or organisations.
>
> Innovation activities include the acquisition of machinery, equipment, buildings, software, and licenses; engineering and development work, feasibility studies, design, training, R&D and marketing when they are specifically undertaken to develop and/or implement a product or process innovation. This includes also all types of R&D consisting of research and development activities to create new knowledge or solve scientific or technical problems.

Examples

The following examples are provided in the official methodological notes accompanying the 2014 Community Innovation Survey questionnaire (Community Innovation Survey 2014b):

> Enterprise managers are unlikely to have difficulty in recognizing major innovations such as the iPhone, ABS braking systems, new anti-cancer drugs, 'sharing economy' innovations such as Lyft, Uber and AirBandB, or financial derivatives. For this reason, the examples given below describe innovations that can be significant but might not be easy to recognize as an innovation. This should help the respondent to think of similar types of innovations in their own enterprise.
>
> 4.1 Product innovations
>
> Product innovations cover goods and services with characteristics or intended uses that differ significantly from previous products produced by the enterprise. This includes new or significantly improved technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.
>
> The product innovations can consist of goods or services that are entirely new to the firm or new to the firm's market, or goods or services that have been significantly improved.
>
> Product innovations exclude the following:
>
> - Minor changes or improvements.
> - Routine upgrades.
> - Seasonal changes (such as for clothing lines).
> - Customisation for a single client that does not include significantly different attributes compared to products made for other clients.
> - Design changes that do not alter the function or technical characteristics of a good or service.
> - The simple resale of new goods and services purchased from other enterprises, but include goods and services developed and produced by foreign affiliates for your enterprise.
>
> 4.1.1 Examples of new or significantly improved goods
>
> - Replacing existing materials with materials with improved characteristics (breathable textiles, light but strong composites, environmentally-friendly plastics, etc).
> - Introducing new or improved components in existing product lines (cameras in mobile telephones, fastening systems in clothing, hybrid technologies in cars, etc).
> - Equipment that incorporate software that improves user friendliness or convenience, such as toasters that

automatically shut off when the bread is toasted or GPS systems that identify the location of specific types of shops or services.
- Adding new functions: bicycle lights that can be recharged through a USB port, rubbish bins that signal when they are full, products that can fold for easy storage, new smartphone apps, etc.
- Wearable technology, clothing and accessories incorporating computer and advanced electronic technologies

4.1.2 Examples of innovative services

- Improving customers' access, such as a home pick-up and drop-off service for rental cars, same-day delivery of online purchases, etc.
- 'Sharing economy' services such as Uber, Lyft, AirBandB, Listia (recycling and reusing goods), TaskRabbit, etc. First time introduction of internet services such as banking, bill-payment systems, electronic purchase and ticketing of travel and theatre tickets, social networking sites, online backup services, cloud-computing, on-demand internet streaming media etc.
- New forms of warranty, such as an extended warranty on new or used goods, or bundling warranties with other services, such as with credit cards, bank accounts, or customer loyalty cards.
- Installing gas heaters in outdoor restaurant and bar terraces or video on demand screens in the back of airline, bus or train seats.

4.2 Process innovations

Process innovations occur in both service and manufacturing sectors and include new or improved production methods; logistics, delivery and distribution systems, and 'back office' activities, such as maintenance, purchasing, and accounting operations. They include significant changes in specific techniques, equipment and/or software, intended to improve the quality, efficiency or flexibility of a production or supply activity, or a reduction in environmental and safety hazards.

Process innovations exclude the following:

- Minor changes or improvements.
- An increase in production or service capabilities through the addition of manufacturing or logistical systems that are very similar to those already in use.
- Innovations that have an important client interface, such as a pick-up or delivery service (these are product innovations).

4.2.1 Examples of innovative methods of producing goods or services

- Installation of new or improved manufacturing technology, such as automation equipment or real-time sensors that can adjust processes or 3D printing techniques.
- New equipment required for new or improved products.
- Computer-assisted product development or other technology to improve research capabilities, such as bio-imaging equipment. More efficient processing that reduces material or energy requirements per unit of output.
- More efficient processing that reduces material or energy requirements per unit of output.

4.2.2 Examples of innovative logistics, delivery or distribution methods

- Introduction of passive radio frequency identification (RFID) chips to track materials through the supply chain.
- GPS tracking systems for transport equipment.
- Automated feed-back to suppliers using electronic data exchange.
- Content delivery network, large distributed system of servers deployed in multiple data centers across the Internet to serve content to end-users.
- Using natural energy sources for logistics, for instance wind energy in maritime logistics, use of meteorological data and navigational algorithms to find and make use of optimum wind angles to reduce energy consumption of ships.

4.2.3 Examples of innovative supporting activities

- Introduction of software to identify optimal delivery routes.
- New or improved software or routines for purchasing, accounting or maintenance systems.

Further Information on the Community Innovation Survey: Methodology and Quality

The Community Innovation Survey is commissioned by the EU Commission and conducted by national research centers (e.g., the German version of the CIS is conducted by ZEW – Leibniz Centre for European Economic Research). The collection of CIS data at the national level is strictly regulated by the European Commission.[1] Member states are required to provide innovation statistics to the EU, and almost all Member States require firms to answer the survey. The data are used for the annual European Innovation Scoreboard, and anonymized micro data can be used for academic research at Eurostat's Safe Center in Luxembourg. The data must be collected and compiled in a standardized way across all countries.

From 2006 onwards, Eurostat discloses Synthesis Quality Reports about the CIS data. These reports highlight that countries were conforming to the regulations on innovation statistics and provide an overview of the quality of the data. The following sections contain a summary of the different so-called "Synthesis Quality Reports" that were released by Eurostat.[2]

1. Methodological Recommendations and Assessments

According to the Synthesis Quality Reports, all countries follow the methodological guidelines of the European Commission concerning the production and development of Community statistics on Innovation.

All countries covered the core population of NACE sections, and all countries were in compliance with the breakdowns by size classes. In addition, all countries included all the harmonized mandatory questions in their survey. Small deviations are reported across the different synthesis quality reports regarding data collection. For example, some countries added additional non-core questions to the survey or did not include some of the optional questions.

As prescribed in the methodological guidelines of Eurostat, almost all countries used the national business register as a sampling frame. According to the national quality reports, the databases that were used for sampling were up-to-date, and provided information on identification characteristics of the enterprise, its economic activity, and the number of employees.

All countries applied a stratified random sampling methodology, as proposed by Eurostat. The stratification of the sample was based on a firm's industry (NACE classification), the firm's size, and in some countries also on the geographical region (NUTS-2 level). To further improve the accuracy of the data for certain strata, most countries oversampled larger firms, while smaller enterprises were randomly sampled.

Because of the stratified random sampling technique, weights must be given to each observational unit to construct meaningful aggregated statistics. It is recommended by Eurostat to use the inverse of the sampling fraction. For example, the weights of a specific stratum would be equal to N_h/n_h where N_h is the total number of enterprises or employees in stratum h of the population, and n_h is the number of enterprises or employees in the realized sample in stratum h of the population. The proposed method will automatically adjust the sample weights of the respondents to compensate for unit non-response. If a different methodology is used to construct a stratum (e.g., not random sampling, but oversampling of larger firms, or oversampling firms with previously known R&D

[1] Commission Regulation No.1450/2004 implementing Decision No. 1608/2003 concerning the production and development of Community statistics on innovation.

[2] For available metadata on the various survey waves see: https://ec.europa.eu/eurostat/web/science-technology-innovation/data/database.

activities in certain stratum) the weights are adjusted. In addition, if the non-response rate is too high for a specific stratum (i.e., response rate < 70%), countries are required to conduct a non-response survey to assess if there is a difference between the answers of the respondents and non-respondents. If this is the case, the results of the non-response analysis are used to calculate the final weighting factors.

Most countries made use of both an electronic and mail survey. This approach follows the recommendation for methods alternations, which is considered to be the most effective practice. In many cases, the login and password of the electronic questionnaire were sent by mail. Enterprises that wanted to reply electronically could fill in the electronic questionnaire available on the website through a web-based platform that is specifically developed for the CIS. Respondents could also print the electronic questionnaire and send the questionnaire back by mail or email. Some countries also contacted the enterprises by telephone. This mode served in most countries mainly as a reminder for replying to the survey, and secondly as a follow-up to clarify non-responses and missing data. Cyprus is an exception in this regard, the data is exclusively collected via face-to-face interviews.

2. Conclusions on Quality of Methodology

The Synthesis Quality Reports highlight that the overall assessment of the quality of the CIS methodology is positive. All countries follow the required regulations and guidelines from the Commission. The national CIS quality reports also highlight some of the strengths and weaknesses of the mandated survey methodology. For example, in the CIS 2012 quality reports, fifteen out of twenty-eight countries explicitly highlighted as a main strength the good quality of the data. Nine countries highlighted the high response rate as a main strength, and six national authorities also explicitly highlight the existence of a high coherence with other data sources (e.g., national R&D surveys, SBS data). Regarding weaknesses, the CIS report of 2012 highlights that seven out of twenty-eight countries indicate that some respondents had difficulties in quantifying innovation expenditures (e.g. difficulties in splitting R&D from other activities), and five countries highlight that some companies have difficulties to assess their own activities as innovative or not innovative. This stands in contrast to eight countries that explicitly highlight that a main strength of the methods used is that respondents have a better knowledge and understanding of the questionnaire. Overall, the conclusion of Eurostat and the national research centers is that the overall quality of the required methodology is perceived as high.

3. Accuracy of the CIS Data

The Synthesis Quality Reports also contain an overall assessment of the accuracy of the CIS data. According to the reports, all countries make considerable efforts to reduce errors or at least to identify and correct them.

3.1. Measurement Error

Measurement errors occur during data collection and cause recorded values of variables to be different from the true ones. Such errors are usually caused by the survey questionnaire and/or the respondents. The reports conclude that measurement error is limited due to the continuous efforts taken by all countries. Efforts that are undertaken to reduce measurement error are the following:

1. Experts regularly review cognitive test questions and answers to assure that the questions elicit the desired information.
2. Staff receives training to help and assistant respondents to fill in the questionnaire correctly. In addition, firms receive detailed guidelines on how to fill in the survey.

3. Comprehensive data validation is the norm during and after data collection. The micro and the aggregated data are checked and corrected for inconsistencies. Quality controls are done on aggregated and micro data at the national level, but Eurostat also carries out independent quality checks. For example, the answers given in the survey are cross-checked for consistency. In addition, variables are compared to firm-level data from other sources (e.g., prior CIS data if available, national R&D surveys, and SBS statistics). If inconsistencies exist, firms are contacted to clarify their answer.

Next to these measures, the general methodological guidelines regarding data collection and availability are further intended to eliminate any reporting bias.

1. Respondents are made aware that only highly aggregated statistics at the country-industry level (NACE 1) are made available to the public. All micro data is anonymized, and not accessible to the public, and neither to politicians. Moreover, if too few observations are available in a specific country-industry cluster, such information is aggregated at a higher level – or not disclosed at all.
2. Only researchers affiliated to recognized research institutes are allowed to access anonymized micro data at the Safe center of Eurostat in Luxembourg.[3]
3. In many countries, the survey is conducted by an independent research organization, and not by a government agency itself. For example, in Germany the survey is conducted by ZEW – Leibniz Centre for European Economic Research. This increases the credibility that data will be treated strictly confidentially and will not be disclosed to any party.
4. Aggregated CIS indicators are made available only after several years, making it in essence useless for business managers. Similarly, micro data is only released after a significant period. For example, CIS 2014 was the last survey wave that was available for researchers in 2020.

The collection of data by independent research organization, the disclosure of highly aggregated data, the significant data release delay, and quality checks performed by the countries and Eurostat allay concerns about measurement error.

3.2. Sampling and Non-Sampling Errors

Sampling and non-sampling errors are eliminated by making use of appropriate sampling techniques. The required sampling techniques lead to smaller sampling errors and make it possible to ensure that there are enough units in the respective domains to produce results of good quality. The non-sampling errors are minimized because most national authorities use the national business registers to draw their sample from. According to Eurostat and the national agencies that conduct the survey, the databases used to draw the sample were up-to-date and of high-quality.

