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The real earnings management gap between private and public firms: Evidence from Europe

Jingwen Yang [a], Danial Hemmings [b], Aziz Jaafar [c,*], Richard H.G. Jackson [d]

[a] Beijing International Studies University, China
[b] Bangor Business School, Bangor University, UK
[c] College of Business Administration, University of Sharjah, United Arab Emirates
[d] School of Management, University of Bath, UK

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ABSTRACT

Employing a comprehensive dataset spanning 11 European Union countries, we provide novel insights on how country-level institutional factors affect differences in the extent of real earnings management (REM) activity by publicly listed and privately held firms (the 'REM gap'). Thus, we explain why the public–private firm REM gap varies systematically across countries. Exploring the impact of country-level governance and legal environment, we observe the REM gap to be greater in weaker market settings and in jurisdictions with higher book-tax conformity, despite REM levels overall typically being lower in such jurisdictions. While overall REM levels are positively related with the strength of investor protection and the extent of disclosure requirements and negatively related with ownership concentration levels, these factors play only a modest role in explaining variations in the REM gap. Our broad-based evidence also provides consistent support for the existence internationally of a 'partial substitution effect' where increased (decreased) REM activity is offset to some extent, but not wholly, by reduced (increased) accruals-based earnings management activity. Our findings have important implications regarding the comparability of financial statement information provided by public and private firms.

1. Introduction

This paper presents a comparative analysis of real earnings management (REM) activity by privately held and publicly listed companies domiciled across 11 European countries. In particular, we examine how the difference in the extent of REM activity by public versus private firms (the 'REM gap') varies with a variety of country-level institutional factors.[1] Prior research observes REM and accruals-based earnings management (AEM) in both privately held and publicly listed firms in a range of different contexts (e.g. Healy & Wahlen, 1999; Dechow & Skinner, 2000; Burgstahler et al., 2006; Haga et al., 2018). Haga et al. (2018) provide evidence that privately held United Kingdom (UK) firms employ less REM than do public firms,

* Corresponding author at: College of Business Administration, University of Sharjah, United Arab Emirates.
E-mail addresses: yangjinwen@bisu.edu.cn (J. Yang), d.hemmings@bangor.ac.uk (D. Hemmings), ajaafar@sharjah.ac.ae (A. Jaafar), r.h.g.jackson@bath.ac.uk (R.H.G. Jackson).

[1] In this paper the term 'public' is used to refer to firms with common stock listed on a stock exchange, and 'private' to refer to unlisted (or privately held) firms.

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attributing this to privately held firms having greater ownership concentration and facing less capital market pressure than public firms.[2] However, how the REM gap between public and private firms varies with and is shaped by the institutional environment in which firms operate is broadly overlooked in the prior literature. The aim of the current study is to address this gap. This is important as the REM gap potentially distorts the comparability of private and public firms. Investors and other stakeholders routinely draw comparisons between private firms and their listed peers when making valuation decisions.[3] Therefore, understanding how the REM gap varies with the institutional environment can help to improve decision-making of financial statement users internationally.

While an extensive literature exists on public firms' engagement in REM (e.g. Graham, Harvey, & Rajgopal, 2005; Cohen & Zarowin, 2010; Alhadab et al., 2015), including some studies on how REM activities of public firms are affected by the institutional environment (Ipino & Parbonetti, 2017), relatively little is currently known about how private firms' engagement in REM activity compares with that of public firms. However, private firms contribute greatly to the international economy and are a significant and increasing focus for capital providers.[4] Incentives to engage in earnings management are known to differ between publicly listed and privately held firms, as private firms are typically smaller (Hope et al., 2013), have more concentrated ownership and also higher levels of inside ownership (Haga et al., 2018), and face less pressure from capital markets (Coppens & Peek, 2005; Chen et al., 2011). Further, as private firms also face lower demand for public information, private firms' financial reporting quality tends to be lower than that of large, publicly traded companies (Hope et al., 2013).[5]

A recent stream of literature demonstrates that public firms' REM activity can vary significantly across the international context. For example, Enomoto et al. (2015) and Francis et al. (2016) provide evidence that public firms in countries characterized by stronger investor protection and legal system engage in more REM. While discipline over AEM increases with legal-system and investor protection strength, legal channels do not provide effective means to address REM (Francis et al., 2016). In a similar vein, Ipino and Parbonetti (2017) find that mandatory International Financial Reporting Standards (IFRS) adoption in the European Union (EU) reduced the relative cost of REM as compared with AEM, and particularly in countries with strong legal enforcement regimes.

We know that private and public firms respond differently to institutional factors (Burgstahler et al., 2006). Therefore, there is no a priori reason to expect their REM-impact to be the same for private firms as previously observed for public firms. First, given that public firms face greater capital pressure, REM of public firms may be more sensitive to capital market orientation than that of private firms. Second, while investor protection and disclosure requirements have been shown to exacerbate REM of public firms, such rules are designed primarily to protect minority-shareholders in public markets; therefore, it is possible their impact is muted for private firms. Third, country-level differences in tax alignment of financial accounting may reduce REM of private firms to a greater extent than public firms, as private firms are more likely to sacrifice earnings informativeness in the process of minimizing taxes (Burgstahler et al., 2006). Finally, cross-country ownership concentration levels can also explain differences in REM of public firms (Jiang et al., 2018); a factor that is less likely to affect private companies due to the inherent differences in ownership structure. We explore testable propositions regarding these factors in an attempt to obtain generalizable conclusions on the manner in which the REM gap varies country-to-country.

Estimating six alternative measures of REM as well as AEM and total earnings management (TEM) and using a comprehensive sample of 355,449 firm-year observations covering 11 European countries over the period 2006 to 2018, we obtain consistent evidence of a REM gap internationally whereby public firms engage in significantly more REM on average than private firms. More pertinent to our study, we observe significant cross-national variation in the REM gap. While we observe generally lower REM across Europe as compared with the UK alone, the REM gap between public and private firms is even more pronounced in non-UK European countries. Explaining this international heterogeneity, we find the public–private firm REM gap is significantly and substantially affected by market orientation and book-tax conformity regime, while investor protection strength and national levels of ownership concentration play only a modest role in shaping the REM gap at best. While REM levels of public and private firms are generally lower in weaker markets due to reduced capital market pressure, the REM gap in this context is even more pronounced than in more liberal market settings such as the UK. This is likely because public firms, in accessing dispersed shareholdings from globally integrated capital markets, are less sensitive to local market conditions. The finding of a larger REM gap in high book-tax conformity regimes implies that private firms avoid REM when facing prohibitively high tax costs. Whereas public firms, facing stronger incentives to maintain earnings informativeness, and under additional scrutiny from tax authorities, instead substitute AEM for more 'hidden' REM.

[2] The results of Haga et al.'s (2018) UK study are unlikely to generalize precisely across the broader European context we examine. The UK's stock market orientation and wider cultural, economic, and political milieux are more akin to those of the US than to those of other European countries (Nobes & Parker, 2010). The accounting classification proposed by Nobes (1998, 2008) characterizes the UK jurisdiction as being commercially driven with strong equity markets, in contrast to certain continental-European countries, including Germany, France, Spain, and Sweden, which are characterized as government-driven and tax-dominated jurisdictions with relatively weak equity markets.

[3] For example, Comparable Company Analysis (CCA) is routinely used as a method to value private firms based on the assumption the private firms should have similar valuation multiples to publicly listed peer companies. This is commonly based on the price-to-earnings or price-to-sales ratios; metrics that are directly affected by REM.

[4] A large number of private companies are small and medium sized enterprises (SMEs), described in FEE (2016) as 'the backbone of the European economy', and comprising more than 99% of European companies.

[5] Providers of capital to privately held firms can typically more easily access inside information and tend to be more active in governance roles than is the case with public firms. Therefore, there is reduced need to rely on communication via external financial reporting.

We also observe consistent, broad-based evidence in support of the existence of a 'partial substitution effect' between REM and AEM: increased (decreased) REM activity is partly, but not wholly, off-set by a reduction (increase) in AEM activity. This is consistent with prior studies finding that when there are binding constraints on engagement in AEM, the propensity for firms to engage in REM is increased (Chan et al., 2015). Our findings suggest that the mechanism whereby firms' institutional environment affects REM activity is not only through affecting earnings management incentives but also the trade-off between doing so through AEM or REM.

This paper provides several incremental contributions to the literature on earnings management and the impacts of national institutional setting. The principal contribution of our paper is in demonstrating how the differential REM practices of public and private firms (i.e., the REM gap) are affected by the institutional environment in which firms operate. This is important as the current understanding of how REM is conducted internationally is based largely on studies of public companies. Our results highlight crucial differences in the REM implications of key institutional dimensions, particularly market orientation and taxation systems. We caution that the ability to draw direct and meaningful comparisons between public and private firms based on financial statement information may be impaired by the existence of a REM gap, and may be particularly challenging in regions where the REM gap is identified to be sizable. Therefore, insights from our study may be useful to providers of finance to public and private firms, as well as other debt and equity market participants and advisors; particularly when decision making relies on comparisons against peer companies. Our findings should also be of interest to accounting standard setters and regulators globally as they shed light on the REM impact of national institutions which they play a key role in developing. For example, accounting standard setters are tasked inter alia with taking into account the consequences of the standards they develop (Accounting Standards Board (ASB) & European Financial Reporting Advisory Group (EFRAG), 2012), including the potential substitution of REM for AEM. Our results can inform the development of national and international standards by highlighting heterogeneity in REM implications across public and private firms in distinct institutional environments. Insights from this study also provide policymakers and regulators with options to address REM levels and the REM gap within their jurisdictions, thus, potentially improving financial statement quality and comparability.

The remainder of this paper is structured as follows: Section 2 reviews the prior literature and presents the development of our hypotheses. Data and methodology are discussed in Section 3, with results reported in Section 4. Our conclusions are presented in Section 5.

2. Literature review and hypotheses development

2.1. Real earnings management activity and public versus private firms

While AEM concerns the management of earnings and masking 'true' performance through choice (opportunistic selection) of accounting policies, REM involves an actual change in normal business practices (Roychowdhury, 2006). Examples of REM activity include strategically timing asset sales, offering relaxed credit terms so as to increase current period reported revenues, and reducing research and development (R&D) or discretionary advertising expenditure. REM has been examined extensively in relation to publicly listed firms, with evidence emerging of firms engaging in REM in order to mislead investors. Cohen and Zarowin (2010) note that REM is more likely to be employed prior to a seasoned equity offering (SEO) than in other circumstances, and that REM is associated with lower post-SEO stock returns. On the other hand, Zhao et al. (2012) and Gunny (2010) argue that REM may be used for signalling, and that REM can be associated with improved subsequent firm performance.

There is only very limited research on REM in private firms and that has tended to focus on REM activity in firms undergoing an Initial Public Offering (IPO). For example, Alhadab et al. (2015) and Wongsunwai (2013) report that firms conducting IPOs engage in both REM and AEM. Alhadab and Clacher (2018) find that high quality auditors constrain AEM and some, but not all, REM, around IPOs.[6] Looking at alternative earnings management incentives, Dierynck et al. (2012) find that private firms employ REM so as to exceed a zero earnings benchmark, and that this may even result in dismissal of employees to reduce labor costs.

In what is to our knowledge the only study to have previously examined the public–private firm REM gap, Haga et al. (2018) report that both privately-held and publicly listed UK firms engage in REM but that public firms enter into REM to a greater extent. There are several reasons why public firms may generally engage in higher REM activity levels than private firms, including differences in ownership characteristics, owners' access to private information, and pressures from capital markets. Ownership of public firms is usually more dispersed and fragmented than that of privately held firms, which creates greater opportunities for managers to divert company resources to their own benefit (Dhaliwal et al., 1982). As public firms typically have lower inside ownership concentration than private firms, they may also be more willing to use the REM method to manage earnings; managers who have a substantial ownership interest would be reluctant to engage in REM due to its value-destroying nature.

[6] Alhadab and Clacher (2018) find that REM via manipulation of discretionary accruals is found to be constrained by high quality auditors, while sales-based REM is not.

Providers of capital to private firms usually have easier access to inside information than investors in public firms and are usually more active in governance roles (Chen et al., 2011). As public firms in contrast rely more on communication through the financial statements, they have more scope to employ earnings management for signalling or opportunistic motives (Bartov et al., 2002). Finally, a large body of literature demonstrates that capital market incentives motivate managers to manipulate earnings, with public firms particularly facing more pressure to ensure that earnings targets are met (Graham et al., 2005; Herrmann et al., 2011). For example, Roychowdhury (2006) reports that publicly listed firms employ income-increasing REM to avoid reporting losses. As private firms face lower capital market pressure and lower agency conflicts, their financial reporting may be influenced more by company policies in relation to dividends, tax, and executive compensation rather than by capital pressures (Ball & Shivakumar, 2005).

2.2. Cross-national institutional factors and REM activity

While we expect that public firms, in general, exhibit greater levels of REM than private firms, absolute REM levels and the REM gap are likely to also be affected by jurisdiction. Firms' institutional environment can have a significant impact on corporate governance and stakeholder relations (Van Essen et al., 2013), and capital market pressures and constraints can vary dramatically from jurisdiction to jurisdiction. This could all impact upon the propensity for REM and AEM activity.

