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The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms

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ABSTRACT: This paper examines how capital market pressures and institutional factors shape firms' incentives to report earnings that reflect economic performance. To isolate the effects of reporting incentives, we exploit the fact that, within the European Union, privately held corporations face the same accounting standards as publicly traded companies because accounting regulation is based on legal form. We focus on the level of earnings management as one dimension of accounting quality that is particularly responsive to firms' reporting incentives. We document that private firms exhibit higher levels of earnings management and that strong legal systems are associated with less earnings management in private and public firms. We also provide evidence that private and public firms respond differentially to institutional factors, such as book-tax alignment, outside investor protection, and capital market structure. Moreover, legal institutions and capital market forces often appear to reinforce each other.

Keywords: *international accounting; earnings management; private companies; legal system; accounting harmonization; earnings properties.*

JEL Classification: *G14, G15, G30, G32, K22, M41.*

I. INTRODUCTION

Much of the international accounting debate has focused on accounting standards per se, which are often viewed as the primary input for high-quality accounting (e.g., Levitt 1998). Consistent with this view, harmonization efforts within the European Union have largely focused on eliminating differences in accounting standards across countries or adopting a common set of standards (e.g., Van Hulle 2004). However, it is important to also examine the role of institutional factors and capital market forces in shaping firms' incentives to report informative earnings. The application of standards involves judgment and underlying measurements are often based on private information. The resulting discretion can be used by corporate insiders either to make reported earnings more informative about the firm's economic performance or to serve other and less benign interests. For this reason, reporting incentives and the forces shaping them are likely to play an integral role for accounting quality. While this insight is not new (e.g., Watts and Zimmerman 1986), it is often overlooked in international standard setting.[1]

To empirically document the importance of reporting incentives, we examine the properties of reported earnings of private and public firms in the European Union (EU). The European setting provides a unique opportunity because EU accounting regulation is based on a firm's legal form, rather than listing status. Thus, private limited companies face largely the same accounting standards as publicly traded corporations, but are subject to very different capital market forces. This feature allows us to study the role of reporting incentives and the demand for information created by public equity markets, both of which are issues of fundamental economic importance. Several prior studies suggest that equity markets have a negative impact on accounting quality (e.g., Teoh et al. 1998a, 1998b; Beatty et al. 2002). However, these studies are either limited to specific industries or major corporate events. Thus, the first-order effect of public equity markets on accounting quality is still an open issue and one that we can analyze in the EU setting. The setting also allows us to examine the effects of cross-country variation in firms' institutional environments and to explore how legal institutions and capital market forces interact in shaping the reporting behavior of private and public firms.

We hypothesize that capital markets as well as critical aspects of a firm's institutional environment determine the role of earnings, e.g., its importance in resolving information asymmetries and in communicating with outside parties (e.g., Watts and Zimmerman 1986; Ball 2001). This role in turn influences how corporate insiders use reporting discretion, which crucially determines the properties of reported earnings.

The use of discretion and the resulting informativeness (or opacity) of earnings are difficult to measure because true economic performance is unobservable. Previous work in international accounting has often focused on the conservatism dimension of accounting quality, i.e., the extent to which losses are incorporated into earnings on a timely basis (e.g., Ball et al. 2000; Ball et al. 2003; Ball et al. 2005; Bushman and Piotroski 2006; Peek et al. 2006). As accounting quality is a broad concept with multiple dimensions, it is important to extend empirical results beyond the conservatism dimension. In this study, we focus on another dimension of accounting quality, namely the degree of earnings management.[2] We rely on an earnings management index suggested by Leuz et al. (2003), which

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[1] More frequently, standard setters recognize the importance of enforcement institutions as a determinant of earnings quality. For instance, Tweedie and Seidenstein (2005) note that a "sound financial reporting infrastructure" must consist of "an enforcement or oversight mechanism that ensures that the principles as laid out by the accounting and auditing standards are followed."

[2] There are other dimensions of accounting quality, e.g., how well earnings predict future cash flows. See Dechow and Schrand (2004) for a definition and a synthesis of the earnings quality literature.

is based on four different proxies. The underlying measures are designed to capture a variety of earnings management practices, such as earnings smoothing and accrual manipulations.[3] We also conduct sensitivity analyses using alternative earnings management metrics similar to those used by Lang et al. (2003) and Lang et al. (2006) as well as measures of conservatism. Our results are similar across these measures and consistent with the idea that all these measures capture aspects of earnings informativeness.

We document substantial variation in earnings informativeness across private and public firms from 13 EU countries, despite decades of accounting harmonization. More importantly, we show that differences in firms' reporting incentives explain this variation. In particular, we find that earnings management is more pervasive in private firms than in publicly traded firms. Thus, contrary to recent allegations that capital markets exacerbate incentives to manage earnings, our findings suggest that the first-order effect of public equity markets is to improve earnings informativeness, either by providing incentives to make earnings more informative or, alternatively, by screening out firms with less informative earnings in the going public process. We also document that earnings management is more pronounced in countries with weaker legal systems and enforcement. This finding holds for both private and public firms and highlights the central importance of enforcement mechanisms.

Moving beyond general characterizations of legal systems, we explore the interaction between market forces and other institutional variables that have the potential to differentially affect private and public firms: (1) the degree of alignment between financial and tax accounting, (2) remaining differences in EU accounting rules, (3) the level of required disclosures in public securities offerings and associated enforcement, (4) the level of minority-shareholder protection, and (5) the structure and activity of capital markets.

The analysis of these interactions supports our earlier finding that capital market forces, by and large, improve the informativeness of earnings. We document that stronger tax alignment is associated with more earnings management, but this effect is mitigated for public firms. We find that legal institutions designed to facilitate equity financing at arm's length in public markets, such as strong minority-shareholder rights and extensive disclosure requirements, are associated with lower levels of earnings management primarily for publicly traded firms, suggesting that markets and institutions reinforce each other. Finally, in countries with large and highly developed equity markets, public firms engage in even less earnings management, which again suggests that strong capital markets and arm's-length financing improve earnings informativeness.

Our study contributes to the literature in several ways. First, by comparing the reporting behavior of private and public firms, we shed light on the first-order effects of public equity markets. Prior evidence on differences in earnings quality between public and private firms is conflicting, and either confined to a particular country (Vander Bauwhede et al. 2003; Ball and Shivakumar 2005), a single regulated industry (Beatty and Harris 1999; Beatty et al. 2002) or specific corporate events (Teoh et al. 1998a, 1998b). Our paper adds to this limited body of work by examining a large sample of public and private firms across many industries and countries, and outside of specific corporate events. Our findings generally

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[3] We use earnings management as a measure of accounting quality for several reasons. First, earnings management measures should be particularly responsive to the use of discretion and firms' reporting incentives, increasing the power of our tests. Second, the measures are widely used and have been shown to produce plausible rankings of earnings informativeness (e.g., Lang et al. 2003; Wysocki 2004; Lang et al. 2006). Third, by showing the robustness of our findings across multiple measures, we are able to minimize concerns that results are attributable to spurious relations of any particular measure.

support the notion that the first-order effect of capital market forces is to improve reporting quality.

Second, we contribute to a fairly recent literature that analyzes the effects of capital market incentives on the properties of reported earnings but is limited to public firms (e.g., Ball et al. 2005; Bushman and Piotroski 2006). Data on private and public firms allows us to shed light on the interplay of market forces stemming from public equity with legal institutions that facilitate arm's-length financing in public markets, such as minority-shareholder protection and securities regulation. Moreover, we can study the extent to which equity-based financial systems and highly developed capital markets explain differences in reporting behavior. Our findings suggest that these institutions and capital market characteristics tend to reinforce the first-order effect of publicly traded equity.

Third, there is little evidence on how institutional factors shape the reporting behavior of private firms. With the exception of a concurrent study by Peek et al. (2006) that looks at earnings conservatism across a sample of private and public EU firms, prior work documents institutional effects on firms' reporting behavior using public firms only (e.g., Ali and Hwang 2000; Ball et al. 2000; Fan and Wong 2002; Ball et al. 2003; Leuz et al. 2003; Bushman et al. 2004). While it is safe to assume that institutions affect private firms as well, it is *a priori* not obvious in what way. We show that there are some institutions like legal enforcement that matter to both public and private firms. But there are others, such as tax alignment, where the negative effect on reporting quality differs across public and private firms, displaying the mitigating influence of market forces.

Finally, our paper contributes to the regulatory issue of accounting harmonization (e.g., Gernon and Wallace 1995; Saudagaran and Meek 1997) and the debate on accounting convergence (Joos and Lang 1994; Land and Lang 2002; Bradshaw and Miller 2005; Joos and Wysocki 2004). Our paper provides evidence supporting the conjecture that effective accounting harmonization is unlikely to be achieved by accounting standards alone (e.g., Ball 2001).

The paper is organized as follows. Section II develops our hypotheses. Section III describes the data and the research design. In Section IV, we present the evidence on the relation between listing status, legal enforcement, and earnings management. In Section V, we analyze the role of additional institutional factors that have the potential to differentially affect private and public firms. Section VI concludes.

II. THE EFFECT OF CAPITAL MARKETS AND INSTITUTIONAL FACTORS ON REPORTED EARNINGS

Our analysis is based on the recognition that accounting standards provide considerable discretion to firms in preparing their financial statements. Corporate insiders can use their private information to report earnings that more accurately reflect firm performance and are more informative to outside parties. However, if earnings play a minor role in communicating performance to outsiders, then insiders are unlikely to do so. Instead, reporting choices may be governed by other considerations, e.g., by the desire to minimize taxes or determine dividend payments. Moreover, corporate insiders can use reporting discretion to hide poor economic performance, achieve certain earnings targets, or avoid covenant violations. Given insiders' information advantage, it is difficult to constrain such behavior.[4]

These arguments suggest that factors that define the role of earnings and shape firms' reporting incentives play an integral role in determining the properties of reported earnings,

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[4]   Note, however, that this is not just an enforcement issue. Even when holding the level of enforcement constant, reporting behavior will differ as long as firms have some discretion and their incentives differ.

such as their informativeness to corporate outsiders (e.g., Ball et al. 2000).[5] We argue that capital market forces and the home country's institutional features are such factors.

Capital Market Forces

Privately held firms and those with publicly traded equity securities face very different demands for accounting information. External financing in public equity markets creates the demand for information that is useful in evaluating and monitoring the firm. Arm's-length equity investors do not have private access to corporate information and rely heavily on *public* information, such as financial statements and reported earnings. If the quality of this information is poor, then outside investors will be reluctant to supply capital to firms. As a result, publicly traded firms have stronger incentives to provide financial statements that help outsiders assess economic performance. In addition, the going public process may screen out firms with less informative earnings that are difficult to evaluate for outside investors. Thus, regardless of the mechanism, being public is likely to be associated with higher reporting quality.

In contrast, privately held firms have relatively concentrated ownership structures and hence can efficiently communicate among shareholders via *private* channels. Because financial statements and reported earnings assume a less important role in communicating firm performance, private firms have relatively fewer incentives to report informative earnings.[6] Accordingly, private firms can place greater relative weight on different roles for reported earnings than can public firms. For instance, it is of a lesser concern to private firms that managing earnings to minimize taxes may make earnings less informative to outsiders. Alternatively, earnings can be used in determining dividends and other payouts to firms' stakeholders. As in Ball and Shivakumar (2005), we argue that these other uses are likely to render earnings of private firms less informative.