3.3. Non-Response Errors

Non-response errors are reduced by sending reminders to enterprises. Most countries send at least two or three paper reminders to non-responding enterprises. Additionally, these enterprises are contacted by phone or e-mail to remind them to fill in and deliver the survey questionnaire. When the response rate is sufficiently high (for each individual stratum), data can be used to extrapolate the findings to the full population.

According to the CIS survey of 2014, the response rate is above 70% in most countries. In the few countries where the non-response rate exceeds 30%, Eurostat requires the country to do an additional non-response survey to assess if differences exist between respondents and non-respondents. If there

[3] Some countries also provide access to their micro-data at similar Safe centers. For example, the German version of the CIS data can be accessed by researchers at the premises of ZEW in Mannheim.

is a statistical difference between the original survey and the non-response survey for certain strata, the information from the non-response survey is used to recalibrate weights.

More information on the Eurostat Community Innovation Survey Page can be found: https://ec.europa.eu/eurostat/web/microdata/community-innovation-survey

Mannheim Innovation Panel

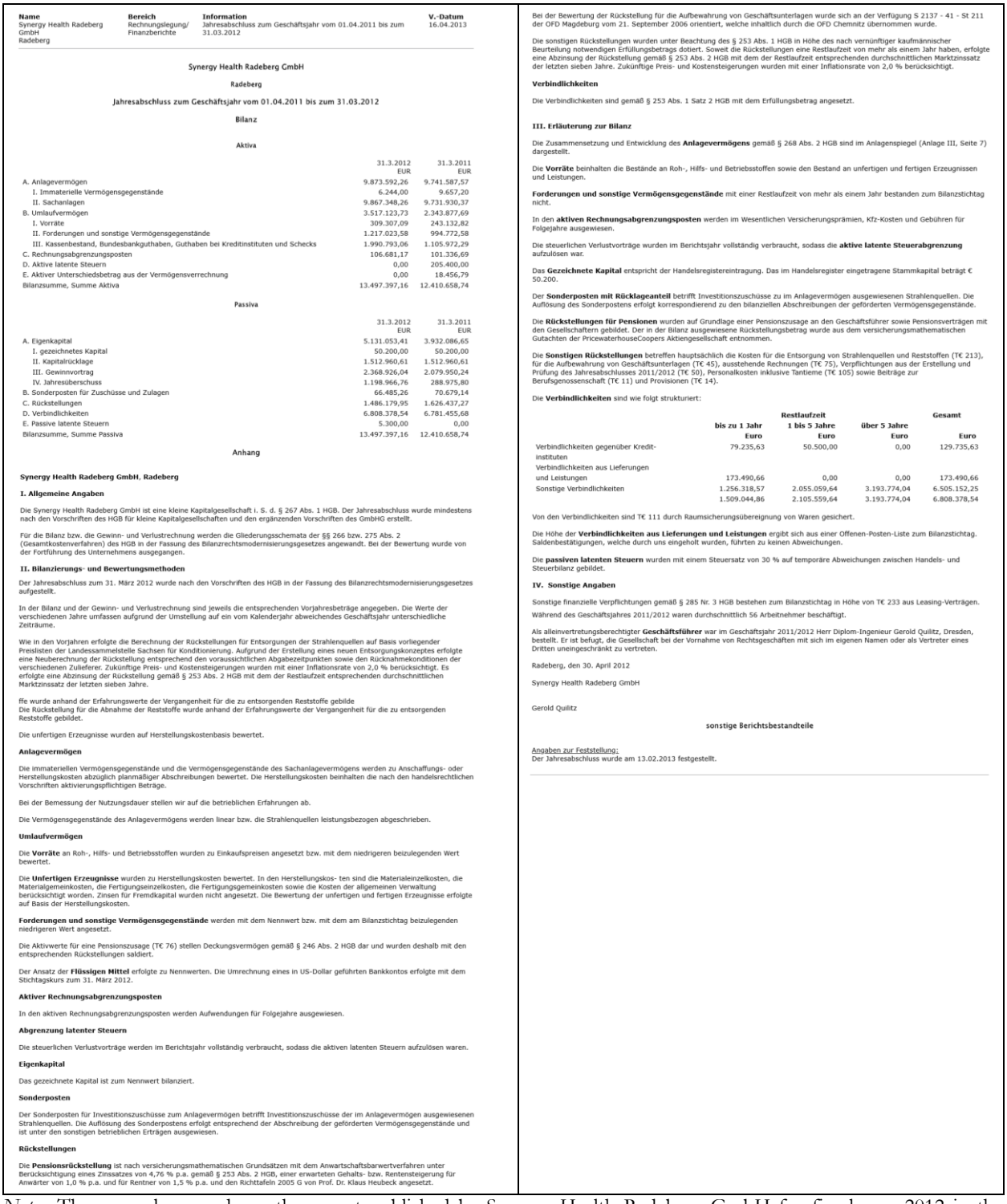
The German version of the Community Innovation Survey is conducted by ZEW – Leibniz Centre for European Economic Research in Germany. The survey data is based on a harmonized CIS questionnaire sent to a representative sample of firms. Similar to other countries, they take various measures to ensure the quality and representativeness of the data. ZEW provides the following abstract description of its data collection and the resulting Mannheim Innovation Panel (ZEW 2019b):

> Since 1993, the ZEW – Leibniz Centre for European Economic Research has been gathering data regarding the innovation behaviour of the German economy on an annual basis. The innovation survey covers firms from various industries including mining, manufacturing, energy- and water- supply, waste disposal, construction, business-related services and distributive services. The survey is representative for Germany and allows projections for the German firm population as well as for individual industries and size classes. The survey is conducted on behalf of BMBF (Federal Ministry of Education and Research) in cooperation with infas (Institute of Applied Social Science) and Fraunhofer ISI (Institute for Systems and Innovation Research). The MIP is the German contribution to the European Commission's Community Innovation Surveys (CIS).
>
> The annual innovation survey is designed as a panel survey including the same firms every year. Sample size varies among the survey years. In 2010 e.g., more than 6000 firms answered the written questionnaire. Every two years the sample is refreshed by a random sample of newly founded firms in order to substitute firms that are closing or left the market through mergers. The MIP provides important information about the introduction of new products, services and processes, expenditures for innovations, ways to achieve economic success with new products, new services and improved processes. In addition, the MIP collects information on a number of competition-related issues which allows studying various topics in industrial economics.

For more information on the sampling and testing, see Rammer and Peters (2014).

Reporting Examples

Exempted Reporting



Name	Bereich	Information	V.-Datum
Synergy Health Radeberg GmbH Radeberg	Rechnungslegung/ Finanzberichte	Jahresabschluss zum Geschäftsjahr vom 01.04.2011 bis zum 31.03.2012	16.04.2013

Synergy Health Radeberg GmbH

Radeberg

Jahresabschluss zum Geschäftsjahr vom 01.04.2011 bis zum 31.03.2012

Bilanz

Aktiva

	31.3.2012 EUR	31.3.2011 EUR
A. Anlagevermögen	9.873.592,26	9.741.587,57
I. Immaterielle Vermögensgegenstände	6.244,00	9.657,20
II. Sachanlagen	9.867.348,26	9.731.930,37
B. Umlaufvermögen	3.517.123,73	2.343.877,69
I. Vorräte	309.307,09	243.132,82
II. Forderungen und sonstige Vermögensgegenstände	1.217.023,58	994.772,58
III. Kassenbestand, Bundesbankguthaben, Guthaben bei Kreditinstituten und Schecks	1.990.793,06	1.105.972,29
C. Rechnungsabgrenzungsposten	106.681,17	101.336,69
D. Aktive latente Steuern	0,00	205.400,00
E. Aktiver Unterschiedsbetrag aus der Vermögensverrechnung	0,00	18.456,79
Bilanzsumme, Summe Aktiva	13.497.397,16	12.410.658,74

Passiva

	31.3.2012 EUR	31.3.2011 EUR
A. Eigenkapital	5.131.053,41	3.932.086,65
I. gezeichnetes Kapital	50.200,00	50.200,00
II. Kapitalrücklage	1.512.960,61	1.512.960,61
III. Gewinnvortrag	2.368.926,04	2.079.950,24
IV. Jahresüberschuss	1.198.966,76	288.975,80
B. Sonderposten für Zuschüsse und Zulagen	66.485,26	70.679,14
C. Rückstellungen	1.486.179,95	1.626.437,27
D. Verbindlichkeiten	6.808.378,54	6.781.455,68
E. Passive latente Steuern	5.300,00	0,00
Bilanzsumme, Summe Passiva	13.497.397,16	12.410.658,74

Anhang

Synergy Health Radeberg GmbH, Radeberg

I. Allgemeine Angaben

Die Synergy Health Radeberg GmbH ist eine kleine Kapitalgesellschaft i. S. d. § 267 Abs. 1 HGB. Der Jahresabschluss wurde mindestens nach den Vorschriften des HGB für kleine Kapitalgesellschaften und den ergänzenden Vorschriften des GmbHG erstellt.

Für die Bilanz bzw. die Gewinn- und Verlustrechnung werden die Gliederungsschemata der §§ 266 bzw. 275 Abs. 2 (Gesamtkostenverfahren) des HGB in der Fassung des Bilanzrechtsmodernisierungsgesetzes angewandt. Bei der Bewertung wurde von der Fortführung des Unternehmens ausgegangen.

II. Bilanzierungs- und Bewertungsmethoden

Der Jahresabschluss zum 31. März 2012 wurde nach den Vorschriften des HGB in der Fassung des Bilanzrechtsmodernisierungsgesetzes aufgestellt.

In der Bilanz und der Gewinn- und Verlustrechnung sind jeweils die entsprechenden Vorjahresbeträge angegeben. Die Werte der verschiedenen Jahre umfassen aufgrund der Umstellung auf ein vom Kalenderjahr abweichendes Geschäftsjahr unterschiedliche Zeiträume.

Wie in den Vorjahren erfolgte die Berechnung der Rückstellungen für Entsorgungen der Strahlenquellen auf Basis vorliegender Preislisten der Landessammelstelle Sachsen für Konditionierung. Aufgrund der Erstellung eines neuen Entsorgungskonzeptes erfolgte eine Neuberechnung der Rückstellung entsprechend den voraussichtlichen Abgabezeitpunkten sowie den Rücknahmekonditionen der verschiedenen Zulieferer. Zukünftige Preis- und Kostensteigerungen wurden mit einer Inflationsrate von 2,0 % berücksichtigt. Es erfolgte eine Abzinsung der Rückstellung gemäß § 253 Abs. 2 HGB mit dem der Restlaufzeit entsprechenden durchschnittlichen Marktzinssatz der letzten sieben Jahre.

ffe wurde anhand der Erfahrungswerte der Vergangenheit für die zu entsorgenden Reststoffe gebilde
Die Rückstellung für die Abnahme der Reststoffe wurde anhand der Erfahrungswerte der Vergangenheit für die zu entsorgenden Reststoffe gebildet.

Die unfertigen Erzeugnisse wurden auf Herstellungskostenbasis bewertet.

Anlagevermögen

Die immateriellen Vermögensgegenstände und die Vermögensgegenstände des Sachanlagevermögens werden zu Anschaffungs- oder Herstellungskosten abzüglich planmäßiger Abschreibungen bewertet. Die Herstellungskosten beinhalten die nach den handelsrechtlichen Vorschriften aktivierungspflichtigen Beträge.

Bei der Bemessung der Nutzungsdauer stellen wir auf die betrieblichen Erfahrungen ab.

Die Vermögensgegenstände des Anlagevermögens werden linear bzw. die Strahlenquellen leistungsbezogen abgeschrieben.

Umlaufvermögen

Die **Vorräte** an Roh-, Hilfs- und Betriebsstoffen wurden zu Einkaufspreisen angesetzt bzw. mit dem niedrigeren beizulegenden Wert bewertet.

Die **Unfertigen Erzeugnisse** wurden zu Herstellungskosten bewertet. In den Herstellungskos- ten sind die Materialeinzelkosten, die Materialgemeinkosten, die Fertigungseinzelkosten, die Fertigungsgemeinkosten sowie die Kosten der allgemeinen Verwaltung berücksichtigt worden. Zinsen für Fremdkapital wurden nicht angesetzt. Die Bewertung der unfertigen und fertigen Erzeugnisse erfolgte auf Basis der Herstellungskosten.

