

Reporting Opaqueness of Private Firms

Empirical Evidence from Mandatory Disclosures
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Abstract

Mandatory disclosure rules force firms to make annual reports publicly available. The publication of (accounting) information, however, is not always in line with their interests as it entails proprietary costs, which can outweigh firm-level benefits. This dissertation analyzes how private firms respond to such mandated disclosure and focuses on managerial discretion to mitigate potentially adverse effects.

The first part (*Regulation*) clarifies the purpose of financial accounting in a private firm setting and discusses aspects of the regulation. In the absence of capital markets, limited ownership-induced agency conflicts, and a strong reliance on debt financing and relationship banking, private firms use financial accounting mostly as a contractual device. Thus, SME accounting is shaped by socio-economic factors and is deeply embedded in countries' institutional environments. Consistent with this notion, we empirically demonstrate that participants in a public consultation (conducted by the European Commission) support further harmonization and internationalization of SME accounting only for larger firms that use non-EU regulated capital markets.

The second part (*Timeliness*) provides evidence on private firms' timing decisions of mandatory disclosures. Timeliness crucially determines the informational value of (non)-financial data and thus influences associated indirect costs. We exploit a regulatory setting, where private firms have a great deal of discretion in disclosure timing and are even in the position to "buy" time beyond the legal deadline, when accepting monetary sanctions. The results suggest that firms facing higher proprietary costs exhibit significantly longer reporting lags and are more likely to overrun the statutory period. We identify performance, the competitive environment and ownership as influencing factors. Moreover, it seems that disclosure timing complements other channels by which a more opaque information environment can be established.

The third part (*Narratives*) focuses on the characteristics of the extensive textual elements of private firms' disclosures. Namely, we approximate the informativeness of firms' management reports by relying on the degree of year-over-year similarity (copy-paste). The results indicate that firms with strong incentives to be more opaque systematically modify and update their narrative reports to a lower extent. In line with our expectations, we further find reports with a high degree of copy-paste to be less useful. The content of

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high-similar reports is less consistent with current accounting numbers and a worse predictor of future earnings. We conclude that firms succeed in creating a more opaque information environment by exploiting copy-paste activities.

The final part (*Overall*) acknowledges that creating opaqueness is not a binary decision but rather the interplay of different managerial choices. Following this notion, the methodologically approach of cluster analysis allows to consider data on earnings properties, textual characteristics and timeliness simultaneously. The clustering outcomes, therefore, provide for a more holistic view on the financial reporting practice. As such, the algorithm groups firms that share financial reporting characteristics and identifies heterogeneous financial reporting profiles, which are mostly sticky over time. The results reveal complementary and substitutional associations among aspects from different domains (e.g., textual modification and timeliness). Moreover, the choice of a certain financial reporting strategy seems to be related to firms' fundamentals.

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Introductory Summary

“Silence is Golden”

Transparency is a virtue that appears in various domains of daily life and typically has a positive connotation. Within the meaning of financial reporting, transparency can be seen as a firm’s characteristic of being open and forthright with stakeholders by granting access to information that allows them to better understand the company, its future development and the reasons for actions and decisions (Dapko 2012). Transparency is seen as a prerequisite for the efficient allocation of resources and it seems to be honored by capital markets. A rich field of research deals with the relationship between the quality of financial reporting as one indicator of transparency and capital market outcomes. It documents positive effects of transparency, as less information asymmetry that results in lower costs of capital, higher liquidity and increased share prices (for a review, see, e.g., Beyer et al. 2010, Leuz and Wysocki 2018 or Roychowdhury et al. 2019).

However, in the absence of capital markets and a lack of benefits, non-listed firms (private firms) are not always as receptive to transparency as their listed counterparts. Given that mandatory disclosure rules do not exist for private firms, this is not a major issue in many parts of the world, for instance, in the United States (US) or in Canada. Based on individual contracts, firms share information on a voluntary basis and determine the optimal level by themselves (market solution). In the European Union (EU), the situation is different. The regulator decided to also require private firms to prepare financial reports and disclose them publicly (regulatory solution).¹ In addition to the obvious direct costs for preparation and publication, there are more or less important indirect costs, which are multilayered and manifest, for example, in an erosion of firms’ competitive position or the privacy of their owners.

In Germany, the *Mittelstand* as the often-quoted backbone of the economy (e.g., Fülbier and Klein 2015), is directly affected by the regulatory solution. Associations of undertakings such as the “Bund der Deutschen Industrie”, “Stiftung Familienunternehmen” or other organizations regularly express their concerns in terms of mandatory disclosure and

¹ For a detailed discussion of pros and cons of both regimes, see, e.g., Grottko et al. (2016) or Shroff and Minnis (2017).

highlight related threats. Lobbying against was prevalent around 2007, following the introduction of a new enforcement system regarding mandatory disclosure. It has also been the case with more recent initiatives such as the *Country-by-country Reporting* or the *Transparency Register* (e.g., Schäfers 2019, Stiftung Familienunternehmen 2018). In a similar vein, the German business press habitually draws attention to firms' reluctance and the jeopardy associated with detailed mandatory disclosure requirements.²

Given the practical importance of this issue, this thesis concentrates on disclosure requirements based on Article 325 of the German Commercial Code (*Handelsgesetzbuch*). All German corporations with limited liability are obliged to publicly file annual financial statements (including the balance sheet, income statement and notes), a management report and other documents, which potentially contain sensitive and confidential information.³ The origin of the rule dates back a long time. However, since a major piece of legislation in 2006⁴, the Federal Office of Justice (FOJ) effectively enforces the disclosure requirements. Non-compliance is subject to monetary fines, repeated as long as a firm fails to submit the required documents. Consequently, disclosure rates increased dramatically after 2006 from single-digits to nearly 100 % (e.g., Fülbier et al. 2019). Moreover, the regulatory act introduced a digital data filing and retrieval infrastructure, the so-called "Electronic Federal Gazette" (*elektronischer Bundesanzeiger*). This online platform facilitates information acquisition for transacting stakeholders, as well as for other parties. The access is free of charge, does not require any registration and is designed to be user-friendly, as there is a full-text search and no restriction on when or where data are retrievable. Hence, the German Federal Gazette is considered to be a convenient and useful tool to gather information about legal entities.⁵ Based on these two major amendments,

² Headlines from the German business press read, e.g., as follows: "*Firmendaten frei Haus*" [Company data on demand] (Kirchdörfer 2019), "*Firmen zahlen lieber, als ihre Daten preiszugeben*" [Companies prefer to pay rather than disclose their data] (Müller and Heide 2018), "*Renitente Verschwiegenheit*" [Renitent secrecy] (Müller et al. 2016), "*Staat zwingt Firmen zu mehr Transparenz*" [Legislator forces companies to be more transparent] (Fockenbrock 2010), "*Zittern vor den offenen Büchern*" [Being afraid of open books] (Mönninghoff 2008).

³ There are some exemptions for small and medium-sized entities.

⁴ *Gesetz über elektronische Handelsregister und Genossenschaftsregister sowie das Unternehmensregister (EHUG)* [Act on Electronic Commercial and Registers of Cooperatives and Business Registers].

⁵ According to a business register survey conducted by the European Commission (EC), only five of 27 member states do not charge for financial statement information. Furthermore, Kaya and Seebeck (2019) classify the German Federal Gazette as one of the most useful company registers in terms of data availability, accessibility and serviceability among register of 90 countries.

it is less surprising that private firms consider the Act a “*transparency shock*” (Laschewski and Nasev 2018), which inevitably leads to the question of how corporations deal with increased transparency and its associated indirect costs. This, however, is not a new issue.

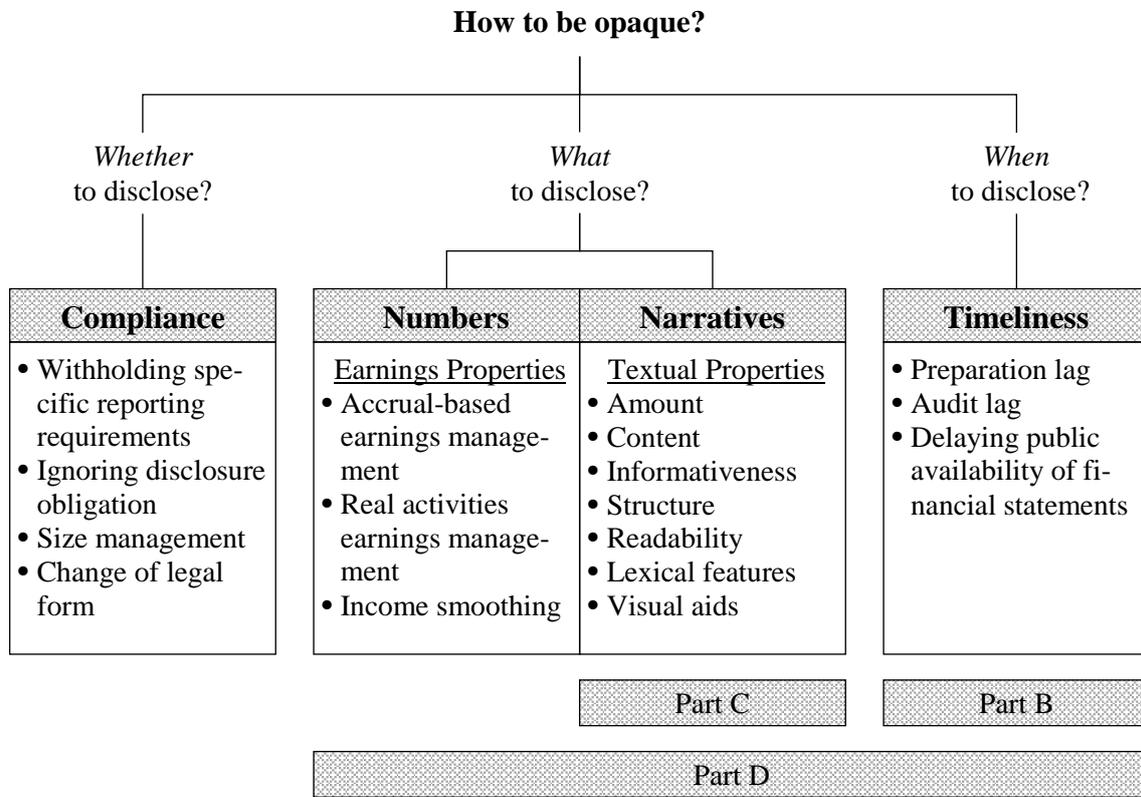
About 40 years ago, Robert E. Verrecchia analytically modeled the costs of disclosed information that is proprietary in nature and the distribution of which is potentially harmful (Verrecchia 1983). He has referred to this form of disclosure-related costs as “proprietary costs”. A large amount of research has followed, “however, we know relatively little empirically about the likely prevalence and the magnitude of proprietary costs in practice” (Lang and Sul 2014, p. 265).

The German accounting literature has also been addressing adverse effects of public disclosure for some time. Wagenhofer (1990) refers to the costs arising from the use of information by third parties to the detriment of the disclosing company as “*indirekte Ausweiskosten*”. In 1962, Adolf Moxter noted that firms that are unable to withdraw from mandatory disclosure seek precautionary actions to avoid impending cuts in profits (Moxter 1962). Based on younger legal developments, as briefly outlined above, however, private firms’ discretion in mandatory disclosure has widely been reduced. Since 2007, firms are no longer in a position to decide about *whether* to disclose information. Instead of simply ignoring disclosure rules, firms need to reflect on a variety of managerial choices in order to achieve the desired level of transparency. Thus, seeking opaqueness shifted from a binary decision to a much more complex exercise. Given mandatory disclosure rules, firms are only left the chance to influence their information environment by exploiting discretion in content (*what* to disclose?) and timeliness (*when* to disclose?). I examine these two potential “channels”. After a regulation-based introduction that clarifies the purpose of financial accounting in a private firm setting and discusses aspects of the underlying regulation the structure of this thesis, therefore, follows the elaborated questions of *what?* and *when?* (Figure 1).⁶

Part A which is a joint project with Marcus Bravidor and Rolf Uwe Fülbier, theoretically describes the role of accounting while differentiating between firms ownership structure

⁶ Although I dedicate a separate chapter to *when?* and *what?*, I do not focus more closely on the perspective of “*whether to disclose*” (Figure 1) for three reasons. First, the German enforcement mechanism prevents loopholes and ensures compliance. Accordingly, avoiding disclosure is not an option. Second, all financial reports that are subject of my empirical analyses have been audited and issued with an unqualified audit opinion. Thus, I presume that filings contain all required items and firms would have failed if they wanted to withhold information. Third, there is already some recent research focusing on “*whether*” (e.g., Bernard 2016).

Figure 1:
Potential channels to achieve opacity



and main stakeholder group. Based on a strong reliance on bank financing and a lower extent of principal-agent conflicts, it becomes apparent that typical private firms rather use accounting as a contractual device. The valuation aspect of accounting is significantly less pronounced. Moreover, we show that SME accounting is shaped by socio-economic factors and is deeply embedded in countries' institutional environments. Given this, we ask whether initiatives for an EU-wide harmonization and internationalization of accounting are meaningful. To address this question, we review results of prior literature and empirically analyze the opinion of European stakeholder groups using comments on a public consultation conducted by the European Commission (EC) in 2015. In particular, respondents support a further harmonization of accounting requirements for larger SMEs, which use non-EU regulated capital markets, but oppose an extension to all SMEs.

Part B, which is a joint project with Marcus Bravidor, covers “when”– the disclosure timing decision. Timeliness is a fundamental characteristic that heavily determines the relevance of information. The older an information, the less useful it is, since each unit

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of elapsed time reduces the capability to create value to third parties. The German legislator allows a period of twelve months to fulfill the annual disclosure requirement. Beyond that period, firms are able to neglect legal deadlines and further delay the public availability if they accept monetary sanctions. Namely, firms can “*buy*” time in order to decrease the informational significance of mandatory disclosed information. Consequently, a rational manager will delay submission as long as the indirect costs of disclosure are higher than the cumulative fines. In addition to the absence of pressure from capital markets and the absence of significant litigation concerns, this setting provides an interesting opportunity to indirectly study the costs of mandatory disclosure.

Based on a manually collected sample of approximately 1,000 firms over a period of six years, we find that firms completely exhaust the legal deadlines. Moreover, the descriptive results reveal that financial statement preparation, audit and approval are completed well in advance of the filing date. This finding indicates a major gap between “a firm is able to disclose” and “a firm is actually disclosing”. Despite that, the reporting lag exhibits a high variance, implying that firms are not homogeneously engaged in delaying disclosure. Examining the determinants of the reporting lag reveals performance, ownership and the competitive environment as influencing factors consistent with theoretical predictions. While loss-reporting firms significantly enhance the reporting lag, firms that beat prior years’ earnings file faster. However, we find a u-shaped relationship between disclosure timing and performance, which suggests that under- and overperforming firms exhibit incentives to file less promptly. This finding is in accordance with agency and proprietary costs theory. We also find that family firms and firms in a more competitive environment withhold their filings for longer. In particular, firms that report a loss and family-owned firms are more likely to accept monetary fines. Lastly, we document that timeliness is complementing other dimensions of financial reporting quality, e.g., discretionary accruals and the amount of disclosure.

Part C refers to “*what*”. It is a joint project with Marcus Bravidor and Thomas Loy. In comparison to many other prior studies, we do not analyze the accounting numbers but rather focus on the narrative content of firms’ annual reports. Private firms are obliged to disclose a management report that contains various textual information, for example, about the economic position, risk and opportunities, research and development, or forecasting. These narrative elements inherently entail a great deal of managerial discretion, such that their usefulness heavily depends on the author’s willingness to design the report

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in an appropriate fashion. We use techniques from computational textual analysis in order to capture the properties of firms' narrative disclosures. In particular, we rely on the year-over-year similarity of firms' narratives to capture the extent of non-updates or non-modifications (stickiness). Namely, we compute the cosine similarity of the management report as well as of the forecast section. We assume that a high share of copy-paste impairs the usefulness, as it word-for-word repeats old content and provides no new information. Thus, we analyze the firm-level determinants of copy-paste intensity and show that firms with incentives to create a more opaque information environment systematically exploit this strategy. Namely, habitual disclosure avoiders, financially constrained firms, firms that act in less concentrated industries and firms with abnormally high margins are significantly more engaged in copy-pasting. In contrast, we find that firms facing greater demand for financial reporting update their reports to a higher degree. All results are consistent to our expectations. We conclude that firms adapt the informativeness of their narrative reports in a way that meets their preferences and needs.

To reinforce that some firms use copy-paste in order to avoid revealing useful information, we further analyze whether firms succeed with this strategy. A narrative report is considered useful if the content is consistent with current accounting data and allows for predicting future performance. Hence, we analyze the consistency and the predictive ability of the content of firms' management reports with respect to its copy-paste intensity. Our results indicate that the content of reports with a high share of copy-paste is less coincided with current accounting numbers and exhibits less predictive power in terms of future earnings. We conclude that private firms systematically file copy-paste reports to lower the value of publicly available information.

The last chapter (*Part D*) provides a more holistic view on the managerial discretion of financial reporting choices. Using cluster analysis, I group firms that share financial reporting characteristics from three different domains (earnings properties, textual properties and timeliness). This approach allows me to identify common disclosure strategies. Based on seven firm-level measures, I identify distinctive patterns in the financial reporting properties of private firms. The results imply complementary and substitutional relationships among certain measures. As such, it appears that the extent of the textual year-by-year modification of firms' management reports and the disclosure delay are positively associated. I also show, that cluster affiliation is related to firms' fundamentals, performance and ownership structures. Moreover, tracking firms' cluster affiliation over

the investigation period allows for insights in the variability of financial reporting choices. During the sample period, most firms remain in their original cluster; however, some firms switch cluster affiliation. A more detailed analysis of the decision to switch cluster affiliation could be a promising research opportunity to enhance our understanding about the financial reporting incentives of private firms.

In summary, this thesis should contribute to the ongoing debate on the financial reporting requirements of private firms⁷ by providing empirical insights to better understand incentives and needs. As such, I present large-sample evidence on the reporting characteristics of German private firms based on comprehensive data that capture multi-domain aspects of financial reporting (accounting numbers, narrative requirements and timeliness). It becomes apparent that mandatorily disclosing information is not always in line with private firms' interests. The results suggest that firms systematically exploit managerial discretion in order to reduce the informational significance of disclosed documents.

Given the increasing availability and efficiency of big data analytics, text mining and machine learning, the challenge of being not too transparent will continue to be important in the future. Adverse effects of disclosing information might intensify when considering that enhanced technological opportunities even enable analyzing unstructured data and gaining insights through connecting data. Admittedly, it is not very likely that certain information, e.g., from the management report or the income statement, is harmful to a firm's prospect. However, this could significantly change when financial statement data is meaningfully connected with information from other sources. Exploiting linked data and building relationships between facts is a powerful approach. As such, so-called uniform resource identifiers facilitate the integration of a wide range of information on single entities.⁸ Another example is the Semantic Web, which allows for presenting multi-domain knowledge from heterogeneous open and commercial databases. The right data in the right context, processed by the right algorithm, may enable a more precise prediction of peers' future actions, needs and weaknesses. Thus, being *silent* will remain a decisive issue for some firms.

⁷ This is not only debated in Europe, but also a current topic in the US. In consequence of a significant decline of listed companies and a drastic raise of private capital, calls for also regulating private firms become more and more prevalent (e.g., DeFontenay 2017).

⁸ For instance, in 2017, the operator of the German Federal Gazette, the "*Bundesanzeiger Verlag GmbH*", has been certified by the Global Legal Entity Identifier Foundation (GLEIF) and already uses the Legal Entity Identifier System (GLEIS), which allow for an unambiguously identification of legal entities and data integration (Bundesanzeiger Verlag 2017).

Part A: Regulation

*Internationalization and harmonization of SME accounting
– Research, regulation and positions in the EU*

Abstract

In this paper, we analyze the demand for a further harmonization and internationalization of the accounting requirements for small and medium-sized entities (SMEs) within the European Union (EU). From a theoretical perspective, SME accounting is closely linked to contractual and legal obligations. Hence, it is shaped by and must account for socioeconomic and national differences. Whereas empirical studies provide evidence on the positive effects of accounting harmonization for the adopting companies, those do not offset the additional costs for users and preparers. Accordingly, respondents of the public consultation to the EU Green Paper *Building a Capital Markets Union* support a further harmonization of accounting requirements for larger SMEs, which use non-EU regulated capital markets, but opposed an extension to all SMEs.

This part of the thesis is a joint project with Rolf Uwe Fülbier and Marcus Bravidor. A version in German language is published as Fülbier et al. (2017).

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1 Introduction

The financial reporting of small and medium-sized entities (SME) significantly differs from large listed companies.⁹ While the latter must provide value-relevant information to anonymous shareholders in a timely manner, the financial reporting of private firms is more strongly aligned to the needs of their main stakeholders. In particular, banks, suppliers and other capital lenders are the primary financial statement users. Accounting information provides the basis for funding decisions as well as regular reviews of contractual relationships. For example, debt covenants often rely on accounting figures and their violation could induce increases of interest or even the withdrawal of loans (Leuz et al. 1998, Haghani et al. 2014, Zülch et al. 2014). Moreover, SME accounting has a strong national character as it is closely embedded in the regulatory environment. Accordingly, national differences regarding company law, insolvency law, or the enforcement of contracts are responsible for cross-country differences in SME accounting (e.g., Fülbier and Gassen 2010, Gassen and Fülbier 2015).

The internationalization and harmonization of accounting requirements based on the capital-market orientated International Financial Reporting Standards (IFRS) has always been accompanied by the question of whether they should affect firms not using capital markets. In particular, the European Commission (EC) – a body that is highly receptive to harmonization – has recently taken up the idea again in the context of the new Green Paper *Building a Capital Markets Union*. However, it is controversial whether the internationalization and the harmonization of SME accounting makes any economic sense at all, for example, if it facilitates the funding of private firms. The present study aims to contribute to the clarification of open issues. After providing a brief evaluation of the characterizing features of SME accounting and a short overview of the regulatory setting (Section 2), we review the literature on relevant accounting research (Section 3). Afterwards, we empirically analyze the public opinion regarding a further internationalization and harmonization of SME accounting (Section 4). The underlying research questions are twofold: First, we examine whether respondents support an expansion of harmonization and if so, which regulatory basis (IFRS, IFRS for SMEs or a new EU-wide standard) they prefer. Second, we analyze the influencing factors of this decision.

⁹ The term *public firm* or *capital-market orientated firm* is based on Article 264d of the German Commercial Code (GCC) and defines firms using organized (and EU-regulated) capital markets.

2 Purpose and regulation of SME accounting

2.1 Financial reporting in a private firm setting

The overall objective of accounting lies in the mitigation of information asymmetries regarding firms' economic situation between stakeholders as "outsiders" and the management as better-informed "insiders". However, when distinguishing between firms using capital markets and private companies, there are sub-functions that vary in their importance (e.g., Fülbier and Gassen 2008): On the one hand, accounting aims to provide timely and useful information to predict future developments and to allow a continuous valuation of companies' shares (*valuation*). For firms with a strong separation of ownership and management, the perspective of current and potential shareholders dominates. They attempt to precisely evaluate equities traded on secondary markets. On the other hand, the second purpose of financial accounting focuses on the coordination of contractual relationships such as dividend distribution, payout restrictions, taxation, or providing the basis for determining interests or the compensation of management (*contracting*).

Apart from regulated capital markets, SME accounting is primarily characterized by the second purpose. Owners of privately held firms are not interested in a daily valuation of their shares and do not need to rely on accounting information. Close ties to the management guarantee privileged channels to obtain information even beyond the scope of accounting. Moreover, the special contractual relationships of their main stakeholders (lenders, customers, employees, or tax authorities) require an accounting regime that considers the domestic company and tax law, as well as further national peculiarities.

In contrast, large public companies operate in globalized markets with more homogeneous requirements. The IFRS reflect this homogeneity as they are consequently aligned to capital markets' needs and are motivated by a strict focus on valuation. In comparison, however, the group of privately held firms is much more heterogeneous in firm characteristics, as well as in stakeholder needs (Fülbier et al. 2010). For example, larger private firms with a broader group of shareholders or those which use unregulated markets (e.g., via SME bonds at the non-EU regulated over-the-counter market) are more likely to be influenced by valuation than small firms with simple ownership structures relying on relationship lending (Nobes 1998).

2.2 Recent steps toward the internationalization of SME accounting

Due to their great importance for economic development, the EC has paid more attention to SMEs during the last decade. The *Small Business Act* in 2008 visibly established the principle of *think small first*. The aim of the initiative is to reduce the bureaucratic burden of complying with legal rules and standards. This was also the leading principle of the latest accounting directive (2013/34/EU), which was implemented in Germany by the *Accounting Directive Implementation Act* (BilRUG) in 2015. A possible and intensively discussed adoption of the IFRS for SMEs (European Commission 2011a) – a simplified version of (*full*) IFRS – was neither addressed nor implemented by the directive. As early as 2010, the EC launched a public consultation on the IFRS for SMEs and already documented very heterogeneous opinions. While representatives from Eastern Europe and from countries with an Anglo-American tradition welcomed the adoption, continental European countries in particular clearly expressed their concerns (European Commission 2010, Quagli and Paoloni 2012). The major role of accounting in code-law countries as a tool for coordination (assessment of dividends, tax or bankruptcy) may explain these results. Capital-market based accounting systems such as IFRS or IFRS for SMEs, which are exclusively designed to convey useful and value-relevant information, are less appropriate for contracting purposes (Fülbier and Gassen 2010, Ball et al. 2015). Moreover, firms in code-law countries traditionally rely more heavily on debt financing. The lending (house) banks are able to individually determine and secure their information needs and access channels beyond financial reporting (e.g., individual conversations or soft and confidential non-accounting information).

Particularly in Germany, an introduction of the IFRS for SMEs is not to be expected as the German legislator positioned the local *Generally Accepted Accounting Principles* (GAAP) against international standards. In 2009, the Accounting Law Modernization Act (BilMoG) significantly revised the local accounting rules, which are now seen as a more cost-efficient and simpler alternative (German Bundestag 2008). However, there are 78 countries around the world (International Accounting Standards Board (IASB) 2016) that apply the IFRS for SMEs or a modified version. Since SMEs in some European countries are even obliged to follow (variants of) *full* IFRS, the question regarding an EU-wide harmonization is sensible and still en vogue. Recently, for example, the Green Paper *Building a Capital Markets Union* (European Commission 2015a) addressed the possibility of a further harmonization for SMEs using the non-EU regulated capital market.

Although public opinion is mainly positive (see Section 5), it was not pursued in the subsequent action plan (European Commission 2015b).

3 Prior empirical research on SME accounting

The internationalization of SME accounting is only rational and economically meaningful if a positive net benefit exists. For large and capital market-oriented companies, there are numerous empirical studies which show positive (capital market) effects of IFRS adoption (for an overview, see, De George et al. 2016, more critically, Brüggemann et al. 2013). The studies measure and document a significantly enhanced earnings quality. Based on higher transparency and a more efficient allocation of capital, firms benefit from lower costs of capital (equity and debt) (e.g., Daske et al. 2008, Daske et al. 2013). However, it is hard to disentangle IFRS adoption effects from other institutional changes (e.g., enforcement). Even if there should be advantages for larger firms, it remains doubtful whether they are also valid for SMEs. The argumentation of the IASB is based on the (continuing) globalization of product markets. Hence, private firms should also benefit from increased transparency, better comparability and *ceteris paribus*, lower transaction costs (IASB 2009, BC 36–37). In addition, it facilitates cross-border financing opportunities and opens access to capital markets. Apart from technical simplifications of group accounting and consolidation, these arguments are solely based on the valuation aspect of accounting.

A large number of empirical studies also deal with the acceptance and suitability of international standards for SMEs. In particular, survey-based evidence emphasizes the high importance of the contracting role of accounting (coordination). Most of these studies analyze the perception of preparers. Only a few consider financial statement users (e.g., banks). Table 1 provides an overview of studies with German participants.¹⁰ Asked about their perception regarding valuation-based accounting systems, such as the IFRS or IFRS for SMEs, participants are rather critical. Both systems receive only a small degree of acceptance, suggesting that (voluntary) adoption is not an option for the majority of firms (Eierle et al. 2007, Eierle and Haller 2010, Grottke et al. 2011). The survey participants cite the complexity of the rules, significant conversion and follow-up costs, and higher earnings volatility as essential arguments. Firms seem to be aware of the advantages, but

¹⁰ For a review of international survey studies on SME accounting, see, Mages (2009).

Table 1:
Survey studies on the perception of international accounting standards

Study	Sample	Subject	Major findings	
			Reasons for adaption (pros)	Reasons against adaption (cons)
Marten et al. (2002)	1,200 members of “ <i>Deutsche Vereinigung für Finanzanalyse und Asset Management (DVFA)</i> ”	IFRS	Participants welcome IFRS also for private firms; private firms often underestimate the benefits of an IFRS adaption.	
Mandler (2003b)	145 academics	IFRS	Compared to firms, academics are more positive regarding the application of IFRS for private firms.	
Mandler (2003a, 2004)	400 member firms of the “ <i>IHK Mittelhessen</i> ”	IFRS	Enhanced international comparability.	Significant costs for adaption.
Wetzel (2003)	8,364 private firms; revenue > 35 m. € or total assets > 13 m. €	IFRS	Substantial interest in the adaption of IFRS; about two thirds of private firms consider an adaption.	
v. Keitz and Stibi (2004)	4,556 firms from North Rhine-Westphalian, revenue > 20 m. €	IFRS	Improves corporate finance opportunities; facilitates consolidation.	High complexity; costs of adaption, negative impact on taxation.
DIHK and PwC (2005)	Members of the “ <i>DIHK</i> ”, response: 600 questionnaires	IFRS	Improves presentation of assets, financial position and performance.	Costs of adaption and follow-up costs.
Oehler (2006a)	250 banks from the “ <i>Bundesverband deutscher Banken</i> ”	IFRS	Banks use different rating tools for large companies than for SMEs; no major facilitations for financial analysis; adaption of IFRS does not per se lead to a better rating.	
Oehler (2006b)	1,800 firms from Franconia, employees < 500, revenue < 50 m. €	IFRS	IFRS adaption only if it would be claimed by banks; more informative value of accounting figures.	Costs of adaption, costly employee training; complexity.
Ochs and Leibfried (2006)	600 firms, employees < 500, revenue < 50 m.	IFRS	Enhances international comparability.	High complexity, costs of adaption and follow-up costs.
Danne et al. (2007)	60 large family firms	IFRS	Enhances comparability with peers.	Increased costs for financial statement preparation, higher earnings volatility.
v. Keitz et al. (2007)	4,780 firms from North Rhine-Westphalian, revenue > 20 m. €	IFRS	Access to alternative financing opportunities; facilitated consolidation.	High complexity; costs of adaption, negative impact on taxation.
Kajüter et al. (2007)	971 firms from Berlin, revenue > 5 m. €, employee 50-500	ED IFRS for SMEs	Enhances comparability with peers.	Additional personnel is required, high complexity.
Eierle et al. (2008)	4,000 firms, revenue > 8 m. €	ED IFRS for SMEs	Many accounting issues that are simplified by the ED-IFRS for SMEs are not/less relevant for participating firms; evaluation of certain accounting rules is mixed; 16 % of firms consider an adaption.	
Zülch and Löw (2008)	2,430 employees from 1.544 banks	IFRS	Firms do not perceive any benefits in credit ratings per se; only two participants would advise their clients to adapt IFRS; no improvements in credit condition through adaption.	
Kajüter et al. (2008)	1,593 SMEs from France, Germany, Netherland, Spain and UK	ED IFRS for SMEs	Overall, there is a need for harmonized accounting rules; however, evaluation is mixed; greater support from the UK; Italian and Spanish participants are more receptive than France and German respondents; the latter two are most critical.	

Table 1:
continued

Study	Sample	Subject	Major findings	
			Reasons for adaption (<i>pros</i>)	Reasons against adaption (<i>cons</i>)
Haller et al. (2009)	59 employees from regional banks	IFRS	Financial statements are relevant for capital lending; international comparable information is also important for SMEs; however, participants do not see any need for special accounting rules (IFRS for SMEs).	
Mages (2009)	2,767 partnerships, revenue > 40 m. €	IFRS	Required by parent company; facilitates consolidation.	Costs of adaption and follow-up costs.
Becker et al. (2009)	113 medium-sized firms from Franconia	IFRS	Only a small proportion has ever dealt with IFRS or IFRS for SMEs; no major interest in adaption.	
Hane and Müller (2011)	6,927 firms, employee < 250	IFRS/ IFRS for SMEs	IFRS for SMEs is advantageous compared to full IFRS; however, considering the purpose of accounting, participants prefer the modernized German GAAP (<i>BilMoG</i>).	
Eierle et al. (2011a)	4,000 private firms, revenue > 10 m. €	IFRS for SMEs	Compared to a prior study, need for international comparability has increased; evaluation of certain rules of the IFRS for SMEs is mixed; 14 % of firms consider an adaption.	
Eierle et al. (2011b)	342 private firms, revenue > 20 m. €	IFRS for SMEs	Compared to the full IFRS, the IFRS for SMEs has a better cost-benefit ratio; only a few firms see advantages in a (hypothetical) change from full IFRS to IFRS for SMEs.	
v. Keitz et al. (2011)	4,564 firms from North Rhine-Westphalian, revenue > 20 m. €	IFRS	Enhanced comparability with peers; harmonization of financial reporting and management accounting.	Complexity; costs of adaption and follow-up costs.
Grottko et al. (2011)	2,930 member firms of <i>HWK, IHK</i> and <i>LSWB Bavaria</i>	IFRS for SMEs	Participants reject an adaption; detailed notes entail indirect costs; no need for international comparability; only 5 % of participants consider the adaption to be useful.	
Müller and Hillebrand (2014)	58 large family firms	IFRS/ IFRS for SMEs	Enhanced international comparability.	Costs of adaption; high complexity.

Notes: Table comprises prior survey-based literature on the perception of international accounting rules for private firms of either *full* IFRS and/or the IFRS for SMEs indicated by column "subject". Moreover, last column is twofold and sums either most cited or most relevant reasons for (*pros*) and against (*cons*) of a potential adaption. If the research design does not allow such a distinction, last column presents major findings.

classify them as less relevant. The assessment of international accounting from the perspective of banks' is less homogenous, but the critical aspects dominate as well. Although banks as financial statement users welcome internationally comparable accounting data, only a small fraction sees significant advantages for their SME clients. Moreover, the results do not suggest substantial improvements in rating or credit costs. Nevertheless, cross-country evidence is mixed and the results are in line with expectations based on countries' legal origin. The mostly negative view of German and French firms is offset by a much more positive perception of countries such as the United Kingdom, the Netherlands and Spain (Kajüter et al. 2008).

Table 2:
Archival studies on financial reporting properties of private firms

Panel A: Differences in accounting quality		
Study	Sample	Major findings
Ball and Shivakumar (2005)	UK private firms 1990-2000	Compared to public companies, private firms exhibit financial reporting properties of lower quality.
Burgstahler et al. (2006)	private firms from 13 European countries 1997-2003	Compared to public companies, private firms exhibit a greater extent of earnings management; a strong legal system negatively affects earnings management for public and private firms.
Goncharov and Zimmermann (2006)	Russian private firms 2001-2002	Compared to listed companies, private firms are stronger engaged in downsizing earnings in order to save taxes.
Garrod et al. (2008)	Slovenian SMEs 2003	SMEs systematically use asset write-downs to reduce their tax bills.
Peek et al. (2010)	private firms from 13 European countries 1993-2000	Listed firms exhibit more asymmetric timeliness of income recognition (conservatism) than private firms; results suggest that creditors of public firms demand asymmetric timeliness.
Hope et al. (2013)	US private firms 2001-2009	Listed firms exhibit higher accrual quality and report more conservatively than private firms.
Kosi and Valentincic (2013)	Slovenian SMEs 2004-2005	SMEs use asset write-downs to reduce their tax bills.
Szczesny and Valentincic (2013)	German SMEs 2003-2006	Significant associations between write-downs and profitability, financial debt and dividends.
Liu and Skerrat (2015)	UK firms 2006-2013	Compared to private firms, listed companies exhibit a higher accounting quality; large and medium-sized private firms exhibit a lower accounting quality compared to small and micro companies.
Gassen and Fülbier (2015)	European private firms 1998-2007	Income smoothing is positively related to the extent of debt financing.
Bigus et al. (2016)	German small firms 1996-2004	The legal form is associated with accounting quality; compared to one-person businesses, corporations exhibit a higher degree of income smoothing, conservatism and timely loss recognition
Panel B: Benefits of financial reporting, accounting quality and audit		
Study	Sample	Major findings
Allee and Yohn (2009)	US small private firms 2003-2004	Firms that provide accrual-based financial statements exhibit lower interest rates than firms using cash accounting.
Chen et al. (2011)	private firms from emerging markets 2002-2005	Accounting quality is positively associated with investment efficiency.
Minnis (2011)	US private firms 2001-2008	Firms with financial audits exhibit significantly lower costs of debt; accounting numbers (accruals) from audited financial statements better predict future cash flows.
Lennox and Pittman (2011)	UK private firms 2004	Firms that voluntarily choose an audit receive improvements in rating.
Karjalainen (2011)	Finish private firms 1999-2006	Perceived audit quality is associated with lower cost of debt capital.
Hope et al. (2011)	private firms from 68 countries 2002-2005	Firms with greater financial reporting credibility experience significantly lower perceived problems in gaining access to external funding.
Dedman and Kausuar (2012)	UK small firms 2004	Private firms that retain to be audited voluntarily receive higher credit rating scores than those that opt out of audit.
Van Caneghem and Van Campenhout (2012)	Belgian private firms 2007	Information quantity and quality is positively associated with leverage of SMEs.
Van Bauwhede et al. (2015)	Belgian private firms 1997-2010	Accrual quality is negatively associated with effective interest costs.
Notes: Table comprises archival studies on accounting properties of private firms. The overview briefly shows a selection of studies from a recent literature review by Singleton-Green (2015).		

Another strand of the literature employs archival data and uses statistical methods to study the accounting properties of SMEs. Most of the studies aim to document differences in financial reporting and accounting behavior between small and large firms, private and public firms, or between owner- and externally managed firms. Table 2 shows a selection of studies based on a recent literature review by Singleton-Green (2015). The results imply that accounting properties depend on the listing status (e.g., Burgstahler et al. 2006), the level of debt financing (e.g., Gassen and Fülbier 2015), or the country of origin. The latter in particular supports the initially stated thesis of high interdependencies between the socio-economic backgrounds and SME accounting. Hence, differential accounting requirements based on country-level idiosyncrasies and company characteristics (e.g., listing status) seem to be an adequate approach. An evaluation of further harmonization should therefore not only be based on a presumably enhanced accounting quality. Rather, the costs and benefits will vary with respect to jurisdiction, the type of SME (distance to capital markets, internationality, or size) and among the main stakeholders (shareholders, banks, suppliers, etc.). However, there is a lack of differentiated empirical support. Thus, we address this issue by analyzing the cross-country perception of further harmonization of SME accounting in the EU.

4 Empirical evidence on the public opinion within the EU

4.1 Research question and data

In this section, we examine the public opinion on a further harmonization of SME accounting and its dependence on socio-economic factors. We therefore analyze the comments on the Green Paper *Building a Capital Markets Union* of the European Commission (2015a). It discusses various initiatives aiming to increase and diversify the financing opportunities of private firms and to reduce the costs of raising capital for SMEs (EC 2015). Among others, it addresses the question of whether standardized accounting should also be extended to firms on "*SME Growth Markets*", introduced by the *Markets in Financial Instruments Directive* (MiFID II). The *SME Growth Markets* are a separate segment or sub-category of *multilateral trading facilities* (MTFs).¹¹ Currently, there are 151 MTFs in the EU, of which 14 are located in Germany (ESMA 2016). Although MTFs fulfill similar functions as a stock exchange, they are not part of the regulated market.

¹¹ According to the EU directive, SMEs are defined as companies with less than 200 m. € market capitalization (Article 4 (13) of MiFID II).

This allows several simplifications, which make it easier for SMEs to obtain a listing and to comply with follow-up requirements. For example, there is no ad-hoc disclosure and no general IFRS obligation, because the operator of the MTF specifies the conditions and requirements.

Analyzing the comments on the Green Paper allows a picture of the public opinion toward further harmonization of SME accounting to be drawn. Indeed, this primarily covers the segment of larger SMEs using non-EU regulated capital markets (*MTFs*). Nevertheless, the results are indicative of the overall acceptance of further harmonization (and internationalization) of SME accounting.¹² Moreover, we examine the determinants of acceptance. There are many influencing factors, such as the opportunistic behavior of the participants (lobbying) or the institutional setting and legal environment of participants' origin. The different and often competing intentions of interest groups (e.g., users, preparers, regulators, accounting profession, etc.) have already been highlighted by various studies (e.g., Jorissen et al. 2012). For example, auditors are more likely to exhibit greater interests in regulatory changes because this creates additional audit and advisory needs. In contrast, preparers will weigh the benefits of switching to a new system (e.g., comparability) against the incurred costs. We expect increased support for harmonization from countries that already allow or require (modified) international standards as costs for adoption are relatively low. However, in these countries, additional benefits are limited. There is also no clear prediction regarding the countries' current SME funding situation. On the one hand, liquid equity markets and frictionless access to debt capital (from banks or debt markets) can reduce incentives to gain additional (international) investors. On the other hand, companies that already use these sources could benefit from increased competition between suppliers and financing alternatives, i.e., they are more likely to prefer harmonization. If firms are mostly interested in the contracting purpose of accounting, they will be confronted with higher costs as they need a second set of reporting instruments. Further, cost-benefit considerations depend on complexity, the administrative burdens of financial statement preparation and the international comparability of accounting figures (Hail et al. 2010).

¹² The raised question is as follows (Q₈): "Is there value in developing a common EU level accounting standard for small and medium-sized companies listed on MTFs? Should such a standard become a feature of SME Growth Markets? If so, under which conditions?" (EC 2015a).

4.2 Methodological approach and research design

In sum, the EU received 376 comment letters during the consultation period from 18th February to 13th May 2015.¹³ The following analysis is limited to comments that contain statements on the harmonization of financial reporting. Since we aim to assess the opinion of European stakeholders, we exclude comments from international institutions and non-EU countries. Furthermore, we drop double submissions (e.g., in different languages), which result in a final sample of 191 comment letters.

First, we conduct a qualitative content analysis (Mayring 2015). Since the relevant section of the Green Paper ends in an open question, we are not able to formulate any ex-ante expectations on proposed accounting systems and the type of argumentation. Hence, we build the categories inductively. All comments are coded twice. In a first step, we predefine appropriate categories. During the second coding, we reduce the number of categories and check consistency. This two-stage procedure enhances the validity of the inherently subjective approach.

Next, we transform the categories into quantitative data. The combination of qualitative and quantitative content analysis is a common approach to statistically evaluate results (Mayring 2001). Moreover, it allows merging data from other sources. By employing logistic regressions, we finally analyze the influence of individual factors on the acceptance (decision behavior) of a further harmonization of SME accounting.

All dependent variables *IFRS*, *IFRSforSMEs*, *NewStandard* and *NoReference* are binary and take the value of “1” if the respondent agrees with the introduction of one of the respective (new) accounting systems (otherwise “0”). Agreement includes both positive comments regarding the introduction of the original standards of the IASB, as well as a participant preference for a modified version. The variable *Harmonization* captures the overall acceptance regardless of the proposed accounting system. It takes the value of “1” if one of the four above-mentioned variables is equal to one.

The independent variables (covariates) cover four different aspects. The first category (*market & regulation*) comprises six country-level measures, which describe the current accounting regulation and financing opportunities of respondents' origin countries: *Equity* proxies the strength of the local equity markets, *Loans* represents the availability of

¹³ All comment letters can be obtained from the website of the European Commission (EU Survey) (<https://goo.gl/JVkcQE>).

debt capital and *Reporting* refers to the quality of financial reporting in respondents' countries. All three variables are based on the *Global Competitiveness Report* of the World Economic Forum (2015), which obtained the indicators by surveying 13,264 professionals from 144 countries. The values refer to the year 2015, i.e., the last complete year before the Green Paper was issued. The variables range from "1" (poor) to "7" (good). *TaxLink* indicates the alignment of financial accounting and taxation (book-tax alignment as it is the case in Germany). The variables *IFRS_{entity}* and *IFRS_{group}* are equal to one if domestic regulation permits or requires IFRS for individual (*entity*) and consolidated financial statements (*group*).

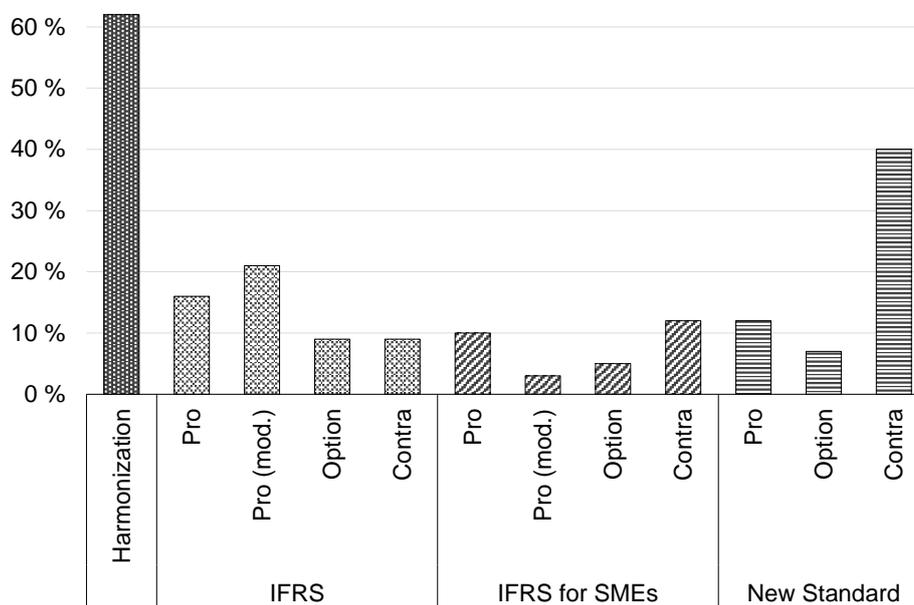
The second group of variables indicates countries' legal origin. The differentiation is based on La Porta et al. (1997) (English origin, *Legor_{uk}*; French origin, *Legor_{fr}*; German origin, *Legor_{ge}*; Scandinavian origin, *Legor_{sc}*). The third set denotes the type of respondent. We classify all participants based on the scheme of Larson (2007): financial statement users (*User*), firms and industry organizations as financial statement preparers (*Preparer*), accounting, tax and auditing firms (*Profession*), governmental institutions and regulators (*Regulators*) and all others, such as academics (*Other*).

The last group of variables captures participants' arguments obtained from the qualitative analysis. We define three pairs of binary measures: increasing (*Costs_{up}*) and decreasing costs (*Costs_{down}*), an increase (*Compare_{up}*) or decrease (*Compare_{down}*) in the comparability of accounting data, and simplified (*Simple*) or increasing accounting complexity (*Complex*) through further EU-level harmonization. All variables are defined in more detail in Appendix A.

5 Results

Overall, there is a high level of acceptance (Figure 2), as 62 % of the respondents support a further harmonization of SME accounting in Europe. However, there are major differences regarding the specific configuration and the regulatory basis for harmonization (Table 3). A new EU-wide standard for SMEs listed on non-regulated capital markets (MTFs) is predominantly rejected (40 %). In particular, the group of accounting profession (65 %) is opposed. Moreover, there is only little support for the IFRS for SMEs, which is preferred by 10 %; 3 % of respondents prefer a modified form. The (*full*) IFRS achieves the greatest amount of approval among all interest groups. About 16 % favor the IFRS as a basis for further harmonization, while another 21 % support the adoption of a modified

Figure 2:
Responses regarding a regulatory basis for further harmonization



Notes: Figure depicts results of content analysis regarding the preferred regulatory solution for further accounting harmonization. The first bar shows participants' overall perception regarding a further harmonization for SMEs listed on MTFs. The coding scheme differentiates between the original standard, a modified version (mod.) and if participant prefers an option for a voluntary application. Comments without a reference to a preferred standard (*NoReference*) are not depicted. Multiple answers possible.

version. Some respondents propose the UK-GAAP as a possible reference for modifications.¹⁴ Among others, the British regulator significantly reduced the amount of notes, resulting in less complex requirements and a less costly application. Of course, a modified standard for SMEs will not fully allow international comparability because other SMEs apply local GAAP or even full IFRS. However, compared to a completely new standard, this would still improve comparability. Before the pros and cons are discussed further, we first characterize the participants and their origins in more detail.

In other comment letter analyses with a focus on accounting, the users of financial statements are generally underrepresented, which might be due to their decentralized organization (e.g., Holder et al. 2013). In this case, however, users make up the largest group of

¹⁴ Private firms from the UK are allowed to use a modified version of the IFRS (Financial Reporting Standard (FRS) 101) or a modified version of the IFRS for SMEs (FRS 102) (Financial Reporting Council 2015).

