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Organizational structure and earnings quality of private and public firms

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Abstract

We examine how heterogeneity in organizational structure affects private firm earnings quality in the European Union. Organizational structure refers to whether the firm is organized as a single legal entity (standalone) or as a business group. Private firms can be organized either way, while public firms are de facto groups. Even though private firms are not affected by market forces, we show that private business groups face greater stakeholder pressure for earnings quality than do standalone firms, while standalone firms have stronger tax minimization incentives. Due to these differences in nonmarket forces, private business groups have higher earnings quality than standalone firms. This heterogeneity among private firms is an important unexplored factor in the study of private firms, affecting the comparison between public and private firm earnings quality. We find that overall, public firms have higher earnings quality than private firms but this relation reverses when we control for nonmarket forces by examining business groups only.

Keywords Private firms · Business groups · Standalone · Stakeholder incentives, Earnings quality · Non-market forces

JEL classification D22 · G15 · G32 K22 · M41

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1 Introduction

We examine the effect of organizational structure on the earnings quality of private firms. Organizational structure refers to the number of formal entities in which the firm is organized: standalone firms are those not controlling nor controlled by another firm; business groups are firms that own a majority stake in subsidiaries.[1] Even though private firms are not affected by capital market forces, business groups and standalone firms are differentially affected by nonmarket forces: stakeholder pressures and tax incentives, which affect earnings quality.[2]

In our sample of European private firms, business groups have larger ownership dispersion, are more leveraged, and have higher transaction intensity with suppliers, relative to standalone firms, so we expect different stakeholder demand for monitoring to arise between the two groups. We also expect different tax incentives to arise, since standalone firms' individual financial statements are used for both tax and financial reporting, whereas business groups' consolidated statements are used for financial reporting only (Hanlon and Heitzman 2010).[3] Consistent with the larger stakeholder demand for earnings quality faced by groups, we find that, among private firms, business groups have higher earnings quality. Consistent with tax incentives (Goncharov et al. 2009), we find that standalone firms manage earnings downward (i.e., have negative abnormal accruals).

Partitioning private firms by organizational structure has implications for the comparison of public versus private firms' earnings quality. This comparison is important, because it attests to the net effects of market forces on firms (Givoly et al. 2010; Hope et al. 2013): public firms' opportunism induces lower earnings quality, but market demand does the opposite. Since de facto all public firms are business groups, to assess the effect of market forces, we must control for nonmarket forces by comparing public versus private business groups.[4] Research is inconclusive on this issue and thus about the effect of market forces on financial reporting. On the one hand, Beatty et al. (2002), Kim and Yi (2006), and Givoly et al. (2010), whose private firms are all business groups, find that private firms have higher earnings quality than public firms. On the other hand, Ball and Shivakumar (2005), Burgstahler et al. (2006), and Hope et al. (2013), whose private firms include both business groups and standalone firms, find that private firms exhibit lower earnings quality than public firms. Thus the different composition of the private firm samples may partly explain these contradictory results.

Overall, we find that public firms have higher earnings quality than private firms. Among private firms, however, consistent with differential stakeholder demand and tax incentives, business groups have higher earnings quality than standalone firms. In effect, the poor earnings quality of private standalone firms lowers private firms'

[1] This definition is consistent with the EU legal concept of corporate groups (Windbichler 2000) and with much of the academic work that focuses on corporate groups (Belenzon et al. 2013; Faccio et al. 2010).

[2] The terms earnings quality, financial reporting quality, accounting quality, and accruals quality have been used interchangably in the literature.

[3] In the European countries we analyze, individual statements are used to determine the tax obligation, and the same tax rules apply for private and public firms (Burgstahler et al. 2006; Leuz and Wüstemann 2003; Pierk 2016; Watrin et al. 2014).

[4] Public standalone firms can exist in theory, but we do not observe any in our sample. Moreover, on Compustat, all the U.S. firms provide consolidated financial statements; i.e., they are business groups.

overall earnings quality. When we compare public versus private business groups, the private ones have higher earnings quality. This is consistent with the notion that, in the European Union, public firms' opportunism outweighs the market's demand in determining public firms' earnings quality.

Using a large sample of 397,386 firm-year observations from 11 European Union countries from 2005 to 2014, our research proceeds as follows. First, we replicate the work of Burgstahler et al. (2006), who compared public versus private firms' earnings quality in 13 European Union countries. Not controlling for organizational structure, we find comparable results (public firms have higher earnings quality than private firms), validating our sample and methodology.

Next, using the proxies for stakeholder demand from Hope et al. (2017) and Lisowsky and Minnis (2018), we hypothesize and empirically show that, among private firms, business groups have larger ownership dispersion, are more leveraged, and have higher transaction intensity with suppliers than private standalone firms. This indicates that there is a differential level of demand for earnings quality by minority shareholders, debtholders, and suppliers and indicates that business groups face greater stakeholder pressure than standalone firms. We expect that the greater stakeholder pressure of private business groups, relative to standalone firms, leads to business groups having higher earnings quality. Our results support this prediction.

Next, we hypothesize and show that, due to different tax incentives, private standalone firms, which use the same financial statements for both financial and tax reporting, manage earnings downward (i.e., have negative abnormal accruals) and this effect is more pronounced in countries with high alignment of financial and tax accounting and for firms that have higher marginal tax rates (Watrin et al. 2014; Goncharov and Zimmermann 2006). In contrast, private business groups, which use consolidated statements for financial reporting but individual statements for taxes, do not have a tax-based incentive to manage earnings at the consolidated level. Consistent with our predictions, we find that private standalone firms have negative abnormal accruals but private business groups do not, implying that the likely purpose of standalone firms' downward earnings management is tax minimization. Together, the differential stakeholder demand and tax incentives cause private business groups to have higher earnings quality than private standalone firms.

Given the difference in incentives noted above and the mixed results in prior research, our findings call for a re-examination of the relative earnings quality of public versus private firms, controlling for firms' organizational structures. Thus, as a final step, analogous to the research of Asker et al. (2015), our empirical strategy uses private business groups as a counterfactual for public firms' earnings quality in the absence of market forces. Our results are consistent with the notion that, in the European Union, opportunism prevails over demand.

Although we find that European private business groups have higher earnings quality than public business groups overall, we do identify one exception: U.K. public business groups have higher earnings quality than private ones, consistent with the results of Ball and Shivakumar (2005). This is likely because the United Kingdom has among the most developed capital markets in the world and thus investor demand for high-quality reporting likely prevails over opportunism (Ball and Shivakumar 2005).

We make three important contributions to the literature. First, we introduce organizational structure (i.e. standalone versus business group) to the accounting literature

and show the importance of private firms' heterogeneous organizational structures for their earnings quality. While we focus on earnings quality, organizational structure might be relevant to private firms in general, which have received growing research interest. Second, by controlling for nonmarket forces, we add further evidence on the effect of market forces on firms, in particular, showing that, in the European Union, opportunism prevails over demand for public firms' earnings quality (with the important exception of the United Kingdom). Third, we reconcile the mixed results of the literature on earnings quality in private versus public firms, by considering standalone firms separately from business groups.

The paper proceeds as follows. Section 2 reviews the literature, provides the institutional background, and develops the hypotheses. Section 3 summarizes the data employed and provides descriptive statistics and our variable measurements. Sections 4 reports our main results. Section 5 discusses our analysis of the organizational structure choice, including controlling for endogeneity, and section 6 reports additional sensitivity tests. Section 7 concludes.

2 Literature review, institutional background and hypotheses

2.1 Literature review

Our research is at the intersection of two streams of literature: studies on the heterogeneity within privately held firms and studies analyzing the relative earnings quality of private versus public firms. Empirical evidence on the heterogeneity among private firms is recent but growing. In the United States, Hope et al. (2017) and Lisowsky and Minnis (2018) explain variations in accrual quality and financial reporting choices among private firms by different stakeholder demands. In the European Union, Bigus et al. (2016) study the effect of organizational legal form on German private firms. Liu and Skerratt (2018) compare income smoothing between small and micro-sized U.K. private firms. Hope et al. (2012) show that Norwegian private firms exhibit heterogeneous ownership characteristics and family relationships and that these characteristics explain audit fees. Bernard et al. (2018) examine size management by European private firms to minimize disclosure and audit costs, and Bernard et al. (2016) compare the financial reporting quality in Germany of private firms that voluntarily disclosed financial statements before enforcement tightened in 2006, private firms that did not, and public firms. Hope et al. (2017) and Hope and Vyas (2017) review the literature on variation within private firms. Overall, this literature has focused mostly on smaller private firms or a single country, whereas we examine both small and large private firms in a multi-country setting. Most importantly, we relate organizational structure to private firm earnings quality.

Empirical evidence on the relative earnings quality of public versus private firms is mixed. Ball and Shivakumar (2005), Burgstahler et al. (2006), and Hope et al. (2013) find that private firms have lower earnings quality than public firms. Beatty et al. (2002), Kim and Yi (2006), and Givoly et al. (2010) find the opposite result, that is, that private firms have higher earnings quality.

Using accounting conservatism as a proxy for earnings quality, Ball and Shivakumar (2005) show that private U.K. companies report less conservatively, exhibiting less

timely loss recognition than public companies. The authors interpret their results as private firms having lower earnings quality.

Using data from 13 European Union countries and multiple earnings quality metrics, Burgstahler et al. (2006) find that public firms have higher earnings quality than private firms. They interpret their findings to indicate that the first-order effect of capital market forces is to improve earnings quality.

Hope et al. (2013) use a sample of U.S. private firms from Sageworks. Using a number of different earnings quality metrics, they find that public firms have higher accruals-based earnings quality than private firms.

Beatty et al. (2002) use a sample of 707 public banks and 1160 private banks. They find that, relative to private banks, publicly held banks are more likely to use their financial reporting discretion to avoid reporting earnings declines, suggesting that earnings quality is lower in these banks.

Kim and Yi (2006) investigate Korean firms affiliated with business groups. They show that public firms have higher discretionary accruals than private firms, which they interpret in terms of the dominance of opportunism.

Givoly et al. (2010) compare the earnings quality of U.S. firms with publicly held equity (public firms) versus those firms with only publicly held debt (private firms). They find that public firms have lower quality accruals, higher propensity to manage income vis-à-vis earnings thresholds, and lower accruals persistence than private firms, leading them to conclude that private firms have higher earnings quality.

Importantly, these studies employ very different samples and reach differing conclusions. De facto, all public firms are organized as business groups. The private firm samples of Burgstahler et al. (2006) and Hope et al. (2013) include both standalone firms and business groups.[5] The private firms in the samples of Beatty et al. (2002), Kim and Yi (2006), and Givoly et al. (2010) are only business groups (i.e., they exclude standalone firms). Kim and Yi (2006) examine only business groups by construction. Beatty et al. (2002) examine banks, almost all of which file consolidated statements for regulatory reasons (i.e., are business groups), and Givoly et al. (2010) examine large private firms, all of which issue consolidated statements (i.e., are business groups). Importantly, papers whose private firm samples include both standalone firms and business groups find that public firms have higher earnings quality; papers whose private firms are all business groups find the opposite. This suggests that private firm organizational structure may be driving the different results.

Not controlling for private firm heterogeneity means that the comparison between public and private firms' earnings quality is affected not only by market demand and managerial opportunism but also by nonmarket forces, due to other stakeholders and tax incentives. As we show, these nonmarket forces are captured by organizational structure. By distinguishing between the two types of private firms, we provide an

[5] In untabulated robustness tests, to test for the effect of tax incentives, Burgstahler et al. (2006) re-run separate analyses either using observations from consolidated financial statement data or observations from unconsolidated (or parent-only) accounts, because the alignment of tax and financial accounting is commonly based on the parent-only accounts. Even though they find a much larger and more significant tax effect, using the subsample of unconsolidated accounts, they do not find evidence of a differential tax effect between public and private firms for either of the two subsamples, which might be due to the substantial decrease in sample size.

explanation for the conflicting results in the literature, and we provide evidence on whether demand or opportunism dominates in the European setting.

2.2 Institutional background and hypotheses

Although most of the literature has studied public firms, private firms' financial reporting choices are of crucial importance, because worldwide most companies are private (Hope and Vyas 2017). In 2014, according the World Development Indicators (WDI), among the 45,000 large enterprises in the European Union, only 8681 companies were listed. In 2017 Eurostat estimates that EU small and medium enterprises (SMEs) constitute 99.8% of the population of the "non-financial business economy," employ 66.4% of the workforce, and account for 56.8% of overall value added.[6] Similar proportions are observable in the United States (Asker et al. 2015; Nagar et al. 2011).

Public and private firms differ in many respects. Most importantly for our purposes, they differ in terms of organizational structure: almost all listed firms are organized as business groups, whereas private firms are standalone entities or business groups. In particular, we argue that private business groups have different incentives than standalone firms and that organizational structure can explain variation in private firms' earnings quality, because of differences in stakeholders' demands and tax incentives.

Figure 1 shows the different incentives affecting earnings quality in the three types of firms. Standalone firms face strong tax incentives, because their financial statements are the starting point for tax reporting (Leuz and Wüstemann 2003). Private and public business groups, by contrast, face weaker tax incentives, because their consolidated statements are used for financial reporting only. Only public firms face capital market incentives.

The key row in Fig. 1 is "stakeholder incentives." While all firms face stakeholder pressures (i.e., nonmarket forces), business groups face greater stakeholder incentives from minority shareholders, debtholders, and suppliers than standalone firms. For example, in our sample, standalone firms have fewer minority shareholders, lower leverage, and lower inventory intensity than private business groups. While public and private business groups might not face identical nonmarket forces, what matters for our tests is that any differences are small, compared to the differences in market forces, and that they both face greater stakeholder incentives than standalone firms.

Because of both (i) the different incentives between private business groups and standalone firms and (ii) the similar incentives between private and public business groups, the appropriate apples-to-apples comparison to determine the effect of capital market forces on earnings quality is between public firms and private business groups. As Fig. 1 shows, by comparing public versus private business groups, we can control for nonmarket forces and isolate the effect of capital market forces, thereby determining whether market demand or opportunism dominates in determining public firms' earnings quality.

[6] Data are available here: http://databank.worldbank.org/data/reports.aspx?source=2&series=CM.MKT.LDOM.NO&country=#advancedDownloadOptions; https://ec.europa.eu/growth/smes/business-friendly-environment/performance-review_en#sba-fact-sheets.