Forderungen und sonstige Vermögensgegenstände werden mit dem Nennwert bzw. mit dem am Bilanzstichtag beizulegenden niedrigeren Wert angesetzt.

Die Aktivwerte für eine Pensionszusage (T€ 76) stellen Deckungsvermögen gemäß § 246 Abs. 2 HGB dar und wurden deshalb mit den entsprechenden Rückstellungen saldiert.

Der Ansatz der **Flüssigen Mittel** erfolgte zu Nennwerten. Die Umrechnung eines in US-Dollar geführten Bankkontos erfolgte mit dem Stichtagskurs zum 31. März 2012.

Aktiver Rechnungsabgrenzungsposten

In den aktiven Rechnungsabgrenzungsposten werden Aufwendungen für Folgejahre ausgewiesen.

Abgrenzung latenter Steuern

Die steuerlichen Verlustvorträge werden im Berichtsjahr vollständig verbraucht, sodass die aktiven latenten Steuern aufzulösen waren.

Eigenkapital

Das gezeichnete Kapital ist zum Nennwert bilanziert.

Sonderposten

Der Sonderposten für Investitionszuschüsse zum Anlagevermögen betrifft Investitionszuschüsse der im Anlagevermögen ausgewiesenen Strahlenquellen. Die Auflösung des Sonderpostens erfolgt entsprechend der Abschreibung der geförderten Vermögensgegenstände und ist unter den sonstigen betrieblichen Erträgen ausgewiesen.

Rückstellungen

Die **Pensionsrückstellung** ist nach versicherungsmathematischen Grundsätzen mit dem Anwartschaftsbarwertverfahren unter Berücksichtigung eines Zinssatzes von 4,76 % p.a. gemäß § 253 Abs. 2 HGB, einer erwarteten Gehalts- bzw. Rentensteigerung für Anwärter von 1,0 % p.a. und für Rentner von 1,5 % p.a. und den Richttafeln 2005 G von Prof. Dr. Klaus Heubeck angesetzt.

Bei der Bewertung der Rückstellung für die Aufbewahrung von Geschäftsunterlagen wurde sich an der Verfügung S 2137 - 41 - St 211 der OFD Magdeburg vom 21. September 2006 orientiert, welche inhaltlich durch die OFD Chemnitz übernommen wurde.

Die sonstigen Rückstellungen wurden unter Beachtung des § 253 Abs. 1 HGB in Höhe des nach vernünftiger kaufmännischer Beurteilung notwendigen Erfüllungsbetrags dotiert. Soweit die Rückstellungen eine Restlaufzeit von mehr als einem Jahr haben, erfolgte eine Abzinsung der Rückstellung gemäß § 253 Abs. 2 HGB mit dem der Restlaufzeit entsprechenden durchschnittlichen Marktzinssatz der letzten sieben Jahre. Zukünftige Preis- und Kostensteigerungen wurden mit einer Inflationsrate von 2,0 % berücksichtigt.

Verbindlichkeiten

Die Verbindlichkeiten sind gemäß § 253 Abs. 1 Satz 2 HGB mit dem Erfüllungsbetrag angesetzt.

III. Erläuterung zur Bilanz

Die Zusammensetzung und Entwicklung des **Anlagevermögens** gemäß § 268 Abs. 2 HGB sind im Anlagenspiegel (Anlage III, Seite 7) dargestellt.

Die **Vorräte** beinhalten die Bestände an Roh-, Hilfs- und Betriebsstoffen sowie den Bestand an unfertigen und fertigen Erzeugnissen und Leistungen.

Forderungen und sonstige Vermögensgegenstände mit einer Restlaufzeit von mehr als einem Jahr bestanden zum Bilanzstichtag nicht.

In den **aktiven Rechnungsabgrenzungsposten** werden im Wesentlichen Versicherungsprämien, Kfz-Kosten und Gebühren für Folgejahre ausgewiesen.

Die steuerlichen Verlustvorträge wurden im Berichtsjahr vollständig verbraucht, sodass die **aktive latente Steuerabgrenzung** aufzulösen war.

Das **Gezeichnete Kapital** entspricht der Handelsregistereintragung. Das im Handelsregister eingetragene Stammkapital beträgt € 50.200.

Der **Sonderposten mit Rücklageanteil** betrifft Investitionszuschüsse zu im Anlagevermögen ausgewiesenen Strahlenquellen. Die Auflösung des Sonderpostens erfolgt korrespondierend zu den bilanziellen Abschreibungen der geförderten Vermögensgegenstände.

Die **Rückstellungen für Pensionen** wurden auf Grundlage einer Pensionszusage an den Geschäftsführer sowie Pensionsverträgen mit den Gesellschaftern gebildet. Der in der Bilanz ausgewiesene Rückstellungsbetrag wurde aus dem versicherungsmathematischen Gutachten der PricewaterhouseCoopers Aktiengesellschaft entnommen.

Die **Sonstigen Rückstellungen** betreffen hauptsächlich die Kosten für die Entsorgung von Strahlenquellen und Reststoffen (T€ 213), für die Aufbewahrung von Geschäftsunterlagen (T€ 45), ausstehende Rechnungen (T€ 75), Verpflichtungen aus der Erstellung und Prüfung des Jahresabschlusses 2011/2012 (T€ 50), Personalkosten inklusive Tantieme (T€ 105) sowie Beiträge zur Berufsgenossenschaft (T€ 11) und Provisionen (T€ 14).

Die **Verbindlichkeiten** sind wie folgt strukturiert:

	Restlaufzeit			Gesamt
	bis zu 1 Jahr Euro	1 bis 5 Jahre Euro	über 5 Jahre Euro	Euro
Verbindlichkeiten gegenüber Kreditinstituten	79.235,63	50.500,00	0,00	129.735,63
Verbindlichkeiten aus Lieferungen und Leistungen	173.490,66	0,00	0,00	173.490,66
Sonstige Verbindlichkeiten	1.256.318,57	2.055.059,64	3.193.774,04	6.505.152,25
	1.509.044,86	2.105.559,64	3.193.774,04	6.808.378,54

Von den Verbindlichkeiten sind T€ 111 durch Raumsicherungsübereignung von Waren gesichert.

Die Höhe der **Verbindlichkeiten aus Lieferungen und Leistungen** ergibt sich aus einer Offenen-Posten-Liste zum Bilanzstichtag. Saldenbestätigungen, welche durch uns eingeholt wurden, führten zu keinen Abweichungen.

Die **passiven latenten Steuern** wurden mit einem Steuersatz von 30 % auf temporäre Abweichungen zwischen Handels- und Steuerbilanz gebildet.

IV. Sonstige Angaben

Sonstige finanzielle Verpflichtungen gemäß § 285 Nr. 3 HGB bestehen zum Bilanzstichtag in Höhe von T€ 233 aus Leasing-Verträgen.

Während des Geschäftsjahres 2011/2012 waren durchschnittlich 56 Arbeitnehmer beschäftigt.

Als alleinvertretungsberechtigter **Geschäftsführer** war im Geschäftsjahr 2011/2012 Herr Diplom-Ingenieur Gerold Quilitz, Dresden, bestellt. Er ist befugt, die Gesellschaft bei der Vornahme von Rechtsgeschäften mit sich im eigenen Namen oder als Vertreter eines Dritten uneingeschränkt zu vertreten.

Radeberg, den 30. April 2012

Synergy Health Radeberg GmbH

Gerold Quilitz

sonstige Berichtsbestandteile

Angaben zur Feststellung:
Der Jahresabschluss wurde am 13.02.2013 festgestellt.

Notes: The example reproduces the report published by Synergy Health Radeberg GmbH for fiscal year 2012 in the *Bundesanzeiger* (i.e., the German Federal Gazette). For the fiscal year 2012, the firm qualified for "small" firm reporting exemptions. The exempted reporting example features an abbreviated balance sheet (Bilanz) and brief notes (Anhang).

Full Reporting

Name	Bereich	Information	V.-Datum
Synergy Health Radeberg GmbH Radeberg	Rechnungslegung/ Finanzberichte	Jahresabschluss zum Geschäftsjahr vom 01.04.2012 bis zum 31.03.2013	07.04.2014

Synergy Health Radeberg GmbH

Radeberg

Jahresabschluss zum Geschäftsjahr vom 01.04.2012 bis zum 31.03.2013

Lagebericht

1 Darstellung des Geschäftsverlaufs

1.1 Entwicklung der Gesamtwirtschaft und der Branche

Nachfolgend ein Zitat aus dem ifo Konjunkturtest Dienstleistungen Deutschland, Berichtsmonat: Dezember 2012:

„Der ifo Geschäftsklimaindikator für die gewerbliche Wirtschaft (Verarbeitendes Gewerbe, Bauhauptgewerbe, Groß- und Einzelhandel) ist erneut gestiegen. Die Firmen bewerteten ihre aktuelle Lage zwar etwas weniger günstig als im Vormonat, der Pessimismus bezüglich der weiteren Geschäftsentwicklung hat jedoch deutlich abgenommen. Im Verarbeitenden Gewerbe hat sich das Geschäftsklima weiter aufgehellt. Zwar schätzten die befragten Industriefirmen ihre Lage etwas ungünstiger ein als im Vormonat, doch blickten sie deutlich optimistischer auf die Entwicklung in den kommenden sechs Monaten. Die Geschäftserwartungen verzeichneten den stärksten Anstieg seit August 2009. Auch die Erwartungen an das Exportgeschäft sind erneut gestiegen. In den beiden Handelsstufen hat sich der Geschäftsklimaindikator abgeschwächt".

Nachfolgend ein Zitat aus dem Commerzbank Branchen-Report Deutschland, Industriebranchen im Fokus. Group Industries Research / März 2013:

„Commerzbank Research erwartet für das für das Wachstum der Weltwirtschaft 2013 eine etwas höhere Rate als im Vorjahr. Die Staatsschuldenkrise im Euroraum dürfte weiter abebben und die Unsicherheit sinken, die zuletzt die Investitionsbereitschaft begrenzte, so dass 2013 die Wirtschaft geringfügig wachsen sollte. In China deuten immer mehr Daten darauf hin, dass das Wirtschaftswachstum sich im Schlussquartal 2012 stabilisiert hat. Das Wachstum der US-Wirtschaft wird durch die Anfang dieses Jahres in Kraft getretenen Steuererhöhungen und das erneute Erreichen der staatlichen Schuldengrenze gedämpft und dürfte etwas niedriger als im Vorjahr ausfallen".

Nachfolgend ein Zitat aus dem ifo Konjunkturtest Dienstleistungen Deutschland, Berichtsmonat: März 2013:

„Das ifo Geschäftsklima für die gewerbliche Wirtschaft (Verarbeitendes Gewerbe, Bauhauptgewerbe, Groß- und Einzelhandel) ist nach starkem Anstieg im Vormonat minimal gesunken. Die Geschäftserwartungen fielen im Vergleich zum Februar etwas weniger positiv aus. Die Unternehmen bewerten ihre momentane Geschäftslage jedoch fast noch genauso gut wie vorher. Im Verarbeitenden Gewerbe gab der Geschäftsindex nach. Die Industriefirmen bewerten sowohl ihre aktuelle Situation als auch den weiteren Geschäftsverlauf weniger optimistisch als im Vormonat. Die Exporterwartungen sanken merklich, sind aber weiter positiv ausgerichtet".

In der Sparte der Bestrahlungs-Dienstleister wird im abgelaufenen 1. Quartal des Jahres 2013 von Umsätzen und Erlösen auf dem Niveau des Vergleichsquartals des Vorjahres, aber auch für das gesamte Jahr 2012 auf dem Vorjahresniveau, gesprochen.

1.2 Umsatz- und Auftragsentwicklung

Neben den üblichen jahreszeitlich bedingten Nachfrageschwankungen hat sich der Eingang der Aufträge im Verlauf des 1. Quartals 2013 wieder erhöht. Im Monat März 2013 wurde der vorherige Bestwert des Vorjahres bei den Erlösen übertroffen.