Table 3:
Responses by interest groups

	User		Preparer		Profession		Regulator		Other		Total	
	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.	abs.	rel.
Harmonization	66	63 %	18	60 %	17	85 %	19	59 %	3	60 %	118	62 %
IFRS	17	16 %	0	0 %	9	45 %	4	13 %	1	20 %	31	16 %
Pro (mod.)	16	15 %	6	20 %	12	60 %	7	22 %	0	0 %	40	21 %
Option	6	6 %	5	17 %	1	5 %	5	16 %	0	0 %	17	9 %
Contra	10	10 %	5	17 %	2	10 %	0	0 %	0	0 %	17	9 %
IFRS for SMEs	12	12 %	1	3 %	2	10 %	4	13 %	0	0 %	19	10 %
Pro (mod.)	2	2 %	1	3 %	0	0 %	3	9 %	0	0 %	6	3 %
Option	2	2 %	4	13 %	1	5 %	2	6 %	0	0 %	10	5 %
Contra	7	7 %	4	13 %	7	35 %	4	13 %	1	20 %	23	12 %
New Standard	11	11 %	6	20 %	3	15 %	1	3 %	1	20 %	23	12 %
Option	4	4 %	4	13 %	0	0 %	4	13 %	1	20 %	13	7 %
Contra	42	40 %	9	30 %	13	65 %	12	38 %	1	20 %	76	40 %

Notes: Table depicts results of content analysis by interest group. The first row show participants' overall perception regarding a further harmonization of accounting for firms listed on MTFs. Other rows denote the preferred regulatory basis for harmonization. The coding scheme differentiates between the original standard, a modified version (mod.) and if participant prefers an option for a voluntary application (option) or reject it (contra). Multiple answers possible.

Table 4:
Descriptive Statistics

	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<u>Market & regulation</u>						
<i>Equity</i>	191	4.157	0.604	3.861	4,252	4.532
<i>Loans</i>	191	3.113	0.613	2.690	3,328	3.349
<i>Reporting</i>	191	5.504	0.446	5.464	5,573	5.791
<i>TaxLink</i>	191	0.717	0.452	0	1	1
<i>IFRS_{entity}</i>	191	0.639	0.482	0	1	1
<i>IFRS_{group}</i>	191	0.979	0.144	1	1	1
<u>Legal origin</u>						
<i>Legor_{uk}</i>	191	0.225	0.419	0	0	0
<i>Legor_{fr}</i>	191	0.440	0.498	0	0	1
<i>Legor_{ge}</i>	191	0.267	0.444	0	0	1
<i>Legor_{sc}</i>	191	0.068	0.253	0	0	0
<u>Interest group</u>						
<i>User</i>	191	0.545	0.499	0	1	0
<i>Other</i>	191	0.026	0.160	0	0	0
<i>Preparer</i>	191	0.157	0.365	0	0	0
<i>Profession</i>	191	0.105	0.307	0	0	0
<i>Regulator</i>	191	0.168	0.374	0	0	1
<u>Argument</u>						
<i>Costs_{up}</i>	191	0.419	0.495	0	0	1
<i>Costs_{down}</i>	191	0.010	0.102	0	0	0
<i>Compare_{up}</i>	191	0.372	0.485	0	0	1
<i>Compare_{down}</i>	191	0.178	0.384	0	0	0
<i>Simple</i>	191	0.110	0.314	0	0	0
<i>Complex</i>	191	0.152	0.360	0	0	0

Notes: Table depicts descriptive statistics of independent variables. All variables are defined as described in Appendix A.

participants (54 %). The broad thematic focus of the Green Paper, which does not explicitly refer to accounting expertise, may provide a possible explanation for this. In particular, a comparable high number of bank and analyst associations as well as shareholder representatives participated. This group is otherwise less involved in, e.g., the due processes of the IASB. The majority of comments are from countries with a French legal origin (*Legor_{fr}*, 44 %). However, this concentration in relation to nationality and other

Table 5:
Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
(1) <i>Equity</i>	1.00																					
(2) <i>Loans</i>	0.36	1.00																				
(3) <i>Reporting</i>	0.80	0.61	1.00																			
(4) <i>TaxLink</i>	-0.57	0.34	-0.40	1.00																		
(5) <i>IFRS_{entity}</i>	0.10	-0.41	0.04	-0.47	1.00																	
(6) <i>IFRS_{group}</i>	0.14	0.13	0.20	-0.09	-0.11	1.00																
(7) <i>Legor_{uk}</i>	0.54	-0.41	0.24	-0.75	0.41	0.08	1.00															
(8) <i>Legor_{fr}</i>	-0.27	0.18	-0.23	0.32	-0.63	0.13	-0.48	1.00														
(9) <i>Legor_{ge}</i>	-0.28	0.04	-0.13	0.35	0.31	-0.24	-0.33	-0.54	1.00													
(10) <i>Legor_{sc}</i>	0.12	0.25	0.28	-0.02	0.03	0.04	-0.15	-0.24	-0.16	1.00												
(11) <i>Other</i>	-0.01	0.03	-0.01	0.03	-0.01	0.02	-0.01	0.05	-0.03	-0.04	1.00											
(12) <i>Preparer</i>	-0.17	-0.07	-0.15	0.18	-0.07	0.06	-0.16	0.05	0.13	-0.06	-0.07	1.00										
(13) <i>Profession</i>	0.16	-0.03	0.10	-0.17	0.01	0.05	0.18	-0.06	-0.09	-0.03	-0.06	-0.15	1.00									
(14) <i>Regulator</i>	-0.06	0.09	0.06	0.03	0.08	0.07	0.03	-0.17	0.11	0.10	-0.07	-0.19	-0.15	1.00								
(15) <i>User</i>	0.07	-0.01	0.01	-0.06	-0.01	-0.13	-0.01	0.11	-0.11	0.00	-0.18	-0.47	-0.37	-0.49	1.00							
(16) <i>Costs_{up}</i>	-0.03	0.17	0.05	0.20	-0.02	-0.10	-0.18	-0.05	0.18	0.07	-0.07	0.13	0.06	0.02	-0.12	1.00						
(17) <i>Costs_{down}</i>	0.09	0.07	0.11	-0.05	0.08	0.02	0.07	0.01	-0.06	-0.03	-0.02	-0.04	0.13	-0.05	-0.01	0.02	1.00					
(18) <i>Compare_{up}</i>	0.18	-0.06	0.15	-0.26	0.06	0.04	0.26	-0.07	-0.12	-0.08	0.01	-0.18	0.20	0.00	0.01	-0.04	0.13	1.00				
(19) <i>Compare_{down}</i>	0.16	0.02	0.07	-0.13	-0.13	0.07	0.18	0.03	-0.22	0.04	-0.08	-0.01	0.24	0.01	-0.12	0.10	0.09	0.18	1.00			
(20) <i>Simple</i>	0.05	0.01	0.02	-0.08	-0.05	0.05	0.13	-0.04	-0.06	-0.03	-0.06	-0.06	0.15	0.02	-0.05	-0.06	0.13	0.22	0.32	1.00		
(21) <i>Complex</i>	0.10	0.10	0.06	0.01	-0.23	0.06	0.02	0.15	-0.16	-0.06	0.02	-0.02	0.28	0.01	-0.17	0.17	0.10	0.16	0.26	0.13	1.00	

Notes: Table depicts correlation coefficients of independent variables. All variables are defined as described in Appendix A.

macroeconomic and regulatory determinants is not surprising when considering the restriction on comments from EU countries. The variables *Equity* and *Reporting* show high values. With a mean of 5.5, the quality of financial reporting is already considered to be relatively high. More than 70 % of comments are from countries with book-tax conformity (*TaxLink*).¹⁵ Moreover, about 64 % (98 %) of participants are from countries, which allow or require IFRS for individual statements (consolidated statements). Higher expected administrative costs for preparers (*Costsup*, 42 %) and increasing the comparability of financial statements (*Compareup*, 37 %) are the most cited arguments. Only 1 % of participants expect a cost reduction through harmonization (*Costdown*). The arguments regarding a proposed increase in complexity vs. potential simplifications are balanced (15 % vs. 11 %). Table 4 reports the descriptive statistics.

Table 5 shows the correlation matrix of independent variables. There are partly high correlations (> 0.5) between the variables capturing the macroeconomic and legal environment. However, the variance inflation factors of all logistic regressions are well below 3.5, indicating only moderate multicollinearity, which should not affect the results (Wooldridge 2009).

Results from logistic regressions are depicted in Table 6. The coefficients show marginal effects that quantify the increase in the probability of an approval of harmonization when the independent variable increases by one unit. Likewise, the coefficients of Models (2-5) indicate the marginal increase in acceptance of the regulatory alternatives (*full IFRS*, *IFRS for SMEs*, etc.). Model (1) shows the influence of determinants toward the harmonization of SME accounting regardless of the underlying accounting system. The acceptance enhances if the marginal costs of the potential change of the accounting system are low. This is the case if the country already possesses a high-quality domestic accounting system (*Reporting*) or allows financial statements in accordance with the IFRS (*IFRS_{entity}*). Both variables are positively associated. Moreover, respondents from countries with a French legal origin, which do not extensively rely on capital-market based funding, are more likely to support harmonization. It is probable that they will benefit from more simplified access to (foreign) capital markets through harmonization. The highly significant coefficients of *Compareup* and *Simple* presumably show the influence

¹⁵ We do not include a binary variable, capturing the (voluntary) application of the IFRS for SMEs of the country of origin, as it correlates almost perfectly with *TaxLink* (correlation amounts to -0,94).

Table 6:
Determinants of perception of further harmonization

	(1) Harmonization	(2) IFRS	(3) IFRS for SMEs	(4) New Standard
<u>Market & regulation</u>				
<i>Equity</i>	-0.182 (-1.56)	-0.217* (-1.77)	0.026 (0.27)	0.101 (0.95)
<i>Loans</i>	-0.221* (-1.69)	-0.005 (-0.03)	-0.126 (-1.20)	0.020 (0.20)
<i>Reporting</i>	0.654*** (3.86)	0.389*** (2.16)	0.087 (0.72)	-0.063 (-0.45)
<i>TaxLink</i>	0.237 (1.54)	0.168 (1.07)	0.064 (0.56)	-0.089 (-0.73)
<i>IFRS_{entity}</i>	0.252** (2.54)	0.148 (1.43)	-0.073 (-0.99)	0.042 (0.54)
<i>IFRS_{group}</i>	-0.384* (-1.80)	-0.600*** (-3.39)	n.a. (.)	-0.101 (-0.82)
<u>Legal origin</u>				
<i>Legor_{uk}</i>	0.187 (1.00)	0.370** (2.25)	-0.073 (-0.61)	-0.155 (-1.00)
<i>Legor_{fr}</i>	0.306* (1.93)	0.302** (2.24)	-0.154 (-1.62)	0.059 (0.56)
<i>Legor_{ge}</i>	0.013 (0.09)	-0.110 (-0.75)	-0.174* (-1.84)	0.072 (0.63)
<u>Interest group</u>				
<i>Other</i>	0.030 (0.16)	-0.073 (-0.39)	n.a. (.)	0.111 (0.99)
<i>Preparer</i>	-0.053 (-0.62)	-0.008 (-0.08)	-0.036 (-0.46)	0.079 (1.32)
<i>Profession</i>	0.150 (1.19)	0.307*** (3.02)	-0.076 (-0.90)	0.067 (0.90)
<i>Regulators</i>	-0.049 (-0.54)	0.028 (0.34)	0.021 (0.35)	-0.105 (-1.03)
<u>Argument</u>				
<i>Costs_{up}</i>	-0.047 (-0.71)	-0.071 (-1.09)	0.026 (0.53)	0.036 (0.76)
<i>Costs_{down}</i>	0.000 (.)	-0.404 (-1.44)	0.000 (.)	n.a. (.)
<i>Compare_{up}</i>	0.204*** (3.13)	0.115* (1.93)	0.039 (0.83)	-0.044 (-0.84)
<i>Compare_{down}</i>	0.139 (1.44)	0.253*** (3.51)	-0.061 (-0.91)	n.a. (.)
<i>Simple</i>	0.513*** (2.73)	0.065 (0.68)	0.174*** (2.95)	0.198*** (3.25)
<i>Complex</i>	0.044 (0.44)	0.072 (0.87)	0.017 (0.25)	-0.090 (-1.15)
n	189	191	189	191
VIF	2.96	2.97	3.15	3.13
AUC	0.81	0.83	0.77	0.78
Pseudo R ²	0.231	0.277	0.155	0.160

Notes: Table depicts logit regression results with either (1) *Harmonization*, (2) *IFRS*, (3) *IFRSforSMEs* and (4) *NewStandard* as dependent variable. For parsimony, (5) *NoReference* is not depicted. All variables are defined as described in Appendix A. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

of financial statement users, who expect a simplified handling of financial information through enhanced international comparability.

Model (2) represents the support for harmonization through the introduction of (modified) IFRS. The results are similar. The accounting profession group is significantly more likely to propose IFRS as regulatory basis for further accounting harmonization.¹⁶ Likewise, respondents from countries with an English or French legal origin significantly support IFRS.¹⁷ The significant coefficient of *Compare_{down}* suggests that respondents desire increasing comparability between all companies, regardless of the type of public capital market they use. Consequently, they are not interested in a further fragmentation of European accounting regulations (28 national systems plus IFRS). Moreover, this highlights the importance of the valuation aspect of accounting from the user's point of view.

The remaining Models (3-5) analyze the support for the (modified) IFRS for SMEs, the introduction of a new set of EU-level accounting rules and general support for further harmonization without reference to a certain standard. Due to the missing variance, some variables are omitted ("n.a."). The IFRS for SMEs, as well as a potential new EU-wide standard, are seen as an opportunity for simplification, however, are not associated with increased comparability. This seems reasonable, since the alternatives neither guarantee comparability to other SMEs that prepare their accounts according to national standards nor to public firms using IFRS.

The explanatory power of the employed models is two-fold. Models (1) and (2) show a pseudo R² of above 20 %, while Models (3-5) are well below.¹⁸ Accordingly, the results of the former appear to be more valid. In addition, the low variance of the independent variables weakens the power of the models examining the preference for certain accounting systems. Overall, this study allows some tentative but interesting inferences. The participants are very interested in the further harmonization of SME accounting. However, they focus less on small, "private" firms (typical SMEs) and more on larger companies listed on regulated capital markets or MTFs. In accordance with the valuation purpose of accounting, they give more weight to gains in comparability on the user side than to additional costs. Hence, the comments do not reveal a clear indication regarding preferences for harmonization or internationalization for firms beyond capital markets. In particular,

¹⁶ The reference category is *User*.

¹⁷ The reference category is *Legor_{sc}*.

¹⁸ The values of the *Area Under the Curve* (AUC) are higher than 0.8 and are thus at a good level (Backhaus et al. 2016).

variables that represent the coordination purpose (*TaxLink* and *Loans*) are either not associated or are negatively associated. On the basis of these comments, effort regarding further harmonization should preferably be limited to firms that are closer to capital markets.

6 Concluding remarks

This paper analyzes the harmonization and internationalization of SME accounting in Europe. First, we discuss its functional characteristics, the focus toward contracting (coordination purpose) and the strong linkage with countries' institutional environments. The results of prior empirical studies are mixed. Survey studies reveal the dominance of the contracting purpose of accounting and a high sensibility regarding the cost-benefit considerations of private firms. In particular, German survey participants are rather skeptical when asked about a potential application of international accounting standards. However, quantitative evidence documents benefits that enhance valuation purpose of financial accounting and thereby support the necessity of differential accounting. Second, we examine the perception of a further harmonization and internationalization of SME accounting based on comments on the EU Green Paper *Building a Capital Markets Union*. Overall, the respondents support a further harmonization for SMEs that are listed on non-regulated capital markets (MTFs). In particular, the comments welcome enhanced comparability with public firms when applying IFRS as the basis for further harmonization. Nevertheless, concerns regarding higher administrative costs are prevalent. Effort on a further harmonization beyond capital markets is only supported if there are substantial administrative simplifications, e.g., by reducing complexity of legal requirements.

Appendix A:
Variable definitions and data sources

Variables	Definition
<u>Dependent variables</u>	
<i>Harmonization</i>	Is a binary variable equal to one if respondent supports further accounting harmonization of firms listed on MTFs.
<i>IFRS</i> <i>IFRSforSMEs</i> <i>NewStandard</i> <i>NoReference</i>	Are binary variables that equal 1 if respondent supports a further accounting harmonization of firms listed on MTFs and therefore either prefers (a modified version of) <i>IFRS</i> , (a modified version of) the <i>IFRS for SMEs</i> , a <i>new</i> EU-wide accounting <i>standard</i> , or provides <i>no reference</i> .
<u>Market & regulation</u>	
<i>Equity</i>	Is a country-level variable capturing the ease of financing through the local the equity market from 1 “extremely difficult” to 7 “extremely easy”. It is based on question 8.03 of the Global Competitive Report (GCR) 2014 (World Economic Forum 2015).
<i>Loans</i>	Is a country-level variable capturing the ease to obtain a bank loan from 1 “extremely difficult” to 7 “extremely easy”. It is based on question 8.04 of the GCR 2014.
<i>Reporting</i>	Is a county-level variable capturing the strength of auditing and reporting standards from 1 “extremely weak” to 7 “extremely strong”. It is based on question 1.18 of the GCR 2014.
<i>TaxLink</i>	Is a binary variable equal to one if respondents’ country has book-tax conformity according to European Commission (2011b).
<i>IFRS_{entity}</i> <i>IFRS_{group}</i>	Is a binary variable equal to one if respondents’ country allows IFRS for the entity-level account (<i>entity</i>)/the consolidated account (<i>group</i>) as exempting financial statement.
<u>Legal origin</u>	
<i>Legor_{uk}</i> <i>Legor_{fr}</i> <i>Legor_{ge}</i> <i>Legor_{sc}</i>	Are binary variables equal to one if the legal tradition of respondents’ country is either English origin (<i>uk</i>), French origin (<i>fr</i>), German origin (<i>ge</i>), or Scandinavian origin (<i>sc</i>) according to La Porta et al. (1997).
<u>Interest group</u>	
<i>User</i>	Is a binary variable equal to one if respondent is a financial statement user as a financial services corporation, an investor, a bank or an analyst (organization).
<i>Profession</i>	Is a binary variable equal to one if respondent is a public accounting firm, tax advisor firm or a professional accountancy body.
<i>Regulator</i>	Is a binary variable equal to one if respondent as regulator as a governmental agency, a private standard setter or a stock exchange operator.
<i>Preparer</i>	Is a binary variable equal to one if respondent as financial statement preparer as a firm or industry associations.
<i>Other</i>	Is a binary variable equal to one if respondent is not assignable to one of the above groups as academics.

Appendix A:
continued

Variables	Definition
<u>Arguments</u>	
<i>Costs_{up}</i> <i>Costs_{down}</i>	Are binary variables equal to one if respondent cites arguments associated with increasing costs (<i>up</i>)/decreasing costs (<i>down</i>) through further harmonization.
<i>Compare_{up}</i> <i>Compare_{down}</i>	Are binary variables equal to one if respondent cites arguments associated with an increasing comparability (<i>up</i>)/decreasing comparability (<i>down</i>) through further harmonization.
<i>Simple</i> <i>Complex</i>	Are binary variables equal to one if respondent cites arguments associated with a more simplification (<i>simple</i>)/higher complexity (<i>up</i>) through further harmonization.

Part B: Timeliness

*The later, the better?
Disclosure timing behavior of German private firms*

Abstract

We analyze the determinants of the disclosure timing decision of private firms. Without capital-market pressure, lower litigation risks and higher relevance of private communication channels, firms face different cost-benefit considerations regarding the public availability of financial statements compared to listed firms. We argue that firms exploit discretion in timeliness to handle related costs. Our analysis is based on a hand-collected sample of 1,000 large private companies from Germany. All firms are subject to the same mandatory disclosure rules, enforcement mechanisms and sanctions. Our results suggest that disclosure delay is particularly pronounced for firms facing higher proprietary costs. Loss-reporting as well as outperforming firms significantly delay filing requirements. Moreover, firms exhibiting higher perceived competition and family-owned firms tend to withhold financial statements for a longer period. Many companies even accept monetary sanctions for overrunning legal deadlines. Finally, we show that disclosure timing seems to complement other channels to create a less transparent information environment. Our results have practical implications as they shed some light on the perception of mandatory disclosure and emphasize that proprietary costs can be substantial.

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1 Introduction

According to European regulations, even private firms are required to publish annual financial reports. Compared to many other parts of the world, the European disclosure requirements for private firms are stricter and more far-reaching. For example, in the US and Canada, financial accounting is largely unregulated and mandatory disclosure is restricted to stock-listed companies. In Germany, the implementation of the EU directive 2003/58/EC in 2006 led to two fundamental changes in the disclosure regime. First, the regulation strengthened the hitherto weak enforcement mechanism. If a company fails to comply with its disclosure obligations, the Federal Office of Justice (FOJ) now fines it automatically. Less surprisingly, this has led to a significant increase in compliance and disclosure rates (e.g., Henselmann and Kaya 2008, Löffelmann 2010). Second, the overall disclosure procedure and data storage were modernized in terms of a digital infrastructure, the Electronic Federal Gazette. This nationwide platform replaced former physical registers, maintained by local courts. As a consequence, both the filing process, and data retrieval have been facilitated by digitalization. Anyone from around world is able to obtain information about a company free of charge. Needless to mention, that useful data are also provided to non-transacting stakeholders¹⁹ as (potential) competitors to the disadvantage of the disclosing company. Hence, in addition to administrative costs, disclosing firms face increased indirect costs; in particular, so-called proprietary costs (Verrecchia 1983).

With a fixed set of disclosure requirements (*what to disclose*) and an automated sanctioning mechanism in place (*whether to disclose*), companies can only decrease indirect costs by varying the timeliness of publicly available financial information (*when to disclose*). Timing is crucial when it comes to influencing the relevance of the information and its capacity to create value for third parties (Elliot and Jacobson 1994). Hence, the magnitude of proprietary costs and the usefulness of publicly available filings diminish over time. In other words, proprietary costs are a function of time (Verrecchia 1983). Thus, firms are

¹⁹ Following Breuer et al. (2019a) we use the term “*transacting stakeholder*” as “the subset of stakeholders who consume the firms’ public disclosures and exchange other goods with the firm” (e.g., banks, suppliers or customers). “*Non-transacting stakeholders*” are stakeholders who are interested in, but do not interact with the firm (e.g., competitors or neighbors).

able to dissipate the inherent indirect costs of mandatory disclosure by exploiting discretion in timing. The resulting and observable delay correlates with firms' incentives to withhold information (Bigus and Hillebrand 2017).

To comply with the legal rules, annual financial statements have to be filed within twelve months after the end of the fiscal year. Firms are allowed to fully exhaust the statutory deadline. Hence, managers possess discretion in timing. It could be even rational to delay filing beyond the legal deadline in order to further reduce the indirect costs of disclosure. If a firm is willing to accept financial penalties, it can “*buy*” some time and withhold publication as long as the cumulative fines are below the anticipated disclosure costs. Empirical (survey) evidence supports the practical relevance of this strategy (e.g., Grottke et al. 2012). However, prior literature on disclosure timeliness mainly concentrates on listed companies (e.g., Givoly and Palmon 1982, Alford et al. 1994, Sengupta 2004, Cao et al. 2016). Given differences in regulatory requirements and in the incentive structure, it is doubtful whether these results are also valid for private companies. In contrast to well-investigated public counterparts, private firms naturally possess a smaller number of stakeholders and exhibit a more concentrated ownership. Considering the lack of interim reporting, ad hoc reporting and a lower media coverage, annual filings are often the only source of information for third parties. Hence, the public available financial statements are of a higher relative importance. In the absence of pressure from capital markets, private firms do not have to follow certain earnings release patterns or disclosure paths. In turn, they are not subject to external pressure and have more discretion in choosing an optimal filing date. Lower litigation risk as well as the existence of private channel information enhance flexibility.

The German economy is characterized by a high importance of private companies. They add approximately 58 % to German GDP (IFM Bonn 2019). Many of those companies are highly specialized technology firms and leading industrial manufacturers (“*hidden champions*”). Publishing detailed information about profitability, margins or the product pipeline may undermine their competitive position (Breuer et al. 2019c).

Germany's Federal Gazette is considered to be reliable and easy to access from a user's perspective.²⁰ Moreover, strict enforcement ensures a level playing field for all companies. It is therefore less surprising, that the regulation of 2006 is regarded as a "*transparency shock*" (Laschewski and Nasev 2018). Featuring these aspects, the German regulatory environment provides a unique setting to observe firms' (un)willingness to provide public information, which in turn allows for inferences on the indirect costs of mandatory disclosure. We thus examine the determinants of the disclosure delay (reporting lag) based on a sample of 1,000 German private firms over a six-year period. Using multivariate regressions, we further investigate whether private firms pursue strategic timing behavior.

Our results indicate that German private firms fully use their discretion on disclosure timing. Whereas the overall disclosure compliance rate is very high, only 38 % of annual reports are filed within legal deadlines. It takes up to 16 months before 90 % of financial statements are publicly available. We show that this lag is not caused by financial statement preparation and auditing processes. In line with prior research on listed companies (e.g., Kothari et al. 2009), we find a strong association between firm performance and the reporting lag. The disclosure delay of loss-reporting firms is significantly longer. In loss-years, companies are even more likely to delay and to accept financial penalties. This is consistent with rising agency costs. We find further support and even stronger effects in cases where reporting incentives change. Companies significantly shorten (extend) the reporting lag if they report a profit (loss) after a loss (profit) in the prior year. In line with the proprietary-costs hypothesis, we also find a u-shaped relationship between profitability and the reporting lag, which is comparable to the results of Muiño and Núñez-Nickel (2016). Outperforming firms significantly delay disclosure as well, indicating disclosure timing as a strategy to hide high margins to deter potential competitors from entering prospering markets. Based on a firm-specific measure of competition using textual analysis, we also find a positive association. Firms in more competitive markets tend to delay financial statements to a significantly greater extent and are more likely to go beyond legal deadlines. This again suggests proprietary concerns to be substantial costs of man-

²⁰ Data retrieval from the German Federal Gazette is completely free of charge, without any user registration requirements or verification mechanisms, allows for full-text searches and mobile access (application), and provides multi-lingual guidance. Based on a self-developed index by Kaya and Seebeck (2019), which captures data availability, accessibility and serviceability, the German Federal Gazette achieves one of the highest scores among company registers from 90 countries.

datory disclosure. Next to proprietary costs, we also find evidence that privacy costs affect the disclosure timing decision. Family ownership is positively related to the reporting lag. Put differently, family firms exhibit longer reporting lags, presumably to impede information on the wealth and income position of the family from being leaked to the public. Finally, we find slight support to indicate that the timing decision is exploited as a complementary channel to decrease firms' information environment. Timing is associated with other financial reporting decisions, as late filed financial statements are shorter in length and exhibit a higher degree of discretionary accruals.

Overall, we document private firms' reluctance regarding the public availability of financial statements and provide evidence that private firms exploit discretion in timeliness to handle indirect costs of mandatory disclosure. Our paper contributes to several strands of the literature. First, we add to the research on disclosure timing behavior. Prior literature predominantly focuses on public companies. Second, we emphasize and analyze differences in the incentive structure of private and public companies, e.g., the relation with proprietary or privacy costs. We also suggest disclosure timeliness as a measure to indirectly operationalize them. Third, according to the results of Anderson et al. (2013), family-owned firms tend to prefer a more opaque information environment. We add to this aspect of the family-firm literature and reveal significantly longer reporting lags for them. Fourth, our study contributes to the ongoing policy debate regarding the regulation of private firms' accounting disclosures. In this way, we contribute to a better understanding of the financial reporting practice of private firms and increase the awareness of proprietary costs in a mandatory disclosure regime.

This paper is structured as follows. Section 2 describes the institutions, historical development and contemporary status of the regulatory landscape for private company disclosures in Germany. In Section 3, we provide a short overview of the relevant literature and derive a theoretical frame for the incentive structures of private companies. We also introduce potential determinants of the disclosure timing decision. Section 4 contains a description of our research design, the model specification and the sample. We present our results in Section 5. Additional analysis and robustness tests are provided in Section 6. The paper concludes with a short summary and discussion in Section 7.

2 German regulatory environment

The mandatory disclosure regime in Germany dates back to the 19th century. However, more recent amendments such as the Accounting and Reporting Law of 1985 (Bilanzrichtliniengesetz (BiRiLiG)) and the Qualifying Partnerships Act (Kapitalgesellschaften-und-Co.-Richtlinie-Gesetz (KapCoRiLiG)) of 2000 aligned the German regulatory environment with European requirements (Eierle 2005). The scope of mandatory disclosure extends to all companies with limited liability which covers public limited (AG) or private limited companies (GmbH) as well as partnerships without a personally liable individual as shareholder (e.g., GmbH & Co. KG). The German Public Disclosure Act (Publizitätsgesetz (PublG)) complements the regulations and even requires large²¹ firms with unlimited liability to disclose annual financial accounts. The rules require firms to file at least the balance sheet, the income statement, notes and the appropriation of net profit. Large companies must add a management report and the report of the supervisory board. Small and medium-sized companies enjoy certain flexibility to avoid overburdening bureaucracy (Eierle 2005), including shortened accounts, the omission of certain positions (e.g., revenues) or the income statement as a whole, as well as certain notes (see Table 7 for details).

All documents have to be filed within 12 months after the fiscal year-end. Despite the outlined mandatory disclosure obligation, many firms ignored the legal requirements in the past.²² Prior to 2007, local register courts lacked sufficient instruments to enforce the disclosure rules. Prosecution required a formal complaint by a third party. As this was rarely the case, firms did not need to fear considerable consequences. The disclosure requirements could therefore be described as “quasi-voluntary”. Unsurprisingly, disclosure rates were at a very low level. Empirical investigations reveal that only a small fraction of companies complied with the rules (Ballwieser and Häger 1991, Marx and Dallmann 2004, Theile and Nitsche 2006). Nevertheless, this was not a major issue. In light of the prevalence of debt financing in Germany (Fülbier and Klein 2015), banks and other major stakeholders directly obtain inside information via private channels.

²¹ According to the German Public Disclosure Act (PublG), an unlimited-liability firm is qualified as large if it meets at least two of the following thresholds in two consecutive years: (i) total assets > 65 m. € (ii) revenues > 130 m. € and (iii) number of employees > 5,000.

²² For empirical evidence, see Section 3.2.

Table 7:
Disclosure requirements by size categories

Size category in German language	Size class	Financial reporting element			
		Income statement	Balance sheet	Notes	Management report
<i>Kleinstkapitalgesellschaft</i>	micro corporation	/	reduced (deposit)	/	/
<i>Kleine Kapitalgesellschaft</i>	small corporation	/	reduced	regarding the balance sheet	/
<i>Mittelgroße Kapitalgesellschaft</i>	medium-sized corporation	reduced	complete with exemptions	complete	complete
<i>Große Kapitalgesellschaft</i>	large corporation	complete	complete	complete	complete

To comply with European regulation, Germany significantly changed its disclosure regime in 2007. Among others, the Act on Electronic Commercial and Registers of Cooperatives and Business Registers (EHUG) included a revision of the disclosure enforcement system. The newly established FOJ now automatically imposes sanctions (ex officio) if disclosure obligation is not fulfilled in time. To prevent a monetary bailout, the fine is repeated until required documents are submitted. In detail, the enforcement procedure is designed as follows: If a company does not file its financial statement within twelve months (Article 325 of the German Commercial Code (GCC)), the FOJ allows an extension of six weeks charging only moderate administrative fees. Afterwards, it imposes repeated fines between 2,500 € and 25,000 € until the financial statement is filed. Furthermore, the EHUG has modernized the overall disclosure procedure. With the introduction of the Electronic Federal Gazette, the physical registers at local courts were replaced by a new digital platform. Since then, all documents must be filed electronically. From the user's perspective, the digital platform allows for easier, faster and unconditional access to mandatory disclosures for every interested party. The financial statements can be retrieved free of charge at any given time. In particular, companies, which have avoided disclosure for many years are now exposed to significantly increased transparency.

3 Literature review and determinants of disclosure timing

3.1 Indirect costs of disclosure as a function of time

Firms face a trade-off between the costs and benefits of (mandatory) disclosure. However, compared to their public counterparts, where disclosures provide essential information to anonymous shareholders and market participants, individual benefits for private firms are not that obvious. The major justifications are economy-wide benefits and improved social welfare through reduced information asymmetry among market participants, resulting in more efficient resource allocation (Shroff 2016, Minnis and Shroff 2017). Consequently, research on the (net) benefits in a private firm mandatory disclosure setting is scarce. There is only evidence that mandated public filings facilitate transactional banking and improve access to bank debt (Arruñada 2011, Breuer et al. 2018, Deno et al. 2019). Public information reduces the reliance on relationship banking and therefore provides broader financing opportunities. Moreover, it helps to reduce uncertainty and positively affects firms' precautionary behavior by enabling a more accurate evaluation of expectations, trends and peers. Supporting this notion, Ortiz (2018) finds a decline in firms' costly cash holdings (liquidity buffer) after the introduction of mandated disclosure. Overall, publicly available information helps to ensure that economic decisions are made based on a higher level of information. Put differently, mandatory disclosures reduce information asymmetries, enhance market transparency and confidence, and thus facilitate arm's length dealing (Breuer 2018). Firm-level benefits are manifested in better (investment) decisions, (trade) credit conditions and financing opportunities (Barry 2006, Arruñada 2011). Additionally, the standardized format for and public access to financial information allow for benchmarking over time (intracompany) and between other companies (intercompany).

However, these more or less vague private benefits are accompanied by much more obvious costs and disadvantages for the disclosing company, which often significantly outweigh the benefits. First, there are direct administrative and compliance costs. Legally required data must be gathered, edited and transferred into the appropriate format. To comply, firms need personnel and IT infrastructure.²³ Additionally, disclosing companies have to pay for filing (submission fees).²⁴ Second, there are indirect costs, which are hard

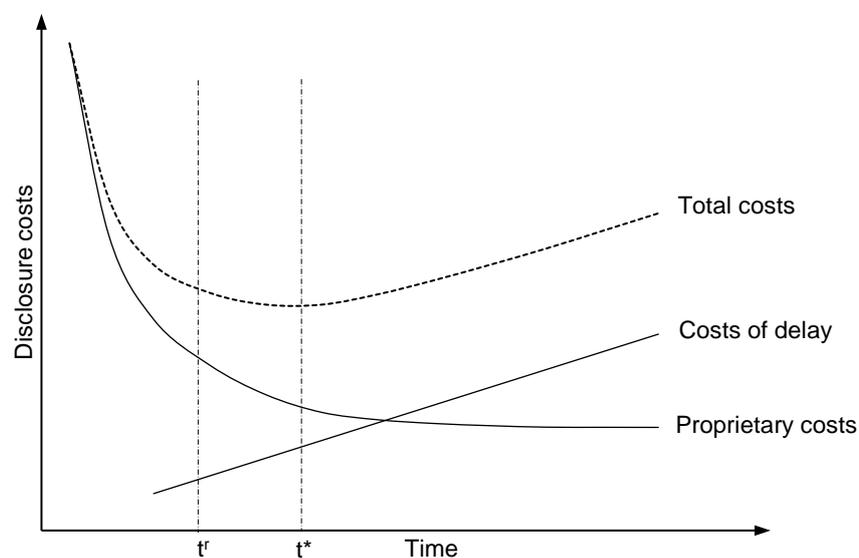
²³ Thus, in particular, small firms often outsource the filing process.

²⁴ Fees are graded and depend on the number of characters as well as the format of the submitted documents (e.g., from 0.13 ct to 1.25 ct for each character using XML or XBRL; 15 €each figure) (Bundesanzeiger Verlag 2016).

to quantify but potentially more substantial. Particularly, proprietary costs are of great significance (Verrecchia 1983). Firms can no longer control the group of beneficiaries and face the risk of presenting relevant information to non-transacting stakeholders. Competitors often pay close attention to the financial report of their rivals and thus can gain advantageous insights into liquidity and financial stability, strengths, weaknesses and expectations. They can also learn from price and capacity changes, expenditure on research and development, investments or divestments, or any other activities. Hence, public information helps them to develop a better understanding of their peers, to better predict future action of rivals and to adjust own activities to the detriment of the disclosing firm. The management accounting literature refers the systematic research on peers, where annual financial statements appear to be a major source of information as “*competitor accounting*” or “*competitive intelligence*” (Subramanian and IsHak 1998, Hoffjan 2003).

In addition, higher transparency allows rivals to identify lucrative targets for takeovers (Bernard 2016). Competitive disadvantages and predatory threats arise. Particularly less diversified firms with small product portfolios involuntarily provide insights into cost structures and profit margins by publishing annually income statements. Successful business models attract new competitors, which could enter the market, and diminish future profits. Thus, concerns regarding a loss of a competitive edge are directly linked to mandated disclosure. Further, high rents or outperformance might arouse monetary desires even among contractual partners. Customers and suppliers could exploit their knowledge on margins or sales in price negotiations. The same holds true for employees and labor unions. Taken together, the restrictions in secrecy and informational self-determination, that follow mandatory disclosure, can lead to significant adverse effects. The problems become even more severe if there are close financial ties between the firm, owners and management. Any information about a firm also carries details on the income and wealth position of the owner, resulting in an erosion of privacy (Barry 2006, Arruñada 2011, Schenke and Teichmann 2018, Muhn and Gassen 2019). Hence, owners of closely held firms are confronted with privacy costs.

Figure 3:
Total costs of disclosure as a function of time



Notes: Figure depicts decreasing proprietary costs, increasing costs of delay and total costs by time. Legal disclosure deadline is denoted as t' and minimum of total costs as t^* .

A key to manage indirect costs is timeliness, which is an essential element of information relevance. “Generally, the older the information is the less useful it is” (IASB 2018, CF 2.33), as, e.g., the IASB notes in its recent conceptual framework.²⁵ Information naturally loses the ability to contribute to decision-making, as time goes by.²⁶ Thus, elapsing time reduces the capacity of information to create disadvantages such as proprietary costs from mandatory disclosure (Elliot and Jacobson 1994). As a consequence, observable disclosure timeliness is partly the result of firms’ weighting of individual costs (and benefits).

With a lack of net benefits, private firms have incentives to withhold certain information as long as possible. However, the legal regime forces private firms to comply. If firms withhold disclosures, they will be sanctioned monetarily. Assuming firms anticipate related costs, entities will delay submission as long as the expected costs of disclosure (proprietary and privacy costs) exceed the imposed sanctions. Based on the assessment of

²⁵ The US standard setter argues the same: “If information is not available when it is needed or becomes available so long after the reported events that it has no value for future action, it lacks relevance and is of little or no use. Timeliness alone cannot make information relevant, but a lack of timeliness can rob information of relevance it might otherwise have had.” (FASB 1980).

²⁶ The more that time elapses, the later the decisions can be made or the less information there is at the time of the decision (Feltham 1972).

these two opposing effects (decreasing proprietary costs and increasing costs of delay), a firm's management will choose the optimal filing date, that is when the total costs of disclosure are minimal. Figure 3 illustrates both curves resulting in a minimum of total costs in t^* . In the example, the entity is willing to accept fines in order to delay filing beyond the legal deadline (t^f).

3.2 Prior literature on disclosure timing

To identify determinants and influencing factors of the timing decision, we review the extant literature. We start with descriptive investigations from Germany, which primarily focus on the question as to whether private firms disclose their accounts at all. Consistently, they reveal low compliance rates prior to the EHUG. For example, Ballwieser and Häger (1991) find that only 12 % of their sample firms file financial statements at the local register courts. Marx and Dallmann (2004) report similar results for the fiscal year of 2000 (6.6 %). Over the period from 1996 to 2004, Theile and Nitsche (2006) reveal rates between 10 % and 17 %. Moreover, the firms file documents with mistakes and irregularities (Ballwieser and Häger 1991, Paschen 1992, Buchheim 2010). All these findings reflect an adverse and negative attitude among German private firms regarding public disclosure requirements. One of the first post-EHUG studies carried out by Henselmann and Kaya (2009) reveals an essential increase in disclosure rates (67 % to 73 %, depending on the region) for the fiscal year of 2006. However, only a small amount of financial statements (about 10 %) are filed by the legal deadline (Henselmann and Kaya 2009). The effectiveness of the EHUG is also highlighted by Löffelmann (2010) who documents accelerated disclosure timing after the regulatory change. In line, Schlauß (2010) shows a drastic increase in compliance (*whether to disclose*), which reached a rate of about 90 % for accounts for the fiscal year of 2007. Additionally, the number of sanction proceedings and appeals against mandatory disclosure drops in 2008 (Schlauß 2010), but statutory deadlines are still violated (*when to disclose*). Consistent with this notion, Eierle et al. (2011) document (i) an overall increase in compliance with a disclosure rate of nearly 100 %. However, (ii) only 30 % of the 2007 financial accounts were filed in time and (iii) it took 20 months after the balance date to achieve 90 % availability. More recent studies also reveal that firms fully exhaust legal deadlines or even go beyond (Pelens et al. 2014, Dilßner and Müller 2017). Table 8 provides an overview of the descriptive studies investigating the disclosure practice of German private firms regarding compliance and/or timing.

Table 8:
Descriptive studies on the disclosure behavior in Germany

Study	Sample	Main findings regarding disclosure avoidance and/or disclosure timing
Schildbach et al. (1990)	274 medium-sized and large companies with limited liability (<i>GmbH</i>) from the trade register of Munich 1987	Sample firms exhibit a disclosure rate of 36 %. Only 50 % of disclosing firms file their accounts within the statutory deadline; larger firms file management reports of higher quality.
Ballwieser and Häger (1991)	150 medium-sized companies with limited liability in Lower Saxony 1988	Sample firms exhibit a disclosure rate of 12 %.
Paschen (1992)	53 medium-sized and large limited liability companies (<i>GmbH</i>) from the trade register of Hanover 1987-1989	Disclosure rate of 24 %; on average disclosing firms file 1.6 accounts in three years.
Marx and Dallmann (2004)	Partnerships with limited liability (in particular <i>GmbH & Co. KG</i>) from the trade register of Bremen 2000-2001	6.6 % of sample firms are compliant and disclose financial statements in 2000 (2001: 4.5 %).
Theile and Nitsche (2006)	271 firms with limited liability from the trade register of Bochum 1996-2004	About 75 % of sample firms avoid disclosure; authors document disclosure rates from 14 % to 17 %; about 74 % of financial statements are filed within statutory deadline.
Henselmann and Kaya (2009)	5,726 limited liability companies (<i>GmbH</i>) from Kassel, Ingolstadt and Kiel 2006	Significantly increased disclosure rates after new regulation (EHUG), sample firms reveal rates of 72 % to 78 %; adjusted samples reveal even higher rates of nearly 90 %.
Buchheim (2010)	Partnerships with limited liability (in particular <i>GmbH & Co. KG</i>) from the trade register of Berlin 2006-2008	Disclosure rates range around 72 %. In 2006, about 38 % of accounts are filed in time; rate increases to 67 % in 2007.
Eierle et al. (2011)	210 small and 241 medium-sized companies with limited liability 2007	Sample firms exhibit a disclosure rate of 92 %; however, only 33 % of small and 25 % of medium-sized firms file the financial accounts within the statutory deadline.
Pellens et al. (2014)	202 medium-sized companies with limited liability 2006-2009	Reporting lag of 66 weeks in 2006; declining trend (2009: 54); firms fully exhaust and violate statutory deadline; heterogeneity regarding the length of disclosed management reports.
Dilßner and Müller (2017)	110 medium-sized and large companies 2015	28 % of sample firms file the financial account prior to statutory deadline; 65 % are able to file accounts after six months but choose to delay disclosure.

There is also some survey evidence documenting private firms' reservations about mandatory disclosure rules. When asked about the Federal Gazette, representatives of private firms emphasize concerns regarding secrecy and privacy as well as the distortion of competition (Grottke 2011). Overall, they feel negative towards mandatory disclosure and see

disadvantages due to proprietary costs. Another study by Grottke et al. (2012) reveals similar results. The benefits of higher transparency are classified as less relevant. While most participants state that they consciously delay submission, a minority even consider fully refusing to submit. Recent survey evidence from Eierle et al. (2019) again supports the notion that private firms are interested in disclosing as little information as possible.

Given the lack of data availability (among others), research on the determinants of disclosure timing and the magnitude of the reporting lag of private firms is scarce. Therefore, we initially take a brief look at the public firm literature, which is much more exhaustive. As a result of being among the first to examine the relationship between the reporting lag (difference in time between fiscal year-end and disclosing date) and corporate attributes of Australian firms, Dyer and McHugh (1975) are considered as pioneers in this discipline. They find company size to be an influencing factor and argue that higher pressure due to greater public awareness leads to faster disclosure. Courtis (1976), Davis and Whittred (1980), and Whittred (1980b) find similar results by adding industry patterns and profitability as further influencing factors. Performance reasons are discussed more broadly in the subsequent literature. Especially, the “*good news early, bad news late*” hypothesis is tested in several settings. Results from Kross (1981), Givoly and Palmon (1982), Chambers and Penman (1984), Kross and Schroeder (1984), Bowen et al. (1992), and Begley and Fischer (1998) support the claim that bad news is published later than good news. Conover et al. (2008) document that the relation between bad performance and timing is more pronounced for firms in common law countries. Notwithstanding, there are also some studies rejecting “*good news early, bad news late*” (Easton and Zmijewski 1994, Annaert et al. 2002).

Other studies reveal that determinants such as the information demand from investors and litigation concerns to be negatively associated with the reporting lag, while concentrated ownership, greater accounting complexity, proprietary cost concerns and the extent of debt financing are positively correlated (Leventis and Weetmann 2004, Senguptha 2004, Henselmann et al. 2017). More recent literature links the reporting lag to internal processes. Based on information from the notification of late filing (Form 12b-25), Impink et al. (2012) find internal control weaknesses to be associated with the incidence of late filing. Moreover, the quality of the information system and firms’ intensity of information technology are associated with improvements in financial reporting timeliness (Bartov et al. 2017, Du and Wu 2018, Ashraf et al. 2019). This also holds true for firms using XBRL

(Johnston and Zhang 2018). In addition, managerial ability (Abernathy et al. 2018) and managerial incentives based on remuneration (Gong et al. 2019) seem to influence the timing decision.

Next to studies on determinants, another strand of the literature analyzes market reactions and the consequences of delayed disclosure. These studies document lower market reactions to reports with longer delays than for those that are published in time (Zeghal 1984, Atiase et al. 1989, Henselmann 2017). There is also some indication that investors view delayed announcements as less credible and generally discount both, negative and positive news (Chen et al. 2018). Appendix A provides a more comprehensive and detailed overview of (aforementioned) studies related to disclosure timing decisions of public firms.²⁷ The fourth column indicates whether the respective study refers to earnings announcements and/or the annual report (mostly 10-K). This differentiation is crucial when interpreting results related to public firms.²⁸

The findings stated above with respect to public firms provide useful insights into the possible determinants and influencing factors of the timing decision. However, they are not directly transferable to private firms. In the absence of capital markets, the managerial incentives and the regulatory environment are completely different. Private firms face less legal scrutiny, capital market pressure as well as litigation concerns, and therefore have much more discretion regarding disclosure timing. Overall, there is a lack of literature concerning disclosure timing in a private firm setting. To the best of our knowledge, we only identify five (relatively recent) studies that are either directly related to the timing decision of private firms or at least consider it as a dimension of reporting quality.

Clatworthy and Peel (2016) provide evidence on the timing decision of private firms' following a regulatory change in the UK, which shortened the legal deadline from ten to nine months after the fiscal year-end. Unsurprisingly, there is a significant reduction in the reporting lag, but the incidence of late filing increases by 46 %. The results show that the reporting behavior is largely regulatory-driven, but is not homogenous. The reporting

²⁷ There is also a broad strand of literature analyzing the audit lag of public firms. Abernathy et al. (2017), Durand (2019), and Habib et al. (2019) provide current and comprehensive literature reviews.

²⁸ While the date of an earnings announcement refers to the preliminary earnings release, the annual report dates refer to its publication (mostly 10-K or 10-Q). In this context, Arif et al. (2018) find that firms are increasingly inclined towards concurrently announcing earnings and disclosing 10-Ks.