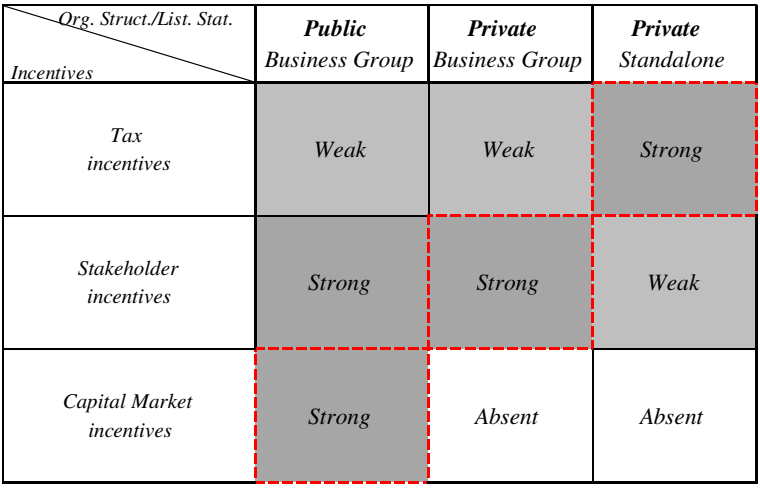

Fig. 1 The level of incentives by organizational structure and listing status. Fig. 1 describes the levels of three types of incentives (i.e., tax, stakeholder, and capital market) faced by each type of organizational structure/listing status

To provide evidence on the earnings quality incentives facing the different types of firms, Fig. 2 shows earnings distributions for public and private business groups and private standalone firms. Based on the discussion above, we expect business groups to have an incentive to avoid losses, but this should not be as much of an issue in standalone firms (where the main incentive is tax-related). Consistent with our expectations and similar to the findings of Burgstahler and Dichev (1997) and Dechow et al. (2003), we find that listed firms and private business groups have the famous kink at zero. For standalone firms, the kink is below zero, suggesting that they are ready to report small losses to avoid taxes but not large losses, which are usually not necessary for tax purposes and would worry their stakeholders.[7]

The different incentives facing the three different groups leads naturally to the question of what motivates firms to choose one business form or another. In Section 6 below, we address this issue, and in so doing, we provide the first analysis of private firms' choice to become business groups.

2.2.1 Stakeholder demand for private firms' earnings quality

The demand for earnings quality is driven by stakeholders, who rely on financial reports to make economic decisions. We aim to understand how private business groups and standalone firms are differentially affected by stakeholder demands. Following Hope et al. (2017) and Lisowsky and Minnis (2018), we focus on the following stakeholders: minority shareholders, debtholders, and suppliers. First, demand-side arguments suggest that minority shareholders have to verify the income produced by a corporation, to avoid controlling shareholders extracting private rent. Rent extraction might be done by attempting to hide activities from other stakeholders

[7] The two-sample Kolmogorov–Smirnov test confirms that the distributions are significantly different from each other.

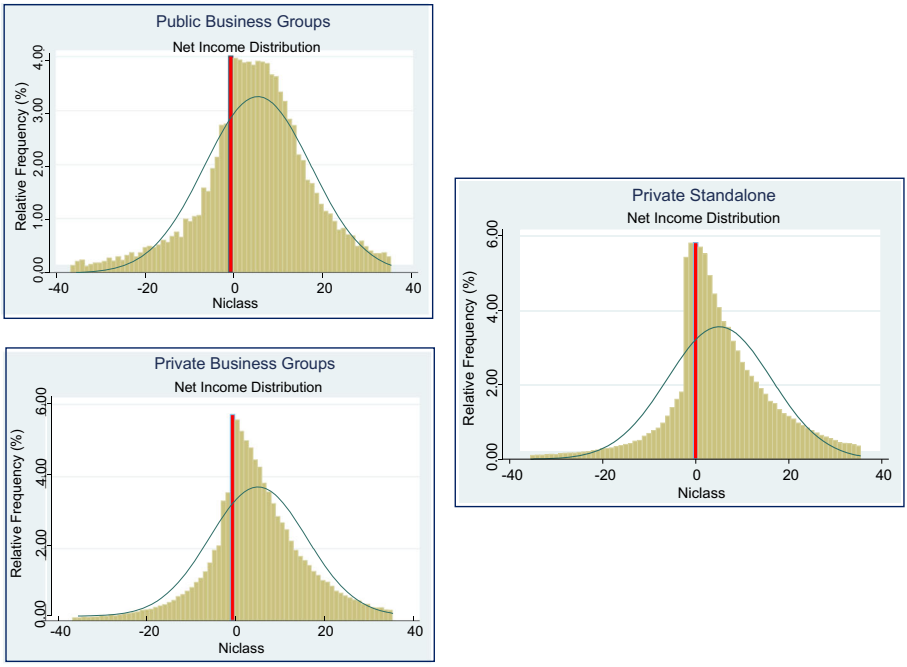

Fig. 2 Profit Distributions by organizational structure and listing status. Figure 2 shows the income distribution across public business group, private business group, and standalone firms. As per Dechow et al. (2003), we group firms into net income classes (niclass) by scaling net income over total assets (NI_TA). The range of each niclass is 0.005. For example, niclass −1 includes all firm-years where $-0.005 \leq$ NI_TA < 0.000. Therefore our benchmark beater class, ***Niclass 0***, includes all firm-years where $0 \leq$ NI_TA < 0.005. Tails are truncated with largest and smallest values of NI_TA being: −17.5 (Niclass −35) and + 17.5 (Niclass +35)

(e.g., minority shareholders and creditors) by manipulating reported performance (Gopalan and Jayaraman 2012; Leuz et al. 2003). Hence dispersed ownership will lead to a higher demand for earnings quality (Morck et al. 1988; Hope et al. 2013). Second, firms with more debt may face ongoing obligations to produce high-quality financial information, due to the existence of financial covenants and the presence of more lenders. Hence we expect leverage to be positively related to accounting quality. Third, similar to lenders, suppliers are exposed to credit risk of the firm, in this case as a counterparty (Hope et al. 2017). Thus suppliers have an interest in assessing the financial quality of the firm. Hope et al. (2017) find that accrual quality within private firms responds predictably to the demand for monitoring of all three types of stakeholders.

On average, business groups are characterized by a strong separation between management and ownership, due to their complex organizational structure. Furthermore, they have, on average, more dispersed ownership than standalone companies, being in general larger (Gopalan et al. 2014). More dispersed ownership may then affect firms' accounting quality, due to minority shareholders' demand. In addition, business groups exhibit higher leverage, since they have superior ability to obtain financing (Gopalan et al. 2014), so we expect creditors to demand quality reporting. Finally, since business groups are larger and more complex than standalone firms, we expect them to face more demand for earnings quality from suppliers. We build on

previous results and test whether stakeholder demand differs between private business groups and standalone firms and how this relates to earnings quality.

This leads us to the following hypotheses.

> ***H1a****: Among private firms, business groups face higher stakeholder demand for earnings quality than standalone firms.*
> ***H1b****: Among private firms, business groups exhibit higher earnings quality than standalone firms.*

2.2.2 Tax incentives

Business groups and standalone firms file different types of financial statements. The former, both public and private, file consolidated (and individual) financial statements, while standalone firms file individual financial statements only. While individual statements are used in Europe for both financial reporting and taxes, consolidated statements are used for financial reporting only (Hanlon and Heitzman 2010; Leuz and Wüstemann 2003; Burgstahler et al. 2006; Watrin et al. 2014; Pierk 2016).[8] Thus tax-motivated earnings management likely affects standalone firms' financial reports but not business groups' consolidated reports.

Of course, private firms face other earnings quality incentives, beyond tax minimization. For example, private standalone firms might have an incentive to smooth earnings, as shown by Coppens and Peek (2005). Herrmann and Inoue (1996) suggest that tax incentives induce firms to smooth earnings, since avoiding high earnings reduces taxes and avoiding low earnings reduces the probability of being investigated by the tax authorities. Moreover, standalone firms might care about debt financing, compensation, dividend smoothing, and potential initial public offerings, among other incentives (Hope et al. 2013). Despite these additional incentives, we believe that taxes are a first-order effect, leading to our second hypothesis.

> ***H2****: Among private firms, income-decreasing earnings management is greater for standalone firms than business groups.*

Hypothesis 2 has two implications. The first is that private standalone firms have *negative* abnormal accruals (Watrin et al. 2014). The second is that these firms have *lower* abnormal accruals than private business groups. This implication is important, because framing Hypothesis 2 in relative terms allows us to control for any country-specific factors, since such factors affect both business groups and standalone firms within a country. In addition, if tax incentives affect private firms' earnings

[8] For example, as Watrin et al. (2014, 59) point out, "Corporate income tax is levied at the single-entity level, which means that every parent and subsidiary is obliged to prepare separate tax statements and to pay taxes. The tax laws of member states frequently allow for group taxation within the territory in question, and some allow for losses that occurred in other member states to be deducted. However, income is generally not taxed based on a consolidated European or international income statement. Even under group taxation, taxable income is assessed at the single-entity level and then consolidated for the group. Thus, even in the case of group taxation, the single financial statement is the basis for taxable income in countries with high book-tax conformity."

management, they are likely to play a larger role in countries with a higher book-tax alignment, firms with higher marginal tax rate (MTR), or both, implying that the difference in abnormal accruals between standalone firms and business groups is greater when alignment and tax rates are higher.

2.2.3 Organizational structure and the relative earnings quality of private and public firms

Based on Hypotheses 1 and 2, to test the impact of market forces (i.e., whether opportunism or market demand for quality dominates) on earnings quality, we then compare public business groups versus private business groups. This leads to our third hypothesis.

> ***H3****: There is no difference in earnings quality between private and public business groups.*

Hypothesis 3 is presented in null form, because there are two competing hypotheses, and whether market demand or opportunism dominates is an empirical question.

On the one hand, the demand hypothesis implies that public firms satisfy the market's demand by producing high-quality financial information (Burgstahler et al. 2006), for example, to mitigate potential lawsuits and reduce the cost of their equity capital (Givoly et al. 2010). On the other hand, the opportunism hypothesis implies that public firms have incentives to manipulate earnings, such as benchmark beating, stock option compensation, etc. (Graham et al. 2005; Givoly et al. 2010), resulting in lower-quality financial information.

3 Data, variable measurement and descriptive statistics

3.1 Data

In this study, we compare earnings quality variations within private firms and between private and public firms by using a large cross-country European dataset of financial statements (Table 1). Our final sample spans 2005–2014, with a total of 397,386 firm-year observations for 11 EU member states: Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, and the United Kingdom.[9] According to Eurostat, these are the most representative European nations in terms of GDP, financial market relevance, and size.[10] The European Union provides us with a unique setting to test our hypotheses, because both private and public firms must publish audited financial statements in the same institutional environment and it is possible to distinguish between business groups and standalone firms. Moreover, EU countries vary in their institutional structures and tax regimes, resulting in different

[9] We have data for fiscal years 2004–2014 and use 2004 to construct lags. This yields a 10-year unbalanced panel.

[10] See http://ec.europa.eu/eurostat/web/national-accounts/statistics-illustrated for national statistics in Europe.

Table 1 Firm types and listing status of our sample setting

Organizational Structure *Listing status*	*Business Group* (A)	*Standalone* (D)	*TOTAL*
PUBLIC (1)	A1	D1	A1 + D1
# Obs.	***12,186***	***0***	***12,186***
% of the Total Sample	*3.07%*	–	*3.07%*
% per Column	*10.09%*	–	*3.07%*
PRIVATE (2)	*A2*	*D2*	*A2 + D2*
# Obs.	***108,582***	***276,618***	***385,200***
% of the Total Sample	*27.32%*	*69.61%*	*96.93%*
% per Column	*89.91%*	*100.00%*	*96.93%*
TOTAL	***120,768***	***276,618***	***397,386***

Table 1 shows the subsamples of firms under investigation. ***PUBLIC*** (1) and ***PRIVATE*** (2) are the listing status, where PUBLIC stands for publicly traded firms and PRIVATE represents privately owned companies. ***Business Group*** (A) and ***Standalone*** (D) are the types of organizational structure. The percentage refers to the final firm-year observations in our analyses

D1 box should include listed companies filing standalone financial statements; however, no observation is found for this specific case in our sample

incentives to report earnings that reflect economic performance (Christensen et al. 2013; Burgstahler et al. 2006).

We get all data from the Amadeus database published by Bureau van Dijk (BvD), which includes ownership and financial information about public and private firms across Europe. The main advantage of this database is that it includes privately held corporations and provides information about the structure of the groups, allowing us to separately identify public/private parent companies, subsidiaries, and standalone firms. To distinguish between business groups and standalone firms, we first construct the business group structure by linking subsidiaries to parents, using the BvD Amadeus *Owners - Subsidiary SubFile* database. We define business groups as firms that directly own subsidiaries at a stake higher than 50%. We define standalone firms as those that are not controlled by any other firm (i.e., are not subsidiaries) and that are not controlling any other firm themselves (i.e., do not own subsidiaries). By definition, we do not have subsidiaries in our sample, since we use the consolidated financial statements of the parent company or the individual financial statement of a standalone firm. Corporate Acts of European countries, following EU recommendations, require that all privately held limited liability firms, above a certain size threshold, have their financial statements audited by independent auditors, that is, external certified public accountants (CPAs). Only small companies might be relieved from this obligation on a country basis. Hence, in our study, we consider only privately held firms that are above country-specific thresholds and hence have audited financial statements. This ensures similar accounting accuracy and level of external supervision of the accounting information reported.[11]

[11] For a summary of the size thresholds and source references, see Appendix C of Bernard et al. (2018).

We download data for all the companies belonging to the above 11 countries from 2005 to 2014. We exclude all firms with missing information (e.g., accruals, control variables, incomplete data to identify either the group, its subsidiaries, or listing status) and firms cross-listed in the United States and the United Kingdom, since both countries have more developed capital markets, relative to the European Union, and this could presumably influence firms' earnings quality. Table 2 reports the sample overview, showing the firm-year observations by country (Panel A) and industry (Panel B). The United Kingdom (Italy) has the most public (private) company observations, but no single nation dominates either group.[12] We compare earnings quality of private and public firms, using both a pooled cross-country sample and by individual country, the latter to better control for national variations in local legal rules and institutions and avoid confounding effects (Barth et al. 2008).

3.2 Variable measurement

3.2.1 Stakeholder demand measures

To capture stakeholder demand for earnings quality, we follow Hope et al. (2017) and Lisowsky and Minnis (2018). First, we proxy for minority shareholder demand by ownership concentration (*Own_Conc*), measured as the ownership percentage of the single largest shareholder. (For robustness, we also used the three largest shareholders, with similar results.) We expect more concentrated firms to have lower demand from minority shareholders and hence lower accounting quality (Leuz 2006). Second, we use leverage, measured by the debt/equity ratio (*LEV*) to proxy debtholder demand. Firms with greater debt financing may face ongoing obligations to produce high-quality financial information, due to the existence of financial covenants and the presence of more lenders. We expect more leveraged firms to have higher accounting quality. Third, to proxy for supplier demand for earnings quality, we use the ratio of total inventory to total assets (*Inv_Int*), and we expect this to be positively associated with accounting quality. As a robustness check, we also use accounts payable to total assets, as do Lisowsky and Minnis (2018).

3.2.2 Earnings quality measures

Since there is no unanimous agreement on earnings quality measures (Dechow et al. 2010), we employ multiple metrics from the literature in our tests[13]:

i) abnormal working capital accruals, estimated using the DeFond and Park (2001) model, which is particularly suitable when the number of observations per year/industry is limited (Wysocki 2004), as in some countries of our sample;

[12] The relative proportions of public and private business groups, among the different countries, resemble the ones in the work of Coppens and Peek (2005), Table 1. Additionally, in our sample, within each country the industry distribution of private and public firms is similar.