Im Geschäftsjahr 2012/2013 erzielt die Gesellschaft ein positives Ergebnis, welches einen erneuten Bestwert in der Firmengeschichte darstellt. Das Ergebnis ist maßgeblich durch die hohen Erlöse bei der Sterilisation und der Bestrahlung von Kundenprodukten im Rahmen von Lohnfertigung beeinflusst.

Im Geschäftsjahr 2012/2013 konnten Umsatzerlöse von EUR 8,2 Mio (Vorjahr: EUR 7,1 Mio) erzielt werden. Der Rohertrag (Umsatzerlöse abzüglich Materialaufwand) lag bei EUR 7,5 Mio (Vorjahr: EUR 6,6 Mio). Dies entspricht einer Erhöhung gegenüber dem Vorjahr von 13,6 %.

Die wesentlichen Sparten haben sich dabei wie folgt entwickelt:

- Erlöse Gamma-Bestrahlung + 15,5 %
  Erlöse Elektronen-Bestrahlung + 15,3 %
  Erlöse Verkauf Dosimeter / Dosimetrieservice + 0,6 %

Die erfreuliche Steigerung der Erlöse im Auslandsgeschäft, speziell in Polen und Dänemark, spiegeln die Marketing-Aktivitäten der letzten Jahre wider.

- Erlöse Gamma-Bestrahlung Ausland + 25,3 %
  Erlöse Elektronen-Bestrahlung Ausland + 8,9 %
  Erlöse Dosimeter / Dosimetrieservice Ausland + 22,8 %

Aber auch der Binnenumsatz ist 2012/2013 gegenüber dem Vorjahr um 12,9 % gestiegen.

1.3 Investitionen

Die Investitionen des Geschäftsjahres beliefen sich auf insgesamt EUR 0,6 Mio (Vorjahr EUR 1,1 Mio) für Kobalt 60-Strahlenquellen, in Anlagenkomponenten als Ersatzinvestitionen sowie für verschiedene Modernisierungsmaßnahmen.

Für das folgende Geschäftsjahr 2013/2014 sind neben Investitionen in Kobalt 60-Strahlenquellen, Investitionen bzw. Ersatzinvestitionen im Bereich der Betriebsausstattungen geplant. Hier ist speziell die Erweiterung in Lagerflächen, die Erneuerung von Anlagenteilen der Gamma-Bestrahlungsanlage GS 3000 und der Elektronenbestrahlungsanlage GSE 80 zu benennen.

1.4 Finanzierungsmaßnahmen bzw. -vorhaben

Die getätigten Investitionen konnten aus dem laufenden Cashflow finanziert werden und planmäßig wurden die üblichen Erneuerungen an den Anlagen vorgenommen.

Wie in den Vorjahren wurden auch im Geschäftsjahr 2012/2013 aufgenommene Bankdarlehen und andere Verbindlichkeiten planmäßig zurückgeführt. Zum Geschäftsjahresende belaufen sich die Gesamtverbindlichkeiten auf EUR 5,5 Mio (Vorjahr: EUR 6,8 Mio).

1.5 Personal- und Sozialbereich

Im Durchschnitt gehörten 58 Mitarbeiter (Vorjahresdurchschnitt: 56) zur Belegschaft sowie ein Auszubildender und eine Studentin.

Die Entlohnung ist prinzipiell einzelvertraglich geregelt.

In den Bereichen Gesundheits- und Arbeitsschutz, z. B. Unfallschutz, Berufsunfälle haben sich im Geschäftsjahr 2012/2013 keine besonderen Vorkommnisse ergeben.

Durch das im Integrierten Management System (IMS) festgelegte Regelwerk wird sichergestellt, dass das Personal, welches die Produktqualität beeinflussende Tätigkeiten ausführt, auf Grund der angemessenen Ausbildung, Schulung, Fertigkeiten und Erfahrungen entsprechend befähigt ist.

1.6 Umwelt- / Strahlenschutz

Die Umwelteinwirkungen liegen in den projektierten und genehmigten Grenzen. Die Umweltleistungen sind in der jährlichen Umwelterklärung kommuniziert und stehen Interessierten zur Verfügung.

Das Unternehmen verfügt über eine kunden- und umweltorientierte Transportorganisation. Der Begrenzung der Umwelteinwirkungen durch eigene Transportmittel messen wir große Bedeutung bei und haben LKW und PKW entsprechend technisch ausgerüstet.

Beim Strahlenschutz zeigen die Kontaminationskontrollen und die Strahlenfeldmessungen, dass die Auslegung und Prozessführung in vollem Maß den sicherheitstechnischen Anforderungen in der Strahlenschutzverordnung entspricht. Die Information und die Kommunikation mit der zuständigen Behörde erfolgten planmäßig gegebenenfalls auch situativ.

Gesetzliche Bestimmungen, insbesondere auf den Gebieten der Qualitätssicherung, des Umweltschutzes, der Sterilisation von Medizinprodukten, des Strahlenschutzes wurden eingehalten.

Die Umwelt- und Qualitätsziele sowie die der technologischen Prozessführung wurden weitestgehend erreicht.

1.7 Sonstige wichtige Vorgänge des Geschäftsjahrs

Das Berichtwesen wurde weiter auf die Bedürfnisse der Synergy Health Gruppe angepasst, das Qualitätsmanagementsystem im Bereich des Geschäftsfelds „AST" (Applied Sterilisation Technologies) gruppenweit harmonisiert.

Insgesamt ist es Synergy Health Radeberg GmbH gelungen, die definierten strategischen Unternehmens-Ziele weitgehend umzusetzen.

2 Darstellung der wirtschaftlichen Lage

2.1 Vermögenslage

Die wesentlichen Vermögensgegenstände und Verbindlichkeiten stellen sich wie folgt dar:

	31.3.2013 EUR Mio	31.3.2012 EUR Mio	Veränderung %
Anlagevermögen	9,5	9,9	-4,3
Umlaufvermögen	4,6	3,5	29,6
Rechnungsabgrenzungsposten	0,1	0,1	0
Eigenkapital	6,9	5,1	34,8
Rückstellungen	1,7	1,5	14,1
Verbindlichkeiten	5,5	6,8	-19,9

Die Bilanzsumme hat sich gegenüber dem Vorjahresstichtag von EUR 13,5 Mio auf EUR 14,1 Mio erhöht. Der Anteil des Anlagevermögens an der Bilanzsumme beträgt 66,9 % (Vorjahr 73,2 %).

Die Veränderungen im Eigenkapital resultieren aus dem Jahresüberschuss des Geschäftsjahres 2012/2013 in Höhe von EUR 1,8 Mio.

Das Fremdkapital (Rückstellungen plus Verbindlichkeiten) hat sich absolut auf EUR 7,2 Mio (Vorjahr: EUR 8,3 Mio), im Wesentlichen aus der planmäßigen Tilgung der Darlehensverbindlichkeiten, reduziert.

2.2 Finanzlage

Der Finanzmittelbestand zum 31. März 2013 betrug EUR 3,2 Mio und hat sich im Vergleich zum Bilanzstichtag 31. März 2012 um EUR 1,2 Mio erhöht. Ein Cashflow aus laufender Geschäftstätigkeit wurde im abgelaufenen Geschäftsjahr in Höhe von EUR 3,0 Mio erwirtschaftet. Der Cashflow aus Finanzierung betrug EUR -1,2 Mio und der Cashflow aus Investition EUR 0,6 Mio.

Infolge dieser Entwicklung konnte im Geschäftsjahr 2012/2013 ausnahmslos auf eine Inanspruchnahme der Kontokorrentlinien verzichtet werden.

Die anfallenden finanziellen Verpflichtungen wurden stets – in der Regel unter Inanspruchnahme von Skonto – durch schnelle Zahlung erfüllt. Die Creditreform Wirtschaftsauskunft bescheinigte der Synergy Health Radeberg GmbH im März 2012 eine positive Geschäftsentwicklung und einen guten Geschäftsgang und bewertete die Bonität mit dem Index von 163 („sehr gute Bonität").

Die Zahlungsfähigkeit der Gesellschaft war im Geschäftsjahr jederzeit gesichert.

2.3 Ertragslage

Die Umsatzerlöse betrugen im Geschäftsjahr 2012/2013 EUR 8,2 Mio (Vorjahr EUR 7,1 Mio). Dies ist im Wesentlichen aus der guten Auftragslage in den Teilbereichen, Medizinprodukte, im Pharmabereich, den kosmetischen- und anderen Rohstoffen sowie im Laborprodukte-Bereich zurückzuführen. Aber auch die Produkte aus technischen Anwendungen der Produktbestrahlung sind auf einem akzeptablen Niveau, da einige neue Kunden in diesem Bereich gewonnen wurden.

Die sonstigen betrieblichen Erträge im Geschäftsjahr 2012/2013 beliefen sich auf EUR 0,3 Mio (Vorjahr EUR 0,3 Mio), der Materialaufwand lag bei einem Wert von EUR 0,6 Mio (Vorjahr EUR 0,5 Mio). Im Wesentlichen wirkten sich hier die Preissteigerung bei den Energiestoffen beziehungsweise die weiter erhöhte EEG-Umlage sowie die Preiserhöhungen bei den Fremdspeditionen aus.

Der Personalaufwand lag mit EUR 2,1 Mio nahezu auf dem Niveau des Vorjahres von EUR 2,0 Mio.

Die planmäßigen Abschreibungen auf immaterielle Vermögensgegenstände des Anlagevermögens sowie Sachanlagen lagen wie im Vorjahr bei EUR 1,0 Mio. Die sonstigen betrieblichen Aufwendungen betrugen EUR 2,2 Mio (Vorjahr EUR 2,0 Mio) und enthalten u. a. Veränderungen bei den Rückstellungen für die Entsorgung der Strahlenquellen.

Im Geschäftsjahr 2012/2013 wurde ein Jahresüberschuss in Höhe von EUR 1,8 Mio erwirtschaftet.

3 Hinweise auf Risiken bei der künftigen Entwicklung

Die Synergy Health Radeberg GmbH hat für das Erkennen wesentlicher Risiken ein umfassendes Kontrollmanagement als Bestandteil der Unternehmensplanung implementiert. Die eingesetzten Steuerungs- und Überwachungssysteme werden fortlaufend weiterentwickelt, um noch besser das Maß der Risiken bewerten und handhaben zu können.

Chancen aber auch Risiken leiten sich weiterhin aus der Erweiterung des Osteuropäischen Markts ab. Das im Geschäftsjahr 2012/2013 abgewickelte Auslandsgeschäft entwickelte sich weiter positiv für die Synergy Health Radeberg GmbH, muss aber für das Geschäftsjahr 2013/2014 vor dem Hintergrund der sich teilweise im Vergleich zu Deutschland in Rezession befindlichen Auslandsmärkte zurückhaltender beurteilt werden. Es müssen auch die damit verbundenen latenten Verlustrisiken (Unterschlagungsrisiken, erhöhte Bonitätsrisiken, Insolvenzen der ausländischen Kunden u. a.) mitberücksichtigt werden; insoweit lassen sich zukünftige Belastungen nicht ausschließen. Positiv wirkt für Synergy Health Radeberg GmbH, neben der Einbindung in die Sales Organisation der Synergy Health Gruppe, insbesondere die Lage im Dreiländereck Deutschland, Polen, Tschechien sowie die Nähe zu Produzenten aus Ungarn, Slowenien und sogar Österreich, findet doch vielmals der Transport der Produkte in unmittelbarer Nähe des Produzenten statt.

Auch im nächsten Geschäftsjahr sehen wir weiterhin ein gutes Potenzial zum Ausbau des Medizinprodukte-Geschäfts. Hier speziell auch mit den so genannten Global Playern des Marktes, die erst durch die Zugehörigkeit zur Synergy Health Gruppe stärkeres Interesse zeigen und auch ein erweitertes Leistungsspektrum angeboten bekommen können.

Das vollzogene Wachstum der Gesellschaft bringt die bestehenden technischen Anlagen, aber auch die Lagerkapazitäten an ihre Grenzen. Es wird an Interimslösungen, wie ein externes Außenwarenlager, aber auch im Verbund mit der Synergy Health Gruppe an entsprechenden Ersatz- und Erweiterungsinvestitionen gearbeitet.

Auf Grund unserer mittelfristigen Ergebnis- und Finanzplanung sehen wir derzeit kein großes Liquiditätsrisiko aus der Finanzierungstätigkeit.