Several studies examine how engagement by public and private firms in AEM are affected by institutional factors. Burgstahler et al. (2006) argue that raising capital in public markets, when there is strong legal enforcement, constrains firms' ability to manage earnings, and, consequently, that public firms may display higher accrual quality than privately held firms. Consistent with this, United States (US) public firms are found to have significantly higher accrual quality, on average, than private firms and exhibit more conservative reporting (Hope et al., 2013). To the extent that markets exclude or penalize firms that engage in earnings management activity, public firms may display a higher propensity than private firms to manage earnings using less easily detectible methods such as REM. Prior literature has found significantly lower AEM amongst European public firms as compared with private firms (Burgstahler et al., 2006; Coppens & Peek, 2005). However, it is important to note that this may be in a context of higher REM partially or wholly offsetting lower AEM, or perhaps increases in REM more than offsetting decreases in AEM.

Therefore, we explore how REM levels of public and private firms, and the REM gap crucially, vary across four major dimensions of institutional differences: (i) market orientation; (ii) investor protection and disclosure requirements; (iii) book-tax conformity; and (iv) national ownership concentration levels. The range of institutional dimensions we choose to cover is similar to other studies on earnings management in an international context, including prior studies on international variation in REM (as we discuss below). They are also clearly linked to REM incentives of public and private firms, albeit likely in differing ways.[7]

2.2.1. Market orientation

As discussed above, REM of public firms, like AEM, is found to be sensitive to capital market pressures (Roychowdhury, 2006). While market pressures vary with local factors, such as proximity to earnings targets, they also vary between national market-settings due to differences in market orientation and corporate governance practices. As public firms inherently face capital market pressures more strongly than private firms, there are compelling reasons to expect the REM gap to be greater in market settings where firms face greater pressure to engage in REM.

The European setting of our study is typified by a mixture of jurisdictions with substantively different market orientations. For example, Nobes (1998, 2008) characterizes the UK as being commercially driven with strong equity markets, in contrast to Germany and France, which have relatively weaker equity markets. Hall and Soskice (2001) similarly distinguish between *liberal market economies* (LMEs), where firms coordinate with key stakeholders mainly through competitive market arrangements, and *coordinated market economies* (CMEs), where coordination occurs mainly through non-market interactions (i.e., weak market settings). In LMEs, such as the UK, firms coordinate with shareholders mainly on an arms-length basis, relying principally on communication of firm outcomes through published annual reports and other public disclosures. Therefore, the terms of capital access are heavily influenced by publicly accessible criteria such as market values and earnings information (Hall & Gingerich, 2009). Consequently, firms in LMEs face strong incentives strategically to manage earnings in order to obtain new capital on more favorable terms (Teoh et al., 1998; Cohen & Zarowin, 2010). By contrast, CMEs, such as Germany, are characterized by dense cross-shareholding and employer association networks that provide for coordination through exchange of private information and fostering of collaborative relationships. Consequently, access to capital depends more on the firm's reputation than it does on the headlines in published financial reports. Because the annual report is a lesser dominant mode of communication in CMEs, "*managers* [in CMEs] *are less sensitive to current profitability*" (Hall & Gingerich, 2009, p. 453). Thus, firms in CMEs (weak markets) likely face lower capital market pressure to engage in earnings management. Prima-facie, this suggests that the REM gap between public and private firms will be lower in CMEs as capital market pressure is a salient factor driving public firms' higher REM engagement.

[7] We consider the range of dimensions we examine to be sufficiently broad to extract meaningful and useful generalisations. However, we note that other institutional factors may also affect the REM gap to lesser or greater extents, including legal enforcement, union strength, and press freedom. Future studies could add further richness in this regard. We thank the anonymous reviewer for these suggestions.

On the other hand, while public companies in CMEs may face lower capital market pressures than those in LMEs (ceteris paribus), they may still face substantially higher market pressures than co-domiciled private companies. Following this line of reasoning, the REM gap between CME public and private firms may be even larger than is the case in LMEs – given that CME private firms operate on the basis of collaborative relationships, while CME public companies still access capital from globally integrated capital markets and must coordinate with diverse shareholder groups from around the world.

Given these competing lines of reasoning, and with no a priori contention as to which, if either, may dominate, we state the following non-directional first hypothesis:

H1. *The difference in the extent of REM activity between public and private firms is associated with national market orientation.*

2.2.2. Investor protection and disclosure requirements

Along with differences in market orientation, there is substantial variation in the strength of investor protection as well as nature and extent of accounting disclosure requirements across jurisdictions. Prior studies find REM incentives to be significantly affected by variation in legal system strength and extent of investor protections (Enomoto et al., 2015; Francis et al., 2016). To the extent that investor protection and disclosure requirements constrain 'visible' channels to manage earnings by AEM, they increase the incentives to engage in REM because it is more hidden. Given that investor protection rules are designed primarily to protect minority-shareholders in public markets, investor protection regime is likely to curtail REM more in public firms than in private firms. Therefore, we examine this as another potentially important dimension in our context.

Investor protection mechanisms, such as director fiduciary duties and disclosure regulation, are designed to inspire investor confidence in capital markets by limiting the ability of company insiders to expropriate investors' interests (Djankov et al., 2008). Given the role played by law in controlling self-serving corporate behavior, common law countries typically provide stronger investor protection than civil law countries (La Porta et al., 1998). Moreover, investor protection tends to be stronger in countries with larger capital markets (La Porta et al., 1997) and greater ownership dispersion (La Porta et al., 1999).[8]

Prior studies which consider investor protection rights show variations in earnings quality across countries (e.g., DeFond et al., 2007; Francis et al., 2005), and suggest that managers' incentives for opportunistic behavior decrease with the level of investor protection (Leuz et al., 2003). In particular, strong legal systems and outside investor protection are associated with reduced levels of AEM (Leuz et al., 2003; Burgstahler et al., 2006) and the opportunistic use of non-GAAP (Generally Accepted Accounting Principles) accounting (Visani et al., 2020). In contrast, and contrary to what we might expect, REM in public firms has been found to increase with increasing investor protection – as AEM is substituted by lesser-detectible real activities' manipulation (Enomoto et al., 2015). Public firms are subject to more extensive regulation and scrutiny than private firms, so this substitution effect is likely to be greater for them. Further, it is possible that strong investor protection places greater pressure on the managers of public companies to demonstrate good performance, creating further incentives to engage in earnings management. Therefore, we state the following directional second hypothesis:

H2. *The difference in the extent of REM activity between public and private firms is positively associated with the strength of investor protections and disclosure requirements.*

2.2.3. Book-tax conformity

Albeit accounting standards for public companies have been harmonized across the EU, accounting standards for private companies and national tax systems vary across member states. Consequently, the degree of book-tax conformity, or the alignment between reported earnings and taxable income, varies considerably across even the European countries we study (Lee & Swenson, 2012). Zang (2012) and Kałdoński and Jewartowski (2020) show that the tax costs of REM, which increase with book-tax conformity, can be substantial and play a significant role in shaping REM activity. Given that tax alignment is known to have a stronger impact on the reporting practices of private firms than those of public firms (Burgstahler et al., 2006), this is a natural third dimension to include in our study.

Low book-tax conformity enables managers to engage in practices which minimize taxable income while also managing reported earnings (Desai, 2005). In line with this, proponents of greater book-tax conformity argue that it will improve earnings quality, reduce aggressive tax avoidance, and increase overall transparency (Desai, 2005; Whitaker, 2006). The reasoning here is based on lower flexibility in accounting policy choice, additional enforcement of financial reporting by tax authorities (Atwood et al., 2012), and disincentives to manage earnings upwards due to the higher tax burden it would create (Lee & Swenson, 2012). Consistent with this argument, Sundvik (2017) finds overall levels of AEM to be lower in high book-tax conformity jurisdictions.

In contrast, opponents of greater book-tax conformity argue that as the information demands of investors and tax authorities differ, high book-tax conformity may result in reported earnings that are less informative (Atwood et al., 2010). Ali and Hwang (2000) provide evidence supporting this position, showing that earnings are less value relevant when book-tax

[8] The development of stock markets is strongly associated with extensive disclosure requirements and a relatively low burden of proof on investors seeking to recover damages resulting from omissions of material information from listing prospectuses.

conformity is high. From this informativeness/quality of earnings perspective, high book-tax conformity may be associated with greater earnings management due to greater incentives to smooth earnings (Lang et al., 2012; Blaylock et al., 2015).

There is a tension here as to the impact of book-tax conformity on earnings management. This has been investigated hitherto in terms of AEM, but a similar tension may well pertain to REM (whether due to the 'substitution effect' discussed above or otherwise). There is no a priori reason to contend that any effect will be the same for public and private companies. Public firms commonly have far more complex tax and accounting affairs than do private firms and different incentives/motivations to meet performance expectations. Therefore, we formulate the following non-directional third hypothesis:

H3. *Differences in REM activity between public and private firms are associated with the level of book-tax conformity.*

2.2.4. Ownership concentration

Given that REM is commonly understood to be value-destroying, large and influential shareholders are incentivized to discourage its use. Indeed, prior studies show that institutional investors play a monitoring role in constraining REM (Zang, 2012). Similarly, REM levels are typically lower for family firms, where ownership is often more concentrated (Achleitner et al., 2014). In addition to significant within-country variation in ownership concentration between public and private firms, substantial between-country variation also exists as regards the balance between controlling and minority shareholders. Consistent with national ownership concentration levels having significant REM implications, Jiang et al. (2018) identify that REM levels are significantly lower in high ownership concentration regimes. Due to structural differences in ownership of public and private firms where the ownership in public firms has more potential and propensity to be diffuse, a high ownership concentration regime may be associated with lower REM among public firms and a reduced REM gap.

The presence of dominant shareholders can help mitigate agency problems through closer and more effective scrutiny of management (Givoly et al., 2010). Moreover, Munari et al. (2010) argue that widely-held firms with lower ownership concentration are more exposed to the effects of external institutions and investors, while firms with controlling ownership are less affected by the external pressure from investors trading their shares. Because dominant shareholders have greater insider access, firms with greater ownership concentration rely to a lesser extent on public disclosure to resolve information asymmetry (Givoly et al., 2010). So, the incentives and ability to engage in both AEM and REM may also be lower.

La Porta et al. (1998) report that investor protection is generally weaker in countries with higher ownership concentration levels. However, Dahya et al. (2008) find that dominant shareholders can act to offset weak country-level shareholder protections by, for example, appointing a more independent board. The presence of dominant shareholders may create additional incentives and ability for managers, on behalf of or complicit with controlling shareholders, to engage in earnings manipulation in order to extract benefits from minority investors (Givoly et al., 2010). Consistent with this argument, Leuz et al. (2003) and Haw et al. (2004) report evidence of a positive relationship between ownership concentration levels and AEM. However, in this context controlling shareholders are typically against value-destroying REM. Therefore, we expect generally lower REM levels in high ownership concentration regimes. Given greater scope for diffusion in ownership of public companies, there is reason to expect the mitigating impact of national ownership concentration norms on REM to be more pronounced for public companies and that the REM gap reduces with ownership concentration.

Therefore, we formulate the fourth and final hypothesis in directional form as follows:

H4. *The difference in the extent of REM activity between public and private firms is negatively associated with national ownership concentration levels.*

3. Data and method

3.1. Data collection and sample selection

We employ Bureau van Dijk's Amadeus database as our primary source of financial data. Amadeus provides standardized data from financial statements of public and private firms across Europe. A key advantage of using the Amadeus database for this study is that it provides extensive coverage of privately held firms. The initial sample of firms comprises all private and public firms domiciled in 11 of the 15 'pre-2004' EU member states.[9] The European setting provides a unique context in which to examine the impact of country-level institutions – there being a high level of heterogeneity across country settings, despite comparable levels of economic development. These countries are among the most representative European nations in terms of gross domestic product (GDP), financial market relevance, and size (Bonacchi et al., 2019). Therefore, we consider that our results will generalize to other European countries and beyond. We collect necessary firm-year data for the period 2006 to 2018 where the data are available on Amadeus. Our sample period begins in 2006 and seeks to avoid confounding effects arising

[9] The 11 jurisdictions in the sample are Belgium, Finland, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Sweden, and the UK. Due to data limitations, we do not include all EU member states. Missing accounting data necessitated the exclusion of firms from Austria, Denmark, Ireland, and Luxembourg.

out of mandatory IFRS adoption by public EU firms in 2005.[10] We exclude the smallest firms, requiring privately held firms to conform with two or more of the following criteria in all years to be retained in the sample[11]: (i) total assets greater than €2.5 million; (ii) greater than €5 million in sales; and (iii) employs more than 50 employees.[12]

Consistent with prior studies (Burgstahler et al., 2006; Van Tendeloo, & Vanstraelen, 2008), we exclude financial companies, including banks and insurance companies (SIC 6000 to 6799), public administration organizations (SIC 4311 and above 9000), and firms operating in regulated industries (SIC 4400 to 5000). The final sample comprises 355,449 firm-year observations (337,640 relating to private firms and 17,809 to public firms) between 2006 and 2018.

3.2. Earnings management measures

We construct several proxies for REM following Roychowdhury (2006) and Cohen and Zarowin (2010). These proxies are constructed on the basis of three approaches to REM: (1) sales manipulation; (2) abnormal production costs; and (3) management of discretionary expenses. In addition, we estimate a measure of AEM following Kothari et al. (2005), as well as aggregate REM measures and a TEM measure.