Table 9:
Studies on the disclosure timing of private firms

Study	Sample	Main findings regarding disclosure timing
Clatworthy and Peel (2016)	31,147 private firms from the UK 2009-2010	Disclosure timing is driven by the regulatory deadline but not homogenous; firms report more timely if they produce accounting information in order to inform outside investors.
Luybaert et al. (2016)	22,108 firm years from Belgian and Luxembourgian small private firms 2006-2008	About 30 % of financial statements are filed after the legal deadline (seven months); about 93 % are filed before sanctions are applied (eight months); firm size and external audit negatively affect the reporting lag; late-filing is associated with lower financial statement quality.
Bigus and Hillebrand (2017)	1,068 firm years from medium-sized private firms from Germany 2009-2012	Firms with fewer bank relationships exhibit weaker financial reporting quality including less timely filing of financial statements.
Breuer et al. (2019a)	About 1.4 m. firm years from private firms from Germany 2006-2012	The number of transacting stakeholders drives firms' disclosure decisions; among others, the number of stakeholders is positively associated with timeliness.
Breuer et al. (2019b)	"Comprehensive" dataset from German private firms 2006-2011	Mandatory disclosure regulation crowds out voluntary disclosure; results indicate that "unregulated" firms exhibit less amount of disclosure as predicted in a voluntary regime; additional analyses show that "unregulated" firms extend the "disclosure gap" by increasing the reporting lag (compared to "regulated" firms).

lag is significantly shorter for firms, which are assumed to produce accounting information for outside stakeholders. For a Belgian sample, Luybaert et al. (2016) study determinants of the filing lag of small private firms. The accounts are filed very close to the legal deadline. The authors identify company size and an external audit to be negatively associated. The former is attributable to the severity of agency conflicts, companies' resources and accounting capabilities. Moreover, firms systematically delay the release of unfavorable information and late-filed financial statements tend to exhibit lower quality. In sum, the authors conclude that public filing is not demand-driven. Bigus and Hillebrand (2017) analyze financial reporting quality in the context of relationship banking. One of their measures (next to discretionary accruals and disclosure amount) relates to timeliness. Based on the proprietary costs theory and the presence of private communication, the results suggest that private firms relying on relationship banking file their accounts in a less timely manner. The authors argue that firms do so in order to keep information private and achieve a more opaque information environment. Lastly, Breuer

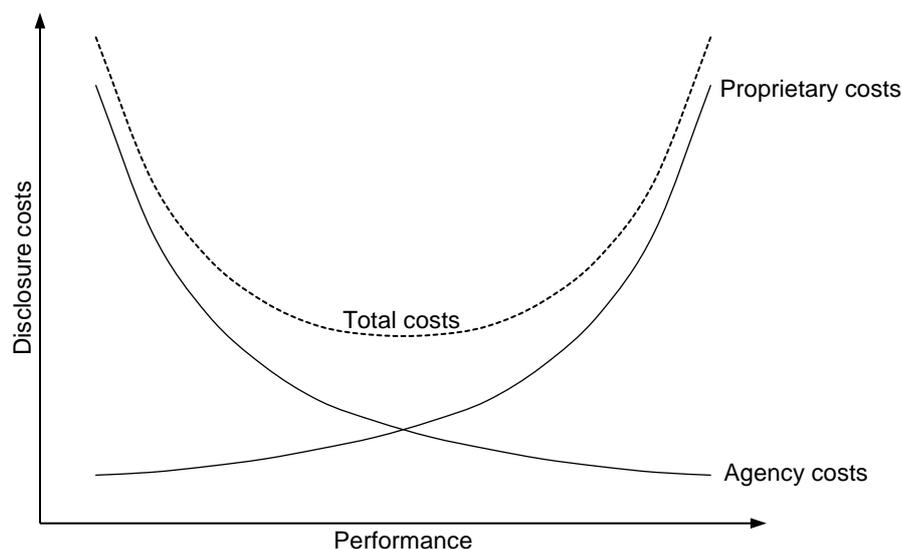
et al. (2019a) develop an economic framework, which suggests that the number of transacting stakeholders shapes private firms' disclosure decision. The authors employ the amount of disclosure, timeliness, and the presence of an audit as indicators for financial reporting quality and find support for their analytically predicted relationship. Private firms with more transacting shareholders provide disclosures with a higher level of quantity, quality, and timeliness (Breuer et al. 2019a). Table 9 sums up the main properties as well as the major findings of the identified studies.

Next to the studies directly analyzing the disclosure timing behavior of private firms, there is relevant research exploiting the setting of the introduction of EHUG. Firms that do not comply with disclosure rules prior to EHUG systematically exhibit greater financial constraints (Bernard 2016). The results indicate that firms avoid disclosure in order to mitigate predation risk. Using the same setting and proprietary data from *Deutsche Bundesbank*, Laschewski and Nasev (2018) support the notion that firms make use of disclosure avoidance in order to reduce related costs. Consistently, Bernard et al. (2018) find that private firms exploit costly size management in order to reduce the level of mandated disclosure and audit requirements. Likewise, their findings indicate that firms do so in order to mitigate proprietary costs.

3.3 Determinants and empirical operationalizations

Performance — Performance is one of the most discussed determinants of the disclosure timing decision. Under the heading of “*good news early, bad news late*”, prior analytical and empirical literature (in particular on public firms) provides broad evidence supporting this association (e.g., Givoly and Palmon 1982, Chambers and Penman 1984, Begley and Fischer 1998, Sengupta 2004). From a theoretical point of view, firms tend to disclose unfavorable information in a less timely manner. This allows managers, e.g., to close deals on more favorable terms, and provides more time to prepare responses or ways to reverse (Begley and Fischer 1998). However, litigation concerns (e.g., potential shareholder lawsuits) encourage managers to also disclose bad news in a timely manner (Skinner 1994, Graham 2005, Donelson et al. 2012). In the absence of a highly litigious environment – as is the case for private firms – this association should be even stronger. Unfavorable information such as a loss or declining profitability increase uncertainty regarding future earnings and solvency and might impede contracting with customers, suppliers and capital lenders (raising agency costs). This could negatively affect firms' reputation or result in worse conditions and a higher risk-premium, which would be consistent with

Figure 4:
Disclosure costs as a function of performance



Notes: Figure depicts increasing proprietary costs, decreasing agency costs and total costs by performance from Muiño and Núñez-Nickel (2016).

the “*bad news late*” hypothesis. In order to signal financial steadiness, growth prospects, and a well-performing business model, managers might even have incentives to accelerate disclosure if they beat certain benchmarks as prior year earnings. Survey evidence from Eierle et al. (2019) empirically supports this notion. Nonetheless, there are also incentives to delay favorable information. Firms might try to hide surpassing performance from potential competitors, suppliers and customers, as they fear imitation of rivals and a deterioration of their own position in price negotiations. Suppliers and customers might want to participate in high margins, too, which raises proprietary costs. In sum, literature provides inconclusive evidence on the association between disclosure and performance. Consistent with mixed evidence, Muiño and Núñez-Nickel (2016) document a reverse u-shaped association between transparency and profitability, which suggests incentives to delay filing on both extrema. In the same manner, Dedman and Lennox (2009) find companies with high gross profits to withhold information. Figure 4 (adopted by Muiño and Núñez-Nickel (2016)) illustrates competing effects of decreasing agency costs and increasing proprietary costs by profitability. It also shows a minimum of total costs for firms with moderate profits.

Referring to timeliness, we expect a longer reporting lag for firms with a loss and shorter lags if firms perform better than in the year before. However, we also expect firms with higher abnormal profitability to delay filing. To operationalize performance, we rely on different measures. We employ binary variables indicating a loss if the operating income is less than zero (*Loss*). Additionally, we have a binary variable equal to one if firms beat their prior year's earnings benchmark (*Improve*). Finally, performance is continuously measured by return on assets (*RoA*).

Ownership structure and agency conflicts — When analyzing disclosure incentives, the ownership structure is an important factor, particularly in a setting where controlling owners play a significant role (Vural 2018). In general, reporting incentives are strongly driven by agency conflicts. Thus, their extent is positively associated with the benefits of transparency and the benefits of timely public availability of financial statements. Ownership-induced agency conflicts arise from the separation of management and control, and depend not only on the number of shareholders but also on the distance between management and ownership. We therefore assume that both influence the reporting incentives and the disclosure timing decision. Sengupta (2004) argues that blockowners (owner holding significant shares) do not rely on public information. They are able to obtain information directly from the management and do not urge timely disclosures. In a private firm setting, this association must be even stronger because owners are usually much closer to firms' sphere and daily business. Even non-managing owners are informed by the general meeting or other channels, and do not need to rely on the Federal Gazette. Hence, typical family firms, directly held by the founder or the descendants, are not urged to file financial statements in a timely manner. Prior literature already shows that *founder and heir* firms report more opaque than diffused shareholder firms (Anderson et al. 2009, Vural 2018). They face less ownership-induced agency problems and do not benefit from high transparency. Beyond that, owners are even confronted with a loss of privacy as financial statements allow for inferences on the personal wealth and income situation (privacy costs). Thus, privacy concerns might explain the disclosure behavior to some extent as well, which is also implied by Muhn and Gassen (2019).

The literature provides various concepts to empirically separate family firms and other firms. We follow Cassar et al. (2015) and rely on a binary measure indicating whether a

firm is owned by a natural person who holds more than 50 % of shares (controlling shareholder).²⁹

Agency conflicts also arise from information asymmetries between transacting outside stakeholders. Publicly available information mitigates such problems and helps to ease contracting, e.g., with suppliers (Arruñada 2011, Ceustermans et al. 2017). Hence, the number of transacting stakeholders shapes financial reporting decisions including timeliness (Breuer et al. 2019a). The broader the set of business relationships, the higher the costs of individual communication via private channels. Thus, the mandated disclosure of a certain set of standardized information reduces duplicate effort and generates cost savings. As a consequence, larger firms, which are more likely to exhibit more severe conflicts as the number and the heterogeneity of stakeholder increases (Eierle and Haller 2009), benefit much more from the public availability of their accounts (Arruñada 2011). We therefore expect larger firms, measured by total assets (*Size*), to file timelier.

Competition — The proprietary costs theory suggests (potential) non-transacting stakeholders such as competitors to be major beneficiaries of public information. Mandatory disclosures provide information about financial constraints, margins, weaknesses, trends, and strategies. Competitors can systematically obtain and analyze this information to the detriment of the disclosing firm. Survey evidence has already revealed that firms study the filings of major competitors and assume rivals to access their publicly available filings as well (Graham et al. 2005, Grottke et al. 2016, Minnis and Shroff 2017).³⁰ In line, Muhn and Gassen (2019) find competition to be the most important reason why small private firms are reluctant to publish financial statements. There is also some evidence suggesting that firms systematically withhold sensitive information (Dedman and Lennox 2009, Ellis et al. 2012). For example, Dedman and Lennox (2009) find that managers of private firms hide information about sales and the cost of sales when they perceive themselves to be acting in highly competitive markets. We therefore assume competitiveness to influence the disclosure timing decision as well. In contrast to many other studies³¹, we proxy competition on a firm-level basis and use a metric which relies on firms' narratives. This

²⁹ This approach is common in the finance and accounting literature and also applied in recent research, e.g., by Murro and Peruzzi (2019).

³⁰ Industry-specific evidence presented by Tomy (2019) suggests that 94 % of surveyed banks use the financial statements of their competitors to analyze current and expected market competition.

³¹ Many empirical accounting studies rely on industry concentration as a measure of competition (the most common is the Herfindahl-Hirschman index (HHI)). However, there are some empirical and theoretical problems: (i) the measure is ambiguous and difficult to interpret; (ii) from a theoretical viewpoint, the

measure, developed by Li et al. (2013), has already been applied in recent accounting research (e.g., Bushman et al. 2016, Bozanic et al. 2019, Li and Zhan 2019, Shi et al. 2018). It is based on the intensity of competition-related terms in a firm's filing and comes with several advantages. Among the important aspects are: (i) it captures managers' perception of firms' individual competitive environment, which allows for industry and year variation; (ii) it refrains from a fixed and crude industry classification scheme; and (iii) it is a holistic approach which does not solely focus on certain aspects of competition, such as more traditional approaches (e.g., market concentration, entry costs or profit margins) (Li et al. 2013, Shi et al. 2018). Appendix B describes the technical details.

Other firm characteristics

Auditor — With respect to the auditor, we expect firms hiring a large auditing company to exhibit shorter reporting lags. Big4 auditors (i) are more experienced and have well qualified personnel, (ii) have more standardized processes and access to international networks, and (iii) are less dependent on individual clients due to higher market shares. Hence, they are able to enforce higher standards regarding earnings and audit quality compared to non-Big4 auditors (Francis and Wang 2008, Loy 2013). We conjecture that large auditors also monitor overall compliance and reporting more strictly, including the timely submission of financial statements. However, an alternative explanation refers to self-selection. Firms that engage an auditor, which is associated with higher audit quality (Big4), could be more receptive to transparency.

Type of financial statement — Depending on the prevalence of subsidiaries, firms are obliged to prepare and publish a consolidated financial statement. In contrast to the single statement account, the only purpose of a consolidated financial statement is to provide information. Thus, the consolidated account is less biased by contracting incentives and therefore more informative for third parties. As a consequence, the information is of higher value and its release causes higher indirect costs (Laschewski and Nasev 2018).

Relationship lending — Private firms heavily rely on external financing by bank loans. Often, the business relationship between the financing bank and the firm is very close and long-term (Berger and Udell 1998). In general, firms that use external debt financing are expected to provide information of a higher quality to satisfy banks' information needs

relation between concentration and competition is unclear; (iii) by definition, the HHI can only be calculated at industry-level. Dedman and Lennox (2009) discuss the problems in more detail.

PART B: TIMELINESS

in order to lower debt-induced agency conflicts. However, firms that are engaged in relationship lending do not need to provide comprehensive public information and can choose to remain more opaque (Bigus and Hillebrand 2017). Based on a close relationship, the financing bank obtains all relevant information via private channels. In this way, the bank has access to information beyond accounting figures and even soft and proprietary information on a confidential basis. Therefore, high accounting quality and timely disclosure are less relevant. Banks can even benefit from the higher opacity of their clients, as analytically modelled by Bigus and Hakenes (2017). To proxy for relationship banking, we rely on the number of house banks. In line with Bigus and Hillebrand (2017), we expect a positive association between the reporting lag and the presence of relationship banking.

4 Data and research design

4.1 Sample selection

Our analysis is based on a sample of German private firms, which are subject to mandatory disclosure rules. Hence, we use the *Amadeus* database maintained by Bureau van Dijk to obtain all firms with limited liability. We exclude companies with publicly traded debt or equity instruments and restrict our sample to large limited liability companies because they are more likely to be independent of external factors such as tax advisers and must meet the full set of disclosure requirements.³² In order to be qualified as large, firms must meet at least two of three size criteria with reference to Article 267 of the German commercial code (GCC) in 2015: total assets of at least 19.25 m. € revenues of at least 38 m. € and at least 250 employees. Furthermore, we drop firms from the public administration as well as the real estate, defense, and compulsory social security sectors.³³ We end in a comprehensive sample of 8,715 firms from which we randomly select 1,000 firms (about 11.5 %).

In a next step, we seek firms' annual filings from the Electronic Federal Gazette and obtain necessary data, which are not provided by *Amadeus*. We hand-collect the date of report completion (preparation), issuance of the audit opinion, shareholders' approval, and final publication for a six-year period (2011–2016). If a firm prepares and files a single as well as a consolidated financial report, we follow Burgstahler et al. (2006) and consider only the latter as a firm's primary set of financial statements from an informational perspective.³⁴ We exclude the years prior to 2011 for the following reasons: First, until 2009 the Electronic Federal Gazette allowed firms to file data in hard copy form, which led to increased administrative burdens and substantial delays due to processing filed statements. Second, another potential bias stems from the Accounting Law Modernization Act (BilMoG), which is considered to be the most fundamental reform of German accounting regulations since the Accounting Directive Act (BiRiLiG) (Fülbier and Klein 2015). For the first time, the BilMoG became effective for fiscal years starting in 2010 (year of transition). Next, we match the hand-collected data with financial data from *Amadeus*, resulting in a unique data set of 6,000 firm-year observations.

³² Small and medium-sized companies benefit from reduced disclosure requirements. Moreover, their financial statements are often prepared and filed by tax consultancy firms.

³³ NACE Revision 2, Main Section L and O.

³⁴ If a firm is the parent company and therefore provides a single and a consolidated report, we use the latter. In all other cases, we obtain and use the unconsolidated (i.e., legal entity-based) report.

Table 10:
Sample selection

	Firms	Firm years
Large private corporations with limited liability (legal forms: “Limited liability company” (GmbH), „Limited liability company & partnerships” (GmbH & Co. KG), ”Limited liability company & partnership by shares” (GmbH & Co. KGaA), “Limited partnership by shares” (KGaA), “Public limited partnership” (AG))	8,715	52,290
Random sample	1,000	6,000
./. Accounts in accordance with IFRS	15	90
./. Missing disclosure timing data	/	54
Total sample of descriptive results of disclosure timing	985	5,772
./. Missing data of independent variables for main analysis	63	510
Total sample of multivariate analysis	912	5,262

We eliminate 90 observations of firms that voluntarily apply IFRS and drop 647 observations with incomplete data. We delete IFRS-firms because they are expected to voluntarily opt to report in a more transparent fashion and systematically differ with respect to firm characteristics (Bassemir 2018, Eierle et al. 2018). For our main analysis, the final sample consists of 5,262 observations from 912 firms (see Table 10).

4.2 Empirical model

One major objective is to analyze the determinants of the variance in private firms’ disclosure timing decision. We therefore introduce the term (*reporting*) *lag* or *delay* as the difference in time between the closing date of the firm’s fiscal year and the date of publication of the financial account at the Electronic Federal Gazette.³⁵ If a filing is amended or complemented, we rely on its first version (the date when the information becomes available for the first time).³⁶ The dependent variable (*Lag_Rep*) is defined as number of days between the financial year-end and the date of filing. We examine the reporting lag by using multivariate regressions. Our main model is specified as follows:

³⁵ The Electronic Federal Gazette can be found at www.bundesanzeiger.de. In fact, the date of publication does not correspond to the date of submission. The Federal Gazette needs an insignificant amount of time to prove and process submitted documents. Henselmann and Kaya (2008) assume a processing time of two to three days. Due to technical achievements and the ban of hard-copy submissions, we expect this processing time to be even shorter and therefore negligible.

³⁶ About 4 % of filings in our sample are complemented (“*Ergänzung*”) and about 2 % are revised (“*Berichtigung*”) after initial submission.

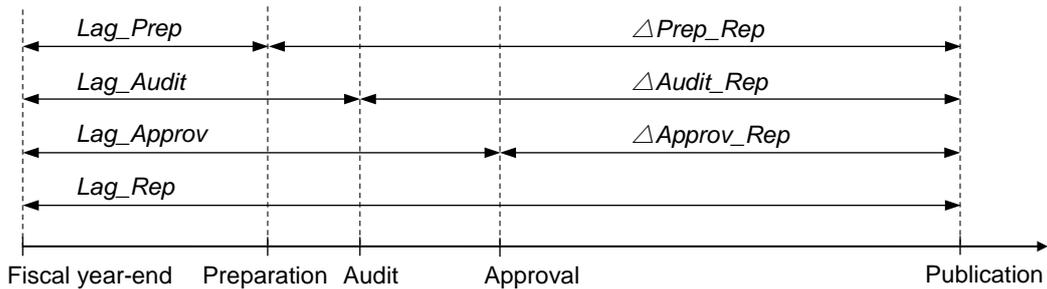
PART B: TIMELINESS

$$\begin{aligned}
 Lag_Rep_{it} = & \beta_0 + \beta_1 * Loss_{it} + \beta_2 * Improve_{it} + \beta_3 * Family_{it} \\
 & + \beta_4 * Competition_{it} + \beta_5 * Size_{it} + \beta_6 * Big4_{it} \\
 & + \beta_7 * StockCorp_{it} + \beta_8 * Startup_{it} + \beta_9 * Banks_{it} \\
 & + \beta_{10} * Group_{it} + \beta_{11} * Leverage_{it} + \beta_{12} * YearEnd_{it} \\
 & + \sum fixedEffects + \epsilon_{it}
 \end{aligned} \tag{1}$$

where i and t denote the firm and year, and β_n and ϵ denote the slope coefficients and error term, respectively. To control for specific yearly and possible industry³⁷ and regional³⁸ differences, we employ fixed effects. Variables are as defined as in Appendix C.

We run the main model in several variants, which are tabulated in Table 15. We primarily focus on the delay between the fiscal year-end and publication in the Federal Gazette (Lag_Rep). However, in our descriptive results and for additional analyses, we separate the reporting lag in four components. We use Lag_Prep for the time in days between the fiscal year-end and the financial statement preparation. To identify, we rely on executives' signature date on the financial statement.³⁹ Moreover, we calculate Lag_Audit (Lag_Approv) as the number of days between the fiscal year-end and the signature date on the audit opinion (the date of approval by the general meeting).⁴⁰ Finally, we use sub-lags, for example, the lag between the approval of a financial statement and its publication ($\Delta Approv_Rep$). All lags are specified in the following figure:

Figure 5:
Time lags during the financial reporting process



³⁷ Industry-fixed effects are based on the Fama/French 48-industry classification.

³⁸ Similar to Bernard (2016), Breuer et al. (2019a) or Breuer et al. (2018), we control for regional differences. Region-fixed effects are based on one-digit zip codes.

³⁹ To extract dates from firms' filings, we use regular expressions. In case our *Python* script does not recognize any (reasonable) date, we manually obtain missing data.

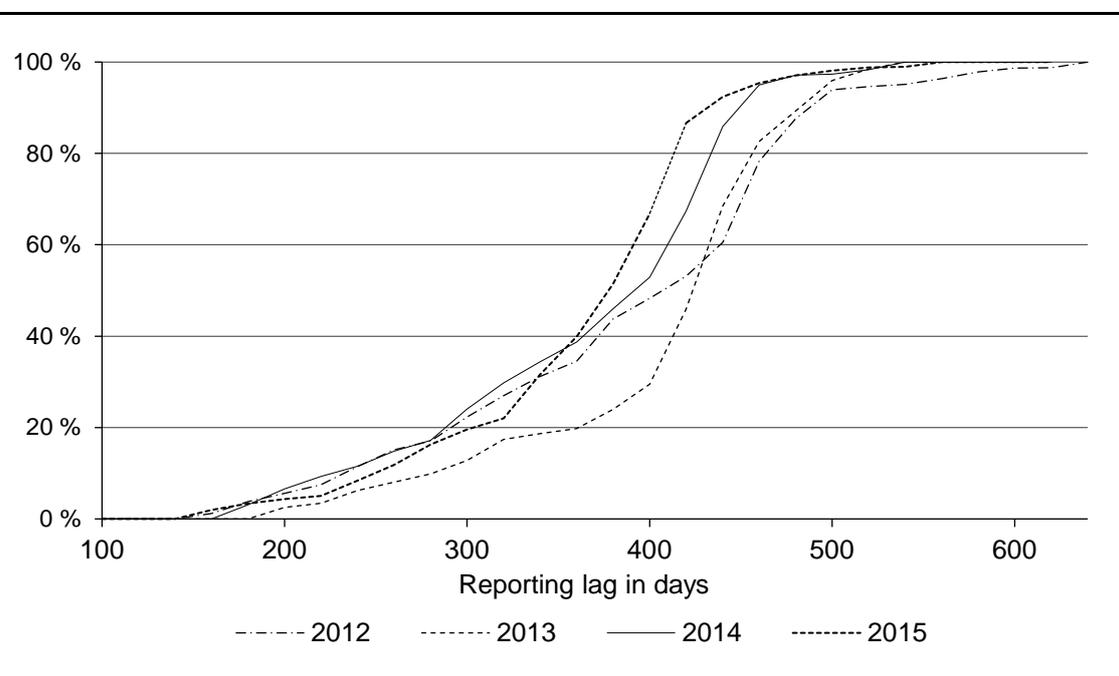
⁴⁰ In case of consolidated reports, which are not adopted by the general meeting ("*Feststellung*"), we use the date of approval ("*Billigung*"). However, we use the term "approval" in both cases.

5 Results

5.1 Descriptive results

Panel A of Table 11 presents summary statistics for the reporting lag variable (*Lag_Rep*) over the sample period in detail. The average reporting lag amounts to 373 days with a median delay of 393 days. The standard deviation is about 87 days (three months), indicating that the reporting date is quite volatile. The year-by-year distribution reveals a peak of reporting lag in 2013,⁴¹ followed by relatively steady means in 2014, 2015, and 2016. On examining Panel B, the frequency distribution shows the highest shares of submission in Month 14 and 15 after the fiscal year-end, which is beyond the legal requirements (see Figure 1).⁴² Only 38 % of financial accounts are filed within the statutory deadline of 12 months. Another 26 % are disclosed within the grace period of six weeks (415 days⁴³), indicating that these firms accept small administrative charges in order to modestly delay publication. The remaining financial statements (about 36 %) are filed substantially late. Failing compliance confronts firms with repeating monetary sanctions until they fulfill

Figure 6:
Cumulative percentage of the reporting lag over time



⁴¹ We cannot provide a causal explanation for the peak in 2013. However, the number of sanctioning proceedings correspondently peaks in 2015, indicating firms' responsibility.

⁴² For parsimony, years 2011 and 2016 are not depicted.

⁴³ The legal deadline amounts to 365 days plus the extension period of 6 weeks (42 days) = 407. We add another week to consider potential administrative delays (415 days) by the Federal Gazette.

PART B: TIMELINESS

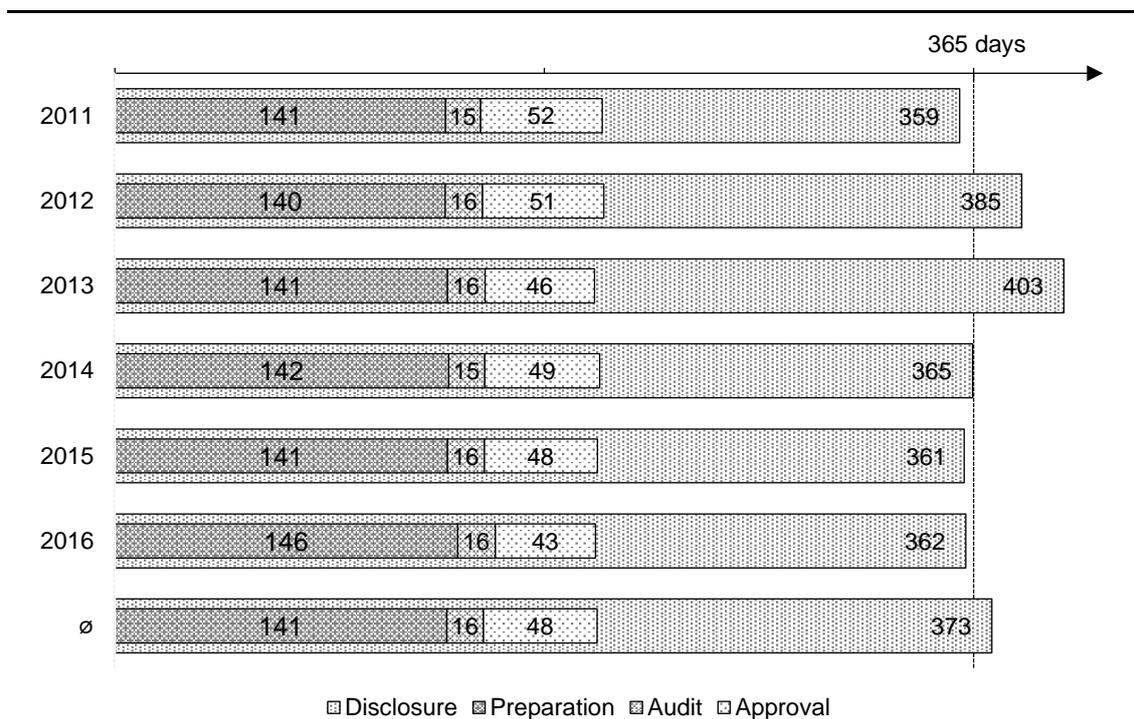
Table 11:
Summary statistics of the reporting lag

Panel A: Reporting lag by year						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
2011	984	359.09	88.74	312	373	415
2012	985	385.42	102.43	312	408	452
2013	984	403.39	76.63	385	422	447
2014	977	364.54	85.69	303	386	428
2015	950	361.00	75.22	327	376	413
2016	892	361.63	78.79	325	375	416
<i>Total</i>	5,772	372.76	86.80	322	392.5	430

Panel B: Frequency by month of filing			
	<u>n</u>	<u>percentage</u>	<u>cumulative</u>
$\leq 4^{\text{th}}$ month	20	0.35	0.35
5 th month	47	0.81	1.16
6 th month	127	2.20	3.36
7 th month	148	2.56	5.93
8 th month	272	4.71	10.64
9 th month	264	4.57	15.21
10 th month	360	6.24	21.45
11 th month	412	7.14	28.59
12 th month	540	9.36	37.94
13 th month	788	13.65	51.59
14 th month	1,156	20.03	71.62
15 th month	1,001	17.34	88.96
16 th month	301	5.21	94.18
17 th month	184	3.19	97.37
18 th month	59	1.02	98.39
19 th month	35	0.61	99.00
20 th month	20	0.35	99.34
$\geq 21^{\text{st}}$ month	38	0.67	100.00
<i>Total</i>	5,772		

their disclosure obligation. Even descriptive results provide some indication of firms' general reluctance towards timely disclosure. The components of the reporting lag, tabulated in Table 13 (Panel A) reinforce this notion. The disaggregation shows that the preparation of financial statements takes 141 days on average. Another 16 days elapse until the audit is completed. Next, the general meeting, where shareholders approve the financial statements is held, on average, about 200 days (median 180 days) after the fiscal year-

Figure 7:
Decomposition of reporting lag over time

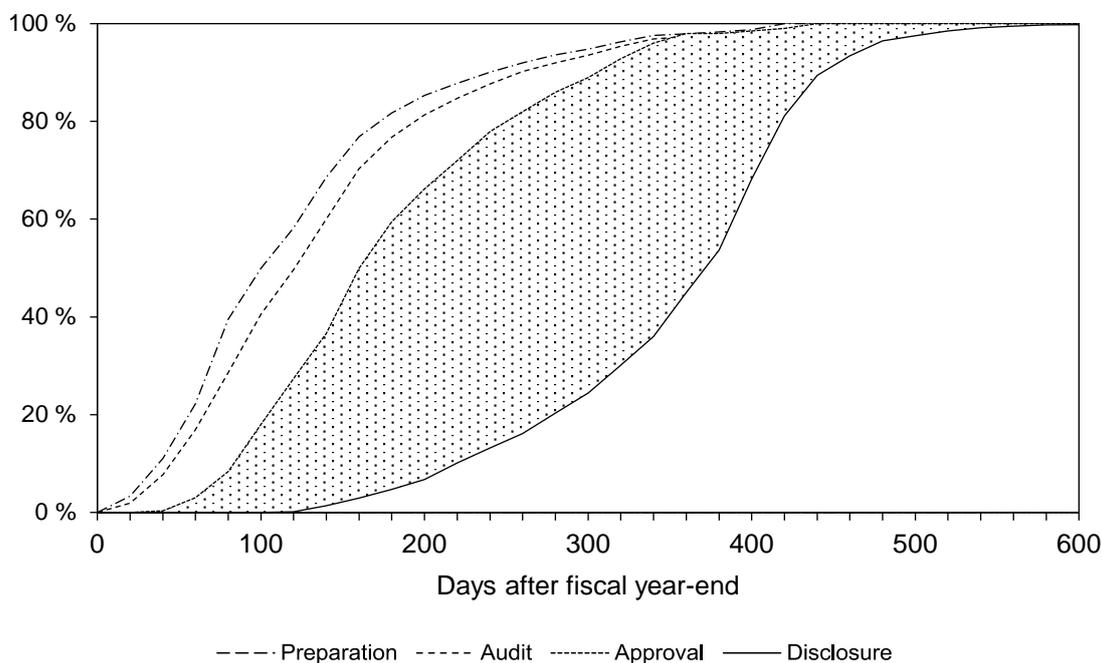


Notes: Figure depicts mean of *Lag_Rep* and time span for preparation, audit and approval as defined in Figure 5 by years ($n=5,772$). The vertical line represents the statutory deadline (365 days). The last bar shows average lags for all years.

end. Finally, Figure 7 graphically reveals a time span of nearly six month between a potential disclosure (after approval) and its actual publication on the Electronic Federal Gazette. Put differently, we observe a major discrepancy between a “*firm is able to disclose*” and a “*firm is willing to disclose*”; release-ready financial accounts are withheld for about half a year on average. This strongly differs from prior findings on public firms, where the complexity of operations and the time spent for preparation and auditing consumes major parts of the reporting lag (Givoly and Palmon 1982, Sengupta 2004). Figure 8 depicts the development from preparation to audit, approval (sub-lags) and actual disclosure cumulatively. The highlighted area presents $\Delta Approv_Rep$ and graphically indicates the sum of the discretionary delay of our sample firms. Overall, the descriptive results document the lack of willingness among some firms to disclose in a timely manner. There are no major differences with respect to the industry (Table 12).⁴⁴ We also find only slight

⁴⁴ The average reporting lag of “Utilities” is relatively short (337 days). This is consistent with the results of Bernard (2016), where “Utilities” show the lowest rate of disclosure avoidance. However, the low

Figure 8:
Cumulative percentage of sub lags



variation regarding firms' local origin. Potential variation due to historical differences between East and West Germany, industry concentration, economic strength or regional competition are not evident and difficult to grasp on a rough classification based on federal states.⁴⁵

Panels B and C of Table 13 present summary statistics of the independent variables of our main model and additional analysis, along with 5,262 observations with full data availability for the main regression model. The median firm exhibits total assets of 58 m. € (*Size*) and a profitability of 6.9 % (*RoA*). About 15 % of financial statements report a loss and 54 % beat prior-year earnings. Moreover, one third of our sample firms is characterized by family ownership and almost half of the accounts are audited by one of the Big4 auditors (41 %). Six percent of sample firms are registered as a stock corporation (AG). Most firms are incorporated as private limited companies (GmbH: 73 %, GmbH & Co. KG: 20 %). Overall, descriptive statistics are consistent with other studies analyzing private firms in similar settings.

number of observations for some industries should be noted. We therefore refrain from further interpretations.

⁴⁵ See Appendix D for details.

Table 12:
Reporting lag by industry

<u>NAICS</u>	<u>Industry label</u>	<u>Mean</u>	<u>n</u>
21	Mining	330.67	42
22	Utilities	336.92	84
23	Construction	367.56	202
31	Food and textile manufacturing	366.10	262
32	Wood product, chemical, and nonmetallic mineral manufacturing	374.08	717
33	Metal, machinery, electronics, and (...) furniture manufacturing	368.02	1,345
42	Wholesale trade	374.83	1,027
44-45	Retail trade	384.53	225
48-49	Transportation and warehousing	365.94	175
51	Information	373.06	36
52	Finance and insurance	384.32	41
53	Real estate, rental and leasing	383.25	48
54	Professional, scientific and technical services	371.08	310
55	Management of companies and enterprises	343.70	30
56	Administrative and support and (...) remediation services	381.14	949
61	Educational services	387.39	18
62	Health care and social assistance	380.01	181
71	Arts, entertainment and recreation	421.42	24
81	Other services (except public administration)	357.21	56
	<i>Total</i>	372.76	5,772

Table 14 displays the correlation matrix of the reporting lag and explanatory variables. Except for *Banks*, all correlations with the dependent variable exhibit expected signs. Unsurprisingly, variables capturing performance (*Loss*, *Improve*, *RoA*) are relatively highly correlated. The highest correlation (*Loss* and *RoA*) amounts to -0.53. Employing a Big4 auditor (0.30) and the presence of a consolidated report (0.29) are associated with company size. Otherwise, all correlations in our main model are modest and well below 0.4, indicating that each predictor captures different information. We also conclude that multicollinearity should not be a serious issue.⁴⁶

⁴⁶ We calculate variance inflation factors for each regression; scores are well-below conventional thresholds.

PART B: TIMELINESS

Table 13:
Summary statistics

Panel A: Components of the reporting lag

	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>Lag_Rep</i>	5,262	371.78	87.26	320	391	430
<i>Lag_Approv</i>	3,127	197.52	80.98	135	180	247
<i>Lag_Audit</i>	5,231	156.86	86.01	93	141	192
<i>Lag_Prep</i>	5,244	141.13	82.46	86	121	174
Δ <i>Approv_Rep</i>	3,127	172.96	93.27	95	168	248
Δ <i>Audit_Rep</i>	5,231	214.30	98.10	136	219	289
Δ <i>Prep_Rep</i>	5,244	230.39	97.68	152	238	307

Panel B: Variables for the main model

	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>Loss</i>	5,262	0.15	0.36	0	0	0
<i>Improve</i>	5,262	0.54	0.50	0	1	1
<i>Family</i>	5,262	0.36	0.48	0	0	1
<i>Competition</i>	5,262	0.48	0.35	0.22	0.44	0.78
<i>Size</i>	5,262	11.12	0.99	10.38	10.97	11.67
<i>Age</i>	5,262	40.56	36.00	16	26	55
<i>StockCorp</i>	5,262	0.06	0.25	0	0	0
<i>Big4</i>	5,262	0.41	0.49	0	0	1
<i>Banks</i>	5,262	2.60	1.51	1	2	4
<i>Group</i>	5,262	0.28	0.45	0	0	1
<i>Leverage</i>	5,262	0.42	0.59	0.22	0.39	0.57
<i>YearEnd</i>	5,262	0.14	0.34	0	0	0

Panel C: Variables for additional analyses

	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
Δ <i>Lag_Rep</i>	4,355	0.01	85.03	-42	-3	44
<i>Lag_Rep_{CS}</i>	1,050	380.88	86.38	328	393	434
<i>Lag_Rep_{UCS}</i>	1,050	364.12	80.04	318	377	421
Δ <i>Lag_Rep_{CS,UCS}</i>	1,050	16.99	50.76	-2	6	35
<i>RoA</i>	5,262	0.08	0.10	0.03	0.07	0.13
<i>NonCompliant₃₆₅</i>	5,262	0.61	0.49	0	1	1
<i>NonCompliant₄₁₅</i>	5,262	0.35	0.48	0	0	1
<i>Amount</i>	5,262	10.66	0.40	10.36	10.63	10.92
<i> dAcc </i>	5,084	0.10	0.12	0.03	0.06	0.12

Notes: Table depicts summary statistics of employed variables. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined as described in Appendix C.

Table 14:
Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
(1) <i>Lag_Rep</i>	1.00																		
(2) <i>Loss</i>	0.12	1.00																	
(3) <i>Improve</i>	-0.09	-0.23	1.00																
(4) <i>Family</i>	0.15	-0.10	0.00	1.00															
(5) <i>Competition</i>	0.04	0.01	-0.02	-0.01	1.00														
(6) <i>Size</i>	-0.10	0.04	-0.01	-0.17	0.03	1.00													
(7) <i>Age</i>	-0.01	-0.08	0.00	0.05	-0.01	0.01	1.00												
(8) <i>StockCorp</i>	-0.04	-0.03	0.00	-0.05	0.00	0.18	0.03	1.00											
(9) <i>Big4</i>	-0.21	0.11	-0.02	-0.35	0.01	0.30	-0.14	-0.03	1.00										
(10) <i>Banks</i>	0.09	-0.08	0.02	0.19	-0.02	0.01	0.32	0.05	-0.26	1.00									
(11) <i>Group</i>	0.09	-0.02	0.02	0.12	0.00	0.29	-0.01	0.25	-0.14	0.01	1.00								
(12) <i>Leverage</i>	-0.03	0.08	0.00	0.00	-0.01	0.01	0.01	0.00	0.04	-0.01	0.02	1.00							
(13) <i>YearEnd</i>	-0.06	-0.02	0.01	0.03	0.02	0.01	0.02	-0.04	0.02	0.04	-0.05	0.02	1.00						
(14) <i>RoA</i>	-0.07	-0.53	0.25	0.08	0.01	-0.12	0.03	-0.04	-0.04	0.00	-0.04	-0.06	0.02	1.00					
(15) <i>NonCompliant</i> ₃₆₅	0.82	0.07	-0.05	0.14	0.04	-0.10	0.01	-0.04	-0.21	0.09	0.04	-0.02	-0.04	-0.04	1.00				
(16) <i>NonCompliant</i> ₄₁₅	0.70	0.12	-0.10	0.11	0.01	-0.08	-0.02	-0.04	-0.12	0.06	0.02	-0.03	-0.14	-0.08	0.59	1.00			
(17) <i>Amount</i>	-0.10	0.10	-0.01	-0.15	0.06	0.56	-0.01	0.27	0.2	0.05	0.46	0.07	-0.02	-0.16	-0.11	-0.10	1.00		
(18) <i>dAcc/</i>	0.02	0.08	0.00	-0.02	-0.01	-0.06	-0.08	-0.06	0.05	-0.06	-0.09	0.03	0.00	0.00	0.02	0.02	-0.05	1.00	

Notes: Table depicts Pearson correlation coefficients of *Lag_Rep* and other employed variables. Significant correlations are denoted in bold. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined as described in Appendix C.

5.2 Determinants of disclosure timing

Table 15 presents the OLS regression results of the main Model (1a) and several specifications (1b–e). In general, the results follow our predictions. The coefficients of *Loss* and *Improve* indicate that performance strongly influences the disclosure timing decision. Firms with bad news (*Loss*) file their accounts significantly later. In the case where firms beat prior year's earnings benchmark (earnings improvement), they tend to file more timely. Nevertheless, the effect of *Loss* is stronger in magnitude and suggests a longer reporting lag of about a month (30 days) for loss-reporting firms.

Ownership structure and timeliness also seem to be linked. Firms held by a natural person with controlling influence (family firms) exhibit a less timely disclosure behavior. First, this is attributable to a less dispersed ownership of family firms, which induces lower ownership/manager-related agency costs. Second, controlling shareholders are more likely to exploit private channels rather than obtain information from public sources and therefore do not demand timely disclosure. Third, this might also be attributable to privacy cost concerns, when considering that the earnings and financial condition of the disclosing company are directly linked to the private sphere, and the private income and wealth of often (locally) well-known entrepreneurs and families. The significant negative relationship between *StockCorp* and the reporting lag supports agency-conflicts to be a major influencing factor. Firms registered as a stock corporation, a legal form that is designed to facilitate the transfer of ownership and to create more distance between owner and management, file timelier. Even *Size* is consistent with the notion of more severe information asymmetries, when assuming a higher number of stakeholders and business partners. Informing various stakeholder via standardized public channels seems to be more efficient and therefore more useful for larger firms (transaction cost savings). However, a shorter reporting lag might also be attributable to a higher level of professionalism in the financial reporting process. Larger firms are more likely to possess sophisticated accounting systems and well-trained personnel for the preparation of financial statements.

We also find a significantly positive relation between *Competition* and the timeliness of financial statement publications, even when controlling for industry.⁴⁷ Firms with a higher perception regarding individual competitiveness exhibit longer reporting lags. This is consistent with the proprietary costs theory and the aspiration of firms' management

⁴⁷ Without industry-fixed effects, the positive association between *Lag_Rep* and *Competition* is highly significant.

PART B: TIMELINESS

Table 15:
Firm-level determinants of disclosure timing decision

	(1a) Lag_Rep	(1b) Lag_Rep	(1c) Δ Approv_Rep	(1d) Lag_Rep	(1e) Lag_Rep
<i>Lag_Prep</i>		0.324*** (24.26)			
<i>Lag_Rep_{t-1}</i>					0.485*** (37.59)
<i>Loss</i>	30.311*** (9.22)	20.404*** (6.49)	19.305*** (3.86)	32.293*** (9.71)	19.432*** (6.31)
<i>Improve</i>	-10.957*** (-4.77)	-9.521*** (-4.37)	-4.469 (-1.36)	-10.853*** (-5.69)	-15.424*** (-7.08)
<i>Family</i>	10.717*** (4.04)	9.220*** (3.66)	12.338*** (3.30)		5.239** (2.07)
<i>Competition</i>	7.472** (2.27)	5.300* (1.70)	9.329* (1.93)		4.407 (1.40)
<i>Size</i>	-3.989*** (-2.96)	-2.313* (-1.81)	3.354* (1.75)		-2.292* (-1.79)
<i>Big4</i>	-27.311*** (-10.05)	-23.869*** (-9.25)	-8.974** (-2.16)		-12.777*** (-4.92)
<i>StockCorp</i>	-17.513*** (-3.61)	-8.932* (-1.94)	21.369*** (3.38)		-8.348* (-1.81)
<i>Startup</i>	7.986** (2.33)	8.353** (2.57)	15.110*** (3.00)		0.016 (0.00)
<i>Banks</i>	4.180*** (4.98)	4.375*** (5.50)	7.822*** (6.62)		2.091*** (2.62)
<i>Group</i>	15.998*** (4.72)	5.751* (1.78)	-17.871*** (-3.48)		6.186* (1.92)
<i>Leverage</i>	-3.746** (-1.98)	-4.220** (-2.36)	-10.695** (-2.34)		-0.940 (-0.56)
<i>YearEnd</i>	-18.175*** (-5.46)	-15.882*** (-5.04)	-13.607*** (-2.84)		-11.381*** (-3.60)
<i>Constant</i>	396.805*** (23.33)	342.962*** (21.08)	110.575*** (4.60)	423.248*** (16.88)	239.221*** (14.19)
Fixed effects	Y, I, R	Y, I, R	Y, I, R	Y, F	Y, I, R
n	5,262	5,244	3,127	5,262	4,355
R ²	0.167	0.254	0.133	0.594	0.377
Adj. R ²	0.156	0.244	0.114	0.508	0.367

Notes: Table depicts OLS regression results of main Model (1a) and several specifications (1b–e) with *Lag_Rep* as dependent variable (1a–b, 1d–e). Dependent variable in Model (1c) is Δ *Approv_Rep*. We employ fixed effects for the year (Y), the industry based on Fama/French 48 classification (I), the region (R), and the firm (F) as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

to withhold information from (potential) competitors by delaying its public availability. A firm might do so in order to protect its competitive advantages. Considering the weak information environment and the relative importance of financial statements in a private firm setting, this seems reasonable. Younger firms (e.g., startups) also publish less timely as the coefficient of variable the *Startup* indicates. Compared to older companies, their operational activities and performance are less known and less predictable. To maintain a reduced information environment, they might be more strongly engaged in delaying. Laschewksi and Nasev (2018) expect the proprietary costs of publishing consolidated accounts to be higher because group accounts are supposed to be more informative and transparent as they serve as a major information source. In line with this notion, we find a significantly positive association between the reporting lag and the release of a consolidated account. They are published 16 days later.⁴⁸

Moreover, we discover a highly significant relationship between the type of auditor and the publication timing. Firms with a Big4 auditor exhibit considerably shorter reporting lags. We provide two possible explanations: first, large auditors are able to exert a stricter influence over clients' behavior in prompting them to comply with legal rules; second, the election of the auditor is a company's (or shareholder's) decision, suggesting self-selection issues. Firms hiring auditors associated with stricter audit quality (Francis et al. 2014) are generally more transparent and less reluctant to disclose timely.

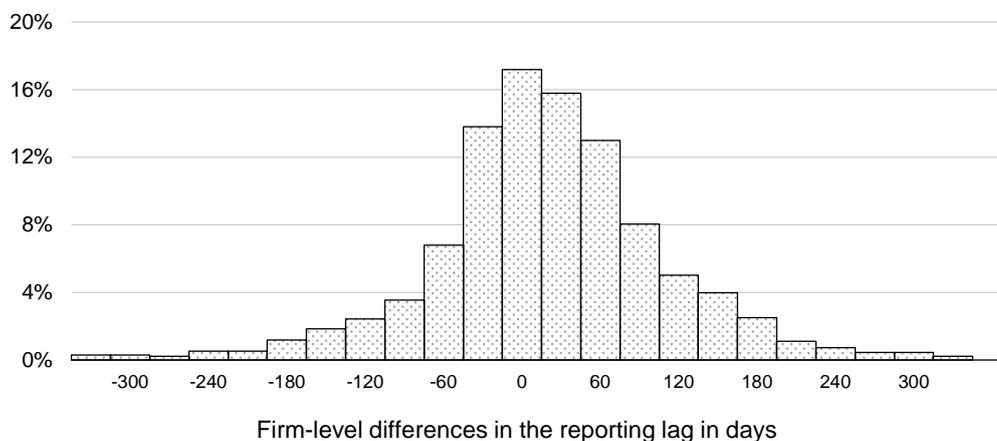
Finally, we expected the number of banks to be negatively related to the reporting lag. This would be in line with the findings of Bigus and Hillebrand (2017) who argue that relationship banking is negatively associated with financial reporting quality (i.a., measured by timeliness). However, the reporting lag increases with the number of *Banks*.⁴⁹ We attribute this to our sample selection and speculate that large firms do not rely as much on relationship banking as their small and medium-sized counterparts.

Overall, the results of our Model (1) are mainly consistent with the prior literature and our expectations. To control for internal effects and preparation delay, we additionally present several specifications of the Model (1b–e) in Table 15. Model (1b) includes the time for the preparation of financial statements (*Lag_Prep*) as an influencing factor. Of course, the lag for preparation explains some variation in the publication delay as they

⁴⁸ We add to this aspect in the course of further analysis (Section 6.1).

⁴⁹ Breuer et al. (2019a) also document a positive association between the number of banks and financial reporting timeliness.

Figure 9:
Histogram of firm-level differences in the reporting lag



are logically linked. Notwithstanding, all of our previous results hold. Next, we replace the dependent variable Lag_Rep with the lag in time between approval and publication ($\Delta Approv_Rep$) to exclude all kinds of possible internally driven delays (1c). The results hold, which reinforce the notion that the time for preparation, audit and approval explains only a minor part of the reporting lag of private firms (see also the descriptive results in Section 5.1 and Figure 7). Moreover, this shows that delaying is an intentional managerial decision.

Since we use panel data, and to control for omitted firm related issues (Amir et al. 2016), we drop all determinants with no or low firm-level variance and employ firm-fixed effects in Model (1d). Unsurprisingly, R^2 rises indicating firm-specific patterns regarding the disclosure timing decision (e.g., ritualistic behavior or prevalence of a certain filing policy). In a similar vein, Model (1e) controls for the reporting lag in the prior year (Lag_Rep_{t-1}). Adding lagged variables controls for non-observable firm properties. Nevertheless, all results also hold under stricter model specifications.