Durch die Zugehörigkeit zu der Synergy Health Gruppe werden sich im Bereich des Einkaufs der Energie Vorteile und verringerte Beschaffungsrisiken ergeben.

Das gewährte Gesellschafterdarlehen der Synergy Health Holdings Limited kann erstmals mit einer 3-monatigen Kündigungsfrist zum 31. Dezember 2013 gekündigt werden. Dieses Risiko stufen wir jedoch als unzutreffend ein, entspräche doch die Vorgehensweise nicht der Wachstums-Politik des Konzerns; an entsprechenden Vertragsergänzungen wird zeitnah gearbeitet werden.

Alle uns sonst bekannten Risiken wurde nach derzeitigem Erkenntnisstand ausreichend Rechnung getragen. Bestandsgefährdende Risiken lassen sich derzeit nicht erkennen.

Sofern unser Lagebericht in die Zukunft gerichtete Annahmen und Einschätzungen enthält, besteht die grundsätzliche Unsicherheit von Prognosen in Bezug auf die tatsächlichen Ergebnisse.

4 Sonstige Angaben, insbesondere über die voraussichtliche Entwicklung

Der gute Geschäftsgang zum 31. März 2013 und die positiven Trends in den für uns relevanten Märkten weisen auf eine Umsatzsteigerung für die Synergy Health Radeberg GmbH für das Geschäftsjahr 2013/2014 hin.

Vor diesem Hintergrund planen wir aus heutiger Kenntnis eine Gesamtleistung für das Geschäftsjahr 2013/2014 in Höhe von EUR 8,5 Mio und für das Geschäftsjahr 2014/2015 in der Höhe von EUR 9,1 Mio. Ergebnisseitig rechnen wir mit Ergebnissen auf dem Niveau des Geschäftsjahres 2012/2013.

Ereignisse von besonderer Bedeutung nach dem Abschlussstichtag haben sich nicht ereignet.

Radeberg, 30. Mai 2013

Gerold Quilitz, Geschäftsführer

Bilanz

Aktiva

	31.3.2013 EUR	31.3.2012 EUR
A. Anlagevermögen	9.452.830,78	9.873.592,26
I. Immaterielle Vermögensgegenstände	3.382,70	6.244,00
1. sonstige immaterielle Vermögensgegenstände	3.382,70	6.244,00
II. Sachanlagen	9.449.448,08	9.867.348,26
1. Grundstücke, grundstücksgleiche Rechte und Bauten einschließlich der Bauten auf fremden Grundstücken	1.981.903,85	2.072.715,85
2. technische Anlagen und Maschinen	7.230.615,44	7.471.582,22
3. andere Anlagen, Betriebs- und Geschäftsausstattung	236.928,79	319.344,79
4. geleistete Anzahlungen und Anlagen im Bau	0,00	3.705,40
B. Umlaufvermögen	4.559.509,71	3.517.123,73
I. Vorräte	272.748,11	309.307,09
II. Forderungen und sonstige Vermögensgegenstände	1.047.643,04	1.217.023,58
1. sonstige Vermögensgegenstände	1.047.643,04	1.217.023,58
davon mit einer Restlaufzeit von mehr als einem Jahr	823,00	37.890,83
III. Kassenbestand, Bundesbankguthaben, Guthaben bei Kreditinstituten und Schecks	3.239.118,56	1.990.793,06
C. Rechnungsabgrenzungsposten	104.443,09	106.681,17
D. Aktive latente Steuern	10.385,00	0,00
Bilanzsumme, Summe Aktiva	14.127.168,58	13.497.397,16

Passiva

	31.3.2013 EUR	31.3.2012 EUR
A. Eigenkapital	6.916.511,83	5.131.053,41
I. gezeichnetes Kapital	50.200,00	50.200,00
II. Kapitalrücklage	1.512.960,61	1.512.960,61
III. Gewinnvortrag	3.567.892,80	2.368.926,04
IV. Jahresüberschuss	1.785.458,42	1.198.966,76
B. Sonderposten für Zuschüsse und Zulagen	62.807,23	66.485,26

	31.3.2013 EUR	31.3.2012 EUR
C. Rückstellungen	1.695.632,82	1.486.179,95
D. Verbindlichkeiten	5.452.216,70	6.808.378,54
1. Verbindlichkeiten gegenüber Kreditinstituten	51.731,25	129.735,63
davon mit einer Restlaufzeit bis zu einem Jahr	51.731,25	118.882,80
2. Verbindlichkeiten aus Lieferungen und Leistungen	142.942,57	173.490,66
davon mit einer Restlaufzeit bis zu einem Jahr	142.942,57	173.490,66
3. sonstige Verbindlichkeiten	5.257.542,88	6.505.152,25
davon aus Steuern	116.762,04	162.707,50
davon gegenüber Gesellschaftern	5.062.061,49	5.693.774,04
davon mit einer Restlaufzeit bis zu einem Jahr	119.164,31	725.911,40
E. Passive latente Steuern	0,00	5.300,00
Bilanzsumme, Summe Passiva	14.127.168,58	13.497.397,16

Gewinn- und Verlustrechnung

	1.4.2012 - 31.3.2013 EUR	1.4.2011 - 31.3.2012 EUR
1. Rohergebnis	7.856.480,48	6.942.267,23
2. Personalaufwand	2.075.431,89	1.963.232,84
a) Löhne und Gehälter	1.723.418,54	1.625.849,09
b) soziale Abgaben und Aufwendungen für Altersversorgung und für Unterstützung	352.013,35	337.383,75
davon für Altersversorgung	38.158,12	32.456,36
3. Abschreibungen	969.796,77	994.570,07
a) Abschreibungen auf immaterielle Vermögensgegenstände des Anlagevermögens und Sachanlagen	969.796,77	994.570,07
4. sonstige betriebliche Aufwendungen	2.170.762,14	1.956.185,36
davon Aufwendungen aus Währungsumrechnung	8.327,08	6.037,84
5. sonstige Zinsen und ähnliche Erträge	13.021,48	13.927,23
davon aus Abzinsung	12.971,89	12.902,44
6. Zinsen und ähnliche Aufwendungen	114.448,63	187.933,83
davon an verbundene Unternehmen	106.425,60	160.296,71
7. Ergebnis der gewöhnlichen Geschäftstätigkeit	2.539.062,53	1.854.272,36
8. Steuern vom Einkommen und Ertrag	739.881,78	641.184,90
a) Ertrag aus der Veränderung latenter Steuern	15.685,00	0,00
b) Aufwand aus der Veränderung latenter Steuern	0,00	210.700,00
9. sonstige Steuern	13.722,33	14.120,70
10. Jahresüberschuss	1.785.458,42	1.198.966,76

Anhang

1 Allgemeine Angaben

Die Synergy Health Radeberg GmbH, Radeberg, ist eine mittelgroße Kapitalgesellschaft im Sinne des § 267 Abs. 2 HGB. Der Jahresabschluss wurde nach den Vorschriften des HGB für mittelgroße Kapitalgesellschaften und den ergänzenden Vorschriften des GmbHG erstellt.

Für die Bilanz bzw. die Gewinn- und Verlustrechnung werden die Gliederungsschemata der §§ 266 bzw. 275 Abs. 2 (Gesamtkostenverfahren) des HGB in der Fassung des Bilanzrechtsmodernisierungsgesetzes angewandt.

Von den größenabhängigen Erleichterungen des § 288 Abs. 2 HGB wird teilweise Gebrauch gemacht.

Bei der Bewertung wurde von der Fortführung des Unternehmens ausgegangen.

2 Bilanzierungs- und Bewertungsmethoden

Anlagevermögen

Die **immateriellen Vermögensgegenstände** und die Vermögensgegenstände des **Sachanlagevermögens** werden zu Anschaffungs- oder Herstellungskosten abzüglich planmäßiger Abschreibungen bewertet. Die Herstellungskosten beinhalten die nach den handelsrechtlichen Vorschriften aktivierungspflichtigen Beträge.

Die Bemessung der Nutzungsdauer erfolgte auf Grund von betrieblichen Erfahrungen.

Die Vermögensgegenstände des Anlagevermögens werden linear und die Strahlenquellen zum Teil leistungsbezogen abgeschrieben.

Die geringwertige Wirtschaftsgüter (GWG) werden nach § 6 Abs. 2 EStG bewertet und mit Anschaffungskosten bis EUR 410 Netto im Jahr der Anschaffung sofort abgeschrieben. Dabei sind die Wirtschaftsgüter von EUR 150,01 bis EUR 410 in ein entsprechendes Verzeichnis geführt.

Die vor dem 1. Januar 2010 angeschafften GWGs werden weiterhin in einem Sammelposten aufgeführt und in gleichen Beträgen über einen Zeitraum von fünf Jahren abgeschrieben.

Umlaufvermögen

Die Vorräte an **Roh-, Hilfs- und Betriebsstoffen und Waren** werden zu Einkaufspreisen angesetzt bzw. mit dem niedrigeren beizulegenden Wert bewertet.

Die **Unfertigen Erzeugnisse und Leistungen sowie die fertigen Erzeugnisse** werden zu Herstellungskosten bewertet. In den Herstellungskosten sind die Material- und Fertigungseinzelkosten , Sondereinzelkosten der Fertigung, angemessene Teile der Material- und Fertigungsgemeinkosten, wie auch der allgemeinen Verwaltung, sowie des Wertverzehrs des Anlagevermögens, soweit dieser durch die Fertigung veranlasst ist, einbezogen.

Forderungen und sonstige Vermögensgegenstände werden zum Nennwert bewertet. Erkennbare Risiken werden durch Einzelwertberichtigungen berücksichtigt.

Die Aktivwerte für eine Pensionszusage (TEUR 94) stellen Deckungsvermögen gemäß § 246 Abs. 2 HGB dar und wurden deshalb mit den entsprechenden Rückstellungen saldiert.

Der Ansatz des **Kassenbestandes** und der **Guthaben bei Kreditinstituten** erfolgte zu Nennwerten. Die Umrechnung eines in US-Dollar geführten Bankkontos erfolgte mit dem Devisenkassamittelkurs zum Bilanzstichtag.

Aktiver Rechnungsabgrenzungsposten

In den aktiven Rechnungsabgrenzungsposten werden Ausgaben vor dem Abschlussstichtag, die Aufwendungen für Folgejahre darstellen, ausgewiesen.

Aktive latente Steuern

Die aktive latente Steuerabgrenzung wurde auf die zum 31. März 2013 bestehenden steuerrechtlichen Unterschiede zur handelsrechtlichen Bilanz gebildet und nach Verrechnung mit passiven latenten Steuern ausgewiesen.

Eigenkapital

Das gezeichnete Kapital ist zum Nennwert angesetzt.

Sonderposten für Zuschüsse zum Anlagevermögen

Der Sonderposten für Investitionszuschüsse zum Anlagevermögen betrifft Investitionszuschüsse der im Anlagevermögen ausgewiesenen Strahlenquellen. Die Auflösung des Sonderpostens erfolgt entsprechend der Abschreibung der geförderten Vermögensgegenstände und ist unter den sonstigen betrieblichen Erträgen ausgewiesen.

Rückstellungen

Die **Rückstellungen für Pensionen und ähnliche Verpflichtungen** ist nach versicherungsmathematischen Grundsätzen nach dem Anwartschaftsbarwertverfahren unter Berücksichtigung eines Zinssatzes von 4,61 % p. a. gemäß § 253 Abs. 2 HGB, einer erwarteten Gehalts- bzw. Rentensteigerung für Anwärter von 1 % p. a. und für Rentner von 1,5 % p. a. sowie den Richttafeln 2005 G von Prof. Dr. Klaus Heubeck ermittelt werden.

Die **sonstigen Rückstellungen** werden unter Beachtung des § 253 Abs. 1 HGB in Höhe des nach vernünftiger kaufmännischer Beurteilung notwendigen Erfüllungsbetrags angesetzt. Soweit die Rückstellungen eine Restlaufzeit von mehr als einem Jahr haben, erfolgte eine Abzinsung der Rückstellung gemäß § 253 Abs. 2 HGB.