3.2.1. Sales manipulation

Sales manipulation occurs when managers accelerate the timing of sales in order to increase current year reported earnings. This might be achieved by providing relaxed credit terms or price discounts to customers. While sales volume will be temporarily increased, the gains are likely to subsequently disappear as the old pricing policy is re-introduced. In the case of offering relaxed credit terms or price discounts, given the level of sales, the REM technique would result in lower current-year cash flows. Therefore, abnormal cash flow from operations (CFO) is commonly employed to detect the level of sales manipulation. We first estimate equation (1) to model the 'normal' level of CFO:

$$\frac{CFO_t}{Assets_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{Sales_t}{Assets_{t-1}} + \alpha_2 \frac{\Delta Sales_t}{Assets_{t-1}} + \varepsilon_t \quad (1)$$

where CFO_t is cash flow from operations during period t, calculated as net income plus amortization and depreciation, minus total accruals; $Assets_{t-1}$ is the beginning-of-period level of total assets; $Sales_t$ is the sales made during the year; and $\Delta Sales_t$ is the change in sales in year t compared with the previous year.[13] To reduce heteroskedasticity, all variables are deflated by lagged total assets. Firm subscripts are omitted in the interests of brevity here and throughout section 3.2 of this paper. We proxy abnormal cash flows from operations ($ACFO$) using the residuals from estimation of model (1).[14] REM activities that result in increased sales, but which do not map into cash flows due to lenient credit terms would result in more negative residuals from the model. Therefore, the residuals from estimation of model (1) are multiplied by minus one to give a measure which is positive for income-increasing REM.

3.2.2. Abnormal production costs

REM could also occur by increasing production levels to more than is necessary, so that the fixed costs of production are absorbed across a larger number of units and so minimizing the cost per unit. Similar to Roychowdhury (2006), we estimate production costs as cost of goods sold ($COGS$) plus changes in inventory (ΔINV) between the beginning and end of the year. Each of these components is modeled as a function of sales as follows:

$$\frac{COGS_t}{Assets_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{Sales_t}{Assets_{t-1}} + \varepsilon_t \quad (2)$$

$$\frac{\Delta INV_t}{Assets_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{\Delta Sales_t}{Assets_{t-1}} + \alpha_3 \frac{\Delta Sales_{t-1}}{Assets_{t-1}} + \varepsilon_t \quad (3)$$

Combining models (2) and (3), we model 'normal' production costs as a function of sales in model (4):

$$\frac{PROD_t}{Assets_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{Sales_t}{Assets_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{Assets_{t-1}} + \alpha_4 \frac{\Delta Sales_{t-1}}{Assets_{t-1}} + \varepsilon_t \quad (4)$$

[10] Regulation (EC) No 1606/2002 of the European Parliament and of the [European] Council (2002) made use of IFRS mandatory for primary market listed companies in all 11 of our sample jurisdictions preparing consolidated accounts for reporting periods commencing 1 January 2005 onwards. Some public firms adopted IFRS early and a few adopted it late. Further, some private companies adopted IFRS voluntarily. Therefore, it is impractical completely to avoid possible confounding effects of IFRS transition. We believe a sample period starting in 2006 is a reasonable approach as the vast majority of public firms across our sample of 11 EU jurisdictions had transitioned to IFRS for reporting periods ending during 2006.

[11] It has been shown that the size of the firm is positively related with earnings management, and some of the private firms on Amadeus are extremely small.

[12] These criteria to eliminate the very smallest firms are based on the parameters in Article 11 of the Fourth Council Directive 78/660/EEC (1978) of The Council of the European Communities, as amended by its Council Directive 94/8/EC (1994).

[13] We calculate cash flow from operations using the balance-sheet approach because data comparable with US cash flow statements are not available for our sample firms. It is acknowledged that this may lead to biased results in some contexts (Hribar & Collins, 2002).

[14] In order to eliminate extreme outliers and potential data errors, the accounting variables required for the estimation of equations (1), (4), (5), and (6) were winsorized below the 1 and above the 99 percentile points. This treatment is common in the AEM and REM literatures.

where $COGS_t$ is the cost of goods sold in period t; ΔINV_t is the change in inventory since the previous year-end; $PROD_t$ is the sum of $COGS_t$ and ΔINV_t; and all other variables in the model are as previously defined. The residuals from estimation of model (4) proxy for abnormal levels of production costs (*APROD*). Positive values of *APROD* reflect income-increasing REM, as they indicate over-production and lower cost of sales.

3.2.3. Managing discretionary expenses

Reducing discretionary expenses, such as advertising, R&D, and selling, general, and administrative expenditures (SG&A), will boost current period earnings. Given a certain level of sales, discretionary expenses are likely to be unusually low for firms undertaking REM via reduction in discretionary expenses (Cohen & Zarowin, 2010). Normal discretionary expenses, modeled as a function of lagged sales, are estimated in model (5) as follows:

$$\frac{DISEXP_t}{Assets_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{Sales_{t-1}}{Assets_{t-1}} + \varepsilon_t \tag{5}$$

where discretionary expenses ($DISEXP_t$) is the sum of SG&A and R&D; and other variables in the model are as previously defined.[15] Lagged sales are employed here to avoid the potential confounding effect of concurrent sales manipulation and expenses manipulation. The residuals from model (5) are taken as our proxy for abnormal discretionary expenses (*ADISX*). Because negative residuals imply that discretionary expenses are not as high as would be expected given sales, as earlier we multiply the residuals by minus one to give a measure that is positive for income-increasing REM.

3.2.4. Accruals-based earnings management

In addition to the REM proxies we employ, we also include a measure of accruals-based earnings management. Specifically, we estimate abnormal discretionary accruals as the residuals from annual cross-sectional regressions following the form specified in equation (6), including adjustment for firm performance, following Kothari et al. (2005).

$$\frac{TA_t}{Assets_{t-1}} = \alpha_1 \frac{1}{Assets_{t-1}} + \alpha_2 \frac{(\Delta Sales_t - \Delta Rec_t)}{Assets_{t-1}} + \alpha_3 \frac{PPE_t}{Assets_{t-1}} + \alpha_2 ROA_t + \varepsilon_t \tag{6}$$

where TA_t is total accruals in year t; ΔRec_t is the change in receivables since the previous year-end; PPE_t is gross property, plant, and equipment; and ROA_t is the return on assets ratio. All other variables are as previously defined.

3.2.5. Composite REM and TEM measures

In addition to the individual REM and AEM measures outlined above, we construct composite measures of REM following Cohen et al. (2008) and Zang (2012). We also include a measure reflecting overall earnings management through management of both real activities and accruals. First, we calculate *REM1* as the sum of *APROD* and *ADISX*. Second, we construct *REM2* by summing *ACFO* and *ADISX*. Third, an overall net REM measure, *REM_agg*, is constructed as the sum of all three REM measures; *ACFO*, *APROD*, and *ADISX*.[16] Finally, we calculate a measure of total earnings management (*TEM*), as the sum of *REM_agg* and *AEM*. The higher the value of these measures, the more likely is it that income-increasing earnings management were employed.

3.2.6. Cross-country institutional factors

We incorporate variables representing four major categories of country-level institutional differences that are manifest across our sample. First, we capture differences between more liberal market settings (i.e., countries approximating LMEs) and weaker market settings (i.e., countries approximating CMEs) using the coordination index of Hall and Gingerich (2009), which we denote *CINDEX*. The values of *CINDEX* are bounded by 0 and 1, where values close to 0 indicate that the economic system is LME in nature, whereas values closer to 1 denote more CME nature. Second, we include four variables which proxy for investor protection and disclosure requirements, being: (i) a rule of law index variable (*LAW*) as reported in La Porta et al. (1998); (ii) an anti-director rights index variable (*ANTDIR*) following La Porta et al. (1998), as revised and reported in Djankov et al. (2008); (iii) a composite investor protection index (*INVPR*) calculated as the product of *LAW* and *ANTDIR*; and (iv) the disclosure index (*DISCIN*) of La Porta et al. (2006). Brief definitions of these variables are in Appendix A. In each case, higher values indicate stronger investor protections. Third, we include a measure of country-level book-tax conformity (*BKTAX*) as reported in Atwood et al. (2010) to capture the alignment between reported book income and taxable income. The lower the value of *BKTAX*, the greater the extent to which a national tax system allows flexibility for book income and taxable income to be managed differently. Finally, we employ a measure of the average level of ownership concentration at the country level (*OWNC*), as reported in Atwood et al. (2010). Values of *OWNC* closer to 1 (0) reflect greater average ownership concentration (dispersion).

[15] Following Roychowdhury (2006), we assume that R&D expenses are zero when data is missing for R&D but available for SG&A.

[16] Like Cohen & Zarowin (2010), we do not combine *ACFO* and *APROD* as a pair, because as found in Roychowdhury (2006), the same activities can lead both to low CFO and to high production costs.

3.3. Principal models

We formulate models designed to test our hypotheses concerning the propensity of firms to engage in real earnings management in relation to listing status, public versus private, as well as country-level institutional factors.

3.3.1. REM by public and private firms

We first analyze differences in the extent of REM activity by publicly listed and privately held firms by estimating the following baseline model:

$$|Y_{i,t}| = \alpha_0 + \alpha_1 PUBLIC_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 ROE_{i,t} + \alpha_4 LOSS_{i,t} + \alpha_5 E\_vol_{i,t}$$
$$+\alpha_6 LEV_{i,t} + \alpha_7 GROWTH_{i,t} + \alpha_8 OP_{CYCLE i,t} + \alpha_9 INV_{i,t}$$
$$+\alpha_{10} ZSCORE_{i,t} \alpha_{11} EM\_control_{i,t} + \varepsilon_{i,t} \quad (7)$$

where omitting subscripts in the interests of brevity, $|Y|$ represents the absolute value of each of our eight REM measures: *ACFO*, *APROD*, *ADISX*, *RM1*, *RM2*, *REM_agg*, *AEM*, and *TEM* in turn. *PUBLIC* is a dummy variable equal to 1 (0) for public (private) firms. Therefore, the base case of the model is for private firms, and α_1 estimates the difference in REM activity as between publicly listed and privately held firms. Following previous studies, we include several firm-specific control variables: Firm size is defined as the natural logarithm of total assets (*SIZE*); Profitability is measured by return on equity (*ROE*)[17]; The cumulative proportion of years in which a loss was reported since the beginning of our sample period is *LOSS*; Earnings volatility is measured by the standard deviation of return on assets over the previous five years (*E_vol*); Financial leverage (*LEV*) is calculated as total debt divided by total assets[18]; Growth is measured by year-on-year percentage increase in total assets (*GROWTH*); The length of the firm's operating cycle in days is *OP_CYCLE*; The percentage of assets accounted for by inventory is *INV*; Bankruptcy risk is proxied by Taffler's (1983) z-score (*ZSCORE*). Following Doukakis (2014), we also control for AEM in models where an REM proxy is the dependent variable, and vice-versa (*EM_control*). Finally, we include year and industry fixed effects.

3.3.2. REM variation across institutional factors

To test H1 to H4, we examine how REM of public and private firms and the REM gap vary with country-level institutional factors. So, we estimate the following interaction model:

$$|Y_{i,t}| = \alpha_0 + \alpha_1 PUBLIC_{i,t} + \alpha_2 Factor_{c,t} + \alpha_3 PUBLIC \times Factor_{c,t} + Controls + \varepsilon_{i,t} \quad (8)$$

where *Factor* denotes each of our country-level institutional factors *CINDEX*, *LAW*, *ANTDIR*, *INVPR*, *DISCIN*, *BKTAX*, and *OWNC* in turn; *Controls* represents the same set of control variables as in equation (8); and all other variables are as previously defined. The inclusion of an interaction term between *PUBLIC* and *Factor* enables us to examine how the REM gap between public and private firms varies with each country-level institutional factor. All variables discussed in this sub-section are defined in Appendix A.

4. Empirical results

4.1. Descriptive statistics and baseline results

Panel A of Table 1 reports the descriptive statistics separately for private and for public firms for all variables employed in our analyses. The mean (median) values observed for the control variables are similar for publicly listed and private firms, with differences mainly concentrated in variables capturing profitability (*ROE* and *LOSS*), earnings volatility (*E_vol*), and firm growth (*GROWTH*). In general, public firms tend to display higher growth rates, are less profitable, and have more volatile earnings. In absolute terms, the mean values of our REM measures typically display larger divergence from zero for our sample of public firms. However, the mean values of our REM measures are close to zero for both public and private firm samples and are comparable with those of Haga et al.'s (2018) sample of UK firms.

In Panel B of Table 1, we report the sample distribution across the 11 European countries, again separately for public and private companies. The UK is the single jurisdiction which contributes the greatest number of public companies to our sample (32 %), and Italy contributes the greatest number of private companies to our sample (36 %).[19] Our sample includes a significant number of observations from each of the countries covered. In Panel C of Table 1, we outline the country-level institutional factors we employ and see a reasonable degree of cross-country variation.

[17] To avoid reporting losses and earnings declines, incentives to employ upwards earnings management are generally greater for managers of less profitable companies (Burgstahler & Chuk, 2017). Zalata and Roberts (2018) report that earnings management techniques, such as classification shifting, are prevalent among firms seeking to avoid reporting a core earnings decrease.

[18] Previous research shows that leverage has an important effect on financial reporting (Shivakumar, 2013), and that income-increasing behavior is more likely to be used to avoid violation of debt covenants (Bekiris & Doukakis, 2011). Anagnostopoulou and Tsekrekos (2017) report that highly leveraged public firms tend to attract heightened scrutiny from capital market participants and, therefore, tend to engage in more 'hidden' REM activity.