5.3 Profitability and firm-level differences in the reporting lag

In a next step, we take a closer look at the firm-level year-over-year changes of the reporting lag. Therefore, we define ΔLag_Rep as the difference in disclosure timing between two consecutive periods. As an example, assume that a firm files the financial statement for fiscal year t_1 after 345 days, the financial statement of t_2 within 400 days

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and the financial statement of t_3 after 380 days. In this example, $\Delta Lag_Rep_{t1/2}$ and $\Delta Lag_Rep_{t2/3}$ are +55 and -20 days, respectively. Hence, the sign provides information whether a firm accelerates (negative sign) or slows down (positive sign) financial statement publication compared to the prior year. The descriptive statistics presented in Table 13 (Panel C) and the histogram (Figure 9) graphically reveal the (nearly normal) distribution of ΔLag_Rep . The mean of the annual change amounts to nearly zero; however, the standard deviation is about 85 days, suggesting that firms alter their timing behavior to some extent. Whereas an essential part of financial statements is filed within +/- 30 days compared to the prior year (indicating constant disclosure timing), the remaining observations (68 %) exhibit greater heterogeneity.

The timing decision does not appear to be sticky. In the absence of capital market pressure and scheduled reporting dates – compared to public firms – this seems less surprising. We next examine whether these annual changes are related to changes in firms' performance. We therefore take a closer look at psychologically important thresholds, namely, when firms' earnings turn from a profit into a loss (P_L) and vice versa (L_P) (DeGeorge et. al 1999). Based on earnings before taxes, we identify 326 observations fulfilling the first mentioned pattern (P_L) and 323 observations concurring with the latter (L_P). Table 16 presents the mean of ΔLag_Rep for all four combinations (2x2 matrix).

Table 16:
Performance and firm-level difference in reporting lag (2x2 matrix)

<i>Profit and loss based on earnings before taxes</i>				<i>Profit and loss based on earnings after taxes</i>			
<i>t</i>	<i>t₁</i>		<i>Diff.</i>	<i>t</i>	<i>t₁</i>		<i>Diff.</i>
	<i>Profit</i>	<i>Loss</i>			<i>Profit</i>	<i>Loss</i>	
<i>Profit</i>	2.07 (3,336)	-49.69 (323)	51.76*** (11.03)	<i>Profit</i>	1.66 (3,212)	-47.39 (351)	49.05*** (10.83)
<i>Loss</i>	36.72 (326)	-6,81 (365)	-43.53*** (-5.89)	<i>Loss</i>	40.02 (352)	-5.95 (420)	-45.97*** (-6.73)
<i>Total</i>	5.16 (3,662)	-26.94 (688)		<i>Total</i>	5.45 (3,564)	-24.82 (771)	

Notes: Table depicts firm-level differences in the reporting lag (ΔLag_Rep) for firms with a loss ($RoA < 0$) in the prior year (t_{-1}) turning to a profit ($RoA \geq 0$) in the current year (t) and vice versa, denoted in bold. Number of observations is in parentheses. Column *Diff.* depicts t-test results of ΔLag_Rep between firms turning from a loss in t_{-1} to a profit in t vs. firms exhibit profits in both years and vice versa. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. Left (right) two-by-two matrix indicates *RoA* based on earnings before taxes (after taxes).

The mean of the annual changes of firms, which report a loss after a prior positive performance (third quadrant), is about +37 days, suggesting that firms with this performance pattern seem to have incentives to (further) delay the public availability of their filings. In contrast, firms that report profits after negative performance (first quadrant) reveal an acceleration in filing by more than 1.5 months (-50 days).⁵⁰ In spite of an overall reluctance of private firms to be transparent, we find a negative sign. It seems that returning to profitability encourages companies to file more timely. All differences in annual changes are significant. T-tests reveal highly significant results based on earnings before taxes (left matrix) as well as on earnings after taxes (right matrix). This is consistent with the notion that underperformance increases agency costs, whereas information about being/becoming profitable reduces them. Hence, the results suggest that performance influences firms' (un)willingness to disclose timely; particularly in the case of critical changes in earnings. Nevertheless, we rather expected a quadratic than a linear relationship between disclosure timing and firm performance. This is because there are two competing effects. Whereas underperformance increases agency costs, outperformance might attract new competitors, which raises proprietary costs (Section 3.3). On a purely descriptive basis, the graph in Figure 10 reveals a minimum in the reporting lag for firms with moderate or average performance. Return on assets is grouped by sextiles. Both extremes exhibit longer reporting lags, suggesting a non-monotonic relationship, which is in line with the results of Muiño and Núñez-Nickel (2016).

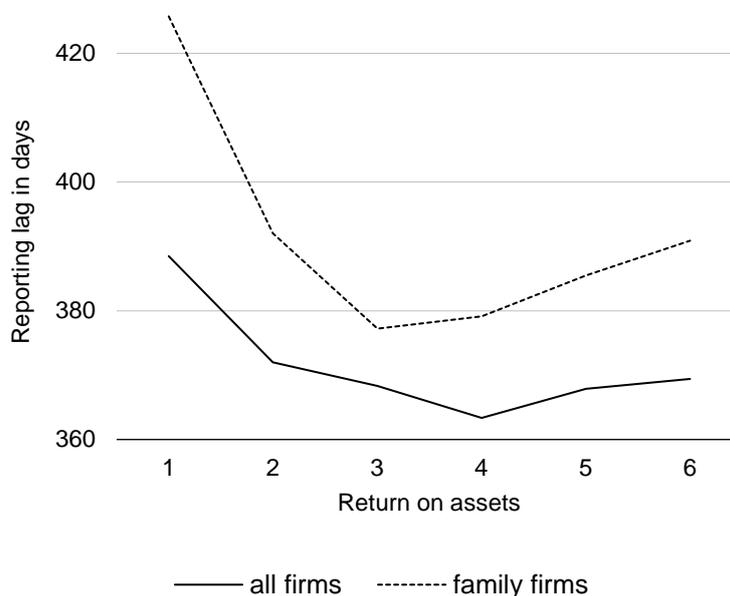
We depict this association for all of our sample firms as well as for family firms only. As can be seen, family firms generally exhibit a higher reporting lag and it appears that the u-shaped association seems even more pronounced for family firms. To multivariately test for a u-shaped relationship, we employ the following regression model:

$$Lag_Rep_{it} = \beta_0 + \beta_1 * RoA_{it} + \beta_2 * RoA_{it}^2 + \sum \beta_c * Controls_{cit} + \sum fixedEffects + \epsilon_{it} \quad (3)$$

Compared to Model (1) we replace the binaries *Loss* and *Improve* with a continuous performance measure (*RoA*). Methodologically adapting, e.g., Bernard (2016), or Muiño and Núñez-Nickel (2016), we further add return on assets squared (RoA^2).

⁵⁰ The results are unlikely to be driven by financial statement preparation. For both groups, the preparation lag (*Lag_Prep*) is quite similar. *Lag_Prep* of firms with positive earnings after a loss ($L_P = 1$) is 156 days; for all other firms it equals 157 days.

Figure 10:
Reporting lag by performance



Notes: Figure depicts the reporting lag by return on assets (sextiles = bins of 16.6 percentiles). Solid (dotted) line represents all firms (family firms only).

Table 17 presents the results of Equation (2) and several specifications. First, it is notable, that profitability is highly negatively associated with the reporting lag (Model 2a) even when measured continuously. Second, the results support our expectations about the properties of the relationship (u-shaped). The negative linear and the positive quadratic coefficients of *RoA* of Model (2b) are highly significant, indicating that poor and outperforming firms are stronger engaged in delaying publication. The unwillingness of the former is attributable to raising agency costs, while the unwillingness of the latter is due to growing proprietary costs concerns (Muiño and Núñez-Nickel 2016). To illustrate the relation, Figure 11 plots the estimated margins and the corresponding 95 % confidence interval of *RoA* based on Model (2b) from Table 17.

Moving from -2 standard deviations to mean of return on assets results in a decrease in *Lag_Rep* of about 10 %. Moving further from +1 to +4 standard deviations results in an increase of 9 %. As already implied by the descriptive results and the shape of the curve in Figure 10, the quadratic relationship is more prominent for family firms (-13 %, +21 %).

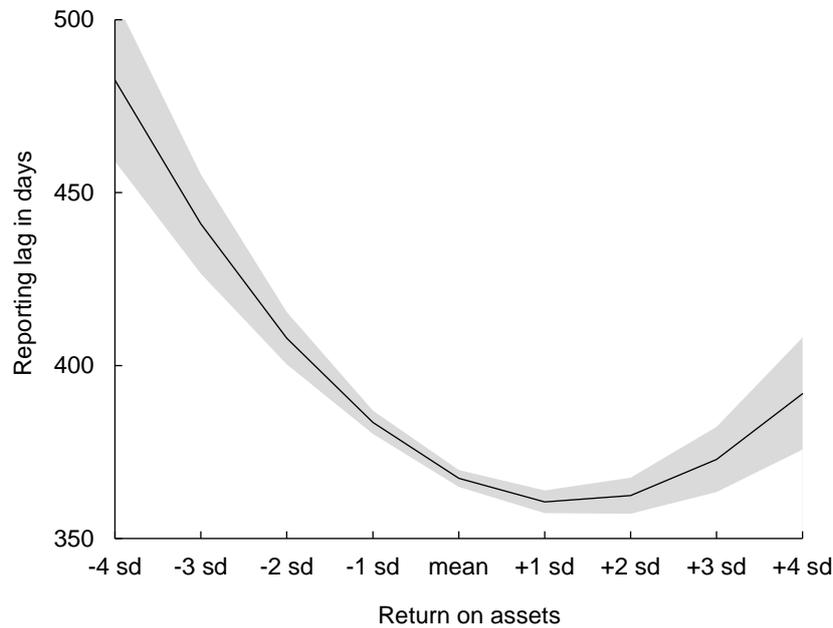
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Table 17:
Performance and reporting lag

	(2a)	(2b)	(2c)	(2d)
	Lag_Rep	Lag_Rep	Lag_Rep	Lag_Rep
<i>RoA</i>	-74.155*** (-6.43)	-183.816*** (-9.80)		
<i>RoA</i> ²		433.727*** (7.40)		
<i>RoA</i> _{adj}			-75.348*** (-6.40)	-109.391*** (-8.73)
<i>RoA</i> _{adj} ²				474.374*** (7.67)
<i>Family</i>	10.464*** (3.91)	10.965*** (4.11)	11.358*** (4.37)	11.871*** (4.59)
<i>Competition</i>	8.055** (2.42)	7.541** (2.28)	11.175*** (3.40)	10.415*** (3.19)
<i>Size</i>	-4.410*** (-3.23)	-3.616*** (-2.66)	-5.193*** (-3.94)	-4.192*** (-3.18)
<i>Big4</i>	-25.796*** (-9.42)	-27.647*** (-10.10)	-25.951*** (-9.57)	-27.898*** (-10.30)
<i>StockCorp</i>	-18.683*** (-3.82)	-17.892*** (-3.68)	-23.346*** (-4.82)	-22.480*** (-4.67)
<i>Startup</i>	9.610*** (2.78)	7.649** (2.22)	9.874*** (2.86)	7.791** (2.27)
<i>Banks</i>	3.715*** (4.38)	3.931*** (4.66)	3.301*** (4.07)	3.514*** (4.35)
<i>Group</i>	15.252*** (4.46)	16.132*** (4.74)	16.764*** (5.91)	17.769*** (6.29)
<i>Leverage</i>	-3.132 (-1.64)	-3.376* (-1.78)	-3.621* (-1.89)	-3.749** (-1.97)
<i>YearEnd</i>	-18.467*** (-5.50)	-18.864*** (-5.65)	-16.681*** (-5.01)	-17.461*** (-5.27)
<i>Constant</i>	405.696*** (23.50)	401.095*** (23.33)	404.443*** (26.52)	388.861*** (25.41)
Fixed effects	Y, I, R	Y, I, R	Y, R	Y, R
n	5,262	5,262	5,262	5,262
R ²	0.152	0.161	0.123	0.132
Adj. R ²	0.141	0.150	0.118	0.128

Notes: Table depicts OLS regression results of Model (2a) and several specifications (2b–d) with *Lag_Rep* as dependent variable. We employ fixed effects for the year (Y), the industry based on Fama/French 48 classification (I), and the region (R) as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

Figure 11:
Estimated margins of reporting lag for return on assets



Notes: Figure depicts the estimated margins and corresponding 95 % confidence intervals of reporting lag (Lag_{Rep}) from -4 standard deviations to +4 standard deviations of return on assets (RoA). Estimated margins are computed based on Model (2b) from Table 17.

For robustness reasons, we industry-adjust the return on assets variable to specify firms' performance relative to their industry-level peers. In order to do so, we subtract the industry-year mean (RoA_{adj}).⁵¹ All results hold (Model 2d). Overall, the findings indicate the presence of systematic and statistical significant timing patterns, which might be useful for outside stakeholders, especially when considering the low information environment of private firms. As such, the findings indicate that the disclosure delay can carry information about a firm's performance.

⁵¹ Bernard (2016) computes industry-adjusted performance and leverage in the same way.

6 Additional analyses

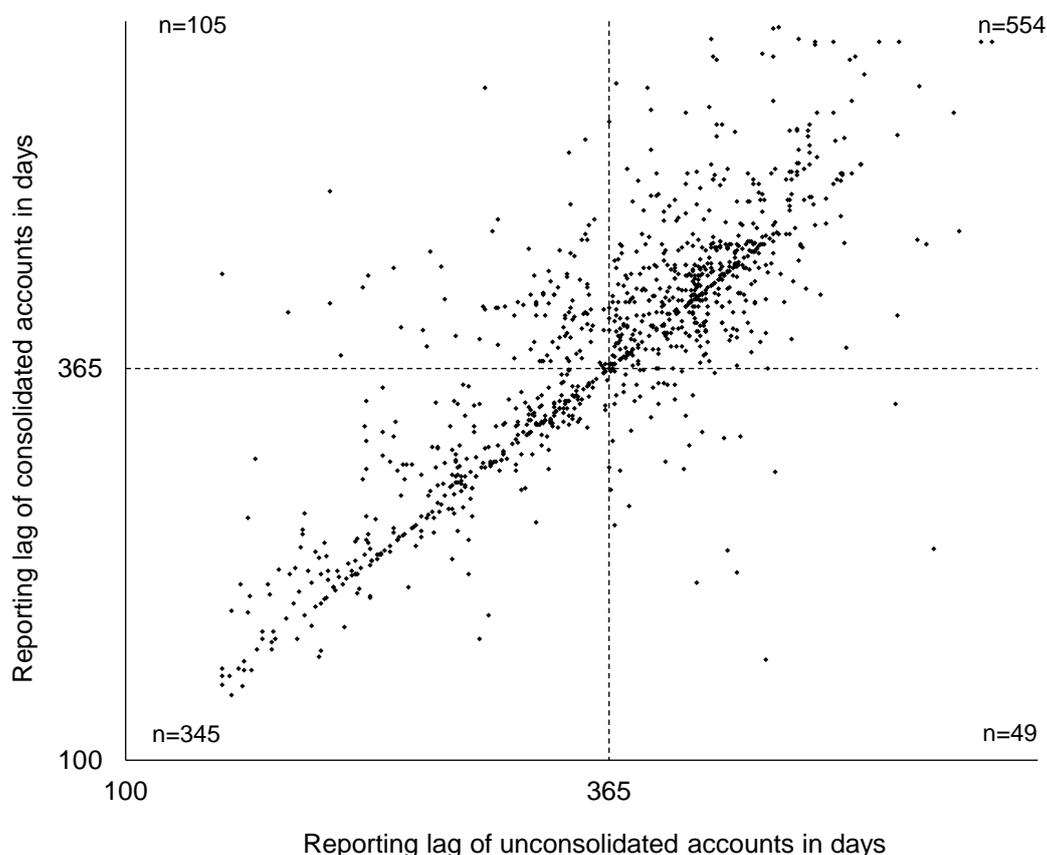
6.1 Reporting lag of consolidated financial statements

The results for firm-level determinants (Section 5.2) reveal a positive association between the type of account and timing, suggesting that consolidated reports are submitted with greater delay compared to unconsolidated accounts (single statement accounts). This is in accordance with Laschewski and Nasev (2018) and the conjecture that consolidated accounts are of higher informational value and reveal additional information about a company. To reinforce this, we analyze the timing decision of the consolidated and the unconsolidated accounts of the same firm. We additionally obtain timing data on unconsolidated accounts from all parent companies of our sample. Hence, there are two filing dates for each firm-year observation. One filing date refers to the unconsolidated statement (UCS) and a second filing date refers to the consolidated statement (CS). Overall, we find 1,053 pairs⁵² from 205 firms with complete data. To reduce administrative effort and direct compliance costs, one could expect firms to file both financial statements concurrently. Indeed, this is only the case for 128 pairs (12 %). Another 273 pairs (25 %) are filed at least within +/-10 days. For the remaining observations, timing is clearly different. While the majority submit the CS posterior to the UCS, some firms do so the other way around. Table 13 (Panel C) displays descriptive statistics for both timing decisions and a variable capturing the difference between the two dates ($\Delta Lag_Rep_{CS_UCS}$).

While a parent company files the unconsolidated accounts on average 364 days after fiscal year-end, it publishes the (by assumption more informative) consolidated accounts 17 days later. Figure 12 plots each pair. The points that lie on an imaginary diagonal ($x=y$) are filed concurrently ($n=128$). Furthermore, Figure 12 graphically reveals that more data points lie above the diagonal, which is consistent with the negative sign of $\Delta Lag_Rep_{CS_UCS}$. Delays in financial statement preparation and auditing are less likely to be responsible, as the results in Figure 7 indicate. Untabulated multivariate results suggest that this association (longer delay of the more informative consolidated report) is more pronounced for family firms and for firms with higher perceived competition.

⁵² Actually, we find 1,075 pairs; however, we drop 22 pairs with a conspicuously great Lag_Rep_{UCS} (> 600 days) indicating that firms might have been unaware of their filing obligation.

Figure 12:
Reporting lag of consolidated vs. unconsolidated financial statements



Notes: Figure depicts scatter plot of the reporting lag of the consolidated accounts (y-axis) and the reporting lag of the unconsolidated account (x-axis) of each parent company (n=1,053). The dotted lines represent the statutory deadline of 365 days.

6.2 Disclosure timing and other financial reporting decisions

Other dimensions of corporate transparency could also influence the timing decision. We therefore examine how timing interacts with the *amount of disclosure* (Bigus and Hillebrand 2017, Breuer et al. 2019a) and the *extent of discretionary accruals* (e.g., Bigus and Hillebrand 2017, Zicke and Kiy 2017, Laschewski and Nasev 2018). Both are often associated with reporting quality and employed in recent research on private firms. Moreover, both are as much under managerial control as the timing decision and contribute to firms' information environment. However, it is questionable as to whether disclosure timing acts as a complement or substitute when seeking to achieve the desired level of transparency. In terms of the disclosure amount, the former would be the case, if firms pursue

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a minimal disclosure strategy and additionally delay their filings. The latter follows the idea that firms enhance their reporting lag because they produce more comprehensive and informative reports. Following this notion, we also analyze the extent of discretionary accruals – a commonly used proxy for accounting quality – as a second financial reporting decision. We test whether firms are engaged in both (complement) or if there is a substitutional association, and firms delay publication when they provide earnings of a higher quality. We therefore use the following regression model where *ReportingQuality* represents either the *amount of disclosure* or the *discretionary accruals*:

$$\begin{aligned} Lag.Rep_{it} = & \beta_0 + \beta_1 * ReportingQuality_{it} + \sum \beta_c * Controls_{cit} \\ & + \sum fixedEffects + \epsilon_{it} \end{aligned} \quad (3)$$

To measure the amount of disclosure, we rely on the total number of characters in a firm’s filing, which is retrievable from the German Federal Gazette (*Amount*). To calculate the extent of potential earnings management, we employ the commonly used modified Jones (1991) model (Dechow et al. 1995) which separates accruals into a normal and a discretionary portion. Following DeFond and Jiambalvo (1994), we apply a cross-sectional model and calculate discretionary accruals (*dAcc*) as the difference between total and “expected” accruals based on the following regression:

$$\frac{tAcc_{it}}{TA_{it-1}} = \beta_0 + \beta_1 * \frac{1}{TA_{it-1}} + \beta_2 * \frac{\Delta Rev_{it} - \Delta Rec_{it}}{TA_{it-1}} + \beta_3 * \frac{PPE_{it}}{TA_{it-1}} + \epsilon_{it} \quad (4)$$

where ΔRev is the change in revenues of firm *i* from year *t-1* to *t*, ΔRec is the change in trade receivables, and *PPE* is the gross property, plant and equipment book value. All variables are scaled by one-year lagged total assets (TA_{t-1}). Total accruals (*tAcc*) are calculated in accordance with Dechow et al. (1995):

$$tAcc_{it} = (\Delta Rev_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STD_{it} - \Delta TP_{it}) - Dep_{it} \quad (5)$$

where ΔCA = change in current assets, $\Delta Cash$ = change in cash and cash equivalents, ΔCL = change in current liabilities, ΔSTD = change in short-term debt, ΔTP = change in taxes payable, and ΔDep = depreciation and amortization.

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Table 18:
Timing decision and other dimensions of reporting quality

	(3a) Lag_Rep	(3b) Lag_Rep
<i>Amount</i>	-22.258*** (-5.47)	
<i> dAcc </i>		16.841* (1.67)
<i>RoA</i>	-79.200*** (-6.86)	-74.525*** (-6.38)
<i>Family</i>	9.407*** (3.51)	10.584*** (3.88)
<i>Competition</i>	9.523*** (2.86)	7.803** (2.30)
<i>Size</i>	-1.203 (-0.81)	-5.090*** (-3.66)
<i>Big4</i>	-23.408*** (-8.46)	-25.464*** (-9.20)
<i>StockCorp</i>	-14.686*** (-2.98)	-17.970*** (-3.66)
<i>Startup</i>	10.728*** (3.11)	10.215*** (2.89)
<i>Banks</i>	4.368*** (5.12)	3.396*** (3.94)
<i>Group</i>	21.985*** (6.06)	16.387*** (4.71)
<i>Leverage</i>	-2.453 (-1.29)	-2.987 (-1.57)
<i>YearEnd</i>	-18.212*** (-5.44)	-18.746*** (-5.52)
<i>Constant</i>	599.115*** (15.22)	409.072*** (23.10)
Fixed effects	Y, I, R	Y, I, R
n	5,262	5,084
R ²	0.157	0.152
Adj. R ²	0.146	0.141

Notes: Table depicts OLS regression results of Model (3) with *Lag_Rep* as dependent variable. We employ fixed effects for the year (Y), the industry based on Fama/French 48 classification (I), and the region (R) as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

We estimate Equation (4) in cross-section by industry and by year and therefore need a minimum of 15 observations for each combination. Industries are based on the 48-industry classification scheme by Fama and French (1997). The residuals of the regression form the discretionary accruals ($dAcc_{it}$). We take absolute values, so that earnings decreasing and increasing effects do not compensate each other ($|dAcc_{it}|$).

The results of the regression Model (3) are tabulated in Table 18. The first column depicts the disclosure amount, which is negatively associated to a significant extent with the timing decision. In this case, a negative (positive) coefficient of *Amount* is interpretable as a slight indication of a complementary (substitutional) relation between timing and amount of disclosure (3a). Firms that produce longer financial statements file significantly prompter. In other words, firms with shorter reports that are already less transparent by assumption, publish them with greater delay. This strategy seems reasonable when pursuing greatest opaqueness (“*little and late*”). The second regression (3b) reveals a positive association between reporting lag and the extent of discretionary accruals.⁵³ This slightly suggests a complementary relationship too. Firms that provide more biased earnings figures file late (“*biased and late*”). Both represents an approach to decrease the information environment and is also in line with the findings of Luybaert et al. (2016), who find extremely late-filed accounts to be associated with lower financial statement quality. However, the results have to be interpreted with caution. First, the correlation between *Size* and *Amount* is about 0.57, suggesting possible reliability issues.⁵⁴ Second, the results are subject to general limitations and problems regarding the measurement as well as the interpretation of discretionary accruals (e.g., Jackson 2017, Chen et al. 2018).

6.3 Compliance with legal deadlines

To further analyze the willingness of firms to accept (substantial) monetary sanctions in order to withhold filings for a longer period, we introduce several variables, which primarily measure compliance at different thresholds in time (*NonCompliant*). The longer a firm delays publication, the higher the monetary sanctions imposed by the FOJ. This fact allows us to derive an approximation of firms’ individual pricing for withholding information. We employ the following logit regression:

⁵³ *N* is slightly lower compared to other models because there are not enough industry-year combinations to calculate $|dAcc|$ for all observations.

⁵⁴ The average variance inflation factor of Regression (3a) is 1.96 with a minimum of 1.03 and a maximum of 2.22 for the main variables. In untabulated tests, we drop *Size* from the controls and scale the number of characters by *Size*, with no effect on the results.

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$$\begin{aligned}
 PR(NonCompliant_{it} = 1) = & \beta_0 + \beta_1 * Loss_{it} + \beta_2 * Improve_{it} + \beta_3 * Family_{it} \\
 & + \beta_4 * Competition_{it} + \beta_5 * Size_{it} + \beta_6 * Startup_{it} \\
 & + \beta_7 * Big4_{it} + \beta_8 * Banks_{it} + \beta_9 * Group_{it} \\
 & + \beta_{10} * Leverage_{it} + \beta_{11} * YearEnd_{it} \\
 & + \sum fixedEffects + \epsilon_{it}
 \end{aligned} \tag{6}$$

The results are presented below (Table 19) and indicate that compliant firms and firms, which do not comply with legal timing requirements, differ with respect to some corporate attributes.

The first logit regression (6a) examines firm-level characteristics, which drive the decision to file in or beyond the legal deadline. Non-complaint firms are more likely (i) to exhibit a loss, (ii) to show a higher score of our perceived competition measure, (iii) to not be audited by a Big4 audit company, and (iv) to be characterized as a family firm based on our definition. In order to obtain an assessment of the economic significance, we also estimate the predicted probabilities of exceeding the deadline. The marginal effects as depicted in Table 20 show the relative impact of a change of an explanatory variable on being non-compliant. For continuous (binary) variables, the marginal effect is defined as a one-standard deviation increase (change from zero to one) while holding all other variables constant at sample means. The predicted probability of being non-compliant ($Lag_Rep > 365$ days) rises from 59 % to 71 % (+12 points) when firms report negative earnings (*Loss*). Increasing *Competition* by one standard deviation rises probability of non-compliance by 6 %. On the contrary, firms hiring a Big4 auditor are about 18 % less likely to overrun the 365 days.

If firms submit their accounts after 12 months, but within the period of grace (six weeks), they are subject to relatively low administrative sanctions. If a firm continues to ignore the filing obligation, it will be confronted with higher fines. Model (6c) analyzes the determinants of firms complying within the extended period vs. those ignoring it. The dependent variable equals one if *Lag_Rep* is higher than 415 days.⁵⁵ Unsurprisingly, *Loss* and *Family* are still positively related, showing a higher probability for loss-reporting and family firms to exceed even the extended period. *Competition* is insignificant, indicating that competitive concerns are an issue when delaying beyond 365 days but not accepting higher financial penalties. The predicted probability to file after 415 days amounts to

⁵⁵ The legal deadline amounts to 365 days plus the extension period of six weeks (42 days) = 407. We add another week in order to consider potential administrative delays (415 days) by the Federal Gazette.

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Table 19:
Firm-level determinants of non-compliance

	(6a) Lag_Rep > 365	(6b) Lag_Rep > 375	(6c) Lag_Rep > 415	(6d) Lag_Rep > 445
<i>Loss</i>	0.556*** (6.09)	0.564*** (6.29)	0.722*** (8.04)	0.995*** (9.55)
<i>Improve</i>	-0.159*** (-2.59)	-0.156** (-2.55)	-0.301*** (-4.66)	-0.248*** (-2.93)
<i>Family</i>	0.307*** (4.45)	0.374*** (5.52)	0.360*** (5.15)	0.536*** (5.99)
<i>Competition</i>	0.268*** (3.09)	0.233*** (2.72)	0.098 (1.09)	0.105 (0.89)
<i>Size</i>	-0.106*** (-3.10)	-0.092*** (-2.70)	-0.099*** (-2.68)	-0.104** (-2.15)
<i>Big4</i>	-0.752*** (-10.78)	-0.660*** (-9.49)	-0.407*** (-5.41)	-0.197** (-2.00)
<i>StockCorp</i>	-0.412*** (-3.34)	-0.464*** (-3.75)	-0.446*** (-3.22)	-0.704*** (-3.61)
<i>Startup</i>	0.165* (1.80)	0.221** (2.43)	0.161* (1.71)	0.309*** (2.68)
<i>Banks</i>	0.067*** (3.13)	0.070*** (3.31)	0.080*** (3.61)	0.097*** (3.39)
<i>Group</i>	0.178** (2.38)	0.239*** (3.23)	0.123 (1.60)	0.595*** (6.21)
<i>Leverage</i>	-0.130* (-1.84)	-0.137* (-1.93)	-0.178** (-2.24)	-0.098* (-1.73)
<i>YearEnd</i>	-0.230*** (-2.67)	-0.531*** (-6.16)	-1.119*** (-10.43)	-0.730*** (-5.21)
<i>Constant</i>	1.290*** (3.44)	0.871** (2.33)	-0.065 (-0.16)	-1.724*** (-3.22)
Fixed effects	Y	Y	Y	Y
n	5,262	5,262	5,262	5,262
Pseudo R ²	0.078	0.089	0.124	0.152

Notes: Table depicts logit regression results of Model (6) with *NonCompliance* as binary dependent variable. In regression (6a) the dependent variable equals one if *Lag_Rep* > 365; in regression (6b) the dependent variable equals one if *Lag_Rep* > 375; in regression (6c) the dependent variable equals one if *Lag_Rep* > 415; in regression (6d) the dependent variable equals one if *Lag_Rep* > 445. We employ year-fixed effects (Y). *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

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33 % and increasing to 48 % when firms report a loss. The marginal effect is stronger than in Model (6a). In the last specification (6d), we add another month and increase the threshold of the dependent variable to 445 days (*extreme delay*). The predicted likelihood for such disclosure timing is 14 %, and doubling to 28 % if a firm reports a loss. The magnitude is high for *Family*, where the probability for filing beyond 445 days rises from 14 % to 20 %.⁵⁶

Overall, performance is highly associated with the managerial decision to accept financial penalties in order to file late. Furthermore, there is some indication that ownership seems to influence the decision, too. Companies that we designate as family firms are more likely to clearly go beyond the legal deadlines.

⁵⁶ Marginal effects are based on the coefficient estimates of Model (6b–d), which are not tabulated.

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Table 20:
Marginal effects of compliance with statutory deadlines

	Model (6a) coefficients	Marginal effect dy/dx	Effect relative to Pr(NonCompliance)
<i>Loss</i>	0.556*** (6.09)	0.122*** (6.58)	0.200
<i>Improve</i>	-0.159*** (-2.59)	-0.037*** (-2.59)	-0.061
<i>Family</i>	0.307*** (4.45)	0.071*** (4.52)	0.116
<i>Competition</i>	0.268*** (3.09)	0.063*** (3.09)	0.102
<i>Size</i>	-0.106*** (-3.10)	-0.025*** (-3.10)	-0.040
<i>Big4</i>	-0.752*** (-10.78)	-0.175*** (-10.85)	-0.289
<i>StockCorp</i>	-0.412*** (-3.34)	-0.100*** (-3.26)	-0.163
<i>Startup</i>	0.165* (1.80)	0.038* (1.83)	0.062
<i>Banks</i>	0.067*** (3.13)	0.016*** (3.13)	0.026
<i>Group</i>	0.178** (2.38)	0.041** (2.40)	0.067
<i>Leverage</i>	-0.130* (-1.84)	-0.030* (-1.84)	-0.050
<i>YearEnd</i>	-0.230*** (-2.67)	-0.055*** (-2.63)	-0.089
<i>Constant</i>	1.290*** (3.44)		
Fixed effects	Y		
n	5,262		
Pseudo R ²	0.079		
Pr(NonCompliance)	0.613		

Notes: Table depicts marginal effects after the logit Model (6a) with *NonCompliance* (equals one if *Lag_Rep* > 365) as binary dependent variable. First column reports coefficients for Model (6a) as in Table 19. For continuous variables, marginal effects are defined as an increase by one standard deviation while holding all other variables constant at sample means. For binary variables, effects are based on a change from zero to one. Unconditional probability of non-compliance (Pr(NonCompliance)) is number of non-compliant accounts divided by total number of observations. We employ year-fixed effects (Y). *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

6.4 Robustness and limitations

6.4.1 Analyzing disclosure timing using hazard duration approach

To validate our main results, we additionally apply a survival analysis, which is a statistical method that is explicitly designed to examine the duration of time until the occurrence of a certain event. This technique was originally developed and applied in medical research where the event is often a disease or the death of a study participant. However, over the years, this approach has been applied to predict the length of time in various disciplines. In this context, the event is the publication of the financial statement at the Federal Gazette. Although, we have no censored data, this approach is advantageous, as *non-parametric* models do not assume any underlying distribution and are more appropriate to study durations. Hence, we use the semi-parametric Cox (1972) proportional hazard model, which is mostly applied (Royston and Lambert 2011). We run the following model, where the dependent variable is the hazard rate:

$$h(T)_{it} = h_0(T) * \exp\left(\sum \beta_d * Determinants_{dit} + \sum \beta_c * Controls_{cit} + \sum fixedEffects + \epsilon_{it}\right) \quad (7)$$

The baseline hazard function is denoted as $h_0(T)$ and T is the elapsed time since firms' fiscal year-end in days.

Table 21 provides the results of the Cox proportional hazard model estimation (7). A hazard rate above one implies a positive marginal impact on the occurrence of the event (the hazard) and thus a reduction in expected time until disclosure (vice versa). All of our influencing factors are statistically significant and exhibit the expected signs. The results are consistent with the multivariate regressions from Section 5.2. For example, a hazard rate < 1 of *Family* (0.826) can be interpreted as follows: given a family firm has not already disclosed prior to t , it is less likely that it discloses on the next day compared to a non-family firm. The same holds for firms with negative earnings, firms with higher perceived competition and younger firms. Larger firms as well as firms beating prior years' earnings report more timely.

6.4.2 Alternatively operationalizing family firms

It is a crucial challenge to define and operationalize family businesses. The literature has established various definitions and concepts to separate family firms from non-family

Table 21:
Cox proportional hazard rate model of determinants on disclosure timing

	(7a) h(T)	(7b) h(T)
<i>Loss</i>	0.634*** (-10.82)	0.564*** (-9.13)
<i>Improve</i>	1.091*** (3.00)	1.213*** (5.53)
<i>Family</i>	0.826*** (-5.85)	
<i>Competition</i>	0.910** (-2.30)	
<i>Size</i>	1.057*** (3.26)	
<i>Big4</i>	0.911** (-2.16)	
<i>StockCorp</i>	1.247*** (3.63)	
<i>Startup</i>	1.172*** (4.71)	
<i>Banks</i>	0.954*** (-4.37)	
<i>Group</i>	0.846*** (-4.02)	
<i>Leverage</i>	1.024 (1.13)	
<i>YearEnd</i>	1.362*** (7.32)	
Fixed effects	Y, I, R	Y, F
n	5,262	5,262

Notes: Table depicts results of the Cox proportional hazard model. The dependent variable is the hazard rate. We employ fixed effects for the year (Y), the industry based on Fama/French 48 classification (I), the region (R), and the firm (F) as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The z-statistics are in parentheses.

firms (Prencipe et al. 2014, Klein 2015). In order to validate our results regarding ownership, we alter the empirical operationalization, which is so far grounded on quantitative data. Alternatively, we employ a stricter definition, which is based on a surname matching. It is common for a typical family firm to carry the name of the founder. We therefore declare a firm to be a family firm, if the name of a person in the management is equal to the firm's name. For example, the "Weber Tiefbau GmbH & Co. KG", which is managed

by “Mr. Konrad Weber” is considered to be a family firm, because parts of the firm’s name are identical with the surname of the manager. This approach captures the managerial influence of the family and the identification with the firm more properly. Of course, there are some problems. First, we will not capture all family firms using this approach. When a family firm does not carry the surname of the founder, there will be some false negatives (Error Type II). Names of younger firms are especially less likely to contain surnames. Moreover, we are not able to identify abbreviations of names, for example, if “Mr. Konrad Weber” would have named his firm “KoWe Tiefbau GmbH & Co. KG”. For this reason, we underestimate the number of family firms, which, however, would contradict any findings. We do not expect notable false positives (Error Type I), which would only occur in rare cases with extremely common surnames. In about 25 % of the sample firms, the surname of a person on the board of directors corresponds with the firm name (*FamilyCEO*).

In a further specification, we identify all firms with at least two individuals with the same surname on the management board (regardless of the firm name). It is most likely, that executive members with the same surname are spouses, siblings or children of the founder (family members). Thus, this approach allows us to alternatively capture family control and decision-making as an important characteristic of family firms.⁵⁷ About 12 % of all firms employ at least two managers with the same surname (*RelatedCEOs*).

We rerun the main Model (1) with the previous family measure (1a) as well *FamilyCEO* (1f) and *RelatedCEOs* (1g). The regression results are depicted in Table 22. The coefficients of the variables of interest are positive and highly significant. Hence, all of our results are stable and robust in relation to an alternative measurement of family firms.

6.4.3 Further limitations

Our study is subject to major caveats and suffers from limitations. First, our sample is limited to large German private firms. We choose large private firms because they are confronted with the full set of mandatory disclosure requirements. Due to the special regulatory setting of the recent introduction of an effective enforcement system as well as a digitalized data retrieval platform (Electronic Federal Gazette), we choose German firms. However, inferences that only rely on the behavior of a group are vulnerable and need to be interpreted with caution. Small and medium-sized private firms could reveal a

⁵⁷ For example, if “KoWe Tiefbau GmbH & Co. KG” employs “Mr. Konrad Weber”, “Mrs. Andrea Weber” and “Mr. Georg Müller” as managers, the firm is classified as a family firm.

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Table 22:
Regression results with alternative family firm measures

	(1a) Lag_Rep	(1f) Lag_Rep	(1g) Lag_Rep
<i>Family</i>	10.717*** (4.04)		
<i>FamilyCEO</i>		9.286*** (3.25)	
<i>RelatedCEOs</i>			13.328*** (3.73)
<i>RoA</i>	30.311*** (9.22)	30.508*** (9.25)	29.762*** (9.06)
<i>Family</i>	-10.957*** (-4.77)	-11.130*** (-4.84)	-11.319*** (-4.93)
<i>Competition</i>	7.472** (2.27)	7.568** (2.29)	7.060** (2.14)
<i>Size</i>	-3.989*** (-2.96)	-4.152*** (-3.08)	-4.310*** (-3.21)
<i>Big4</i>	-27.311*** (-10.05)	-28.611*** (-10.71)	-28.187*** (-10.52)
<i>StockCorp</i>	-17.513*** (-3.61)	-20.340*** (-4.21)	-18.684*** (-3.87)
<i>Startup</i>	7.986** (2.33)	7.979** (2.32)	7.792** (2.27)
<i>Banks</i>	4.180*** (4.98)	4.281*** (5.10)	4.550*** (5.46)
<i>Group</i>	15.998*** (4.72)	17.181*** (5.09)	16.668*** (4.93)
<i>Leverage</i>	-3.746** (-1.98)	-3.669* (-1.94)	-3.582* (-1.89)
<i>YearEnd</i>	-18.175*** (-5.46)	-17.209*** (-5.15)	-18.001*** (-5.41)
<i>Constant</i>	396.805*** (23.33)	402.435*** (23.82)	404.149*** (23.98)
Fixed effects	Y, I, R	Y, I, R	Y, I, R
n	5,262	5,262	5,262
R ²	0.167	0.166	0.167
Adj. R ²	0.156	0.155	0.156

Notes: Table depicts OLS regression results of Model (1) with *Lag_Rep* as dependent variable. Model (1f) and (1g) contain alternative family firm measures. We employ fixed effects for the year (Y), the industry based on Fama/French 48 classification (I), and the region (R) as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses.

different disclosure behavior grounded on differential cost-benefit considerations. Second, we only rely on a randomly chosen sample. We are not aware of any indication, that our sample is unrepresentative for the population of companies included in the *Amadeus* database.⁵⁸ Nonetheless, it is possible that firms that severely suffer from proprietary costs are not included. Such firms could have found ways to completely circumvent or significantly reduce disclosure requirements (e.g., change in legal form or size management as indicated by Bernard et al. (2018)). Third, the financial filing procedure could be outsourced to external parties (e.g., tax advisers), which could influence the disclosure timing decision. Since we only consider large firms, this, however, should be not a major issue.

7 Discussion and concluding remarks

In this study, we examine the timing decision regarding the mandatory disclosure of private firms. We argue that firms use discretion in legal requirements in order to deal with indirect costs of disclosure. Timeliness is a parameter that determines the value of information to third parties. The literature already highlights the reluctance of private firms towards the public availability of financial statements and high transparency (e.g., Grottke 2011, Grottke et al. 2012, Eierle et al. 2019). Prior to a regulatory change (EHUG), simply ignoring the disclosure obligation was prevalent. However, since 2007, automated sanctioning has forced private firms to file annual reports within twelve months after fiscal year-end. We use this setting, to analyze how private firms respond to enforced mandated filing.

In line with prior literature, we reveal high disclosure rates but add evidence on delaying disclosure to be a strategy to reduce indirect costs. We observe a high number of violations concerning statutory deadlines. Only 38 % of financial statements are filed in time. The mean reporting lag as the difference in days between the fiscal year-end and submission is 373 days (i.e., on average, private firms totally exhaust legal discretion of 365 days).

Whereas Gregory and Van Horn (1960, p. 352) generally define “the chief element of delay [as] the time required to process data” and also note that only small amounts of time

⁵⁸ To ensure representativeness, we compared our sample and the *Amadeus* population with respect to size, profitability and distribution over industries without any peculiarities.

are required to distribute financial reports, this does not seem to be valid for private firms. Only a minor part of the reporting lag is consumed by financial statements' preparation and auditing processes. Between the date when a firm is able to publish its annual report (following approval) and actual submission, there is an average time span of about six months. This significant gap between "*a firm is able to disclose*" and "*a firm is willing to disclose*" highlights firms' unwillingness and indicates a tendency to create a less transparent information environment. Notwithstanding, timing behavior is not homogenous. The reporting lag exhibits high variance. Some firms comply in a timely fashion, while others even accept monetary sanctions to overrun statutory deadlines. We therefore take a closer look at the determinants of the disclosure timing decision.

Our results suggest corporate performance as an important influencing factor. In line with the "*good news early, bad news late*" hypothesis, we find that loss-reporting firms exhibit significantly longer reporting lags. This is also the case, if firms are not able to beat prior year earnings. Against the background of rising agency conflicts, it seems reasonable, to withhold *cost-raising* news as long as possible. In particular, extreme changes in earnings, namely moving from a profit situation to a loss situation and vice versa, shape disclosure timing. Firms that report a loss after a profit in the previous year significantly slow down the public availability of financial statements. In the opposite case, disclosure timing is accelerated. Consistent with the findings of Muiño and Núñez-Nickel (2016), we also observe a u-shaped relationship between disclosure timing and firm performance. This indicates that highly profitable firms cherish incentives to file less timely as well. Firms might try to hide outperformance and high margins from (potential) competitors and other stakeholders. Hence, a longer withholding of information allows them to deal with increasing proprietary costs.

In line with the proprietary costs theory, we find that firms exposed to higher (perceived) competition exhibit longer reporting lags. Additionally, we show the ownership structure to be related with timeliness. Family firms, which are more strongly confronted with privacy costs, delay disclosure to a higher degree. Thus, we also add to this aspect of the literature, which already documents a higher opacity of family firms (e.g., Anderson et al. 2009, Ma et al. 2017).

Overall, we provide evidence to show that private firms exploit discretion in timeliness in order to handle indirect costs of mandatory disclosure. From a financial statement user's perspective, we present insights into the potential informativeness of the reporting

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lag. We also document slight indication that timeliness is related to other aspects of financial reporting quality. Our results suggest that firms which delay financial reporting provide shorter reports (less information) and exhibit a higher extent of discretionary accruals.

The study extends the literature on private firms, particularly on the costs of mandatory disclosure. It also contributes to a better understanding of the financial reporting practice of private firms and emphasizes the importance of proprietary costs. Moreover, findings are of practical relevance to standard setters and regulators, when defining the requirements of mandatory disclosure and designing its enforcement mechanism.

Appendix A:
Empirical research on disclosure timing of public firms

The following table provides an overview of prior research regarding disclosure timing of public firms. In early years, the studies focus on the determinants of the reporting lag. Moreover, the “*good news early, bad news late*” hypothesis is often tested. Another important field deals with capital market implications regarding the timing decision of either annual and/or quarterly reports as well as earnings announcements. More recent studies focus on regulatory changes, technological issues and more specific determinants. Since some studies cover multiple topics and hence are not unambiguously assignable, we refrain from clustering and arrange them chronologically. We do not consider research on intra-day or weekday timing of disclosures as for example Patell and Wolfson (1982) or Michaely et al. (2016).

Study	Country	Subject	Sample	Main results
Dyer and McHugh (1975)	Australia	Annual reports	120 companies listed on the Sydney Stock Exchange 1965-1971	Reporting lag of 118 days (mean) in 1971; larger firms exhibit shorter reporting lags, which is expected because they are more in the public eye.
Courtis (1976)	New Zealand	Annual reports	204 listed New Zealand public companies 1974	Reporting lag of 127 days (mean) in 1974; differences in reporting lag with respect to profitability and industry.
Whittred (1980a)	Australia	Earnings announcements and annual reports	245 firm years from firms with qualified audit reports (125) and non-qualified reports (120) 1965-1974	Delay in publication of preliminary profit reports and delay of the final annual account is longer for firms with qualified audit reports; results indicate a positive association between the severity of the qualification and the delay.
Whittred (1980b)	Australia	Annual reports	100 companies listed on the Australian Associated Stock Exchange 1972-1977	Reporting lag of 105 days (mean) in 1977; replication study of Dyer and McHugh (1975) with more stable results.

Appendix A:
continued

Study	Country	Subject	Sample	Main results
Davis and Whitted (1980)	Australia	Annual reports	100 companies listed on the Australian Associated Stock Exchange 1972-1977	Larger firms exhibit shorter reporting lags; financial year-end and profitability seem not to be related.
Kross (1981)	US	Earnings announcements	108 randomly selected firms listed on the NYSE 1972-1975	Late earnings announcements are more likely to contain bad news; if earnings are lower than analyst forecasts, announcements are more likely to be released later than expected (vice versa).
Givoly and Palmon (1982)	US	Annual earnings announcements	210 companies listed on the NYSE from 25 industries 1960-1974	Improvements in timeliness of earnings announcement over the period of 1960-1974; delays appear to be related to industry and tradition rather than to companies' attributes; bad news tend to be delayed; differential degree of market reaction to early and late announcements.
Chambers and Penman (1984)	US	Interim and annual earnings announcements	100 randomly selected firms listed on the NYSE 1970-1976	Reporting lag is quite regular and predictable; return variability is associated with date of release of earnings reports; larger firms report faster; larger price reactions to earnings reports of small firms; market interprets missed expected reporting dates as bad news.
Kross and Schroeder (1984)	US	Quarterly earnings announcements	297 companies listed on the NYSE 1977-1980	Abnormal returns of firms that announce early (late) are significantly higher (lower).
Zeghal (1984)	US	Interim and annual earnings announcements	1,402 companies listed on the NYSE 1973-1975	Reports with shorter delay exhibit a higher informational content than those with longer delay; association seems to be more significant for interim rather than annual reports.
Atiase et al. (1989)	US	Annual earnings announcements	Firms with earnings announcement dates available on Compustat (total sample 8,320 firm years) 1975-1984	Reporting delay is inversely related to the intensity of price reaction; longer delays are associated with smaller market reactions.
Bowen et al. (1992)	US	Earnings announcements	581 firms that release earnings within 24 days after stock market crash on October 21 st , 1987	Association between earnings news and timing; timing decision is motivated by a desire to minimize adverse reaction of stakeholders to bad news.

Appendix A:
continued

Study	Country	Subject	Sample	Main results
Easton and Zmijewski (1993)	US	Annual earnings announcements and annual reports	listed firms (NY/AMEX and NASDAQ) 1962-1985	10-K (and 10-Q) are filed close to the statutory deadline of 90 (45) days; no evidence for the “ <i>good news early, bad news late</i> ” hypothesis; for firms without preliminary earnings announcement, there is information content around 10-K/10-Q disclosure dates.
Alford et al. (1994)	US	Annual reports	7,887 listed firms 1978-1985	20 percent of 10-Ks of the sample are filed after the statutory due date (90 days); firms that delay are more likely to experience unfavorable economic events; they are smaller in size, exhibit negative accounting returns, negative earnings changes, lower liquidity and higher leverage.
Begely and Fischer (1998)	US	Interim and annual earnings announcements	11,039 annual and 29,934 interim announcements from US public firms 1983-1992	Early announcements are associated with good news relative to late announcements; relation does not appear to be monotonic; unexpected earnings explain only little of variation in timing.
Annaert et al. (2002)	Belgium	Semi-annual reports	Firms listed on the forward market of the Brussels Stock Exchange 1991-1998	Absolute reporting lags shorten over the years; no association between content of news and timeliness; type of news has a more substantial impact on abnormal returns than timeliness.
Bagnoli et al. (2002)	US	Quarterly earnings announcements	25,934 observations from 4,434 firms from the first call expected report date database 1995-1998	Firms that miss their own voluntarily disclosed expected date tend to report earnings below forecasts. The amount is positively related to the number of days of delay.
Senguptha (2004)	US	Quarterly earnings announcements	11,071 firm years from listed firms 1995-2000	Shorter reporting lag for firms facing greater demand for information from investors and greater litigation costs; lag is longer for firms with more block ownership and those in complex operations.
Conover et al. (2008)	Cross Country	Earnings announcements	5,370 firms from 22 countries 1986-1996	Reporting lag differs systematically between common and code law countries; firm performance and reporting lags are stronger linked in common law countries.
Lee et al. (2008)	US	Annual earnings announcements	9,555 firm years of listed firms 2000-2004	Audit delay is not significantly longer for multinational firms; however, multinational firms report earnings more timely compared to domestic firms.