Wie in den Vorjahren erfolgte die Berechnung der Rückstellungen für die Entsorgungskosten der Strahlenquellen auf Basis eines Entsorgungskonzeptes sowie den Rücknahmekonditionen der verschiedenen Zulieferer. In die Berechnung der Rückstellungen sind die voraussichtlichen Abgabezeitpunkte der Strahlenquellen eingeflossen. Zukünftige Preis- und Kostensteigerungen wurden mit einer Inflationsrate von 2,0 % berücksichtigt. Es erfolgte eine Abzinsung der Rückstellung gemäß § 253 Abs. 2 HGB nach den Abzinsungssätzen der Deutschen Bundesbank.

Verbindlichkeiten

Die Verbindlichkeiten sind gemäß § 253 Abs. 1 Satz 2 HGB mit dem Erfüllungsbetrag angesetzt.

3 Erläuterung zur Bilanz

Die Zusammensetzung und Entwicklung des **Anlagevermögens** gemäß § 268 Abs. 2 HGB sind im Anlagenspiegel (Anlage 1 zum Anhang) dargestellt.

Die **Vorräte** beinhalten die Bestände an Roh-, Hilfs- und Betriebsstoffen sowie den Bestand an unfertigen und fertigen Erzeugnissen und Leistungen.

Die **Forderungen aus Lieferungen und Leistungen** wurde in Höhe von TEUR 1 wertberichtigt. Die **Sonstigen Vermögensgegenstände** enthalten im Wesentlichen Forderungen aus Investitionszulage (TEUR 92). Zum Bilanzstichtag bestanden Forderungen mit einer Restlaufzeit von mehr als einem Jahr in Höhe von TEUR 1.

In den **aktiven Rechnungsabgrenzungsposten** werden im Wesentlichen Versicherungsprämien, Kfz-Kosten und Gebühren für Folgejahre ausgewiesen.

Die **aktive latente Steuerabgrenzung** ergibt sich aus dem Saldo der passiven latenten Steuern aus Unterschieden in den Abschreibungen des Anlagevermögens und aktiven latenten Steuern aus der Bewertung von Pensionsrückstellungen und den Rückstellungen für die Entsorgungskosten der Strahlenquellen. Der zu Grunde gelegte Steuersatz beträgt 29,13 %.

Der Gesamtbetrag der ausschüttungsgesperrten Beträge beläuft sich auf TEUR 10 und betrifft die aktiven latenten Steuern.

Das **Gezeichnete Kapital** entspricht der Handelsregistereintragung. Das im Handelsregister eingetragene Stammkapital beträgt EUR 50.200.

Die **Rückstellungen für Pensionen und ähnliche Verpflichtungen** wurden auf Grundlage einer Pensionszusage an den Geschäftsführer sowie Pensionsverträgen mit den zwei Altgesellschaftern gebildet. Der in der Bilanz ausgewiesene Rückstellungsbetrag entstammt dem versicherungsmathematischen Gutachten der PricewaterhouseCoopers Aktiengesellschaft Wirtschaftsprüfungsgesellschaft vom 9. April 2013.

Die **Steuerrückstellungen** enthalten im Wesentlichen Rückstellungen für Körperschaftsteuer (TEUR 325) und Gewerbesteuer (TEUR 212).

Die **Sonstigen Rückstellungen** betreffen hauptsächlich die Kosten für die Entsorgung von Strahlenquellen (TEUR 236), Personalkosten inklusive Tantieme (TEUR 172), ausstehende Rechnungen (TEUR 100), Rückstellungen für die Aufbewahrung von Geschäftsunterlagen (TEUR 45), Verpflichtungen aus der Prüfung des Jahresabschlusses zum 31. März 2013 (TEUR 30), sowie Beiträge zur Berufsgenossenschaft (TEUR 10).

Die Verbindlichkeiten sind wie folgt strukturiert:

	Restlaufzeit bis zu einem Jahr TEUR	von einem bis zu fünf Jahren TEUR	über fünf Jahre TEUR	Gesamtbetrag TEUR
Verbindlichkeiten gegenüber Kreditinstituten	52	0	0	52
(Vorjahr)	(79)	(51)	(0)	(130)
Verbindlichkeiten aus Lieferungen und Leistungen	143	0	0	143
(Vorjahr)	(173)	(0)	(0)	(173)
Verbindlichkeiten gegenüber Gesellschafter	562	2.000	2.500	5.062
(Vorjahr)	(1.194)	(2.000)	(3.000)	(6.194)
Sonstige Verbindlichkeiten	155	40	0	195
(Vorjahr)	(256)	(55)	(0)	(311)
Verbindlichkeiten gesamt	912	2.040	2.500	5.452
(Vorjahr)	(1.702)	(2.106)	(3.000)	(6.808)

Die **Verbindlichkeiten gegenüber Gesellschafter** bestehen im Wesentlichen aus Darlehensverbindlichkeiten (TEUR 5.015).

Von den Verbindlichkeiten sind TEUR 51 durch Raumsicherungsübereignung von Waren gesichert.

Die **Sonstigen Verbindlichkeiten** enthalten Verbindlichkeiten aus Umsatzsteuer (TEUR 98), Verbindlichkeiten aus Mietkauf (TEUR 76) und Verbindlichkeiten Lohnsteuer (TEUR 18).

4 Erläuterungen zur Gewinn- und Verlustrechnung

Die **Umsatzerlöse** wurden überwiegend durch steuerpflichtige Lieferungen und Leistungen im Inland (TEUR 5.683) und steuerfreie bzw. nicht steuerbare Lieferungen und Leistungen im Ausland (TEUR 2.511) erzielt.

Die **Sonstigen betrieblichen Erträge** enthalten im Wesentlichen Erträge aus Forschung und Entwicklung (TEUR 115), Stromsteuererstattungen (TEUR 56), Erlöse aus Weiterberechnungen (TEUR 48), Erträge aus Währungsumrechnung (TEUR 31), Erträge aus Investitionszulagen (TEUR 28), Sachbezügen (TEUR 26), Erträge aus Versicherungsentschädigungen (TEUR 14), und Erträge aus der Auslösung des Sonderpostens (TEUR 4) und Erträge aus der Auflösung von Rückstellungen (TEUR 2). In den sonstigen betrieblichen Erträgen sind periodenfremde Erträge in Höhe von TEUR 6 enthalten.

Die **Abschreibungen** enthalten Normalabschreibungen, die sich nach der betriebsgewöhnlichen Nutzungsdauer der Wirtschaftsgüter bemessen.

Unter den **Sonstigen betrieblichen Aufwendungen** werden vor allem Fahrzeugkosten (TEUR 616), Kosten der Warenabgabe (TEUR 431), Reparaturen und Instandhaltungen (TEUR 434), Raumkosten (TEUR 163), Reise- und Werbekosten (TEUR 55), Aufwand für die

Entsorgung radioaktiver Abfälle (TEUR 36) sowie periodenfremde Aufwendungen (TEUR 82) ausgewiesen.

Die **Sonstigen Zinsen und ähnlichen Erträge** enthalten Erträge aus der Abzinsung von Rückstellung in Höhe von TEUR 13.

Die **Steuern vom Einkommen und vom Ertrag** enthalten Aufwand aus der Abgrenzung von latenten Steuern in Höhe von TEUR 16.

5 Sonstige Angaben

Sonstige finanzielle Verpflichtungen gemäß § 285 Abs. 3 HGB bestehen zum Bilanzstichtag in Höhe von TEUR 490 aus Leasing-Verträgen.

Während des Geschäftsjahres 2012/2013 waren durchschnittlich 58 Arbeitnehmer beschäftigt . Davon waren 28 Lohn- und 30 Gehaltsempfänger.

Als alleinvertretungsberechtigter Geschäftsführer war im Geschäftsjahr 2012/2013 Herr Gerold Quilitz, Dresden, bestellt. Er ist befugt, die Gesellschaft bei der Vornahme von Rechtsgeschäften mit sich im eigenen Namen oder als Vertreter eines Dritten uneingeschränkt zu vertreten.

Das Mutterunternehmen ist die Synergy Health Holding Limited mit Firmensitz in Swindon, Großbritannien. Der Jahresabschluss der Synergy Health Radeberg GmbH, Radeberg, fließt in den Konzernabschluss der Synergy Health PLC, Großbritannien ein, die den Konzernabschluss für den größten und zugleich kleinsten Teil vom Unternehmen aufstellt. Der Konzernabschluss ist am Sitz der Synergy Health PLC erhältlich.

Radeberg, den 30. Mai 2013

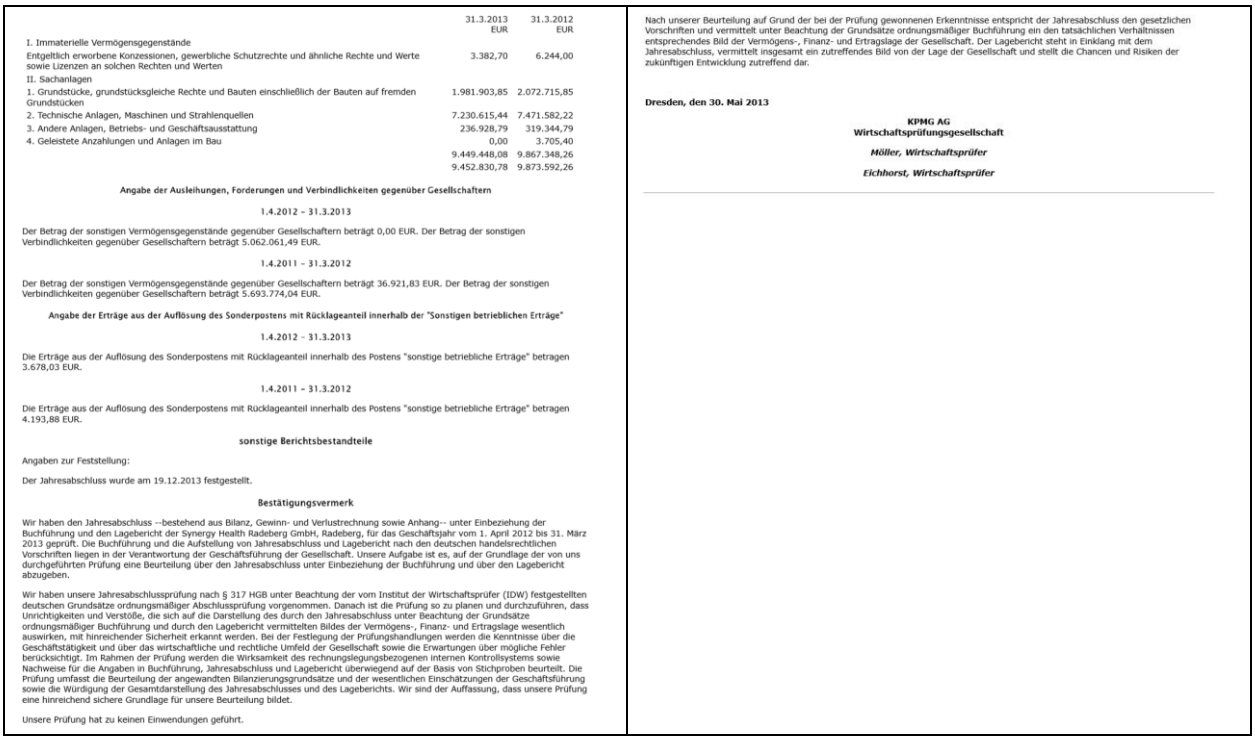
Gerold Quilitz, Geschäftsführer

Anlagespiegel

	Anschaffungs- und Herstellungskosten: Vortrag 1.4.2012 EUR	Zugänge EUR	Umbuchungen EUR	Abgänge EUR	Stand 31.3.2013 EUR
I. Immaterielle Vermögensgegenstände					
Entgeltlich erworbene Konzessionen, gewerbliche Schutzrechte und ähnliche Rechte und Werte sowie Lizenzen an solchen Rechten und Werten	22.322,01	549,70	0,00	0,00	22.871,71
II. Sachanlagen					
1. Grundstücke, grundstücksgleiche Rechte und Bauten einschließlich der Bauten auf fremden Grundstücken	3.722.934,37	0,00	0,00	0,00	3.722.934,37
2. Technische Anlagen, Maschinen und Strahlenquellen	18.780.149,96	542.716,22	0,00	4.488,12	19.318.378,06
3. Andere Anlagen, Betriebs- und Geschäftsausstattung	948.604,87	8.862,62	29.585,40	92.540,49	894.512,40
4. Geleistete Anzahlungen und Anlagen im Bau	3.705,40	25.880,00	-29.585,40	0,00	0,00
	23.455.394,60	577.458,84	0,00	97.028,61	23.935.824,83
	23.477.716,61	578.008,54	0,00	97.028,61	23.958.696,54

	kumulierte Abschreibungen: Vortrag 1.4.2012 EUR	Abschreibungen des Geschäftsjahres EUR	Abgänge EUR	Stand 31.3.2013 EUR
I. Immaterielle Vermögensgegenstände				
Entgeltlich erworbene Konzessionen, gewerbliche Schutzrechte und ähnliche Rechte und Werte sowie Lizenzen an solchen Rechten und Werten	16.078,01	3.411,00	0,00	19.489,01
II. Sachanlagen				
1. Grundstücke, grundstücksgleiche Rechte und Bauten einschließlich der Bauten auf fremden Grundstücken	1.650.218,52	90.812,00	0,00	1.741.030,52
2. Technische Anlagen, Maschinen und Strahlenquellen	11.308.567,74	781.891,75	2.696,87	12.087.762,62
3. Andere Anlagen, Betriebs- und Geschäftsausstattung	629.260,08	93.682,02	65.358,49	657.583,61
4. Geleistete Anzahlungen und Anlagen im Bau	0,00	0,00	0,00	0,00
	13.588.046,34	966.385,77	68.055,36	14.486.376,75
	13.604.124,35	969.796,77	68.055,36	14.505.865,76