[19] We obtain consistent results when excluding Italy from our sample.

Table 1
Sample summary statistics.

Panel A: Full sample descriptive statistics

	Public firms N = 17,809					Private firms N = 337,640				
Variables	Mean	Std.dev.	25th Pct.	Median	75th Pct.	Mean	Std.dev.	25th Pct.	Median	75th Pct.
ACFO	0.022	0.231	−0.077	−0.004	0.085	−0.003***	0.158	−0.070	0.002	0.063
ADISX	−0.110	0.403	−0.288	−0.008	0.134	0.039***	0.232	0.025	0.065	0.116
APROD	−0.030	0.383	−0.209	−0.004	0.163	0.038***	0.269	−0.038	0.051	0.149
REM1	−0.140	0.709	−0.475	−0.027	0.296	0.077***	0.476	−0.003	0.116	0.259
REM2	−0.088	0.450	−0.284	−0.025	0.161	0.036***	0.281	−0.039	0.064	0.160
REM_agg	−0.118	0.764	−0.481	−0.029	0.317	0.074***	0.520	−0.060	0.117	0.296
AEM	−0.019	0.161	−0.078	−0.020	0.036	−0.008***	0.136	−0.067	−0.007	0.049
TEM	−0.142	0.812	−0.530	−0.052	0.306	0.070***	0.568	−0.105	0.113	0.324
SIZE	9.631	3.508	7.567	10.322	12.249	9.839***	1.143	9.022	9.630	10.399
ROE	−0.030	0.598	−0.074	0.068	0.158	0.119***	0.460	0.021	0.096	0.215
LOSS	0.346	0.360	0.000	0.250	0.625	0.190***	0.293	0.000	0.000	0.333
E_vol	0.084	0.103	0.018	0.042	0.101	0.039***	0.056	0.010	0.022	0.044
LEV	0.190	0.194	0.022	0.146	0.288	0.196***	0.212	0.005	0.133	0.323
GROWTH	0.254	0.708	−0.054	0.042	0.190	0.088***	0.266	−0.032	0.043	0.149
OPCYCLE	201.47	410.34	66.22	116.31	185.77	172.91***	329.31	66.81	114.68	176.75
INV	0.121	0.143	0.005	0.073	0.193	0.173***	0.180	0.014	0.123	0.271
ZSCORE	2.917	14.301	−3.113	2.425	8.725	1.932***	13.855	−3.748	0.574	6.631

Panel B: Distribution of observations by country and listing status

		Firms		Firm-year observations			
Country		Private	Public	Private	Public	Total	%
IT	Italy	27,731	294	150,993	1,257	152,250	42.8%
GB	UK	14,146	928	51,423	5,587	57,010	16.0%
FR	France	14,956	426	52,162	3,141	55,303	15.6%
ES	Spain	6,824	119	32,336	885	33,221	9.3%
DE	Germany	4,061	396	13,636	2,862	16,498	4.6%
BE	Belgium	2,394	38	10,569	259	10,828	3.0%
SE	Sweden	1,900	384	7,664	2,037	9,701	2.7%
GR	Greece	1,522	154	7,546	684	8,230	2.3%
PT	Portugal	1,336	21	6,577	112	6,689	1.9%
FI	Finland	1,003	98	3,547	784	4,331	1.2%
NL	Netherlands	527	58	1,187	201	1,388	0.4%
Total		76,400	2,916	337,640	17,809	355,449	100%

Panel C: Cross-country institutional factors

Country		CINDEX	LAW	ANTDIR	INVPR	DISCIN	BKTAX	OWNC
IT	Italy	0.87	8.33	2.0	16.66	0.67	0.6	0.60
GB	UK	0.00	8.57	5.0	42.85	0.83	0.6	0.15
FR	France	0.68	8.98	3.5	31.43	0.75	1.0	0.24
ES	Spain	0.62	7.80	5.0	39.00	0.50	1.0	0.50
DE	Germany	0.93	9.23	3.5	32.31	0.42	0.0	0.50
BE	Belgium	0.60	10.00	3.0	30.00	0.42	0.2	0.62
SE	Sweden	0.62	10.00	3.5	35.00	0.58	0.4	0.28
GR	Greece	*NA*	6.18	2.0	12.36	0.33	0.2	0.68
PT	Portugal	0.66	8.68	2.5	21.70	0.42	*NA*	*NA*
FI	Finland	0.65	10.00	3.5	35.00	0.50	0.6	0.34
NL	Netherlands	0.60	10.00	2.5	25.00	0.50	0.8	0.31

Panel D: The overall REM gap by country and listing status

		Average |REM_agg|			*"REM gap"*
		(1)	(2)	(3)	(2) – (3)
Country		Total	Public	Private	
IT	Italy	0.234	0.307	0.234	0.073***
GB	UK	0.678	0.614	0.685	−0.070***
FR	France	0.327	0.633	0.308	0.325***
ES	Spain	0.263	0.348	0.260	0.088***
DE	Germany	0.449	0.492	0.440	0.052***
BE	Belgium	0.352	0.322	0.353	−0.030
SE	Sweden	0.480	0.716	0.418	0.298***
GR	Greece	0.367	0.218	0.381	−0.163***
PT	Portugal	0.237	0.385	0.234	0.151***
FI	Finland	0.395	0.459	0.380	0.079***

NL	Netherlands	0.936	1.07	0.913	0.161**
Total		0.351	0.552	0.340	0.212***

Notes: *, **, and *** denote significant difference in means between public and private firms at the 10 %, 5 %, and 1 % levels, respectively. See Appendix 1 for variable definitions.

Notes: CINDEX is coordination index reflecting market orientation (Hall & Gingerich, 2009); LAW is rule of law (La Porta et al., 1998); ANTDIR is anti-director rights index (revised by Djankov et al., 2008); INVPR is investor protection index (LAW x ANTDIR); DISCIN is disclosure index (La Porta et al., 2006); BKTAX is book-tax conformity (Atwood et al., 2010); OWNC is country average ownership concentration (Atwood et al., 2010).

Notes: The panel presents mean values of |REM_agg| in public and private firms by country. *, **, and *** denote significant difference in means between public and private firms at the 10%, 5%, and 1% levels, respectively.

Finally, Panel D provides a first glimpse of international variation in the REM gap by contrasting mean absolute values of *REM_agg* of public and private firms on a country-by-country basis, with the final column of Panel D presenting this mean-difference for each sample country separately.[20] While we observe in Panel D some similarities in average REM of public and private firms across individual countries, variations in the REM gap do not closely track overall country-REM levels. Instead, the REM gap does appear to vary internationally along the hypothesized institutional dimensions. For example, while overall REM levels of Spain and Portugal are broadly similar, the REM gap is much lower in Spain (0.088) than Portugal (0.151), where investor protections are relatively weaker. The REM gap is particularly pronounced in France, under very high book-tax conformity and low ownership concentration, but it is relatively low in Germany, where book-tax conformity is very low and ownership concentration levels are higher.

As discussed previously, there is strong reason to believe that public firms generally engage in more REM activity than private firms. Only Haga et al. (2018) has previously examined this REM gap empirically, providing support within the UK context. While our primary focus is to examine the institutional mechanisms resulting in international variation of the REM gap, we first examine as a benchmark the overall REM gap in our European sample, and the extent to which the UK REM gap level identified in prior studies is atypical. Results from estimation of model (7) for the full sample are set out in Table 2. We observe a positive coefficient on *PUBLIC*, significant at the 1 % level, for each of our six REM measures, alongside a negative coefficient on *PUBLIC* for our AEM measure. The results overall are consistent with publicly listed firms generally employing greater levels of REM, but lower levels of AEM, as compared with privately held firms. This implies that public firms are generally more likely to trade-off lower AEM for greater REM.

We observe in Table 2 somewhat more pronounced public–private differences than reported in UK-centric studies (Haga et al., 2018), suggesting that UK REM gap levels are atypical. We explore this conjecture more concretely by augmenting the baseline model to include a *UK* indicator variable, equal to 1 for UK firms and 0 otherwise, as well as a *PUBLIC* × *UK* interaction term. The results are presented in Table 3. To assist with interpretation of the results, in Fig. 1 we present interaction plots based on the principal results of Table 3. REM levels are typically higher in the UK, as significantly positive coefficients are estimated on UK in each of our REM models. However, the public–private firm REM gap is more pronounced across the non-UK European countries included in our sample, with the coefficients on *PUBLIC* × *UK* being negative in all of our REM models, and significant at the 1 % level in five out of the six cases. Here again we find evidence of a partial substitution effect where a smaller REM gap in the UK is partially, but not wholly, offset by a larger AEM gap.

4.2. Impact of institutional factors on REM of public and private firms

We consider how REM is affected by a range of country-level institutional factors, namely: market orientation (*CINDEX*), investor protections and disclosure requirements (*LAW*, *ANTDIR*, *INVPR*, and *DISCIN*), book-tax conformity (*BKTAX*), and national ownership concentration (*OWNC*). We first examine how REM varies with each factor, irrespective of firms' listing status. The results are presented in Table 4. We include the same control variables as before but, in the interest of brevity, do not report the coefficients estimated for them.[21] Overall, we observe typical REM levels to be: 1) lower in weaker market settings (higher *CINDEX* values), compared with more liberal market settings (Panel A); 2) higher in areas with stronger investor protection (Panels B through E); 3) lower in areas with greater book-tax conformity (Panel F); and 4) lower in jurisdictions with greater ownership concentration levels (Panel G). Here we also find evidence for a partial substitution effect. The sign of the estimated coefficients on the focal variable in the TEM regressions are all significant at 1 %, being as for the REM regressions. Those in the AEM regressions are of the opposite sign and significant in four of seven cases, with three at the 1 % level and one at the 10 % level.

To explore how the REM gap varies with the institutional environment, in equation (8) we include the *PUBLIC* indicator variable and an interaction between *PUBLIC* and the national institutional factor of interest in each case. The results presented in Table 5 provide a basis for testing H1 through H4. To aid interpretation, we also present interaction plots in Fig. 2 for the regressions of *REM_agg*, *AEM*, and *TEM*. Supportive of exploratory hypothesis H1, we observe in Panel A of

[20] While these descriptive statistics are useful to gauge the way the REM gap varies across Europe, we interpret them with caution as they do not account for systematic variation in public and private firm characteristics within and between countries which may partially explain differences in REM levels. We include such omitted factors as controls in our subsequent analyses.

[21] Full results are available from the authors.

Table 2
The extent of earnings management in private versus public firms across the European Union.

	(1) |ACFO|	(2) |ADISX|	(3) |APROD|	(4) |REM1|	(5) |REM2|	(6) |REM_agg|	(7) |AEM|	(8) |TEM|
PUBLIC	0.017***	0.088***	0.058***	0.151***	0.075***	0.141***	−0.024***	0.118***
	(14.33)	(33.45)	(23.45)	(32.06)	(28.16)	(28.63)	(-26.80)	(22.65)
SIZE	−0.003***	−0.022***	−0.020***	−0.042***	−0.018***	−0.040***	−0.003***	−0.041***
	(−22.00)	(-81.54)	(-69.73)	(-80.51)	(-60.30)	(-71.09)	(-19.19)	(-67.08)
ROE	0.005***	0.015***	0.015***	0.022***	0.010***	0.023***	0.007***	0.034***
	(8.11)	(15.15)	(14.45)	(12.39)	(9.70)	(11.55)	(14.00)	(15.81)
LOSS	0.008***	−0.016***	0.019***	0.009***	0.002*	0.025***	0.004***	0.015***
	(11.66)	(-12.56)	(14.70)	(3.91)	(1.86)	(10.05)	(6.30)	(5.56)
E_vol	0.248***	0.455***	0.535***	0.857***	0.424***	0.930***	0.309***	1.176***
	(42.27)	(45.60)	(56.23)	(49.68)	(42.80)	(51.33)	(69.31)	(61.87)
LEV	0.010***	−0.001	−0.034***	−0.030***	0.006***	−0.012***	0.006***	0.019***
	(11.94)	(-0.32)	(-18.86)	(-8.87)	(3.55)	(-3.60)	(6.61)	(5.00)
GROWTH	0.046***	0.061***	0.143***	0.195***	0.084***	0.214***	0.085***	0.310***
	(48.92)	(30.55)	(72.05)	(57.94)	(41.29)	(58.28)	(78.89)	(74.46)
OPCYCLE	0.001**	−0.001***	−0.001***	−0.001***	0.000	−0.001***	−0.001***	−0.001***
	(2.50)	(-3.45)	(-14.21)	(-9.33)	(0.37)	(-6.96)	(-7.73)	(-4.42)
INV	−0.008***	−0.001	0.131***	0.134***	0.021***	0.160***	−0.012***	0.152***
	(-9.38)	(-0.77)	(60.92)	(35.40)	(9.96)	(39.70)	(-10.88)	(33.18)
ZSCORE	0.001***	−0.001***	0.000	−0.001***	0.001***	0.001***	−0.001***	0.000
	(28.80)	(-9.01)	(0.57)	(-16.27)	(6.03)	(5.13)	(−23.51)	(0.34)
EM_control	0.766***	0.029***	0.150***	0.137***	0.546***	0.466***	0.036***	
	(324.46)	(7.98)	(36.79)	(19.32)	(120.10)	(58.12)	(60.29)	
Constant	0.004	0.175***	0.137***	0.301***	0.131***	0.265***	0.066***	0.315***
	(1.00)	(18.83)	(14.91)	(17.99)	(13.73)	(15.10)	(15.83)	(17.06)
Obs.	355,449	355,449	355,449	355,449	355,449	355,449	355,449	355,449
R-squared	0.58	0.25	0.22	0.23	0.26	0.22	0.17	0.18
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Ordinary Least Squares (OLS) regressions based on all sample observations for 11 EU countries between 2006 and 2018. EM_control refers to the inclusion of AEM for models where the REM measures are dependent variables, and REM_agg where AEM is the dependent variable. *t*-statistics shown in parentheses based on robust standard errors. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively. See Appendix 1 for variable definitions.