[13] As a robustness check, we also use Dechow and Dichev (2002) abnormal accruals and Kothari et al. (2005) performance-matched discretionary accruals with similar results (untabulated).

Table 2 Sample overview

Panel A: Sample distribution by country ranked by total observations (sum of A1, A2, D2)							
	Public Business Group (A1)		***Private Business Group (A2)***		***Private Standalone (D2)***		***Total***
Country	**# Obs.**	**Frequency**	**# Obs.**	**Frequency**	**# Obs.**	**Frequency**	**Total**
Italy	677	5.56%	13,366	12.31%	95,538	34.54%	*109,581*
United Kingdom	4,448	36.50%	34,434	31.71%	31,375	11.34%	*70,257*
Germany	1,744	14.31%	9,168	8.44%	41,485	15.00%	*52,397*
France	1,843	15.12%	4,078	3.76%	38,112	13.78%	*44,033*
Belgium	460	3.77%	2,616	2.41%	25,930	9.37%	*29,006*
Sweden	577	4.73%	10,899	10.04%	10,443	3.78%	*21,919*
Spain	601	4.93%	9,173	8.45%	9,453	3.42%	*19,227*
Norway	598	4.91%	10,200	9.39%	6,676	2.41%	*17,474*
Netherlands	532	4.37%	8,261	7.61%	5,991	2.17%	*14,784*
Finland	483	3.96%	4,509	4.15%	6,160	2.23%	*11,152*
Denmark	223	1.83%	1,878	1.73%	5,455	1.97%	*7556*
Total	***12,186***	***100%***	***108,582***	***100%***	***276,618***	***100%***	***397,386***
Panel B: Sample Distribution by Industry							
Cons. Nondurables	1,102	9.04%	9239	8.49%	24,854	8.98%	35,195
Consumer Durables	311	2.55%	2,631	2.42%	7,256	2.62%	10,198
Manufacturing	1,523	12.50%	12,823	11.78%	45,323	16.38%	59,669
Energy, Oil, and Gas	229	1.88%	674	0.62%	1,564	0.57%	2467
Chemicals and Allied	382	3.13%	1,420	1.30%	6,656	2.41%	8458
Business Equipment	1,705	13.99%	4,385	4.03%	10,967	3.96%	17,057
Teleph. & Television	353	2.90%	1,021	0.94%	1,765	0.64%	3139
Utilities	312	2.56%	2,945	2.71%	4,187	1.51%	7444
Wholesale and Retail	1,732	14.21%	27,540	25.30%	99,400	35.93%	128,672
Healthcare	372	3.05%	2,682	2.46%	8,543	3.09%	11,597
Other	4,165	34.18%	43,222	39.96%	66,103	23.90%	113,760
Total	***12,186***	***100.00%***	***108,582***	***100.00%***	***276,618***	***100.00%***	***397,386***

Table 2 shows the sample breakdown by country and industry. Panel A of Table 3 shows the distribution of our sample by country and by our subgroups of investigation (i.e. A1 Public Business Groups; A2 Private Business Groups; and D1 Standalone firms). We present data by ranking countries based on the total number of observations (sum of A1, A2 and D2). Panel B shows the sample distribution by Fama and French 12-industry divided by our subgroups of investigation

ii) residuals from the modified Jones model of Dechow et al. (1995), which adjusts Jones model to exclude growth in credit sales;
iii) the aggregate measure of earnings management as per Burgstahler et al. (2006).

DeFond and Park Our first earnings management metric is abnormal working capital accruals (*AWCA*). Following DeFond and Park (2001) and Carey and Simnett (2006),

abnormal working capital accruals are defined as:

$$AWCA_{i,t} = WC_{i,t} - WC_{i,t-1} * \left(\mathrm{Rev}_{i,t}/\mathrm{Rev}_{i,t-1}\right) \quad (1)$$

where Rev. is revenues and $WC_{i,t}$ is the level of noncash working capital observed in year t for firm i, scaled by the beginning total assets determined as follows:

$$WC_{i,t} = \left(CA_{i,t} - Cash_{i,t}\right) - \left(CL_{i,t} - D_{i,t}\right) \quad (2)$$

Where, in eq. (2), CA is current assets, $Cash$ is cash and short-term investments, CL is current liabilities, and D is short-term debt. The second term of eq. (1) represents the predicted value of working capital, calculated as working capital in the previous year ($WC_{i,t-1}$) adjusted for the change in sales. The signed AWCA are used to test Hypotheses 2, where we are interested in the direction of the manipulations. The absolute AWCA are used to test Hypotheses H1b and H3, since direction does not matter for earnings quality.

Modified Jones Our second measure of earnings management is the modified Jones model, as per (Dechow et al. 1995):

$$TA_{i,t}/Assets_{i,t-1} = \alpha_0 + b_1\left(1/Assets_{i,t-1}\right) + b_2\left(\Delta Rev_{i,t} - \Delta AR_{i,t}\right)/Assets_{i,t-1}\Big) + b_3\left(PPE_{i,t}/Assets_{i,t-1}\right) + \varepsilon_{i,t} \quad (3)$$

where $TA_{i,t}$ is total accruals for firm i in year t, $Assets_{i,t-1}$ is total assets at $t–1$, $\Delta Rev_{i,t}$ is the change in revenue from t-1 to t, $\Delta AR_{i,t}$ is the change in accounts receivable from t-1 to t, and $PPE_{i,t}$ is net property, plant, and equipment in year t. We deflate all variables by lagged total assets to control for differences in firm size. The parameters β_1, β_2, and β_3 are estimated by year and by Fama and French's 12-industry classifications. Total accruals (TA) are defined as per (Dechow et al. 1995):

$$TA_{i,t} = \left(\Delta CA_{i,t} - \Delta Cash_{i,t}\right) - \left(\Delta CL_{i,t} - \Delta D_{i,t}\right) - Dep_{i,t} \quad (4)$$

where $\Delta CA_{i,t}$ is the change in total current assets, $\Delta Cash_{i,t}$ is the change in cash/cash equivalents and short investments, $\Delta CL_{i,t}$ is the change in current liabilities, $\Delta D_{i,t}$ is the change in financial debt included in current liabilities, and $Dep_{i,t}$ is depreciation and amortization expense in year t. Changes in cash/cash equivalents and financial debt are excluded from accruals, because they relate to financial transactions as opposed to operations. The residuals from the industry-specific regression estimation of eq. (3) are used to proxy for discretionary accruals. Signed discretionary accruals are used to test Hypotheses 2, where we are interested in the direction of the manipulations. The absolute values of discretionary accruals are used to test Hypotheses H1b and H3, since direction does not matter for earnings quality.

Burgstahler et al. (2006) aggregate index of earning management We use Burgstahler et al.'s aggregate earnings management index, EM_{aggr}, to replicate their results on our sample. To calculate EM_{aggr}, we first calculate its four components:

- *EM1* – ratio of small profits to small losses for the set of firms defined by industry and country and public versus private firms (business group and standalone); a firm-year observation is classified as small profit (small loss) if positive (negative) after-tax net income falls within the range of 1% of lagged total assets;
- *EM2* – median ratio of the absolute value of total accruals to the absolute value of cash flow from operations[14];
- *EM3* – ratio of the standard deviation of operating income divided by the standard deviation of cash flow from operations, multiplied by −1, so that higher values correspond to more earnings smoothing and, following Burgstahler et al. (2006), we calculate the standard deviations in the cross-section;
- *EM4* – contemporaneous Spearman correlation between changes in total accruals and changes in cash flow from operations (both scaled by lagged total assets) calculated for each industry-country unit of analysis, again multiplied by −1, so that higher values indicate higher levels of earnings management.

Finally, EM_{aggr} is obtained after transforming each individual score into a percentage rank (ranging from 0 to 100) and averaging the percentile ranks. All the EM scores are constructed such that higher values imply higher levels of earnings management.

3.2.3 Country-level institutional characteristics

Many studies have emphasized that variation in earnings quality across countries seems to be due to variation in firms' reporting incentives that are shaped by country-level institutions, like the quality of the institutional environment (Leuz 2010; Leuz et al. 2003; Ball et al. 2000; Ball et al. 2003). We measure the quality of legal enforcement, following Burgstahler et al. (2006). LEGAL is measured by the average score across three proxies from La Porta et al. (1998): (1) an index of the judicial system's efficiency, (2) an index of the rule of law, and (3) the level of corruption. Based on the work of Burgstahler et al. (2006), we expect public firms to manage earnings less in countries with strong legal systems and enforcement. Since the institutional environment may affect private and public firms differently, in our empirical analysis, we interact LISTED with LEGAL.

3.2.4 Tax incentives

As mentioned above, tax incentives vary by the country's degree of book-tax alignment and the firm's marginal tax rate (MTR) (Keating and Zimmerman 2000). To measure book-tax alignment, we follow Peek et al. (2010) and Burgstahler et al. (2006) and create a dummy variable equal to one when (a) the financial accounts serve as the basis for the tax accounts and (b) the tax law requires that several items be treated equally in the financial accounts and the tax accounts. MTR is also a dummy variable, equaling 1 if the firm's effective tax rate (tax expense from income statement divided by earnings before taxes) is equal or higher than the top statutory tax rate and 0 otherwise (Goncharov and Zimmermann 2006; Keating and Zimmerman 2000).

[14] We calculate cash flow from operations using the balance-sheet approach, because U.S. style cash flow statements are generally not available for our sample of private and public European companies.

3.3 Descriptive statistics

Table 3 provides the descriptive statistics of the variables included in our models, clustered by organizational structure, for our pooled sample (i.e., 11 EU countries). All variables are defined in the appendix. Overall, as expected, standalone firms are

Table 3 Descriptive statistics of the European sample

	***Public Business Group* (A1)**		***Private Business Group* (A2)**		***Private Standalone* (D2)**		***Mean Differences***	
Variable	***Mean***	***Median***	***Mean***	***Median***	***Mean***	***Median***	***A1 vs A2***	***A2 vs D2***
Controls								
SIZE	16.67	15.95	14.32	13.20	12.54	12.84	*2.35*** (16.90)*	*1.78*** (12.10)*
LEV	0.887	0.834	0.845	0.860	0.810	0.830	*0.042*** (13.74)*	*0.025*** (20.42)*
ROA	0.064	0.058	0.052	0.041	0.041	0.039	*0.013*** (4.11)*	*0.009*** (4.17)*
OP_CYCLE	119.50	98.20	114.50	90.84	124.15	96.72	*5.60*** (2.72)*	*−9.45** (2.90)*
GROWTH	0.064	0.058	0.052	0.041	0.079	0.071	*0.012 (1.67)*	*−0.027*** (3.98)*
EM Metrics								
|DeFond|	0.081	0.041	0.070	0.044	0.109	0.066	*0.011** (2.67)*	*−0.039*** (−34.70)*
DeFond_Sign	0.001	0.001	0.002	0.003	−0.007	−0.005	*−0.001 (1.32)*	*0.009*** (16.10)*
|Jones_Mod|	0.066	0.042	0.056	0.037	0.089	0.057	*0.010*** (5.32)*	*−0.033*** (−12.34)*
Jones_Sign	0.001	0.001	0.003	0.001	−0.008	−0.005	*−0.002 (−0.89)*	*0.011*** (9.50)*
EM_{aggr}	*36.85*	36.30	29.60	27.20	57.20	53.15	*7.25*** (5.01)*	*−27.60*** (−14.20)*
# Obs.	***12,186***		***108,582***		***276,118***			

Table 3 reports descriptive statistics (means and medians) for our control variables and earnings management proxies. We present descriptive statistics by organizational structure. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income. ***GROWTH*** measures the change in sales from t-1 to t. ***|DeFond|*** *i*s the unsigned abnormal working capital accruals, computed as per DeFond and Park (2001). ***DeFond_Sign*** is the signed abnormal working capital accruals, computed as per DeFond and Park (2001). ***|Jones_Mod|*** is the unsigned discretionary accruals estimated using the modified Jones model (Dechow and Sloan 1995). ***Jones_Sign*** is the signed discretionary accruals estimated using the modified Jones model (Dechow and Sloan 1995). ***EMaggr*** is the average percentage rank across all four individual scores, EM1 to EM4, as per Burgstahler et al. (2006). EM scores are all constructed such that higher values imply higher levels of earnings management

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-stats for differences across groups. All variables are winsorized at 1%

smaller: SIZE is significantly different among the three groups of firms with public firms (mean log of total assets is 16.67) higher than private business groups (mean 14.32), which are higher than standalone firms (mean 12.54). The same pattern holds for financial leverage (LEV), with standalone firms having less leverage than private and public business groups. Standalone firms are also less profitable than private business groups, as measured by ROA (mean of 0.041 versus 0.052 and 0.064 for public and private business groups, respectively). Private standalone firms have higher growth than private or public business groups: GROWTH is significantly lower for public firms (mean 0.064) and private business groups (mean 0.052) than standalone firms (mean 0.079). Finally, standalone firms have a longer operating cycle, suggesting less efficiency.[15] Given the above differences, we control for size, leverage, profitability, growth, and operating cycle (as well as other factors) in our tests below.

When we examine our earnings quality proxies, Table 3 shows that private standalone firms have larger mean unsigned abnormal accruals (|DeFond|) than private business groups, 0.109 versus 0.070, and the same holds true for |Jones_Mod| (0.089 versus 0.056) and the aggregate earnings management score, EM_{aggr} (57.20 versus 29.60). This is our first piece of evidence that standalone firms have lower earnings quality than private business groups, consistent with H1b. The results in Table 3 validate our assumption that private standalone firms undermine the overall earnings quality of private firms. Table 3 also shows that standalone firms have negative signed abnormal accruals, while private business groups do not, consistent with Hypotheses 2. Finally, and most interesting for our purposes, all our earnings management proxies (i.e., |DeFond|, |Jones_Mod|, and EM_{aggr}) are higher for public business groups than for private business groups, indicating higher earnings quality of the latter. We test these relations formally below.

4 Results

4.1 Validation of European sample

As a first step, we replicate Burgstahler et al.'s (2006) research design to verify that our sample has similar properties.[16] In particular, using the definitions in Table 1, A1 is the listed subsample, and A2 and D2 are the private subsample.

In Table 4, we compare earnings quality between public (A1) and all private firms (A2 + D2), using the four Burgstahler et al. (2006) proxies as well as the aggregate earnings management index (EM_{aggr}): (1) EM1, the tendency of firms to avoid small losses; (2) EM2, the magnitude of total accruals; (3) EM3, the smoothness of earnings relative to cash flows; and (4) EM4, the correlation of accounting accruals and operating cash flows. For all the proxies, a higher figure indicates more earnings management and lower earnings quality. Following Burgstahler et al. (2006), our units of observation are country-industry-listing status medians.

[15] The difference in operating cycles is not due to industry effects, since, as pointed out above, the industry compositions of all three groups are similar.

[16] Results are similar if we use Hope et al.'s (2013) research design (untabulated).

Table 4 Validation test as per Burgstahler et al. (2006)

Panel A: Past research sampling procedures: Earnings quality (A1 versus A2 + D2)

Country	*Listing Status*	*Firm-Years*	*Industry Obs.*	*EM1*	*EM2*	*EM3*	*EM4*	$EM_{aggr.}$
Italy	Private	108,904	11	2.046	0.762	−0.434	0.945	76.6
	Public	677	11	1.418	0.739	−0.591	0.802	60.2
U.K.	Private	65,809	11	1.745	0.663	−0.514	0.861	43.1
	Public	4,448	11	1.799	0.467	−0.564	0.696	28.8
Germany	Private	50,653	11	4.09	0.691	−0.501	0.842	83.2
	Public	1,744	11	2.875	0.601	−0.541	0.713	57.9
France	Private	42,190	12	2.693	0.694	−0.529	0.867	51.6
	Public	1,843	11	1.744	0.554	−0.649	0.717	32.5
Belgium	Private	28,546	11	2.468	0.741	−0.524	0.812	61.1
	Public	460	9	1.686	0.722	−0.637	0.818	48.2
Sweden	Private	21,342	11	1.731	0.63	−0.558	0.833	50.7
	Public	577	8	0.543	0.544	−0.521	0.792	38.9
Spain	Private	18,626	11	2.456	0.732	−0.569	0.921	64.8
	Public	601	10	2.217	0.619	−0.609	0.761	49.1
Norway	Private	16,876	9	1.621	0.641	−0.548	0.832	44.2
	Public	598	9	1.048	0.602	−0.566	0.663	31.6
Netherlands	Private	14,252	11	1.674	0.732	−0.558	0.832	51.2
	Public	532	10	1.545	0.612	−0.583	0.792	42.3
Finland	Private	10,669	10	2.654	0.66	−0.512	0.821	40.2
	Public	483	9	1.731	0.537	−0.534	0.731	30.3
Denmark	Private	7,333	11	4.46	0.678	−0.551	0.656	50.7
	Public	223	10	1.842	0.612	−0.584	0.603	36.9
Mean	*Private*		*119*	*2.528*	*0.694*	*−0.526*	*0.838*	*56.7*

Table 4 (continued)

	Public	*109*	*1.713***	*0.601***	*−0.579***	*0.735***	*40.9****
Median	*Private*	*119*	*2.44*	*0.684*	*−0.527*	*0.823*	*51.3*
	Public	*109*	*1.731***	*0.608***	*−0.581***	*0.710***	*36.0****
Stand. Dev.	*Private*	*119*	*1.83*	*0.098*	*0.085*	*0.066*	*14.8*
	Public	*109*	*1.62*	*0.121*	*0.143*	*0.102*	*18.5*

Panel B: Past research regression design: The role of listing status and legal enforcement (A1 vs A2 + D2)

Model: $EM_{aggr\_i} = \alpha_0 + \beta_1 LISTED_i + \beta_2 LEGAL_i + \beta_3 SIZE_i + \beta_4 LEV_i + \beta_5 GROWTH_i + \beta_6 ROA_i + \beta_7 OP\_CYCLE_i + \sum_{j=1}^{n-1} \delta_j IndustryFE_j + \varepsilon_i$

Variables	Prediction	(1)	(2)	(3)
LISTED	–	***−10.038****		***−9.044****
		(−4.84)		***(−7.24)***
LEGAL	–		***−7.544****	***−4.444****
			(−4.64)	***(−4.14)***
SIZE	*?*	*1.644**	*1.114**	*1.434***
		(1.97)	*(1.94)*	*(2.09)*
LEV	*?*	*12.323***	*10.014****	*9.114****
		(2.83)	*(3.04)*	*(3.04)*
GROWTH	*?*	*−12.533*	*−14.541**	*−16.124**
		(−1.55)	*(−1.89)*	*(−1.92)*
ROA	*?*	*−3.095**	*−3.437*	*−5.123**
		(−2.02)	*(−1.09)*	*(−1.83)*
OP_CYCLE	*?*	*0.010*	*0.030*	*0.033*
		(0.86)	*(0.99)*	*(1.14)*
Intercept		*37.493*	*41.122***	*44.254***
		(1.61)	*(2.13)*	*(2.46)*
Industry Control		*Yes*	*Yes*	*Yes*

Table 4 (continued)

# Obs.	*228*	*228*	*228*
R^2	*0.395*	*0.422*	*0.441*

Table 4, Panel A, presents median values by country and listing status for the four individual earnings management scores as well as the EM_{aggr}. All metrics are calculated as per Burgstahler et al. (2006). We present data by ranking countries by number of private firms. The computations are at the industry-level using the Fama and French's 12 industry classification, i.e., we calculate each score by country, industry, and listing status. We require a minimum of 10 firm-year observations per subgroup. ***EM1*** represents the number of "small profits" divided by the number of "small losses." A firm-year observation is classified as small profit (small loss) if positive (negative) net income falls within the range of 1% of lagged total assets. ***EM2*** is the median ratio of the absolute value of total accruals to the absolute value of cash flow from operations. Total accruals are calculated as follows: (Δtotal current assets - Δcash) - (Δtotal current liabilities - Δshort-term debt) - depreciation expense. Cash flow from operations is equal to operating income minus total accruals (Burgstahler et al. 2006). **CFO** measures the cash flow from operations scaled by lagged total assets. ***EM3*** is the ratio of the cross-sectional standard deviations of operating income and cash flow from operations (multiplied by −1). ***EM4*** is the Spearman correlation between the change in total accruals and the change in cash flow from operations (multiplied by −1). All accounting items are scaled by lagged total assets. The aggregate earnings management index, EM_{aggr}, is the average percentage rank across all four individual scores, EM1 to EM4. EM scores are constructed such that higher values imply higher levels of earnings management. We evaluate differences between sample means (medians) using t-tests (Wilcoxon rank sum tests). *, **, *** show significance at the 10%, 5%, and 1% levels, respectively. All variables are winsorized at 1%

Table 4 panel B, replicates Burgstahler et al. (2006) and reports the coefficient estimates from a regression of an aggregate earnings quality metric (EM_{aggr}) on ***LISTED*** plus control variables. The dependent variable, ***EMaggr***, is the average percentage rank across all four individual earnings management scores, EM1 to EM4, as described in panel A. ***LISTED*** is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. ***LEGAL*** is the mean of three institutional variables from La Porta et al. (1998), as per Burgstahler et al. (2006): efficiency of the judicial system, rule of law, and corruption index. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the firm level. In parentheses, we report t-stats. All continuous variables are winsorized at 1%

Table 4, Panel A, shows univariate results. Consistent with the work of Burgstahler et al. (2006), public firms have, on average, significantly better earnings quality than private firms. This result is confirmed among all 11 countries. Note, too, that the United Kingdom exhibits less earnings management, compared to the other European countries, both in private (EM_{aggr} 43.0) and public firms (EM_{aggr} 28.9). We discuss this further below.

In Table 4, Panel B, we test the demand versus opportunism hypotheses by estimating Burgstahler et al.'s (2006) regression model:

$$EMaggr\_i = \alpha 0 + \beta_1 LISTEDi + \beta_2 LEGALi + \beta_3 SIZEi + \beta_4 LEVi + \beta_5 GROWTHi + \beta_6 ROAi + \beta_7 OP\_CYCLEi + \sum_{j=1}^{n-1} \delta_j IndustryFE_j + \varepsilon_i \quad (5)$$

where *LISTED*, our variable of interest, is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. LEGAL is measured by the mean of three institutional variables of La Porta et al. (1998) (i.e., efficiency of the judicial system, rule of law, and corruption index). OP_CYCLE measures the average time between the acquisition of material or services entering the process and the final cash realization and is computed as follows: [(365/purchases) x average inventories + (365/credit sales) x average accounts receivables]. All other variables are defined as before.

A negative (positive) coefficient on LISTED indicates that public (private) firms have superior earnings quality. Consistent with the results of both Burgstahler et al. (2006) and Hope et al. (2013), in validating the European sample, we find that public firms have higher earnings quality than private ones, supporting the demand hypothesis and providing reassurance about our data and methodology.

4.2 Earnings management incentives within private firms

We now turn to testing our hypotheses. In Tables 5 and 6, we test H1a, which predicts that private business groups face greater stakeholder pressure for monitoring financial reporting than private standalone firms, and in Table 7, we test H1b, which predicts that private business groups have higher earnings quality than standalone firms.

For all three proxies of stakeholder demand (Table 5, Panels A, B and C), our results are consistent with private business groups having more pressure than private standalone firms. For the pooled sample, the univariate analysis in Table 5 shows the following mean differences, all of which are statistically significant[17]: (i) business groups' ownership concentration is 13.2% lower than standalone firms' (Panel A), implying that minority shareholders' demand for earnings quality plays a stronger role in groups than in standalone firms; (ii) business groups' leverage is 6.8% higher than standalone firms' (Panel B), implying that debtholders exert more influence on financial reporting in groups than in standalone firms; and (iii) business groups' inventory

[17] In Table 5, for each individual country, the mean difference and t-statistic are computed from a firm-year level regression of the stakeholder metric against a dummy variable for business group versus standalone, with industry and year fixed effects and clustering standard errors at the firm level. The aggregate statistics are computed from the mean of the 11 country differences.

Table 5 On the different levels of stakeholder pressure among private firms

Panel A: Ownership concentration

Country	*Business Group* (A2)		*Standalone* (D2)		Regression Coefficients	
	# Obs.	*Own_Conc (%)*	# Obs.	*Own_Conc (%)*	Beta	t-stat
Italy	10,855	56.845	84,559	64.955	−8.677***	−10.86
Belgium	2,014	60.74	16,388	78.965	−17.093***	−8.37
Spain	7,647	61.174	8,375	72.271	−10.199***	−6.34
France	3,908	66.219	32,862	73.512	−6.770***	−6.43
Norway	9,087	66.875	4,864	89.353	−20.618***	−11.5
United Kingdom	33,949	67.012	31,338	86.863	−19.538***	−22.94
Denmark	1,410	67.507	3,682	76.454	−10.522***	−5.04
Germany	8,075	68.366	39,651	81.396	−13.503***	−16.54
Finland	3,480	72.589	4,558	86.094	−12.681***	−7.97
Sweden	5,235	81.294	7,917	93.374	−11.473***	−11.7
Netherlands	5,778	84.741	4,394	93.941	−8.656***	−8.56
Aggregate	***91,437***	***67.508***	***238,588***	***75.756***	***−13.213******	***−8.72***

Panel B: Leverage levels

Country	*Business Group* (A2)		*Standalone* (D2)		Regression Coefficients	
	# Obs.	*LEV*	# Obs.	*LEV*	Beta	t-stat
Sweden	5,235	1.059	7,917	1.036	0.014***	3.02
United Kingdom	33,949	1.053	31,338	0.966	0.083***	19.4
Finland	3,480	1.043	4,558	0.979	0.047***	6.55
Norway	9,087	1.017	4,864	0.971	0.052***	6.87
Denmark	1,410	1.011	3,682	0.963	0.052***	6.7
Italy	10,855	1.009	84,559	1.004	0.014***	5.44
France	3,908	1.002	32,862	0.952	0.047***	11.5
Spain	7,647	0.994	8,375	0.964	0.079***	6.67
Belgium	2,014	0.966	16,388	0.882	0.063***	9.81
Netherlands	5,778	0.848	4,394	0.612	0. 198***	23.84
Germany	8,075	0.818	39,651	0.718	0.101***	16.65
Aggregate	***91,437***	***1.001***	***238,588***	***0.925***	***0.068******	***3.69***

Panel C: Inventory intensity

Country	*Business Group* (A2)		*Standalone* (D2)		Regression Coefficients	
	# Obs.	*Inv_Int*	# Obs.	*Inv_Int*	Beta	t-stat
Finland	3,480	0.247	4,558	0.203	0.071***	9.22
Belgium	2,014	0.239	16,388	0.146	0.108***	14.23
France	3,908	0.234	32,862	0.194	0.051***	10.26
United Kingdom	33,949	0.231	31,338	0.151	0.080***	30.22
Italy	10,855	0.229	84,559	0.192	0.051***	18.39
Spain	7,647	0.227	8,375	0.167	0.069***	10.2
Denmark	1,410	0.227	3,682	0.266	−0.039***	−5.98
Netherlands	5,778	0.224	4,394	0.131	0. 101***	11.74
Germany	8,075	0.218	39,651	0.191	0. 055***	11.01

Table 5 (continued)

Sweden	5,235	0.152	7,917	0.123	0.053***	17.25
Norway	9,087	0.143	4,864	0.113	0.042***	17.42
Aggregate	***91,437***	***0.217***	***238,588***	***0.179***	***0.064******	***5.11***

Table 5 presents the means by country on the three stakeholder demand proxies, among private firms. ***Own_Conc*** is the share percentage owned by the largest shareholder. (We also replicate the analysis using the three largest shareholders, and results are unaffected by this different ownership qualification.) ***LEV*** is the debt-to-equity ratio. ***Inv_Int*** is the ratio of total inventory divided by total assets. For each country, beta and t-statistic—reported in the two most right columns—are computed from a firm-year level regression of the stakeholder metric against a dummy variable for business group versus standalone, with industry and year fixed effects and clustering at the firm level. The aggregate statistics are computed from the mean of the 11 country differences. We rank the countries by stakeholder pressure. Panel A reports ***Own_Conc*** from the lowest to highest having business group as a benchmark, where the lower ownership concentration, the higher stakeholder pressure by minority shareholders. Panel B reports ***LEV*** from the highest to lowest having business group as a benchmark, where the higher the leverage, the higher the stakeholder pressure by debtholders. Panel C reports ***Inv_Int*** among private firms from the highest to lowest having business group as a benchmark, where the higher the inventory intensity, the higher the stakeholder pressure by suppliers

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. All variables are winsorized at 1%

intensity is 6.4% higher than standalone firms' (Panel C), implying that suppliers have a stronger influence on financial reporting in groups than in standalone firms. Moreover, over all three panels, 32 of the 33 individual country differences are significant in the hypothesized direction (all except Denmark in Panel C). Assuming a 50% chance of a positive (or negative) difference, the binomial probability of all 11 (10 out of 11) countries having the hypothesized sign is 0.0005 (0.005).

Next, following Hope et al. (2017), we test whether stakeholder demand is associated with earnings quality, using our sample of private firms.

$$\begin{aligned} EQ_{i,t} = {} & \alpha_0 + \beta_1 Own\_Conc_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Inv\_Int_{i,t} + \beta_4 SIZE_{i,t} \\ & + \beta_5 GROWTH_{i,t} + \beta_6 ROA_{i,t} + \beta_7 OP\_CYCLE_{i,t} + \sum_{t=1}^{T-1} \gamma_t \mathrm{YearFE_t} \\ & + \sum_{c=1}^{10} \theta_j CountryFE_c \varepsilon_{i,t} \end{aligned} \tag{6a}$$

where the dependent variable, $EQ_{i,t}$, is alternatively one of the earnings quality measures (|DeFond|, |Jones_Mod|, EM_{aggr}) defined above. The variables of interest are the stakeholder demand proxies (Own_Conc, LEV, Inv_Int). SIZE, GROWTH, ROA, and OP_CYCLE are control variables.[18]

Table 6 shows that the coefficients on the three proxies for stakeholder pressure have the expected sign and are statistically significant. These results indicate that, consistent with H1a, the demands of minority shareholders, debtholders, and suppliers are associated with higher earnings quality among the private firms in our sample.