Buchwerte



	31.3.2013 EUR	31.3.2012 EUR
I. Immaterielle Vermögensgegenstände		
Entgeltlich erworbene Konzessionen, gewerbliche Schutzrechte und ähnliche Rechte und Werte sowie Lizenzen an solchen Rechten und Werten	3.382,70	6.244,00
II. Sachanlagen		
1. Grundstücke, grundstücksgleiche Rechte und Bauten einschließlich der Bauten auf fremden Grundstücken	1.981.903,85	2.072.715,85
2. Technische Anlagen, Maschinen und Strahlenquellen	7.230.615,44	7.471.582,22
3. Andere Anlagen, Betriebs- und Geschäftsausstattung	236.928,79	319.344,79
4. Geleistete Anzahlungen und Anlagen im Bau	0,00	3.705,40
	9.449.448,08	9.867.348,26
	9.452.830,78	9.873.592,26

Angabe der Ausleihungen, Forderungen und Verbindlichkeiten gegenüber Gesellschaftern

1.4.2012 - 31.3.2013

Der Betrag der sonstigen Vermögensgegenstände gegenüber Gesellschaftern beträgt 0,00 EUR. Der Betrag der sonstigen Verbindlichkeiten gegenüber Gesellschaftern beträgt 5.062.061,49 EUR.

1.4.2011 - 31.3.2012

Der Betrag der sonstigen Vermögensgegenstände gegenüber Gesellschaftern beträgt 36.921,83 EUR. Der Betrag der sonstigen Verbindlichkeiten gegenüber Gesellschaftern beträgt 5.693.774,04 EUR.

Angabe der Erträge aus der Auflösung des Sonderpostens mit Rücklageanteil innerhalb der "Sonstigen betrieblichen Erträge"

1.4.2012 - 31.3.2013

Die Erträge aus der Auflösung des Sonderpostens mit Rücklageanteil innerhalb des Postens "sonstige betriebliche Erträge" betragen 3.678,03 EUR.

1.4.2011 - 31.3.2012

Die Erträge aus der Auflösung des Sonderpostens mit Rücklageanteil innerhalb des Postens "sonstige betriebliche Erträge" betragen 4.193,88 EUR.

sonstige Berichtsbestandteile

Angaben zur Feststellung:

Der Jahresabschluss wurde am 19.12.2013 festgestellt.

Bestätigungsvermerk

Wir haben den Jahresabschluss --bestehend aus Bilanz, Gewinn- und Verlustrechnung sowie Anhang-- unter Einbeziehung der Buchführung und den Lagebericht der Synergy Health Radeberg GmbH, Radeberg, für das Geschäftsjahr vom 1. April 2012 bis 31. März 2013 geprüft. Die Buchführung und die Aufstellung von Jahresabschluss und Lagebericht nach den deutschen handelsrechtlichen Vorschriften liegen in der Verantwortung der Geschäftsführung der Gesellschaft. Unsere Aufgabe ist es, auf der Grundlage der von uns durchgeführten Prüfung eine Beurteilung über den Jahresabschluss unter Einbeziehung der Buchführung und über den Lagebericht abzugeben.

Wir haben unsere Jahresabschlussprüfung nach § 317 HGB unter Beachtung der vom Institut der Wirtschaftsprüfer (IDW) festgestellten deutschen Grundsätze ordnungsmäßiger Abschlussprüfung vorgenommen. Danach ist die Prüfung so zu planen und durchzuführen, dass Unrichtigkeiten und Verstöße, die sich auf die Darstellung des durch den Jahresabschluss unter Beachtung der Grundsätze ordnungsmäßiger Buchführung und durch den Lagebericht vermittelten Bildes der Vermögens-, Finanz- und Ertragslage wesentlich auswirken, mit hinreichender Sicherheit erkannt werden. Bei der Festlegung der Prüfungshandlungen werden die Kenntnisse über die Geschäftstätigkeit und über das wirtschaftliche und rechtliche Umfeld der Gesellschaft sowie die Erwartungen über mögliche Fehler berücksichtigt. Im Rahmen der Prüfung werden die Wirksamkeit des rechnungslegungsbezogenen internen Kontrollsystems sowie Nachweise für die Angaben in Buchführung, Jahresabschluss und Lagebericht überwiegend auf der Basis von Stichproben beurteilt. Die Prüfung umfasst die Beurteilung der angewandten Bilanzierungsgrundsätze und der wesentlichen Einschätzungen der Geschäftsführung sowie die Würdigung der Gesamtdarstellung des Jahresabschlusses und des Lageberichts. Wir sind der Auffassung, dass unsere Prüfung eine hinreichend sichere Grundlage für unsere Beurteilung bildet.

Unsere Prüfung hat zu keinen Einwendungen geführt.

Nach unserer Beurteilung auf Grund der bei der Prüfung gewonnenen Erkenntnisse entspricht der Jahresabschluss den gesetzlichen Vorschriften und vermittelt unter Beachtung der Grundsätze ordnungsmäßiger Buchführung ein den tatsächlichen Verhältnissen entsprechendes Bild der Vermögens-, Finanz- und Ertragslage der Gesellschaft. Der Lagebericht steht in Einklang mit dem Jahresabschluss, vermittelt insgesamt ein zutreffendes Bild von der Lage der Gesellschaft und stellt die Chancen und Risiken der zukünftigen Entwicklung zutreffend dar.

Dresden, den 30. Mai 2013

KPMG AG
Wirtschaftsprüfungsgesellschaft

Möller, Wirtschaftsprüfer

Eichhorst, Wirtschaftsprüfer

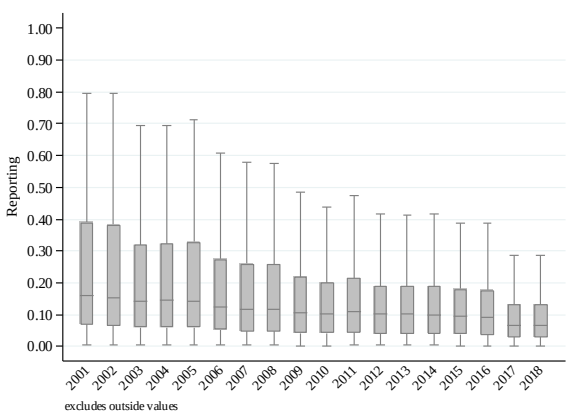
Notes: The example reproduces the report published by Synergy Health Radeberg GmbH for fiscal year 2013 in the *Bundesanzeiger* (i.e., the German Federal Gazette). For the fiscal year 2013, the firm no longer qualified for the "small" firm reporting exemption and hence provides a full report. Full reporting features a management report (Lagebericht) discussing business developments (1), the economic position (2), business risks (3), and future developments (4). In the business developments section, the report reviews developments in the economy and industry (1.1), sales and profitability by segments (1.2), investment activities (1.3), financing activities (1.4), employment (1.5), environmental and radiation protection (1.6), and other changes during the fiscal year (1.7). With full reporting, the example company provides an extended balance sheet (Bilanz), income statement (Gewinn- und Verlustrechnung), detailed notes (Anhang) including additional information on balance sheet and income statement items (e.g., breaking out R&D related income) and a statement of changes in non-current assets (Anlagespiegel), and an audit opinion (Bestätigungsvermerk).

Figures & Tables

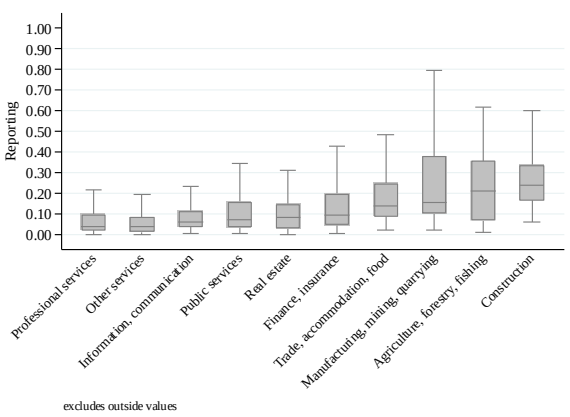
Figure OA1

DISTRIBUTION OF REPORTING INTENSITIES

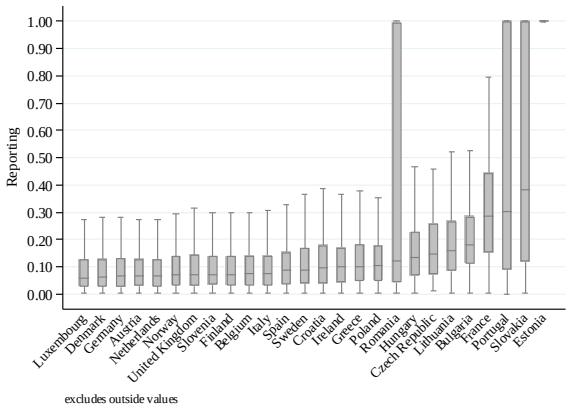
Panel A: Intensities by Time



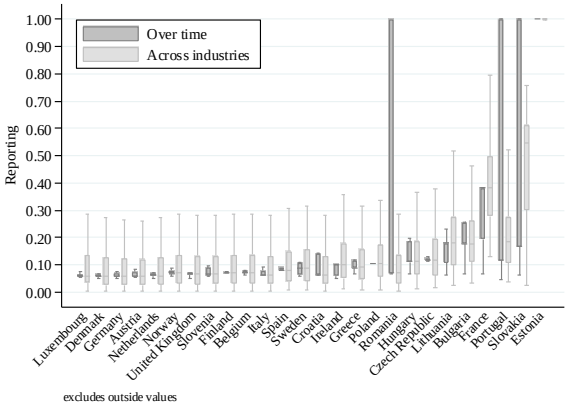
Panel B: Intensities by Industry



Panel C: Intensities by Country



Panel D: Intensities by Country (Decomposed)



Notes: The figure summarizes the distribution of reporting intensities capturing the (simulated) share of firms above countries' exemption thresholds. Panel A plots the distribution of reporting intensities by year. Panel B plots the distribution of reporting intensities by (one-digit) industry. Panel C plots the distribution of the reporting intensities by country. Panel D shows a decomposition of the reporting intensities by country, plotting variation related to changes over time (i.e., the distribution of the median country-year intensities) and variation from industry differences (i.e., the distribution of the median country-industry intensities). The box plots provide the median (horizontal line within the boxes), the 25th and 75th percentile (lower and upper bound of the boxes), and adjacent values (end points of vertical lines/whiskers). Adjacent values are defined as the lowest and highest observations that are still inside the region spanned by the following limits: 25th (75th) percentile – (+) 1.5 × (75th – 25th percentile). Values outside are excluded from the plots.