Table 5 the REM gap to be particularly affected by market orientation. Except for *ACFO*, the coefficient on *PUBLIC* × *CINDEX* is positive and significant at the 1 % level across each of our REM proxies. These results indicate that a larger REM gap exists in weaker markets, as compared with more liberal market settings. While REM levels are generally lower for both public and private firms in weaker markets as compared to counterparts in liberal markets, this mitigating effect is weaker for public firms as they still face a relatively higher capital market pressure through access to globally integrated capital markets – as such, the REM gap is exacerbated. This implies increased inability to compare public and private firms in weaker markets.

With H2, we predict the REM gap to be positively associated with the strength of investor protections. We observe mixed results on the impact of investor protections and disclosure requirements on the REM gap in Table 5 (Panels B through E). While we observe some significant coefficients on the *PUBLIC* × *Factor* interactions in the REM models, the direction of the coefficients is not consistently positive or negative, and a visual inspection of the interaction plot in Fig. 2 shows only a slight difference at best. Therefore, we do not have consistent results to allow acceptance of H2 at any generally acceptable level of significance.[22] We do consistently observe significantly positive coefficients on *Factor* in our REM models across Panels B through E, strongly suggesting REM levels generally increase with investor protection strength. While this is consistent with prior evidence for public firms (Enomoto et al., 2015; Francis et al., 2016), our contribution here is in showing that the effect is comparable between public and private firms, such that the REM gap implications are modest at best.

On the other hand, we observe in Panel F a pronounced widening of the REM gap at higher levels of book-tax conformity (with a positive coefficient on *PUBLIC* × *BKTAX* significant at the 1 % level across each of our REM measures), providing strong support for our exploratory hypothesis H3. Specifically, high book-tax conformity regimes are associated with higher levels of REM by public firms, but lower REM by private firms. In high book-tax conformity regimes, firms' ability to simultaneously minimize taxes and manage earnings to signal performance is reduced. As it is less of a concern to private firms if earnings informativeness is reduced in the process of minimising taxes (Burgstahler et al., 2006), given high tax costs of REM, they become less willing to employ REM to signal performance (Zang, 2012). On the other hand, public firms are less willing to sacrifice earnings informativeness due to higher capital market pressures. Given that firms in high book-tax conformity regimes face higher scrutiny of book earnings from tax authorities, they may under such conditions face additional incen-

[22] However, we find that investor protection and disclosure requirements are consistently associated with an increased difference the 'AEM gap', significant at the 1% level.

Table 3
Differences in the extent of earnings management as between the UK and other European countries.

	(1) |ACFO|	(2) |ADISX|	(3) |APROD|	(4) |REM1|	(5) |REM2|	(6) |REM_agg|	(7) |AEM|	(8) |TEM|
PUBLIC	0.017***	0.095***	0.080***	0.189***	0.087***	0.181***	−0.025***	0.148***
	(12.82)	(35.95)	(31.44)	(39.99)	(31.08)	(36.21)	(−23.48)	(27.84)
UK	0.007***	0.159***	0.157***	0.324***	0.162***	0.323***	−0.008***	0.318***
	(15.31)	(108.59)	(107.53)	(113.50)	(104.84)	(109.28)	(-14.10)	(103.86)
PUBLIC × UK	−0.003	−0.070***	−0.116***	−0.216***	−0.086***	−0.225***	0.003**	−0.191***
	(-1.60)	(-13.27)	(−23.40)	(−22.87)	(-15.49)	(−22.82)	(1.97)	(-18.46)
SIZE	−0.003***	−0.021***	−0.019***	−0.040***	−0.017***	−0.037***	−0.003***	−0.039***
	(-21.64)	(-80.90)	(-67.97)	(-79.30)	(-58.47)	(-69.38)	(-18.89)	(-65.44)
ROE	0.005***	0.010***	0.010***	0.012***	0.005***	0.013***	0.007***	0.024***
	(7.74)	(10.77)	(9.78)	(7.08)	(5.08)	(6.59)	(14.39)	(11.48)
LOSS	0.008***	−0.004***	0.030***	0.032***	0.014***	0.048***	0.004***	0.038***
	(12.46)	(-3.47)	(23.68)	(14.17)	(10.91)	(19.71)	(5.38)	(14.03)
E_vol	0.242***	0.321***	0.406***	0.588***	0.288***	0.663***	0.313***	0.905***
	(40.85)	(34.24)	(43.88)	(36.30)	(30.16)	(38.08)	(70.01)	(49.46)
LEV	0.008***	−0.040***	−0.074***	−0.111***	−0.034***	−0.093***	0.008***	−0.060***
	(9.84)	(−22.83)	(-41.37)	(−33.75)	(-18.60)	(-27.14)	(8.63)	(-15.49)
GROWTH	0.046***	0.060***	0.143***	0.193***	0.083***	0.212***	0.084***	0.307***
	(48.93)	(31.69)	(73.07)	(60.17)	(42.11)	(59.59)	(78.33)	(75.00)
OPCYCLE	0.001***	−0.001**	−0.001***	−0.001***	0.001*	−0.001***	−0.001***	−0.001***
	(2.75)	(-2.33)	(-13.74)	(-8.50)	(1.87)	(-5.89)	(-7.85)	(-3.24)
INV	−0.007***	0.006***	0.138***	0.148***	0.028***	0.174***	−0.013***	0.166***
	(-8.98)	(3.21)	(65.47)	(40.75)	(13.80)	(44.39)	(-11.49)	(37.03)
ZSCORE	0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(27.89)	(-24.01)	(-11.10)	(-31.74)	(-6.56)	(-8.01)	(−22.44)	(-11.32)
EM_control	0.766***	0.021***	0.142***	0.121***	0.537***	0.449***	0.038***	
	(324.14)	(6.10)	(35.66)	(17.71)	(119.99)	(57.28)	(60.15)	
Constant	0.004	0.180***	0.129***	0.290***	0.131***	0.251***	0.065***	0.309***
	(1.03)	(19.62)	(14.29)	(17.73)	(13.92)	(14.59)	(15.44)	(17.13)
Obs.	355,449	355,449	355,449	355,449	355,449	355,449	355,449	355,449
R-squared	0.58	0.32	0.28	0.30	0.32	0.29	0.17	0.24
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: OLS regressions based on all sample observations for 11 European countries between 2006 and 2018. *t*-statistics shown in parentheses based on robust standard errors. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively. See Appendix 1 for variable definitions.

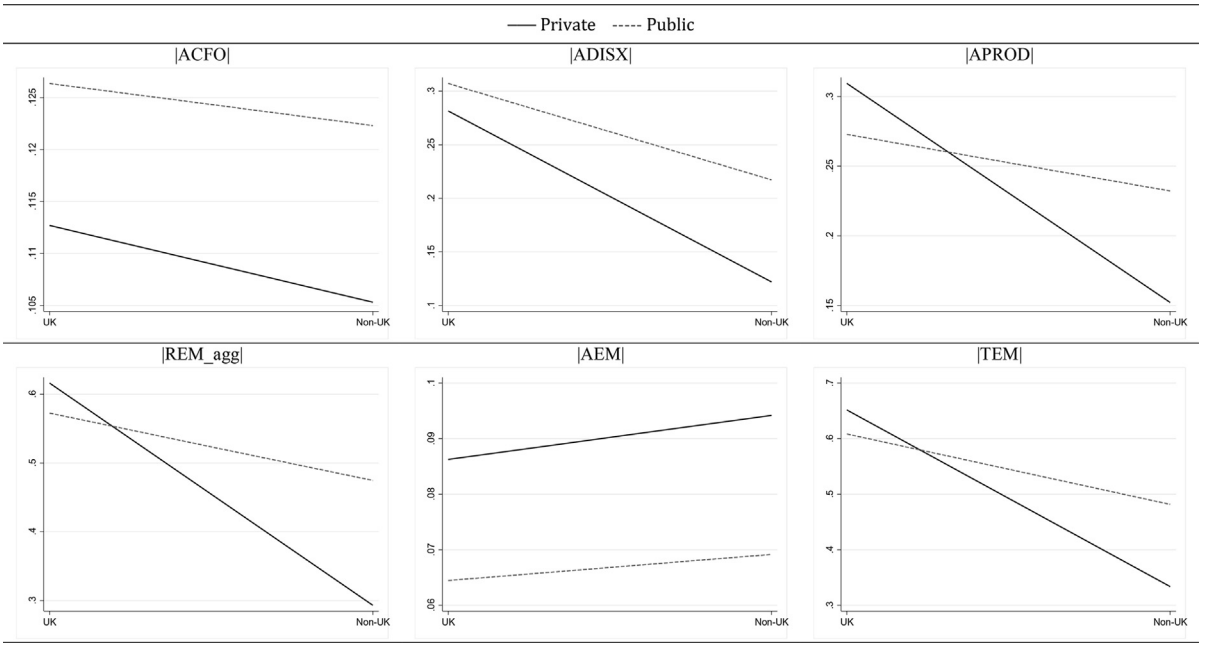

Fig. 1. Interaction plots for earnings management at in and EU public and private firms. This figure displays interaction plots delineating how the contrast in extent of earnings management activity between public and private companies differs as between the UK and other European countries, based on the estimated models presented in columns 1 (ACFO), 2 (ADISX), 3 (APROD), 6 (REM_agg), 7 (AEM), and 9 (TEM) of Table 3.

Table 4
Cross-country institutional differences and the extent of earnings management.

	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
Panel A: Coordination index (market orientation)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CINDEX	−0.010***	−0.178***	−0.172***	−0.357***	−0.180***	−0.353***	0.008***	−0.353***
	(-18.60)	(-110.28)	(-105.66)	(-113.32)	(-104.27)	(-107.81)	(13.15)	(-103.46)
R^2	0.58	0.32	0.28	0.30	0.31	0.28	0.17	0.24
Panel B: Rule of law								
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
LAW	0.004***	0.011***	0.013***	0.025***	0.010***	0.023***	0.003***	0.023***
	(18.82)	(22.53)	(22.72)	(24.60)	(17.58)	(21.31)	(11.19)	(19.70)
R^2	0.58	0.25	0.22	0.22	0.25	0.22	0.17	0.18
Panel C: Anti-director rights index								
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
ANTDIR	0.002***	0.030***	0.029***	0.060***	0.030***	0.059***	0.000	0.061***
	(19.53)	(98.62)	(91.49)	(101.08)	(89.80)	(93.85)	(0.03)	(91.06)
R^2	0.58	0.27	0.24	0.25	0.28	0.24	0.17	0.21
Panel D: Investor protection index								
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
INVPR	0.001***	0.004***	0.004***	0.007***	0.004***	0.007***	0.000	0.007***
	(23.43)	(103.55)	(96.92)	(106.57)	(93.82)	(98.70)	(1.63)	(95.53)
R^2	0.58	0.28	0.25	0.26	0.28	0.24	0.17	0.21
Panel E: Disclosure index								
	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
DISCIN	0.014***	0.202***	0.195***	0.396***	0.218***	0.408***	−0.015***	0.397***
	(12.20)	(68.67)	(62.79)	(67.91)	(68.70)	(67.18)	(-11.26)	(61.69)
R^2	0.58	0.26	0.23	0.24	0.27	0.23	0.17	0.20
Panel F: Book-tax conformity								
	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)
BKTAX	−0.001	−0.054***	−0.051***	−0.109***	−0.044***	−0.101***	0.001*	−0.093***
	(-1.23)	(-59.56)	(-44.09)	(-57.04)	(-38.67)	(-46.93)	(1.65)	(-37.83)
R^2	0.58	0.25	0.22	0.23	0.26	0.22	0.17	0.19
Panel G: Ownership concentration index								
	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)
OWNC	−0.021***	−0.235***	−0.234***	−0.478***	−0.234***	−0.467***	0.004***	−0.470***
	(-25.35)	(-109.77)	(-104.51)	(-112.95)	(-101.26)	(-105.59)	(3.70)	(-100.59)
R^2	0.58	0.29	0.25	0.27	0.29	0.25	0.17	0.22

Notes: OLS regressions based on all sample observations for 11 European countries between 2006 and 2018. All regressions include the same control variables as Table 2, including industry and year fixed effects. *T*-statistics shown in parentheses based on robust standard errors. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively. See Appendix 1 for variable definitions.

tives to use more hidden REM methods to manage earnings. Crucially for our study, the results imply comparability of public and private firms is lower in high book-tax conformity regimes.

In Panel G, we observe evidence of a reduced REM gap with greater ownership concentration at the 1 % level of significance in three of six REM regressions, but no significant evidence of such in the other three. Therefore, we have only modest support for H4 which predicts the REM gap is negatively impacted by ownership concentration levels. We do observe significantly negative coefficients on *OWNC* in all six REM models, suggesting that higher ownership concentration results in lower REM levels across both public and private firms. This is consistent with prior evidence focused on public firms (Jiang et al., 2018). Large shareholders face strong incentives to deter value-destroying REM activity, and this effect appears to mostly transcend differences in listing status.