While these arguments suggest that the first-order effect of public securities markets is to create incentives to report earnings that reflect economic performance, we recognize that there are trade-offs and potentially important countervailing effects. For instance, controlling insiders in public firms might expropriate outside investors by consuming large private control benefits. As an attempt to hide these activities and prevent outsider intervention, they could mask firm performance by managing reported earnings (Leuz et al. 2003).[7] However, analogous arguments can be made for private firms that are highly levered and in financial distress. The fear of creditor interference in this situation and the subsequent loss of private control benefits can also create incentives to obfuscate true performance.[8] Moreover, insiders in private firms may attempt to transfer assets out of the firm, effectively expropriating the creditors, which in turn creates similar hiding incentives as described for public firms. Thus, there are specific situations in which both private and public firms have

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[5] This logic has also been exploited in the accounting choice and earnings management literature. See Watts and Zimmerman (1986), Healy and Wahlen (1999), and Dechow and Skinner (2000).

[6] In addition, private firms may have incentives to obfuscate firm performance because the EU requires them to file financial statements to the corporate registrar. In particular, family-owned private firms may try to hide true firm performance from employees and the general public.

[7] Other examples of forces that could give rise to more earnings management in public firms are managerial compensation contracts, debt covenants, particularly in public debt agreements, or political pressure. See Healy and Wahlen (1999) for a survey of the empirical evidence on these forces.

[8] Extensive creditor rights in many European countries make the threat of creditor intervention even more real for private firms. While it is common in some European countries that bank representatives sit on supervisory boards of public firms, making them effectively corporate insiders, banks rarely assume this role in private firms, for the most part because supervisory boards are less common. Therefore, reported performance is likely to be an important trigger for lender intervention.

strong incentives to misrepresent economic performance, but it is not clear whether there is a differential effect and how commonly these situations arise.

Another reason why capital markets can create incentives to manage reported earnings is related to earnings targets set for public firms. Beatty et al. (2002) argue that small investors in stock markets are more likely to rely on simple heuristics than fairly sophisticated private investors (e.g., banks), which makes public firms more likely to engage in accounting manipulations to meet or beat earnings targets. In a similar vein, Fischer and Stocken (2004) argue that analyst forecasts can create incentives to manipulate earnings. Consistent with these claims, Beatty and Harris (1999) and Beatty et al. (2002) present evidence from the U.S. banking industry suggesting that public banks engage in more earnings management than their private counterparts. However, as the banking industry is heavily regulated, which may result in unusual reporting incentives, it is not clear that the results extend to a more general setting. The same holds for earnings management documented around firms' seasoned equity offerings or initial public offerings (Teoh et al. 1998a, 1998b).

Thus, it is ultimately an empirical question to what extent these opposing effects prevail and whether capital markets push public firms to report earnings that are more informative about firm performance than do private firms. Accordingly, we formulate our tests as two-sided.

Enforcement Quality and Other Institutional Features

The home country's institutional framework also shapes reporting incentives. Prior work by La Porta et al. (1998) and La Porta et al. (1999) show that certain institutional structures encourage external equity financing and dispersed ownership structures, which in turn determines the role of earnings in reducing information asymmetries. Prior studies focus on summary measures for these institutional structures (e.g., legal origin) or on institutions that are primarily geared toward publicly traded firms (e.g., outside investor protection) and demonstrate that institutional differences influence the reporting behavior of public firms (e.g., Ball et al. 2000; Leuz et al. 2003; Bushman et al. 2004).

There is little evidence on how private firms respond to institutional factors. To address this void, we examine a number of key institutional features. The first factor is the quality of legal enforcement. Without proper enforcement, legal rules remain largely ineffective. Thus, we hypothesize that firms in countries with weak legal enforcement are more likely to abuse discretion afforded by the accounting rules. This logic is fairly general and should apply to both private and public firms. Holding everything else constant, a firm that operates in a country where courts are inefficient and the chance of prosecution is remote seems more likely to engage in earnings manipulations than in a country where courts are efficient.

We also examine four factors where we might expect a differential effect on public and private firms: (1) financial accounting and tax alignment, (2) differences in accrual accounting rules, (3) securities regulation and minority-shareholder protection, and (4) capital market structure. These are discussed in more detail below.

First, we analyze the effect of tax accounting on reported earnings numbers. Ball et al. (2000) hypothesize that the link between financial and tax accounting can play an important role in firms' reporting behavior.[9] Specifically, a close link between reported earnings and

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[9] However, there is little direct evidence supporting this hypothesis. The recent work by Coppens and Peek (2005) is a notable exception, suggesting that taxes could play a role in observed earnings distributions as well as firms' tendency to avoid losses.

taxable income is expected to muddle firms' incentives to report true economic performance (e.g., Alford et al. 1993). Moreover, it is plausible that the degree of tax alignment of financial accounting has a differential effect on private and public firms. As private firms are less reliant on earnings to communicate firm performance, it is less of a concern to private firms if they make earnings less informative in the process of minimizing taxes. In contrast, we expect public firms to be relatively less likely to sacrifice earnings informativeness.

Second, we examine the effect of accounting rules that are designed to produce timely and informative reported earnings. In principle, such accrual rules should have a positive effect on earnings informativeness of all firms, provided that they are properly enforced. However, accounting rules that make more extensive use of accruals provide more reporting discretion to firms and are more difficult to enforce. As a consequence, we hypothesize that the effect of accrual rules depends on firms' reporting incentives and, therefore, is likely to differ across private and public firms. That is, we expect accounting rules that make heavier use of accruals to be associated with less earnings management for public firms than private firms.

Third, we examine whether stricter disclosure rules in securities offerings and associated enforcement make it harder for firms to engage in earnings management and create incentives to reveal economic performance. However, as these rules apply only to firms with publicly traded securities, we expect to observe little or no effect for privately held firms. Similarly, strong minority-shareholder protection rules are designed to facilitate equity financing at arm's length in public markets and hence are expected to reduce earnings management primarily for publicly traded firms.

Fourth, we consider the effects of two important aspects of capital market structure, the extent to which the financial system is relatively more equity-market- or bank-based and the degree of financial development. Equity-based financial systems rely more on arm's-length financing and hence create demand for high-quality financial statements. In contrast, bank-based financial systems support relationship lending, which leads to more financial information being privately communicated, rather than via financial statements (see also, Bushman and Piotroski 2006). More generally, market forces faced by public firms are likely to be stronger when a country's capital markets are active and highly developed. Thus, we expect that these two capital market features are negatively associated with earnings management primarily for the public firms.

III. RESEARCH DESIGN AND DATA
Accounting Harmonization in the European Union

The European setting provides a unique opportunity to analyze the role of reporting incentives. First, there is a substantial range of institutional differences across Europe. For example, the U.K. is generally viewed as an outsider economy with legal institutions and accounting regulations designed to meet the demands of arm's-length financing in debt and equity markets (see e.g., Ball et al. 2000; Leuz et al. 2003). On the other end of the spectrum, Germany and Italy are typically referred to as insider economies where firms establish close relationships with banks and other financial intermediaries, and legal institutions and accounting rules are designed to facilitate debt contracting and relationship financing. The Netherlands and the Scandinavian countries are generally viewed as being somewhere in the middle.

Second, accounting regulation within the European Union is not based on listing status. Privately held companies with limited liability face largely the same accounting standards

as publicly traded corporations. Thus, within a given country, accounting standards are held constant across the two sets of firms. Moreover, accounting standards have been formally harmonized across EU countries for many years (Van Hulle 2004).

The cornerstones of EU accounting harmonization are the Fourth and the Seventh Directives. The Fourth Directive applies to some five million limited liability companies in the EU, whether they are publicly traded or privately held. It requires these firms to prepare audited financial accounts according to the principles laid out in the directive and to provide publicly accessible financial statements to the corporate registers. The Seventh Directive complements these harmonization efforts with requirements on when and how firms must prepare consolidated financial accounts. Thus, the two directives effectively prescribe a *common* set of accounting rules for private *and* public corporations with respect to their consolidated and unconsolidated (or parent-only) financial statements.[10]

Thus, the European setting is unique insofar as it provides substantial within-country and cross-country variation in capital market forces and institutional incentives while holding the accounting rules largely constant. Our study exploits this variation by explicitly linking it to the properties of reported earnings.

Proxies for Earnings Management

Our hypotheses call for measures that capture the extent to which firms use reporting discretion to make earnings more (or less) informative about the underlying economic performance. However, it is impossible to directly observe how firms use discretion to influence the informativeness of earnings. We therefore focus on the level of earnings management as a proxy for the extent to which firms use reporting discretion to reduce the informativeness of earnings. Note that we do not claim that firms always use discretion in a way to obfuscate economic performance.[11] However, we do rely on the assumption that more extreme realizations of our earnings management measures for a large set of private (or public) firms in an industry and country over several years suggest that reported earnings are less likely to reflect economic performance.

Following Leuz et al. (2003) and drawing on prior accounting research (e.g., Healy and Wahlen 1999; Dechow and Skinner 2000), we compute four different proxies capturing a range of earnings management activities: (1) the tendency of firms to avoid small losses, (2) the magnitude of total accruals, (3) the smoothness of earnings relative to cash flows and (4) the correlation of accounting accruals and operating cash flows. We recognize that these proxies are not perfect and indicate earnings management only in a relative sense, but relative measures meet the demands of our design. Moreover, recent studies using these proxies suggest that they yield country rankings that are consistent with widespread perceptions of earnings informativeness, and that they behave in a plausible fashion (e.g., Lang et al. 2003; Lang et al. 2006; Wysocki 2004).

Burgstahler and Dichev (1997) and Degeorge et al. (1999) present evidence that U.S. firms use accounting discretion to avoid reporting small losses.[12] Thus, the incidence of

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[10] The two Directives had to be transformed into national laws by the member states during the late 1980s and early 1990s. As a result, accounting standards across EU member states are fairly similar, though not necessarily equal in every respect. Explicit transformation choices in the directives as well as so-called "soft transformations" lead to remaining differences (e.g., Stolowy and Jeny-Cazavan 2001). We address this issue in Section V by analyzing to what extent residual differences in the accounting rules affect our results.

[11] In fact, there is evidence for the U.S. that, on average, managers use their discretion in a way that makes earnings more informative (e.g., Watts and Zimmerman 1986; Subramanyam 1996). We care about the relative informativeness of earnings and its association with reporting incentives.

[12] While firms have incentives to avoid losses of any magnitude, limitations on reporting discretion make it increasingly costly to avoid larger and larger losses.

small profits relative to small losses indicates the extent to which a set of firms uses accounting discretion to avoid losses. A firm-year observation is classified as small profit (small loss) if positive (negative) after-tax net income falls within the range of 1 percent of lagged total assets.[13] Our first earnings management proxy (*EM1*) is the ratio of small profits to small losses for the set of firms defined by industry and country, and by public versus private firms.