Appendix A:
continued

Study	Country	Subject	Sample	Main results
Aubert (2009)	France	Annual earnings announcements and annual reports	1,131 firm years from listed firms of the SBF 250 1997-2002	Reporting lag is shortening under mounting pressure from capital markets; absolutely, however, the reporting lag is raised over the investigation period.
Krishnan and Yang (2009)	US	Earnings announcements	1,077 public firms 2001-2006	After SOX (Section 404) and accelerated filing requirements by SEC, firms are more likely to announce earnings prior to the completion of the audit.
Son and Crabtree (2011)	US	Earnings announcements	11,169 firm years from listed firms 2000-2005	Negative association between earnings announcement delay and analyst following; announcement timing and analyst following seem to be complementary.
Impink et al. (2012)	US	Annual reports	36,876 firm years from listed firms with 3,248 late filings 1999-2006	Accelerated deadlines do not affect the incidence of late filing; internal control weaknesses seem to be a major reason for non-timely filing; market reaction is more negative when firms do not provide a meaningful explanation (Form 12b-25).
Leventis and Weetmann (2012)	Greece	Annual reports	91 listed companies of the Athens Stock Exchange 1997	High variation in timing; some evidence that timing is related to proprietary costs, information cost savings and relative good news or bad news.
Bryant-Kutcher et al. (2013)	US	Annual reports	1,128 listed firms 2001-2005	The likelihood of a restatement increases for firms, which are required to file more quickly (after the regulatory induced acceleration of 10-K filings).
Choudhary et al. (2014)	US	Annual reports	9,606 listed firms 1994-2011	Financial reports are filed early when they are less informative; early reports are more reliable and more similar (in terms of year-over-year content revision) compared to on-time reports; results suggest that the decision to file early is consistent with confirmation role of financial reporting.
Cao et al. (2016)	US	Annual reports	4,946 firm years from listed firms 2000-2010	Late-filing firms tend to exhibit lower financial reporting quality.
Bartov et al. (2017)	US	Annual earnings announcements and annual reports	3,330 listed firms 2001-2014	Quality of firms' information system is associated with improved financial reporting timeliness (and reduced earnings management activities).

Appendix A:
continued

Study	Country	Subject	Sample	Main results
Bartov and Konchitchki (2017)	US	Annual earnings announcements and annual reports	2,115 firm years from listed firms 2000-2008	Delayed quarterly filings have other valuation implication than delayed annual filings over the short and long run; the reaction is more negative to late quarterly filings than to late annual filings; especially when accounting reasons explain the delay (Form NT).
Henselmann et al. (2017)	Germany	Interim financial reports	1,368 firm years from listed firms (HDAX) 2008-2012	Indirect costs of disclosure, level of debt financing, litigations costs, and size as determinants of the reporting lag; delayed reports evoke less market reaction.
Abernathy et al. (2018)	US	Earnings announcements	38,476 firm years from listed firms	Negative association between managerial ability and earnings announcement lag.
Arif et al. (2018)	US	Annual earnings announcements and annual reports	86,556 firm years from listed firms 1995-2013	Firms tend to disclose earnings announcements concurrently with the 10-K filings instead of first issuing them "stand-alone".
Chen et al. (2018)	US	Earnings announcements	firms with shares traded on NYSE, AMEX or NASDAQ 1984-2015	Investors react negatively to late earnings announcements; they react more negative to delayed announcements with positive news than to those with negative news.
Johnston and Zhang (2018)	US	Earnings announcements	13,245 firm years from listed firms 1999-2009	Intensity of information technology is negatively associated with earnings announcement lag; relation is stronger for firms in industries which are more likely to have an <i>automate</i> or <i>informate</i> strategic role in IT.
Du and Wu (2018)	US	Annual and interim reports	16,837 firm years from listed firms 2007-2014	Reporting lag is slightly shorter for firms using XBRL. Results hold for <i>large accelerated filers</i> and <i>accelerated filers</i> (SEC categories).
Ashraf et al. (2019)	US	Annual earnings announcements	26,411 firm years from listed firm 2004-2015	Information technology expertise on the audit committee is associated with a lower likelihood of restatements and more timely earnings announcements.
Gong et al. (2019)	US	Quarterly earnings announcements	1,036 firm years from US firms with relative performance evaluation (RPE) 1998-2014	Delaying earnings release enables managers to observe peers' performance and exploit "last-minute reporting discretion" in order to achieve their own RPE goals. The results suggest RPE to influence the timing decision.

Appendix B:
Competition measure

To proxy for a firm's competitive environment, we employ a textual-based measure developed by Li et al. (2013). The idea is to capture management's perception of the intensity of competition by referring to the number of occurrences of competition-related terms in firms' management report. We therefore translate, adjust and complement the key terms provided by Li et al. (2013). To control for length, we scale the measure by total number of words. We extract the management report from the document filed at Federal Gazette by each firm and year, and count the competition-related words.⁵⁹

$$PctComp = \frac{\text{number of competition related words}}{\text{total number of words}} \quad (8)$$

In a next step, we form decile ranks of *PctComp* each year, subtract one of the decile rank and divide it by nine (Li et al. 2013). We denote the decile ranked variable, which is now scaled in [0,1], *Competition*.

⁵⁹ Li et al. (2013) employ *competition*, *competitor*, *competitive*, *compete*, *competing* including those words with an "s" appended as competition-related words. We use the following appropriate German expressions: **wettbewerb**, **konkurr**, **rival**, **erlösdruck**, **preisdruck**, **margendruck**, **ertragsdruck**, **kostendruck**, **kompetitiv**.

PART B: TIMELINESS

Appendix C:
Variable definitions and data sources

Timing variables

	<u>Definition</u>	<u>Source</u>
<i>Lag_Prep</i>	is the difference in days between firms' fiscal year-end and the date of completion of the financial statement (preparation).	Federal Gazette
<i>Lag_Audit</i>	is the difference in days between firms' fiscal year-end and the date of audit completion (signature date).	Federal Gazette
<i>Lag_Approv</i>	is the difference in days between firms' fiscal year-end and the date of financial statement approval through the general meeting.	Federal Gazette
<i>Lag_Rep</i>	is the difference in days between firms' fiscal year-end and the date of the public filing at the Federal Gazette.	Federal Gazette
$\Delta Prep_Rep$	is the difference in days between the date of completion of the financial statement and the date of public filing at the Federal Gazette.	Federal Gazette
$\Delta Audit_Rep$	is the difference in days between the date of audit completion and the date of public filing at the Federal Gazette.	Federal Gazette
$\Delta Approv_Rep$	is the difference in days between the date of financial statement approval through the general meeting and the date of public filing at the Federal Gazette.	Federal Gazette
ΔLag_Rep	is the difference between <i>Lag_Rep</i> in year <i>t</i> and <i>Lag_Rep</i> in year <i>t-1</i> .	Federal Gazette

Variables of the main model

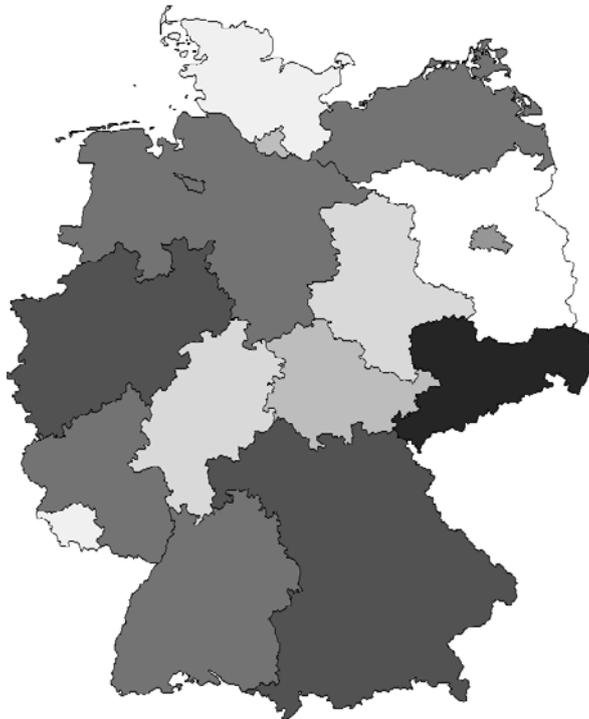
	<u>Definition</u>	<u>Source</u>
<i>Loss</i>	is a binary variable equal to one if the operating income is negative.	Amadeus
<i>Improve</i>	is a binary variable equal to one if the operating income in year <i>t</i> is higher compared to the previous year (<i>t-1</i>).	Amadeus
<i>Family</i>	is a binary variable equal to one if a natural person holds more than 50 % of shares (controlling shareholder).	Amadeus
<i>Competition</i>	is a measure for perceived competition following Li et al. (2013). See Appendix B for details.	Federal Gazette
<i>Size</i>	is the natural logarithm of total assets.	Amadeus
<i>Startup</i>	Is a binary variable equal to one if the age of the company is less than ten years.	Amadeus
<i>StockCorp</i>	is a binary variable equal to one if firm is incorporated as a stock corporation (<i>Aktiengesellschaft</i> , AG).	Amadeus
<i>Big4</i>	is a dummy variable equal to one if a firm is audited by one of the Big4 auditor firms.	Federal Gazette
<i>Banks</i>	is the number of bank contacts.	Amadeus

Appendix C:
continued

	<u>Definition</u>	<u>Source</u>
<i>Group</i>	is a dummy variable equal to one if a firm's primary financial report from an informational perspective is a consolidated report.	Amadeus
<i>Leverage</i>	is the firm-level ratio of non-current liabilities to the sum of non-current liabilities plus the book value of equity.	Amadeus
<i>YearEnd</i>	is a binary variable equal to one if firms' fiscal year-end does not correspond with the calendar year.	Amadeus
Variables for additional analyses		
	<u>Definition</u>	<u>Source</u>
<i>RoA</i>	is the ratio of operating income to average total assets.	Amadeus
<i>RoA_{adj}</i>	is the ratio of operate income to average total assets, minus the mean of this ratio for all other firms of the same industry based on Fama/French 48-classification.	Amadeus
<i>Lag_Rep_{CS}</i>	is the difference in days between firms' fiscal year-end and the date of public filing of the consolidated account at the Federal Gazette.	Federal Gazette
<i>Lag_Rep_{UCS}</i>	is the difference in days between firms' fiscal year-end and the date of public filing of the unconsolidated account at the Federal Gazette of firms that provide also a consolidated account.	Federal Gazette
Δ <i>Lag_Rep_{CS_UCS}</i>	is the difference in days between public filing of the consolidated account minus the difference in days between public filing of the unconsolidated account.	Federal Gazette
<i>Amount</i>	is the natural logarithm of the number of characters of the publicly filed documents.	Federal Gazette
<i> dAcc </i>	is the absolute firm-level value of discretionary accruals based on the cross sectional modified Jones Model (Dechow et al. 1995) calculated using data on the population of large private firms in Amadeus.	Amadeus
<i>NonCompliant₃₆₅</i>	is a binary variable equal to one if a firm's reporting lag is greater than 365 days.	Federal Gazette
<i>NonCompliant₃₇₅</i>	is a binary variable equal to one if a firm's reporting lag is greater than 375 days.	Federal Gazette
<i>NonCompliant₄₁₅</i>	is a binary variable equal to one if a firm's reporting lag is greater than 415 days.	Federal Gazette
<i>NonCompliant₄₄₅</i>	is a binary variable equal to one if a firm's reporting lag is greater than 445 days.	Federal Gazette
<i>FamilyCEO</i>	is a binary variable equal to one if the surname of a person of the board of directors is equal to firms' name.	Federal Gazette
<i>RelatedCEOs</i>	is a binary variable equal to one if there are at least two persons on the board of directors that have the same surname.	Federal Gazette

Appendix D:
Regional differences

<u>Federal state</u>	<u>Mean</u>	<u>n</u>
Baden-Württemberg	371.92	945
Bavaria	378.35	1,001
Berlin	369.97	145
Brandenburg	340.76	76
Bremen	353.49	78
Hamburg	368.29	230
Hesse	356.61	388
Lower Saxony	377.70	501
Mecklenburg Western Pomerania	376.77	65
North Rhine-Westphalia	379.10	1,480
Rhineland Palatinate	378.18	237
Saarland	355.14	66
Saxony	380.75	158
Saxony-Anhalt	356.89	124
Schleswig Holstein	354.48	192
Thuringia	358.93	86
<i>Total</i>	372.76	5,772



Notes: Appendix depicts the reporting lag (*Lag_Rep*) by federal states. The darker, the longer the average reporting lag of the firms in the federal state ($n=5,772$). The federal state with the lowest (highest) number of observation is “Mecklenburg Western Pomerania” (“North Rhine-Westphalia”) with 65 (1,480) firm years.

Part C: Narratives

*When you say nothing (new) –
Do firms strategically distort the informativeness of their narrative reports?*

Abstract

We analyze whether private firms use discretion to decrease the informativeness of mandatory narrative disclosures. As such, we identify narrative opaqueness by measuring the intensity of report stickiness (“copy-paste”). First, we show that firms with strong incentives to be more opaque systematically modify and update their narrative disclosures to a lower extent. In contrast, firms facing greater demand for financial reporting, update them to a significantly higher degree. Second, we provide evidence of a potential mechanism for decreased usefulness of reports with a greater copy-paste intensity (high similarity), whose content exhibits less predictive power. Put differently, the content of more modified management reports (low similarity) is more consistent with current performance and a better predictor of future earnings. We conclude that some firms successfully create management reports that are less informative by generously using copy-paste.

This part of the thesis is a joint project with Marcus Bravidor and Thomas Loy. A paper version is available as Wittmann et al. (2019).

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1 Introduction

In contrast to privately held firms in the United States, European firms are obliged to prepare financial statements and make them publicly available. Apart from quantitative accounting data in balance sheets, income statements and accompanying notes, firms must also prepare narrative sections with detailed qualitative information about risks and opportunities, their strategies and forecasts in the management report (*Lagebericht*). Ideally and in line with the management approach, the report contains information from an insider's perspective, complements accounting numbers and provides additional and future-related information. Thus, the report is considered as a superior information source, which enhances a firm's transparency (e.g., Feldman et al. 2010). Notwithstanding, this only applies if the management report is written with the intention of conveying relevant, concise and non-biased information in a structured way. However, as the management report is a narrative report with numerous qualitative and subjective assertions, it inherently entails a high degree of managerial discretion. Although, the management report is regulated with respect to its basic content, the actual breadth and depth of discussion and the transmission of managerial "sentiment" are largely under the author's control.

A growing body of accounting and finance research employs tools and practices from computational linguistics to examine the textual properties of financial reports (for a review of the earlier small-sample and contemporaneous large-sample literature, see, e.g., Jones and Shoemaker 1994 or Loughran and McDonald 2016). We build on the extant literature – which has so far solely focused on listed companies and capital market consequences – and present initial evidence related to the properties of private firms' narrative disclosures.

Managers of private firms trade off the potential benefits of transparency (e.g., more readily available trade credit and better borrowing conditions) against the downsides attributable to regulatory and proprietary costs (Minnis and Shroff 2017). In consequence, some firms seek to be more opaque and choose to create a less transparent information environment. There are different "channels" how firms can achieve a lower level of transparency⁶⁰ – even in a mandatory disclosure setting. First, firms could refuse to publicly file

⁶⁰ We apply the terms "lower transparency" and "higher opaqueness" synonymously.

financial reports (Bernard 2016),⁶¹ manage the size of their operations to fall below disclosure thresholds (Bernard et al. 2018) or withhold specific information (Dedman and Lennox 2009). Second, firms can systematically disclose lower-quality accounting figures (Ball and Shivakumar 2005, Burgstahler et al. 2006, Hope et al. 2013). Third, they could delay the public availability of their filings (Bigus and Hillebrand 2017, Clatworthy and Peel 2016, Luypaert et al. 2016). We argue that a potential fourth channel relates to the textual and linguistic properties of corporate narratives. To the best of our knowledge, this channel has not been studied in the context of private firms.

This lack of research is rather surprising given the importance of non-financial disclosures for European as well as German regulators in recent years. As such, Article 19 of Directive (EC) 2013/34/EU stipulates that firms' management reports should contain information on current and expected performance, research and development activities, and risks and opportunities. German regulations are even more extensive than required by the European rules. For example, German firms need to provide detailed forecasts of changes in key performance indicators.

The comparatively scant attention paid to private firm narratives may be the result of problematic data availability due to the absence of a comprehensive and automatically retrievable database that includes these textual disclosures. Hence, our sample consists of manually collected data from 1,000 large, privately held German corporations over six years.

Our results contribute to the literature in multiple ways. To the best of our knowledge, we present the first large-sample evidence on private firms' textual properties. We provide insights into a potential approach to create less informative filings, which is largely at managerial discretion. Namely, we use textual year-over-year modifications as a proxy for firms' intention to provide informative narratives. We follow the notion that textual passages copied from prior years (i.e., synonymous with leaving annual narratives unchanged) provide the readers of financial statements with no new information and are more likely to just resemble standard phrases or boilerplate language. We find that firms with strong incentives to create a more opaque information environment systematically file narrative reports with a higher degree of copy-paste intensity. As such, we provide evidence that firms which have previously chosen the most efficient way to be opaque

⁶¹ This channel is no longer available to German firms, which we will explain in more detail in Section 2.

(i.e., avoiding disclosure completely) are now stronger engaged in copy-paste activities. Likewise, financially constrained firms exhibit similar patterns as they update their management reports less thoroughly. Moreover, firms in less concentrated industries and those firms that exceed average industry profitability leave yearly narratives unchanged to a higher degree. We attribute this to proprietary cost concerns. In comparison, firms facing greater demand for financial reporting revise their management reports more properly. We conclude that firms systematically shape the informativeness of narrative requirements according to their needs and preferences (for privacy). Lastly, we show that firms succeed in publishing less informative reports by relying on copy-paste activities. Compared to more updated reports, the content of those with a high degree of copy-paste exhibits significantly less consistency with current accounting numbers and significantly less predictive power in terms of future earnings.

Overall, the results suggest that firms adapt informativeness to their reporting needs by exploiting copy-paste activities in order to reduce the incremental information of mandatory narrative disclosures.

The paper is organized as follows: Section 2 describes the German regulatory environment. Section 3 provides a review of the relevant literature on private firm disclosure attributes and presents channels to achieve higher opaqueness even in mandatory disclosure settings. In Section 4, we develop our hypotheses. The research design, data and results are presented in Sections 5 and 6. Section 7 contains robustness checks and the final section concludes.

2 Institutional background

Regulation of management reporting

In addition to annual quantitative financial accounts, public and private limited liability firms must prepare a mandatory (group) management report, which requires various types of information, including non-financial and especially future-oriented information. Firms are required to report on risks, opportunities and their business prospects from the management's point of view. To complement retrospective accounting figures, the management report must include a wide range of information, which should convey a comprehensive picture of firms' present and future economic situation. Based on European regulation, German law mandates the evaluation and explanation of expected developments

and accompanying risks and opportunities (Article 289 of the German Commercial Code (GCC) for individual accounts and Article 315 GCC for consolidated accounts). As GCC does not provide clear guidance on the content and presentation of the required information, German Accounting Standard 20 (GAS 20) has, since 2013, specified the requirements of the consolidated reports in greater detail. Following the management approach, it requires an outlook and estimates for the most important financial and non-financial key performance indicators, comments on current research and development activities, and a report about material events occurring after the balance sheet date. The regulation requires the management to explicitly provide unbiased descriptions of firms' opportunities (GAS 20.B40) and further mandates a detailed description of the risk management system, as well as the methods employed for consolidating and assessing entity-level risks (GAS 20.B38). GAS 20 is not mandatory but strongly recommended on a legal entity-level (i.e., for individual financial statements). As such, the management report should consist of different narrative sections, for instance, a discussion and analysis of the economic position, and individual risks and opportunities (including the macroeconomic and sector-specific environment). In summary, the main objective of the management report is to enable an informed user to obtain a suitable understanding of expected future development, crucial risks and opportunities.

Mandatory disclosure regulation

In addition to the preparation of annual accounts and management reports, German regulation also mandates public disclosure for all companies with limited liability. The scope of disclosure depends on the size of the company, with some relaxations for smaller firms (Bernard et al. 2018, Deno et al. 2019). Annual financial statements, the accompanying management report and other documents must be published within a period of twelve months after fiscal year-end. The Electronic Trade Register and Company Register Act (EHUG) of 2007 significantly amended the German mandatory disclosure regime. First, disclosure enforcement was improved. Now, firms that do not fulfill their filing obligations are automatically subject to fines. The introduction of this highly effective sanctioning mechanism notably raised compliance rates (e.g., Bernard 2016, Grottke et al. 2016). Second, an online platform replaced the old-fashioned hard-copies of local trade registers. The Federal Gazette (*Bundesanzeiger*) allows for online submission and significantly facilitates data retrieval. Interested parties can obtain reliable financial data for almost every

German company. Despite European harmonization efforts, there are still notable differences among member states (Kaya and Seebeck 2019). The relevant EU directive, 2013/34/EU (Article 30), gives them some discretion in terms of designing the data filing and retrieval processes. For example, in France, access to filings is subject to fees and requires registration. Moreover, French private firms are allowed to exclude the management report from publicly available filings (Article L. 232-21 f. French Commercial Code (FCC)).⁶² The German legislator decided to make online access completely free of charge, without any user-registration requirements and implemented a useful criteria-based and multilingual full-text-search.⁶³ According to a business register survey, only five of 27 member states do not charge for financial statement information.⁶⁴ From a user's perspective, the *German Electronic Federal Gazette* thus provides a comfortable and helpful tool to research firms. Most private firms, therefore, consider the EHUG a "transparency shock" (Deno et al. 2019, Bernard 2016, Breuer et al. 2018, Breuer et al. 2019c, Laschewski and Nasev 2018).

Cumulatively, the German setting with its requirement to prepare and publish management reports, provides an ideal opportunity to test our research question of whether firms with increased incentives to be more opaque are engaged in activities to render their management report less informative.

3 Prior literature

3.1 Incentives to create a more opaque information environment

Incentives to be (more) opaque stem from different sources, which have been extensively discussed in prior literature. A major reason is based on competition (e.g., Breuer et al. 2019c, Muhn and Gassen 2019). Firms seek to protect competitive advantages and high margins and aim to hide relevant information from actual and potential rivals. This relation is based on the conjecture that disclosure reveals sensitive information to competitors, which may reduce future cash flows.⁶⁵ Thus, disclosure is costly and potentially harmful to the disclosing firm (Verrecchia 1983). Recent survey evidence by Minnis and

⁶² There is an exception to the obligation to file management reports; however, these reports have to be made available upon request (Article L. 232-23 I 2 FCC). The exception is not applicable to group management reports.

⁶³ Only, filings of micro entities are only available upon request and require payment of a service charge.

⁶⁴ For details, see: https://e-justice.europa.eu/content_business_registers_in_member_states-106-en.do.

⁶⁵ Using IP addresses and access data on EDGAR, Bernard et al. (2019) empirically show information flows between rival firms.

Shroff (2017) supports this notion. Private firms subject to mandatory disclosure are most concerned that competitors will learn about their financial position and performance. Furthermore, even suppliers, customers and debtholders can use such information to review their contractual relationships, with possible negative monetary implications (Loy 2016). These aspects intensify when considering that (potential) competitors from the US or other countries do not need to disclose any financial statements. Product market predation is another source, which is supported by analytical and empirical research. It is argued that financially constrained firms are potential targets for predation. As such, they have incentives to conceal their financial situation in order to impede being identified as vulnerable prey (Bernard 2016). Beyond the abovementioned factors, there are many other rational and irrational reasons that depend on the personal preferences of the owner and/or manager, and the idiosyncrasies of the disclosing firm. Concluding, a number of (un)observable factors determine the optimal level of transparency/opaqueness.

3.2 Channels to create a more opaque information environment

Extant literature has already taken a closer look at some of the channels which influence firms' information environment. Most previous studies have concentrated on the numbers in financial statements. For instance, Burgstahler et al. (2006) show that European private firms tend to manage their earnings comparatively more than public firms. Numeric (mostly accrual-based) evidence documents that private firms tend to be less transparent than their public counterparts (Ball and Shivakumar 2005, Hope et al. 2013). Moreover, it seems that firms strategically distort the informativeness of their earnings figures to conceal actual numbers (e.g., Ellul et al. 2016, Imhof et al. 2018, Shi et al. 2018). Research on other channels how to provide less transparent financial accounting information is scarce. As an exception, e.g., Dedman and Lennox (2009) find that firms strategically withhold specific information (details about sales and the cost of sales). Results indicate that firms tend to mitigate the informativeness of their reports by leaving them out. Likewise, Bigus and Hillebrand (2017) examine disclosure timing and reporting quantity of private firms. Their results indicate that firms with fewer bank relationships systematically choose to remain more opaque by providing shorter reports and publishing them significantly later. Bernard (2016) shows that (many) private firms not only attempt to withhold specific information but actually completely avoid disclosure. His results suggest that financially constrained firms are more likely to ignore their disclosure obligations in order to mitigate predation risks. This was possible as the Germany enforcement

regime in Germany was lax and did not effectively sanction non-compliance. It was the most effective way to achieve opacity (i.e. ‘staying dark’). However, since the new regulation (Section 2) de facto forces all private corporations to disclose their financial statements, we argue that firms exploit other channels to make their filings less informative. In addition to (i) disclosure avoidance and the withholding of specific information, (ii) earnings management, and (iii) disclosure timeliness, we assume that managing the properties of textual disclosure requirements (narratives) could be another “channel”.

3.3 *Narratives as a potential channel for achieving higher opacity*

Textual analysis is a growing field in finance and accounting research (Lewis and Young 2019). Within the last decade, many studies have employed language-processing techniques to assess textual attributes, and examine their economic correlates and implications. Some of these build on the notion that firms manage textual properties in order to alter their information environment. For instance, one of the first studies interprets the use of complex language as an intentional managerial choice and documents a positive relation between annual report readability and firm performance (Li 2008). The results suggest that firms selectively manage the lexical features of narratives to hide adverse information, consistent with managerial obfuscation (see also Li and Zhan 2019). Lo et al. (2017) pick up this point and find that managers chose higher linguistic complexity in conjunction with earnings management. The authors conclude that decreased readability serves as a tool to conceal actual earnings management procedures. Next to readability, managers seem to exploit the specificity of language in order to influence reports’ informativeness. As such, Hope et al. (2016) assert that firms which face higher proprietary costs are less likely to provide specific and precise information. In other words, firms systematically choose to use unspecific wording (i.e., cheap talk) to reduce the informativeness of their reports. Likewise, the results of Cazier and Pfeiffer (2017) reveal that firms strategically employ repetitive disclosures to inflate narratives and report information in a more opaque fashion.⁶⁶ Lastly, recent literature indicates that narratives are potentially uninformative to stakeholders if they are not updated decisively following significant economic changes (Brown and Tucker 2011, Bozanic et al. 2017, Amel-Zadeh and Fraase 2016, Cohen et al. 2018).

⁶⁶ Although Cazier and Pfeiffer (2017) mainly refer to obfuscation, they also note litigation concerns to be a potential influencing factor. In our private firm setting, however, litigation risks are not significant.

In summary, previous research provides some indication that discretion in preparing narratives is used to manage the informativeness of disclosures. However, to the best of our knowledge, textual analysis studies have exclusively focused on public firms and capital market implications. The narratives of private firms seem to provide an exciting research opportunity for (at least) three reasons. First, from the perspective of third parties, private firms exhibit an overall weaker information environment than comparable public firms. There are fewer competing sources of information, which increases the relative importance of accounting information for third parties (Chen et al. 2011). Apart from a low level of media coverage for most of private firms, there are no ad hoc disclosures, interim reports, analyst reports, earnings press releases or conference calls. In many cases, firms' yearly filings are the main – or possibly only – source of substantial and reliable information about a non-listed firm (Hope et al. 2017, Hope and Yvas 2017). Second, the (narrative) disclosures of private firms offer a more genuine management perspective. In the absence of broad and costly marketing and legal divisions as well as specialized investor relations, filings are less likely to be rehearsed or optimized. Third, private European firms generally face lower litigation risks in terms of financial disclosure (Chaney et al. 2004, Hope and Langli 2010). Hence, substantial litigation issues should not bias managerial behavior or the properties of private firms' narratives.

4 Development of hypotheses

4.1 Firm-level determinants of reports' informativeness

Given that the regulation of narratives is vague and difficult to enforce (e.g., compared to accounting numbers), the author of a report can significantly influence its informativeness. Based on this high level of discretion, we would therefore expect firms to adapt the informativeness of textual disclosures to their needs. Following this idea, we formulate two sets of opposing hypotheses. First, H_1 presumes that firms facing greater financial reporting demand prepare more informative management reports as follows:

H_1 : Firms facing greater reporting demand file more informative narratives.

H_{1a} : Firms with more dispersed ownership publish more informative narratives.

H_{1b} : Firms that rely on transactional banking publish more informative narratives.

H_{1c} : Firms with labor participation publish more informative narratives.

In contrast, we would expect that firms incentivized to seek greater opaqueness prepare management reports that have less informative value. Based on proprietary costs theory, our second set of hypotheses, therefore, reads as follows:

H₂: Firms facing proprietary-cost concerns file less informative narratives.

H_{2a}: Habitual disclosure avoiders publish less informative narratives.

H_{2b}: Financially constrained firms publish less informative narratives.

H_{2c}: Firms in less concentrated industries publish less informative narratives.

H_{2d}: Firms with above-industry margins publish less informative narratives.

4.2 The relation between copy-paste intensity and reports' informativeness

Our approach to determine the informativeness of firms' narratives is based on the idea that useful disclosures provide updated information to financial statement readers. Information that is already publicly known does not enhance a firm's information environment. Hence, the informativeness depends on the willingness of the author to adjust narratives to the firm's economic situation year by year. Moreover, copied passages are more likely to be standard phrases or boilerplate and do not contain relevant information. Thus, we rely on the following basic association: The larger the proportion of information already published in previous year(s) (through copy-paste), the lower the usefulness of the report.

To obtain a better understanding of our notion, we refer to Exhibit 1 at the end of this section, which shows the management report of one of our sample firms for the year 2016. Passages copied word for word from the 2011 report (five years old) are marked in dark grey; passages copied from the preceding year's report are marked in light grey. Only updated or newly introduced sections (which potentially provide new information) are not greyed out. The author of this exemplary report chose to reduce updated passages to a bare minimum, and scarcely revealed any new information. This contributes to an overall opaque information environment. In a similar vein, Exhibit 2 shows the forecast section – a financial reporting element with sensitive forward-looking information – for a sample firm from 2011 through 2016. The firm published an equally worded forecast section without any adjustment over a period of at least six years. Of course, both examples are extremes, but they demonstrate that some firms engage heavily in copy-paste activities. We thus rely on the extent of yearly revisions as a proxy for a report's informativeness.

Nevertheless, there are alternative explanations (aside from managerial discretion) for keeping narratives unchanged. First, copy-pasting is a common practice in the process of preparing financial statements. To a certain extent, it is reasonable to use the preceding year's filing as a template for the current year and repeat language from one year to the next. Recent survey evidence supports the practical relevance of this procedure. When asked about financial statement preparation, respondents document a strong reliance on prior year's MD&A as a template (Amel-Zadeh et al. 2019).⁶⁷ Copied fractions are, therefore, not an indicator for an uninformative report per se. In particular, legislative and legal literature has developed theories to explain the existence of terms that are only copy-paste (boilerplate). Accompanying benefits – discussed under the heading of “economics of boilerplate” (Kahan and Klausner 1997) – are partly transferable to the preparation of management reports (McMullin 2016). Reliance on a default language and a default structure minimizes the transaction costs associated with drafting, internal coordination and negotiating (Ahdieh 2006). In addition, readers, auditors and regulators are accustomed to standard terms, which create a kind of familiarity and promote information digestion.

Second, organizational and behavioral theory offers further explanations by referring to the tendency of established structures and routines to perpetuate existing disclosure procedures (Hannan and Freeman 1984, Gibbins et al. 1990). The content and style of financial reporting is affected by ritualistic and bureaucratic behavior (Aerts 2010). Hence, report stickiness is partly a result of routine, automatic processes and a general reluctance to deviate from the status quo (*status quo bias*).⁶⁸ Undoubtedly, there is a reasonable amount of copy-paste in management reports, which explain some degree of year-over-year similarity.

Nonetheless, extensive stickiness impairs the usefulness of management reports. Several empirical studies have already provided evidence of this relation. Brown and Tucker (2011) were the first to analyze the textual modification of MD&As. Given the significant association between the extent of yearly revisions and magnitude of stock price responses, the authors conclude that modified narratives are informative. They even find some evidence that firms facing more competition are less likely to revise their MD&A in order

⁶⁷ Public US firms respond to the question “When creating the draft for the current year's MD&A, to what degree does the primary author rely on the prior year's MD&A as a template?” with a mean (median) of 0.6 (0.7), where 0 is *no reliance* and 1 is *very strong reliance* (n=189) (Amel-Zadeh et al. 2019).

⁶⁸ Samuelson and Zeckhauser (1988) introduced the term “status quo bias” in economics. It describes individuals' preference for the current state and the maintenance of prior decisions based on psychological and behavioral theories (Kahneman et al. 1991).

to disclose less informative reports. Likewise, Amel-Zadeh and Fraase (2016) empirically show that year-over-year changes are informative to investors. In a similar vein, Bozanic et al. (2017) assert that high year-over-year textual similarity is a tool to hide information from specific stakeholders and to make mandatory disclosures less informative. By examining the implementation of new disclosure requirements, they find that firms engage more intense copy-paste activities when proprietary costs are high. Following the idea that (only) changes in narratives are informative and valuable, Cohen et al. (2018) indicate that changes are predictive of the future. The extent of modification allows for predicting profitability, future news announcements, and even future firm-level bankruptcies. Likewise, Rawte et al. (2018) integrate modifications of risk factors disclosures (Form 10-K, Item 1A) into a model to predict bank failures more accurately.

Aforementioned studies build on the notion that only revised narratives are informative. Thus, reports with a higher share of copy-paste have less predictive power. We follow this assumption and argue that private firms can exploit this channel even more extensively as they face far less severe litigation concerns and are not exposed to capital market pressure. Therefore, we assume that firms which choose to be more opaque are more strongly engaged in creating a less transparent information environment by refraining from updating their narrative reports, as formulated in H_1 .

To empirically support our argumentation about the creation of a more opaque information environment through exploiting copy-paste, we evaluate the usefulness of management report content with respect to copy-paste intensity. Thus, we state our last set of hypothesis as follows:

H₃: The content of reports with greater copy-paste intensity is less useful.

H_{3a}: The content of reports with greater copy-paste intensity exhibits less consistency with current accounting numbers.

H_{3b}: The content of reports with greater copy-paste intensity exhibits less predictive power.

Exhibit 1:*Exemplary management report (sticky passages highlighted)***Lagebericht für das Geschäftsjahr 2016****Entwicklung der Gesamtwirtschaft**

Die Gesamtwirtschaft der Bundesrepublik Deutschland hat sich in 2016 weiter stabilisiert und im Vergleich zu 2015 eine positive Entwicklung genommen. Die Produktion in Deutschland konnte damit stabilisiert werden, der Absatz stand jedoch durch verschiedene Krisenstaaten in Europa weiter unter Druck. Investitionen werden im Wesentlichen als Ersatzinvestitionen aber auch als Erweiterungsinvestitionen vorgenommen.

Entwicklung der Märkte

Im Jahr 2016 war weiterhin eine Stabilisierung der Märkte zu verzeichnen. Daher konnte insbesondere im Bereich der Standardprodukte eine Auslastung auf gestiegem Niveau erreicht werden was insbesondere im Inland zu einer entsprechenden Erhöhung der Umsatzerlöse führte.

Geschäftsentwicklung**Ertragslage**

Die Umsatzsteigerung des Jahres 2016 resultiert im Wesentlichen aus einer Steigerung der Inlandsumsätze sowie gestiegenen Materiallieferungen.

Während sich der Exportanteil für die [redacted] auf 29,3 % (Vorj.: 30,2 %) vermindert hat, ist der Inlandsatz mit Kunden im Vergleich zum Vorjahr auf rd. 70,7 % (Vorj.: 69,8 %) gestiegen.

Der gestiegenen Gesamtleistung standen entsprechend höhere Materialkosten gegenüber, so dass sich ein Rohertrag in Höhe von [redacted] T€ (Vorj.: [redacted] T€) ergibt, der damit im Vergleich zum Vorjahr um 2.521 T€ gestiegen ist.

Kapitalstruktur

Die Kapitalstruktur der [redacted] stellt sich weiterhin als solide dar. Die Bilanzsumme hat sich gegenüber dem Vorjahr um rund 4,9 % auf [redacted] T€ erhöht.

Insgesamt werden [redacted] T€ (Vorjahr [redacted] T€) der gesamten Verbindlichkeiten an Banken geschuldet. Die Gesellschaft konnte dabei ihren Zahlungsverpflichtungen im Geschäftsjahr 2016 jederzeit nachkommen.

Das Eigenkapital erhöhte sich unter Berücksichtigung einer Ausschüttung von [redacted] T€ um [redacted] T€, die Eigenkapitalquote beträgt [redacted] % (Vorj.: [redacted] %) der Bilanzsumme.

Dies zeugt weiterhin von einer sehr soliden Kapital- und Finanzstruktur.

Finanzlage

Der Cashflow beträgt [redacted] T€ in 2016 nach [redacted] T€ im Jahr 2015.

Unsere Mitarbeiter

Erstklassig qualifizierte, motivierte und engagierte Mitarbeiter sind weiterhin ein entscheidender Faktor für den Erfolg unseres Unternehmens. Obwohl auch im Bereich der Stammebelegschaft Anpassungen erforderlich waren, ist die weitere Zukunft der Unternehmung von gut ausgebildeten Mitarbeitern in allen Unternehmensbereichen abhängig.

Unser Dank gilt allen Mitarbeiterinnen und Mitarbeitern, die sich mit ganzer Kraft für das Unternehmen eingesetzt haben, ihr Engagement, ihre Leistung und Loyalität waren die Voraussetzung dafür, dass die Herausforderungen des Geschäftsjahres 2016 bewältigt werden konnten.

Organisationsstruktur

Die Organisationsstruktur der [redacted] ist effizient und schlank. Kennzeichnend sind flache Hierarchien. Sie erlauben schnell und effektiv sich verändernden Kundenanforderungen und Marktschwankungen anzupassen.

Risikobericht

Unternehmerisches Handeln bietet nicht nur Chancen, sondern unterliegt naturgemäß auch Risiken. Durch das möglichst vollständige und frühzeitige Erkennen und Bewerten dieser Risiken tragen wir zur langfristigen Sicherung unseres Geschäftserfolges bei. Die Gesamtverantwortung des Risikomanagements liegt bei der Geschäftsführung. Die wesentlichen Risiken für unseren Geschäftserfolg stellen sich wie folgt dar:

Wirtschaftliche und rechtliche Risiken

Viele unserer Geschäftsbereiche unterliegen signifikanten, nicht durch eigenes Verhalten zu beeinflussenden externen Risiken. Zu diesen zählen insbesondere die gesamtwirtschaftliche Entwicklung in der Bundesrepublik Deutschland, den Staaten der Europäischen Gemeinschaft sowie die Entwicklung in Osteuropa.

Wir begegnen diesen Risiken unter anderem durch eine engere Kundenbindung sowie einer stetigen Verbesserung unserer — von unseren Kunden geschätzten — hohen Qualität bei den von uns hergestellten sowie der Entwicklung neuer und innovativer Produkte sowie durch die Bereitschaft, auf individuelle Kundenwünsche und Sonderanfertigungen einzugehen.

Für allgemeine Risiken und Schadensfälle haben wir Versicherungen abgeschlossen, um die möglichen Folgen von im Unternehmen verbleibenden Risiken in Grenzen zu halten beziehungsweise sie ganz auszuschließen.

Finanzierungsrisiken

Die stabile Ertragslage der Gesellschaft bildet die Grundlage für eine solide Finanzierung des Geschäftsbetriebes. Aufgrund der in der Vergangenheit aufgebauten Kapitalstruktur und der zugesagten Finanzierungslinien sind Finanzierungsrisiken derzeit grundsätzlich nicht erkennbar.

Risikocontrolling

Das operative Tagesgeschäft wird durch eine moderne Informationstechnologie effizient und transparent abgewickelt. Der Bereich der Ertrags-, Liquiditäts- und Finanzplanung wird permanent überwacht und fortgeschrieben.

Basierend auf den dargestellten Einzelrisiken kommt der Überprüfung von Funktionalität und Vollständigkeit des bestehenden Risikomanagementsystems sowie dessen Überwachung und Erweiterung eine zentrale Rolle zu.

Zusammenfassende Beurteilung

Außer den allgemeinen Risiken, insbesondere der weiteren konjunkturellen Entwicklung, denen durch eine zeitnahe Anpassung Rechnung getragen wird, sind uns keine sonstigen wirtschaftlichen oder rechtlichen Gefährdungspotentiale bekannt, die besonderen Einfluss auf die Vermögens- und Ertragslage haben könnten, oder den Bestand des Unternehmens gefährden würden.

Prognosebericht

Angeichts der Entwicklung der Umsatzerlöse zu Beginn des Jahres sowie dem derzeitigen Auftragsbestand rechnen wir für das Geschäftsjahr 2017 mit einer steigenden Nachfrage.

Notes: Exhibit depicts the management report of the year 2016 of a sample firm, which each is obtained from the German Federal Gazette. Passages that already appeared verbatim in the management report of 2011 are marked in dark grey. Passages that already appeared verbatim in the management report of 2015 are marked in light grey. New passages are not highlighted. Firm's name and location are blacked out. Similarity of this reports amounts to 0.971 (*SimilarityMR*).

Exhibit 2:

Exemplary forecast section over a six years period

Panel A: Forecast section in 2011

Prognosebericht

Auf der Grundlage neuer Marktdeterminanten haben sich die Agrarmärkte besonders in den letzten Jahren substantiell verändert mit gestiegenen Volatilitäten. Zusätzlich ist das Marktumfeld unserer Produkte geprägt von politischen und klimabedingten Risiken. Zur Kontrolle der in der Konsequenz gestiegenen Marktrisiken haben wir die notwendigen Instrumente entwickelt. Wir gehen davon aus, dass es sich bei den Veränderungen nicht um einen temporären Effekt handelt. Durch unsere langfristigen Investitionen in unsere Vernetzung in den wesentlichen Ursprungsländern und in unsere Kundenprofilierung sehen wir uns im Wettbewerb gut aufgestellt zur optimalen Nutzung der Chancen, die sich aus dem veränderten Marktumfeld ergeben.

Für das Geschäftsjahr 2011/2012 erwarten wir ein positives Ergebnis.

Panel B: Forecast section in 2012

Prognosebericht

Auf der Grundlage neuer Marktdeterminanten haben sich die Agrarmärkte besonders in den letzten Jahren substantiell verändert mit gestiegenen Volatilitäten. Zusätzlich ist das Marktumfeld unserer Produkte geprägt von politischen und klimabedingten Risiken. Wir gehen davon aus, dass es sich bei den Veränderungen nicht um einen temporären Effekt handelt. Zur Kontrolle der in der Konsequenz gestiegenen Marktrisiken haben wir die notwendigen Instrumente entwickelt. Durch unsere langfristigen Investitionen in unsere Vernetzung in den wesentlichen Ursprungsländern und in unsere Kundenprofilierung sehen wir uns im Wettbewerb gut aufgestellt zur optimalen Nutzung der Chancen, die sich aus dem veränderten Marktumfeld ergeben. Für das Geschäftsjahr 2012/2013 erwartet wir im Rahmen der allgemein gültigen Marktfaktoren wieder ein positives Ergebnis.

Panel C: Forecast section in 2015

Prognosebericht

Auf der Grundlage neuer Marktdeterminanten haben sich die Agrarmärkte besonders in den letzten Jahren substantiell verändert mit gestiegenen Volatilitäten. Zusätzlich ist das Marktumfeld unserer Produkte geprägt von politischen und klimabedingten Risiken. Wir gehen davon aus, dass es sich bei den Veränderungen nicht um einen temporären Effekt handelt. Zur Kontrolle der in der Konsequenz gestiegenen Marktrisiken haben wir die notwendigen Instrumente entwickelt. Durch unsere langfristigen Investitionen in unsere Vernetzung in den wesentlichen Ursprungsländern und in unsere Kundenprofilierung sehen wir uns im Wettbewerb gut aufgestellt zur optimalen Nutzung der Chancen, die sich aus dem veränderten Marktumfeld ergeben. Für das Geschäftsjahr 2015/2016 erwartet wir im Rahmen der allgemein gültigen Marktfaktoren wieder ein positives Ergebnis.

Panel D: Forecast section in 2016

Prognosebericht

Auf der Grundlage neuer Marktdeterminanten haben sich die Agrarmärkte besonders in den letzten Jahren substantiell verändert mit gestiegenen Volatilitäten. Zusätzlich ist das Marktumfeld unserer Produkte geprägt von politischen und klimabedingten Risiken. Wir gehen davon aus, dass es sich bei den Veränderungen nicht um einen temporären Effekt handelt. Zur Kontrolle der in der Konsequenz gestiegenen Marktrisiken haben wir die notwendigen Instrumente entwickelt. Durch unsere langfristigen Investitionen in unsere Vernetzung in den wesentlichen Ursprungsländern und in unsere Kundenprofilierung sehen wir uns im Wettbewerb gut aufgestellt zur optimalen Nutzung der Chancen, die sich aus dem veränderten Marktumfeld ergeben. Für das Geschäftsjahr 2016/2017 erwartet wir im Rahmen der allgemein gültigen Marktfaktoren wieder ein positives Ergebnis.

Notes: Exhibit depicts the forecast section of the management report of the year 2011, 2012, 2015 and 2016 of a sample firm, which each is obtained from the German Federal Gazette. For parsimony, years 2013 and 2014 are omitted. The similarity of this section amounts to 0.961 (2012), 1 (2013), 1 (2014), 1 (2015), 1 (2016) (*SimilarityFC*).

5 Research design

5.1 Sample and data

We employ a sample of 1,000 randomly selected German private firms. To ensure sufficient disclosure, we abstain from considering small and medium-sized entities and restrict our sample to large corporations.⁶⁹ To circumvent potential distortions associated with the German Accounting Law Modernization Act (*Bilanzrechtsmodernisierungsgesetz*, BilMoG), which came into effect in 2010, this study covers the period 2011 to 2016. Following Burgstahler et al. (2006), our analysis is based on firms' primary financial statements from an informational perspective.⁷⁰ We manually collect all yearly filings, including management reports (*Lagebericht*) from the Federal Gazette (*Bundesanzeiger*). Afterwards, the collected narrative data is matched with financial data from Bureau van Dijk's *Amadeus* database.

The German Federal Gazette is not comparable to SEC's EDGAR system. Filings can neither be downloaded in large chunks nor are they XBRL-tagged or machine readable; they also cannot be parsed automatically. Hence, we manually extract the management report and the forecast section from firms' filings. After separation, we removed all tables, headlines and lists to exclusively obtain raw text.⁷¹

5.2 Measuring management report similarity

As outlined above, we use copy-paste intensity as our measure for the informativeness of management reports. To quantify the proportion that is copy-paste from the previous year, we calculate the cosine similarity between these two documents (Brown and Tucker 2011). The metric is based on a *vector space model*, which represents a document as a vector in an n -dimensional Euclidean space, where n is the number of unique words in a document. The similarity between any two documents is measured by the angle between the two vectors, with a smaller angle indicating greater similarity between documents. Technically, the cosine similarity is defined as follows:

⁶⁹ More specifically, we chose firms that meet at least two of three size requirements derived from Article 267 GCC: (i) total assets equal to or more than 19.25 m. €, (ii) revenues equal to or more than 38.25 m. €, or (iii) 250 or more employees. Firms below these size thresholds benefit from relaxed disclosure requirements.

⁷⁰ If a firm is a parent company, we use the consolidated report. In all other cases, we obtain and use the unconsolidated (i.e., legal entity-based) report.