4.3. Propensity score matching

One potential caveat is that the results reported above might be influenced by systematically different characteristics between public and private firms. For example, publicly listed firms are typically less profitable and display higher rates of growth than private firms. Therefore, we use propensity score matching (PSM) to obtain a control sample of private firms that closely reflect the characteristics of public firms in our sample. The PSM procedure helps to mitigate concern that our results may be driven by omitted variables. The advantages of the PSM method are that: (i) it provides relatively more direct estimates of the treatment effect, due to non-reliance on any specific functional form; and (ii) possible impacts from non-linearities in the estimation of treatment effects are mitigated. Because PSM results in a reduced sample size, matching via PSM entails trading-off the generalization of results and the identification of treatment effects (Cram et al.,2009).

We estimate the propensity of firms being public via a logit model employing *SIZE*, *LEV*, *ROE*, and *GROWTH*. Caliper matching without replacement is employed to match public firms with private firms that have a propensity score within a caliper of 0.1 %. This is to ensure that firm characteristics are closely balanced between the treatment (public firms) and control (private firms) samples.

Table 5
Cross-country institutional differences and the 'earnings management gap' between public and private firms.

	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
Panel A: By coordination index (market orientation)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PUBLIC	0.017***	0.038***	−0.018***	0.005	0.019***	−0.005	−0.025***	−0.011
	(9.10)	(8.04)	(-4.02)	(0.56)	(3.96)	(-0.59)	(-17.50)	(-1.14)
CINDEX	−0.010***	−0.181***	−0.179***	−0.370***	−0.184***	−0.366***	0.008***	−0.364***
	(-17.16)	(-107.77)	(-106.23)	(-112.77)	(-103.09)	(-107.65)	(11.45)	(-102.85)
PUBLIC × CINDEX	−0.000	0.072***	0.123***	0.235***	0.086***	0.238***	0.001	0.203***
	(-0.09)	(11.18)	(19.95)	(20.21)	(12.49)	(19.58)	(0.37)	(15.84)
R-squared	0.58	0.32	0.28	0.30	0.31	0.28	0.17	0.24
Panel B: By rule of law								
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
PUBLIC	−0.025***	0.206***	0.067***	0.184***	0.027	0.021	0.023***	0.103***
	(-2.67)	(11.45)	(3.87)	(5.86)	(1.38)	(0.63)	(3.02)	(2.81)
LAW	0.004***	0.011***	0.012***	0.022***	0.008***	0.019***	0.004***	0.021***
	(16.10)	(21.33)	(20.49)	(21.73)	(14.24)	(17.60)	(13.90)	(17.38)
PUBLIC × LAW	0.005***	−0.014***	−0.001	−0.004	0.005**	0.013***	−0.006***	0.001
	(4.24)	(-6.66)	(-0.64)	(-1.19)	(2.36)	(3.44)	(-6.18)	(0.27)
R-squared	0.58	0.25	0.22	0.23	0.26	0.22	0.17	0.18
Panel C: By anti-director rights index								
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
PUBLIC	0.008***	0.048***	0.084***	0.160***	0.045***	0.152***	−0.016***	0.092***
	(2.58)	(6.54)	(11.61)	(11.79)	(5.50)	(10.63)	(-5.80)	(6.05)
ANTDIR	0.002***	0.029***	0.029***	0.059***	0.029***	0.058***	0.001**	0.060***
	(17.47)	(94.64)	(90.21)	(98.55)	(86.88)	(91.65)	(2.09)	(88.77)
PUBLIC × ANTDIR	0.002**	0.007***	−0.010***	−0.009**	0.005**	−0.010**	−0.002***	−0.000
	(2.31)	(3.45)	(-5.16)	(-2.48)	(2.11)	(-2.47)	(-3.14)	(-0.05)
R-squared	0.58	0.28	0.24	0.26	0.28	0.24	0.17	0.21
Panel D: By investor protection index								
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
PUBLIC	0.001	0.054***	0.076***	0.148***	0.033***	0.125***	−0.013***	0.075***
	(0.23)	(8.00)	(11.48)	(11.82)	(4.52)	(9.59)	(-4.76)	(5.41)
INVPR	0.001***	0.004***	0.004***	0.007***	0.004***	0.007***	0.001***	0.007***
	(20.59)	(98.88)	(94.96)	(103.22)	(89.94)	(95.56)	(4.22)	(92.59)
PUBLIC × INVPR	0.001***	0.001**	−0.001***	−0.001**	0.001***	−0.001	−0.001***	0.000
	(4.78)	(2.48)	(-5.01)	(-2.33)	(3.30)	(-1.27)	(-4.53)	(0.59)
R-squared	0.58	0.28	0.25	0.26	0.28	0.25	0.17	0.21
	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
Panel E: By disclosure index								
	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
PUBLIC	0.009**	0.037***	0.079***	0.181***	0.057***	0.185***	−0.014***	0.112***
	(2.55)	(5.04)	(10.74)	(13.45)	(6.95)	(12.90)	(-4.85)	(7.34)
DISCIN	0.013***	0.197***	0.198***	0.402***	0.216***	0.416***	−0.014***	0.398***
	(11.33)	(65.16)	(61.57)	(66.45)	(66.57)	(65.98)	(-10.26)	(59.62)
PUBLIC x DISCIN	0.013**	0.082***	−0.029**	−0.041*	0.030**	−0.063***	−0.016***	0.013
	(2.47)	(6.69)	(-2.44)	(-1.83)	(2.28)	(-2.66)	(-3.69)	(0.52)
R-squared	0.58	0.27	0.23	0.24	0.27	0.23	0.17	0.20
Panel F: By book-tax conformity								
	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)
PUBLIC	0.013***	−0.000	−0.017***	0.004	0.002	0.002	−0.017***	−0.022***
	(6.86)	(-0.12)	(-4.73)	(0.55)	(0.54)	(0.23)	(-10.46)	(-2.90)
BKTAX	−0.001	−0.064***	−0.060***	−0.126***	−0.053***	−0.117***	0.002**	−0.110***
	(-1.40)	(-77.60)	(-52.25)	(-68.02)	(-47.77)	(-55.19)	(2.24)	(-44.72)
PUBLIC x BKTAX	0.008***	0.154***	0.131***	0.254***	0.128***	0.241***	−0.014***	0.244***
	(2.95)	(26.39)	(22.66)	(23.58)	(19.55)	(21.31)	(-6.10)	(20.18)
R-squared	0.58	0.26	0.23	0.23	0.26	0.22	0.17	0.19
Panel G: By ownership concentration index								
	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)
PUBLIC	0.024***	0.094***	0.033***	0.108***	0.079***	0.105***	−0.036***	0.096***
	(11.36)	(17.80)	(6.53)	(11.30)	(14.48)	(10.54)	(-21.42)	(9.25)
OWNC	−0.018***	−0.225***	−0.231***	−0.468***	−0.226***	−0.457***	0.000	−0.460***
	(−22.05)	(-103.42)	(-101.48)	(-108.59)	(-96.14)	(-101.52)	(0.21)	(-96.68)
PUBLIC x OWNC	−0.028***	−0.077***	0.016	0.007	−0.070***	−0.011	0.035***	−0.055**
	(-6.07)	(-7.30)	(1.57)	(0.37)	(-6.12)	(-0.54)	(8.66)	(-2.55)
R-squared	0.58	0.29	0.26	0.27	0.29	0.25	0.17	0.22

Notes: OLS regressions based on all sample observations for 11 European countries between 2006 and 2018. *t*-statistics shown in parentheses based on robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. See Appendix 1 for variable definitions.

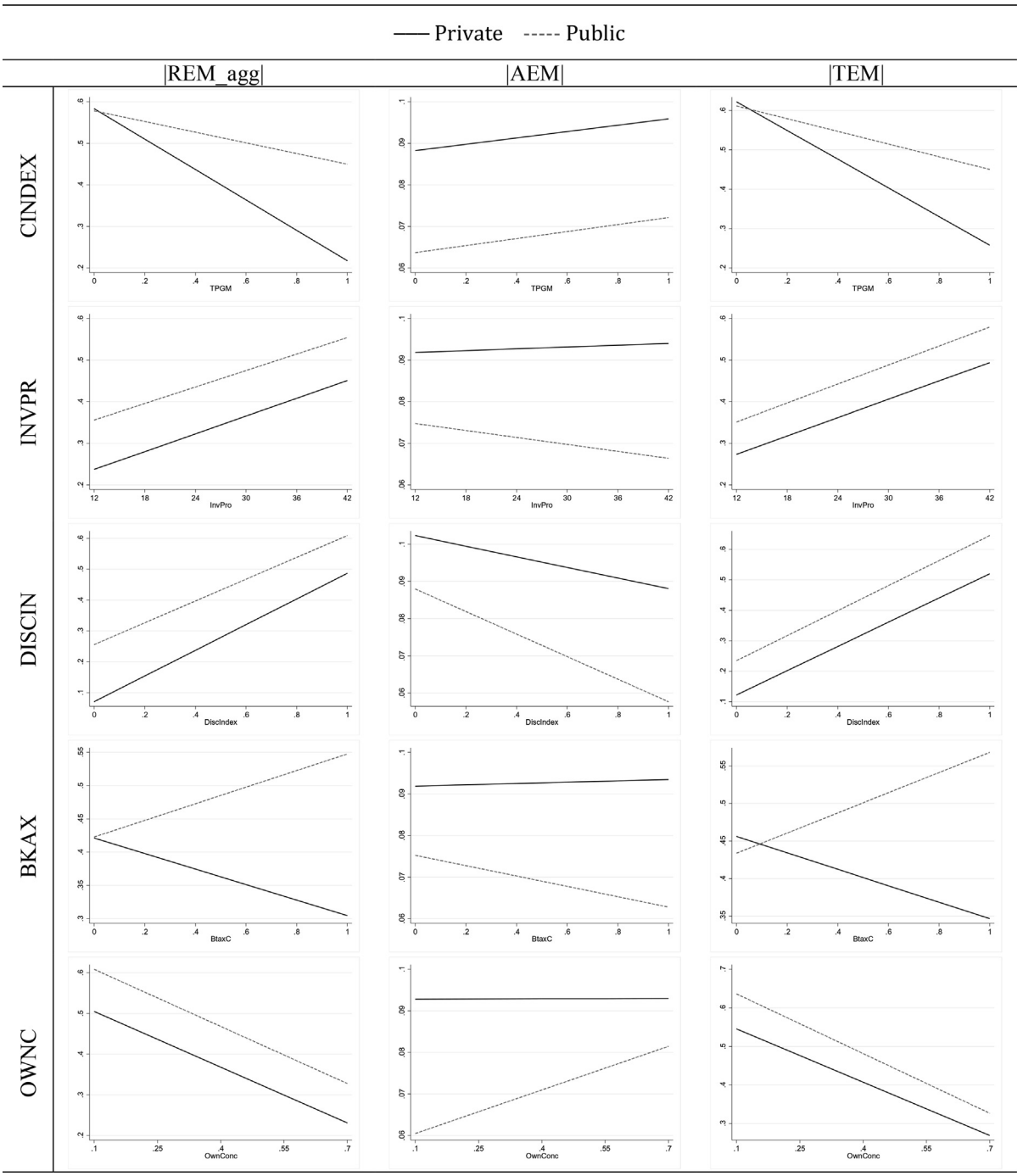

Fig. 2. Interaction plots: differences in earnings management activity by institutional factors. This figure displays interaction plots delineating how the contrast in extent of earnings management activity as between public and private companies differs with each of five country-level institutional factors: CINDEX, INVPR, DISCIN, BKTAX, and OWNC. The interaction plots are based on the model estimations presented in Table 5.

The results following re-estimation of models (7) and (8) using the matched sample are reported in Panel A and Panels B through H of Table 6, respectively. In Panel A, we observe our finding of generally greater REM activity by publicly listed firms relative to private firms across Europe to be robust to potential confounding effects resulting from systematic differences between public and private firms. We re-examine how the REM gap varies with each country-level institutional factor in Panels B through H and find that our results and inferences are, for the most part, robust.

There is more consistency in the results for investor protection, with the *PUBLIC* × *Factor* interaction being negative in all REM regressions. However, without consistent significance at generally acceptable levels, there is at most weak evidence

Table 6
Key regressions after propensity score matching.