Firms can use reporting discretion to mask or misstate economic performance. For instance, firms can overstate reported earnings to achieve certain earnings targets or report extraordinary performance in specific instances, such as an equity issuance (e.g., Teoh et al. 1998a). Similarly, in years of poor performance, firms can boost their earnings using reserves or aggressive revenue recognition practices. Common to these examples is that earnings are temporarily inflated due to accrual choices, but cash flows are unaffected. Thus, our second proxy (*EM2*) is the magnitude of accruals relative to the magnitude of operating cash flow.[14] *EM2* is computed as the median ratio of the absolute value of total accruals scaled by the corresponding value of cash flow from operations for an industry within a country, where the scaling controls for differences in firm size and performance.[15]

Controlling owners and managers can conceal changes in their firm's economic performance by smoothing reported earnings. Our third measure (*EM3*) attempts to capture the extent to which corporate insiders reduce the variability of reported earnings using accruals. It is computed as the ratio of the standard deviation of operating income divided by the standard deviation of cash flow from operations, multiplied by −1 so that higher values correspond to more earnings smoothing. Due to data restrictions, we calculate the standard deviations in the cross-section (see also, Lang et al. 2003; Lang et al. 2006).

Our final measure examines accrual choices in response to shocks to the firm's economic performance. Firms can use accruals to hide bad current performance or to under-report good current performance, effectively saving for the future. This behavior induces a negative correlation between changes in accruals and the shocks to operating cash flows. While a negative correlation is a "natural" result of accrual accounting (e.g., Dechow 1994), larger magnitudes of this negative correlation indicate, *ceteris paribus*, smoothing of reported earnings that does not reflect a firm's underlying economic performance (Myers et al. 2006).[16] Our fourth earnings management measure (*EM4*) is the contemporaneous Spearman correlation between changes in total accruals and changes in the cash flow from operations (both scaled by lagged total assets) calculated for each industry-country unit of analysis, again multiplied by −1 so that higher values indicate higher levels of earnings management.

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[13] Alternative cutoff values of 0.5 percent or 2 percent of lagged total assets yield results that are qualitatively very similar to those reported in the tables below.

[14] The exercise of reporting discretion does not always imply that earnings become less informative, but prior studies show that extreme accruals are indicative of poor earnings quality (e.g., Sloan 1996). Note further that we assume that cash flows are free of manipulation, although this is not always the case (e.g., Roychowdhury 2005).

[15] Cash flow from operations is calculated using the balance-sheet approach because U.S. style cash flow statements are generally not available for our sample of private and public European companies. Following Dechow et al. (1995), we compute the accrual component of earnings as (Δtotal current assets − Δcash) − (Δtotal current liabilities − Δshort-term debt) − depreciation expense, where Δ denotes the change over the last fiscal year. If a firm does not report information on cash or short-term debt, then the changes in both variables are assumed to be zero. We scale all accounting items by lagged total assets to ensure comparability across firms.

[16] As accounting systems likely under-react to economic shocks, insiders signaling firm performance use accruals in a way that on average results in a less negative (and in specific cases even positive) correlation with cash flows.

To mitigate potential measurement error in the individual scores, we base most of our analyses on an aggregate measure of earnings management. Specifically, we transform each individual score into percentage ranks (ranging from 0 to 100) and combine the ranks by averaging into an aggregate index of earnings management, denoted EM_{aggr}.[17]

Data, Sample Selection, and Descriptive Statistics

The primary source of financial data is the June 2005 version of the Amadeus Top 200,000 database supplied by Bureau van Dijk. Amadeus provides financial statement data for a vast set of European private and public companies and is compiled from several well-established national information collectors. Since its coverage is less detailed in the early years, we focus on the seven-year period from 1997 to 2003. Amadeus provides consolidated financial statements when they are available and parent-only accounts otherwise. Thus, our analysis is based on a firm's primary set of financial statements from an informational perspective. The main advantage of the relatively new Amadeus database is that it includes privately held corporations, allowing us to focus on an economically important group of firms that is relatively under-represented in academic research.

The initial sample consists of all firm-year observations from private and public companies that have their domicile in one of the 15 member states of the EU by the year 2003 and for which current year's net income and previous year's total assets are available on Amadeus. By adopting size restrictions similar to those laid out in the Fourth EU Directive, we explicitly exclude small privately held firms to which the EU directives may not fully apply.[18] Specifically, we require privately held firms to meet at least two of the following three criteria in every year: (1) total assets greater than EUR 2.5 million, (2) sales greater than EUR 5 million, and (3) number of employees greater than 50. We also exclude banks, insurance companies and other financial holdings (SIC codes 6000–6799), public administrative institutions (SIC codes above 9000), as well as privately held subsidiaries of quoted companies as indicated in Amadeus. Investment, financing, and operating decisions in the latter firm category are likely to be influenced by parent companies, which could bias results if they were included in the analyses.

Next, we screen out private firms whose legal form is not equal to the status of corporations or its national equivalents. Strictly speaking, the argument that private and public firms face similar accounting rules only applies to corporations and does not extend to other legal forms like sole proprietorships or partnerships. We further eliminate all firms that go public during the sample period because prior work shows that those firms are subject to systematically higher levels of earnings management (e.g., Teoh et al. 1998b).[19] Finally, we also discard observations from two sample countries with missing accounting and legal

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[17] See Section IV for an assessment of the sensitivity of the results to alternative dependent variables (Table 5, Panel B).

[18] The Fourth EU Directive distinguishes between small-, medium-, and large-sized companies depending on three criteria: balance sheet total, net turnover, and average number of employees (Articles 11 and 27). Small- and medium-sized companies are subject to certain exemptions from reporting requirements, e.g., they are allowed to draw up abridged balance sheets and income statements.

[19] Amadeus does not provide time-series data on a firm's listing status and classifies each corporation by its most recent status available (i.e., either listed or not). However, by comparing firms' listing status across two annual releases of the Amadeus database we were able to identify formerly private companies that went public over the sample period. We thank Leora Klapper for providing this information. In addition, Amadeus indicates for a small subset of firms the date of the IPO, which also lets us identify firms with changes in their listing status. We use both sources of information to eliminate firms with recent IPOs. The results are very similar if we keep those recently listed firms in our analyses. In related tests (not reported), we confirm that our results are not unduly affected by quoted firms that are cross-listed on multiple international exchanges.

institutional data. Amadeus does not provide data on operating income and depreciation expenses for companies from Ireland, and several institutional proxies used in the analysis are missing for Luxembourg.[20]

To mitigate the influence of outliers and potential data errors we truncate accounting items needed in the calculation of our proxies at the 1st and 99th percentile and delete firm-year observations where accounting items are exactly equal to zero, most likely indicating missing data. For robustness, we check that our results do not hinge on either of these two design choices. The final sample consists of 378,122 firm-year observations from private and publicly traded, nonfinancial corporations over the fiscal years 1997 to 2003 across 13 European countries.

Several of our earnings management proxies have to be computed for a group of firms. Prior work typically uses *country*-level observations (e.g., Leuz et al. 2003). To better control for firm characteristics, we choose a finer partition and define a unit of analysis within each country on the *industry*-level using the industry classification in Campbell (1996). That is, we calculate the individual and aggregate earnings management scores by country and industry for both public and private firms, resulting in 312 possible observations (= 13 countries × 12 industry classes × 2 firm types).[21] We require a minimum of ten firm-year observations per unit of analysis. This requirement reduces the sample to a total number of 269 industry-level observations, of which 151 are from privately held firms and 118 are from publicly listed firms.[22]

Table 1 presents descriptive statistics for the four individual earnings management measures (*EM1* through *EM4*) as well as the overall earnings management index (EM_{aggr}). On the country-level, mean values of industry observations from privately held companies generally exceed their public counterparts. For EM_{aggr}, only Greece exhibits less earnings management among private companies, which may partly reflect the fact that Greek publicly traded firms exhibit more earnings management than public companies in any other sample country.[23] On the other end of the spectrum, public firms from the U.K. and Finland exhibit low levels of earnings management. For the sample as a whole, mean and median values calculated from public companies are significantly lower than private company means and medians for both the individual and aggregate EM measures, except that median *EM4* is not significantly different between the two groups.

Table 2 presents descriptive statistics for firm characteristics used as control variables in the multivariate tests. We choose proxies for which prior work suggests an association with the level of earnings management (or accruals) and which are also likely to capture the apparent heterogeneity across private and public firms. Firm size (*SIZE*) is measured as the book value of total assets at the end of the fiscal year (in EUR thousands). Since access to capital and other corporate financing decisions depend on the extent of agency costs and asymmetric information (e.g., Titman and Wessels 1988; Rajan and Zingales 1995) and

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[20] If we include Luxembourg in the analysis adopting the legal institutional data from Belgium, all the results and inferences remain the same.

[21] Observations with missing industry data in Amadeus are grouped together in a separate industry class. If we delete this *ad hoc* group from our analyses, the results and the inferences remain unchanged.

[22] As we increase the required number of firm-year observations per group to n ≥ 25 (and then n ≥ 50), we lose 41 (70) public firm observations, and 3 (7) private firm observations, respectively. We replicated subsequent analyses using these two larger minimum numbers of observations. The substantial reduction in public firm observations weakens the statistical power, resulting in lower significance levels for the public firm indicator in some of the analyses but without changing the tenor of the results.

[23] This finding is consistent with Leuz et al. (2003) where Greece (together with Austria) ranked highest in terms of earnings management for an international sample of quoted companies.

TABLE 1
Descriptive Statistics for the Individual and Aggregate Earnings Management Scores by Country and Listing Status

Country	Listing Status	Firm-Years	Industry Obs.	EM1	EM2	EM3	EM4	EM_{aggr}
Austria	private	1,944	11	4.098	0.801	−0.461	0.931	75.1
	public	20	1	0.000	0.729	−0.205	0.983	70.3
Belgium	private	27,702	12	3.055	0.744	−0.542	0.901	65.9
	public	204	9	0.722	0.620	−0.595	0.868	43.2
Denmark	private	9,400	12	2.902	0.641	−0.621	0.833	45.7
	public	272	11	0.818	0.601	−0.699	0.772	35.3
Finland	private	9,334	11	3.150	0.521	−0.703	0.812	30.9
	public	354	10	1.000	0.430	−0.747	0.700	24.0
France	private	39,330	12	3.764	0.695	−0.619	0.873	57.3
	public	1,041	11	3.245	0.505	−0.791	0.814	28.6
Germany	private	8,271	12	4.613	0.796	−0.474	0.933	80.4
	public	1,159	10	2.792	0.614	−0.584	0.906	52.8
Greece	private	8,191	11	1.574	0.728	−0.600	0.893	50.0
	public	742	11	1.945	0.608	−0.512	0.936	55.8
Italy	private	71,081	12	3.984	0.733	−0.496	0.935	78.7
	public	327	10	2.700	0.676	−0.576	0.913	59.3
The Netherlands	private	21,679	12	1.830	0.609	−0.634	0.870	40.2
	public	570	10	2.333	0.503	−0.728	0.856	34.1
Portugal	private	9,062	10	5.881	0.744	−0.504	0.937	79.3
	public	140	6	4.000	0.823	−0.624	0.885	64.2
Spain	private	61,021	12	4.457	0.665	−0.573	0.889	61.6
	public	470	12	1.667	0.422	−0.587	0.852	41.4
Sweden	private	22,554	12	2.386	0.632	−0.630	0.834	40.3
	public	230	6	0.700	0.687	−0.811	0.771	37.6
United Kingdom	private	79,051	12	1.992	0.686	−0.586	0.858	49.0
	public	3,973	11	2.206	0.466	−0.706	0.750	24.2

TABLE 1 (Continued)

Mean	private	368,620	3.335	0.691	−0.573	0.884	57.9
(Total)	public	9,502	1.977**	0.565**	−0.655**	0.836**	41.1**
Median	private	151	2.882	0.695	−0.575	0.895	57.1
	public	118	1.500**	0.542**	−0.649**	0.879	40.1**
Standard Deviation	private	151	2.260	0.107	0.091	0.059	18.9
	public	118	1.964	0.159	0.198	0.144	19.7

** Indicates statistical significance at the 1 percent level (two-tailed).

The base sample consists of 378,122 firm-year observations from private and public, nonfinancial companies over the fiscal years 1997 to 2003 across 13 countries of the European Union. We exclude Ireland and Luxembourg because of insufficient financial and institutional data. We also exclude firms that change their listing status during the sample period. Financial data are obtained from the June 2005 version of the Amadeus Top 200,000 database. The computations are at the industry-level using the classification in Campbell (1996), i.e., we calculate each score by country, industry, and listing status. We require a minimum of ten firm-year observations per subgroup. We truncate firm-level realizations at the first and 99th percentile before computing the score per subgroup. The table presents mean values by country and listing status for the four individual earnings management scores and the aggregate earnings management index (see Leuz et al. 2003). $EM1$ is the number of "small profits" divided by the number of "small losses." A firm-year observation is classified as small profit (small loss) if positive (negative) net income falls within the range of 1 percent of lagged total assets. $EM2$ is the median ratio of the absolute value of total accruals to the absolute value of cash flow from operations. Total accruals are calculated as follows: (Δ total current assets − Δ cash) − (Δ total current liabilities − Δ short-term debt) − depreciation expense. Cash flow from operations is equal to operating income minus total accruals. $EM3$ is the ratio of the cross-sectional standard deviations of operating income and cash flow from operations (multiplied by −1). $EM4$ is the Spearman correlation between the change in total accruals and the change in cash flow from operations (multiplied by −1). All accounting items are scaled by lagged total assets. The aggregate earnings management index, EM_{aggr}, is the average percentage rank across all four individual scores, $EM1$ to $EM4$. EM scores are constructed such that higher values imply higher levels of earnings management. We evaluate differences between sample means (medians) using t-tests (Wilcoxon rank sum tests).

TABLE 2
Descriptive Statistics for the Firm-Level Control Variables by Country and Listing Status

Country	Listing Status	Industry Obs.	SIZE	LEV	GROWTH	ROA	CYCLE	AUDIT	AGE	OWNER
Austria	private	11	27,900	46.2%	4.2%	3.0%	94.6	NA	14.0	100.0%
	public	1	182,845	39.9%	11.8%	3.6%	137.5	100.0%	13.5	46.2%
Belgium	private	12	11,676	23.8%	5.5%	2.2%	90.3	25.9%	19.5	98.5%
	public	9	283,906	31.7%	4.9%	4.2%	126.0	85.2%	74.5	41.7%
Denmark	private	12	14,462	27.4%	4.5%	3.7%	71.9	76.0%	14.5	100.0%
	public	11	188,272	27.8%	6.6%	4.3%	88.2	99.5%	40.5	29.0%
Finland	private	11	10,014	26.2%	7.7%	5.7%	62.4	95.5%	13.0	100.0%
	public	10	191,941	30.3%	7.8%	6.7%	89.5	99.8%	43.3	31.3%
France	private	12	12,993	20.8%	6.7%	2.9%	81.8	14.8%	20.5	79.5%
	public	11	161,900	9.0%	4.9%	4.0%	105.7	43.8%	45.0	51.0%
Germany	private	12	38,195	52.6%	3.4%	2.4%	71.1	NA	16.0	100.0%
	public	10	211,650	50.4%	3.2%	3.0%	103.8	91.7%	66.5	66.4%
Greece	private	11	13,202	8.7%	11.3%	3.1%	151.0	0.0%	12.0	52.6%
	public	11	58,989	6.7%	10.6%	5.3%	198.4	35.4%	22.0	34.8%
Italy	private	12	21,705	37.4%	7.1%	1.1%	122.7	0.0%	19.5	81.0%
	public	10	406,272	36.7%	4.1%	3.6%	142.4	98.6%	59.8	50.8%
The Netherlands	private	12	20,433	30.1%	5.4%	4.1%	84.5	87.4%	20.5	100.0%
	public	10	571,746	37.1%	5.9%	6.4%	94.5	100.0%	66.0	16.4%
Portugal	private	10	13,921	21.4%	7.8%	2.2%	126.0	0.0%	20.5	65.0%
	public	6	69,293	28.0%	5.4%	1.6%	188.7	95.1%	39.5	40.3%
Spain	private	12	14,150	17.1%	10.7%	4.0%	111.4	58.1%	15.5	85.8%
	public	12	293,161	22.6%	9.6%	5.6%	148.7	99.4%	42.0	26.7%
Sweden	private	12	11,224	37.0%	7.4%	3.2%	67.6	NA	18.5	100.0%
	public	6	80,994	42.8%	6.1%	2.9%	87.8	100.0%	32.3	32.5%
United Kingdom	private	12	18,628	17.3%	6.5%	3.8%	60.7	80.7%	18.0	100.0%
	public	11	182,965	23.5%	7.3%	5.3%	75.4	98.2%	33.0	13.9%

TABLE 2 (Continued)

Mean	private	151	25,802	29.4%	7.0%	3.1%	93.4	47.0%	17.2	88.9%
	public	118	475,551**	29.2%	7.6%	4.5%***	116.0**	79.7%***	46.3**	36.7%***
Median	private	151	15,767	27.7%	6.6%	3.0%	84.4	52.8%	17.0	99.9%
	public	118	178,307**	29.2%	6.3%	4.3%***	106.1**	97.3%***	41.0**	33.9%***
Standard Deviation	private	151	38,101	14.0%	3.7%	1.5%	37.7	39.0%	5.2	16.4%
	public	118	1,181,688	14.9%	5.1%	2.3%	49.2	31.3%	26.2	18.1%

** Indicates statistical significance at the 1 percent level (two-tailed).

The base sample consists of 378,122 firm-year observations from private and public, nonfinancial companies over the fiscal years 1997 to 2003 across 13 countries of the European Union. We exclude Ireland and Luxembourg because of insufficient financial and institutional data. We also exclude firms that change their listing status during the sample period. Financial, auditor, and ownership data are obtained from the June 2005 version of the Amadeus Top 200,000 database. The analysis is based on country-industry medians by listing status, i.e., private and public firms in a particular industry and country form separate subgroups. We require a minimum of ten firm-year observations per subgroup. We truncate firm-level realizations at the first and 99th percentile before computing the subgroup median. The industry classification is based on Campbell (1996). The table presents medians for the control variables by country and listing status. SIZE is the book value of total assets at the end of the fiscal year (in EUR thousands). Financial leverage (LEV) is measured as the ratio of noncurrent liabilities to the sum of noncurrent liabilities plus book value of equity. GROWTH is the annual percentage change in revenue. ROA stands for yearly return on assets and equals net income divided by lagged total assets. CYCLE represents the operating cycle (in days) calculated as (yearly average accounts receivable)/(total revenue/360) + (yearly average inventory)/(cost of goods sold/360). Cost of goods sold is equal to total revenue minus operating income. AUDIT is the weighted market share of Big 5 audit firms and calculated as Big 5 clients' total assets divided by all firms' total assets under audit. AGE is firm age in years. Ownership concentration (OWNER) is measured as the percentage of direct holdings by the single largest shareholder of the firm. We evaluate differences between sample means (medians) of private and public firms using t-tests (Wilcoxon rank sum tests).

these attributes likely differ between public and private companies, we include financial leverage as a control variable. We calculate *LEV* as the ratio of total non-current liabilities to total assets.

Other potential sources of variation in accruals and between privately held and public companies are firm growth, profitability, the length of the operating cycle, audit quality, firm age, and ownership concentration. *GROWTH* is defined as the annual percentage change in revenue. Profitability is measured as return on assets (*ROA*) defined as net income divided by lagged total assets. Following Dechow (1994), we compute the length of the operating cycle in days, *CYCLE*, as (yearly average accounts receivable)/(total revenue /360) + (yearly average inventory)/(cost of goods sold/360). Since the cost of goods sold number is not reported separately for many companies, we use total revenue minus operating income instead. We proxy for audit quality, *AUDIT*, by the weighted market share of Big 5 audit firms, calculated as Big 5 clients' total assets divided by all firms' total assets under audit.[24] *AGE* is the number of years since incorporation. Finally, we measure ownership concentration, *OWNER*, as the percentage of direct holdings by the single largest shareholder as provided in Amadeus. All firm attributes are computed as industry-level medians.

Table 2 shows that, as expected, public firms are on average larger, more profitable, have longer operating cycles, rely more frequently on high-quality auditors, exist for a longer time period, and have more dispersed ownership than private firms. With respect to financial leverage and sales growth, no clear pattern arises.[25] Table 3 provides descriptive country-level information (raw values and binary classifications) on the legal, institutional, and capital market variables discussed and used in the next sections.

IV. THE ROLE OF PUBLIC EQUITY MARKETS AND LEGAL ENFORCEMENT

We begin our analysis of firms' reporting incentives by studying the effect of public equity markets and legal enforcement—an institutional variable that we expect to influence the reporting behavior of both private and public firms. We use a binary variable to indicate observations stemming from firms with publicly traded equity securities (*PUBL*). The quality of legal enforcement (*LEGAL*) is measured by the average score across three proxies from La Porta et al. (1998): (1) an index of the judicial system's efficiency, (2) an index of the rule of law, and (3) the level of corruption. *LEGAL* ranges from 0 to 10 with higher values corresponding to stricter legal enforcement (see Table 3).[26]

In selected analyses, we also examine the effects of a country's legal origin (i.e., English, Scandinavian, French, or German), which is probably the most exogenous classification of international legal institutions. However, the arguments in La Porta et al. (1998) and Ball et al. (2000), as well as results from a cluster analysis in Leuz et al. (2003, Table 3, Panel B) suggest that legal origins are more appropriately viewed as a summary measure

[24] We only can collect audit information for about 65 percent of the firm-year observations. In particular, auditor data for private firms in Austria, Germany, and Sweden does not exist.

[25] The insignificant mean and median differences for *LEV* may be due to our inability to distinguish between various forms of debt. Amadeus does not provide detailed data on firms' liabilities on a consistent basis across countries, which prevents us from using leverage proxies that are specific to particular forms of debt. Untabulated sensitivity analyses, however, show that our results do not hinge on the specific definition of financial leverage.

[26] Note that the variables from La Porta et al. (1998) used here and several other institutional variables introduced in Section V were measured before the start of our sample period and therefore are not contemporaneous with our other variables. However, we do not believe this has a major effect on our analysis because we rely only on relative values of these variables and because countries' institutional features tend to change only slowly over time.

TABLE 3
Descriptive Statistics for the Institutional Variables by Country

Country	Legal and Enforcement Quality		Tax Alignment		Accrual Accounting Rules	Securities Regulation and Investor Protection		Capital Market Structure	
	ORIGIN	*LEGAL*	*TAX*	*RATE*	*ACCRUAL*	*SECREG*	*ANTIDIR*	*SYSTEM*	*DEV*
Austria	German	9.36 (1)	1	34.0% (1)	0.55 (0)	0.18 (0)	2 (0)	−3.55 (0)	5.23 (1)
Belgium	French	9.44 (1)	1	40.2% (1)	0.64 (1)	0.34 (0)	0 (0)	−2.27 (1)	4.33 (0)
Denmark	Scandinavian	10.00 (1)	0	32.0% (0)	0.55 (0)	0.50 (1)	2 (0)	−2.81 (0)	4.69 (0)
Finland	Scandinavian	10.00 (1)	1	28.0% (0)	0.77 (1)	0.49 (0)	3 (0)	−3.10 (0)	4.99 (0)
France	French	8.68 (0)	1	40.0% (1)	0.64 (1)	0.58 (1)	3 (0)	−2.83 (0)	6.01 (1)
Germany	German	9.05 (0)	1	53.0% (1)	0.41 (0)	0.21 (0)	1 (0)	−1.64 (1)	7.26 (1)
Greece	French	6.82 (0)	1	40.0% (1)	0.41 (0)	0.38 (0)	2 (0)	−4.48 (0)	2.58 (0)
Italy	French	7.07 (0)	1	37.0% (1)	0.59 (0)	0.46 (0)	1 (0)	−2.79 (1)	5.01 (0)
The Netherlands	French	10.00 (1)	0	35.0% (0)	0.77 (1)	0.62 (1)	2 (0)	−1.65 (1)	7.31 (1)
Portugal	French	7.19 (0)	1	37.4% (1)	0.55 (0)	0.55 (1)	3 (0)	−4.26 (0)	4.24 (0)
Spain	French	7.14 (0)	1	35.0% (1)	0.77 (1)	0.50 (1)	4 (1)	−2.71 (1)	5.71 (1)
Sweden	Scandinavian	10.00 (1)	1	28.0% (0)	0.64 (1)	0.45 (0)	3 (0)	−1.60 (1)	6.68 (1)
United Kingdom	English	9.22 (1)	0	31.0% (0)	0.86 (1)	0.72 (1)	5 (1)	−0.76 (1)	7.14 (1)

The table presents raw and dichotomized indicator values (in parentheses) of the institutional proxies used in the analyses across the 13 sample countries from the European Union. We use institutional factors that capture countries' legal tradition and enforcement, the role of corporate taxes in determining financial accounts, firms' discretion in accounting for accruals, the strength of securities regulation, and minority shareholder protection, as well as the structure and development of organized capital markets. The legal variables consist of two measures from La Porta et al. (1998): the classification of the legal origin (*ORIGIN*), and the quality of the legal system and enforcement (*LEGAL*) measured by the mean of three institutional variables (i.e., efficiency of the judicial system, rule of law, and corruption index). *TAX* is an indicator variable taking on the value of 1 if financial accounts for external reporting and tax purposes are highly aligned, and 0 otherwise (see Alford et al. 1993; Hung 2001). We assume a tax status of 1 for the three countries with missing tax information (Austria, Greece, and Portugal). *RATE* stands for the average corporate tax rate in percent of earnings before taxes (Source: *IMD World Competitiveness Yearbook 2000*). *ACCRUAL* is the accrual index from Hung (2001) (updated for European countries by Comprix et al. [2003]), and captures differences in accrual accounting rules across countries. *SECREG* captures the strength of securities regulation mandating and enforcing disclosures for publicly listed firms. It is measured as the mean of the disclosure index, the liability standard index and the public enforcement index from La Porta et al. (2006). *ANTIDIR* is the antidirector rights index from La Porta et al. (1998) capturing the legal protection of minority shareholders. The capital market variables consist of two measures from Beck and Levine (2002): *SYSTEM* captures whether a country's financial system is more market- or bank-based, and equals the natural log of (total value of stock traded/claims on the private sector by commercial banks), both scaled by GDP. Financial development, *DEV*, is a measure of the overall activity of financial intermediaries and of capital market development. It equals the natural log of (total value of stock traded*claims on the private sector by financial institutions), both scaled by GDP. For most of our analyses we transform the continuous institutional factors into binary variables splitting by the median (except for *TAX*RATE* where we use 34 percent as a cut-off, and *ANTIDIR* where we split at 4, which is commonly viewed as an indication of high investor-protection; see discussion in the text for details).

that captures a multitude of institutional factors, rather than a proxy for the quality of legal enforcement. For this reason, we view these results more as a general robustness check.

Univariate Comparisons across the Capital Market and Legal Dimensions

Table 4 provides univariate tests across the two main incentive dimensions under study. Panel A summarizes the results of within-country analyses effectively holding the institutional environment constant. We test for differences between private and public firms' individual earnings management scores (*EM1* through *EM4*) using within-country Monte Carlo simulation.[27] For the aggregate earnings management index (EM_{aggr}), we run within-country univariate regressions with an indicator variable to compare earnings management for public versus private firms. Note that these regressions are based on a small number of industry observations per country and hence have relatively low power—we provide them primarily for descriptive purposes. The evidence in Panel A suggests that earnings management is significantly more pervasive among private firms than among public firms for most, but not all, individual countries. This result holds for each individual earnings management score as well as for EM_{aggr}.

Panel B of Table 4 reports pairwise Spearman correlations. We note that all four individual earnings management measures are highly correlated and well represented by the aggregate index. Since the Amadeus database has not been used much in prior studies, we also benchmark our earnings management measures with those in Leuz et al. (2003) based on public firms from the frequently used Worldscope database. In (untabulated) analyses we find that the correlations between their proxies and our measures calculated on the country-level for public firms only are above .50 for the individual EM scores (*EM1* produces the lowest correlation with $\rho = .52$, followed by *EM2* with $\rho = .65$), and above .90 for the aggregate index. As reliably measuring loss avoidance requires a substantial number of firm-years, it is possible that the relatively low correlation of *EM1* with the respective proxy in Leuz et al. (2003) is driven by the smaller number of public firms in the Amadeus database. As a robustness check, we repeat all our analyses dropping *EM1* (or any other individual EM score) from the construction of the aggregate index. The results are very similar.[28] The correlation between the EM scores and listing status or legal enforcement quality is significantly negative, except in one case.

Panel C of Table 4 compares the aggregate earnings management index across groups of countries defined by their legal origins, which broadly capture investor protection and ownership regimes across countries (La Porta et al. 1999). The ordering of the mean and median values of EM_{aggr} shows the lowest scores for firms in countries with English and Scandinavian legal origins, followed by firms in countries with French origin. Firms with German legal origin exhibit the highest earnings management. These findings are consistent with Leuz et al. (2003). Thus, even within the set of EU countries, we observe significant variation in the level of earnings management reflecting institutional differences.

Panel D of Table 4 reports average EM_{aggr} for subgroups defined by the two main variables, quality of legal enforcement and listing status, in a simplified analysis that serves

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[27] For each individual EM score, we generate test statistics based on 1,000 random draws from the population of private firms and compare the actual realization stemming from all the public firms within the same country to the generated null-hypothesis distribution.

[28] Factor analysis further supports the use of an aggregate index. We find that there is only one factor with an Eigenvalue above 1 and that all of the four individual scores exhibit substantial loadings onto this factor. Moreover, when we conduct the analyses using any one of the individual measures alone, the results are generally consistent, albeit at times weaker in statistical significance, which is consistent with the notion that aggregation across measures reduces measurement error.

as a precursor to the more complete analysis in subsequent tables. We create a binary variable indicating high and low enforcement quality countries splitting *LEGAL* by the median. As hypothesized, publicly traded firms in countries with strict enforcement show the lowest level of earnings management. In contrast, private firms located in low-quality legal enforcement environments exhibit the highest levels of earnings management. The

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TABLE 4
Univariate Analysis of Earnings Management Variables, Listing Status (*PUBL*) and Legal Enforcement (*LEGAL*)

Panel A: Within-Country Analysis of Public versus Private Firms

Variables	*EM1*	*EM2*	*EM3*	*EM4*	EM_{aggr}
# higher/not distinguishable/ lower EM scores for Private Firms	(4/9/0)	(9/4/0)	(9/3/1)	(8/3/2)	(8/5/0)

Panel B: Spearman Correlation Coefficients

Variables (n = 269)	*EM1*	*EM2*	*EM3*	*EM4*	EM_{aggr}
EM2	0.325**				
EM3	0.233**	0.507**			
EM4	0.200**	0.396**	0.606**		
EM_{aggr}	0.570**	0.765**	0.808**	0.752**	
PUBL	−0.398**	−0.444**	−0.255**	−0.097	−0.381**
LEGAL	−0.241**	−0.224**	−0.325**	−0.387**	−0.415**

Panel C: Pairwise Comparison across Legal Origins

Legal Origins		English	Scandinavian	French	German
English (n = 23)	Mean	37.1		(Variable = EM_{aggr})	
	Median	35.7			
Scandinavian (n = 62)	Mean	(0.32)	35.9		
	Median	(0.06)	36.3		
French (n = 150)	Mean	(4.54)**	(7.31)**	54.1	
	Median	(3.77)**	(6.06)**	54.2	
German (n = 34)	Mean	(7.57)**	(10.18)**	(5.05)**	70.3
	Median	(5.29)**	(7.04)**	(4.23)**	72.4

Panel D: Pairwise Comparison across Legal Enforcement/Listing Status Subgroups

Legal Enforcement (Variable = EM_{aggr})		Listing Status		Test of Difference
		Public	Private	
High Enforcement Quality	Mean	33.1	49.5	(5.34)**
	Median	33.7	46.5	(4.70)**
		(n = 58)	(n = 82)	
Low Enforcement Quality	Mean	48.8	67.8	(6.36)**
	Median	49.2	70.6	(5.54)**
		(n = 60)	(n = 69)	
Test of Difference		(4.72)**	(6.84)**	
		(4.32)**	(6.04)**	

TABLE 4 (Continued)

** Indicates statistical significance at the 1 percent level (two-tailed).
The sample comprises 269 industry-level observations from 13 European countries. The aggregate earnings management index, EM_{aggr}, is the average percentage rank across all four individual earnings management scores, *EM1* to *EM4*, as described in Table 1. EM scores are constructed such that higher values imply higher levels of earnings management. In Panel A, we assess differences in the four individual EM scores and the aggregate EM index across public and private firms within country using Monte Carlo simulation (*EM1* to *EM4*) or regression analysis with the public/private indicator as independent variable (EM_{aggr}). The table reports the number of countries where the EM scores for private firms are (1) significantly higher, (2) not distinguishable, and (3) significantly lower than the EM scores for public firms at the 10 percent level (two-tailed). In Panel B, we report Spearman correlation coefficients for *EM1* through *EM4*, the aggregate EM index and the incentive variables of interest. *PUBL* is an indicator variable taking on the value of 1 if the observation stems from publicly traded firms, and 0 otherwise. *LEGAL* stands for the mean of three variables in La Porta et al. (1998), which measure the quality of the legal system and enforcement (i.e., efficiency of the judicial system, rule of law, and corruption index). In Panels C and D, we report means and medians of EM_{aggr} by subgroup (i.e., legal origin and legal enforcement/listing status). We assign observations to the high (low) legal enforcement quality subgroup according to the median value of *LEGAL*. In parentheses, we report t-stats and Z-stats for pairwise differences across groups.

off-diagonal comparisons show both variables appear to play an equal role in the pervasiveness of earnings management, as the private firms/high enforcement quality and the public firms/low enforcement quality cells are statistically indistinguishable. The results of this simplified analysis suggest that both incentive dimensions contribute separately to the reporting behavior of European private and public firms.

Multivariate Tests of the Reporting-Incentives Hypotheses

Table 5 presents results of regressions that examine the role of capital market forces and legal factors, separately and jointly, and include additional controls for differences in firm characteristics. In Panel A, we use the aggregate earnings management index based on the four Leuz et al. (2003) measures as the dependent variable. Panel B provides sensitivity checks using alternative proxies for earnings informativeness as dependent variables. Throughout the discussion, assessments of statistical significance are based on heteroscedasticity-corrected t-statistics.[29]

The first two columns of Table 5, Panel A, examine the effects of listing status and legal enforcement separately on the level of earnings management. We introduce controls for size, financial leverage, growth, return on assets, and operating cycle. These variables are intended to control for heterogeneity in firms' business processes, which could affect the magnitude of the accruals and the properties of reported earnings. In addition, we include industry controls based on the industry classification in Campbell (1996). The coefficient on *PUBL* in column one is significantly negative. This finding is consistent with our hypothesis that the first-order effect of public equity markets is to increase the demand for informative earnings. Results in column two for the separate effect of legal enforcement also show a significantly negative coefficient on *LEGAL*. Except for operating cycle, all the firm-level controls are statistically significant at the .05 level or better. The sign switch of the size coefficient occurs presumably because firm size captures the public versus private dimension, which is omitted in this specification.

[29] As the legal variable varies only at the country level, we repeat our analyses using heteroscedasticity-corrected standard errors *clustered* by country, resulting in a more conservative assessment of statistical significance. However, the inferences are the same and the legal variable remains significant at the .05 level in all models presented in Table 5.

TABLE 5
Earnings Management and Reporting Incentives: The Role of Listing Status and Legal Enforcement

$$EM_{aggr,i} = \alpha_0 + \alpha_1 PUBL_i + \alpha_2 LEGAL_i + \alpha_3 SIZE_i + \alpha_4 LEV_i + \alpha_5 GROWTH_i + \alpha_6 ROA_i + \alpha_7 CYCLE_i + \Sigma\alpha_j Industry\ Controls_i + \varepsilon_i$$

Panel A: Aggregate Earnings Management Index as Dependent Variable[a]

Variables	Capital Market and Legal Incentives (Base Model)			Base Model Plus Additional Controls			Balanced Panel	Largest Private Firms
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
n	269	269	269	234	269	269	110	264
PUBL	-23.568**	—	-18.997**	-14.052**	-18.590**	-16.393**	-24.929**	-16.353**
	(-6.18)		(-4.86)	(-3.56)	(-4.54)	(-3.71)	(-3.82)	(-6.41)
LEGAL	—	-7.614**	-6.270**	-5.015**	-6.273**	-6.357**	-7.528**	-5.669**
		(-6.32)	(-5.22)	(-4.12)	(-5.24)	(-5.30)	(-3.69)	(-4.66)
Intercept	10.293	159.055**	90.543**	93.435**	90.234**	84.471**	82.947**	94.205**
	(0.81)	(9.83)	(4.56)	(4.79)	(4.57)	(3.99)	(2.77)	(4.55)
SIZE	2.737*	-3.965**	1.457	0.714	1.530	1.573	2.712	1.033
	(2.16)	(-5.45)	(1.08)	(0.52)	(1.12)	(1.16)	(1.26)	(0.76)
LEV	21.016*	43.750**	30.999**	21.075*	31.124**	29.870**	20.832	15.355#
	(2.38)	(5.03)	(3.49)	(2.11)	(3.49)	(3.35)	(1.35)	(1.70)
GROWTH	-25.056	-58.373*	-62.154*	-49.938#	-63.791*	-57.262*	-98.769	-55.758#
	(-1.00)	(-2.14)	(-2.33)	(-1.82)	(-2.37)	(-2.11)	(-1.57)	(-1.69)
ROA	-3.370**	-2.907**	-2.624**	-2.634**	-2.623**	-2.635**	-1.473	-1.782**
	(-4.92)	(-4.25)	(-3.96)	(-3.99)	(-3.95)	(-4.02)	(-1.18)	(-2.73)
CYCLE	0.214**	0.001	0.074#	0.078#	0.074#	0.078#	0.085	0.055
	(6.58)	(0.02)	(1.74)	(1.79)	(1.73)	(1.82)	(1.41)	(1.36)
AUDIT	—	—	—	-5.224	—	—	—	—
				(-1.44)				
AGE	—	—	—	—	-0.020	—	—	—
					(-0.35)			
OWNER	—	—	—	—	—	0.058	—	—
						(1.06)		
Industry Controls	included	included	included	included	included	included	included	included
R²	54.7%	55.2%	59.6%	60.3%	59.6%	59.8%	61.8%	54.8%

(continued on next page)

TABLE 5 (Continued)

Panel B: Sensitivity Analyses with Alternative Dependent Variables[b]

Variables	Earnings Conservatism Index EC_{aggr} (higher values = less earnings conservatism)	Alternate Earnings Management Index EM_{alt} (higher values = more earnings management)	Overall Earnings Informativeness Index EI_{aggr} (higher values = less informative earnings)
n	252	258	249
PUBL	-16.197**	-10.619**	-17.074**
	(-3.23)	(-2.73)	(-5.11)
LEGAL	-3.456*	-4.738**	-4.771**
	(-2.35)	(-3.88)	(-4.43)
Intercept	92.120**	71.365**	79.038**
	(3.25)	(3.13)	(4.33)
SIZE	-2.557	0.589	0.632
	(-1.37)	(0.38)	(0.52)
LEV	36.740**	27.607**	28.415**
	(4.41)	(3.63)	(4.69)
GROWTH	-17.332	-11.785	-26.961
	(-0.48)	(-0.44)	(-1.13)
ROA	2.216**	-0.967#	-0.822#
	(3.44)	(-1.79)	(-1.75)
CYCLE	0.068	0.080*	0.067#
	(1.28)	(2.02)	(1.74)
Industry Controls	included	included	included
R²	35.1%	43.9%	59.2%

TABLE 5 (Continued)

**, *, and # Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

[a] In Panel A, the sample comprises a maximum of 269 industry-level observations from 13 European countries. The dependent variable, EM_{aggr}, is the average percentage rank across all four individual earnings management scores, $EM1$ to $EM4$, as described in Table 1. EM scores are constructed such that higher values imply higher levels of earnings management. $PUBL$ is an indicator variable taking on the value of 1 if the observation stems from publicly traded firms, and 0 otherwise. $LEGAL$ stands for the mean of three variables in La Porta et al. (1998), which measure the quality of the legal system and enforcement (i.e., efficiency of the judicial system, rule of law, and corruption index). $SIZE$ is the book value of total assets at the end of the fiscal year (in EUR thousands). We use the natural log of the size variable in the analysis. Financial leverage (LEV) is measured as the ratio of noncurrent liabilities to the sum of noncurrent liabilities plus book value of equity. $GROWTH$ is the annual percentage change in revenue. ROA stands for the yearly percentage return on assets. $CYCLE$ represents the operating cycle (in days) calculated as (yearly average accounts receivable)/(total revenue/360) + (yearly average inventory)/(cost of goods sold/360). Cost of goods sold is equal to total revenue minus operating income. Industry controls based on the classification in Campbell (1996) are included but not reported. In Models 4 to 6 we further include one of the following control variables: $AUDIT$ is the weighted market share of Big 5 audit firms and calculated as Big 5 clients' total assets divided by all firms' total assets under audit. AGE is firm age in years. Ownership concentration $(OWNER)$ is measured as the percentage of direct holdings by the single largest shareholder of the firm. Model 7 presents a balanced panel including only observations from the same set of industries across countries and private and public firms (5 industries from 11 countries). In Model 8 we limit the subgroup of private firms to the largest 25 percent (based on total assets), which makes private and public firms more comparable in size. The table reports OLS coefficient estimates and t-statistics based on heteroscedasticity corrected standard errors (in parentheses).

[b] In Panel B, we present results corresponding to Model 3 in Panel A substituting the following alternative dependent variables: The earnings conservatism index, EC_{aggr}, consists of the average percentage rank across three individual conservatism measures: (1) the number of "large profits" divided by the number of "large losses," with firm-year observations classified as large if net income falls outside the range of 20 percent of lagged total assets, (2) the skewness of earnings over the middle part of the distribution (i.e., net income +/− 20 percent of lagged total assets), and (3) the coefficient on lagged negative changes in net income from a Basu (1997)-style regression as implemented by Ball and Shivakumar (2005). We also construct an alternative aggregate earnings management index, EM_{alt}, using a set of individual earnings management scores not contained in our main proxy EM_{aggr}. We include (1) the variance of the absolute value of changes in annual net income (multiplied by −1), (2) the variance of the absolute value of changes in operating income divided by the same metric for cash flow from operations (multiplied by −1), and (3) the absolute value of Jones (1991)-model discretionary accruals calculated separately by industry. Finally, we construct an overall earnings informativeness index, EI_{aggr}, combining all individual earnings management and conservatism scores (i.e., $EI_{aggr} = EM_{aggr} + EC_{aggr} + EM_{alt}$). All earnings scores are calculated as percentage ranks and constructed such that higher values imply higher levels of earnings management (lower levels of earnings conservatism). The regressions include the two incentive variables, listing status and legal enforcement, and the full set of controls (see Panel A for a description). The table reports OLS coefficient estimates and t-statistics based on heteroscedasticity corrected standard errors (in parentheses).

In column three we estimate the combined model that simultaneously includes the indicator for public firms and the legal enforcement variable. Again, we find that listing status and the quality of legal enforcement are significant, and each remains negatively related to EM_{aggr}. Together with the controls, these variables explain about 60 percent of the total variation in earnings management.

Next, we address several concerns about correlated omitted variables by extending our Model 3 with proxies for audit quality, firm age, and ownership concentration. First, it is possible that our findings partly reflect differences in audit quality across private and public firms. For instance, private firms may hire lower quality auditors because communicating via reported earnings is less important to them. Alternatively, auditors of publicly traded firms may face stronger pressures to be tough on their clients than auditors of private firms. Both of these effects would be consistent with our hypothesis in Section II, which does not distinguish between the *ex ante* screening and the *ex post* incentive effect of capital markets. Our analysis aims to shed light on the first-order effect of public markets on earnings informativeness, but it does not attempt to identify the exact mechanism(s).

Nevertheless, we check whether our results are robust to controls for audit quality. Results in column four of Table 5, Panel A show a negative, but insignificant coefficient on *AUDIT*. However, introducing this additional variable does not change the results or inferences for the two main variables, *PUBL* and *LEGAL*, suggesting that audit quality is unlikely to be the primary mechanism through which public markets reduce earnings management.

Second, we introduce firm age to control for the fact that listed firms are often more mature, which could lead to different earnings properties and in turn influence our findings. However, results in column five show that *AGE* is not significant and that, compared to Model 3, the magnitudes and significance levels of the coefficients on *PUBL* and *LEGAL* are nearly unchanged.

Third, going public usually goes hand in hand with an increase in ownership dispersion. Thus, ownership concentration is potentially an important omitted variable. Furthermore, ownership concentration is expected to have a similar effect on reporting quality among the subset of public firms as the private versus public distinction in our analysis.[30] Results for Model 6 show that *OWNER* is also not significant and the coefficients on *PUBL* and *LEGAL* remain negative and highly significant.[31]

The final two columns in Table 5, Panel A report results for alternative sample compositions. First, we construct a balanced panel where the industry composition is constant across countries and across public and private firms. To the extent that economic differences between industries across countries and listing status are systematically related to the informativeness of reported earnings, it is possible that industry composition accounts for some of the reported results. The balanced panel addresses this concern. The reduced sample includes five industries from 11 countries, resulting in a total of 110 public- and private-firm observations. The results are reported in column seven and indicate that our findings do not appear to be driven by differences in industry composition.

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[30] We confirm this conjecture by performing an analysis for the subset of public firms. When we introduce a binary indicator variable into the base model using different cut-off values of the *OWNER* distribution, we always find a negative and significant relation. This result is consistent with the notion that high ownership concentration has a negative effect on earnings informativeness. See also Fan and Wong (2002), Haw et al. (2004), and Wysocki (2004).

[31] Our results continue to hold if we include the three additional firm-level controls simultaneously in the model. Moreover, in unreported analyses we confirm that country-level factors like macroeconomic growth and per capita wealth do not unduly affect our results.

Second, as public firms are on average much larger than private firms, we also compute the EM scores using only the largest quartile of private firms in order to improve the size comparability between the two groups. Column eight shows that the results for our key variables of interest, *PUBL* and *LEGAL*, are essentially unchanged.[32]

Alternative Proxies for Earnings Informativeness

Panel B of Table 5 provides sensitivity analyses using alternative proxies for earnings informativeness. For brevity, we only report results for the specification corresponding to Model 3 in Panel A, jointly including the two incentive variables and the full set of controls. First, we examine the effect of market forces and legal enforcement on accounting conservatism, a frequently used dimension of earnings quality (see e.g., Ball et al. 2000; Ball and Shivakumar 2005; Bushman and Piotroski 2006). We construct an earnings conservatism index, EC_{aggr}, consisting of the following three measures: (1) the ratio of large profits to large losses, with large defined as net income exceeding 20 percent of lagged total assets. Smaller values of this ratio indicate a higher propensity of big bath accounting. (2) The skewness of net income deflated by lagged total assets over the middle part of the distribution (i.e., net income $+/-$ 20 percent of lagged total assets). A more negatively skewed distribution indicates that firms recognize losses in a more timely manner. (3) We run a Basu (1997)-style regression as implemented by Ball and Shivakumar (2005) of changes in earnings on lagged changes in earnings and use the coefficient estimate of lagged negative changes in net income as a proxy for timely loss recognition.[33] Column one of Panel B reports results regressing EC_{aggr} on listing status and legal enforcement quality (plus controls). Both incentive variables are negative and significant, indicating more earnings conservatism for public firms and in countries with stricter legal enforcement.

Next, we present results using an alternative set of earnings management scores, EM_{alt}, not contained in our aggregate earnings management index. We combine the following three additional measures suggested by Lang et al. (2003) and Lang et al. (2006):[34] (1) The variance of the absolute values of changes in annual net income (multiplied by −1) as a measure of earnings variability. (2) The ratio of the variance of absolute changes in operating income to the same metric for cash flow from operations (multiplied by −1). These first two measures are intended to capture earnings smoothing. (3) The absolute value of discretionary accruals derived from a cross-sectional version of the Jones (1991) model, calculated separately for each industry. All else equal, a greater level of discretionary accruals is generally viewed as indicative of more earnings management (see Healy and Wahlen 1999). Column two of Table 5, Panel B shows that both incentive variables remain negative and highly significant using this separate set of earnings management scores as the dependent variable.

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[32] In order to explicitly account for differences in the availability of input data across countries and industry groups, we also re-estimate the regressions in Table 5, Panel A, using weighted least squares. The square root of the number of firm-level observations serves as the weighting variable. The results are very similar to those reported in the table.

[33] In separate tests (not reported), we replicate the analysis of Ball and Shivakumar (2005, Table 3) for the U.K. and extend it to the other EU countries. We find confirmatory evidence for Denmark, France, Germany, The Netherlands, and Sweden. For the remaining countries, the results are either not significant or go in the other direction. However, one problem with such an analysis in a cross-country setting (e.g., Peek et al. 2006) is that lagged earnings changes in the Basu-style regression are likely to reflect institutional differences and hence may not be a good proxy for shocks to economic earnings.

[34] To be consistent with the rest of our analyses, we do not use firm-level controls in the calculation of the individual earnings management scores (see Lang et al. 2003), but control for firm-level attributes when regressing aggregate *EM* scores on the incentive variables.

In the final column we present results using an overall earnings informativeness index, EI_{aggr}, consisting of all the individual earnings management and conservatism scores (i.e., $EI_{aggr} = EM_{aggr} + EC_{aggr} + EM_{alt}$). Higher values of EI_{aggr} indicate less informative earnings. The results are again consistent with our earlier findings.

Taken as a whole, the results throughout Table 5 are consistent with our main hypothesis that public equity markets and strong legal enforcement provide incentives to report earnings that reflect economic performance. These results hold after controlling for a variety of firm-specific factors, after substantial modifications to the sample composition, and across a number of proxies for earnings management and earnings conservatism and hence are unlikely to be driven by correlated omitted variables, measurement error or anomalies in any particular proxy.

V. THE ROLE OF ADDITIONAL INSTITUTIONAL FEATURES AND CAPITAL MARKET STRUCTURE

In this section, we examine several institutional factors, which we expect to differentially affect private and public firms. Specifically, we introduce binary indicator variables into our base model (Table 5, Model 3) to analyze whether the relation between earnings management and tax alignment, accrual accounting rules, securities regulation, outside investor protection, and capital market structure in fact differs across private and public firms. Unless indicated otherwise, we create these indicator variables by splitting at the median value of the institutional factors (see Table 3).

Financial Accounting and Tax Alignment

To capture differences in the tax regimes across EU countries, we rely on a classification provided by Alford et al. (1993) and Hung (2001). The classification indicates countries with a high alignment of financial and tax accounting, for instance, because financial statements serve as the basis for taxation or because tax laws explicitly require that certain items are treated equally in both sets of accounts. The *TAX* variable takes on a value of 1 when financial and tax accounts are highly aligned, and 0 otherwise. For the three countries with missing tax information (Austria, Greece, and Portugal), we assume a tax status of 1.[35]

Column one in Table 6 presents the results introducing the *TAX* variable. The coefficient on tax alignment has the expected sign and is significant over and above listing status and enforcement quality. The interaction between tax alignment and listing status is negative, as expected, but not statistically significant. To construct a finer measure of the extent to which there are tax incentives, we multiply the tax alignment factor with the average corporate tax rate (*IMD World Competitiveness Yearbook 2000*). Based on this combined metric, we create a dichotomous variable splitting the sample into two groups (high tax alignment/tax rate countries versus low tax alignment/tax rate countries).[36] For the former group, tax considerations are likely to play a larger role resulting in less informative earnings. Consistent with this claim, we find a positive and highly significant main effect for the adjusted tax alignment variable (column 2), suggesting that firms in high alignment/

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[35] The rationale for these assignments is that Austria is close to the German system, which is classified as a 1, and Portugal and Greece are both French legal origin countries, which generally exhibit a relatively high tax alignment. If we exclude the three countries without explicit classification from the tax analysis, the results do not materially change.

[36] We use a tax rate of 34 percent as cut-off value to account for the fact that the three countries with low tax alignment automatically get assigned to the base group. If we split by the median (i.e., reclassify Austria), the results are very similar although the interaction term is weaker in statistical significance.

TABLE 6
Earnings Management and Reporting Incentives: The Incremental Role of Tax Alignment, Accrual Accounting Rules, Securities Regulation, Investor Protection, and Capital Market Structure

$$EM_{aggr,i} = \alpha_0 + \alpha_1 Conditional\ Variable_i + \alpha_2 Conditional\ Variable_i * PUBL_i + \alpha_3 PUBL_i + \alpha_4 LEGAL_i + \alpha_5 SIZE_i + \alpha_6 LEV_i$$
$$+ \alpha_7 GROWTH_i + \alpha_8 ROA_i + \alpha_9 CYCLE_i + \Sigma \alpha_j Industry\ Controls_i + \varepsilon_i$$

Variables	Tax Alignment		Accrual Accounting	Securities Regulation and Investor Protection		Capital Market Structure	
	TAX	*TAX*RATE*	*ACCRUAL*	*SECREG*	*ANTIDIR*	*SYSTEM*	*DEV*
n	269	269	269	269	269	269	269
Conditional Variable	4.180#	16.554**	-7.354**	-0.306	-0.011	1.735	2.110
	(1.67)	(6.22)	(-3.08)	(-0.14)	(0.00)	(0.82)	(1.03)
Conditional Variable*PUBL	-3.384	-8.772**	-1.844	-5.614	-9.372**	-6.931#	-8.511*
	(-0.94)	(-2.58)	(-0.50)	(-1.60)	(-2.61)	(-1.80)	(-2.44)
PUBL	-17.269**	-12.978**	-18.995**	-17.254**	-18.269**	-16.151**	-15.438**
	(-3.75)	(-3.06)	(-4.77)	(-3.80)	(-4.51)	(-3.78)	(-3.65)
LEGAL	-5.707**	-2.379#	-5.185**	-6.027**	-6.987**	-6.724**	-6.437**
	(-4.30)	(-1.67)	(-4.33)	(-5.09)	(-5.71)	(-5.48)	(-5.48)
SIZE	1.767	1.072	2.130	2.031	1.935	1.951	1.977
	(1.26)	(0.84)	(1.55)	(1.45)	(1.44)	(1.40)	(1.43)
LEV	27.787**	22.554**	20.907*	25.542**	29.793**	33.283**	29.351**
	(3.03)	(2.69)	(2.39)	(2.61)	(3.24)	(3.59)	(3.37)
GROWTH	-65.498*	-56.209*	-57.577**	-61.065*	-61.492*	-67.984*	-61.227*
	(-2.35)	(-1.97)	(-2.36)	(-2.34)	(-2.38)	(-2.48)	(-2.36)
ROA	-2.546**	-2.115**	-2.431**	-2.726**	-2.447**	-2.536**	-2.691**
	(-3.77)	(-3.27)	(-4.12)	(-4.13)	(-3.89)	(-3.94)	(-4.22)
CYCLE	0.079#	0.076#	0.053	0.073#	0.057	0.063	0.061
	(1.84)	(1.78)	(1.27)	(1.75)	(1.35)	(1.47)	(1.44)
Intercept and Industry Controls	included	included	included	included	included	included	included
R^2	59.9%	64.1%	62.3%	60.4%	60.8%	60.2%	60.7%

TABLE 6 (Continued)

**, *, and # Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.
The sample comprises 269 industry-level observations from 13 European countries. The dependent variable, EM_{aggr}, is the average percentage rank across all four individual earnings management scores, $EM1$ to $EM4$, as described in Table 1. $PUBL$ is an indicator variable taking on the value of 1 if the observation stems from publicly traded firms, and 0 otherwise. $LEGAL$ stands for the mean of three variables in La Porta et al. (1998), which measure the quality of the legal system and enforcement (i.e., efficiency of the judicial system, rule of law, and corruption index). The table reports results for the following conditional variables: TAX is an indicator variable taking on the value of 1 if financial accounts for external reporting and tax purposes are highly aligned, and 0 otherwise (see Alford et al. 1993; Hung 2001). We assume a tax status of 1 for the three countries with missing tax information (Austria, Greece, and Portugal). $TAX*RATE$ is the tax alignment indicator multiplied by the average corporate tax rate in percent of earnings before taxes (Source: *IMD World Competitiveness Yearbook 2000*) thereby giving more weight to high tax rate countries. $ACCRUAL$ is the accrual index from Hung (2001) (updated for European countries by Comprix et al. [2003]), and captures differences in accrual accounting rules across countries. $SECREG$ captures the strength of securities regulation mandating and enforcing disclosures for publicly listed firms. It is measured as the mean of the disclosure index, the liability standard index, and the public enforcement index from La Porta et al. (2006). $ANTIDIR$ is the antidirector rights index from La Porta et al. (1998) capturing the legal protection of minority shareholders. The capital market variables consist of two measures from Beck and Levine (2002): $SYSTEM$ captures whether a country's financial system is more market- or bank-based, and equals the natural log of (total value of stock traded/claims on the private sector by commercial banks), both scaled by GDP. Financial development, DEV, is a measure of the overall activity of financial intermediaries and of capital market development. It equals the natural log of (total value of stock traded*claims on the private sector by financial institutions), both scaled by GDP. We transform the continuous institutional factors into binary variables splitting by the median (except for $TAX*RATE$ where we use 34 percent as a cut-off, and $ANTIDIR$ where we split by the value of 4; see discussion in the text for details). The model includes the main effects and the interaction term of the conditioning variable and listing status, the legal enforcement variable as well as the controls from the base specification (see Model 3 in Table 5). The table reports OLS coefficient estimates and t-statistics based on heteroscedasticity corrected standard errors (in parentheses).

tax rate countries engage in more earnings management. However, we also find a significantly negative interaction term, consistent with our hypothesis in Section II that capital market forces provide a counterweight to the influence of tax incentives.[37]

Remaining Differences in Accrual Accounting Rules

To capture remaining accounting differences in the EU, we use the "accrual rules index," *ACCRUAL*, constructed by Hung (2001) and updated for EU countries by Comprix et al. (2003). This index measures the use of accrual rules to accelerate recognition of economic transactions (e.g., R&D activities, pension plans), which is generally viewed as improving the informativeness of earnings (e.g., Dechow 1994). Higher index values correspond to more extensive accrual rules (see Table 3).

Column three in Table 6 examines the relation between a binary indicator for accrual accounting regimes and earnings management. The results show that *ACCRUAL* is significantly negative at the .01 level, and so are the two main incentives variables. Thus, our previous results are not adversely affected when we explicitly control for residual differences in EU accounting rules. As discussed in Section II, the effects of accrual accounting rules may differ across private and public firms. Rules that are designed to produce timely and informative earnings are likely to be more important for public firms, which rely heavily on financial statements to communicate performance to outside investors. The negative coefficient on the interaction term between *ACCRUAL* and *PUBL* points in this direction, but it is insignificant. Thus, standards that are intended to produce timely and informative earnings play an incremental role and appear to matter equally to all firms in an economy.[38]

Securities Regulation and Minority-Shareholder Protection

To capture differences in securities regulation, we create a variable using three indices from a recent study by La Porta et al. (2006): (1) the disclosure requirements index representing several aspects of prospectus disclosure in public security offerings, (2) the liability standard index measuring the procedural difficulties in recovering losses from the issuer and its directors in a civil liability case, and (3) the public enforcement index capturing market supervision by a regulator and its investigative powers and sanctions. By calculating the arithmetic mean of the three indices, we create a summary measure *SECREG* representing the overall effectiveness of a country's securities regulation (see Table 3). To capture minority-shareholder protection, we use the anti-director rights index from La Porta et al. (1998). This index aggregates several regulatory measures protecting shareholders' voting and supervisory rights and ranges from 0 to 6. Values of 4 or higher are generally viewed as representing high outside investor protection, which is why we use this cut-off to form our binary indicator variable (e.g., Leuz et al. 2005).

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[37] In further robustness tests (not tabulated) we re-run separate analyses either using observations from consolidated financial statement data or observations from unconsolidated (or parent-only) accounts because the alignment of tax and financial accounting is commonly based on the parent-only accounts. Even though we find a much larger and more significant positive main effect using the subsample of unconsolidated accounts, we do not find evidence of a differential tax effect between public and private firms for either of the two subsamples, which might be due to the substantial decrease in sample size. Moreover, when we re-run the analyses weighting *TAX* by a tax-compliance measure (using a survey metric of the extent of tax compliance in each country from the *2000 IMD World Competitiveness Yearbook*) instead of *RATE*, the results are similar, though the main effect of tax compliance is not significant.

[38] We further examine the above findings by either using consolidated or parent-only data. Untabulated analyses show that the main effect of the accrual rules variable for the consolidated sample is significant at the .02 level, consistent with the idea that consolidated numbers serve as the primary tool to convey information to company outsiders. Using parent-only accounts, on the other hand, the *ACCRUAL* variables are not statistically significant.

In Table 6, we present results introducing these two variables into our model. Column four shows that the interaction term between *SECREG* and *PUBL* is negative and marginally significant at the .11 level (two-sided) and that the main effect is insignificant. The latter result is expected, given that securities regulation is primarily geared toward public firms. The marginally significant interaction term suggests that strong securities regulation may reinforce the effect of capital markets in reducing earnings management. We obtain a similar but much stronger result when we use *ANTIDIR* (column 5). The interaction effect is now highly significant while the main effect remains insignificant, which is expected given that strong minority-shareholder rights matter primarily for arm's-length financing in public equity markets. We interpret these findings as evidence that capital market forces faced by public firms and legal institutions geared toward public firms reinforce each other in providing incentives to report earnings that reflect firms' economic performance.

Capital Market Structure

To further explore the effects of market forces, we examine two features that capture countries' capital market structure and financial development. The basic idea is that capital market incentives should be stronger in countries that already have active and highly developed public capital markets (see also, Bushman and Piotroski 2006). We employ two variables from Beck and Levine (2002) to capture these aspects and interact them with *PUBL. SYSTEM* measures whether the financial system is relatively more equity-market-based versus bank-based and, hence, the extent to which there is arm's length or relationship financing. It is computed as the natural log of the value of stock transactions in an economy divided by commercial banks' claims on the private sector. *DEV* is a measure of financial development and the overall capital market activity. It equals the natural log of the value of stock transactions in an economy times financial institutions' claims on the private sector (see Table 3).[39]

The last two columns in Table 6 present results introducing binary indicator variables for both capital market features into the model. The results are very similar across the two variables. In both cases, the interaction terms between the capital market features and *PUBL* are significantly negative, indicating that there is less earnings management among public firms in countries with equity-based and highly developed capital markets. Again, we find that these effects apply only to public firms, as might be expected.

Taken together, our analyses suggest that the first-order effect of public equity markets is to reduce earnings management.[40] This effect interacts with several institutional features in interesting ways. Capital market forces can mitigate the negative effects of tax alignment and reinforce the positive effects of legal institutions geared primarily toward public firms. Moreover, the strength of equity market forces depends on the structure and development of countries' capital markets in place.

VI. CONCLUSIONS

This study provides compelling evidence that firms' reporting incentives created by market forces and institutional factors are important determinants of accounting quality. We exploit the EU setting and a relatively new database to examine whether public equity

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[39] If we use Wurgler's (2000) summary statistic of financial development instead, we obtain exactly the same country partition.

[40] In separate tests (untabulated), we repeat the analyses in Table 6 using our aggregate earnings informativeness index, EI_{aggr}, as the dependent variable (see Table 5, Panel B). With the exception of the interaction term in the *TAX*RATE* specification, all results are very similar and none of the inferences change.

markets and strong legal enforcement exert a systematic influence on firms' incentives to report earnings that accurately reflect economic performance.

We focus primarily on earnings management as one dimension of accounting quality and find for a large sample of private and public firms from 13 European countries that earnings management is more pervasive in privately held firms. These results are contrary to recent allegations that capital markets exacerbate incentives to mask economic performance. Instead, our findings suggest that the first-order effect of capital markets is to increase earnings informativeness. Capital markets may do so in several ways. For instance, the going public process may *ex ante* screen out firms with earnings that are innately less informative or difficult to evaluate by outsiders. In addition, capital markets are likely to provide incentives *ex post* to make earnings more informative. Our study does not attempt to identify the exact mechanism by which capital markets appear to curb earnings management. Given the substantial number of controls for firm characteristics in our analyses, we believe that *ex post* incentives are more likely to explain our findings than *ex ante* screening based on innate earnings quality, but leave this issue to future research.

We also provide evidence that earnings management is more pronounced in countries with weaker legal systems and enforcement. This effect is present for both public and private firms, confirming the central role of enforcement mechanisms. In addition, we explore the interaction between market forces and other institutional variables. The results generally support our primary finding that capital market forces improve the informativeness of earnings. We find that stronger tax alignment is associated with more earnings management, but that this effect is mitigated by market pressure on public firms. We find that legal institutions that facilitate equity financing in public markets, such as strong minority-shareholder rights and extensive disclosure requirements, reduce the level of earnings management primarily for publicly traded firms, suggesting that markets and institutions reinforce each other. The evidence also shows that in countries with large and highly developed equity markets, public firms engage in even less earnings management, providing further support for the notion that strong capital markets and arm's-length financing improve earnings informativeness.

While our results are robust to several alternative definitions of the dependent variable, to the inclusion of many different control and institutional variables, and to substantial modifications of the sample composition, we acknowledge that earnings management and earnings informativeness are notoriously difficult to measure. Thus, it is hard to preclude the possibility that our results are influenced by omitted variables, which is why we encourage future research to study the important issue of firms' reporting incentives in a variety of ways and settings.

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