⁷¹ A detailed description of data gathering and pre-processing can be found in Appendix A.

$$Similarity = \cos(\theta) = \frac{v_1}{\|v_1\|} \cdot \frac{v_2}{\|v_2\|} = \frac{v_1 \cdot v_2}{\|v_1\| \|v_2\|} \quad (1)$$

where θ is the angle between v_1 and v_2 . As such, we compare firms' management report for a given year (t) with the management report for the preceding year (t_{-1}) to quantify the copy-paste intensity. Scores are limited to values ranging between 0 and 1, with higher values indicating greater similarity. We drop stop-words and employ the *term frequency-inverse document frequency* (tf-idf) approach, which assigns lower weights to very common words (*SimilarityMR*).

To acknowledge the reasonable (i.e., normal) degree of copy-paste (see Section 4.2) in a firm's management report, we analogously compute the similarity of the forecast section for two reasons. First, we assume that when the management intends to report in an informative manner, the need for yearly updates is greatest in the forecast section (as compared to, for example, the risk reporting section or the description of a firm's structure and business model). Second, stakeholders are particularly interested in future-oriented information. Hence, the forecast section is of utmost importance and a crucial element of the management report. According to an interview study of Knauer and Wömperer (2011), all surveyed managers (of private and public firms) declared that they were reluctant to reveal too much information in the forecast section. Therefore, analyzing the informativeness of the forecast section provides an interesting opportunity to reinforce our results. Thus, we compute the similarity of the forecast section (*SimilarityFC*) in the same way as described in Appendix B.⁷²

5.3 Operationalization of treatments

5.3.1 Measures of incentives to *increase* a report's informativeness (H_1)

To operationalize firms' need to report to outside stakeholders, we rely on four measures capturing demand-driven factors for high-quality financial reporting. Breuer et al. (2019a) have shown that the number of employees, number of banks and number of shareholders are positively related with the amount of online views of firms' yearly filings (disclosure demand). Accordingly, we use number of banks (*NbBanks*) as an indicator for a situation where the information demand is higher. Bigus and Hillebrand (2017) find comparable

⁷² The forecast section is a major element of the management report. The average extent – measured by the number of characters – amounts to 10.7 % of the management report (9.4 % at median).

results in the case of firms not engaged in relationship lending, and that firms with more bank relationships (i.e., transactional banking) exhibit higher financial reporting quality. Banks engaged in arm's length-lending need informative financial statements in order to make funding decisions and monitor them regularly. Likewise, we use the number of shareholders (*NbShareholder*) as an indicator for increased demand for accounting information. Further, we use a binary variable if there is no controlling shareholder (*NoCtrlShareholder*). In both cases, we would expect greater demand for informative management reporting as non-controlling shareholder have less access to the management and internal data and are more likely to rely on firms' filings. Finally, we proxy for the presence of employee participation and labor unions, as research provides evidence for their interest in private firms' financial statements (Loy 2013). *Labor* is a binary variable equal to one if labor participation, co-determination and unionization play a major role for the corporation (identified using a word-list approach).⁷³

5.3.2 Measures of incentives to *decrease* a report's informativeness (H_2)

Our first proxy does not measure incentives for opaqueness in a direct fashion. Instead, we examine firms' disclosure decisions when disclosure avoidance (the most effective way to achieve opaqueness) was still possible. This approach captures different ulterior and unobservable reasons for seeking opaqueness. To determine disclosure avoiders, we follow Bernard (2016) and employ an indicator variable equal to zero if a firm appears in the *Amadeus* database before the enforcement shock. If a firm already appears in the database for the first time after the new enforcement mechanism was introduced, we classify it as a former disclosure avoider (*Avoider*).

Second, we measure financial constraints and rely on three distinct specifications. We again follow Bernard (2016) and use firms' book leverage net of cash holdings (total debt net of cash (*tDnoC*)). In addition, financial distress is proxied through the commonly used Altman's z-Score. The original model is designed for public firms and incorporates capital market data (Altman 1968). Hence, we employ the revised z-Score model from Altman (2000), which is applicable to private firms:

⁷³ *Labor* is equal to one if a firm's annual financial statement contains at least two key terms that are associated with labor participation and unionization (**betriebsrat**, **gewerkschaft**, **arbeitnehmersvertretung**, **montanmitbestimmung**, **drittelbeteiligung**, **personalrat**, **betriebsverfassung** and all respective legal sources including abbreviations).

PART C: NARRATIVES

$$Zscore = 0.717 * x_1 + 0.847 * x_2 + 3.107 * x_3 + 0.420 * x_4 + 0.998 * x_5$$

$$\begin{aligned}
 &x_1 \text{ is working capital scaled by total assets} \\
 &x_2 \text{ is retained profits scaled by total assets} \\
 &x_3 \text{ is EBIT scaled by total assets} \\
 &x_4 \text{ is book value of equity to book value of total liabilities} \\
 &x_5 \text{ is sales to total assets}
 \end{aligned} \tag{2}$$

where lower *ZScore* values imply a greater risk of bankruptcy. To align the direction with other measures, *ZScore* are multiplied by minus one. The third proxy for financial constraints is *Leverage*, which is defined as the firm-level ratio of non-current liabilities to the sum of non-current liabilities and the book value of equity.

Third, we capture incentives to be more opaque based on industry concentration. To operationalize, we rely on the widely-used Herfindahl Hirschman Index (*HHI*):

$$HHI_j = \sum_{i=1}^n \left(\frac{TA_{ij}}{TA_j} \right)^2 \tag{3}$$

where TA_{ij} refers to the total assets of company i operating in industry j . Further, n is the number of companies operating in industry j . Three-digit SIC codes are used to specify industries. We calculate *HHI* based on total assets instead of sales figures in order to capture all German private and public firms (i.e., the population of German firms included in *Amadeus*).⁷⁴ A lower (higher) score indicates a less (more) concentrated industry, respectively. Attributable to more intense competition, we expect higher proprietary costs for firms in less concentrated industries. To align the direction with other measures, we multiply *HHI* by minus one, such that higher values indicate less concentration.

The fourth and final measure is based on a firm's abnormal profitability and the relative strength of its competitive position within its industry. The variable *ZMargin* captures the ability to earn higher rents than industry peers, for instance, due to a lack of substitute products or successful marketing strategies (Isidro and Marques 2019).

$$ZMargin_{ij} = \frac{Margin_{ij} - \frac{\sum_{i=1}^n Margin_{ij}}{n_j}}{\sigma_j(Margin_{ij})} \tag{4}$$

⁷⁴ Small and medium-sized private firms are not required to disclose revenues.

Margin is firm's revenue, scaled by the revenue minus the operating income after depreciation (EBIT). We then calculate *ZMargin* as a firm's *Margin* in year t minus the average margin of a firm's industry, divided by the industry's (j) standard deviation. Again, industries are based on three-digit SIC codes.

5.4 Empirical models

Our first set of hypotheses (H_1) is built on the notion that firms with incentives to *increase* their information environment prepare more informative narratives. Hence, this association is tested as follows:

$$\begin{aligned} Similarity_{it} = & \beta_0 + \beta_1 * Increase_{it} + \sum \beta_c * Controls_{cit} \\ & + \sum fixedEffects + \epsilon_{it} \end{aligned} \quad (5)$$

The dependent variable captures the degree of copy-paste intensity in a firm's management report. Lower values indicate greater year-over-year modification. We separately test four treatments (5a–d) that are associated with the demand for more informative financial reports (*Increase*).

Analogously, we test the second set of hypotheses (firms with incentives to *decrease* their information environment reduce the informativeness of their narrative reports). We employ six distinct measures of proprietary cost concerns (6a–f):

$$\begin{aligned} Similarity_{it} = & \beta_0 + \beta_1 * Decrease_{it} + \sum \beta_c * Controls_{cit} \\ & + \sum fixedEffects + \epsilon_{it} \end{aligned} \quad (6)$$

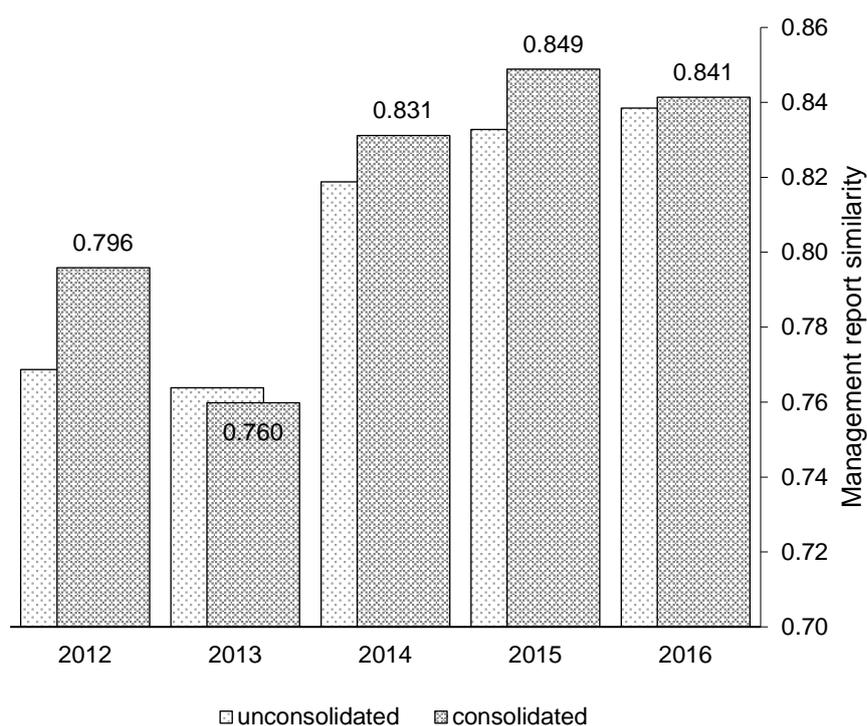
Both models consider typical controls in private firm accounting research (see Table 25). Furthermore, we add controls that could potentially explain major modifications in management reporting. Namely, we control for changes in the board of management (*MgmtChange*) and a change of auditor (*AudChange*). In the private firm setting, the auditor exerts high influence on the style and textual design of management reporting (Mauritz et al. 2019). Moreover, we would expect larger economic and organizational changes in a given year to correspond with a greater need for explanation and, thus, modification in the narratives (Brown and Tucker 2011). We, therefore, control for absolute change in total assets (*OrgChange*), which indicates major events such as investments and divestments, acquisitions or impairments.

We run each regression with year- and/or industry-fixed effects as denoted in the table notes. The research design for testing H_3 is outlined in Section 6.2.

5.5 Descriptive statistics

Table 23 presents descriptive statistics relating to our above-mentioned variables and controls. The variable *SimilarityMR* (bounded from zero to one), has a mean of 0.769, indicating that a large proportion of narrative is copied from the previous year. Considering the financial statement preparation procedure in practice, and other reasons, mentioned in Section 4.2, this finding is not very surprising. To validate the similarity measure, Figure 13 presents median *SimilarityMR* over the sample period. On average, management reports are modified to the highest degree in 2013.

Figure 13:
Similarity by year and type of account



Notes: Figure depicts yearly median of *SimilarityMR* separated by firms' primary financial account type. *SimilarityMR* from consolidated financial accounts is plotted in darker grey (n=4,348).

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Table 23:
Descriptive Statistics

Panel A: Variables for main analyses						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>SimilarityMR</i>	4,348	0.769	0.154	0.689	0.811	0.886
<i>SimilarityFS</i>	3,259	0.527	0.266	0.316	0.522	0.744
<i>Avoider</i>	3,419	0.244	0.429	0	0	0
<i>tDnoC</i>	4,348	0.510	0.281	0.326	0.539	0.724
<i>ZScore</i>	4,304	-2.917	1.328	-3.52	-2.762	-2.092
<i>Leverage</i>	4,348	0.417	0.251	0.216	0.387	0.569
<i>HHI</i>	4,348	-0.028	-0.044	-0.005	-0.014	-0.032
<i>ZMargin</i>	4,297	0.023	0.518	-0.248	-0.065	0.179
<i>NbBanks</i>	4,025	2.636	1.463	1	2	4
<i>NbShareholder</i>	4,094	2.754	2.710	1	2	3
<i>NCrtlShareholder</i>	4,348	0.492	0.500	0	0	1
<i>Labor</i>	4,348	0.080	0.271	0	0	0
<i>Size</i>	4,348	11.13	0.964	10.401	10.982	11.685
<i>RoA</i>	4,348	0.082	0.100	0.027	0.068	0.124
<i>Loss</i>	4,348	0.158	0.365	0	0	0
<i>OrgChange</i>	4,348	0.106	0.118	0.033	0.071	0.135
<i>Intangibles</i>	4,348	0.022	0.050	0.001	0.005	0.017
<i>Age</i>	4,348	41.072	36.066	16	27	55
<i>AuditorChange</i>	4,348	0.055	0.228	0	0	0
<i>MgmtChange</i>	4,348	0.035	0.184	0	0	0
<i>Big4</i>	4,348	0.411	0.492	0	0	1
<i>Group</i>	4,348	0.279	0.449	0	0	1
<i>East</i>	4,348	0.112	0.315	0	0	0
<i>Tone</i>	4,346	1.342	0.697	0.875	1.199	1.622
Panel B: Variables for additional analyses						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>SimilarityMR_{t-2}</i>	3,436	0.687	0.171	0.578	0.722	0.822
<i>SimilarityMR_{len}</i>	4,348	0.001	0.148	-0.075	0.03	0.107
<i>GAS20</i>	4,348	0.770	0.421	1	1	1

Notes: Table depicts descriptive statistic of measures of management report similarity, disclosure incentives and controls. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined as described in Appendix C.

When the regulatory change in management reporting (GAS 20) came into effect, firms were required to add new aspects and restructure content, resulting in lower similarity scores in 2013. Hence, we reasonably expect that firms have revised their reports the most

thoroughly going from 2012 to 2013. As such, this pattern indicates that our measure actually captures intended document similarity. Higher values of *Similarity* in 2014, 2015 and 2016 suggest that subsequent reports are updated comparatively less exhaustively. Major changes, thus, seem to be a one-time and regulatory-driven effect.

Figure 14 plots the kernel density of *SimilarityMR* and *SimilarityFC* and graphically reveals the distinct distributions. The average copy-paste intensity of the forecast section (0.507) is significantly lower, however, *SimilarityFC* exhibits a higher bandwidth (i.e., the standard deviation is almost twice as high). The 1st quartile exhibits a similarity of 0.305, indicating substantial revision of some sections. In contrast, we also identify 110 forecast sections with a similarity score of 1, which means that the content in t is fully copied from $t-1$ without any adjustments. For the forecast section, the number of observations ($n=3,259$) is smaller for the following reasons: (i) in 86 cases, we could not identify any section designated as “forecast” or “outlook”. Moreover, (ii) German management report regulations allow for inclusion of a combined “risk, opportunities and outlook” section.⁷⁵ In 829 cases, firms made use of this option. Since it is not possible to separate the forecast section from other elements in a precise manner, we drop those observations. Lastly, (iii) the lack of a stand-alone report in $t-1$ (as the reference to measure the similarity) also reduced the number of observations.

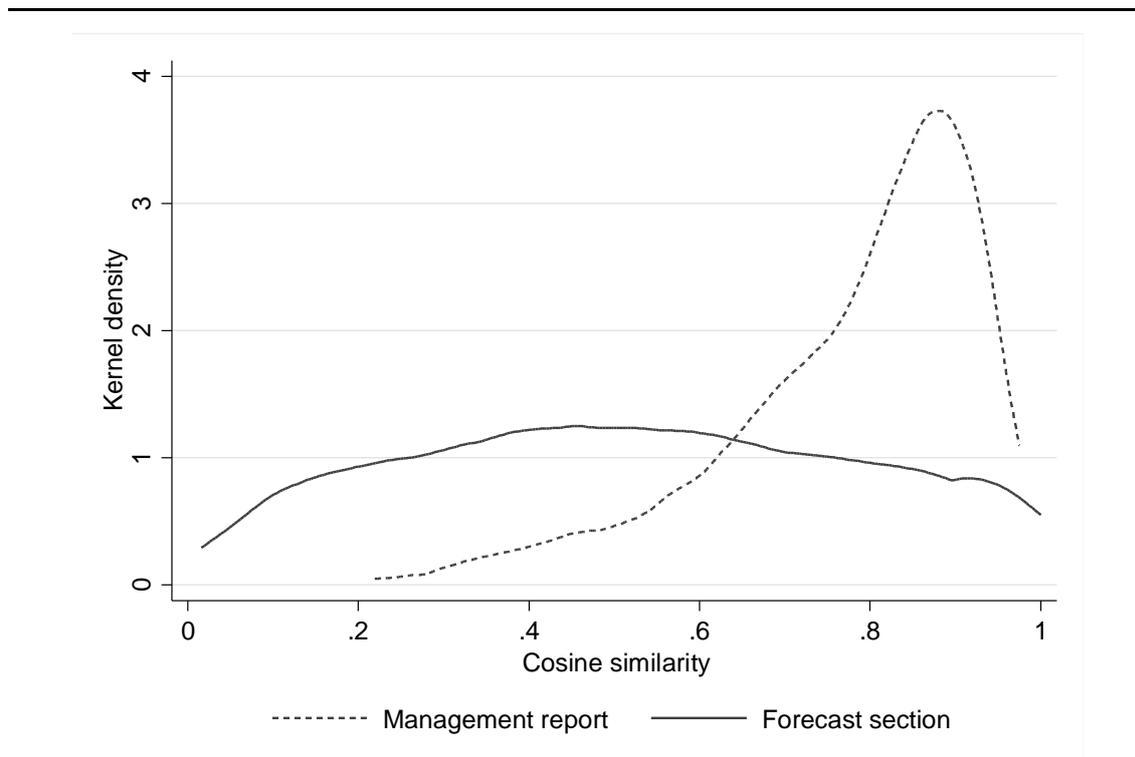
Approximately 25 % of firms in our sample ignored disclosure obligations and did not file any financial statements before the regulatory shock (EHUG).⁷⁶ The share of avoiders is lower when compared to the findings of Bernard (2016). We attribute this to the fact that we concentrate on large firms. Small and medium-sized entities are more likely to have withheld financial statements in the past.⁷⁷ On average, the firms in our sample exhibit a ratio of total debt net of cash to total assets of 0.51 (*tDnoC*), an aligned *ZScore* of -2.91 and *Leverage* of 0.42. Furthermore, our descriptive statistics reveal that 28 % of sample firms provide a consolidated financial statement (*Group*) and that approximately 41 % hire one of the Big4 audit firms (*Big4*). The median return on asset rate is 8 %,

⁷⁵ “(...) the two reports or the combined report on risks and opportunities can be integrated into the report on expected developments or presented separately from that report. The issue of whether these reports are presented separately or are combined is governed by the form of presentation that group management believes more clearly conveys the expected developments and the associated opportunities and risks to a knowledgeable user in each specific instance” (GAS 20.117).

⁷⁶ Due to changes in company structures and companies that became incorporated after 2005, we are only able to track 3,375 (79 %) of our observations and classify these as former discloser avoiders or non-avoiders.

⁷⁷ In line with this notion, the results of Bernard (2016) show a significant negative correlation between size and disclosure avoidance.

Figure 14:
Density plot of similarity (management report vs. forecast section)



Notes: Figure depicts the kernel density distribution of the similarity of the management report (dotted) compared to the forecast section (solid).

while 16 % report a loss. On average, firms have 2.6 bank relationships and 2.8 shareholders. Overall, the descriptive statistics are consistent with comparable private firm accounting studies (Table 23).

Table 24 depicts Pearson correlations. Most variables show the expected association with copy-paste intensity. Unsurprisingly, *Leverage* and *tDnoC* (0.71) as well *ZMargin* and *RoA* (0.70) are highly correlated. However, those pairs are not employed concurrently in one regression. All other correlations are well below established thresholds and models' variance inflation factors do not indicate any multicollinearity issues.

Table 24:
Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	
(1) <i>SimilarityMR</i>	1.00																							
(2) <i>SimilarityFC</i>	0.52	1.00																						
(3) <i>Avoider</i>	0.10	0.06	1.00																					
(4) <i>tDnoC</i>	0.02	-0.02	0.01	1.00																				
(5) <i>ZScore</i>	0.10	0.00	0.03	0.17	1.00																			
(6) <i>Leverage</i>	0.05	0.00	-0.03	0.71	0.17	1.00																		
(7) <i>HHI</i>	0.02	0.04	0.08	0.02	-0.02	0.02	1.00																	
(8) <i>ZMargin</i>	0.06	0.07	-0.06	-0.29	-0.09	-0.21	-0.09	1.00																
(9) <i>NbBanks</i>	-0.10	-0.09	-0.07	-0.06	-0.01	-0.01	0.02	-0.04	1.00															
(10) <i>NbShareholders</i>	-0.01	-0.06	-0.07	-0.06	0.04	0.02	0.04	0.02	0.05	1.00														
(11) <i>NoCrtlShareholder</i>	0.12	0.07	0.05	0.08	0.01	0.01	-0.08	0.01	-0.17	-0.37	1.00													
(12) <i>Labor</i>	0.10	-0.05	0.01	0.05	0.12	0.08	-0.10	-0.05	0.01	-0.03	0.09	1.00												
(13) <i>Size</i>	0.19	-0.04	0.02	-0.03	0.31	0.01	-0.08	0.03	0.01	0.04	0.02	0.35	1.00											
(14) <i>RoA</i>	0.06	0.10	-0.06	-0.24	-0.41	-0.17	-0.01	0.70	-0.02	0.01	0.03	-0.11	-0.11	1.00										
(15) <i>Loss</i>	-0.02	-0.08	0.03	0.23	0.27	0.22	-0.01	-0.42	-0.07	-0.05	0.05	0.09	0.04	-0.54	1.00									
(16) <i>OrgChange</i>	-0.02	0.00	0.04	0.11	-0.05	0.06	0.01	-0.01	-0.06	-0.07	0.09	-0.05	-0.03	0.03	0.06	1.00								
(17) <i>Intangibles</i>	0.08	0.00	0.04	0.04	0.16	0.08	0.01	-0.04	-0.09	0.11	0.04	0.02	0.12	-0.09	0.12	-0.01	1.00							
(18) <i>Age</i>	-0.08	-0.08	-0.17	-0.04	0.01	0.00	-0.09	0.03	0.31	0.08	-0.16	0.03	0.01	0.02	-0.07	-0.09	-0.06	1.00						
(19) <i>AuditorChange</i>	-0.07	-0.04	0.01	0.03	0.02	0.05	0.01	-0.04	-0.01	-0.02	0.01	0.00	-0.03	-0.04	0.04	0.04	-0.01	0.00	1.00					
(20) <i>MgmtChange</i>	-0.02	-0.05	-0.01	0.04	0.04	0.02	-0.04	-0.06	-0.05	-0.02	0.09	0.02	0.01	-0.11	0.14	0.02	-0.01	-0.04	0.03	1.00				
(21) <i>Big4</i>	0.22	0.05	0.00	0.16	0.12	0.11	-0.11	0.02	-0.24	-0.03	0.25	0.19	0.30	-0.04	0.10	0.06	0.11	-0.14	0.02	0.10	1.00			
(22) <i>Group</i>	0.04	-0.06	0.12	-0.05	0.10	0.04	0.16	-0.01	0.02	0.13	-0.28	0.01	0.29	-0.04	-0.02	-0.11	0.17	-0.01	-0.01	-0.07	-0.14	1.00		
(23) <i>East</i>	0.00	0.04	-0.02	0.01	0.07	-0.05	-0.06	0.02	-0.08	-0.01	0.04	0.04	-0.03	-0.07	0.04	0.02	-0.05	-0.18	0.01	0.04	0.05	-0.08	1.00	

Notes: Table depicts Pearson correlation coefficients of similarity measures, treatments and controls. All variables are defined as described in Appendix C.

6 Results

6.1 Firm-level determinants of copy-paste intensity (H_1 and H_2)

Incentives to increase management report informativeness (H_1)

We begin by analyzing firms' incentives to increase their information environment. Table 25 presents the results of Model (5). The number of banks and number of shareholders are both negatively associated with management report stickiness (*SimilarityMR*). This is in line with our expectations (H_{1a} and H_{1b}). Firms with more bank contacts are more likely to be engaged in arm's length lending (i.e., transactional banking) and hence, are more likely to need to provide informative management reports. The same holds for firms with more diffused ownership. Their reports contain less copy-paste (see Model 5b). This finding is supported by the binary measure *NoCtrlShareholder*, which is also negatively associated and highly significant. While a controlling shareholder is able to directly obtain information, non-controlling shareholders are more likely to rely on a firm's filings. This leads to a greater demand for informative reports and, in turn, a higher need for updated narratives. On its own, the positive coefficient of *Labor* does not meet our expectations, when assuming that employees and labor unions are a major stakeholder of private firms (H_{1c}). The positive sign would be more in line with the results of Scott (1994), who finds disclosure to be negatively associated with labor power as it raises proprietary costs and impairs firms' negotiating position.

Controls reveal that younger firms (*Age*) and firms with more intangible assets (often used as a proxy for higher proprietary cost) exhibit significantly more stickiness in their narrative disclosures. The negative and significant association with *OrgChange* provides plausible evidence regarding the validity of our similarity measure. Firms with larger year-over-year changes in assets (organizational changes) update their management reports more extensively. Moreover, personnel changes in firms' management boards correlate with the extent of modification. This is also the case when firms switch their auditors. This finding is in line with the results of Mauritz et al. (2019), who analyze the textual similarity of firms sharing the same auditor and thus produce evidence of auditors' influence. Both negative coefficients (management and auditor change) suggest that our similarity metric performs well. For parsimony, controls are not presented in further regression result tables.

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Table 25:
Demand factors: Firm-level determinants of management report similarity

	(5a)	(5b)	(5c)	(5d)
<i>NbBanks</i>	-0.006*** (-3.54)			
<i>NbShareholders</i>		-0.003*** (-3.04)		
<i>NoCrtIShareholder</i>			-0.026*** (-5.39)	
<i>Labor</i>				0.014** (2.04)
<i>Size</i>	0.018*** (7.57)	0.018*** (7.37)	0.017*** (7.36)	0.016*** (6.60)
<i>RoA</i>	0.114*** (4.18)	0.119*** (4.42)	0.115*** (4.35)	0.123*** (4.68)
<i>Loss</i>	-0.001 (-0.20)	-0.002 (-0.21)	-0.002 (-0.26)	-0.001 (-0.21)
<i>OrgChange</i>	-0.036* (-1.72)	-0.040* (-1.90)	-0.039** (-1.97)	-0.033* (-1.69)
<i>Intangibles</i>	0.101** (2.17)	0.125*** (2.79)	0.090** (2.04)	0.109** (2.49)
<i>Age</i>	-0.000*** (-3.27)	-0.000*** (-3.72)	-0.000*** (-3.17)	-0.000*** (-4.05)
<i>AudChange</i>	-0.048*** (-4.08)	-0.049*** (-4.25)	-0.049*** (-4.35)	-0.049*** (-4.29)
<i>MgmtChange</i>	-0.032** (-2.35)	-0.030** (-2.30)	-0.028** (-2.23)	-0.024* (-1.96)
<i>Big4</i>	0.048*** (9.45)	0.052*** (10.50)	0.051*** (10.57)	0.054*** (11.36)
<i>Group</i>	0.021*** (3.18)	0.019*** (2.92)	0.024*** (3.57)	0.017** (2.57)
<i>East</i>	-0.008 (-1.06)	-0.007 (-0.90)	-0.003 (-0.37)	-0.003 (-0.42)
Constant	0.529*** (15.50)	0.518*** (15.45)	0.506*** (15.27)	0.524*** (15.35)
Fixed effects	Y, I	Y, I	Y, I	Y, I
n	4,025	4,094	4,348	4,348
Adj. R ²	0.139	0.136	0.145	0.140

Notes: Table OLS depicts regression results of Model (5) with similarity of the management report (*SimilarityMR*) as dependent variable. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

Table 26:
Demand factors: Firm-level determinants of forecast section similarity

	(5a)	(5b)	(5c)	(5d)
<i>NbBanks</i>	-0.016*** (-4.68)			
<i>NbShareholders</i>		-0.004*** (-2.68)		
<i>NoCtrlShareholder</i>			-0.026** (-2.50)	
<i>Labor</i>				-0.050*** (-3.02)
Controls	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I
n	3,028	3,078	3,259	3,259
Adj. R ²	0.056	0.049	0.050	0.033

Notes: Table depicts OLS regression results of Model (5) with similarity of the forecast section (*SimilarityFC*) as dependent variable. Controls are considered as in Table 25. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

Table 26 presents the results regarding the stickiness of the forecast section. The coefficients of number of banks, number of shareholders and *NoCtrlShareholder* are in line with our hypotheses and are highly significant. Furthermore, we provide linear prediction plots for each of our treatment variables to graphically complement our results. A compilation of all treatment variables is depicted in Figure 15 at the end of this section.

Incentives to decrease management report informativeness (H₂)

Table 27 presents the results of analyzing firms' incentives to decrease the information environment (Model 6). The first treatment (*Avoider*) is significantly associated with *SimilarityMR* indicating that former disclosure avoiders make greater use of copy-paste, i.e., they are more reluctant to make narrative modifications. Consistently habitual avoiders also publish less modified forecast sections, as indicated by the results in Table 28. Such firms seem to exhibit incentives to report more opaquely, which is in line with H_{2a}.

Furthermore, financially constrained firms are more engaged in copy-paste activities. All three measures (*tDnoC*, *ZScore* and *Leverage*) are positively associated with management

Table 27:
Firm-level determinants of management report similarity

	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Avoider</i>	0.031*** (5.43)					
<i>tDnoC</i>		0.018** (2.09)				
<i>ZScore</i>			0.006*** (2.85)			
<i>Leverage</i>				0.021** (2.33)		
<i>HHI</i>					0.126** (2.46)	
<i>ZMargin</i>						0.016*** (3.78)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	3,419	4,348	4,304	4,348	4,348	4,305
Adj. R ²	0.152	0.140	0.143	0.140	0.117	0.138

Notes: Table depicts OLS regression results of Model (6) with similarity of the management report (*SimilarityMR*) as dependent variable. Controls are considered as in Table 25. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

report stickiness (H_{2b}). In general, literature argues that financially constrained and distressed firms should report more transparently to acquire capital and satisfy the information needs of actual and potential lenders. Based on these findings, this seems less likely to be the case for publicly available narratives. Hence, this indirectly emphasizes the relevance of private channel communication in private firm financing and a potential overweight of concerns regarding predation risks (Bernard 2016).

The positive coefficient of *HHI* is consistent with the assumption that firms in less concentrated industries are exposed to higher competition and, therefore, report more opaquely.⁷⁸ However, inferences about competition based on industry concentration have to be interpreted with caution and are controversial (e.g., Ali et al. 2014).

⁷⁸ Note that *HHI* is multiplied by minus one. Thus, higher values indicate less industry concentration.

Table 28:
Firm-level determinants of forecast section similarity

	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Avoider</i>	0.036*** (2.91)					
<i>tDnoC</i>		-0.001 (-0.06)				
<i>ZScore</i>			0.011** (2.55)			
<i>Leverage</i>				0.010 (0.50)		
<i>HHI</i>					0.293*** (2.97)	
<i>ZMargin</i>						0.036*** (3.75)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	2,567	3,259	3,224	3,259	3,259	3,222
Adj. R ²	0.054	0.048	0.050	0.048	0.044	0.044

Notes: Table depicts OLS regression results of Model (6) with similarity of the forecast section (*SimilarityFC*) as dependent variable. Controls are considered as in Table 25. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

We also find a positive relation between copy-paste intensity and abnormal profitability (*ZMargin*). The positive coefficient indicates that firms are more reluctant to provide informative management reports if they achieve abnormally high margins. This is in line with the theory of proprietary costs as outperforming firms try to hide specific information in order to keep their competitive advantages.

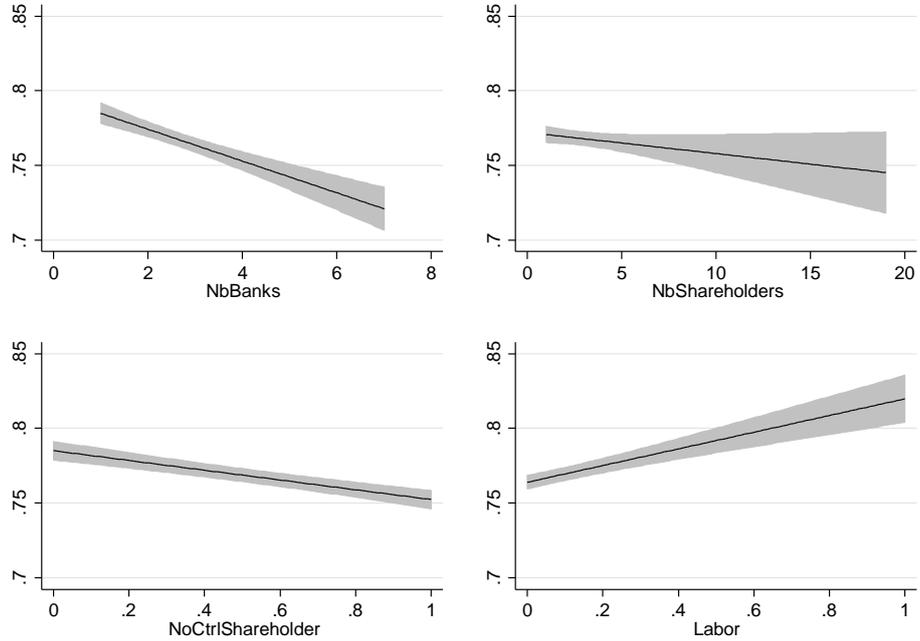
Although similarity of the forecast section reveals a distinct distribution, the coefficients (except for financial constraints) support our findings (Table 28). Graphically, the linear prediction plots in Panel B of Figure 15 support H_2 and the notion that proprietary cost concerns are correlated with the degree of copy-paste intensity.⁷⁹ With the exception of *Labor*, all treatments reveal the expected association with *SimilarityMR*.

⁷⁹ For prediction plots of the coefficients concerning the forecast section similarity, see Appendix D.

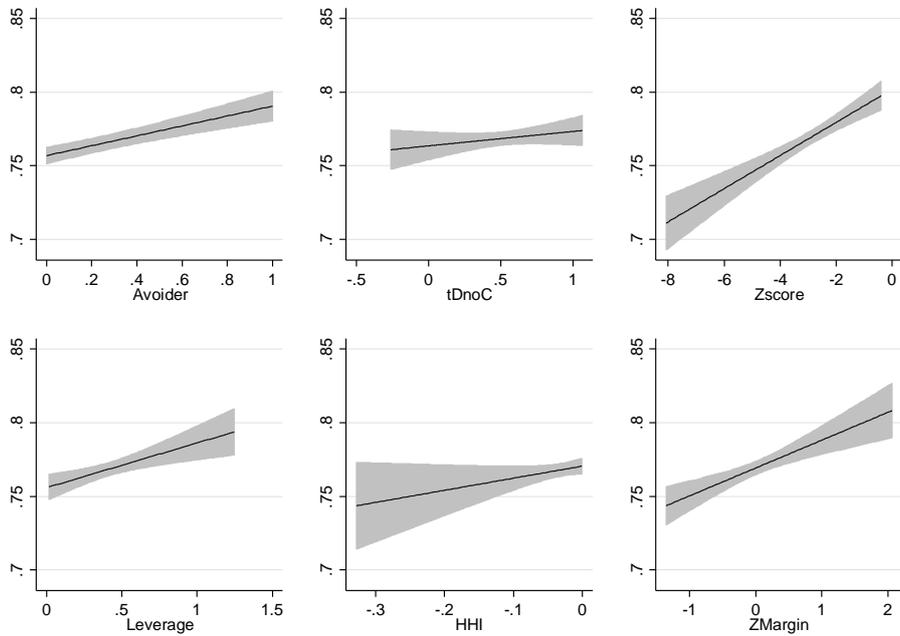
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Figure 15:
Linear prediction plots of management reports' similarity

Panel A: Incentives to publish more informative narratives (H_1)



Panel B: Incentives to publish less informative narratives (H_2)



Notes: Figure depicts linear prediction plots of the management report similarity and treatment variables for H_1 (Panel A) and H_2 (Panel B) including the 95 % confidence interval. The y-axis depicts *SimilarityMR*.

6.2 Consistency and predictive power of firm's narratives (H_3)

In this section, we test H_3 and empirically evaluate whether firms succeed in making the content of their narrative reports less useful when using copy-paste. Textual elements of financial statements are considered useful if they complement numerical accounting data (Chou et al. 2018) and enable substantial inferences to be made about firms' future performance and financial condition. In particular, certain sections of the management report explicitly aim to provide an outlook and describe a firm's prospect. Consequently, if a report is written with the intention of conveying relevant (additional) information, its content should coincide with firms' current and future performance indicators. Related literature has already shown that the information content of firms' narratives (measured, e.g., through textual sentiment) is associated with (future) stock returns, profitability and other firm fundamentals (e.g., Li 2010, Henry and Leone 2016, Amel-Zadeh and Faasse 2016, Hering 2018). Following this notion, we examine the usefulness of private firms' narratives based on their consistency with current fundamentals (H_{3a}) and their ability to predict future performance (H_{3b}).

To examine the content of firms' management reports, we rely on the textual sentiment, which is an approach often used in finance and accounting research. The measure is based on the intensity of words associated with a particular sentiment. Hence, the quality of the measure strongly depends on the underlying word list (dictionary). Loughran and McDonald (2011) emphasize the importance of a domain-specific dictionary and established the word-list most widely used in accounting research for the English language. Given that our management reports are in German, we employ the dictionary of Bannier et al. (2019). This is a domain-specific German word list for business communication, which is based on Loughran and McDonald (2011). We identify the positive and negative sentiments of our firms' management reports using the word list of Bannier et al. (2019), adjust them by negation and define our measure as the ratio of positive to negative words (*Tone*).

In a first step, we conduct a simple correlation analysis and divide the sample into reports with high and low levels of similarity based on a median split.⁸⁰ Table 29 presents the correlation matrix for *Tone*, and the current and future performance indicators of management reports with low (Panel A) and high similarity (Panel B). The coefficients in

⁸⁰ The sample is divided according to the yearly median of the length-adjusted similarity (*SimilarityMR_{len}*). For more details, see Section 7.2.

Table 29:
Correlation matrices (splitted samples)

Panel A: Low similarity (“more updated reports”)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) <i>Tone</i>	1.000						
(2) <i>RoA</i>	0.161	1.000					
(3) <i>RoA_{t+1}</i>	0.135	0.712	1.000				
(4) <i>RoA_{t+2}</i>	0.106	0.642	0.722	1.000			
(5) <i>Loss</i>	-0.170	-0.551	-0.324	-0.303	1.000		
(6) <i>Loss_{t+1}</i>	-0.119	-0.328	-0.536	-0.364	0.419	1.000	
(7) <i>Loss_{t+2}</i>	-0.110	-0.301	-0.344	-0.543	0.374	0.463	1.000

Panel B: High similarity (“less updated reports”)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) <i>Tone</i>	1.000						
(2) <i>RoA</i>	0.091	1.000					
(3) <i>RoA_{t+1}</i>	0.067	0.787	1.000				
(4) <i>RoA_{t+2}</i>	0.053	0.683	0.781	1.000			
(5) <i>Loss</i>	-0.143	-0.522	-0.373	-0.274	1.000		
(6) <i>Loss_{t+1}</i>	-0.090	-0.366	-0.530	-0.369	0.468	1.000	
(7) <i>Loss_{t+2}</i>	-0.012	-0.286	-0.359	-0.528	0.323	0.474	1.000

Notes: Table depicts Pearson correlation coefficients of *Tone* and firms’ current and future performance indicators. The sample is splitted by the yearly median of *SimilarityMR_{len}*. Panel A (Panel B) shows the correlation for observations with similarity scores that are lower (higher) than the median. Significant correlations (at 5 %) are depicted in bold. All variables are defined as described in Appendix C.

column (1) are most relevant. All correlations exhibit the expected sign, indicating that the narratives of private firms generally provide information that is consistent with current and future performance. However, descriptive results clearly show differences with respect to the degree of copy-paste. While the correlation for *Tone* of less similar reports and *RoA* is 0.161, it is only 0.091 for reports with greater stickiness. The correlation between future return on assets (*RoA_{t+1}*) of high-similar reports is only about half (0.067) compared with narratives of lower similarity (0.135). In sum, the correlation analysis suggests higher consistency with current accounting numbers, a greater association with firms’ future performance, and, therefore, a higher usefulness of management reports with lower year-over-year similarity.

In a second step, we test the differences in usefulness in a multivariate manner and employ the following prediction model:

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$$\begin{aligned}
 Performance_{it} = & \beta_0 + \beta_1 * Tone_{it} + \sum \beta_c * Controls_{cit} \\
 & + \sum fixedEffects + \epsilon_{it}
 \end{aligned}
 \tag{7}$$

where *Performance* is one of six measures of current and future performance (*RoA*, *RoA_{t+1}*, *RoA_{t+2}*, *Loss*, *Loss_{t+1}* and *Loss_{t+2}*). Again, we divide our sample according to the median of the management reports' similarity (high vs. low similarity), and run the prediction model for both groups separately. The dependent variable (*Performance*) is interchanged with the performance indicators. We then analyze whether the predictive power of reports differs with respect to the copy-paste intensity by comparing the coefficients of *Tone* from both regressions (low vs. high similarity).

Alternatively, we test the association by adding an interaction term (Model 8) and pool data as follows:

$$\begin{aligned}
 Performance_{it} = & \beta_0 + \beta_1 * Tone_{it} + \beta_2 * HighSim_{it} \\
 & + \beta_3 * Tone \times HighSim_{it} + \sum \beta_c * Controls_{cit} \\
 & + \sum fixedEffects + \epsilon_{it}
 \end{aligned}
 \tag{8}$$

where *HighSim* is a binary variable equal to one if a firm's management report similarity score is above the median.

Table 30 provides the results of Model (7). For parsimony, only the coefficients of *Tone* are shown. However, each coefficient is the result of a separate regression. The multivariate results support the notion that the content of management reports with lower year-over-year similarity is more useful. All coefficients are more strongly associated with current performance and exhibit a significantly higher predictive ability. The *Tone* coefficients for the sub-sample of low-similarity reports are greater in magnitude than the coefficients of the reports with high similarity. In the case of predicting *RoA*, *RoA_{t+1}*, *Loss*, *Loss_{t+1}* and *Loss_{t+2}*, the differences are statistically significant. In other words, high similarity reports show more dissonance between narratives and numbers and, therefore, are of lower usefulness.

Alternative tests, presented in Table 31, also support these findings. The coefficients of the interaction terms show the expected signs and reveal significant differences in consistency (*H_{3a}*) and predictive power (*H_{3b}*) with respect to the copy-paste intensity in five of the six cases.

Table 30:
Consistency and predictive power of low vs. high-similar reports

	(1) Low-similar reports ("updated")	(2) High-similar reports ("copy-paste")	(3) Difference (2) – (1)
<i>RoA</i>	0.0215*** (7.28) n=2,174	0.0095*** (3.02) n=2,172	-0.012*** (-2.78)
<i>RoA_{t+1}</i>	0.0168*** (4.97) n=1,710	0.0065* (1.82) n=1,711	-0.010** (-2.12)
<i>RoA_{t+2}</i>	0.0118*** (3.04) n=1,256	0.0041 (1.00) n=1,259	-0.008 (-1.35)
<i>Loss</i>	-0.0965*** (-7.98) n=2,174	-0.0585*** (-5.73) n=2,172	0.038*** (2.40)
<i>Loss_{t+1}</i>	-0.0617*** (-4.63) n=1,710	-0.0310*** (-2.61) n=1,716	0.031* (1.72)
<i>Loss_{t+2}</i>	-0.0557*** (-3.60) n=1,256	0.0066 (0.54) n=1,259	0.063*** (3.11)

Notes: Column 1 (Column 2) presents coefficients on *Tone* (β_1) of each regression of Model (7) with dependent variable as denoted, for observations with low similarity (high similarity). Controls comprise *Size*, *OrgChange*, *Intangibles*, *Age*, *Big4*, *Group* and *East*. All models include industry- and year-fixed effects. The t-statistics are in parentheses. Column 3 shows the difference in coefficient estimates (Column 1 - Column 2). The z-statistics are in parentheses. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level. All variables are defined as described in Appendix C.

These findings are consistent with our expectations and the notion that a high copy-paste intensity impairs the usefulness of firms' textual disclosures. Continually updated and adjusted content is more useful because it considers current macroeconomic and company-specific factors, short-term developments and other features more thoroughly. Hence, they better describe the economic reality of a firm's business, allow for better predictions and, therefore, are of higher informative value. In sum, we find support for H_3 and conclude that the degree of copy-paste is negatively associated with the informativeness of management reports.⁸¹

⁸¹ We do not separately test the predictive ability of the forecast sections because they usually do not contain enough sentiments to meaningfully determine *Tone*.

Table 31:
Consistency and predictive power of narratives (interaction model)

	(8a) RoA	(8b) RoA _{t+1}	(8c) RoA _{t+2}	(8d) Loss	(8e) Loss _{t+1}	(8f) Loss _{t+2}
<i>Tone</i>	0.0206*** (6.70)	0.0163*** (4.60)	0.0113*** (2.75)	-0.0932*** (-8.35)	-0.0615*** (-4.80)	-0.0543*** (-3.76)
<i>HighSim</i>	0.0344*** (5.32)	0.0326*** (4.48)	0.0348*** (4.19)	-0.0948*** (-4.03)	-0.0732*** (-2.78)	-0.1326*** (-4.55)
<i>Tone</i> × <i>HighSim</i>	-0.0100** (-2.36)	-0.0101** (-2.09)	-0.0071 (-1.28)	0.0310** (2.01)	0.0298* (1.70)	0.0612*** (3.13)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I
n	4,346	3,428	2,522	4,346	3,428	2,524
Adj. R ²	0.064	0.060	0.062	0.071	0.055	0.059

Notes: Table depicts OLS regression results of Model (8). Dependent variable is either *RoA*, *RoA_{t+1}*, *RoA_{t+2}*, *Loss*, *Loss_{t+1}*, *Loss_{t+2}* (8a-f) as indicated in the heading. Controls comprise *Size*, *OrgChange*, *Intangibles*, *Age*, *Big4*, *Group* and *East*. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

7 Additional analyses and robustness checks

7.1 Two-year lagged similarity

In addition to year-by-year (*SimilarityMR*), we additionally calculate a two-year-lagged similarity and compute the degree of copy-paste in firms' management reports that is at least two years old (*SimilarityMR_{t-2}*). We assume that two-year old passages would be even less informative and even more likely to be boilerplate. Technically, we calculate the cosine similarity between firms' management reports in year *t* and *t-2*. Since we do not have narrative data for 2010, we cannot compute the lagged similarity of management reports for the fiscal year 2012. Hence, the sample size is slightly lower. Nevertheless, we are able to compute *SimilarityMR_{t-2}* for 3,436 observations resulting in a mean (median) similarity of 0.687 (0.722) which is – as can be expected – lower than the year-by-year similarity (*SimilarityMR*). We consider a high lagged similarity to be an indicator

Table 32:
Firm-level determinants of lagged management report similarity

	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Avoider</i>	0.033*** (4.56)					
<i>tDnoC</i>		0.014 (1.31)				
<i>ZScore</i>			0.005** (2.06)			
<i>Leverage</i>				0.025** (2.21)		
<i>HHI</i>					0.120** (2.01)	
<i>ZMargin</i>						0.020*** (3.68)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	2,704	3,436	3,399	3,436	3,436	3,400
Adj. R ²	0.153	0.145	0.148	0.146	0.121	0.141

Notes: Table depicts OLS regression results of Model (6) with the lagged similarity of the management report (*SimilarityMR_{t-2}*) as dependent variable. Controls are considered as in Table 25. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

for even greater reluctance to update and properly revise reports. To test whether firms with incentives to report more opaquely exhibit a higher portion of lagged similarity, we re-run Model (6) with *SimilarityMR_{t-2}* as the dependent variable. Table 32 provides the regression results. All coefficients have the expected sign and reinforce previous results. In particular, former disclosure avoiders, firms in concentrated industries, firms with above-industry margins and financially constrained firms exhibit significantly more two-year old textual fragments in their management reports. The results also hold true for the forecast section (untabulated). Overall, the results of lagged similarity regressions support H₁ (untabulated) and H₂ (Table 32).⁸²

⁸² In further tests, we also dropped all controls referring to yearly changes (i.e., *OrgChange*, *AudChange* and *MgmtChange*) with no impact on the results of two-year lagged similarity regressions.

7.2 Length-adjusted similarity

Given that longer documents are more likely to contain any given word, Brown and Tucker (2011) show that cosine similarity can be affected by document length. To address this problem, the authors use a Taylor expansion at zero to estimate the functional form between the calculated cosine similarity and the document length. We follow this approach and regress cosine similarity ($SimilarityMR$) on the first five polynomials of document length (measured by the number of words). To check for robustness, we employ the fitted scores ($SimilarityMR_{len}$) and re-run Model (6). The results are qualitatively unchanged. Firms with incentives to be more opaque also exhibit a higher portion of length-adjusted similarity in their reports (Table 33). Only, two of three financial constraint measures become insignificant.

Table 33:
Firm-level determinants of length-adjusted management report similarity

	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Avoider</i>	0.033*** (5.74)					
<i>tDnoC</i>		0.009 (1.08)				
<i>ZScore</i>			0.007*** (3.51)			
<i>Leverage</i>				0.007 (0.78)		
<i>HHI</i>					0.142*** (2.91)	
<i>ZMargin</i>						0.025*** (5.94)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	3,419	4,348	4,304	4,348	4,348	4,305
Adj. R ²	0.110	0.093	0.098	0.093	0.079	0.091

Notes: Table depicts OLS regression results of Model (6) with the length-adjusted similarity of the management report ($SimilarityMR_{len}$) as dependent variable. Controls are considered as in Table 25. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

7.3 Effect of the implementation of GAS 20

As laid out in Section 2, the newly introduced GAS 20 specified and extended the requirements for group management reporting. The new regulation has to be applied in reports referring to fiscal years beginning after December 31st, 2012. Where companies fiscal year coincides with the calendar year, reports for 2013 onwards will be affected. To control for this regulatory change and to assess its impact, we conduct several robustness checks. In consequence of the extended requirements, firms have to adjust their management reporting, which leads to a lower *SimilarityMR* in the year of the initial application. Figure 13 in Section 5.5 has already illustrated this. However, to ensure that this effect does not influence our results, we first employ a dummy variable indicating whether a management report is prepared before or after GAS 20 became effective (*GAS20*). Second, we drop all observations from the year of transition.⁸³ The results from Model (6) with a reduced sample size are reported in Table 34. Nevertheless, controlling for GAS 20 does not change the results.⁸⁴ Hence, the robustness checks support our main findings and provide additional support for H_1 and H_2 . We conclude that GAS 20 negatively affects management report similarity but does not drive our findings.

7.4 Multinomial logit approach

The last test acknowledges a normal extent of similarity and employs an alternative methodological approach. We concentrate on firms exhibiting the lowest level of *SimilarityMR* (1st quartile) or the highest level of *SimilarityMR* (4th quartile). Firms in the two middle quartiles are assigned to be “normal”. We translate this logic into a variable with a value of “1” (low), “2” (normal) or “3” (high) and use a multinomial logistic regression to test for the likelihood of a firm being in the extreme quartiles as a function of reporting in-

⁸³ For 815 firms, we excluded the observations for 2013. For the remaining firms with a deviating fiscal year, we excluded the year 2014 (93 firms).

⁸⁴ We also evaluate the degree of modifications in firms’ management reports due to GAS 20 in the year of transition. Given that GAS 20 is a vague regulation and difficult to enforce, a manager is able to construct a meaning of compliance in a way that accommodates managerial interests (Edelman 1992, Holder-Webb and Cohen 2012). Hence, we expect firms with incentives to create a more opaque information environment to revise their narratives as little as possible and to make generous use of copy-paste despite new disclosure requirements. Untabulated tests show that the treatment firms (with incentives to decrease their information environment) systematically exhibit a greater copy-paste intensity in the year of transition, compared to non-treatment firms (serious adopters). We interpret this as reluctance to implement new requirements that may enhance a firm’s information environment, which supports H_2 .

Table 34:*Firm-level determinants of management report similarity excluding year of GAS 20 transition*

	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Avoider</i>	0.030*** (4.84)					
<i>tDnoC</i>		0.017* (1.76)				
<i>ZScore</i>			0.006** (2.48)			
<i>Leverage</i>				0.022** (2.13)		
<i>HHI</i>					0.185*** (3.14)	
<i>ZMargin</i>						0.014*** (3.10)
<i>GAS20</i>	0.063*** (8.06)	0.062*** (8.97)	0.061*** (8.95)	0.062*** (9.00)	0.060*** (8.65)	0.061*** (8.94)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	2,707	3,440	3,398	3,440	3,440	3,399
Adj. R ²	0.157	0.139	0.143	0.140	0.116	0.140

Notes: Table depicts OLS regression results of Model (3) with the similarity of the management report (*SimilarityMR*) as dependent variable. Models include a dummy variable indicating GAS 20 regulation. Observations from the year of transition are excluded. Controls are considered as in Table 25. Fixed effects for the year (Y) and industry based on two-digit NAICS codes (I) are employed as denoted. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

centives and controls (Biddle et al. 2009). Panel A of Table 35 presents the results regarding low similarity. All coefficients associated with reporting incentives show the expected signs. Firms with a higher number of shareholders (*NbShareholders*) and firms without a controlling shareholder (*NoCtrlShareholder*) are significantly more likely to be in the group of low similarity (*H₁*). Consistent with *H₂*, former disclosure avoiders, financially constrained firms, firms in less concentrated industries and those with abnormally high margins, are less likely to belong to the low similarity group. Consequently, these firms are more likely to be in the group with high similarity, which is depicted in Panel B of Table 35. Likewise, coefficients of *Avoider*, *ZScore*, *HHI* and *ZMargin* are positively associated with the likelihood that a firm is in the 4th quartile.

Table 35:
Multinomial logistic regression approach

	(5a)	(5b)	(5c)	(5d)	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>NbBanks</i>	0.015 (0.49)									
<i>NbShareholder</i>		0.036** (2.45)								
<i>CritShareholder</i>			0.381*** (4.54)							
<i>Labor</i>				-0.418** (-2.15)						
<i>Avoider</i>					-0.427*** (-3.85)					
<i>tDnoC</i>						-0.423*** (-2.87)				
<i>ZScore</i>							-0.011 (-0.32)			
<i>Leverage</i>								-0.335** (-2.04)		
<i>HHI</i>									0.455 (0.50)	
<i>ZMargin</i>										-0.022 (-0.28)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y	Y, I

Table 35:
continued

	(5a)	(5b)	(5c)	(5d)	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>NbBanks</i>	-0.066** (-2.13)									
<i>NbShareholder</i>		-0.036** (-2.19)								
<i>CritShareholder</i>			-0.180** (-2.12)							
<i>Labor</i>				-0.064 (-0.45)						
<i>Avoider</i>					0.165* (1.66)					
<i>tDnoC</i>						-0.221 (-1.50)				
<i>ZScore</i>							0.086** (2.31)			
<i>Leverage</i>								0.071 (0.44)		
<i>HHI</i>									2.621*** (2.76)	
<i>ZMargin</i>										0.368*** (5.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y, I	Y	Y, I
n	4,025	4,094	4,348	4,348	3,419	4,348	4,304	4,348	4,348	4,297
Pseudo. R ²	0.059	0.060	0.063	0.060	0.067	0.061	0.062	0.060	0.044	0.059

Notes: Table depicts results from multinomial logit regressions. The dependent variable is a variable based on the level of *SimilarityMR*. Firm-year observations on the bottom (top) quartile of *SimilarityMR* are classified as “low” (“high”). Observations in the middle two quartiles are classified as the benchmark group (“normal”). Panel A (B) presents the results for a model predicting the likelihood that a firm will be in the “low” (“high”) group. Controls are considered as in Table 25. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix C.

8 Concluding remarks

This paper presents new evidence on the relation between private firms' disclosure incentives and narrative reporting properties in a mandatory disclosure setting. German private firms are required to prepare and disclose a management report covering firm-specific and in parts, highly sensitive information about (future) risks and opportunities as well as detailed business forecasts. By the nature of narrative reports, managers have a great deal of discretion in preparing them. We argue that firms adapt the informativeness of their narrative reports in a way that meets their preferences and needs. In order to empirically operationalize the informativeness of narrative disclosures, we focus on the textual year-over-year similarity. This is based on the idea that passages that are copied from previous years do not contain new information. Thus, we assume that a high degree of copy-paste intensity impairs the usefulness of narrative disclosures. To test our hypotheses, we rely on a unique hand-collected sample of 1,000 private firms. Given a weak information environment, a more likely genuine management perspective in the narratives and a less likely influence of litigation concerns, we strongly believe that private firms provide a straightforward setting.

The first set of analyses builds on the notion that firms seeking a more opaque information environment publish less informative narratives by neglecting yearly modification. In line with our expectation, we find that firms facing higher proprietary costs disclose narratives with a higher degree of copy-paste intensity. In contrast, we discover significantly less textual stickiness in the reports of firms facing greater financial reporting demand from stakeholders. These significant associations hold for firms' management reports as well as for separately testing the textual stickiness of the forecast section. A battery of robustness tests further ensures the stability of our results.

The second set of analyses provides evidence on the relation between management report's copy-paste intensity and usefulness. As such, we empirically show that the content of reports with a high share of copy-paste is less coincided with current accounting numbers. Compared to reports with more extensive revision, we also find a significant lower degree of predictive power to proxy firms' future performance. We conclude that firms succeed in making their narratives less informative through copy-pasting.

Appendix A:

Data gathering and pre-processing

1. Article 267 II of the German Commercial Code (*Handelsgesetzbuch*) defines large corporations according to three size criteria based on total assets, sales and/or number of employees.¹ We obtained an initial sample (n=8,715 firms) of large German private firms from the *Amadeus* database (Bureau van Dijk), based on the criteria for 2013.
2. We randomly selected 1,000 firms (approximately 12 % of the population of large German private cooperations) and obtained their financial filings from the Electronic Federal Gazette (*Bundesanzeiger*) for the six-year period from 2011 to 2016. Technical restrictions and data protection mechanisms do not allow automated downloads. Hence, all filings are obtained manually and saved in *docx*-format for further processing.
3. We manually extracted the management report from the complete filing. Due to a lack of *XBRL* or any other standardized structure, automated document parsing (which is usually applied to structured data as, e.g., 10-K filings) is not applicable. We identify the beginning (and end) of a management report by its header (the signature of the executive).
4. Next, we employed a *Python* script to convert all extracted reports into homogenous *.txt*-files. More specifically, we extract the raw text through the following steps:
 - a. Removal of all tables and visual elements (i.e., pictures, charts, diagrams, etc.);
 - b. Removal of all HTML tags and footnotes;
 - c. Removal of all headlines and paragraph headers (i.e., text that does not end with a punctuation mark).
 - d. Removal of all numbers and special characters (e.g., “€”, “\$”, “&”, “%”, etc.)

Appendix B:
Cosine similarity

To measure similarity, we follow Brown and Tucker (2011) and compute cosine similarity between a firm's management report in year t and the report from the previous year ($t-1$). We convert the documents into an n -dimensional vector of the word counts, where n is the total number of unique words. Next, we take the dot product (\cdot) of the vectors scaled by the product of their lengths:

$$\text{Similarity} = \cos(\theta) = \frac{v_1}{\|v_1\|} \cdot \frac{v_2}{\|v_2\|} = \frac{v_1 \cdot v_2}{\|v_1\| \|v_2\|} \quad (1)$$

We discard stop words and we employ the term frequency-inverse document frequency approach (*tf-idf*), which gives a lower weight to very common words. We use different German stop-word lists with no impact on the results. Technically, we compute the similarity metrics using *Python* and employing the *scikit-learn* package and the *Natural Language Toolkit (NLTK)*.

Brown and Tucker (2011) note that cosine similarity can be affected by document length because longer documents are more likely to contain a given word. To address this problem, the authors use a Taylor expansion at zero to estimate the functional form between cosine similarity and document length. We follow this approach and regress cosine similarity on the first five polynomials of document length (i.e., number of words). For robustness, we use the length-adjusted values (*SimilarityMR_{len}*), defined as *SimilarityMR* minus fitted values.

Appendix C:
Variable definition

Measures of textual similarity

	<u>Definition</u>
<i>SimilarityMR</i>	is the cosine similarity between a firm's management report in years t and t ₁ considering term weighting which gives lower weight to common words (term frequency-inverse document frequency approach (<i>tf-idf</i>)). See Appendix B for details.
<i>SimilarityMR_{len}</i>	is the cosine similarity between a firms' management report in years t and t ₁ considering term weighting which gives lower weight to common words (<i>tf-idf</i>) and length adjustment. See Appendix B for details.
<i>SimilarityMR_{t-2}</i>	is the cosine similarity between a firms' management report in years t and t ₂ (two years lagged similarity) considering term weighting which gives lower weight to common words (term frequency-inverse document frequency approach (<i>tf-idf</i>)). See Appendix B for details.
<i>SimilarityFC</i>	is the cosine similarity between a firm's forecast section in years t and t ₁ considering term weighting which gives lower weight to common words (term frequency-inverse document frequency approach (<i>tf-idf</i>)). See Appendix B for details.

Variables for main analyses and additional tests

	<u>Definition</u>
<i>Avoider</i>	is a dummy variable equal to one if a firm appears in the database for the first time after the new enforcement mechanism (<i>EHUG</i>) was introduced.
<i>tDnoC</i>	is the firm's total debt net of cash scaled by total assets.
<i>ZScore</i>	is Altman's (2000) revised Z-Score for private firms equal to: $0.717 * (\text{working capital}/\text{total assets}) + 0.847 * (\text{retained earnings}/\text{total assets}) + 3.107 * (\text{earnings before interest and taxes}/\text{total assets}) + 0.420 * (\text{book value equity}/\text{total liabilities}) + 0.998 * (\text{sales}/\text{total assets})$. To align with other financial constraint measures, it is multiplied by minus one.
<i>Leverage</i>	is the firm-level ratio of non-current liabilities to the sum of non-current liabilities plus the book value of equity.
<i>HHI</i>	is the Hirschman-Herfindahl index formed by three-digit SIC codes and constructed using total assets from the population of German firms in the Amadeus database.
<i>Zmargin</i>	is firms' sales divided by sales minus earnings before interests and taxes. Next, the ratio is standardized within each industry-year combination, by subtracting its industry-year mean and dividing the difference by the industry-year standard deviation.
<i>Banks</i>	is the number of a firm's bank relationships.
<i>Shareholders</i>	is the number of a firm's shareholders.
<i>CtrlShareholder</i>	is a dummy variable equal to one if one shareholder holds more than 50 % of a firm's shares.

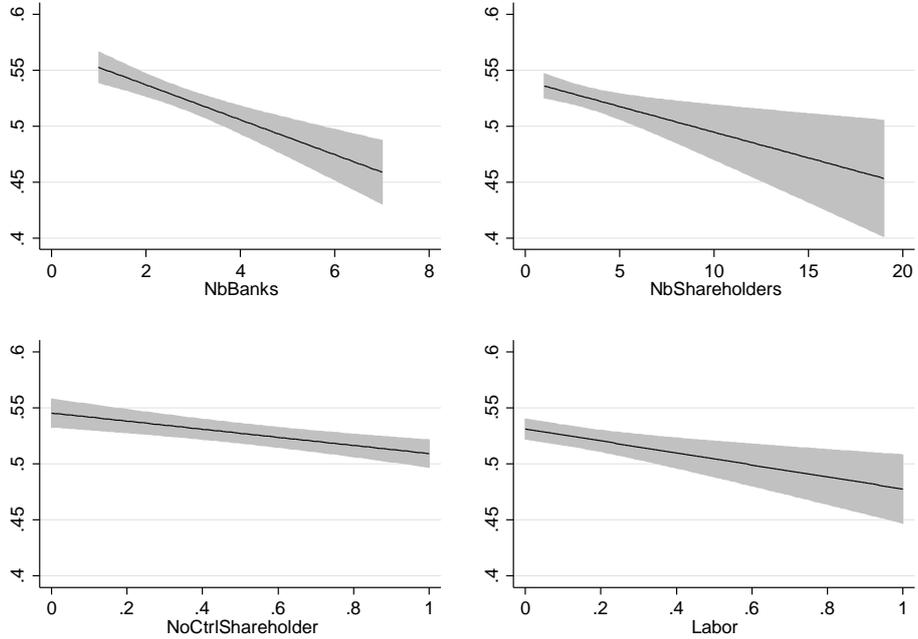
Appendix C:
continued

	<u>Definition</u>
<i>Labor</i>	is a dummy variable equal to one if a firm's annual financial statement contains at least two key terms that are associated with labor participation and unionization (*betriebsrat*, *gewerkschaft*, *arbeitnehmervertretung*, *montanmitbestimmung*, *drittelbeteiligung*, *personalrat*, *betriebsverfassung* and all respective legal sources including abbreviations).
<i>Size</i>	is the natural logarithm of total assets.
<i>RoA</i>	is the ratio of operating income to average total assets.
<i>Loss</i>	is a dummy variable equal to one if the result of the ordinary business is negative, and zero otherwise.
<i>Big4</i>	is a dummy variable equal to one if a firm is audited by one of the Big4 audit firms, and zero otherwise.
<i>Intangibles</i>	is the firm's intangible assets, scaled by total assets.
<i>Age</i>	is the number of years between the date of incorporation and the current year.
<i>AuditorChange</i>	is a dummy variable equal to one if the firm changed its auditor compared to the previous year.
<i>MgmtChange</i>	is a dummy variable equal to one if the firm entirely changes the (board of) management. Information is obtained from the notes.
<i>East</i>	is a dummy variable equal to one if the firm is located in the former German Democratic Republic (<i>GDR</i>), and zero otherwise.
<i>OrgChange</i>	is the absolute change in total assets between two fiscal years.
<i>Group</i>	is a dummy variable equal to one if a firm's primary financial report is a consolidated report, and zero otherwise.
<i>Tone</i>	is the ratio of positive words to negative words in a firm's management report. Positive and negative words are identified using the wordlist of Banner et al. (2019), while considering negation.
<i>HighSim</i>	is a binary variable equal to one if a firm's length-adjusted similarity (<i>SimilarityMR_{len}</i>) is above the median.
<i>GAS20</i>	is a dummy variable equal to one if a management report is prepared after GAS 20 became effective.

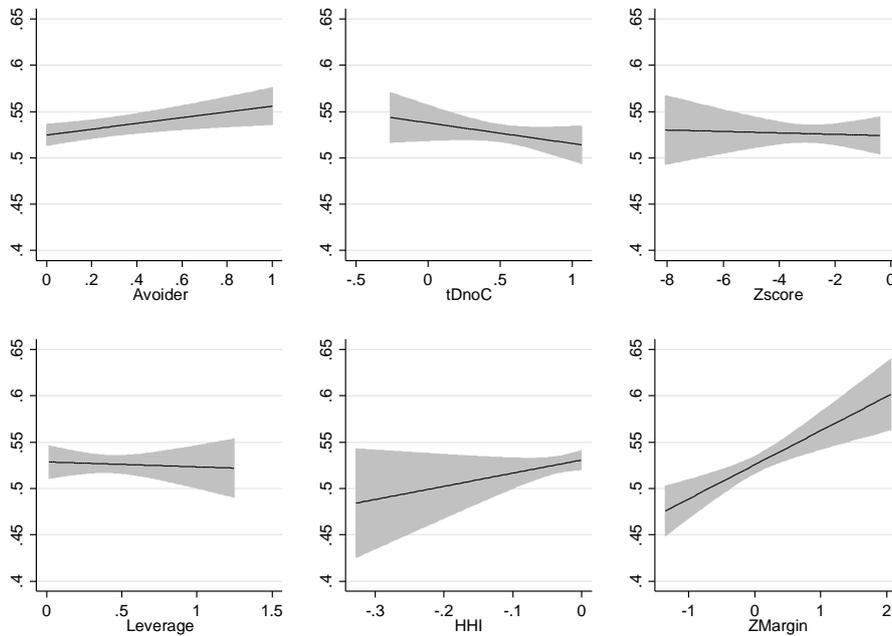
PART C: NARRATIVES

Appendix D:
Linear prediction plots of forecast section similarity

Panel A: Incentives to publish more informative narratives (H_1)



Panel B: Incentives to publish less informative narratives (H_2)



Notes: Figure depicts linear prediction plots of the forecast section similarity and treatment variables for H_1 (Panel A) and H_2 (Panel B) including the 95 % confidence interval. The y-axis depicts *SimilarityFC*.

Part D: Overall

*Spotting disclosure strategies –
An exploratory data mining approach*

Abstract

As financial reporting quality is at least a function of earnings properties, textual properties and timeliness, firms can vary it by exploiting managerial discretion from all these domains. While previous literature usually focuses on a single aspect, I use cluster analysis to concurrently consider measures from different domains of financial reporting. Based on a sample of German private companies, the algorithm groups firms that share financial reporting characteristics and identifies distinct and more holistic financial reporting profiles. First, the explorative research design provides insights into complementary and substitutional associations among domains. Second, an analysis of firm-level determinants provides slight evidence that firms' fundamentals and economic situations are associated with cluster affiliation. Third, tracking clusters over time suggests that financial reporting practice is relatively invariant; however, I show that some firms switch cluster affiliation. Examining the decision to switch between clusters in more detail could be a promising future research opportunity in order to gain a deeper understanding of incentives and associated costs and benefits of mandatory disclosure.

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1 Introduction

Publishing financial statements and other narrative reports produces indirect costs due to divulging proprietary information (Verrecchia 1983). Third parties are able to gather public information, process it, and adjust their actions to the detriment of the disclosing firm. As a consequence, indirect costs can manifest, e.g., in a loss of the competitive position or privacy. Empirical research has already documented that firms that suffer from indirect costs of disclosure strive to reduce the informational significance of published documents (for a selection of exemplary studies, see Figure 16).

To affect their information environment, firms can vary the quality of mandatory disclosures. However, this is not a binary decision but rather the result of managerial discretion in different domains. Compared to their public counterparts, private firms are even more flexible in aligning financial reporting properties with their needs. They are not exposed to capital market pressure and do not have to fear high scrutiny and litigation (Hope and Langli 2010). Put differently, in particular, private firms can pursue miscellaneous and heterogeneous strategies to make their financial statements more or less informative. For example, firms can i) choose to file late and report information that is shorter in length and less detailed. Others might ii) exploit earnings management opportunities and use a complex and generic language to increase processing costs for third parties. Again others iii) report on a timely basis, but provide only vague and unspecific information. As these model strategies demonstrate, managers can choose and combine several ways to influence firms' information environment.

In this paper, I take a comprehensive view on these financial reporting choices by concurrently considering multiple firm-level measures from different domains. Namely, I employ measures from three domains: disclosure timing, earnings properties, and textual characteristics of narrative disclosure requirements. I use cluster analysis to gather more holistic insights into financial reporting strategies, which I define as the sum of different managerial choices. Clustering firms that share financial reporting characteristics allows me to identify potential common disclosure strategies, as well as anomalies and potentially interesting irregularities in financial reporting properties. As such, this study aims to discover patterns in financial reporting characteristics and is therefore explorative and mostly descriptive.

For the empirical analysis, I use data from 605 large German private firms which are required to publish an annual set of accounting information. The German regulatory setting provides an ideal opportunity as firms' disclosure obligation is effectively enforced and the data-retrieval platform allows easy access for third parties (Kaya and Seebeck 2019). Hence, firms need to carefully decide when to provide what information. I cluster the sample firms based on their financial reporting properties and track their cluster affiliation over three years. The underlying algorithm extracts three groups of firms that significantly differ with respect to five (seven) financial reporting properties from three domains (timing, textual properties, and earnings properties). The shape of the identified clusters is relatively stable over time and each cluster reveals unique features and idiosyncrasies. For example, the group of firms that updates their management reports the most thoroughly (textual property) exhibits the longest reporting lag (timeliness). Likewise, firms belonging to the cluster with the highest amount of abnormal tone are also engaged in delaying disclosure. Another group of firms exhibits the highest amount of discretionary accruals and the lowest readability scores. Prior literature on the interplay among financial reporting properties is scarce.⁸⁵ Hence, I provide evidence of the relation among reporting characteristics and derive further research suggestions. In particular, complementary and substitutional associations across domains are potentially interesting and worthy of examining in more detail.

Moreover, tracking movements during the investigation period enables me to identify firms that switch their cluster affiliation over time. While the majority pursue an unchanged (stable) disclosure strategy over three years, some firms switch between clusters. Thus, it could be a fruitful future research opportunity to gain a deeper understanding of firms' decisions to switch cluster and to provide either more transparent or more opaque financial reports compared to the previous year. Finally, I contribute to the notion that firms' economic environment and characteristics are a source of variation in reporting properties. The cluster affiliation significantly differs with respect to typical fundamentals, such as ownership, financial structure, profitability and growth option or business complexity.

⁸⁵ There are some studies suggesting a substitutional relationship between accrual-based earnings management and real-activities earnings management (Zang 2012, Achleitner et al. 2014). However, research on inter-domain associations is rarer. Lo et al. (2017) find a complementary relation between earnings management and textual attributes (readability). Huang et al. (2014) suggest a substitutional relationship between the extent of abnormal tone and discretionary accruals.

In the next section, I discuss the related literature that focuses on different ways to achieve a more (less) transparent information environment. It is structured according to the different domains of managerial discretion. Then, I describe the data, the sample selection and the measures for the employed properties (Section 3). Section 4 provides the results of the cluster analysis. Finally, I discuss them and suggest potential opportunities for future research in Section 5.

2 Prior literature and research questions

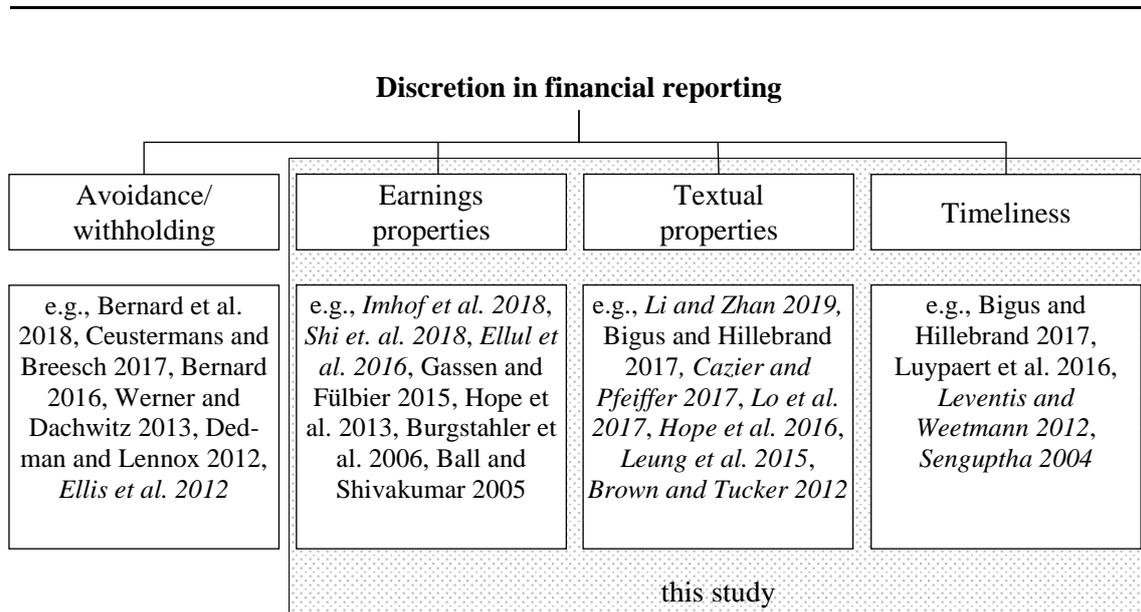
2.1 Evidence from public and private firms

There is a wide body of research examining the effects of indirect costs of disclosure using different financial reporting choices. The results are mostly consistent with the notion that firms which are exposed to higher proprietary costs decrease corporate transparency by reducing the quality of mandatory disclosure. The literature has already documented several ways to achieve this (Figure 16).

First, the most obvious and effective option to reduce corporate transparency is disclosure avoidance (Bernard 2016), which is only possible in a (de facto) voluntary disclosure regime. Moreover, redacting certain information (Verrecchia and Weber 2006, Heinle 2019) and withholding specific disclosure items (Dedman and Lennox 2009, Ellis et al. 2012, Ceustermans and Breesch 2017) are further reasonable approaches to do so. Empirical research predicts and finds that firms avoid disclosures and redact or withhold specific items (e.g., information about sales and the cost of sales or about large customers) as a consequence of proprietary-cost concerns. Firms also provide less disaggregated information and conduct less detailed segment reporting for competitive reasons (e.g., Harris 1998, Berger and Hann 2007, Bens et al. 2011). They are even engaged in costly size management in order to avoid or to reduce statutory disclosure requirements, which is also attributable to proprietary costs (Bernard et al. 2018).

Second, managers can manipulate accounting numbers to conceal a firm's true financial and performance position. Numerous studies show that private and public firms are engaged in earnings management. The authors often interpret this as a tool to reduce the informativeness of earnings and conceal actual numbers (e.g., Burgstahler et al. 2006, Shi et al. 2018). Likewise, earnings smoothing contributes to firms' accounting opacity, as managers dampen any fluctuation in accounting and obfuscate changes in fundamental

Figure 16:
Domains of financial reporting discretion



Notes: Figure presents four domains of financial reporting discretion underpinned by exemplary research. Studies that exclusively focus on public firms are depicted in italic.

performance (Ellul et al. 2016).⁸⁶ In a similar vein, Imhof et al. (2018) find that firms respond to proprietary-cost-concerns by decreasing the comparability of their financial statements. Accrual-based and real earnings management seem also to be related with competition (Shi et al. 2018, Guo et al. 2019).

A younger strand of literature has examined managerial discretion regarding the textual characteristics of narrative disclosure elements as a third domain of corporate transparency. It appears that firms strategically elaborate their narratives in order to provide low-quality disclosures. Cazier and Pfeiffer (2017) document that firms inflate their reports by the discretionary repetition of information if they have incentives to report more opaquely. Likewise, firms confronted with higher proprietary costs provide less specific risk-factor disclosures (Hope et al. 2016), update their management discussion and analysis (MD&A) less appropriately (Brown and Tucker 2011) or pursue a minimal narrative disclosure strategy (Leung et al. 2015). There is also empirical evidence suggesting that firms strategically influence the readability of their reports in terms of obfuscation (Li 2008, Lo et al. 2016, Li and Zhan 2019).

⁸⁶ For a review on (other) motivations for earnings management, see, e.g., Healy and Wahlen (1999)

Finally, strategic disclosure timing appears to be a fourth domain. Timeliness crucially determines the relevance of information and, in turn, the value for third parties. Thus, delaying disclosure is a reasonable way to deal with indirect cost (Senguptha 2004, Leventis and Weetmann 2012). The longer a firm withholds information, the lower the associated adverse effects.

While prior studies have already focused on several financial reporting choices, most of them concentrate on only one dimension.⁸⁷ However, corporate transparency rather seems to be a function of at least earnings properties, the quality of narrative information as well as timeliness. Yet, I am unaware of literature considering a more comprehensive view on managerial discretion.

2.2 Research questions

In the European Union (EU), even most private firms are obliged to publish yearly financial statements. The EU requires their member states to implement mandatory disclosure and effective enforcement mechanisms for all firms with limited liability. It took a long time until German regulators committed themselves to introduce a de-facto mandatory disclosure regime for private firms. Only in 2007 did a major piece of legislation⁸⁸ enhance disclosure compliance in an effective way. In consequence, disclosure avoidance is no longer possible and seeking opaqueness, thus, has shifted from a binary decision to a much more complex exercise. Instead of simply ignoring disclosure rules, firms need to reflect on different kinds of managerial discretion in order to achieve the desired level of transparency. This covers at least accounting figures, the content and style of reports, and the timing of publication. Therefore, my first research question reads as follows:

RQ₁: Which, if any, disclosure strategies do firms pursue?

To this extent, the term “disclosure strategy” should comprehensively describe firms’ reporting practice as the sum of managerial discretion from multiple domains (earnings properties, textual properties and timeliness).

⁸⁷ Only a few exceptions document at least a complementary or substitutional association between two dimensions (see also Fn. 85). Moreover, some studies, such as Bigus and Hillebrand (2017), employ financial reporting measures from different domains, but analyze them in isolation.

⁸⁸ In 2007, the Act on Electronic Commercial and Registers of Cooperatives and Business Registers (EHUG) significantly strengthened the German disclosure enforcement mechanism. For more details, see Part B (Section 2) of this thesis.

Based on such a holistic view on financial reporting properties and the results of cluster analysis, the second research question is directly linked:

RQ₂: Do firm-level characteristics influence the choice of disclosure strategy?

The extant literature has already revealed that a variety of firm-level characteristics shape firms' financial reporting incentives. Financing needs and capital structure, ownership or the extent of agency conflicts are especially associated with financial reporting properties (e.g., Gassen and Fülbier 2015, Bigus and Hillebrand 2017, Breuer et al. 2019a). The last research question is twofold and focuses on the time (in)variance of reporting profiles over a longer period. First, it considers the potential stickiness of reporting profiles over the sample period. Second, it takes into account whether firms are constantly affiliated to the same cluster or if there are movements between clusters. I state the third research question as follows:

RQ₃: Are reporting profiles sticky over time and do firms switch between them?

These research questions being explorative by nature, are answered using methods from unsupervised machine learning (cluster analysis). Moreover, I focus on descriptions and associations.

3 Methodology and data

3.1 Research design

To identify common financial reporting profiles (RQ_1) from multidimensional data, I use cluster analysis. The method classifies objects into groups (i) with a high similarity in terms of their characteristics, while (ii) the groups in relation to each other are as heterogeneous as possible (Backhaus et al. 2016). Therefore, clustering optimizes the minimum variance within groups and forms homogenous clusters of firms that reveal similar financial reporting properties. I use a hierarchical agglomerative clustering approach and employ the *Ward's* method,⁸⁹ which is widely used (e.g., Ketchen and Shook 1996). At the beginning of the algorithm, each firm represents one cluster. At each stage, the two closest clusters are merged to form a new cluster. To measure the (dis)similarity between data

⁸⁹ The Ward's (1963) method calculates the (dis)similarity between clusters based upon the error sum of squares (SSE) and minimizes the increase in the total within-cluster SSE at each stage.

points, I rely on correlation instead of squared Euclidean distance. The former is recommended for higher dimensional datasets⁹⁰ using hierarchical clustering approaches (e.g., Shirktorshidi et al. 2015). Moreover, I normalize all clustering variables (objects) to be bounded from 0 to 1 because uniform scaling facilitates the presentation and interpretation of results. The transformation preserves distribution and all other characteristics of data.⁹¹ A further critical issue in cluster analysis is the determination of the optimal number of clusters. Rules and guidance developed in prior literature have not enjoyed widespread adoption. Instead, it is more common to rely on heuristics, which take the exploratory nature of cluster analysis into account. In the end, the decision is also a trade-off between simplicity and the homogeneity requirements of the cluster solution. In order to obtain an indication of a potentially appropriate number of clusters, I consider the stopping rule proposed by Calinski and Harabasz (1974).⁹²

3.2 Data and measurement of constructs

3.2.1 Sample selection

To examine the outlined research questions and to study disclosure strategies, I focus on private firms. These tend to be more concerned with mandatory disclosure, as there are (proprietary) costs, but typically not enough firm-level benefits to outweigh them (Minnis and Shroff 2017). In addition, they are much more flexible regarding financial reporting choices. In the absence of capital markets, high litigation concerns, and scrutiny, managers can exert more discretion to meet a firm's optimal level of transparency. Based on the special regulatory environment and the significance of private firms with numerous "hidden champions", Germany offers an interesting setting. Until 2007, German firms were more likely to ignore disclosure obligation. However, a major regulatory change introduced an effective enforcement mechanism as well as a transparent and user-friendly data retrieval-platform. Thus, private firms were confronted with a drastic increase in corporate transparency, requiring them to thoughtfully prepare and publish mandatory disclosure.

⁹⁰ Shirktorshidi et al. (2015) categorize datasets with four or more dimensions as "higher dimensional".

⁹¹ I do not z-transform data because the standard deviation in normalized financial reporting measures is quite similar (about 0.20, see Panel B of Table 37).

⁹² The rules are explained in more detail in Section 4.1.1.

I randomly choose 1,000 large private firms as they are subject to the maximum disclosure requirements.⁹³ I obtain financial data from the *Amadeus* database run by Bureau van Dijk and collect all further necessary data from the Federal Gazette for a three-year period from 2012 to 2014. I drop all firms that prepare financial statements in accordance with International Financial Reporting Standards (IFRS) since they voluntarily choose to report more transparently. As unconsolidated accounts systematically differ with respect to purpose and amount, I further drop all parent companies that prepare a consolidated account. Finally, I delete all firms with incomplete data for the three-year period. Thus, the final sample consists of 605 unlisted firms, which prepare and file an unconsolidated financial report.

3.2.2 Measures of financial reporting properties

I rely on the following seven measures (a–g) capturing financial reporting choices from three domains (I–III):

I. Timeliness

a) Reporting lag (Lag) — The delay in disclosure negatively influences firms' transparency, as outdated information is less relevant and of lower value to third parties. I therefore collect yearly disclose timing data from the Federal Gazette and compute the reporting lag as the difference in days between the fiscal year end and the financial statements' filing date.

II. Textual attributes

b) Amount of disclosure (Length) — A common measure for the disclosure amount is document length. Although, from a theoretical point of view, it is inconclusive as to whether shorter or longer documents are more informative, I follow the latter claim and assume that longer reports provide more information and thus enhance firms' information environment. Compared to public companies, private firms prepare significantly more compact reports, which makes obfuscation by increasing document length less likely (Bigus and Hillebrand 2017). Specifically, I measure the amount of disclosure by the natural logarithm of the number of words of the management report. I do not rely on the complete filing, because balance sheet, income statement and notes are regulated in more detail, whereas the management report allows for greater managerial discretion in terms of length. This allows me to capture a firm's intentional choice regarding the amount of

⁹³ Small and medium-sized private firms are allowed to exploit the relaxations in restrictions with respect to the amount and content of mandatory disclosure.

disclosure more appropriate. Moreover, I scale the number of words by company size (total assets). To align direction with other measures, scaled length is multiplied by minus one.

c) Report stickiness (Similarity) — The next measure relies on firms' willingness to properly update and revise the yearly narratives. I assume that only new information is potentially informative. Large passages copied from previous years' reports tend to be less informative, as they are not individually tailored to a firm's current situation. Further, they are more likely to involve standard phrases or boilerplate. Of course, there is a reasonable amount of copying and pasting, as it is common practice to use the previous year's report as a template. However, the literature implies negative consequences for firms' information environment due to a high level of copy-paste intensity.⁹⁴ I measure the extent of report stickiness by computing the cosine similarity between firms' management report in year t and $t-1$ (Brown and Tucker 2011). The value is bounded from 0 to 1. A higher score indicates higher similarity. Thus, a value of 1 denotes identical reports.

d) Discretionary tone (dTone) — Narrative elements in financial reporting are considered to be useful if they are consistent with firms' current fundamentals and/or allow for the prediction of firms' future performance. However, narrative disclosure requirements are subjected to high discretion regarding focus, emphasis, and wording. For example, managers can mask fundamental performance with upwardly biased narratives (exaggeration) or narrative understatement. Methodologically following Huang et al. (2014), I decompose the tone into a normal and an abnormal component. Therefore, I compute the extent of the tone of a firm's management report, which cannot be explained by its fundamentals. The residual of a model that controls for performance, risk, and complexity (Model 1) captures the extent of potential tone management. Specifically, I employ and adapt the expected tone model of Huang et al. (2014) by considering the context of private firms and available data:⁹⁵

$$Tone_{it} = \beta_0 + \beta_1 * RoA_{it} + \beta_2 * \Delta RoA_{it} * StDRoA_{it} + \beta_3 * Loss_{it} + \beta_4 * Size_{it} + \beta_5 * Age_{it} + \sum fixedEffects + \epsilon_{it} \quad (1)$$

⁹⁴ For a more detailed discussion of the association between report stickiness and informational opacity, see Part C of this thesis (Section 4.2).

⁹⁵ The model differs from Huang et al. (2014) with respect to annual stock returns and analyst data, which are not applicable to private firms.

Tone [(number of positive words) – (number of negative words)] is scaled by firms’ total number of words in the management report. Positive and negative words are identified using the domain-specific word list of Banner et al. (2019) while considering negation.⁹⁶ *RoA* refers to ordinary earnings scaled by lagged total assets; ΔRoA is the difference between *RoA* in year *t* and *t-1*; *StDRoA* is the standard deviation of *RoA* over the last three years; *Loss* is a binary variable indicating negative ordinary earnings; *Size* is the natural logarithm of total assets, and *Age* is the age of the firm in years. I also control for year- and industry-fixed effects. The abnormal tone (*dTone*) is the residual (ε) of regression (1).

e) Readability (Read) — The fourth measure captures the complexity of a firm’s management report. Prior literature argues and empirically finds that managers strategically enhance the complexity of narratives in order to make it harder for third parties to identify firms’ true fundamentals (e.g., Li et al. 2008, Lo et al. 2017, deHaan et al. 2019). I also follow the notion that a complex management report negatively affects firms’ information environment (managerial obfuscation). The most common metric to proxy financial report complexity is the Fog index, which is restricted to the English language. I therefore use four common metrics (Table 36) which consider the idiosyncrasies of the German language. Following Guay et al. (2016), I construct the readability index (*Read*) as the first principal component of the four measures.⁹⁷

Table 36:
Measures of readability

<i>WSTF</i>	<u>“Vierte Wiener Sachtextformel” (Bamberger and Vanecek 1984):</u> 0.2744 * number of words with more than two syllables + 0.2656 * average sentence length – 1.693
<i>SMOG</i>	<u>Smog-Index (Bamberger and Vanecek 1984):</u> $\sqrt{\text{number of words with more than two syllables} / \text{number of sentences} * 30} - 2$
<i>FLESCH</i>	<u>Flesch Reading Ease (Amstad 1978)</u> $180 - \text{average sentence length} - (58.5 * \text{average syllables per word})$
<i>LIX</i>	<u>LIX for German language (Björnsson 1968)</u> $\text{average sentence length} + (\text{number of words over six letters} / \text{number of words} * 100)$

Notes: Table provides the definitions of the four employed metrics of readability for German language. Higher values of WSTF, SMOG, and LIX indicate less readability. Higher values of FLESCH indicate more readability. To align with other metrics, FLESCH is multiplied by minus one.

⁹⁶ I employ a *Python* script to count the number of sentiments in firms’ management reports. In the case of negation, a positive word is considered as negative (and vice versa).

⁹⁷ The first component has an eigenvalue of 3.67 and explains 91.9 % of variance.

f) *Hard information (hardInfo)* — The last measure refers to the amount of hard information in textual disclosures. There are concerns that narratives are vague or less concise compared to numbers. I therefore measure the extent to which narrative elements are supported by quantitative data, which is more verifiable and precise (Hope et al. 2016, Bozanic et al. 2017, Dyer et al. 2017). Data of a higher specificity positively contribute to firms' transparency. I compute the ratio of informative numbers to the number of words in firms' management reports.⁹⁸ To align the direction with other measures, this is multiplied by minus one, so that higher values indicate less specificity.

III. Earnings attributes

g) *Discretionary accruals (dAcc)* — To represent the domain of accounting figures, I employ the widely-used modified Jones Model (Dechow et al. 1995) which measures accrual quality by separating accruals into a normal and a discretionary portion:

$$\frac{tAcc_{it}}{TA_{it-1}} = \beta_0 + \beta_1 * \frac{1}{TA_{it-1}} + \beta_2 * \frac{\Delta Rev_{it} - \Delta Rec_{it}}{TA_{it-1}} + \beta_3 * \frac{PPE_{it}}{TA_{it-1}} + \epsilon_{it} \quad (2)$$

where ΔRev is the change in the revenue of a firm from year $t-1$ to t ; ΔRec is the change in trade receivables; and PPE is the book value of gross property, plant and equipment.⁹⁹ All variables are scaled by one-year lagged total assets (TA_{t-1}). Equation (2) is estimated cross-sectionally by industry-year groups¹⁰⁰ with at least 15 observations. The residuals form the discretionary accruals. Higher discretionary accruals are associated with lower earnings quality or higher earnings management.

3.2.3 Summary statistics

Panel A of Table 37 presents summary statistics of employed financial reporting choice measures. Variables $dacc$ and $dTone$ are the residuals of a regression model, thus I provide signed and unsigned values. However, in cluster analysis and further sections, I rely on absolute values.

The median reporting lag amounts to 412 days with a standard deviation of 89 days, suggesting heterogeneous disclosure timing. Moreover, the scaled length of the management

⁹⁸ All numbers with no information, such as dates, section numbers, enumerations, or legal and standard specifications, are excluded. The ratio is multiplied by 1,000.

⁹⁹ Total accruals ($tAcc$) are calculated in accordance with Dechow et al. (1995). See Part B (Section 6.2) of this thesis for more details.

¹⁰⁰ Based on the Fama/French 48-industry classification.

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Table 37:
Summary statistics

Panel A: Financial reporting properties variables						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>Lag</i>	1,815	376.865	89.679	311	412	441
<i>Length</i>	1,815	-5.127	0.548	-5.505	-5.121	-4.746
<i>Similarity</i>	1,815	-0.011	0.155	-0.093	0.02	0.103
<i>dTone</i>	1,815	0	0.007	-0.005	0	0.005
<i> dTone </i>	1,815	0.006	0.004	0.002	0.005	0.008
<i>Read</i>	1,815	-0.090	1.894	-1.360	-0.096	1.177
<i>hardInfo</i>	1,815	-32.486	13.888	-40.416	-31.194	-22.705
<i>dAcc</i>	1,815	-0.008	0.165	-0.073	-0.001	0.061
<i> dAcc </i>	1,815	0.109	0.124	0.029	0.066	0.136
Panel B: Normalized financial reporting properties variables [0,1]						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>Lag</i>	1,815	0.464	0.188	0.326	0.538	0.598
<i>Length</i>	1,815	0.524	0.199	0.387	0.527	0.663
<i>Similarity</i>	1,815	0.627	0.229	0.506	0.673	0.796
<i> dTone </i>	1,815	0.315	0.242	0.123	0.265	0.443
<i>Read</i>	1,815	0.496	0.206	0.358	0.495	0.633
<i>hardInfo</i>	1,815	0.642	0.185	0.537	0.659	0.772
<i> dAcc </i>	1,815	0.181	0.205	0.048	0.110	0.225
Panel C: Variables for additional analysis						
	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>Q1</u>	<u>Median</u>	<u>Q3</u>
<i>tDnoC_{adj}</i>	1,815	0.011	0.270	-0.156	0.040	0.212
<i>RoA_{adj}</i>	1,815	0.001	0.104	-0.060	-0.011	0.046
<i>Family</i>	1,815	0.322	0.467	0	0	1
<i>Size</i>	1,815	10.968	0.891	10.305	10.814	11.461
<i>Growth</i>	1,815	0.046	0.179	-0.045	0.024	0.107
<i>Intangibles</i>	1,815	0.017	0.048	0.001	0.003	0.011
<i>PublicRival</i>	1,815	0.336	0.472	0	0	1
<i>HighLaborEnforce</i>	1,815	0.068	0.251	0	0	0
<i>IncomePerCapita</i>	1,815	21.295	2.791	19.503	21.04	22.971
<i>HHI</i>	1,815	0.034	0.047	0.010	0.020	0.040
<i>YearIncorp</i>	1,815	1971.674	37.453	1958	1986	1997

Notes: Table depicts summary statistics of employed variables. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined as described in Appendix A.

PART D: OVERALL

reports amounts to 5.127. The longest (shortest) report contains 8,904 (485) words, which is about 25 (1.5) pages. The average report stickiness (*Similarity*) amounts to 0.748 (median: 0.786). Moreover, the quantity of numbers in a management report (*hardInfo*) ranges from five to 80 per 1,000 words. On average a management reports consists of 32 numbers per 1,000 words. Finally, the abnormal tone variable (*dTone*) indicates firms that use overly optimistic ($dTone > 0$) or overly pessimistic ($dTone < 0$) language. The earnings quality measure can be interpreted in the same way. Positive discretionary accruals ($dAcc > 0$) indicate income-increasing while $dAcc < 0$ implies income-decreasing earnings management. Panel B of Table 37 shows normalized values.

Table 38 presents Pearson correlations of all measures (objects). As high correlation can distort the results of cluster analysis, highly correlated variables should be excluded. However, the coefficients are well below established thresholds (e.g., Backhaus 2016). The highest correlations exist between *hardInfo* and *Read* (0.415) as well as *Length* and *Read* (-0.279). Problems based on correlated objects should not be an issue.

Table 38:
Correlation matrix for financial reporting properties

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>Lag</i>	1.000								
(2) <i>Length</i>	0.115	1.000							
(3) <i>Similarity</i>	-0.127	-0.004	1.000						
(4) <i>dTone</i>	0.042	0.027	-0.012	1.000					
(5) $ dTone $	0.048	0.194	-0.041	-0.050	1.000				
(6) <i>Read</i>	-0.033	-0.279	0.036	0.000	-0.015	1.000			
(7) <i>hardInfo</i>	0.068	-0.120	-0.213	0.165	0.041	0.415	1.000		
(8) <i>dAcc</i>	0.007	0.049	-0.024	0.022	-0.022	-0.037	0.017	1.000	
(9) $ dAcc $	0.029	-0.069	-0.005	-0.009	-0.042	0.013	0.037	-0.148	1.000

Notes: Table depicts Pearson correlation coefficients of financial reporting properties. Significant correlations (at 5 %) are denoted in bold. All continuous variables are winsorized at the 1st and 99th percentiles. All variables are defined as described in Appendix A.

4 Results

4.1 Five-dimensional clustering

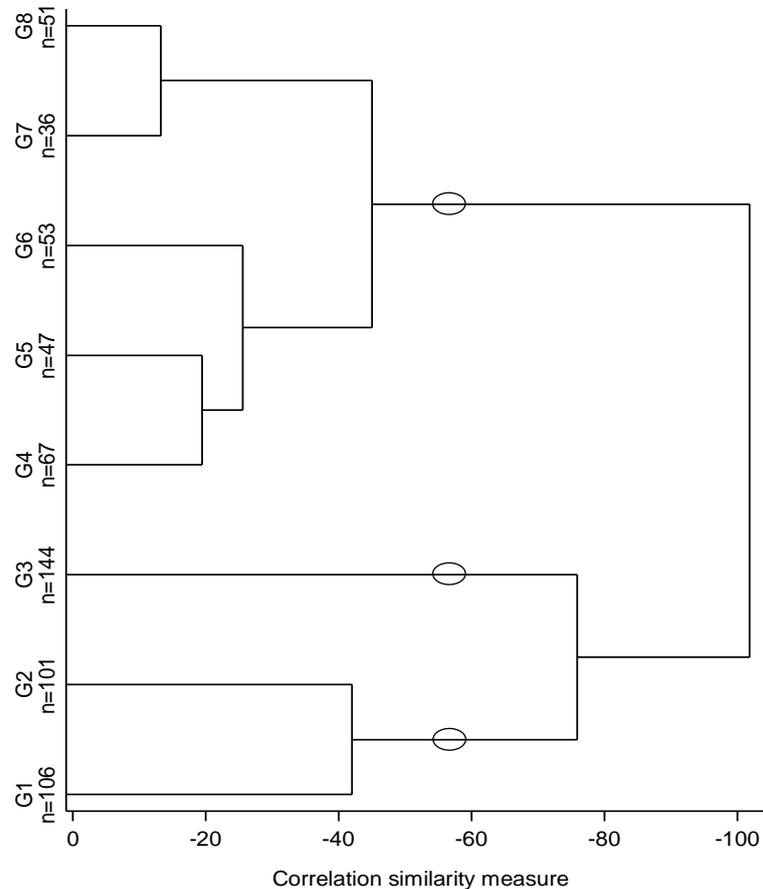
4.1.1 Classification of firms: spotting disclosure profiles

To address my first research question, I classify sample firms using cluster analysis as described above. In a first step, I only focus on variables that are not based on inferences-in-residuals. Thus, I omit */dAcc/* and */dTone/*. Both variables are extremely skewed due to the underlying statistical method, which potentially could affect clustering outcomes. I add them in Section 4.2.

Hence, I start with the year-wise clustering of firms based on five dimensions. Figure 17 provides an extract of the so-called dendrogram for 2012, which shows the sequential building of clusters at different fusion levels (starting from an eight-cluster solution and ending at a one-cluster solution). A major task of the researcher is to identify an appropriate number of clusters which (i) is feasible but (ii) provides an adequate level of detail. For simplification, I generally chose to keep the number of clusters as low as possible. However, to reinforce the decision more formally, I apply the stopping rule by Calinski and Harabasz (1974). This criterion suggests choosing the number of clusters with the highest Calsinski-Harabasz index (CH), which is a ratio of the mean between-cluster variance to the mean within-cluster variance. In 2012, the peak of CH amounts to 104.32 in a three-cluster solution as indicated in Figure 17 by ellipses.¹⁰¹ Given the outcome stopping at three clusters, the algorithm categorize 207 firms to Cluster A, 144 firms to Cluster B, and 254 firms in Cluster C, based on their similarity in case of five financial reporting properties. Table 39 reports the median values of the normalized variables for each cluster (A, B, and C). To verify the effectiveness of the clustering, I test the differences between the clusters using ANOVA. The results in Table 39 provide evidence that clusters are distinctive and all differences are significant. I also rank the median of each variable across the clusters from the lowest (1) to the highest (3) value variables. Higher (lower) values indicate more opaqueness (more transparency). The ranking already reveals that there seems to be no superior strategy for providing disclosures, which achieve the highest or lowest scores over all metrics. This suggests substitutional associations

¹⁰¹ The CH of a two-cluster solution (four-cluster solution) amounts to 102.14 (96.21). The CH of 2013 and 2014 data also suggests choosing a three-cluster solution with peaks at 128.45 and 132.4.

Figure 17:
Dendrogram



Notes: Figure depicts the partial dendrogram from a eight to a one cluster solution of data for the year 2012 using Ward's method and correlations as dissimilarity measure ($n=605$). Ellipses indicate the chosen three cluster solution.

between individual financial reporting choices. Figure 18 depicts percentile-ranked variables in radar graphs. In the following, I briefly describe the three identified clusters for the year 2012:¹⁰²

- Firms in *Cluster A* file management reports with the highest degree of textual stickiness, i.e., copy-paste (median: 0.78) and the shortest reports (0.64). However, Cluster-A firms provide documents with the best readability scores and the highest level of specificity, as they use the greatest extent of hard information in their management reports.

¹⁰² For parsimony, I refrain from characterizing the clusters for each year (depicted in Figure 18). The shapes of clusters is relatively stable over time. However, the cluster size varies.

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Table 39:
Median values and ranks of variables by clusters

	Cluster			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=207	B n=144	C n=254			
2012						
<i>Lag</i>	0.50 (2)	0.44 (1)	0.58 (3)	0.50	6.31	< 0.001
<i>Length</i>	0.64 (3)	0.38 (1)	0.61 (2)	0.55	117.85	< 0.001
<i>Similarity</i>	0.78 (3)	0.73 (2)	0.46 (1)	0.65	214.44	< 0.001
<i>Read</i>	0.38 (1)	0.61 (3)	0.49 (2)	0.49	65.99	< 0.001
<i>hardInfo</i>	0.51 (1)	0.70 (2)	0.76 (3)	0.66	182.86	< 0.001
	Cluster			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=313	B n=187	C n=105			
2013						
<i>Lag</i>	0.55 (2)	0.55 (1)	0.58 (3)	0.56	20.05	< 0.001
<i>Length</i>	0.58 (2)	0.34 (1)	0.59 (3)	0.52	128.29	< 0.001
<i>Similarity</i>	0.71 (3)	0.67 (2)	0.25 (1)	0.64	326.73	< 0.001
<i>Read</i>	0.40 (1)	0.66 (3)	0.47 (2)	0.50	160.92	< 0.001
<i>hardInfo</i>	0.62 (1)	0.68 (2)	0.72 (3)	0.66	21.82	< 0.001
	Cluster			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=340	B n=146	C n=119			
2014						
<i>Lag</i>	0.46 (2)	0.46 (1)	0.56 (3)	0.48	26.23	< 0.001
<i>Length</i>	0.55 (3)	0.30 (1)	0.54 (2)	0.50	110.75	< 0.001
<i>Similarity</i>	0.77 (3)	0.71 (1)	0.35 (1)	0.71	386.04	< 0.001
<i>Read</i>	0.43 (1)	0.68 (3)	0.46 (2)	0.49	129.01	< 0.001
<i>hardInfo</i>	0.58 (1)	0.74 (3)	0.72 (3)	0.65	65.14	< 0.001

Notes: Table depicts normalized median values of variables by clusters. The ranking (1-3) of each variable across clusters is given in parentheses. A higher rank indicates greater opaqueness. Differences of variables between clusters are tested using analysis of variance (ANOVA). All variables are defined as described in Appendix A.

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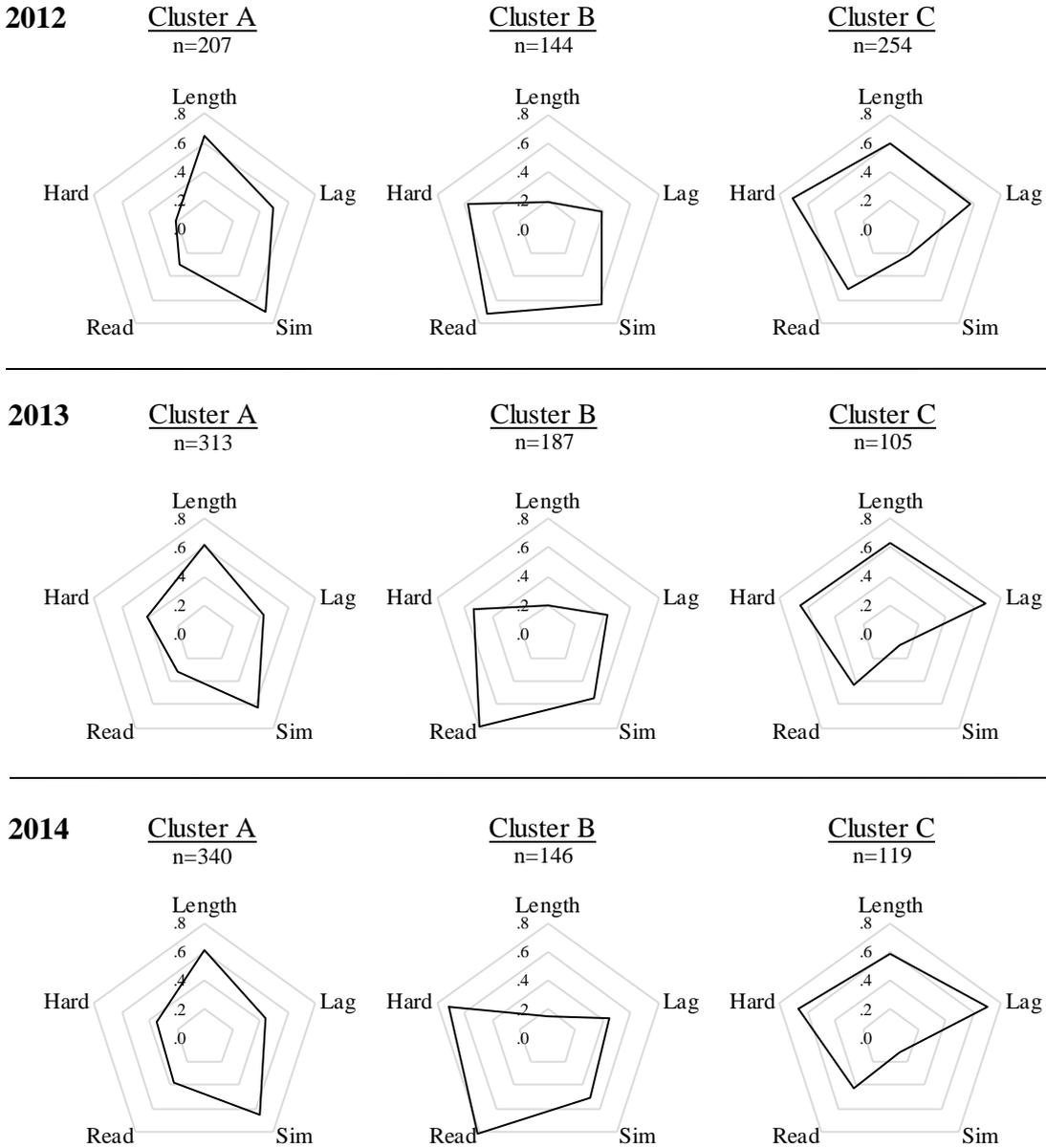
- *Cluster B* consists of the lowest number of firms ($n=144$) and is characterized by the longest management reports (0.38) and the shortest reporting lag (0.44). Both are associated with higher transparency. However, the firms in this cluster provide less readable reports.
- Finally, firms in *Cluster C* ($n=254$) file the most modified management reports (0.46), but exhibit the highest disclosure delay (0.58). This indicates a potential substitutional relationship between disclosure timing and the extent of revision. Moreover, these firms are distinctive as they provide narratives with the lowest amount of quantitative information.

Nonetheless, classifying the clusters as a more or less transparent disclosure strategy is difficult; therefore, it would be necessary to weight variables' influence on firms' information environment.¹⁰³ Based on naïve equal weighting, one could describe Cluster-B firms as slightly more transparent compared to firms in Clusters A and C.

¹⁰³ For example, it would be necessary to quantify whether delaying disclosure is (i) equally, (ii) less, or (iii) more effective in influencing firms' information environment than decreasing readability.

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Figure 18:
Radar graphs of financial reporting profiles (five dimensions)



Notes: Figure depicts median of percentile ranked variables (financial reporting properties) of each cluster in radar graphs by year. Values are calculated by year-wise clustering using Ward's method and correlations as dissimilarity measure. Variables are aligned that higher values are associated with greater opacity. All variables are defined as described in Appendix A.

4.1.2 Determinants of cluster affiliation

The next analysis refers to the question of *who* pursues which disclosure strategy. To examine if there are differences in firms' fundamentals across clusters, I employ the following logit regression model:

$$\begin{aligned}
 PR(Cluster_u_i = 1) = & \beta_0 + \beta_1 * tDnoC_adj_i + \beta_2 * RoA_adj_i + \beta_3 * Family_i \\
 & + \beta_4 * Size_i + \beta_5 * Growth_i + \beta_6 * Intangibles_i \\
 & + \beta_7 * PublicRival_i + \beta_8 * HighLaborEnforce_i \\
 & + \beta_9 * IncomePerCapita_i + \beta_{10} * HHI_i \\
 & + \beta_{11} * YearIncorp_i + \epsilon_i
 \end{aligned} \tag{3}$$

Cluster_u is a binary variable indicating whether a firm belongs to Cluster *u*, where *u* is either A, B or C. I test cluster affiliation regarding typical fundamentals in private firms' accounting research as capital structure, performance, ownership, and size. I use the industry-adjusted total debt net of cash ratio (*tDnoCadj*) as well as the industry-adjusted return on assets (*RoAadj*). Moreover, I employ a binary variable, indicating if a natural person holds more than 50 % of shares (*Family*). Companies' size is measured as the natural logarithm of total assets (*Size*) and growth as the yearly percentage difference in revenues (*Growth*). All controls are based on the model of Bernard (2016).¹⁰⁴ A (more) detailed definition of variables can be found in Appendix A. Results for 2012 are depicted in Table 40.¹⁰⁵ First, higher leveraged firms are significantly more likely to exhibit disclosure profiles, which are best described by Cluster B and are also less likely to report as Cluster-C firms. Second, there are differences regarding the ownership structure. Firms that are designated as family firms, based on the above-mentioned definition are more likely to reveal disclosure profiles as in Cluster C, which means longer reporting lags and less specific management reports. Moreover, family firms are less probable to belong to Cluster B, which is characterized by lengthy reports and higher timeliness. Third, there are significant differences regarding company size. Larger firms are more likely to belong to Cluster B and significantly less likely to be affiliated to Cluster A. Fourth, there are slight differences regarding firms' performance and growth. Companies whose performance is above the industry average are less likely to be classified according to Cluster C. Firms with higher growth rates are more likely to appear in Cluster B.

¹⁰⁴ Compared to Bernard (2016), I only omit the control *East* (a binary measure indicating whether a firm is located in former East Germany). I do so because the average disposable income of residents of the federal state where the firms are located (*IncomePerCapita*) is highly correlated with *East*.

¹⁰⁵ The results for other years are presented in Appendix B.

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Table 40:
Firm-level determinants of cluster affiliation (five dimensions)

	(3a) Cluster A	(3b) Cluster B	(3c) Cluster C
<i>tDnoC_{adj}</i>	0.123 (0.36)	0.857** (2.11)	-0.749** (-2.24)
<i>RoA_{adj}</i>	0.513 (0.58)	1.201 (1.19)	-1.488* (-1.67)
<i>Family</i>	-0.232 (-1.22)	-0.448* (-1.94)	0.506*** (2.79)
<i>Size</i>	-0.185* (-1.75)	0.429*** (3.82)	-0.177* (-1.72)
<i>Growth</i>	0.248 (0.49)	-1.482** (-2.34)	0.835* (1.70)
<i>Intangibles</i>	0.849 (0.49)	1.805 (1.01)	-2.633 (-1.35)
<i>PublicRival</i>	0.021 (0.11)	0.055 (0.25)	-0.076 (-0.41)
<i>HighLaborEnforce</i>	-0.494 (-1.31)	0.713* (1.88)	-0.122 (-0.35)
<i>IncomePerCapita</i>	0.016 (0.53)	-0.022 (-0.62)	0.001 (0.04)
<i>HHI</i>	-2.539 (-1.24)	2.298 (1.18)	-0.098 (-0.05)
<i>YearIncorp</i>	0.000 (0.18)	0.000 (0.11)	-0.001 (-0.32)
<i>Constant</i>	0.348 (0.07)	-6.011 (-1.08)	2.910 (0.61)
n	605	605	605
Pseudo R ²	0.01	0.06	0.03

Notes: Table depicts logit regression results of Model (3) with *Cluster_u* as binary dependent variable and data from 2012. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix A.

Taken together, Cluster-B firms are greater in size, leveraged to a higher extent, less likely to be family-owned, and show lower growth. In contrast, Cluster-C firms exhibit lower leverage scores, lower performance compared to industry peers, and are more likely to be a family firm. Firms in Cluster A do not significantly differ with respect to analyzed characteristics.

4.1.3 Switching disclosure strategy over time

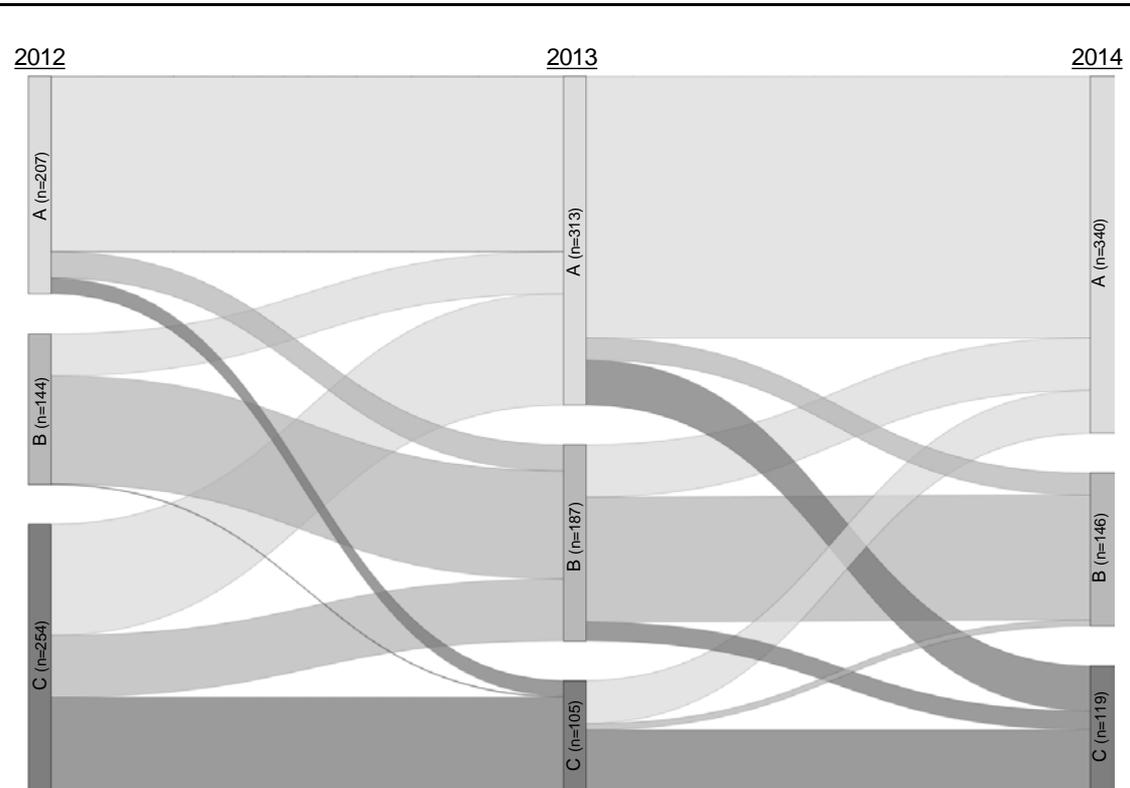
In this section, I examine whether firms' disclosure strategy is stable over time or if a substantial number of firms switches clusters during the period from 2012 to 2014. Figure 18 graphically reveals the shapes of disclosure profiles in the form of radar graphs. I depict percentile ranks to meaningfully present and interpret variables. Moreover, all variables are aligned, so that higher values imply greater opaqueness.¹⁰⁶ The graphs show that the cluster shape is relatively stable over time. In particular, the characterizing features of clusters are sticky. For example, the shape of Cluster A in 2012 is quite similar to Cluster A in 2013 and 2014. The same holds for Cluster B and Cluster C. However, the number of firms affiliated to each cluster differs between years. There is a remarkable increase in cluster-A firms, which are characterized by the least narrative revision, the lowest amount of information and a high portion of quantitative data in all three years. The cluster size increases by over 60 % from 207 firms in 2012 to 340 firms in 2014. This could be interpreted as an indication of convergence over time. Firms might align their disclosure practice. The size of Cluster C has nearly halved. In other words, the number of firms with a substantial revision of narratives (low similarity), short reports, and a great reporting lag decreased. Cluster B, which is associated with higher transparency, is rather stable regarding both its shape and its cluster size.

To provide further insights, I track the cluster affiliation of firms over time. Figure 19 provides a so-called alluvial diagram, which illustrates yearly movements from 2012 to 2014. It shows whether and where firms are switching. The greatest fluctuation is in 2013, when 106 firms change from Cluster C to Cluster A. However, for most firms, the cluster affiliation is sticky in two consecutive years. In 2013 (2014) about 60 % (70 %) of firms remain in the same cluster as in the previous year.

This is even the case for the whole investigation period. About a quarter of sample firms (151) is constantly affiliated to Cluster A, and does not change it over time (AAA). There are 72 firms which are constantly allocated to Cluster B (BBB) and 56 firms to Cluster C (CCC). In sum, 279 firms (46 %) do not switch their cluster affiliation and exhibit a stable disclosure practice over three years. However, this means that more than a half of the firms change their disclosure profile at least once in three years. The most frequent non-

¹⁰⁶ As this, *hardInfo* and *Length* are multiplied by minus one so that higher values are associated with greater opaqueness.

Figure 19:
Alluvial diagram of cluster movements (five dimensions)



Notes: Figure depicts the alluvial diagram of cluster movements from 2012 to 2014. Clusters are based on five dimensions using Ward's method and correlation as dissimilarity measure ($n=1,815$).

stable disclosure practice movement pattern is in the change from Cluster C to Cluster A in 2013 (CAA), which can be observed for 72 firms. Other changes are relatively rare.¹⁰⁷

While it is less surprising that disclosure practice is relatively sticky over time, firms that switch between clusters are potentially interesting. Thus, it could be fruitful, to study firms that do not behave like the majority and instead switch patterns in an abnormal way (indicated by thin "waves" in the alluvial diagram). For example, it would be interesting to come to know, why a few firms switch from Cluster A in 2012 to Cluster B or C in 2013. Moreover, it would be fruitful to determine whether firms switch to a cluster that is associated with higher or lower transparency compared to the prior year cluster. However, I refrain from further interpretation concerning the low number of observation and the underlying explorative approach including a couple of assumptions.

¹⁰⁷ The second most common non-stable pattern is CBB including 30 firms (6.3 %); all other patterns are ≤ 5 %.

4.2 Seven-dimensional clustering

Following the same approach as outlined before, I repeat the clustering procedure with all previously described variables and include */dAcc/* and */dTone/*. For terms of comparability, I also choose to present a three-cluster solution.¹⁰⁸ Again, I cluster each year separately. In 2012, the hierarchical clustering groups 347 firms to Cluster A, 144 firms to Cluster B, and 114 to Cluster C.¹⁰⁹ Table 41 reports the median values of the normalized variables of each identified cluster (A, B and C). Consistent with Section 4.1, I briefly characterize the clusters of 2012:

- Cluster A is the largest (n=347) and reveals the least distinctive features. Most variables exhibit average values. However, the reports are relatively long (median: 0.47) and show the best tone properties (lowest degree of discretionary tone (0.20)).
- Cluster B is characterized by the greatest similarity among management reports (0.81). However, affiliated firms file their financial reports timelier (0.45) and their narratives contain the highest volume of quantitative data (0.45).
- Finally, firms in Cluster C exhibit reports with the lowest extent of narrative similarity (0.42), but have the longest reporting lags (0.60). This substitutional relationship has already been documented previously in Section 4.1. Moreover, these firms exhibit the highest degree of abnormal tone (0.59).

Regarding the newly introduced dimension of earnings quality, there are no major differences in 2012. Cluster A differs only slightly from Cluster B and C in terms of earnings management. Interestingly, it changes in subsequent years, as shown in Figure 21. In 2013 and 2014, the clustering algorithm groups a small number of firms which are strongly engaged in earnings management (Cluster B).¹¹⁰ In 2013, affiliated firms (45) clearly reveal the highest portion of discretionary accruals. Moreover, they provide reports with the lowest readability. This also holds for 2014, where Cluster B does not differ substantially compared to the prior year. Cluster A, which seems to contain firms with ordinary financial reporting properties, and Cluster C are also stable over time. However,

¹⁰⁸ In 2012, the CH score is highest in case of a two-cluster solution (73.65). However, the CH score of the three-cluster solution is only slightly lower (72.68). In 2013 (2014), the CH approach suggests choosing three (five) clusters.

¹⁰⁹ The order and naming of clusters are arbitrary and completely independent of the results in Section 4.1.

¹¹⁰ In 2013, from the top 10 (top 20) firms with the greatest extent of earnings management, five (seven) belong to Cluster B.

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Table 41:
Median values and ranks of variables by clusters (seven dimensions)

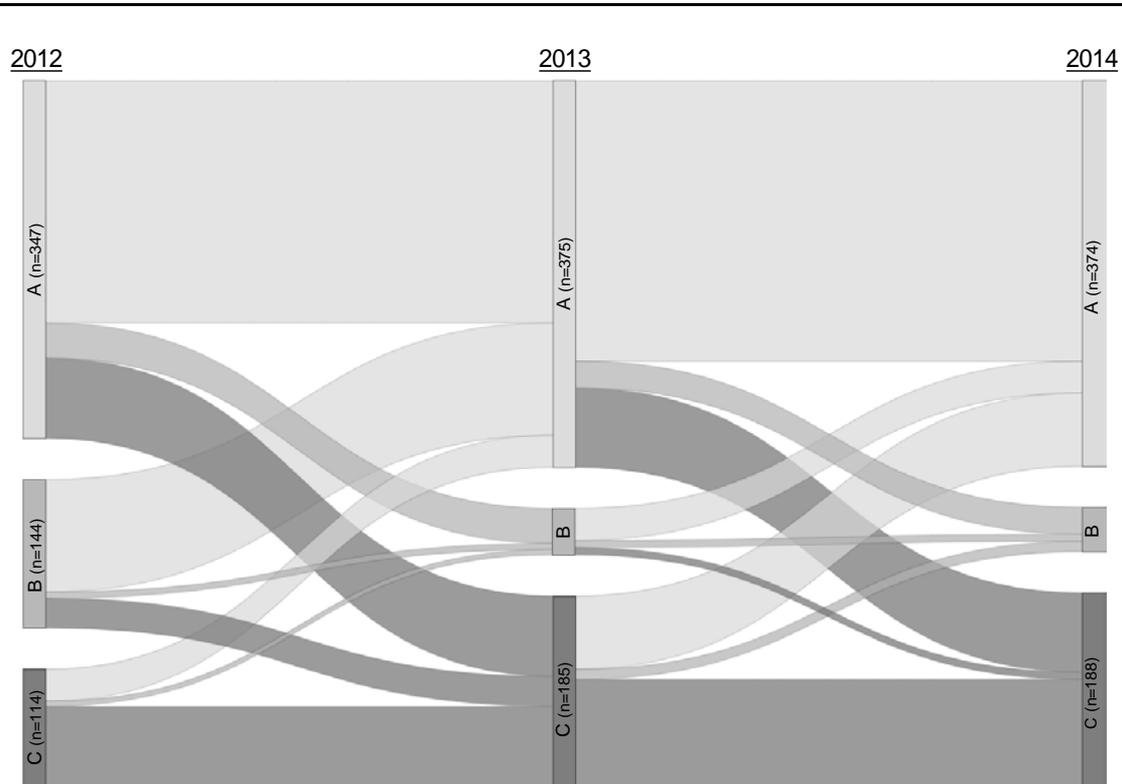
2012	Clusters			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=347	B n=144	C n=114			
<i>Lag</i>	0.46 (2)	0.45 (1)	0.60 (3)	0.50	13.46	< 0.001
<i>Length</i>	0.47 (1)	0.64 (2)	0.68 (3)	0.55	71.36	< 0.001
<i>Similarity</i>	0.65 (2)	0.81 (3)	0.42 (1)	0.65	114.73	< 0.001
<i> dTone </i>	0.20 (1)	0.37 (2)	0.59 (3)	0.27	90.81	< 0.001
<i>Read</i>	0.56 (3)	0.34 (1)	0.40 (2)	0.49	60.49	< 0.001
<i>hardInfo</i>	0.72 (3)	0.45 (1)	0.68 (2)	0.66	184.95	< 0.001
<i> dAcc </i>	0.11 (3)	0.10 (2)	0.09 (1)	0.11	5.93	0.003

2013	Cluster			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=375	B n=45	C n=185			
<i>Lag</i>	0.55 (1)	0.56 (2)	0.57 (3)	0.56	1.32	0.268
<i>Length</i>	0.51 (2)	0.34 (1)	0.58 (3)	0.52	13.91	< 0.001
<i>Similarity</i>	0.70 (3)	0.65 (2)	0.39 (1)	0.64	159.27	< 0.001
<i> dTone </i>	0.20 (1)	0.23 (2)	0.50 (3)	0.26	117.65	< 0.001
<i>Read</i>	0.50 (1)	0.56 (3)	0.51 (2)	0.50	1.52	0.220
<i>hardInfo</i>	0.63 (1)	0.68 (2)	0.72 (3)	0.66	13.95	< 0.001
<i> dAcc </i>	0.11 (2)	0.89 (3)	0.10 (1)	0.12	515.89	< 0.001

2014	Cluster			all firms n=605	ANOVA <i>F</i>	<i>p</i>
	A n=374	B n=43	C n=188			
<i>Lag</i>	0.48 (2)	0.47 (1)	0.51 (3)	0.48	2.20	0.111
<i>Length</i>	0.47 (2)	0.40 (1)	0.57 (3)	0.50	22.63	< 0.001
<i>Similarity</i>	0.75 (3)	0.64 (2)	0.50 (1)	0.71	103.72	< 0.001
<i> dTone </i>	0.21 (1)	0.23 (2)	0.48 (2)	0.26	94.45	< 0.001
<i>Read</i>	0.51 (2)	0.52 (3)	0.46 (1)	0.49	2.67	0.070
<i>hardInfo</i>	0.64 (1)	0.65 (2)	0.69 (3)	0.65	9.88	< 0.001
<i> dAcc </i>	0.11 (2)	0.72 (3)	0.09 (1)	0.11	467.22	< 0.001

Notes: Table depicts normalized median values of variables by clusters. The ranking (1-3) of each variable across clusters is given in parentheses. A higher rank indicates greater opaqueness. Differences of variables between clusters are tested using analysis of variance (ANOVA). All variables are defined as described in Appendix A.

Figure 20:
Alluvial diagram of cluster movements (seven dimensions)

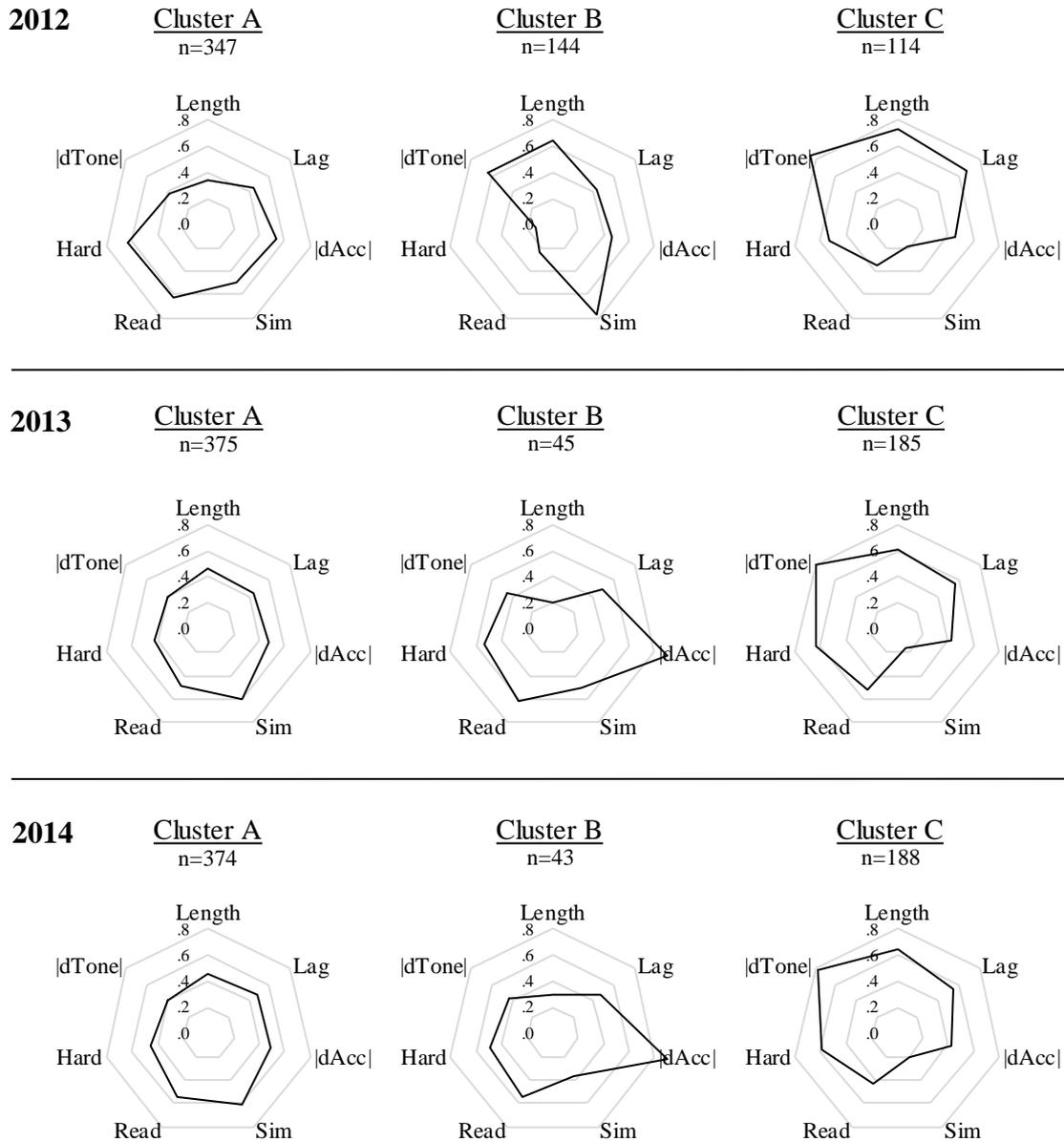


Notes: Figure depicts the alluvial diagram of cluster movements from 2012 to 2014. Clusters are based on seven dimensions using Ward's method and correlation as dissimilarity measure ($n=1,815$).

compared to the analysis presented in Section 4.1, clusters are less stable. I can provide two reasons to explain this. First, from a technical side, the high dimensionality (seven variables) entails more noise, resulting in less stable clustering. Second, the integration of the earnings management dimension might contribute to this finding. An increase in discretionary accruals in year t is followed by a decrease in subsequent years, and vice versa. Given the reversal effect of accruals, firms cannot be engaged in earnings management over a longer period of time. The alluvial diagram graphically supports this (Figure 20). Most firms in Cluster B, which is characterized by higher discretionary accruals, switch either to A or to C in subsequent years. Over the whole investigation period, only one of 605 firms is constantly assigned to Cluster B (BBB).

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Figure 21:
Radar graphs of financial reporting profiles (seven dimensions)



Notes: Figure depicts median of percentile ranked variables (financial reporting properties) of each cluster in radar graphs by year. Values are calculated by year-wise clustering using Ward's method and correlations as dissimilarity measure. Variables are aligned so that higher values are associated with higher opaqueness. All variables are defined as described in Appendix A.

5 Robustness checks and limitations

Of course, the results and implications from this study are subject to several limitations. In particular, the methodological approach involves a high degree of freedom and judgement. Cluster analysis requires various decisions, e.g., the selection of variables, the number of clusters, the underlying clustering algorithm or the dissimilarity measure. All parameters potentially affect the outcome. There are only conventions, as opposed to clear rules or guidance. In addition, it is difficult to evaluate the clustering quality without labeled data (i.e., lacking of predefined groups or a hold-out sample). However, to validate the results and to ensure that the outcome is not a methodological artifact, I alter some parameters to assess the sensitivity of my results. I alternatively use *k-means* as a partitional clustering approach instead of a hierarchical method. Based on a predefined number of clusters (*centroids*), *k-means* assigns every firm to a randomly selected centroid. To optimize the position of the centroid, this step is repeated as long as there is a stable clustering solution or the given number of iterations has been reached. Nevertheless, varying the clustering method leads to similar cluster shapes and sizes, and thus only has limited impact on the emphasized results.

Moreover, high dimensionality contradicts a stable cluster solution.¹¹¹ To tackle this problem, I use principal component analysis to reduce dimensions. Based on the included set of seven variables in Section 4.2, I extract four components.¹¹² Table 42 depicts components and their loadings. Performing a clustering procedure on extracted components yields a slightly more stable solution with more distinct clusters since the number of objects (variables) has nearly halved. Cluster sizes are comparable to the seven-cluster solution. However, as components load on different domains of financial reporting properties (in particular Component 1 and 3), the results are more difficult to interpret. For descriptive purpose, I therefore decide to rely on “raw” variables.

¹¹¹ Compared to five-dimensional clustering, clusters are less distinctive with respect to certain attributes. This is, e.g., indicated by a lower variance uncovered by ANOVA in Table 41.

¹¹² Three components have an eigenvalue greater than one. I add a fourth component as its eigenvalue is only slightly below the threshold of one. The four components explain 70 % of variance.

Table 42:
Principal component analysis on financial reporting measures

	1 st Component	2 nd Component	3 rd Component	4 th Component
<i>Lag</i>		0.508	-0.363	
<i>Length</i>	-0.470	0.386		
<i>Similarity</i>		-0.519		0.445
<i>/dTone/</i>		0.450	0.488	0.508
<i>Read</i>	0.624			
<i>hardInfo</i>	0.579	0.343		
<i>/dAcc/</i>			-0.661	0.702
Variance explained	0.227	0.186	0.150	0.136
Cumulative	0.227	0.414	0.564	0.700

Notes: Table shows results of principal component analysis based on three components with eigenvalue greater than one. A fourth component (eigenvalue = 0.955) is added to explain 70 % of total variance. For simplicity, unsigned factor loadings below 0.3 are omitted. All variables are defined as described in Appendix A.

6 Discussion and avenues for further research

Without capital market data, it is even harder to empirically approximate a firm's information environment. Moreover, corporate transparency cannot be proxied by relying on a single measure. It is rather the sum of managerial discretion from different domains. Hence, I provide a methodological approach that considers multiple firm-level properties.¹¹³ Specifically, I use cluster analysis to form groups of private firms based on their financial reporting properties. Overall, the research questions and the methods are exploratory in nature. Thus, the results should be treated as tentative and could be considered as implications for further research opportunities.

The major aim of this study is to discover patterns and associations in financial reporting properties. While admittedly exploratory, I believe that the results allow for some noteworthy insights into the financial reporting behavior of private firms, which add to the prior literature. First, I present descriptive evidence for a wide range of textual properties,

¹¹³ Compared to a simple overall score, e.g., based on a rank sum, cluster analysis considers substitutional and complementary relationships between certain properties.

which have not been studied in case of private firms (in particular readability, report stickiness, and tone). Second, the applied clustering algorithm identifies three distinct and time-invariant financial reporting profiles. The differences between clusters and cluster-specific peculiarities suggest that firms pursue heterogeneous financial reporting strategies (regarding timeliness, textual properties, and earnings properties). Fourth, the analysis of determinants implies that firms' fundamentals are associated with cluster affiliation. Hence, this aspect adds to the rich literature investigating the relationship between firm-specific incentives and financial reporting practice. In particular, financing structure, ownership, performance, and company size are correlated with cluster affiliation. Third, the results suggest some relations between single financial reporting properties. In particular, the substitutional and complementary associations across different domains are potentially interesting. As such, the findings of all specifications of the cluster analysis imply a potential trade-off between management report modification and timeliness. Firms belonging to the cluster with the most updated reports (lowest degree of copy-paste intensity) file their documents with the greatest delay. Reports with a higher portion of copy-paste intensity are published more timely. Untabulated uni- and multivariate tests support this association. In addition, firms that delay disclosure exhibit the highest amount of abnormal tone in all three years. In the light of creating a more opaque information environment, both seem to be interesting topics for future research. The same holds for earnings management which potentially correspond to a decreased readability of firms' reports, as suggested by Cluster B (Section. 4.2). This association has already been documented for public firms and could be attributed to managerial obfuscation (Lo et al. 2017). Other relationships have to be interpreted with more caution. Although correlation analysis reveals only minor dependencies, some proxies could be related through technical measurement issues (e.g., document length and readability). Fifth, it becomes apparent that cluster affiliation is relatively sticky within the investigation period. However, some firms switch between clusters. Hence, it seems promising to examine firms' decision to switch cluster affiliation in more detail. Yearly clustering and tracking of cluster movements allows to identify such firms and to analyze underlying incentives.

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Appendix A:
Variable definitions and data sources

Financial reporting properties		
	<u>Definition</u>	<u>Source</u>
<i>Lag</i>	is the difference in days between a firm's fiscal year end and the date of public filing.	Federal Gazette
<i>Length</i>	is the natural logarithm of the number of words in firms' management report scaled by <i>Size</i> .	Federal Gazette
<i>Similarity</i>	is the cosine similarity between a management report in year t and t_{-1} considering term weighting which gives lower weight to common words (term frequency-inverse document frequency approach (<i>tf-idf</i>)).	Federal Gazette
<i> dTone </i>	is the absolute value of the residual of the expected tone model by Huang et al. (2014). Dependent variable is <i>Tone</i> , which is the number of positive words minus negative words scaled by total number of words in firms' management report. Positive and negative words are identified using the wordlist of Bannier et al. (2019) while considering negation.	Federal Gazette
<i>Read</i>	is the first principal component of the following four measures of readability: "Vierte Wiener Sachtextformel" (<i>WSTF</i>), <i>SMOG</i> readability, Flesch Reading Ease (<i>FLESCH</i>) and <i>LIX</i> for German language.	Federal Gazette
<i>hardInfo</i>	is the ratio of informative numbers in firms' management report to the total number of words multiplied by 1,000.	Federal Gazette
<i> dAcc </i>	is the absolute firm-level value of discretionary accruals based on the cross sectional modified Jones Model (Dechow et al. 1995) calculated using data on the population of large private firms in Amadeus.	Amadeus
<i>Lag</i>	is the difference in days between firms' fiscal year end and the date of public filing.	Federal Gazette
Firm characteristics		
	<u>Definition</u>	<u>Source</u>
<i>tDnoC_{adj}</i>	is the firm's total debt net of cash, scaled by total assets, minus the mean of this ratio for all other firm the same industry based Fama/French 48-classification.	Amadeus
<i>RoA_{adj}</i>	is the ratio of operate income to average total assets, minus the mean of this ratio for all other firm the same industry based Fama/French 48-classification.	Amadeus
ΔRoA	is the difference of RoA between year t and year t_{-1} .	Amadeus
<i>StDRoA</i>	is the standard deviation of RoA over the last three years.	Amadeus
<i>Loss</i>	is a binary variable equal to one if the operating income is negative.	Amadeus

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Appendix A:
continued

	<u>Definition</u>	<u>Source</u>
<i>Family</i>	is a binary variable equal to one if a natural person holds more than 50 % of shares (controlling shareholder).	Amadeus
<i>Size</i>	is the natural logarithm of total assets.	Amadeus
<i>Growth</i>	is the growth in revenues scaled by revenues in t_{-1} .	Amadeus
<i>Intangibles</i>	is the firm's intangible assets, scaled by total assets.	Amadeus
<i>PublicRival</i>	is a binary variable equal to one if there is at least one public German company in firms' four-digit NAICS code.	Amadeus
<i>HighLaborEnforce</i>	is a binary variable equal to one if firm operates in an industry that is subject to additional scrutiny under German labor laws. That is if a firm is in the three-digit NAICS codes 113, 236, 237, 238, 481, 482, 483, 484, 485, 486, 487, 488, 721, and 722 as well as four-digit NAICS codes 3116, 5612, and 5617.	Amadeus
<i>IncomePerCapita</i>	is the average disposable income of residents in the district where the firm is located in thousands. Data are provided by the "National Accounts of the Federal States".	Destatis
<i>HHI</i>	is the Hirschman-Herfindahl index formed by three-digit SIC codes and constructed using total assets from the population of German firm in the Amadeus database.	Amadeus
<i>YearIncorp</i>	is the year the firm was incorporated.	Amadeus
Additional variables		
	<u>Definition</u>	<u>Source</u>
<i>WSTF</i>	is the readability of the management report based on the following formula: $0.2744 * \text{number of words with more than two syllables} + 0.2656 * \text{average sentence length} - 1.693$ (Bamberger and Vanecek 1984).	Federal Gazette
<i>SMOG</i>	is the readability of the management report based on the following formula: $\sqrt{\text{number of words with more than two syllables} / \text{number of sentences} * 30} - 2$ (Bamberger and Vanecek 1984).	Federal Gazette
<i>FLESCH</i>	is the readability of the management report based on the following formula: $180 - \text{average sentence length} - (58.5 * \text{average syllables per word})$ (Amstad 1978).	Federal Gazette
<i>LIX</i>	is the readability of the management report based on the following formula: $\text{average sentence length} + (\text{number of words over six letters} / \text{number of words} * 100)$ (Björnsson 1968).	Federal Gazette

Appendix B:
Firm-level determinants of cluster affiliation (five dimensions)

	2012			2013			2014		
	(3) Cluster A	(3) Cluster B	(3) Cluster C	(3) Cluster A	(3) Cluster B	(3) Cluster C	(3) Cluster A	(3) Cluster B	(3) Cluster C
<i>tDnoC_{adj}</i>	0.123 (0.36)	0.857** (2.11)	-0.749** (-2.24)	-0.543* (-1.68)	1.331*** (3.54)	-0.926** (-2.22)	-0.161 (-0.52)	0.653* (1.70)	-0.511 (-1.33)
<i>RoA_{adj}</i>	0.513 (0.58)	1.201 (1.19)	-1.488* (-1.67)	2.253** (2.56)	-0.177 (-0.19)	-4.100*** (-3.11)	1.918** (2.28)	-0.641 (-0.65)	-2.512*** (-2.26)
<i>Family</i>	-0.232 (-1.22)	-0.448* (-1.94)	0.506*** (2.79)	-0.171 (-0.94)	-0.427** (-2.03)	0.806*** (3.52)	0.090 (0.48)	-0.538** (-2.15)	0.340 (1.53)
<i>Size</i>	-0.185* (-1.75)	0.429*** (3.82)	-0.177* (-1.72)	-0.222** (-2.20)	0.406*** (3.80)	-0.277* (-1.89)	-0.220** (-2.22)	0.540*** (4.80)	-0.381*** (-2.70)
<i>Growth</i>	0.248 (0.49)	-1.482** (-2.34)	0.835* (1.70)	0.968** (2.22)	-0.892* (-1.87)	-0.432 (-0.66)	-0.969* (-1.77)	0.463 (0.74)	1.190* (1.75)
<i>Controls</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y
n	605	605	605	605	605	605	605	605	605
Pseudo R ²	0.011	0.060	0.030	0.037	0.071	0.066	0.023	0.082	0.042

Notes: Table depicts logit regression results of Model (3) with *Cluster* as binary dependent variable. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix A.

Appendix C:
Firm-level determinants of cluster affiliation (seven dimensions)

	2012			2013			2014		
	(3) Cluster A	(3) Cluster B	(3) Cluster C	(3) Cluster A	(3) Cluster B	(3) Cluster C	(3) Cluster A	(3) Cluster B	(3) Cluster C
<i>tDnoC_{adj}</i>	0.941*** (2.82)	-0.475 (-1.27)	-0.957** (-2.30)	0.250 (0.77)	1.031 (1.57)	-0.610* (-1.78)	0.161 (0.51)	1.641** (2.34)	-0.603* (-1.82)
<i>RoA_{adj}</i>	0.707 (0.80)	1.441 (1.48)	-3.256*** (-2.64)	1.940** (2.16)	0.904 (0.61)	-2.436** (-2.45)	0.875 (1.05)	-0.229 (-0.14)	-0.777 (-0.87)
<i>Family</i>	-0.218 (-1.20)	-0.181 (-0.85)	0.551** (2.47)	-0.271 (-1.48)	-0.729* (-1.82)	0.493** (2.57)	-0.034 (-0.18)	-0.840* (-1.79)	0.224 (1.14)
<i>Size</i>	0.241** (2.33)	-0.074 (-0.63)	-0.323** (-2.26)	0.113 (1.10)	0.034 (0.19)	-0.139 (-1.25)	0.188* (1.81)	0.285 (1.56)	-0.316*** (-2.76)
<i>Growth</i>	-0.095 (-0.19)	0.089 (0.16)	0.050 (0.07)	-0.375 (-0.88)	1.813*** (3.21)	-0.687 (-1.33)	-0.705 (-1.28)	3.326*** (3.58)	-0.365 (-0.61)
<i>Controls</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y
n	605	605	605	605	605	605	605	605	605
Pseudo R ²	0.029	0.014	0.052	0.014	0.082	0.029	0.010	0.114	0.030

Notes: Table depicts logit regression results of Model (3) with *Cluster* as binary dependent variable. *, **, and *** indicate significance at the 10 %, 5 % and 1 % level (two-tailed test). The t-statistics are in parentheses. All variables are defined as described in Appendix A.

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