	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
Panel A: Overall public–private REM gap								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PUBLIC	0.006***	0.081***	0.048***	0.134***	0.064***	0.119***	−0.034***	0.084***
	(3.37)	(21.96)	(13.91)	(20.75)	(16.82)	(17.31)	(−22.39)	(11.41)
Obs public	17,663	17,663	17,663	17,663	17,663	17,663	17,663	17,663
Obs private	17,663	17,663	17,663	17,663	17,663	17,663	17,663	17,663
R-squared	0.57	0.23	0.20	0.18	0.26	0.19	0.34	0.18
Panel B: By coordination index (market orientation)								
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
PUBLIC	−0.003	−0.022***	−0.032***	−0.066***	−0.017**	−0.058***	−0.038***	−0.079***
	(-0.87)	(-2.61)	(-4.12)	(-4.40)	(-1.98)	(-3.77)	(-13.54)	(-4.85)
CINDEX	−0.024***	−0.267***	−0.184***	−0.456***	−0.223***	−0.414***	−0.000	−0.418***
	(-7.52)	(-31.71)	(−22.94)	(-29.21)	(-25.83)	(-25.74)	(-0.10)	(-24.47)
PUBLIC × CINDEX	0.014***	0.153***	0.124***	0.312***	0.121***	0.278***	0.008**	0.250***
	(3.53)	(14.47)	(12.49)	(16.29)	(11.17)	(14.01)	(2.13)	(11.86)
R-squared	0.57	0.28	0.22	0.22	0.29	0.22	0.34	0.21
Panel C: By rule of law								
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
PUBLIC	0.000	0.198***	0.102***	0.231***	0.058*	0.095*	0.020	0.105*
	(0.02)	(7.22)	(3.56)	(4.56)	(1.89)	(1.73)	(1.40)	(1.72)
LAW	0.006***	0.017***	0.027***	0.048***	0.018***	0.046***	0.006***	0.042***
	(4.46)	(6.77)	(9.45)	(9.63)	(6.23)	(8.56)	(3.92)	(6.99)
PUBLIC × LAW	0.000	−0.014***	−0.007**	−0.012**	0.000	0.002	−0.006***	−0.003
	(0.27)	(-4.34)	(-2.03)	(-2.07)	(0.06)	(0.23)	(-3.75)	(-0.49)
R-squared	0.57	0.23	0.20	0.18	0.26	0.19	0.34	0.18
Panel D: By anti-director rights index								
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
PUBLIC	0.004	0.088***	0.078***	0.192***	0.063***	0.165***	−0.022***	0.100***
	(1.09)	(10.17)	(9.05)	(12.00)	(6.67)	(9.71)	(-5.78)	(5.40)
ANTDIR	0.005***	0.046***	0.032***	0.079***	0.039***	0.072***	0.002***	0.076***
	(7.01)	(28.11)	(19.47)	(25.94)	(22.68)	(22.57)	(2.94)	(21.71)
PUBLIC × ANTDIR	−0.000	−0.008***	−0.012***	−0.025***	−0.005*	−0.022***	−0.003***	−0.014**
	(-0.24)	(-2.96)	(-4.75)	(-5.25)	(-1.69)	(-4.29)	(-3.23)	(-2.55)
R-squared	0.57	0.25	0.21	0.20	0.27	0.20	0.34	0.20
	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
Panel E: By investor protection index								
	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)
PUBLIC	0.000	0.090***	0.069***	0.175***	0.052***	0.137***	−0.019***	0.077***
	(0.01)	(11.21)	(8.45)	(11.64)	(5.85)	(8.57)	(-5.16)	(4.43)
INVPR	0.001***	0.006***	0.004***	0.010***	0.005***	0.009***	0.000***	0.009***
	(7.97)	(29.98)	(21.73)	(28.25)	(24.18)	(24.55)	(3.57)	(23.31)
PUBLIC x INVPR	0.000	−0.001***	−0.001***	−0.003***	−0.000	−0.002***	−0.000***	−0.001**
	(0.60)	(-3.91)	(-4.43)	(-5.11)	(-1.11)	(-3.43)	(-4.04)	(-1.98)
R-squared	0.58	0.25	0.21	0.21	0.28	0.21	0.34	0.20
Panel F: By disclosure index								
	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)
PUBLIC	0.008	0.084***	0.073***	0.220***	0.048***	0.165***	−0.018***	0.076***
	(1.42)	(7.09)	(6.05)	(9.94)	(3.68)	(6.99)	(-3.09)	(2.95)
DISCIN	0.029***	0.292***	0.212***	0.509***	0.223***	0.435***	−0.004	0.408***
	(4.24)	(18.92)	(13.75)	(17.60)	(13.74)	(14.34)	(-0.55)	(12.34)
PUBLIC x DISCIN	−0.003	0.001	−0.033*	−0.120***	0.031	−0.061	−0.026***	0.022
	(-0.34)	(0.07)	(-1.74)	(-3.36)	(1.48)	(-1.63)	(-3.03)	(0.53)
R-squared	0.57	0.25	0.21	0.20	0.27	0.20	0.34	0.19
Panel G: By book-tax conformity								
	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)
PUBLIC	−0.002	−0.016***	−0.029***	−0.028***	−0.022***	−0.042***	−0.025***	−0.077***
	(-0.68)	(-3.03)	(-4.90)	(-2.76)	(-3.39)	(-3.73)	(-8.29)	(-6.03)
BKTAX	−0.005	−0.075***	−0.061***	−0.143***	−0.071***	−0.144***	0.001	−0.138***
	(-1.47)	(-16.58)	(-10.18)	(-15.30)	(-11.55)	(-12.97)	(0.32)	(-10.35)
PUBLIC x BKTAX	0.014***	0.164***	0.130***	0.272***	0.144***	0.269***	−0.015***	0.270***
	(3.20)	(22.63)	(15.95)	(19.53)	(16.44)	(17.28)	(-3.42)	(15.25)
R-squared	0.57	0.23	0.20	0.18	0.26	0.19	0.34	0.18
Panel H: By ownership concentration index								
	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)
PUBLIC	0.002	0.046***	0.017**	0.050***	0.050***	0.061***	−0.049***	0.045***
	(0.73)	(5.56)	(2.18)	(3.35)	(5.84)	(3.91)	(-15.81)	(2.74)
OWNC	−0.040***	−0.344***	−0.267***	−0.613***	−0.282***	−0.547***	−0.011**	−0.542***
	(-8.35)	(-31.19)	(-24.22)	(-29.62)	(-24.26)	(-25.20)	(-2.13)	(−22.97)

(*continued on next page*)

Table 6 (*continued*)

	|ACFO|	|ADISX|	|APROD|	|REM1|	|REM2|	|REM_agg|	|AEM|	|TEM|
PUBLIC x OWNC	−0.000	0.013	0.023	0.089***	−0.032*	0.028	0.043***	−0.027
	(-0.06)	(0.82)	(1.52)	(3.18)	(-1.94)	(0.94)	(6.57)	(-0.83)
R-squared	0.57	0.27	0.22	0.22	0.28	0.22	0.34	0.21

Notes: OLS regressions based on all sample observations for 11 European countries between 2006 and 2018. *t*-statistics shown in parentheses based on robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. See Appendix 1 for variable definitions.

here for H2. One possible reason why we observe inconsistent results is that the role of investor protection in shaping the REM gap is more nuanced than we at first hypothesized. For instance, differences in the impact of investor protections on REM of public and private firms may depend on the intensity of capital market pressures, or on the tax incentives or costs of REM. By restricting firm-level differences with a matched sample we obtain somewhat stronger evidence of a REM gap impact of investor protections, and this indeed suggests firm-level circumstances matter. However, the overall REM gap impact of investor protections appear modest at best. Therefore, they do not appear to play a sizable role in explaining international differences in the public–private firm REM gap. Finally, the result for ownership concentration (H4) appears to weaken, although the overall REM gap impacts of ownership concentration are visibly small in any case.

5. Conclusion

Using a broad sample of firms domiciled across 11 EU countries, this paper examines how and why differences in the extent of real earnings management (REM) between publicly listed and privately held firms (the REM gap) are shaped by the institutional environment in which firms operate. This is important because investors and other stakeholders routinely draw comparisons between public and private firms using financial statement information for valuation purposes. Understanding how public and private firms' REM differences are affected by institutional factors should, therefore, help financial statement users to draw better comparisons.

We provide strong, cross-country evidence that publicly listed firms engage in greater levels of REM activity than privately held firms, but that the magnitude of the public–private difference in REM is dependent, inter alia, on the institutional environment that prevails. We observe a more pronounced REM gap between public and private firms in weaker markets, as compared with more liberal markets, such as the UK. The REM gap is also found to be significantly larger in higher book-tax conformity regimes. We also find strong and consistent evidence of a partial substitution effect between REM and AEM activity: in general, an increase in REM gap is, to some extent, but not wholly, off-set by a reduction in AEM gap (and vice-versa).

Our findings are of importance as they provide generalizable insight on public and private firms' engagement in value-destroying REM practices. While planned or opportunistic REM practices help to meet short-term market expectations, they are damaging to owners' wealth over the longer term. Our findings should, therefore, be of interest to accounting standard setters and regulators globally as they shed light on the REM impact of national institutions which they play a key role in developing. We highlight important differences in REM implications across public and private firms in distinct institutional environments. Insights from this study also provide policymakers with options to potentially address REM levels and the REM gap within their jurisdictions, thus, potentially improving financial statement quality and comparability.

Our study is subject to the following limitations. First, while the accounting standards employed by public companies are relatively uniform across the 11 countries in our sample, accounting standards applied by private firms commonly differ both from those applied in-country by public firms, and to a lesser extent by firms across national borders. Therefore, there is a small possibility that differences in REM measures are partially explained by systematic differences in accounting as opposed to systematic differences in REM activity. Second, while we consider a broad range of institutional dimensions which have clear REM implications, other institutional factors may also affect the REM gap to lesser or greater extents, such as legal enforcement, union strength, and press freedom. Future studies could add further richness in this regard. Third, while we draw a broad distinction between REM incentives of public and private firms, future research on how the REM gap varies across private firm types, such as standalone versus business groups, may be insightful. Fourth, the seven measures of REM and AEM we employ capture (imperfectly) only some of the means how firms may manage earnings. Therefore, future studies could contribute further by conducting analyses between public and private firms based on alternative earnings management techniques.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Variable definitions.

Variables	Definitions
PUBLIC	Dummy variable set to 1 for public firms and 0 for privately held firms.
ACFO	Abnormal cash flow from operations, as defined in Section 3.2.
APROD	Abnormal production costs, as defined in Section 3.2
ADISX	Abnormal discretionary expenses, as defined in Section 3.2
REM1	Composite REM measure, calculated as the sum of APROD and ADISX.
REM2	Composite REM measure, calculated as the sum of ACFO and ADISX.
REM_agg	Composite REM measure, calculated as the sum of APROD, ACFO, and ADISX.
AEM	Accruals earnings management measure, as defined in Section 3.2.
TEM	Total earnings management measure, calculated as the sum of REM_agg and AEM.
SIZE	Firm size, calculated as the natural logarithm of total assets.
ROE	Return on equity ratio, calculated as net income before extraordinary items divided by the book value of equity.
LOSS	Cumulative proportion of years in which a loss was reported since the beginning of the sample period.
E_vol	Earnings volatility, calculated as the standard deviation of ROA, estimated for each firm over the whole sample period provided a minimum of three years of observations is available.
LEV	Financial leverage, calculated as total debt divided by total assets.
GROWTH	Proportion change in total assets since the previous year.
OPCYCLE	The operating cycle of the firm, being the average time between the outlay of cash required to produce goods and the ultimate cash receipt from customers, calculated as: (inventory/cost of sales + receivable/sales)/365.
INV	The proportion of assets represented by inventory, calculated as inventory divided by total assets.
ZSCORE	The Taffler (1983) Z-score, calculated as: 3.2 + 12.18*profit before tax/current liabilities + 2.5*current assets/total liabilities–10.68*current liabilities/total assets + 0.029*(quick assets – current liabilities)/daily operating expenses.
EM_control	Earnings management control, being AEM in model when the dependent variable is an REM measure, and REM_agg in models when AEM is the dependent variable.
UK	Dummy variable set to 1 for UK firms and 0 otherwise.
CINDEX	Country-level coordination index of Hall & Gingerich (2009), whereby values closer to 0 indicate the firm's country of incorporation more closely approximates a liberal market setting (LME), while values closer to 1 indicate weaker market setting (CME).
LAW	Country-level rule of law index, as per La Porta et al. (1998). This rule of law index proxies the strength of tradition for law and order in a country. It ranges from 0 to 10.
ANTDIR	Country-level anti-director rights index of La Porta et al. (1998) as revised by Djankov et al. (2008). This anti-director rights index proxies the strength of a country's legal system in protecting minority shareholders against managers or dominant shareholders in the corporate decision-making process. It ranges from 0 to 5.
INVPR	Country-level investor protection index, calculated as the product of LAW and ANTDIR.
DISCIN	Country-level disclosure index of La Porta et al. (2006). This disclosure requirements index is calculated as the arithmetic mean of six indices which seek to capture the strength of regulation on disclosures relating to: (i) prospectus; (ii) compensation; (iii) shareholders; (iv) inside ownership; (v) irregular contracts; and (vi) transactions. It and its constituents, range from 0 to 1.
BKTAX	Country-level book-tax conformity, as per Atwood et al. (2010).
ONWC	Country-level ownership concentration levels, as per Atwood et al. (2010).

References

Achleitner, A. K., Günther, N., Kaserer, C., & Siciliano, G. (2014). Real earnings management and accrual-based earnings management in family firms. *European Accounting Review, 23*(3), 431–461. https://doi.org/10.1080/09638180.2014.895620.

Alhadab, M., & Clacher, I. (2018). The impact of audit quality on real and accrual earnings management around IPOs. *British Accounting Review, 50*(4), 442–461. https://doi.org/10.1016/j.bar.2017.12.003.

Alhadab, M., Clacher, I., & Keasey, K. (2015). Real and accrual earnings management and IPO failure risk. *Accounting and Business Research, 45*(1), 55–92. https://doi.org/10.1080/00014788.2014.969187.
Ali, A., & Hwang, L. S. (2000). Country-specific factors related to financial reporting and the value relevance of accounting data. *Journal of Accounting Research, 38*(1), 1–21. https://doi.org/10.2307/2672920.
Anagnostopoulou, S. C., & Tsekrekos, A. E. (2017). The effect of financial leverage on real and accrual-based earnings management. *Accounting and Business Research, 47*(2), 191–236. https://doi.org/10.1080/00014788.2016.1204217.
Accounting Standards Board (ASB) & European Financial Reporting Advisory Group (EFRAG) (2012). *Considering the effect of accounting standards*. Position Paper. Retrieved from https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FProject%20Documents%2F217%2F120926_Final_Position_Paper_ES.pdf (Accessed 21 October 2019)
Atwood, T. J., Drake, M. S., & Myers, L. A. (2010). Book-tax conformity, earnings persistence and the association between earnings and future cash flows. *Journal of Accounting and Economics, 50*(1), 111–125. https://doi.org/10.1016/j.jacceco.2009.11.001.
Atwood, T. J., Drake, M. S., Myers, J. N., & Myers, L. A. (2012). Home country tax system characteristics and corporate tax avoidance: International evidence. *The Accounting Review, 87*(6), 1831–1860. https://doi.org/10.2308/accr-50222.
Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics, 39*(1), 83–128. https://doi.org/10.1016/j.jacceco.2004.04.001.
Bartov, E., Givoly, D., & Hayn, C. (2002). The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics, 33*(2), 173–204. https://doi.org/10.1016/S0165-4101(02)00045-9.
Bekiris, F. V., & Doukakis, L. C. (2011). Corporate governance and accruals earnings management. *Managerial and Decision Economics, 32*(7), 439–456. https://doi.org/10.1002/mde.1541.
Blaylock, B., Gaertner, F., & Shevlin, T. (2015). The association between book-tax conformity and earnings management. *Review of Accounting Studies, 20*(1), 141–172. https://doi.org/10.1007/s11142-014-9291-x.
Bonacchi, M., Marra, A., & Zarowin, P. (2019). Organizational structure and earnings quality of private and public firms. *Review of Accounting Studies, 24*(3), 1066–1113. https://doi.org/10.1007/s11142-019-09495-y.
Burgstahler, D., & Chuk, E. (2017). What have we learned about earnings management? Integrating discontinuity evidence. *Contemporary Accounting Research, 34*(2), 726–749. https://doi.org/10.1111/1911-3846.12301.
Burgstahler, D. C., Hail, L., & Leuz, C. (2006). The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review, 81*(5), 983–1016. https://doi.org/10.2308/accr.2006.81.5.983.
Chan, L. H., Chen, K. C., Chen, T. Y., & Yu, Y. (2015). Substitution between real and accruals-based earnings management after voluntary adoption of compensation clawback provisions. *The Accounting Review, 90*(1), 147–174. https://doi.org/10.2308/accr-50862.
Chen, F., Hope, O., Li, Q., & Wang, X. (2011). Financial reporting quality and investment efficiency of private firms in emerging markets. *The Accounting Review, 86*(4), 1255–1288. https://doi.org/10.2308/accr-10040.
Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and accrual-based earnings management in the pre-and post-Sarbanes-Oxley periods. *The Accounting Review, 83*(3), 757–787. https://doi.org/10.2308/accr.2008.83.3.757.
Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics, 50*(1), 2–19. https://doi.org/10.1016/j.jacceco.2010.01.002.
Coppens, L., & Peek, E. (2005). An analysis of earnings management by European private firms. *Journal of International Accounting, Auditing and Taxation, 14*(1), 1–17. https://doi.org/10.1016/j.intaccaudtax.2005.01.002.
Cram, D. P., Karan, V., & Stuart, I. (2009). Three threats to validity of choice-based and matched-sample studies in accounting research. *Contemporary Accounting Research, 26*(2), 477–516. https://doi.org/10.1506/car.26.2.7.
Dahya, J., Dimitrov, O., & McConnell, J. J. (2008). Dominant shareholders, corporate boards, and corporate value: A cross-country analysis. *Journal of Financial Economics, 87*(1), 73–100. https://doi.org/10.1016/j.jfineco.2006.10.005.
Dechow, P. M., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons, 14*(2), 235–250. https://doi.org/10.2308/acch.2000.14.2.235.
DeFond, M., Hung, M., & Trezevant, R. (2007). Investor protection and the information content of annual earnings announcements: International evidence. *Journal of Accounting and Economics, 43*(1), 37–67. https://doi.org/10.1016/j.jacceco.2006.09.001.
Desai, M. A. (2005). The degradation of reported corporate profits. *Journal of Economic Perspectives, 19*(4), 171–192. https://doi.org/10.1257/089533005775196705.
Dhaliwal, D. S., Salamon, G. L., & Smith, E. D. (1982). The effect of owner versus management control on the choice of accounting methods. *Journal of Accounting and Economics, 4*(1), 41–53. https://doi.org/10.1016/0165-4101(82)90005-2.
Dierynck, B., Landsman, W. R., & Renders, A. (2012). Do managerial incentives drive cost behavior? Evidence about the role of the zero earnings benchmark for labor cost behavior in private Belgian firms. *The Accounting Review, 87*(4), 1219–1246. https://doi.org/10.2308/accr-50153.
Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The law and economics of self-dealing. *Journal of Financial Economics, 88*(3), 430–465. https://doi.org/10.1016/j.jfineco.2007.02.007.
Doukakis, L. C. (2014). The effect of mandatory IFRS adoption on real and accrual-based earnings management activities. *Journal of Accounting and Public Policy, 33*(6), 551–572. https://doi.org/10.1016/j.jaccpubpol.2014.08.006.
Enomoto, M., Kimura, F., & Yamaguchi, T. (2015). Accrual-based and real earnings management: An international comparison for investor protection. *Journal of Contemporary Accounting & Economics, 11*(3), 183–198. https://doi.org/10.1016/j.jcae.2015.07.001.
Francis, B., Hasan, I., & Li, L. (2016). A cross-country study of legal-system strength and real earnings management. *Journal of Accounting and Public Policy, 35*(5), 477–512. https://doi.org/10.1016/j.jaccpubpol.2016.06.004.
Francis, J. R., Khurana, I. K., & Pereira, R. (2005). Disclosure incentives and effects on cost of capital around the world. *The Accounting Review, 80*(4), 1125–1162. https://doi.org/10.2308/accr.2005.80.4.1125.
Givoly, D., Hayn, C. K., & Katz, S. P. (2010). Does public ownership of equity improve earnings quality? *The Accounting Review, 85*(1), 195–225. https://doi.org/10.2308/accr.2010.85.1.195.
Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics, 40*(1), 3–73. https://doi.org/10.1016/j.jacceco.2005.01.002.
Gunny, K. A. (2010). The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary Accounting Research, 27*(3), 855–888. https://doi.org/10.1111/j.1911-3846.2010.01029.x.
Haga, J., Höglund, H., & Sundvik, D. (2018). Stock market listing status and real earnings management. *Journal of Accounting and Public Policy, 37*(5), 420–435. https://doi.org/10.1016/j.jaccpubpol.2018.09.002.
Hall, P. A., & Soskice, D. (Eds.). (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford: Oxford University Press.
Hall, P. A., & Gingerich, D. W. (2009). Varieties of capitalism and institutional complementarities in the political economy: An empirical analysis. *British Journal of Political Science*, 449–482. https://doi.org/10.1017/S0007123409000672.
Haw, I. M., Hu, B., Hwang, L. S., & Wu, W. (2004). Ultimate ownership, income management, and legal and extra-legal institutions. *Journal of Accounting Research, 42*(2), 423–462. https://doi.org/10.1111/j.1475-679X.2004.00144.x.
Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons, 13*(4), 365–383. https://doi.org/10.2308/acch.1999.13.4.365.
Herrmann, D., Hope, O., Payne, J. L., & Thomas, W. B. (2011). The market's reaction to unexpected earnings thresholds. *Journal of Business Finance & Accounting, 38*(1–2), 34–57. https://doi.org/10.1111/j.1468-5957.2010.02230.x.

Hope, O., Thomas, W. B., & Vyas, D. (2013). Financial reporting quality of U.S. private and public firms. *The Accounting Review, 88*(5), 1715–1742. https://doi.org/10.2308/accr-50494.
Hribar, P., & Collins, D. W. (2002). Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research, 40*(1), 105–134. https://doi.org/10.1111/1475-679X.00041.
Ipino, E., & Parbonetti, A. (2017). Mandatory IFRS adoption: The trade-off between accrual-based and real earnings management. *Accounting and Business Research, 47*(1), 91–121. https://doi.org/10.1080/00014788.2016.1238293.
Jiang, H., Habib, A., & Wang, S. (2018). Real earnings management, institutional environment, and future operating performance: An international study. *The International Journal of Accounting, 53*(1), 33–53. https://doi.org/10.1016/j.intacc.2018.02.004.
Kałdoński, M., & Jewartowski, T. (2020). Do firms using real earnings management care about taxes? Evidence from a high book-tax conformity country. *Finance Research Letters, 35*. https://doi.org/10.1016/j.frl.2019.101351 101351.
Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics, 39*(1), 163–197. https://doi.org/10.1016/j.jacceco.2004.11.002.
La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (2006). What works in securities laws? *The Journal of Finance, 61*(1), 1–32. https://doi.org/10.1111/j.1540-6261.2006.00828.x.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance, 52*(3), 1131–1150. https://doi.org/10.1111/j.1540-6261.1997.tb02727.x.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113–1155. https://doi.org/10.1086/250042.
La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance, 54*(2), 471–517. https://doi.org/10.1111/0022-1082.00115.
Lang, M., Lins, K. V., & Maffett, M. (2012). Transparency, liquidity, and valuation: International evidence on when transparency matters most. *Journal of Accounting Research, 50*(3), 729–774. https://doi.org/10.1111/j.1475-679X.2012.00442.x.
Lee, N., & Swenson, C. (2012). Are multinational corporate tax rules as important as tax rates? *The International Journal of Accounting, 47*(2), 155–167. https://doi.org/10.1016/j.intacc.2012.03.001.
Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics, 69*(3), 505–527. https://doi.org/10.1016/S0304-405X(03)00121-1.
Munari, F., Oriani, R., & Sobrero, M. (2010). The effects of owner identity and external governance systems on R&D investments: A study of Western European firms. *Research Policy, 39*(8), 1093–1104. https://doi.org/10.1016/j.respol.2010.05.004.
Nobes, C. W. (1998). Towards a general model of the reasons for international differences in financial reporting. *Abacus, 34*(2), 162–187. https://doi.org/10.1111/1467-6281.00028.
Nobes, C. W. (2008). Accounting classification in the IFRS era. *Australian Accounting Review, 18*(3), 191–198. https://doi.org/10.1111/j.1835-2561.2008.0024.x.
Nobes, C. W., & Parker, R. B. (2010). *Comparative international accounting*. Harlow, UK: Pearson Education Limited.
Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002.
Shivakumar, L. (2013). The role of financial reporting in debt contracting and in stewardship. *Accounting and Business Research, 43*(4), 362–383. https://doi.org/10.1080/00014788.2013.785683.
Sundvik, D. (2017). Book-tax conformity and earnings management in response to tax rate cuts. *Journal of International Accounting, Auditing and Taxation, 28*, 31–42. https://doi.org/10.1016/j.intaccaudtax.2016.12.003.
Taffler, R. J. (1983). The assessment of company solvency and performance using a statistical model. *Accounting and Business Research, 13*(52), 295–308. https://doi.org/10.1080/00014788.1983.9729767.
Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics, 50*(1), 63–99. https://doi.org/10.1016/S0304-405X(98)00032-4.
Van Essen, M., Van Oosterhout, J., & Heugens, P. P. (2013). Competition and cooperation in corporate governance: The effects of labor institutions on blockholder effectiveness in 23 European countries. *Organization Science, 24*(2), 530–551. https://doi.org/10.1287/orsc.1120.0742.
Van Tendeloo, B., & Vanstraelen, A. (2008). Earnings management and audit quality in Europe: Evidence from the private client segment market. *European Accounting Review, 17*(3), 447–469. https://doi.org/10.1080/09638180802016684.
Visani, F., Di Lascio, F. M. L., & Gardini, S. (2020). The impact of institutional and cultural factors on the use of non-GAAP financial measures. International evidence from the oil and gas industry. *Journal of International Accounting, Auditing and Taxation, 40*. https://doi.org/10.1016/j.intaccaudtax.2020.100334 100334.
Whitaker, C. (2006). How to build a bridge: Eliminating the Book-Tax Accounting Gap. *The Tax Lawyer, 59*(4), 981–1020 https://www.jstor.org/stable/20772638.
Wongsunwai, W. (2013). The effect of external monitoring on accrual-based and real earnings management: Evidence from venture-backed initial public offerings. *Contemporary Accounting Research, 30*(1), 296–324. https://doi.org/10.1111/j.1911-3846.2011.01155.x.
Zalata, A. M., & Roberts, C. (2018). Managing earnings using classification shifting: UK evidence. *Journal of International Accounting, Auditing and Taxation, 29*(1), 52–65. https://doi.org/10.1016/j.intaccaudtax.2017.04.001.
Zang, A. Y. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review, 87*(2), 675–703. https://doi.org/10.2308/accr-10196.
Zhao, Y., Chen, K. H., Zhang, Y., & Davis, M. (2012). Takeover protection and managerial myopia: Evidence from real earnings management. *Journal of Accounting and Public Policy, 31*(1), 109–135. https://doi.org/10.1016/j.jaccpubpol.2011.08.004.