By examining the effects of stakeholder demand on EQ, eq. (6a) provides an indirect test of the relative earnings quality of private business groups versus standalone firms.

[18] As a robustness test, we also use the Dechow and Dichev (2002) and Kothari et al. (2005) earnings management proxies, with similar results to those reported in the paper. Results are qualitatively and quantitalively similar using accounts payable scaled by assets instead of *Inv_Int* as an independent variable.

Table 6 On the influence of stakeholders proxies on accounting quality

$$EQ_{i,t} = \alpha_0 + \beta_1 Own\_Conc_{i,t} + \beta_2 LEV_{i,t} + \beta_3 Inv\_Int_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 ROA_{i,t} + \beta_7 OP\_CYCLE_{i,t} + \sum_{t-1}^{T-1} \gamma_t YearFE_t + \sum_{c=1}^{10} \theta_j CountryFE_c + \varepsilon_{i,t}$$

Variables	Prediction	(1)	(2)	(3)
		|DeFond|	***|Jones_Mod|***	***EM_{aggr}***
Own_Conc	+	***0.012****	***0.011****	***0.008****
		(2.21)	***(2.39)***	***(2.46)***
LEV	–	***- 0.022*****	***−0.018****	***−0.017****
		(−3.08)	***(−3.50)***	***(−3.35)***
Inv_Int	–	***−0.036****	***−0.030****	***−0.037****
		(−1.97)	***(−2.12)***	***(−1.97)***
SIZE	*?*	*0.011**	*0.014**	*0.013****
		(2.54)	*(2.64)*	*(2.85)*
GROWTH	*?*	*−0.029*	*−0.024**	*−0.028**
		(−1.54)	*(−1.84)*	*(−1.85)*
ROA	*?*	*−0.093****	*−0.088****	*−0.123****
		(−2.93)	*(−3.04)*	*(−3.01)*
OP_CYCLE	*?*	*0.008*	*0.014*	*0.017*
		(0.81)	*(1.04)*	*(1.13)*
Intercept		*−0.198**	*−0.132**	*−0.152**
		(−2.58)	*(−2.42)*	*(−2.46)*
Year Control		*Yes*	*Yes*	*Yes*
Country Control		*Yes*	*Yes*	*Yes*
# Obs.		*322,488*	*290,506*	*322,488*
R^2		*0.149*	*0.138*	*0.129*

Table 6 reports the coefficient estimates from a regression of three measures of earnings quality (***|DeFond|***, ***|Jones_Mod|***, and ***EM_{aggr}***) on stakeholders' demand proxies (***Own_Conc***, ***LEV***, and ***Inv_Int***) plus control variables for the private firms subsample. The regressions control for year and country fixed effects. ***Own_Conc*** is the share percentage owned by the largest shareholder. (We also replicate the analysis using the three largest shareholders, and results are unaffected by this different ownership qualification.) ***LEV*** is the debt-to-equity ratio. ***Inv_Int*** is the ratio of total inventory divided by total assets. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the firm level. In parentheses, we report t-stats. All continuous variables are winsorized at 1%

To provide a direct test, we estimate (6b), where we replace the stakeholder demand proxies as independent variables, with dummy variable STAND_ALONE,[19] which equals 1 for standalone firms and 0 for business groups, plus controls.

[19] To avoid counfounding effects in this model, we do not include leverage (LEV) as control, as this is also a proxy for stakeholders demand. Nonetheless, we run a sensitivity test (untabulated), and results hold above and beyond the inclusion of such control.

$$EQ_{i,t} = \alpha_0 + \beta_1 STAND\_ALONE_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 ROA_{i,t} + \beta_5 OP\_CYCLE_{i,t} + \sum_{t=1}^{T-1}\gamma_t \mathrm{YearFE_t} + \sum_{c=1}^{10}\theta_j CountryFE_c \varepsilon_{i,t} \quad (6b)$$

H1b implies that the coefficient on STAND_ALONE is positive. The results are shown in Table 7. For all three EQ metrics, the coefficient on STAND_ALONE is significantly positive, indicating that, among private firms, business groups have higher earnings quality than standalone firms.

Whether a firm is a business group or stands alone might be correlated with its maturity, operational complexity, effectiveness of management, or a combination of these. Including size, growth, and ROA helps to control for these factors. In addition, in Section 5 we estimate a two-stage regression (Heckman et al. 1997) to explicitly address the endogeneity issue.

Table 7 On the overall accounting quality among private firms (A2 vs D2)

$$EQ_{i,t} = \alpha_0 + \beta_1 STAND\_ALONE_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 ROA_{i,t} + \beta_5 OP\_CYCLE_{i,t} + \sum_{t-1}^{T-1}\gamma_t YearFE_t + \sum_{c=1}^{10}\theta_j CountryFE_c + \varepsilon_{i,t}$$

Variables	Prediction	(1)	(2)	(3)
STAND_ALONE		***|DeFond|***	***|Jones_Mod|***	***EM_{aggr}***
	+	***0.029*** (2.87)***	***0.026*** (3.19)***	***0.148*** (2.96)***
SIZE	?	*0.018** (2.58)*	*0.020** (2.65)*	*0.032*** (2.89)*
GROWTH	?	*−0.032 (−1.59)*	*−0.029* (−1.88)*	*−0.024* (−1.88)*
ROA	?	*−0.086*** (−3.23)*	*−0.101*** (−3.24)*	*−0.111*** (−3.31)*
OP_CYCLE	?	*0.028 (1.12)*	*0.021 (1.34)*	*0.020 (1.41)*
Intercept		*−0.076** (−2.38)*	*−0.081** (−2.33)*	*−0.094** (−2.50)*
Year Control		*Yes*	*Yes*	*Yes*
Country Control		*Yes*	*Yes*	*Yes*
# Obs.		*322,488*	*290,506*	*322,488*
R^2		*0.136*	*0.151*	*0.147*

Table 7 reports the coefficient estimates from a regression of three measures of earnings quality (***|DeFond|***, ***|Jones_Mod|***, and ***EMaggr***) on ***STAND_ALONE*** plus control variables for the private firms subsample. The regressions control for year and country fixed effects. ***STAND_ALONE*** is a dummy variable equal to 1, if the private firm is a standalone one as per our definition (see appendix). ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income.*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the firm level. In parentheses, we report t-stats. All continuous variables are winsorized at 1%

In summary, both the univariate analysis in Table 5 and the multivariate analyses in Tables 6 and 7 are consistent with our Hypotheses 1a and 1b that private business groups face greater stakeholder pressure for quality earnings than private standalone firms, and this is associated with lower earnings quality of private standalone firms.

Hypothesis 2 predicts that private standalone firms manage earnings downward (have negative abnormal accruals) and more so than private business groups. To test Hypotheses 2, we examine the signed abnormal accruals of private standalone firms by themselves and compared to private business groups. Results are reported in Table 8, which shows the signed abnormal accruals of each group and a test for their difference. Panel A shows univariate results with DeFond and Park (2001) abnormal working-capital accruals, while Panel B uses the modified Jones model as per Dechow et al. (1995). Panel C presents multivariate regression results that include control variables as follows.

$$\begin{aligned} EQ_{i,t} = {} & \alpha_0 + \beta_1 STAND\_ALONE_{i,t} + \beta_2 MTR_{i,t} \\ & + \beta_3 MTR_{i,t} STAND\_ALONE{*}MTR_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} \\ & + \beta_6 GROWTH_{i,t} + \beta_7 ROA_{i,t} + \beta_8 OP\_CYCLE_{i,t} + \sum_{t=1}^{T-1} \gamma_t \mathrm{YearFE_t} \\ & + \sum_{c=1}^{10} \theta_j CountryFE_c \varepsilon_{i,t} \end{aligned} \tag{7}$$

In Table 8, Panels A and B, column (6), shows that, in aggregate, private standalone firms in the European Union manage earnings downward: mean abnormal accruals are −0.0088 in Panel A and − 0.0087 in Panel B. Moreover, in all countries, private standalone firms have significantly negative abnormal accruals as indicated by significance level in Columns 4 and 6. Also, in 10 out of 11 countries (all except the United Kingdom), private standalone firms have lower abnormal accruals (at the 10% level) than private business groups (Column 7).

As discussed above, an implication of H2 is that, if tax incentives affect private firms' earnings management, they are likely to play a larger role in countries with a higher book-tax alignment, firms with higher MTR, or both, implying that the difference in abnormal accruals between standalone firms and business groups is greater when alignment and tax rates are higher. Consistent with our tax incentive explanation, Table 8 shows that the magnitude of downward earnings management is larger for standalone firms incorporated in high book-tax alignment countries (Panels A and B) and larger the higher the firm's marginal tax rate (Panel C).

Table 8 Panel A shows average signed abnormal accruals of −0.0095 (Column 6, last 3 rows) for HIGH book-tax alignment countries and − 0.0057 for LOW book-tax alignment countries, so abnormal accruals are, on average, 66% more negative in countries with HIGH book-tax alignment, and the difference between the two clusters is significant at the 1% level. Results in Panel B are similar.

In Table 8, Panel C, the negative coefficients on STAND_ALONE imply that standalone firms manage earnings downward more than private business groups, and the negative coefficients on STAND_ALONE*MTR imply that this effect is even stronger for standalone firms with higher marginal tax rates.

Table 8 Private firms tax incentives: business group versus standalone

Panel A: Univariate tests on signed accruals – earnings quality proxy: DeFond and Park (2001)

Country			*Private Business Group* (A2)		*Private Standalone* (D2)		Diff. (A2 – D2)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Book-Tax Alignment	**Average Statutory rate**	**# Obs.**	***DeFond_Sign***	**# Obs.**	***DeFond_Sign***	**Diff.**	**T-stat**
Italy	HIGH	32.70%	13,366	0.004**	95,538	−0.012***	*0.016***	6.12
Germany	HIGH	31.45%	9,168	0.003***	41,485	−0.008***	*0.011***	4.45
France	HIGH	33.33%	4,078	0.007***	38,112	−0.008***	*0.015***	5.34
Belgium	HIGH	33.99%	2,616	0.006***	25,930	−0.007***	*0.013***	5.22
Sweden	HIGH	25.91%	10,899	0.008***	10,443	−0.007**	*0.015***	4.13
Spain	HIGH	30.83%	9,173	0.002***	9,453	−0.006*	*0.008***	2.88
Finland	HIGH	25.00%	4,509	0.001	6,160	−0.010***	*0.011***	7.13
United Kingdom	LOW	26.67%	34,434	−0.002***	31,375	−0.005**	0.003	1.45
Norway	LOW	27.89%	10,200	0.004**	6,676	−0.008**	*0.012**	1.92
Netherlands	LOW	25.73%	8,261	0.003*	5,991	−0.006**	*0.009**	1.90
Denmark	LOW	25.28%	1,878	0.001	5,455	−0.007**	*0.008***	1.91
Weighted Average HIGH Book-Tax Alignment		***30.46%***	***53,809***	***0.0044*****	***227,121***	***−0.0095*****	***0.0139*****	***5.48***
Weighted Average LOW Book-Tax Alignment		***26.39%***	***54,773***	***−0.0000*****	***49,497***	***−0.0057*****	***0.0057*****	***3.21***
Aggregate		***28.98%***	***108,582***	***0.0022*****	***276,618***	***−0.0088*****	***0.010*****	***9.21***

Panel B: Univariate tests on signed accruals – earnings quality proxy: Jones Modified (1995)

Country			*Private Business Group* (A2)		*Private Standalone* (D2)		Diff. (A2 – D2)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Book-Tax Alignment	**Average Statutory rate**	**# Obs.**	***Jones_Mod_Sign***	**# Obs.**	***Jones_Mod_Sign***	**Diff.**	**T-stat**
Italy	HIGH	32.70%	12,151	0.003**	85,776	−0.010***	*0.013***	6.32
Germany	HIGH	31.45%	8,342	0.003**	37,236	−0.009***	*0.012***	4.42
France	HIGH	33.33%	3,700	0.004***	34,209	−0.010***	*0.014***	5.52
Belgium	HIGH	33.99%	2,373	0.003***	23,265	−0.009***	*0.012***	5.01
Sweden	HIGH	25.91%	9,911	0.005***	9,374	−0.007***	*0.012***	4.10
Spain	HIGH	30.83%	8,147	0.004***	8,485	−0.007**	*0.011***	2.86
Finland	HIGH	25.00%	4,102	0.002	5,529	−0.009***	*0.011***	7.08
United Kingdom	LOW	26.67%	31,072	−0.002**	28,051	−0.005*	0.003	1.6

Table 8 (continued)

Norway	LOW	27.89%	9,282	0.005**	5,992	−0.007***	*0.012**	1.95
Netherlands	LOW	25.73%	7,517	0.003*	5,418	−0.004**	*0.007**	1.88
Denmark	LOW	25.28%	1,702	0.004**	4,899	−0.007**	*0.011***	1.92
Weighted Average HIGH Book-Tax Alignment		***30.46%***	***48,726***	***0.0030*****	***203,874***	***−0.0094*****	***0.0124*****	***5.56***
Weighted Average LOW Book-Tax Alignment		***26.39%***	***49,573***	***−0.0003*****	***44,360***	***−0.0054*****	***0.0063*****	***3.28***
Aggregate		***28.98%***	***98,299***	***0.0019*****	***248,234***	***−0.0087*****	***0.0106*****	***8.41***

Panel C: Multivariate analysis on signed accruals

Model: $EQ_{i,t} = \alpha_0 + \beta_1 STAND\_ALONE_{i,t} + \beta_2 MRT_{i,t} + \beta_3 STAND\_ALONE*MRT_{i,t} + \beta_4 SIZE_i + \beta_5 LEV_{i,t}$

$$+ \beta_6 GROWTH_{i,t} + \beta_7 ROA_{i,t} + \beta_8 OP\_CYCLE_{i,t} \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{c=1}^{10} \theta_j CountryFE_c + \varepsilon_i$$

Variables	Prediction	**(1)**	**(2)**	**(3)**	**(4)**
		DeFond_Sign	***DeFond_Sign***	***Jones_Mod_Sign***	***Jones_Mod_Sign***
STAND_ALONE	–	***−0.013*****	***−0.008****	***−0.017*****	***−0.010****
		(−3.21)	***(−2.24)***	***(−3.32)***	***(−2.16)***
MTR	**?**		***−0.008***		***−0.013***
			(−1.65)		***(−1.67)***
STAND_ALONE-MTR*	–		***−0.014*****		***−0.017*****
			(−3.04)		***(−3.94)***
SIZE	*?*	*−0.011***	*−0.013***	*−0.014***	*−0.013***

Table 8 (continued)

		(−2.21)	*(−2.75)*	*(−2.46)*	*(−2.24)*
LEV	*?*	*0.044***	*0.046***	*0.050***	*0.054***
		(3.82)	*(3.67)*	*(3.23)*	*(3.74)*
GROWTH	*?*	*−0.021*	*−0.024*	*−0.032*	*−0.024*
		(−1.21)	*(−1.45)*	*(−1.32)*	*(−1.24)*
ROA	*?*	*−0.075****	*−0.055****	*−0.066****	*−0.064****
		(−3.01)	*(−3.32)*	*(−4.13)*	*(−3.95)*
OP_CYCLE	*?*	*0.002*	*0.004*	*0.002*	*0.003*
		(1.46)	*(1.23)*	*(1.28)*	*(1.22)*
Intercept		*0.056***	*0.067****	*0.074***	*0.078***
		(2.48)	*(2.92)*	*(2.56)*	*(2.88)*
Year Control		*Yes*	*Yes*	*Yes*	*Yes*
Industry Control		*Yes*	*Yes*	*Yes*	*Yes*
# Obs.		*385,200*	*385,200*	*344,192*	*344,192*
R^2		*0.140*	*0.144*	*0.136*	*0.157*

Table 8, Panels A and B, report the univariate analysis on private firms (i.e., private business group versus standalone) tax incentives. Panel A reports univariate results, using the signed abnormal working capital accruals (***DeFond_Sign***), computed as per DeFond and Park (2001). Panel B replicates same analysis by using the signed discretionary accruals (***Jones_Mod_Sign***), estimated using the modified Jones model (Dechow and Sloan 1995). Book-tax alignment (Column 1) is HIGH when financial accounts for external reporting and tax purposes are highly aligned and is LOW otherwise (Burgstahler et al. 2006). We retrieved corporate tax rate around the world from https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html and report the average rate in 2005–2014. We separate the countries by book tax alignment (HIGH and LOW) and rank the countries by total number of observations. Column 4 and 6 report the level of signed accruals and related significance level for private business group and standalone, while the differences (between 4 and 6) is reported in Column 7. In Column 8, the t-statistic for the difference in means is reported

For columns 4, 6, and 7, *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. All variables are winsorized at 1%.

Table 8, Panel C, of reports the coefficient estimates from a regression model, among private firms, of two earnings quality metric (***DeFond_Sign***; ***Jones_Mod_Sign***) on ***STAND_ALONE*** and MTR plus control variables. ***STAND_ALONE*** is a dummy variable equal to 1, if the private firm is a standalone one as per our definition (see appendix), and zero, if it is a private business group. ***MTR*** is a dummy variable taking the value of 1, if firm effective tax rate is above the country average tax rate, and 0 otherwise (i.e., firm effective tax rate − country average tax rate > 0: dummy equal 1). ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the country level. In parentheses, we report t-stats. All continuous variables are winsorized at 1%

Overall, the results in Table 8 are strongly consistent with our tax-motivated Hypothesis 2. Burgstahler et al. (2006) find that tax alignment is associated with more earnings management but this effect is mitigated for public firms. We complement their results by showing that this effect is also mitigated for private business groups.[20]

4.3 Earnings quality of public versus private business groups

Overall, the results in Tables 5, 6, 7, and 8 are consistent with Hypotheses 1a, 1b, and 2 and show that private business groups and standalone firms face different demands for earnings quality and thus different incentives for it. Based on these results, we now test our Hypothesis H3 and compare the earnings quality of public versus private business groups.

We re-estimate model (5) for public and private *business groups only* (A1 versus A2 in Table 1), thereby controlling for organizational structure. Our variable of interest is, as before, LISTED, that is, a dummy variable taking the value of 1 if the firm is a publicly listed company and 0 otherwise. Results on the pooled sample are reported in Table 9.

Table 9, Panel A, columns 1 and 2, shows results using the same earnings management proxy (EM_{aggr}) as do Burgstahler et al. (2006). Note that Table 9, Panel A, column 1, is comparable to Table 4, Panel B, column 3, where the analysis is based on country-industry medians by listing status. In Table 9, Panel A, columns 2–4, we use firm-year observations, and we add the interaction term LISTED*LEGAL.

Regardless of the unit of analysis or the particular earnings quality metric, the LISTED dummy in Table 9, Panel A, is always positive and statistically significant. This shows that, after controlling for organizational structure by comparing business groups only (A1 and A2 in Table 1), we find lower earnings quality for public than for private business groups. This contrasts with Table 4, where we found that public firms have higher earnings quality than private firms, when we did not control for organizational structure, by including all private firms.

Based on the literature, we expect firms to manage earnings less in countries with strong legal systems and enforcement. Consistent with the findings of Burgstahler et al. (2006), LEGAL is negative and significant, confirming that country specific institutional factors affect earnings quality. In addition, a key finding of Burgstahler et al. (2006) is that institutional factors differentially affect private and public firms. For example, they find that public firms manage earnings even less in countries with more developed equity markets, consistent with the demand hypothesis. To know whether these institutional factors also have differential effects on private and public business groups, we add the interaction between LISTED and LEGAL to eq. (5). Results are shown in Table 9, Panel A, columns 2–4. We find that the interacted term is significantly negative, indicating that public business groups are more affected by country-specific institutional factors than private business groups.

Since demand and opportunism are shaped by country-level institutional factors, in Table 9, Panel B, we compare earnings quality of private and public business groups by country. A country level analysis is also important, because a single country setting controls for national variation in local legal rules and institutions, and it avoids

[20] Note that, in Table 7, Columns 1 and 2, the dependent variable is unsigned, while in Table 8, the dependent variable is signed.

Table 9 Earnings quality and private versus public business groups (A1 vs A2)

Panel A – Multivariate Analysis Pooled Sample

Model: $EQ_{i,t} = \alpha_0 + \beta_1 LISTED_{i,t} + \beta_2 LEGAL_{i,t} + \beta_3 LISTED{*}LEGAL + \beta_4 SIZE_i + \beta_5 LEV_{i,t} + \beta_6 OP\_CYCLE_{i,t} + \beta_7 ROA_{i,t} + \beta_8 GROWTH_{i,t} \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{j=1}^{n-1} \delta_j IndustryFE_j + \varepsilon_i$

Variables	Prediction	(1)	(2)	(3)	(4)
		EM_{aggr}	***EM_{aggr}***	***|DeFond|***	***|Jones_Mod|***
LISTED	**?**	***4.431****	***0.028****	***0.026*****	***0.027*****
		(3.97)	***(2.78)***	***(4.57)***	***(4.68)***
LEGAL	**?**	**−2.322*** **	**−0.008****	**−0.009****	**−0.007****
		(−3.17)	**(−2.23)**	**(−2.62)**	**(−2.03)**
LISTED LEGAL*	**?**		**−0.011*****	**−0.012*****	**−0.021*****
			(−3.22)	**(−3.16)**	**(−3.13)**
SIZE	*?*	*1.457***	*−0.013***	*−0.012***	*−0.012***
		(2.02)	*(−2.32)*	*(−2.11)*	*(−2.34)*
LEV	*?*	*10.002***	*0.044*****	*0.047*****	*0.044*****
		(2.52)	*(6.36)*	*(7.10)*	*(6.74)*
GROWTH	*?*	*−12.521*	*−0.011*	*−0.018*	*0.014*
		(−1.52)	*(−0.82)*	*(−1.43)*	*(−1.44)*
ROA	*?*	*−2.842****	*−0.076*****	*−0.055***	*−0.064*****
		(−3.43)	*(−3.51)*	*(−3.53)*	*(−3.54)*
OP_CYCLE	*?*	*0.003*	*0.005*	*0.003*	*0.004*
		(1.39)	*(1.56)*	*(1.42)*	*(1.23)*
Intercept		*37.494***	*0.096*****	*0.083*****	*0.087*****
		(2.83)	*(3.22)*	*(5.26)*	*(4.45)*
Year Control		*No*	*Yes*	*Yes*	*Yes*

Table 9 (continued)

Industry Control	*Yes*	*Yes*	*Yes*	*Yes*
# Obs.	*228*	*120,768*	*120,768*	*102,190*
R^2	*0.322*	*0.089*	*0.102*	*0.098*

Panel B – Multivariate analysis by country

Model: $EQ_{i,t} = \alpha_0 + \beta_1 LISTED_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 OP\_CYCLE_i + \beta_5 ROA_{i,t} + \beta_6 GROWTH_{i,t} + \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{j=1}^{n-1} \delta_j IndustryFE_j + \varepsilon_i$

Country	**Obs.**	EM_{aggr}	R^2	|***DeFond***|	R^2	|***Jones_Mod***|	R^2
United Kingdom	38,882	−0.001* (−1.92)	0.098	−0.002* (−1.94)	0.156	−0.002 (1.63)	0.088
Italy	14,043	0.019*** (3.34)	0.112	0.014*** (4.35)	0.126	0.015*** (3.66)	0.104
Sweden	11,476	0.010** (2.33)	0.103	0.007** (2.23)	0.112	0.008*** (2.81)	0.075
Germany	10,912	0.021** (2.79)	0.101	0.012** (2.67)	0.104	0.011*** (2.99)	0.098
Norway	10,798	0.008** (2.29)	0.111	0.009** (2.28)	0.123	0.008** (2.56)	0.124
Spain	9774	0.003 (1.23)	0.099	−0.001 (−1.12)	0.096	0.002 (1.57)	0.076
Netherlands	8,793	0.010** (2.56)	0.121	0.011** (2.68)	0.129	0.011** (2.57)	0.127
France	5,921	0.018*** (2.93)	0.102	0.015*** (3.57)	0.139	0.018*** (3.50)	0.117
Finland	4,992	0.010** (2.43)	0.119	0.011** (2.38)	0.105	0.011** (1.91)	0.091
Belgium	3,076	0.015*** (4.02)	0.107	0.016*** (3.89)	0.100	0.014*** (3.78)	0.088

Table 9 (continued)

Denmark	2,101	0.021*** (3.01)	0.123	0.017*** (2.97)	0.132	0.015** (2.45)	0.109

Table 9, Panel A, reports regression analysis of private versus public firms (A1 versus A2). In column 1, we replicate the Burgstahler et al. (2006) (Please notice that Column (1) replicates the industry average EM_{aggr}, as per Burgstahler et al. (2006), while in column (2), we use firm-years specification as in all our main models) models using our sample, while in columns (2) to (4), we also measure the marginal effects of institutional factors on earnings management, using different earnings management proxy. ***EM_{aggr}*** is the average percentage rank, as per Burgstahler et al. (2006). **|*DeFond*|** is the unsigned abnormal working capital accruals, computed as per DeFond and Park (2001). |Jones_Mod| is the unsigned discretionary accruals estimated, using the modified Jones model (Dechow and Sloan 1995). ***LISTED*** is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. ***LEGAL*** is the mean of three institutional variables from La Porta et al. (1998), as per Burgstahler et al. (2006): efficiency of the judicial system, rule of law, and corruption index. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days), calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. Standard errors are clustered at the firm level. All continuous variables are winsorized at 1%

Table 9, Panel B, reports regression analysis of private versus public firms (A1 versus A2), as per Panel A of Table 9 on a country by country basis, using different earnings quality proxy. We rank the countries by total number of observations. The dependent variable is alternatively the following proxies of earnings quality. ***EMaggr*** is the average percentage rank, as per Burgstahler et al. (2006). **|*DeFond*|** is the unsigned abnormal working capital accruals, computed as per DeFond and Park (2001); **|*Jones_Mod*|** is the unsigned discretionary accruals estimated using the modified Jones model (Dechow and Sloan 1995). The variable of interest, ***LISTED***, is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. All other independent variables included (with the exception of LEGAL) are as the regression model of Panel A (untabulated for parsimony). ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income. Note: the number of observations reported (***Obs.*** column) refers to |DeFond|, while for parsimony of space, we do not report the Jones model modified observations.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. Year and Industry fixed effects are included standard errors are clustered at the firm level. All continuous variables are winsorized at 1%

confounding effects (Barth et al. 2008). In the interest of brevity Table 9, Panel B, reports only the coefficients and t-statistics for our variable of interest, LISTED.[21]

In 10 out of 11 countries (a binomial probability of 0.005), the coefficient on LISTED is positive, indicating that private firms have higher earnings quality than public firms. The exception is the United Kingdom, where public firms have higher earnings quality. The superior earnings quality of U.K. public firms is likely due to the fact that U.K. financial markets are highly developed, liquid, and characterized by high investor protection, so that the demand for high-quality financial reporting dominates managerial opportunism (Ball and Shivakumar 2005). Our results indicate that the institutional architecture of the United Kingdom (common law, courts, tradition of audit profession, strong enforcement, etc.) provides a better set of incentives for public firms' earnings quality than the institutions in other E.U. countries, confirming that the relative earnings quality of public and private business groups is determined by the interplay among institutional architecture, tax regime, and firms' incentives.

Overall, Table 9 shows that, in the European Union, private business groups have superior earnings quality, compared to public business groups, consistent with opportunism prevailing over market demand in determining public firms' earnings quality, with the United Kingdom as an exception.

Unfortunately, since no database of U.S. private firms identifies which are standalone versus business groups, one limitation of our study is that we cannot directly examine how stakeholder incentives and tax incentives differ for the two types of U.S. private firms.[22] Thus an important question for future research is whether Hope et al.'s (2013) finding that U.S. public firms have higher earnings quality than U.S. private firms is robust to organizational structure. The United States has high-quality capital markets, but opportunistic reporting is prevalent there (Graham et al. 2005), so it is not clear whether demand or opportunism prevails.

4.4 Propensity-score matching

Because public and private firms differ on many dimensions, for our primary analysis comparing the earnings quality of public versus private business groups, we re-estimate Eq. (5) for each country using propensity-score matched samples. Specifically, for each LISTED firm, we identify a matched firm with the closest propensity score that did not receive the treatment (i.e., is not listed). We follow the propensity-score methodology developed by Rosenbaum and Rubin (1983), extended by Heckman et al. (1997), and introduced to the accounting literature by Armstrong et al. (2010). Hence, in the first stage, we estimate the following logistic regression.

$$LISTED_{i,t} = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Own\_Conc_{i,t} + \sum_{t=1}^{T-1} \gamma_t \mathrm{YearFE_t} + \sum_{j=1}^{n-1} \delta_j IndustryFE_j \varepsilon_{i,t} \quad (8)$$

[21] The coefficients of the control variables at the country level are consistent with those in Table 9, Panel A (except, of course, for LEGAL, which is not in the country-level regressions, since it is a constant at the country level).

[22] Most studies of U.S. private firms, such as those by Asker et al. (2015), Minnis (2011), Hope et al. (2013), use the Sageworks database, which does not disclose firm names or whether a firm is a business group or a standalone (Asker et al. 2015).

where all variables are as defined above. On a country basis, for each year and industry, we match by log of assets (SIZE), return on assets (ROA), leverage and debt to equity ratio (LEV), and ownership concentration (Own_Conc). We use a one-to-one nearest-neighbor matching without replacement, restricting the attention to a propensity score falling in the common support for both groups (Smith and Todd 2005). Table 10, Panel A, reports the means of the treatment and controls groups, along with the results of t-tests for group differences in means. None of the t-tests is significant, confirming the efficacy of the propensity-score matching.

Table 10, Panel B, reports the results with propensity-score matching by country and for the pooled sample (last row in Table 10 Panel B). In the interest of brevity, we only report the coefficients and t-statistics for our variable of interest, LISTED. A negative (positive) coefficient on LISTED indicates that public (private) firms have superior earnings quality. Consistent with Table 9 (Panel C), Table 10 (Panel B), shows that the coefficients on LISTED are significantly positive for all countries (except the United Kingdom), indicating that publicly listed business groups have lower earnings quality than their private peers.

5 Determinants of organizational structure

Firms can choose to be private standalone, private business group, or public business group, and we want to understand the determinants of these choices. In so doing, we extend our previous analyses to account for the endogeneity of the choice at each stage. Following the classic entrepreneurial model (Berle and Means 1991; Franks et al. 2012; Chandler 1977), we see these choices as sequential, occurring at certain points of the firm's life. Firms start out as private standalone units and may choose to become (private) business groups if they need to grow and diversify (geographically, for example). Once having become business groups, they can choose to stay private or go public. The sequential nature of the choices is important, because our tests compare private standalone firms versus private business groups on the one hand and private business groups versus public business groups on the other. Since a private firm's decision to stay as a standalone firm or become a business group comes first, we start with this choice.

Research has not investigated the determinants of private firms' choice to remain standalone or become business groups, and since the drivers of this evolution are complex, our analysis is exploratory. We adapt the model used by Pagano et al. (1998) and by Ball and Shivakumar (2005) for the private-public choice, by adding variables to take into consideration the stakeholder demand factors previously analyzed and the evolution in the life cycle of the company. Accordingly, we examine a private firm's choice of being standalone versus business group as follows.

$$\begin{aligned} STAND\_ALONE_{i,t} = {} & \alpha_0 + \beta_1 AGE_{i,t} + \beta_2 Own\_Conc_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Inv\_Int_{i,t} \\ & + \beta_5 SIZE_{i,t} + \beta_6 GROWTH_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 OP\_CYCLE_{i,t} + \sum_{t=1}^{T-1} \gamma_t \mathrm{IndustryFE_t} \\ & + \sum_{c=1}^{10} \theta_j CountryFE_c \varepsilon_{i,t} \end{aligned} \quad (9)$$

Table 10 Earnings management levels private *versus* public business group – propensity-score matching

Panel A – Descriptive Statistics of treatment and matched firms pooled across countries

PSM Variable	*Treatment (#11,420)*	*Matched (#11,420)*		
	Mean	***Mean***	***Diff***	***t-stat***
SIZE	16.43	16.28	0.14	0.64
LEV	0.88	0.85	0.03	0.83
ROA	0.061	0.062	−0.01	0.51
Own_Conc	62.78	*65.22*	−2.44	1.13
AGE	31.15	*30.90*	0.25	0.89

Panel B: Multivariate analysis by country – propensity-score matching

Model: $EQ_{i,t}\alpha_0 + \beta_1 LISTED_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 OP\_CYCLE_i + \beta_5 ROA_{i,t} + \beta_6 GROWTH_{i,t} + \sum_{t=1}^{T-1} \gamma_t YearFE_j + \sum_{j=1}^{n-1} \delta_j IndustryFE_j + \varepsilon_i$

Country	**Obs**	EM_{aggr}	R^2	|*DeFond*|	R^2	|*Jones_Mod*|	R^2
United Kingdom	8,648	−0.002** (−1.96)	0.101	−0.003* (−1.81)	0.132	−0.002 (1.69)	0.102
Germany	3,186	0.020** (2.76)	0.103	0.012** (2.69)	0.121	0.010*** (3.16)	0.104
France	3,464	0.013*** (3.93)	0.123	0.016*** (3.28)	0.141	0.017*** (3.34)	0.124
Italy	1,256	0.015*** (3.42)	0.106	0.015*** (3.34)	0.112	0.016*** (3.56)	0.105
Sweden	1,070	0.007** (2.83)	0.103	0.006** (2.31)	0.105	0.007*** (2.84)	0.084
Finland	866	0.014** (2.33)	0.104	0.013** (2.38)	0.112	0.012** (1.94)	0.089
Belgium	894	0.019*** (3.39)	0.117	0.017*** (3.86)	0.108	0.017*** (3.65)	0.099

Table 10 (continued)

Spain	1,068	0.004 (1.32)	0.102	0.002 (1.12)	0.097	0.000 (1.55)	0.085
Norway	1,094	0.009** (2.39)	0.115	0.009** (2.36)	0.116	0.010** (2.52)	0.119
Netherlands	876	0.014** (2.52)	0.122	0.014** (2.59)	0.129	0.015** (2.52)	0.122
Denmark	418	0.019*** (3.04)	0.128	0.016** (2.77)	0.119	0.016** (2.50)	0.112
Pooled Sample	22,840	0.018*** (3.09)	0.132	0.019*** (3.43)	0.149	0.021*** (3.52)	0.147

Table 10 Panel A, reports the t-tests for the difference in the main characteristics of the treatment group (public business group) and the control group (private business group) produced by propensity-score matching. Variables are all computed as per the appendix. *, **, *** show significance at the 10%, 5%, and 1% levels, respectively

Table 10, Panel B, shows a comparison between public business groups and a propensity-score matched sample of private business groups (A1 and A2 in Table 1). The dependent variable is alternatively the following proxies of earnings quality. $\mathbf{EM_{aggr}}$ is the average percentage rank, as per Burgstahler et al. (2006). |***DeFond***| is the unsigned abnormal working capital accruals, computed as per DeFond and Park (2001). |***Jones_Mod***| is the unsigned discretionary accruals, estimated using the modified Jones model (Dechow and Sloan 1995). The variable of interest, ***LISTED***, is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. All other independent variables included (with the exception of LEGAL) are as the regression model of Panel A (untabulated for parsimony). ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income. The pooled sample includes the variable ***LEGAL*** as the mean of three institutional variables from La Porta et al. (1998), as per Burgstahler et al. (2006): efficiency of the judicial system, rule of law, and corruption index.

Note: the number of observations reported (***Obs.*** Column) refers to |DeFond|, while for parsimony of space, we do not report the Jones model modified observations.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. Year and Industry fixed effects are included, and standard errors are clustered at the firm level. All continuous variables are winsorized at 1%

where *STAND_ALONE* equals one for a standalone firm and zero for a business group, AGE is the number of years since incorporation, and all other variables are as defined before. We expect the coefficients on AGE and SIZE to be negative, since standalone firms are likely to be younger and smaller. We expect the coefficient on ownership concentration to be positive, since standalone firms are more closely held. We do not have specific predictions for the coefficients in the remaining variables.

The results of estimating (9), with our sample of private firms, are shown in Table 11, Panel A. As expected, AGE and SIZE are negatively related, and ownership concentration is positively related to the decision to stay as a standalone firm. The coefficients of inventory intensity and leverage are not significant in Table 11, indicating that these variables are not important determinants of the standalone versus business group choice.[23]

Because public and private firms differ on many dimensions, differences in firm maturity, operational complexity, effectiveness of management, or a combination of these could generate differences in earnings quality. To account for the endogenous choice of a private firm to remain as standalone or become a business group, we re-estimate eq. (7) from Table 8, Panel C, as the second stage in a two-stage Heckman et al. (1997) procedure, after incorporating the model from Table 11, Panel A, in the first stage.

In the first stage, the standalone versus business group choice (eq. 9) is estimated as a probit model, and, using the parameters from this model, the inverse Mills ratios are computed for all firms in the sample. In eq. (9), AGE, which is exogenous since it is predetermined, acts as instrumental variable, since it is correlated with the choice to be a standalone firm or a business group but is uncorrelated with earnings quality. In the second stage, eq. (7) is estimated, including the inverse Mills ratio as a control variable and allowing its coefficient to vary between standalone firms and private business groups. The results are reported in Table 11, Panel B. Both qualitatively and quantitatively, the results after controlling for endogeneity resemble the results in Table 8, Panel C, thus adding to our confidence in our conclusion that standalone firms' earnings quality is affected by tax incentives.

The second choice, whether business groups remain private or become listed, has been studied by Pagano et al. (1998). We repeat our main analysis from Table 9, also by applying the Heckman two-stage procedure, as above. To implement the first-stage probit model, we start with the Ball and Shivakumar (2005) model, and we include AGE as instrumental variable as in eq. (9):

$$\begin{aligned} LISTED_{i,t} = {} & \alpha_0 + \beta_1 AGE_{i,t} + \beta_2 EXPORT_{i,t} + \beta_3 QUICK\_RATIO_{i,t} + \beta_4 SIZE_{i,t} \\ & + \beta_5 LEV_{i,t} + \beta_6 GROWTH_{i,t} + \sum_{t=1}^{T-1} \gamma_t \mathrm{IndustryFE_t} \\ & + \sum_{c=1}^{10} \theta_j CountryFE_c \varepsilon_{i,t} \end{aligned} \tag{10}$$

[23] When we estimate equation (9) with only leverage or inventory intensity as the sole independent variable, neither is significant. This shows that it is not the other independent variable that is causing leverage and inventory intensity to be insignificant. By contrast, Table 5 showed that business groups and standalone firms differed in their stakeholder pressure, as proxied by inventory intensity and leverage. The different results for inventory intensity and leverage in Table 5 versus Table 11, Panel A, are due to the fact that the different tests flip the independent and dependent variables and consequently have different statistical properties (different coefficients and different error terms) and different interpretations. Despite the fact that standalone firms and business groups have different inventory intensity and leverage ex-post (Table 5), inventory intensity, and leverage are not important determinants of the choice to become a business group ex-ante (Table 11, Panel A).

Table 11 Heckman two-stage approach – private business groups versus standalone (A2 vs. D2)

Panel A: First stage – On the determinants of organizational structure among private firms

$$STAND\_ALONE_{i,t} = \alpha_0 + \beta_1 AGE_{i,t} + \beta_2 Own\_Conc_{i,t} + \beta_3 Inv\_Int_{i,t} + \beta_4 SIZE_i + \beta_5 LEV_{i,t} + \beta_6 GROWTH_{i,t} + \beta_7 ROA_{i,t} + \beta_8 OP\_CYCLE_{i,t} \sum_{t=1}^{T-1} \gamma_t IndustryFE_t + \sum_{j=1}^{n-1} \theta_j CountryFE_c + \varepsilon_i$$

Variables	Prediction	(1)
		STAND_ALONE
AGE	–	−0.014***
		(3.19)
Own_Conc	+	0.013***
		(3.13)
Inv_Int	?	−0.043
		(−1.53)
SIZE	–	−0.025***
		(−3.08)
LEV	?	- 0.019
		(−1.49)
GROWTH	?	−0.023**
		(−2.14)
ROA	?	0.044
		(1.24)
OP_CYCLE	?	0.024
		(1.44)
Intercept		−0.076**
		(−2.16)
Industry Control		*Yes*
Country Control		*Yes*
# Obs.		*322,488*
R^2		*0.180*

Panel B: Second stage – addressing the potential endogenous choices of organizational structure among private firms (A2 vs. D2). Tax incentives and earnings management levels

$$EQ_{i,t} = \alpha_0 + \beta_1 STAND\_ALONE_{i,t} + \beta_2 MTR_{i,t} + \beta_3 STAND\_ALONE*MTR_{i,t} + \beta_4 SIZE_i + \beta_5 LEV_{i,t} + \beta_6 GROWTH_{i,t} + \beta_7 ROA_{i,t} + \beta_8 OP\_CYCLE_{i,t} + \beta_9 INVERSE\_MILLS_{i,t} \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{c=1}^{10} \theta_j CountryFE_c + \varepsilon_i$$

Variables	Prediction	(1)	(2)	(3)	(4)
		DeFond_Sign	***DeFond_Sign***	***Jones_Mod_Sign***	***Jones_Mod_Sign***
STAND_ALONE	–	***−0.016******	***−0.010****	***−0.018******	***−0.011****
		(−3.12)	***(−2.57)***	***(−2.97)***	***(−2.05)***
MTR	**?**		***−0.009***		***−0.013***
			(−1.64)		***(−1.55)***
*STAND_ALONE*MTR*	–		***−0.019******		***−0.021******
			(3.23)		***(−3.55)***
SIZE	*?*	*−0.013***	*−0.013***	*−0.014***	*−0.015****

Table 11 (continued)

		(−2.22)	*(−2.53)*	*(−2.34)*	*(−3.03)*
LEV	*?*	*0.038****	*0.041****	*0.043****	*0.044****
		(3.44)	*(3.12)*	*(2.98)*	*(3.24)*
GROWTH	*?*	*−0.011*	*−0.013*	*−0.018*	*−0.014*
		(−1.22)	*(−1.43)*	*(−1.52)*	*(−1.44)*
ROA	*?*	*−0.054****	*−0.054****	*−0.052****	*−0.054****
		(−3.23)	*(−3.12)*	*(−3.77)*	*(−3.34)*
OP_CYCLE	*?*	*0.003*	*0.004*	*0.003*	*0.004*
		(1.23)	*(1.30)*	*(1.45)*	*(1.44)*
INVERSE_MILLS		*−0.066****	*−0.055***	*−0.054***	*−0.047****
		(−3.16)	*(−2.83)*	*(−2.87)*	*(−3.04)*
Intercept		*0.045***	*0.054***	*0.045***	*0.047***
		(2.37)	*(2.81)*	*(2.77)*	*(2.82)*
Year Control		*Yes*	*Yes*	*Yes*	*Yes*
Industry Control		*Yes*	*Yes*	*Yes*	*Yes*
# Obs.		*322,488*	*322,488*	*290,506*	*290,506*
R^2		*0.160*	*0.161*	*0.152*	*0.161*

Table 11, Panel A, shows our regression analysis on the determinant of being a standalone. The dependent variable is a dummy variable (***STAND_ALONE***), taking the value of 1 if a firm is a standalone and 0 if it is organized as a private business group. ***AGE*** is the number of years since incorporation. ***Own_Conc*** is the share percentage owned by the largest shareholder. (We also replicate the analysis using the three largest shareholders, and results are unaffected by this different ownership qualification.) ***Inv_Int*** is the ratio of total inventory divided by total assets. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. Industry and country fixed effects are included, and standard errors are clustered at the firm level. All continuous variables are winsorized at 1%.

Table 11, Panel B, reports results of the second-stage regression analysis, using the Heckman et al. (1997) procedure for the determinant of tax incentive among private firm (Table 8, Panel C, in the paper). The inverse Mills ratio has been calculated using the model of Panel A. The coefficients are estimated from a regression, among private firms, of two earnings quality metrics (***DeFond_Sign***; ***Jones_Mod_Sign***) on ***STAND_ALONE*** and ***MTR*** plus control variables. ***STAND_ALONE*** is a dummy variable equal to 1, if the private firm is a standalone one as per our definition (see appendix), and zero, if it is a private business group. ***MTR*** is a dummy variable taking the value of 1, if firm effective tax rate is above the country average tax rate, and 0 otherwise (i.e., firm effective tax rate – country average tax rate > 0: dummy equal 1). ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income. ***INVERSE_MILLS*** is the estimated inverse Mills ratios of the first-stage regression.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. Standard errors are clustered at the firm level. All continuous variables are winsorized at 1%

where, as before, LISTED is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. In eq. (10), we include firm size (SIZE), as larger firms list to access equity and debt markets; debt-to-equity ratio (LEV) as a measure of financial constraints and equity risk; sales growth (GROWTH) as a measure of growth options; the quick ratio (QUICK_RATIO) as a measure of liquidity needs and financial risk; and the ratio of exports to total sales (EXPORT) as a measure of risk, as per Ball and Shivakumar (2005) and Hope et al. (2013).

Table 12, Panel A, reports the results of the Heckman test for the pooled sample. Panel A reports the output of the first-stage regression. As can be seen, all coefficients are significant at less than the 1% level, similar to the findings of Ball and Shivakumar (2005).

In Panel B of Table 12, we show the results of the second-stage regression, using our three earnings quality proxies (EM_{aggr}, $|DeFond|$, and $|Jones\_Mod|$), and we observe that the coefficients on the inverse Mills ratios are always significant, justifying the endogeneity concerns. However, controlling for endogeneity has little effect on the estimated coefficients. For example, when the EM metric is the DeFond and Park (2001) measure, the coefficient of primary interest (LISTED) is 0.021 (t = 6.27), whereas it is 0.026 (t = 4.57) using standard OLS (Table 9, Panel A). Results are confirmed also using the modified Jones model and EM_{aggr}, showing that our findings are not sensitive to different EM metrics and endogeneity concerns.[24]

6 Sensitivity analyses and robustness checks

We conduct a number of sensitivity analyses and robustness tests. To make sure that our results are not sensitive to variable specification, we construct our controls in different ways and re-run all our tests (results untabulated). First, we use the Dechow and Dichev (2002) and the Kothari et al. (2005) earnings management proxies. Second, for control variables, we use ROE instead of ROA, and we measure firm size (SIZE) in quantiles, instead of as the natural logarithm of total assets. We also compute leverage (LEV) as debt over lagged total assets, instead of debt scaled by equity. Third, to proxy for suppliers' demand for earnings quality, we also use accounts payable to total assets, as do Lisowsky and Minnis (2018). Fourth, we use a different specification for Own_Conc by including the percentage owned by the three largest shareholders. Fifth, consistent with the literature (Burgstahler et al. 2006), we eliminate firms that went public recently during the sample period, because those firms are subject to systematically higher levels of earnings management (Teoh et al. 1998). Sixth, we eliminate firms de-listing from the stock exchanges, since they might have managed earnings to hide financial difficulties prior to the delisting (Campbell et al. 2015). Seventh, we check whether there is a difference between private versus public business groups in the number of foreign subsidiaries, because this might cause differential earnings management. The number of foreign subsidiaries is very similar in the two groups (untabulated). Eighth, we control for firm maturity by including retained earnings divided by total assets as an independent variable (Asker et al. 2015; DeAngelo et al. 2006), and our results (untabulated) are unaffected. Finally, we exclude the United

[24] We also replicate the analysis on a country basis (untabulated), and results are quantitatively and qualitatively similar to the ones reported in Table 9, Panel B, using standard OLS.

Table 12 Heckman two-stage approach: public vs. private business group and earnings quality

Panel A: First-stage estimation results

$$\mathrm{LISTED}_{i,t} = \alpha_0 + \beta_1 \mathrm{AGE}_{i,t} + \beta_2 \mathrm{EXPORT}_{i,t} + \beta_3 QUICK\_RATIO_{i,t} + \beta_4 SIZE_i + \beta_5 LEV_{i,t} + \beta_6 GROWTH_{i,t} + \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{c=1}^{10} \theta_j CountryFE_c + \varepsilon_i$$

Variables	Prediction	***LISTED***
Intercept	*?*	*−0.865*** (−25.55)*
AGE	+	0.034*** (14.84)
EXPORT	*?*	*0.092*** (10.02)*
QUICK_RATIO	?	*0.054*** (10.24)*
SIZE	+	0.304*** (32.42)
LEV	?	−0.683 *** (−26.07)
GROWTH	*?*	*0.175*** (11.55)*
Year and Country Controls		*YES*
Pseudo R^2		0.201
#Obs.		*120,786*

Panel B - Second stage – addressing the potential endogenous choices of organizational structure among private versus public business groups (A1 vs. A2)

$$\mathrm{EQ}_{i,t} = \alpha_0 + \beta_1 \mathrm{LISTED}_{i,t} + \beta_2 \mathrm{LEGAL}_{i,t} + \beta_3 \mathrm{LISTED}^{*}\mathrm{LEGAL} + \beta_4 \mathrm{SIZE}_i + \beta_5 \mathrm{LEV}_{i,t} + \beta_6 \mathrm{OP\_CYCLE}_{i,t} + \beta_7 \mathrm{ROA}_{i,t} + \beta_8 \mathrm{GROWTH}_{i,t} + \beta_9 \mathrm{INVERSE\_MILLS}_{i,t} \sum_{t=1}^{T-1} \gamma_t YearFE_t + \sum_{t=1}^{T-1} \gamma_t IndustryFE_t + \varepsilon_i$$

Variables	Prediction	(1)	(2)	(3)
		EMaggr	***|DeFond|***	***|Jones_Mod|***
LISTED	?	***0.021*** (2.96)***	***0.021*** (6.27)***	***0.022*** (5.84)***
LEGAL	*?*	**−0.011*** (−2.98)**	**−0.012** (−2.43)**	**−0.011** (−2.75)**
LISTED* LEGAL	*?*	***−0.009** (−2.54)***	***−0.010*** (−2.74)***	***−0.010** (−2.66)***
SIZE	?	*−0.011** (−2.32)*	*−0.014*** (−9.35)*	*−0.007*** (−8.34)*
LEV	?	*0.029*** (6.52)*	*0.034*** (10.01)*	*0.033*** (9.73)*
GROWTH	?	*−0.028 (−1.56)*	*−0.022** (−2.10)*	*−0.023* (−1.93)*
ROA	?	*−0.054*** (−4.11)*	*−0.021*** (3.21)*	*−0.035*** (−4.45)*

Table 12 (continued)

OP_CYCLE	?	*0.005*	*0.007*	*0.012*
		(1.43)	*(1.23)*	*(1.232)*
INVERSE_MILLS	?	*−0.033***	*−0.038***	*−0.033***
		(−4.21)	*(−3.56)*	*(−3.62)*
Intercept		*0.112***	*0.098***	*0.086***
		(5.02)	*(6.72)*	*(5.86)*
Year Control		*Yes*	*Yes*	*Yes*
Industry Control		*Yes*	*Yes*	*Yes*
# Obs.		*120,768*	*120,768*	*102,210*
R^2		*0.108*	*0.148*	*0.133*

Table 12, Panel A, reports results using the Heckman et al. (1997) procedure for our pooled sample of public and private business group. Panel A reports the probit first-stage regression and shows the determinant of being a ***LISTED*** business group. The dependent variable is a dummy variable (LISTED), taking the value of 1 if a firm is publicly listed and 0 otherwise. AGE is the number of years since incorporation. ***EXPORT*** is the ratio of foreign sales over total sales. ***QUICK_RATIO*** is computed as the sum of cash and cash equivalents and current receivables, scaled by current liabilities. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. In parentheses, we report t-statistics. Industry and country fixed effects are included, and standard errors are clustered at the firm level.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered at the firm level. All continuous variables are winsorized at 1%.

Table 12, Panel B, reports the results of the second-stage regression analysis for our three earnings quality measures (EMaggr, |DeFond|, and |Jones_Mod|) on LISTED plus control variables. Different from previous literature, we run the regression pooling only public (A1) and private (A2) business groups. $\boldsymbol{EM_{aggr}}$ is the average percentage rank across four individual earnings management scores, as per Burgstahler et al. (2006). ***|DeFond|*** is the unsigned abnormal working capital accruals, computed as per DeFond and Park (2001). ***|Jones_Mod|*** is the unsigned discretionary accruals estimated, using the modified Jones model (Dechow and Sloan 1995). ***AGE*** is the number of years since incorporation. ***LISTED*** is a dummy variable equal to 1 if the firm is publicly listed and 0 otherwise. ***LEGAL*** is the mean of three institutional variables from La Porta et al. (1998), as per Burgstahler et al. (2006): efficiency of the judicial system, rule of law, and corruption index. ***SIZE*** is the book value of total assets at the end of the fiscal year (natural log). ***LEV*** is the debt-to-equity ratio. ***GROWTH*** measures the change in sales from t-1 to t. ***ROA*** stands for yearly return on assets and equals net income divided by lagged total assets. ***OP_CYCLE*** represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue/ 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income. ***INVERSE_MILLS*** is the estimated inverse Mills ratios of the first-stage regression.

*, **, *** show significance at the 10%, 5%, and 1% levels, respectively. In parentheses, we report t-statistics. All continuous variables are winsorized at 1%. Standard errors are clustered at the firm level

Kingdom from the pooled sample analysis for two reasons: 1) the institutional architecture there differs from that of other European countries; 2) the United Kingdom is the country with the greatest number of business groups, almost three times as many as the second country, France. The results of our analysis, with respect to all hypotheses and with all these different variable specifications, are quantitatively and qualitatively unchanged.

Taken together, the results of all our tests show that private standalone firms lower the overall earnings quality of private firms and that, when evaluating public versus private firms with similar organizational structures (i.e., business

groups), private firms have superior earnings quality. This is consistent with managerial opportunism prevailing over market demand in determining public firms' earnings quality.

7 Conclusion

We introduce organizational structure to the accounting literature and show the importance of private firms' heterogeneous organizational structures for their earnings quality. We find that all public firms are business groups, while private firms can be either groups or standalone firms. We focus on organizational structure, because, while private firms are not affected by market forces, business groups and standalone firms are differentially affected by such nonmarket forces as stakeholder pressures and tax incentives, which then affect earnings quality. We show that business groups have greater stakeholder demand for earnings quality, while standalone firms' earnings management is more driven by tax minimization.

The finding that private business groups face nonmarket forces similar to those faced by public firms but are not affected by market forces makes the private business group the natural counterfactual for comparing private and public firms' earnings quality. This comparison is important, because it attests to the net effect of market forces on firms: public firms' opportunism induces lower earnings quality, but market demand for reporting quality does the opposite. The empirical evidence is mixed, and the earnings quality of private versus public firms remains an open question. We find that public firms have higher earnings quality than private firms but that this relation reverses when we control for nonmarket forces by examining business groups only. Our findings suggest that, in the European Union, opportunism outweighs market demand in determining public firms' earnings quality and reconcile past conflicting evidence on public versus private earnings quality.

We identify, however, an important exception: in the United Kingdom, public business groups have higher earnings quality than private business groups. This might be because that country has among the most developed and highest quality capital markets in the world and thus investor demand for high-quality reporting likely prevails (Ball and Shivakumar 2005). Although data limitations do not permit such a test in the United States, since no database of U.S. private firms distinguishes between business groups and standalone firms, an important question for future research is whether Hope et al.'s (2013) finding that U.S. public firms have higher earnings quality than U.S. private firms is robust to organizational structure. The United States has high-quality capital markets but opportunistic reporting is prevalent (Graham et al. 2005), so it is not clear which force would prevail.

Our evidence is important, because it shows that opportunistic earnings management prevails over capital market demand for high-quality financial reporting in determining public firms' earnings quality. We thus resolve an important puzzle in the literature, and we show that different organizational structures lead to different earnings quality.

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Appendix: Variable definitions

Organizational Structure	
Business Group	A collection of parent and subsidiary firms that function as a single economic entity
Parent	Firm-entity controlling other firms (i.e., controlling subsidiaries).
Subsidiary	Firm belonging to a group controlled by a given parent firm. We define subsidiaries as firms directly owned by the parent (Level 1) at a stake higher than 50%.
Standalone	Firm that does not belong to a group and is not controlled by any other firm (i.e., no other firm owns more than 20%) and is not controlling any other firm itself (i.e., does not own subsidiaries).
Dependent Variables (Earnings Quality Proxy)	
|*DeFond*|	unsigned abnormal working capital accruals, computed as per DeFond and Park (2001).
DeFond_Sign	signed abnormal working capital accruals, computed as per DeFond and Park (2001).
|*Jones_Mod*|	unsigned discretionary accruals estimated using the modified Jones Model (Dechow et al. 1995).
Jones_Mod_Sign	signed discretionary accruals estimated using the modified Jones Model (Dechow et al. 1995).
EM1	is the number of "small profits" divided by the number of "small losses." A firm-year observation is classified as small profit (small loss) if positive (negative) net income falls within the range of 1% of lagged total assets, as per Burgstahler et al. (2006).
EM2	is the median ratio of the absolute value of total accruals to the absolute value of cash flow from operations. Total accruals are calculated as follows: (Δtotal current assets - Δcash) - (Δtotal current liabilities - Δshort-term debt) - depreciation expense. Cash flow from operations is equal to operating income minus total accruals, as per Burgstahler et al. (2006).
EM3	is the ratio of the cross-sectional standard deviations of operating income and cash flow from operations (multiplied by −1), as per Burgstahler et al. (2006).
EM4	is the Spearman correlation between the change in total accruals and the change in cash flow from operations (multiplied by −1), as per Burgstahler et al. (2006).
EM_{aggr}	is the average percentage rank across all four individual scores, EM1 to EM4. EM scores are constructed such that higher values imply higher levels of earnings management, as per Burgstahler et al. (2006).

Organizational Structure	
Business Group	A collection of parent and subsidiary firms that function as a single economic entity
Test Variables	
LISTED	dummy variable equal to 1 if the firm is publicly listed and 0 otherwise.
LEGAL	is the mean of three institutional variables from La Porta et al. (1998), as per Burgstahler et al. (2006): efficiency of the judicial system, rule of law, and corruption index.
STAND_ALONE	dummy variable equal to 1, if the firm is a standalone, and zero if it is a private business group.
MTR	dummy variable taking the value of 1, if firm effective tax rate is above the country statutory tax rate and 0 otherwise (i.e. firm effective tax rate – country average tax rate > 0: dummy equal 1).
Own_Conc[25]	share percentage owned by the single largest shareholder.
Inv_Int	ratio of total inventory divided by total assets.
LEV	debt-to-equity ratio.
Controls	
AGE	is the number of years since incorporation.
LEV	debt-to-equity ratio.
OP_CYCLE	represents the operating cycle (in days) calculated as (yearly average accounts receivable) / (total revenue / 360) + (yearly average inventory) / (cost of goods sold / 360). Cost of goods sold is equal to total revenue minus operating income.
SIZE	is the book value of total assets at the end of the fiscal year (natural log).
ROA	stands for yearly return on assets and equals net income divided by lagged total assets.
GROWTH	is the annual percentage change in revenue.
EXPORT	is the ratio of foreign sales over total sales.
QUICK_RATIO	is computed as the sum of cash and cash equivalents and current receivables, scaled by current liabilities.

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[25] We also use a different specification by including the percentage owned by the three largest shareholders.

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