The figure illustrates that there is substantial variation in reporting intensities. Most variation comes from differences in firm sizes across industries (even within coarse one-digit industries) and differences in thresholds across countries. By contrast, the reporting intensities vary little over time, as only few countries' reporting thresholds change much over time and firm-size changes are purged, by construction, from the reporting intensities. Our research design deliberately focuses

on the rich cross-sectional variation arising from the interaction of country-level differences in thresholds and industry-level differences in firm sizes, instead of the relatively scarce and possibly confounded time-series variation (e.g., concurrent with a country's EU accession or other major changes at the country level).

Table OA1

REGULATORY REPORTING THRESHOLDS					
Country	Period	Currency	Total Assets	Sales*	Employees
Austria	2000-2004	EUR	3,125,000	6,250,000	50
Austria	2005-2007	EUR	3,650,000	7,300,000	50
Austria	2008-2015	EUR	4,840,000	9,680,000	50
Austria	2016-2018	EUR	5,000,000	10,000,000	50
Belgium	2000-2004	EUR	3,125,000	6,250,000	50
Belgium	2005-2015	EUR	3,650,000	7,300,000	50
Belgium	2016-2018	EUR	4,500,000	9,000,000	50
Bulgaria	2000-2004	BGN	800,000	1,000,000	50
Bulgaria	2005-2006	BGN	1,000,000	5,000,000	50
Bulgaria	2007-2015	BGN	1,500,000	2,500,000	50
Bulgaria	2016-2018	BGN	8,000,000	16,000,000	50
Croatia	2000-2005	DEM	2,000,000	4,000,000	50
Croatia	2006-2007	HRK	27,000,000	54,000,000	50
Croatia	2008-2015	HRK	32,500,000	65,000,000	50
Croatia	2016-2018	HRK	30,000,000	60,000,000	50
Czech Republic	2000-2001	CZK	0	0	0
Czech Republic	2002-2018	CZK	40,000,000	80,000,000	50
Denmark	2000-2001	DKK			
Denmark	2002-2003	DKK	20,000,000	40,000,000	50
Denmark	2004-2009	DKK	29,000,000	58,000,000	50
Denmark	2010-2015	DKK	36,000,000	72,000,000	50
Denmark	2016-2018	DKK	44,000,000	89,000,000	50
Estonia	2000-2015	EUR	0	0	0
Estonia	2016-2018	EUR	4,000,000	8,000,000	50
Finland	2000-2001	FIM	10,000,000	20,000,000	50
Finland	2002-2004	EUR	3,125,000	6,250,000	50
Finland	2005-2015	EUR	3,650,000	7,300,000	50
Finland	2016-2018	EUR	6,000,000	12,000,000	50
France	2000-2001	FRF	1,750,000	3,500,000	10
France	2002-2010	EUR	267,000	534,000	10
France	2011-2013	EUR	1,000,000	2,000,000	20
France	2014-2018	EUR	4,000,000	8,000,000	50
Germany	2000-2001	DEM	6,720,000	13,440,000	50
Germany	2002-2003	EUR	3,438,000	6,875,000	50
Germany	2004-2007	EUR	4,015,000	8,030,000	50
Germany	2008-2013	EUR	4,840,000	9,680,000	50
Germany	2014-2018	EUR	6,000,000	12,000,000	50
Greece	2000-2001	GRD	500,000,000	1,000,000,000	50
Greece	2002-2007	EUR	1,500,000	3,000,000	50

Greece	2008-2014	EUR	2,500,000	5,000,000	50
Greece	2015-2018	EUR	4,000,000	8,000,000	50
Hungary	2000-2001	HUF	150,000,000	300,000,000	100
Hungary	2002-2005	HUF	150,000,000	300,000,000	50
Hungary	2006-2015	HUF	500,000,000	1,000,000,000	50
Hungary	2016-2018	HUF	1,200,000,000	2,400,000,000	50
Ireland	2000-2004	IEP	1,500,000	3,000,000	50
Ireland	2005-2012	EUR	1,904,607	3,809,214	50
Ireland	2013-2016	EUR	4,400,000	8,800,000	50
Ireland	2017-2018	EUR	6,000,000	12,000,000	50
Italy	2000-2001	ITL	4,700,000,000	9,500,000,000	50
Italy	2002-2006	EUR	3,125,000	6,250,000	50
Italy	2007-2008	EUR	3,650,000	7,300,000	50
Italy	2009-2018	EUR	4,400,000	8,800,000	50
Lithuania	2000-2002	LTL	5,000,000	10,000,000	
Lithuania	2003	LTL	5,000,000	10,000,000	250
Lithuania	2004-2007	LTL	5,000,000	7,000,000	10
Lithuania	2008-2014	LTL	6,000,000	10,000,000	15
Lithuania	2015-2015	EUR	1,800,000	2,900,000	15
Lithuania	2016-2018	EUR	4,000,000	8,000,000	50
Luxembourg	2000-2010	EUR	3,125,000	6,250,000	50
Luxembourg	2011-2018	EUR	4,400,000	8,800,000	50
Netherlands	2000-2001	NLG	7,500,000	15,000,000	50
Netherlands	2002-2003	EUR	3,500,000	7,000,000	50
Netherlands	2004-2005	EUR	3,650,000	7,300,000	50
Netherlands	2006-2015	EUR	4,400,000	8,800,000	50
Netherlands	2016-2018	EUR	6,000,000	12,000,000	50
Norway	2000-2003	NOK	20,000,000	40,000,000	50
Norway	2004-2010	NOK	30,000,000	60,000,000	50
Norway	2011-2018	NOK	35,000,000	70,000,000	50
Poland	2000-2000	EUR	1,000,000	2,000,000	50
Poland	2001-2015	EUR	2,000,000	4,000,000	50
Poland	2016-2018	PLN	17,000,000	34,000,000	50
Portugal	2000-2007	EUR	0	0	0
Portugal	2008-2009	EUR	10,000,000	10,000,000	50
Portugal	2010-2010	EUR	500,000	1,000,000	20
Portugal	2011-2015	EUR	1,500,000	3,000,000	50
Portugal	2016-2018	EUR	4,000,000	8,000,000	50
Romania	2000-2004	EUR	0	0	0
Romania	2005-2014	EUR	3,650,000	7,300,000	50
Romania	2015-2015	EUR	4,000,000	8,000,000	50
Romania	2016-2018	EUR	3,946,953	7,893,906	50

Slovakia	2000-2008	SKK	0	0	0
Slovakia	2009-2014	EUR	1,000,000	2,000,000	30
Slovakia	2015-2018	EUR	4,000,000	8,000,000	50
Slovenia	2000-2001	SKK	100,000,000	200,000,000	50
Slovenia	2002-2004	SIT	500,000,000	1,000,000,000	50
Slovenia	2005-2005	SIT	850,000,000	1,700,000,000	50
Slovenia	2006-2008	EUR	3,650,000	7,300,000	50
Slovenia	2009-2015	EUR	4,400,000	8,800,000	50
Slovenia	2016-2018	EUR	4,000,000	8,000,000	50
Spain	2000-2007	ESP	395,000,000	790,000,000	50
Spain	2008-2013	EUR	2,850,000	5,700,000	50
Spain	2014-2018	EUR	4,000,000	8,000,000	50
Sweden	2000-2006	SEK	23,000,000		10
Sweden	2007-2010	SEK	25,000,000	50,000,000	50
Sweden	2011-2018	SEK	40,000,000	80,000,000	50
United Kingdom	2000-2003	GBP	1,400,000	2,800,000	50
United Kingdom	2004-2007	GBP	2,800,000	5,600,000	50
United Kingdom	2008-2015	GBP	3,260,000	6,500,000	50
United Kingdom	2016-2018	GBP	5,100,000	10,200,000	50

Notes: The table lists threshold values for reporting exemptions gathered via researching legal sources and surveying knowledgeable parties in the respective countries. * The sales dimension is defined as operating income in a few countries.

Table OA2

ROBUSTNESS TO CRISIS EXPOSURE				
Outcome	Innovating Firm		Innovation Spending	
Market Level	Simple Average	Total	Simple Average	Total
Column	(1)	(2)	(3)	(4)
Limited Share × Post	-0.128***	-0.506***	-2.284***	-3.027***
	(-3.37)	(-6.02)	(-3.29)	(-4.00)
Commerzbank Share × Post	-0.062	-0.066	-0.521	-0.610
	(-1.54)	(-0.74)	(-0.72)	(-0.83)
County-Industry FE	X	X	X	X
County-Year FE	X	X	X	X
Industry-Year FE	X	X	X	X
Observations	47,283	47,279	26,778	26,778
Clusters (County-Industry)	8,193	8,178	5,859	5,861
Adj. R^2	0.393	0.561	0.533	0.528

Notes: The table assesses the robustness of our German enforcement results to controlling for firms' exposures to a large, distressed German bank during the financial crises. While county-year fixed effects are likely to absorb much of the crisis impact on innovation, this robustness analysis checks if there is any residual impact that is not purged by our main design. Following Huber (2018), we use the share of firms with bank relationships with Commerzbank as our crisis exposure measure ("Commerzbank Share"). We calculate the share as the average Commerzbank dependence of firms in a given county-industry using only pre-crisis data from 2006 and 2007. (Given scarce bank data before the enforcement, we set missing Commerzbank share values at the county-industry level to zero. Irrespective of the treatment of missing values, the Commerzbank share is only little correlated with the Limited share (correlation coefficient of about 0.1).) Our enforcement results (coefficients of interest) are largely unaffected by the additional control for crisis exposure. The innovation measures are simple averages or totals calculated for a given county, industry, and year. The enforcement intensity is captured by the interaction of the share of affected (limited-liability) firms in the pre-enforcement period in a given county and industry ("Limited Share") and a post-enforcement reform indicator ("Post"). The regressions include county-industry, county-year, and industry-year fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the county-industry level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.

Table OA3

INTELLECTUAL PROPERTY PROTECTION – ALTERNATIVE SPECIFICATIONS						
Outcome	Patents					
Specification	Intensive Margin		Raw Count		Poisson	
Market Level	Total	Total	Total	Total	Total	Total
Column	(1)	(2)	(3)	(4)	(5)	(6)
Reporting	1.805**	0.125	141.284*	23.102	-0.096	-2.961***
	(2.23)	(0.15)	(1.65)	(1.27)	(-0.09)	(-2.88)
Reporting × Medium Firms		0.624***		2.836*		1.107
		(3.39)		(1.90)		(1.61)
Reporting × Large Firms		1.522***		5.660		3.187***
		(4.01)		(1.44)		(4.03)
Country-Year FE	X	X	X	X	X	X
Industry-Year FE	X	X	X	X	X	X
Size-Group FE		X		X		X
Observations	17,763	30,112	37,769	96,962	37,246	95,487
Clusters (Country-Industry)	1,681	1,601	2,197	2,192	2,190	2,181
Clusters (Country-Year)	463	459	466	466	466	461
Adj. R^2	0.678	0.529	0.335	0.248	-	-

Notes: The table presents estimates from regressions of the total number of patents on the share of firms subject to full reporting requirements in the European setting. The estimates pertain to distinct specifications. The first specification ("Intensive Margin") only focuses on country-industries with non-zero patenting. It uses the logarithm of the total number of patents. Country-industries with zero patents, thus, drop out. The second specification uses the raw count of total patents instead of the logarithm plus one (which is reported in Table 10) in OLS regressions. The third specification uses the raw count of total patents in Poisson regressions. The treatment variation, "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. "Medium Firms" is an indicator taking the value of one for the size group comprising firms with 50 or more employees but less than 250 employees. "Large Firms" is an indicator taking the value of one for the size group comprising firms with 250 or more employees. The regressions in columns 1, 3, and 5 include industry-year and country-year fixed effects. The regressions in columns 2, 4, and 6 additionally include size-group fixed effects. We truncate the outcomes at the 1st and 99th percentile of their distributions, after accounting for the fixed effects. This truncation approach can lead to differing sample sizes across columns due to singletons. *t*-statistics (in parentheses) are based on standard errors clustered at the country-industry level and the country-year level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively.