The association between book-tax conformity and earnings management

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Abstract There is an ongoing debate in the literature about the costs and benefits of conforming book and taxable income. Proponents argue that increased book-tax conformity will reduce aggressive financial reporting: managing earnings up increases taxes and will curtail abusive tax shelters because managing taxes down decreases earnings reported to shareholders. We use a panel of 139,536 firm-year observations across 34 countries over the period 1996–2007 to test whether high levels of book-tax conformity are associated with less earnings management. We find that higher book-tax conformity is associated with significantly more, not less, earnings management. We conclude that one of the primary claimed benefits of increasing book-tax conformity, more truthful financial reporting with less earnings management, is unlikely to be as large as previously thought.

Keywords Book-tax conformity · Earnings management · Earnings smoothing · Discretionary accruals

JEL Classification H20 · H25 · M41

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1 Introduction

The issue of whether the United States should increase the required conformity between reported earnings and taxable income has been debated for years.[1] Proponents argue that book-tax conformity will reduce managerial opportunism over financial reporting, curtail abusive tax shelters, and minimize firm compliance costs. Opponents of book-tax conformity counter that conformity will lead to a significant loss of financial information, as the information required by financial statement users and tax authorities differs significantly, and that the reduction in compliance costs would not be as large as proponents of book-tax conformity claim.

One of the primary arguments in favor of increased conformity in the U.S. is that it will lead to less managerial discretion over financial reporting and consequently to less earnings management (Desai 2005; Whitaker 2005).[2] For example, according to Desai (2005), "A system that allows managers to characterize income differently depending on the audience legitimizes earnings manipulation…. Restricting managers to one definition of profits may constrain the impulse to characterize profits opportunistically more generally" (p. 190). Proponents argue that conformity would mitigate incentives for opportunistic reporting, since any upwards earnings management would be countered by higher taxes while downwards earnings management to avoid taxes would be met with disapproval from investors. Another argument suggests that increased conformity would decrease earnings management by eliminating tax accruals, which can be used to either manage or smooth GAAP income without affecting taxable income (Whitaker 2005).[3]

The argument that increased book-tax conformity would lead to less earnings management is rarely questioned in the popular press or academic circles,[4] although empirical evidence on this link is mixed. In this study, we use an international setting to directly test the relation between book-tax conformity and earnings management.

We use several proxies for earnings management from prior literature (Leuz et al. 2003), including two measures capturing earnings management with respect to

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[1] For an in-depth discussion of this debate, see Hanlon and Heitzman (2010). For examples of proponents of book-tax conformity, see Desai (2003, 2005, 2006), Graetz (2005), Whitaker (2005), and Chan et al. (2010). For examples of opponents, see Shackelford (2006), Hanlon and Shevlin (2005), Hanlon et al. (2008), and McClelland and Mills (2007).

[2] Like Healy and Wahlen (1999) and Leuz et al. (2003), we define earnings management as alterations in firms' reported economic performance by insiders to either mislead stakeholders or influence contractual outcomes.

[3] According to Whitaker (2005), "By substantially eliminating deferred tax expenses, uniform accounting would reduce such opportunities for potentially misleading earnings management." (p. 708).

[4] The exception relates to the effect of increased conformity on earnings smoothing. While proponents of conformity argue that book-tax differences help firms smooth book income, a subset of the accounting literature argues that managers' incentives to smooth taxable income will carry over to smoother accounting earnings under high book-tax conformity (Alford et al. 1993; Lang et al. 2012). Supporting this view, Lang et al. (2012) find a positive correlation between their measure of smoothing and a dummy indicating high book-tax alignment. Issues regarding smoothing, however, should not affect earnings management with respect to the probability of small losses or the magnitude of signed accruals at the country-year level. We note that our conclusions are quite similar when we eliminate earnings smoothing from our study and focus on nonsmoothing-related earnings management.

smoothing, one measure capturing overall financial reporting discretion (calculated as the absolute value of accruals), and one measure capturing the avoidance of small losses (calculated as the ratio of firms reporting small losses to small gains). We evaluate the relation between book-tax conformity and each of these individual measures and combine these four measures into an aggregate earnings management variable to mitigate concerns about measurement error in the individual measures. In addition, we examine the relation between book-tax conformity and upwards earnings management using the modified Jones model with lagged return on assets to estimate discretionary accruals. Examining signed discretionary accruals responds to concerns by the proponents of book-tax conformity who were motivated in part by the concern that the growing gap between taxable income and book income in the 1990s and early 2000s was caused specifically by upwards earnings management.[5]

A recent innovation in measuring book-tax conformity by Atwood et al. (2010) allows us to conduct a more powerful test of the relation between book-tax conformity and earnings management than the tests conducted in prior literature. Using international data provides us with substantial variation in the level of *required* book-tax conformity, which is the focus of our study.

Using a panel of 139,536 firm-year observations across 34 countries worldwide, we find that firms in countries with higher levels of required book-tax conformity exhibit higher rather than lower levels of earnings management. This finding holds for each of the individual measures of earnings management as well as for the aggregate measure. Our analysis controls for factors known to influence earnings management in international settings, including outside investor rights, legal enforcement, ownership concentration, legal tradition, firm size, the percentage of manufacturing firms, gross domestic product (GDP), and inflation.

To assess the robustness of the positive relation between aggregate earnings management and book-tax conformity, we also perform a series of additional tests and find that our results are not sensitive to conducting our analysis at the country-level or firm-year level (rather than at the country-year level), removing any single country from the analysis, using alternative scaling variables, controlling for IFRS adoption, using alternative measures of book-tax conformity used by Skaife and Lafond (2012), and controlling for countries' top statutory corporate tax rates. We also discuss the possibility that management's discretionary reporting actions affect our variable of interest, cross-country variation in required book-tax conformity, and conclude that these actions are unlikely to be driving our results.

As with all international studies, our results may be subject to endogeneity concerns. As argued by Leuz et al. (2003), required country-level book-tax conformity is likely correlated with other institutional features such as legal origin,

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[5] Note that, if we find less accruals management, one might ask whether firms switched to more real earnings management. Real earnings management (cutting R&D, advertising, sales promotions, etc.) generally involves book-tax conforming behavior, and thus its relative cost declines as book-tax conformity on accruals increases. If book-tax conformity increases the costs of accruals earnings management—reducing earnings management—then we might expect to observe more real earnings management. However, our results suggest more, not less, accruals earnings management in book-tax conformed systems.

the level of law enforcement, etc. To the extent we can identify these variables, we include them as controls in our model. However, because book-tax conformity is likely a choice variable for the country, we cannot be sure we have identified and included all the determinants of book-tax conformity that could be correlated with earnings management. We address concerns over correlated omitted variables using the impact threshold for a confounding variable method of Frank (2000). We find that a potential correlated omitted variable would need to have an impact factor of 0.227. Since the highest impact factor among the control variables used in our model, is 0.054, we believe that our results are reasonably robust to potential correlated omitted variables.

Our empirical tests are most related to *robustness tests* performed in Leuz et al. (2003), Burgstahler et al. (2006), and Lang et al. (2012). Leuz et al. (2003) find that a dummy variable indicating high-conformity is not significantly related to earnings management. In a subsequent study of European firms, Burgstahler et al. (2006) use a similar approach and find a positive relation between book-tax conformity and earnings management for private firms but a negative interaction between earnings management and book-tax conformity for public firms that is roughly equal in magnitude to the positive coefficient for private firms. Overall, Burgstahler et al.'s (2006) findings provide some evidence of a positive relation between book-tax conformity and earnings management, but that positive relation appears to be limited to private firms.

However, Atwood et al. (2010) find the proxy for conformity used in these two studies to be inadequate and demonstrate that the binary measure of book-tax conformity used in prior studies has a very high correlation with a common law indicator (Spearman $= -0.927$). In untabulated analysis, we find no relation between book-tax conformity and earnings management in our sample of public firms using the indicator variable approach of Leuz et al. (2003) and Burgstahler et al. (2006). This finding is consistent with Leuz et al. (2003), who report that

"We therefore re-run the main regression including a proxy for the degree of a country's tax-book conformity (e.g., Alford et al. 1993; Hung 2001). In this regression (not reported), the tax variable is not significant while the results for the investor protection variables are similar to those reported in Table 4" (p. 524).

We further explore the Burgstahler et al. (2006) finding that book-tax conformity is positively related to earnings management in high tax countries. We find no relation between our indicator variable measure of book-tax conformity and earnings management in high tax countries after also controlling for legal origin, but we do obtain a statistically significant relation between earnings management and legal origin when tax rates are high. These findings are consistent with the positive relation between book-tax conformity and earnings management in high tax rate countries documented by Burgstahler et al. (2006) being driven primarily by legal origin rather than by book-tax conformity. Atwood et al. (2010) propose a new continuous measure for the degree of book-tax alignment and find that it subsumes the explanatory power of the conformity indicator used in Leuz et al. (2003) and Burgstahler et al. (2006). We extend both of these studies by using a more comprehensive and refined measure of book-tax conformity to study the relation between book-tax conformity and earnings

management and by finding a consistent and robust positive relation between book-tax conformity and earnings management.

Lang et al. (2012) in untabulated analyses in an appendix examine the relation between earnings smoothing and a binary proxy for book-tax conformity based on book-tax alignment for inventory and depreciation and find evidence consistent with smoothing increasing when book-tax conformity is higher. They do not, however, examine the other two variables studied in Leuz et al. (2003) (i.e., magnitude of absolute accruals and the ratio of small losses to small gains). We extend Lang et al. (2012) by considering earnings management more broadly and by using a more powerful proxy for book-tax conformity. We also extend Leuz et al. (2003), Burgstahler et al. (2006), and Lang et al. (2012) by performing a battery of robustness tests to assess the strength of the link between earnings management and conformity. As a result we believe our findings cast significant doubt on the premise that increased conformity will lead to lower management discretion over earnings. Finally, unlike the three studies mentioned above, our study is the only one to examine and find a positive relation between discretionary signed accruals and book-tax conformity.

Our study makes a significant contribution to the book-tax conformity debate. While ample evidence suggests that book-tax conformity will lead to less informative financial statements (Hanlon et al. 2005, 2008; Atwood et al. 2010), direct evidence related to the potential benefits of greater conformity is scarce. Chan et al. (2010) find an increase in tax audit adjustments over the period 1996–2003 as the financial reporting rules were delinked from the tax rules in China. They find further that the increase in audit adjustments was related primarily to items that caused book-tax differences and not to book-tax conforming items. They conclude that as book-tax conformity decreased, tax noncompliance increased consistent with Chinese firms becoming more tax aggressive. Whether these results extend to other countries is debatable given the rule of law, enforcement, and market development in China during that time period. Hanlon and Heitzman (2010) call for research into other potential costs and benefits of book-tax conformity. They state:

> "the evidence suggests there will a substantial cost in terms of the information loss in accounting earnings should book-tax conformity be adopted. We have little evidence about anything else…. Further evidence on a broader set of costs and benefits would be valuable to inform this debate." (p. 136).

We respond to this call by testing whether one of the asserted benefits of book-tax conformity exists. Specifically, we perform a more comprehensive and robust statistical analysis than prior literature on the association between book-tax conformity and earnings management to directly test the claim that higher book-tax conformity is associated with less earnings management.

Our findings are inconsistent with the claim that higher book-tax conformity limits earnings management and suggest that one of the primary asserted benefits of higher book-tax conformity is likely to be smaller than previously thought and may actually work in the opposite direction. These findings should matter to academics and policymakers in considering the benefits and costs of conforming book income and taxable income.

The remainder of the paper proceeds as follows: Sect. 2 discusses related literature and hypothesis development. Section 3 describes the construction of our variables, while Sect. 4 describes our sample and data. Section 5 reports our findings, and Sect. 6 concludes.

2 Hypothesis development

President Bush's Tax Reform Panel considered the proposal to increase the level of book-tax conformity and recommended further study (see Hanlon et al. 2008). Hanlon and Heitzman (2010) also note that when the European Union adopted IFRS for financial reporting, the EU seriously considered also adopting IFRS as a common consolidated tax base. The EU considered a common consolidated corporate tax base (CCCTB) to be used by all members. One proposal was to link the CCCTB to the common adoption by all EU members of IFRS. However, this proposal met opposition by members who did not want to cede control of their tax base to a foreign entity such as the International Accounting Standards Board. Most recently, one of the primary goals of President Obama's 2012 framework for corporate tax reform in the U.S. is to "reduce the gap between book income, reported to shareholders, and taxable income, reported to the IRS" (Treasury 2012, p. 10), suggesting that the book-tax conformity debate still matters to policymakers in the U.S. and abroad.

The academic response to proposals to increase conformity has focused primarily on the issue of whether this would result in less-informative earnings: Guenther and Young (2000) and Ali and Hwang (2000) find that earnings are less informative in conformed economies in an international setting. Hanlon et al. (2005) show that conformity is likely to result in a loss of information in a U.S. setting. Hanlon et al. (2008) show that earnings informativeness declines for a small sample of U.S. firms facing increased conformity after the Tax Reform Act of 1986. Atwood et al. (2010) find that higher book-tax conformity is related to lower earnings persistence and a weaker link between current earnings and future cash flows. We replicate Atwood et al. (2010) to ensure consistency with prior literature and obtain similar results. Specifically, we find a negative relation between earnings persistence and book-tax conformity and a negative relation between the ability of earnings to predict 1-year-ahead cash flows and book-tax conformity. Thus, consistent with Atwood et al. (2010), we find that higher book-tax conformity limits managers' ability to provide information to outsiders that is relevant to predicting future earnings and cash flows.[6] Despite this finding, Atwood et al. (2010) concede that "conformity may restrain managers from using their discretion to report earnings opportunistically." (112). That is, the Atwood et al.'s (2010) results speak only to the effects of

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[6] Initially our results may appear to be inconsistent with Atwood et al. (2010) because firms with smoother earnings are likely to have more rather than less persistent earnings. However, while we find a positive relation between book-tax conformity and smoothing, we also find a positive relation between book-tax conformity and other forms of earnings management that are likely to decrease earnings persistence. Thus we conclude that effects of persistence decreasing earnings management outweigh the effects of earnings smoothing in our sample.

increased book-tax conformity on various earnings attributes, not on how book-tax conformity affects managers' actual reporting choices (earnings management). Consequently, they are careful to conclude that their results do not speak directly to the relation between book-tax conformity and earnings management.[7] We note that none of this literature attributes the negative relation between earnings informativeness and book-tax conformity to earnings management, which is our focus.

A primary difference between our work and most prior book-tax conformity literature is that we test the effect of book-tax conformity on manager behavior (earnings management) rather than on the potential effects of management's behavior on various earnings attributes such as earnings persistence (Atwood et al. 2010), earnings response coefficients (Hanlon et al. 2005, 2008), etc. While it is likely that increased earnings management affects these earnings attributes, there are at least two alternative explanations offered by the prior literature for the negative relation between book-tax conformity and these attributes of earnings that do not rely on increased earnings management. First, to the extent that tax laws allow for less managerial discretion in determining the reported earnings number, increased book-tax conformity constrains managers from revealing value-relevant information to investors. Consequently, reported earnings are a poorer reflection of economic performance and provide less information to equity market participants about firm prospects. In other words, under this interpretation, lower ERCs and earnings persistence result from managers using *less* discretion to report earnings, not more. Second, to the extent that tax law is designed to measure firms' ability to pay taxes rather than to measure economic performance, reported earnings will be a noisier measure of economic performance in a more highly conformed system. Under this interpretation, book-tax conformity will be negatively related to ERCs and earnings persistence without any change in firms' earnings management behavior.

2.1 Reasons why book-tax conformity might constrain earnings management

We hypothesize that there are two reasons why higher book-tax conformity could be associated with lower levels of earnings management. First, as argued by its proponents, high levels of book-tax conformity might mitigate the incentive to

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[7] A contemporaneous working paper by Watrin et al. (2012) also tests for the relation between book-tax conformity and earnings management in a European setting using book-tax conformity measures based on whether the firm's country uses a one-book, two-book, or three-book system. They observe less earnings management (measured as discretionary accruals) in two- and three-book firms, consistent with a positive relation between book-tax conformity and earnings management. We acknowledge that this measure of book-tax conformity overcomes some difficulties of the Atwood et al. (2010) measure that we use. We note, however, that the distinction between a one-book or two-book system exists at the single-entity level and that multinational corporations would likely operate in various one-book as well as two- and three-book systems. At the consolidated level, the distinction between a one-book versus two-book firm is less clear and assumes that the consolidated entity does not have any levers to influence reported earnings that will not affect taxable income at the single-entity level. Since the capital market pressures that influence earnings management are felt at the consolidated rather than single-entity level, it is difficult to infer the effect of book-tax conformity on earnings management by examining single-entity financial statements. We view our analysis as complementing theirs by using a measure of book-tax conformity that can be applied to many countries and by including both upward and downward earnings management in our tests to consider the effects of book-tax conformity on managers' reporting behavior more broadly.

manage earnings by forcing upwards earnings management to be met with higher taxes and forcing downwards management of taxes (i.e., downward earnings management in a system with high book-tax conformity) to decrease earnings reported to investors. Consequently, we expect managers to have weaker incentives to manage earnings when book-tax conformity is high, ceteris paribus. Second, assuming in a conformed system that tax rules are ultimately used as the basis for reported income due to the political pressures noted by Hanlon and Shevlin (2005), tax rules generally allow for less managerial discretion than accounting rules because the two systems have different goals. Under accrual accounting, revenues are recognized when earned, and expenses are matched to the revenues they helped to generate. Matching expenses to revenues requires a great deal of estimation for warranties, bad debts, contingent liabilities, and so forth. In contrast, tax law generally more closely mirrors cash-basis accounting and requires more proof that a debt is uncollectible, that a firm incurred costs to repair or replace defective items, etc. Tax rules are generally closer to cash basis accounting because tax authorities are more concerned about taxpayers' ability to pay and about raising sufficient revenues to meet policy objectives than they are about the measurement of economic performance. Thus, to the extent that book income moves towards taxable income, managers lose some of their discretion and have a reduced ability to manage earnings, even if they have the same incentives to manage earnings. To the extent that higher book-tax conformity is associated with less managerial discretion, we expect higher book-tax conformity to be associated with less accruals earnings management.

Some prior studies provide indirect evidence consistent with book-tax conformity constraining earnings management. Underlying the arguments supporting this prediction is that, if firms must pay taxes on any upwards earnings management, then there will be less upwards earnings management. (Recall, the other side of the prediction is that high levels of book-tax conformity might mitigate the incentive to avoid taxes because such actions will result in lower reported earnings.) First, Guenther et al. (1997) examine a small sample of U.S. firms that were required to shift from cash basis tax accounting to accrual basis tax accounting around Tax Reform Act of 1986. They find that these firms managed earnings downwards by deferring more income. Second, a number of studies examine the effect on reported earnings for U.S. firms subject to the alternative minimum tax book income adjustment introduced in 1986 and effective for 3 years. The adjustment directly linked the calculation of the alternative corporate minimum tax to the corporation's pretax book income. These studies generally find that firms managed earnings downward to reduce their exposure to the adjustment (see Shackelford and Shevlin 2001, pp. 333–334, for a brief summary of these studies). Third, several studies examine the effect of LIFO adoption. Under the LIFO conformity rule, while firms adopt LIFO to save taxes, the adopting firms also report lower book income. After reviewing the literature, Jenkins and Pincus (1998) conclude that the tax savings arising from LIFO adoption outweigh the reduction in reported book income. Finally, Frank et al. (2009) find a positive association between aggressive financial reporting (managing earnings upwards) and aggressive tax planning (managing taxable income down).

2.2 Reasons why book-tax conformity might lead to more earnings management

On the other hand, the information loss that results from higher book-tax conformity could lead to a more positive relation between earnings management and book-tax conformity for at least two reasons. First, the loss of an alternative measure of performance (taxable income) likely reduces outsiders' ability to detect earnings management. Some prior studies (e.g., Hanlon 2005; Blaylock et al. 2012) provide evidence consistent with investors using book-tax differences to detect earnings management and adjusting their expectation for future earnings accordingly. In a highly conformed system, book-tax differences are small or non-existent and therefore cannot be used by investors to detect earnings management. Second, the loss of information associated with higher book-tax conformity could increase the extent to which firms smooth their earnings, especially if they rely more heavily on debt financing. For example, Harris et al. (1994) argue that German firms have historically had incentives to report earnings conservatively, because of the higher degree of book-tax conformity in Germany than in the U.S. and increased reliance on debt among German firms, among other reasons. Such conservatism, however, also allows firms to manage earnings by reversing conservative reserves in periods of lower pre-managed earnings, and a smoother earnings path is likely to be appealing to lenders who care less about firms' upside earnings potential than about whether firms have sufficiently stable cash flows to repay their debts.

Some prior studies provide indirect evidence consistent with the prediction that book-tax conformity could lead to more earnings management. For example, several studies show that firms are willing to pay taxes to increase reported earnings, which casts doubt on the argument that increasing book-tax conformity would decrease earnings management. First, in addition to saving taxes, LIFO also allows firms to manage earnings (via the timing of inventory purchases) and Dhaliwal et al. (1994) and Hunt et al. (1996) document that firms are willing to incur taxes while managing earnings upwards under LIFO inventory management. Second, Erickson et al. (2004) report that a small sample of firms accused of fraudulently overstating reported book income actually paid taxes on the overstated earnings to avoid detection. Both of these findings are consistent with firms ignoring the tax cost of managing earnings, at least in some settings. Third, Lennox et al. (2013) expand on Erickson et al. (2004) and Frank et al. (2009) by examining the association between aggressive financial reporting and tax aggressiveness for a large sample of firms accused of overstating earnings by the SEC (as identified in Accounting and Auditing Enforcement Releases). They find that the probability of engaging in accounting fraud is decreasing in firms' tax aggressiveness. That is, they find that accounting and tax aggressiveness are negatively related. Finally, as previously noted, Burgstahler et al. (2006) and Lang et al. (2012) find some (albeit mixed) evidence that book-tax conformity is associated with more earnings management.

Thus overall the extant evidence mostly speaks only to whether increased book-tax conformity would limit upwards earnings management and is mixed: some studies are consistent with increased taxes reducing/constraining upwards earnings management, but others indicate that firms are also willing to manage earnings upwards despite the tax cost. Consequently, we state a nondirectional hypothesis:

H1: Book-tax conformity is associated with earnings management.

3 Variable construction

3.1 Book-tax conformity

Atwood et al. (2010) model book-tax conformity as the amount of variation in current tax expense that is not captured by variation in pre-tax earnings in a given country-year. They reason that countries that allow greater flexibility in the reporting of taxable income given a particular level of financial pre-tax earnings have lower required book-tax conformity.

We follow Atwood et al. (2010) in calculating book-tax conformity by estimating the conditional variance of current tax expense from the following model, estimated by country-year:

$$\text{CTE} = \theta_0 + \theta_1 \text{PTBI} + \theta_2 \text{ForPTBI} + \theta_3 \text{DIV} + \varepsilon, \tag{1}$$

where CTE is current tax expense (Item #23 − Item #25)[8]; PTBI is pre-tax book income (Item #21); ForPTBI is an estimate of the foreign pre-tax book income [foreign tax expense (Item #51)/total tax expense (Item #23) x PTBI]; DIV is total dividends (Item #34); and ε is a disturbance term with mean zero.[9,10] To control for cross-sectional differences in scale, we divide CTE, PTBI, ForPTBI, and DIV by average total assets (Item #89). The measure of book-tax conformity is calculated as the scaled ranking of the root mean squared errors (RMSEs) obtained from country-year estimates of Eq. (1). While a higher RMSE corresponds to lower book-tax conformity and vice versa, we use descending ranks. (That is, highest RMSE in a given year is ranked 0 and the lowest is ranked $n − 1$, where n is the number of included countries in that year.) We then divide by $n − 1$ to scale the rankings so that they range between zero and one.[11] Thus higher ranks on the BTC measure indicate higher conformity.

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[8] All financial variables are drawn from Compustat's Global Vantage files. We use Compustat Global Vantage instead of the more recent Compustat Global files because the recent version does not report foreign tax expense, which Atwood et al. (2010) require to compute book-tax conformity.

[9] Like Atwood et al. (2010), we use current tax expense (if available) when either total tax expense or deferred tax expense is missing. Atwood et al. (2010) include ForPTBI, because foreign earnings of multinationals may be taxed at different rates than their domestic statutory rate, and DIV to control for potential cross-sectional differences in current tax expense arising from dividend distributions (e.g., such as the transition between the imputation system to the current system in Germany). Atwood et al. (2010) find that book-tax conformity rankings are unchanged after excluding either ForPTBI or DIV from the model.

[10] Given that we use financial statement disclosures to estimate taxable income rather than directly examining taxable income from tax returns, some of the cross-country differences in book-tax conformity may be captured by the intercept term in model 1 rather than in the root mean-squared error. In untabulated analysis, we find a higher than 99 % correlation between the book-tax conformity measure when we omit the intercept term from model 1 and the book-tax conformity measure when the intercept is included. Thus we conclude that the intercept is not capturing a meaningful amount of cross-country variation in book-tax conformity.

[11] This procedure converts the ranks into percentiles. We do this conversion because the number of included countries varies by year as in Atwood et al. (2010). This transformation gives the book-tax conformity variable a consistent scale across years.

3.2 Earnings management

We use four different measures of earnings management, consistent with Leuz et al. (2003).[12,13] Our first measure (EM1) captures the extent to which firms smooth earnings or reduce the variability of reported earnings through the use of accruals. We use the country-year median ratio of the firm-level standard deviation of operating earnings divided by the firm-level standard deviation of cash flow from operations. Operating earnings and cash flow from operations are scaled by average total assets. Standard deviations are calculated using data from $t - 4$ to t. Lower values of this measure indicate that firms utilize accruals to smooth reported operating earnings (ceteris paribus), indicating more earnings management.

Because data on firms' cash flows are not widely available for many countries we follow prior literature (Dechow et al. 1995; Leuz et al. 2003) and measure cash flow from operations by subtracting the accrual component from earnings. We measure accruals as

$$\text{Accruals}_{it} = (\Delta CA_{it} - \Delta CASH_{it}) - (\Delta CL_{it} - \Delta STD_{it} - \Delta TP_{it}) - DEP_{it}, \quad (2)$$

where ΔCA_{it} is the annual change in total current assets (Item #75); $\Delta CASH_{it}$ is the annual change in cash and cash equivalents (Item #60); ΔCL_{it} is the annual change in current liabilities (Item #104); ΔSTD_{it} is the annual change in short-term debt included in current liabilities (Item #96); ΔTP_{it} is the annual change in taxes payable (Item #100); and DEP_{it} is depreciation and amortization expense (Item #11) for firm i in year t. Both ΔSTD_{it} and ΔTP_{it} are set to zero when missing.

Our second earnings management measure (EM2) also captures firms' smoothing. While a negative correlation between changes in accruals and operating cash flows is a natural product of accrual accounting (Dechow 1994), larger magnitudes of this correlation indicate smoothing of reported earnings not attributable to firms' underlying performance, ceteris paribus (Myers et al. 1999; Leuz et al. 2003). Therefore we use the correlation between changes in accruals and changes in operating cash flows as our second measure of earnings smoothing. Accruals and operating cash flows are defined above and the changes are both scaled by average total assets. The correlations are calculated cross-sectionally at the country-year level.

We use the magnitude of accruals as our third measure of earnings management (EM3), as firms can use their reporting discretion to mask their underlying economic performance. For example, firms can use discretion over financial reporting to overstate reported earnings through accruals to increase management

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[12] Barth et al. (2008) use modified versions of these measures to test for changes in earnings management around an event. They note that "An alternative approach used in some prior research (Dechow 1994; Leuz et al. 2003) is to base comparisons on alternative metrics constructed using a time series of firm-specific data. Data limitations preclude this approach because it requires a time series of observations for each firm that is not overlapping in the pre- and postadoption periods" (p. 481). Since we are not testing changes in earnings management around an event and we have the firm-specific time series of data, we follow Leuz et al. (2003) in constructing our measures of earnings management.

[13] Because the arguments in favor of increasing book-tax conformity focus on accrual (as opposed to real) earnings management, our tests focus on measures of accrual rather than real earnings management.

compensation or to achieve market expectations.[14] Therefore we use the country-level median of the absolute value of firms' accruals divided by the absolute value of firms' cash flow from operations. Accruals and operating cash flows are defined above.

We use the degree to which firms avoid small losses as our fourth measure of earnings management (EM4), since prior literature suggests that firms use accounting discretion to avoid reporting small losses (Burgstahler and Dichev 1997; Degeorge et al. 1999).[15] Ideally, we would use the ratio of firms just meeting or beating analyst forecasts rather than avoiding small losses as the fourth measure of earnings management, but the limited availability of analyst forecasts in an international setting makes it not feasible to use the analyst benchmark in our setting. We include this measure, in part, because there is some debate in the literature about whether smoother earnings indicate earnings management (e.g., Leuz et al. 2003) or higher quality accruals (Francis et al. 2004). While there is little insiders can do to mask large losses, they can use their discretion over financial reporting to avoid reporting small losses. We measure small loss avoidance as the ratio of the number of "small losses" to the number of "small profits" (small losses/small profits) for each country-year. Firm-year observations are classified as having a small loss if after-tax earnings (Item #32) scaled by average total assets are in the range of $[-0.01, 0.00]$ and a small profit if after-tax earnings scaled by average total assets are in the range of $[0.00, 0.01]$. Our specification differs slightly from Leuz et al. (2003), who use the inverse of this ratio. Because small profits are more prominent in our sample (i.e., some country-years do not have a small loss), using the ratio of small losses to small profits maximizes sample size. However, in untabulated analyses we obtain the same inferences as those reported below when we define EM4 to be the country-year ratio of small profits to small losses as in Leuz et al. (2003).

Following Leuz et al. (2003), we aggregate the above four measures of earnings management to reduce potential measurement error. For each country-year the four measures of earnings management are ranked such that a higher rank corresponds to a higher level of earnings management. As with the book-tax conformity measure, we convert these ranks into percentiles by subtracting 1 and dividing by $n - 1$ where n is the number of countries in the sample in a given year. This procedure

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[14] Firms can also use discretionary accruals to improve the usefulness of accounting information (Watts and Zimmerman 1986). However, Leuz et al. (2003) argue this may be a result of effective outside investor protection and therefore may not extend to countries with inferior investor protection. Consistent with their argument, they find a negative relation between investor protection and measures of accounting discretion.

[15] This approach to identifying earnings management has recently come under attack in Durtschi and Eason (2005, 2009), who argue that the results of Burgstahler and Dichev (1997) are driven largely by scaling and sample selection issues. Burgstahler and Chuk (2012), however, continue to find earnings discontinuities using unscaled earnings with differing bin sizes as a function of firm size. They also find that the majority of firms in Durtschi and Easton's (2005, 2009) sample are very small firms with stock prices of less than $5, with very little analyst following and generally much weaker incentives to manage earnings than sample firms in Burgstahler and Dichev (1997). Burgstahler and Chuk (2012) observe earnings discontinuities in firms that are likely to have sufficient capital market pressures to manage earnings, consistent with the earnings management interpretation of discontinuities around earnings benchmarks. Nevertheless, in untabulated tests, we omit EM4 from our analysis and find similar results.

converts the aggregate earnings management variable to the same scale as the book-tax conformity variable and removes any time effects from this variable. Our aggregate measure of earnings management is then created by averaging the country-year rankings for our four individual earnings management variables.[16]

In addition, we test the relation between book-tax conformity and upwards earnings management using the modified Jones model with lagged return on assets. We calculate the model at the country-industry-year level and require at least 10 observations per country-industry-year to calculate the model. We use the median estimated discretionary accrual in each country-year observation as our measure of upwards earnings management (DAP).

4 Sample selection and descriptive statistics

4.1 Sample selection

We obtain all firm-year observations in Compustat's Global Vantage files from 1996 to 2007 with necessary data to compute our four earnings management variables.[17] Following prior literature, we eliminate banks and financial institutions from our sample (Leuz et al. 2003). We also require each country-year to have at least 40 firm-year observations. Finally, we limit our main analysis to the countries studied in La Porta et al. (1998), for which data are available on countries' legal environment and investor protection. Our sample selection criteria yield 139,536 firm-year observations from 34 countries for our main tests. Due to additional data requirements, we use a reduced sample of 120,054 firm-year observations in 28 countries for tests involving upwards earnings management.

Our country-year estimates of book-tax conformity are estimated using the sample selection criteria of Atwood et al. (2010). We begin with all firm-year observations in Compustat Global Vantage from 1996 to 2007 with available data to estimate Eq. (1). Firms with negative pre-tax book income (i.e., PTBI < 0) or negative current tax expense (i.e., CTE < 0) are eliminated from the sample for purposes of calculating the book-tax conformity measure because it is difficult to interpret the current tax expense number (see Hanlon et al. 2005). These observations however are retained when estimating our earnings management variables and included in the hypothesis tests. We also exclude firms in the top or bottom 0.5 percent of the distributions of CTE, PTBI, ForPTBI, and DIV in each year. Lastly, we require each country to have at least 40 usable firm-year observations. We are left with 131,045 firm-year observations to estimate Eq. (1).

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[16] In untabulated tests, we substitute our aggregate measure of earnings management with a single factor obtained from factor analysis and find similar results. We also use aggregates of EM1 and EM2 (which capture smoothing) and of EM3 and EM4 (which capture overall discretion in financial reporting) separately and again find similar results for both sets of earnings management measures.

[17] Compustat Global Vantage begins its coverage in 1991. However, because our aggregate earnings management measure requires 5 years of lagged data our sample period starts in 1996.

4.2 Descriptive statistics

Table 1 presents the number of firm-years included for each country as well as descriptive statistics at the country level. There is substantial variation in the number of firm-years per country, which is due to differences in market development, country size, and Compustat's data coverage. There is also substantial variation in the median size of firms. To address these differences in scale, we divide all financial variables by average total assets. Table 1 also shows substantial variation in capital intensity, fraction of manufacturing firms, GDP, and inflation across countries. We control for these factors in our multivariate tests.

Table 1 also displays the average book-tax conformity for each country (averaged across the country-year ranks). Our book-tax conformity rankings are comparable to Atwood et al. (2010) but differ somewhat because we use a later version of Compustat Global Vantage and impose different sample selection criteria (e.g., availability of data from La Porta et al. 1998).[18] Like Atwood et al. (2010) we find that Canada ranks lowest in book-tax conformity, while Chile ranks the highest. In addition, our samples share eight countries in the lowest conformity tercile and seven countries in the highest. Conformity is lowest in Canada, Germany, Norway, South Africa, and the U.S. and highest in Chile, Ireland, Switzerland, Spain, and Hong Kong.[19]

In Table 2, we provide descriptive data for our earnings management variables by country. We present each earnings management variable in Table 2 according to their original unranked definition for intuition. However, all earnings management variables are ranked so that larger values indicate higher earnings management throughout the empirical tests. Consistent with Leuz et al. (2003), we find that earnings management generally prevails more in Continental Europe and Asia than in Anglo-American countries. Italy, Austria, Portugal, Greece, and Belgium have the lowest volatility in income after controlling for the volatility of cash flows (EM1). Meanwhile, the correlation between changes in accruals and cash flows (EM2) is lowest for Portugal, Italy, Taiwan, Brazil and Mexico, indicating higher smoothing behavior in these countries. The magnitude of accruals (EM3) is highest for the Philippines, Austria, Taiwan, Singapore and Thailand, while loss avoidance (EM4) is most prevalent in Spain, India, Japan, Pakistan, and Ireland. The aggregate score of these four measures indicates that earnings management is highest in Italy, Austria, Portugal, Belgium, and Greece and lowest in the U.S., Australia, Canada, Sweden, and South Africa. The discretionary accrual proxy is close to zero for all

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[18] Due to increases in Compustat's data coverage over time, we can estimate book-tax conformity for three countries (Ireland, Pakistan, and Portugal) in addition to those included in Atwood et al. (2010). However, our results are very similar when we delete these three countries from our sample (untabulated). Also, China and Indonesia are included in Atwood et al. (2010) but are excluded from our sample due to missing data from La Porta et al. (1998) (China) or the CIFAR index (Indonesia). We discuss inclusion of China and Indonesia below.

[19] While the conventional wisdom holds that Germany has high book-tax conformity, given the close tie between tax and book numbers in Germany, prior literature shows that such book-tax conformity requirements do not apply to the "group accounts" in the consolidated financial statements (Leuz and Wustemann 2004). Atwood et al. (2010) show that overall conformity in Germany can be quite low, similar to that of Australia, where conventional wisdom indicates a low level of book-tax conformity.

Table 1 Descriptive statistics of sample firms

	Years covered	# firm-years	Median firm size in US$ (millions)	Median capital intensity	Fraction of mfg. firms	Median GDP in US$ (billions)	Median inflation (%)	Average book-tax conformity
Canada	1996–2007	4,587	246.8	0.445	0.275	1,085.0	2.00	0.070
Germany	1996–2007	5,605	201.1	0.213	0.551	2,753.4	1.56	0.123
Norway	1996–2007	1,176	143.9	0.246	0.406	278.5	2.33	0.126
South Africa	1999–2007	1,302	922.1	0.247	0.233	204.7	5.34	0.131
United States	1996–2007	31,837	442.9	0.229	0.504	11,347.2	2.68	0.131
India	1996–2006	2,002	226.5	0.394	0.787	602.0	4.25	0.167
Belgium	1996–2007	922	274.0	0.221	0.547	348.3	1.79	0.231
Australia	1996–2007	7,197	17.4	0.265	0.241	684.9	2.68	0.243
Pakistan	1999–2001	128	63.7	0.502	0.664	89.0	4.14	0.285
Thailand	1996–2007	2,806	53.0	0.430	0.603	158.0	2.24	0.342
Mexico	1997–2007	669	940.9	0.560	0.478	706.7	5.03	0.348
Denmark	1996–2007	1,198	177.7	0.328	0.573	245.8	2.11	0.399
United Kingdom	1996–2007	12,039	126.5	0.239	0.350	2,071.3	2.91	0.415
Sweden	1996–2007	2,216	144.8	0.176	0.472	330.9	1.04	0.424
Philippines	1999–2007	803	40.6	0.410	0.386	93.4	5.89	0.436
Italy	1996–2007	1,901	348.2	0.202	0.588	1,723.3	2.21	0.534
Netherlands	1996–2007	1,571	576.3	0.228	0.498	585.5	2.12	0.575
Japan	1996–2007	30,465	295.6	0.292	0.515	4,094.2	−0.27	0.577
Greece	1999–2007	608	272.4	0.337	0.484	200.8	3.37	0.579
France	1996–2007	5,359	194.4	0.142	0.471	2,050.3	1.70	0.581
New Zealand	1999–2007	604	91.8	0.403	0.293	93.9	2.56	0.584
Finland	1996–2007	1,032	317.6	0.248	0.627	179.1	1.40	0.604
Brazil	1996–2007	1,173	736.9	0.445	0.598	890.5	6.84	0.607
Malaysia	1996–2007	6,046	40.4	0.373	0.551	119.7	2.03	0.622
Portugal	1998–1999	86	253.0	0.463	0.535	160.8	2.51	0.671
Singapore	1996–2007	3,329	66.6	0.301	0.457	103.0	0.96	0.690
South Korea	1999–2007	1,612	817.2	0.404	0.679	812.7	2.75	0.700
Taiwan	1998–2007	4,949	115.5	0.303	0.803	351.9	1.61	0.703
Austria	1996–2007	760	240.5	0.314	0.621	289.1	1.80	0.770
Hong Kong	1996–2007	1,250	151.3	0.275	0.405	147.2	−1.03	0.777
Spain	1996–2007	1,257	419.8	0.345	0.485	1,033.1	3.07	0.785
Switzerland	1996–2007	1,863	386.7	0.311	0.616	351.1	0.81	0.812
Ireland	1998–2006	397	258.7	0.328	0.378	174.5	3.48	0.815
Chile	1999–2007	787	174.8	0.549	0.480	108.4	3.34	0.954
Mean		4,104	287.6	0.328	0.505	1,013.8	2.57	0.494
Median		1,437	233.5	0.312	0.501	339.6	2.29	0.576

Table 1 continued

	Years covered	# firm-years	Median firm size in US$ (millions)	Median capital intensity	Fraction of mfg. firms	Median GDP in US$ (billions)	Median inflation (%)	Average book-tax conformity
Standard deviation		7,308	246.5	0.106	0.137	2,030	1.62	0.244
Min		86	17.4	0.142	0.233	89.0	−1.03	0.070
Max		31,837	940.9	0.560	0.803	11,347.2	6.84	0.954

The full sample consists of 139,536 firm-year observations for the fiscal years 1996–2007 across 34 countries. Financial accounting information is obtained from Compustat's Global Vantage files. Firm size is measured as total US$ sales (in millions). Capital intensity is measured as the ratio of long-term assets over average total assets. The fraction of manufacturing firms is the percentage of firm-year observations with SIC 2000–3999. GDP is the gross domestic product (in billions). Inflation is the annual percentage change in consumer prices. Book-tax conformity is the amount of variation in current tax expense that cannot be explained by the variation in pre-tax earnings, income from foreign operations, and dividends (see Atwood et al. 2010)

countries for which we have sufficient data to construct this variable since it is constructed as the country-year median of DAP rather than as a country-year rank. However, the general pattern is similar to the aggregate earnings management variable. Specifically, we observe the highest values for DAP in Singapore, India, South Korea, and Chile and the lowest values in Australia, the UK, and Canada.

Table 3 presents descriptive statistics on institutional characteristics, which may be correlated with earnings management and with book-tax conformity, for each country in our sample. With the exception of the CIFAR index, which we take from Bushman et al. (2004), all measures are taken from La Porta et al. (1998). The first column shows each country's legal origin. Legal tradition refers to the code-law versus common-law characterization. Code-law countries tend to be rule-oriented, while legal systems in common-law countries tend to be based on precedent (La Porta et al. 1998). Consequently, politics has a greater influence on accounting in code-law countries, while accounting practices in common-law countries are largely established by the private sector (Ball et al. 2000). Outside investor rights is an anti-director index, which captures the voting rights of minority shareholders. Legal enforcement is the average of three measures: an index of the legal system's efficiency, an assessment of the rule of law, and the level of corruption (Leuz et al. 2003). Ownership concentration is the median percentage of common shares owned by the largest three shareholders in the 10 largest privately owned nonfinancial firms.[20] The CIFAR index captures country-level disclosure policies and measures the inclusion or exclusion of 90 accounting items in firms' annual reports.

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[20] La Porta et al. (1998) define privately owned firms to be those in which the state is not a known shareholder. Under this definition, these firms may have publicly traded stock.

Table 2 Earnings management variables

	Earnings smoothing measures		Earnings discretion measures		Aggregate earnings management score (+)	DAP
	EM1 σ(OpInc)/ σ(CFO) (−)	EM2 ρ(ΔAcc, ΔCFO) (−)	EM3 |Acc|/ |CFO| (+)	EM4 # of SmLoss/# of SmProfit (−)		
Italy	0.195	−0.994	0.756	0.406	0.794	−0.0017
Austria	0.199	−0.979	0.785	0.488	0.760	NA
Portugal	0.123	−0.995	0.751	0.417	0.760	NA
Belgium	0.208	−0.978	0.731	0.384	0.729	0.0016
Greece	0.199	−0.977	0.721	0.435	0.723	NA
Spain	0.214	−0.976	0.624	0.129	0.712	0.0004
Japan	0.252	−0.986	0.693	0.269	0.708	−0.0026
Taiwan	0.271	−0.968	0.782	0.368	0.674	−0.0015
Thailand	0.254	−0.981	0.769	0.559	0.662	−0.0023
France	0.270	−0.971	0.665	0.397	0.601	−0.0026
Brazil	0.268	−0.983	0.624	0.642	0.601	−0.0016
South Korea	0.257	−0.953	0.641	0.335	0.596	−0.0003
Philippines	0.312	−0.914	0.790	0.698	0.595	−0.0002
Malaysia	0.312	−0.889	0.766	0.334	0.579	0.0022
Singapore	0.298	−0.921	0.772	0.368	0.579	−0.0004
Hong Kong	0.320	−0.911	0.736	0.390	0.579	−0.0016
Chile	0.263	−0.978	0.550	0.773	0.562	−0.0001
Switzerland	0.286	−0.916	0.554	0.333	0.490	−0.0024
Germany	0.330	−0.906	0.700	0.326	0.489	−0.0083
Denmark	0.322	−0.862	0.649	0.578	0.470	−0.0001
Mexico	0.296	−0.981	0.475	0.768	0.443	0.0039
Finland	0.409	−0.942	0.593	0.463	0.434	−0.0040
Netherlands	0.317	−0.882	0.578	0.358	0.424	−0.0002
Ireland	0.345	−0.785	0.549	0.286	0.421	NA
India	0.360	−0.933	0.466	0.250	0.387	−0.0007
Pakistan	0.357	−0.922	0.537	0.278	0.361	NA
New Zealand	0.387	−0.853	0.496	0.417	0.327	NA
Norway	0.466	−0.818	0.638	0.784	0.318	−0.0078
United kingdom	0.381	−0.878	0.543	0.481	0.318	−0.0061
South Africa	0.381	−0.884	0.500	1.170	0.249	0.0025
Sweden	0.508	−0.769	0.542	0.707	0.210	−0.0019
Canada	0.507	−0.810	0.495	0.667	0.200	−0.0023
Australia	0.560	−0.706	0.522	0.616	0.184	−0.0073
United states	0.559	−0.915	0.445	0.650	0.168	−0.0024
Mean	0.323	−0.915	0.630	0.486	0.503	−0.002
Median	0.312	−0.921	0.631	0.417	0.526	−0.002
Standard deviation	0.105	0.072	0.110	0.208	0.185	0.003

Table 2 continued

	Earnings smoothing measures		Earnings discretion measures		Aggregate earnings management score (+)	DAP
	EM1 σ(OpInc)/ σ(CFO) (−)	EM2 ρ(ΔAcc, ΔCFO) (−)	EM3 |Accl/ |CFO| (+)	EM4 # of SmLoss/# of SmProfit (−)		
Min	0.123	−0.995	0.445	0.129	0.168	−0.008
Max	0.560	−0.706	0.790	1.170	0.794	0.004

This table reports mean earnings management proxies by country. All earnings management variables are measured at the country-year level. EM1 is the country's median ratio of the firm-level standard deviations of operating income and operating cash flow (both scaled by average total assets). The sign in the column heading indicates whether higher scores for the respective EM measures imply more earnings management (+) or less (−). The cash flow from operations is equal to operating income minus accruals, where accruals are calculated as (Δtotal current assets − Δcash) − (Δtotal current liabilities − Δshort-term debt − Δtaxes payable) − depreciation expense. EM2 is the country-year's Spearman correlation between the change in accruals and the change in cash flow from operations (both scaled by average total assets). EM3 is the country-year's median ratio of the absolute value of accruals and the absolute value of the cash flow from operations. EM4 is the number of "small losses" divided by the number of "small profits" for each country-year. A firm-year observation is classified as a small loss if net earnings before extraordinary items (scaled by average total assets) are in the range $[-0.01,0]$. A firm-year observation is classified as a small profit if net earnings before extraordinary items (scaled by average total assets) are in the range $[0,0.01]$. The aggregate earnings management score is the average rank across all four measures, EM1–EM4, where each variable has been ranked so that higher values correspond to more earnings management. As with the book-tax conformity measure, we convert the ranks for aggregate earnings management into percentiles by subtracting 1 and dividing by $n - 1$ where n is the number of countries in the sample in a given year. DAP is discretionary accruals calculated from a cross-sectional modified Jones model with lagged return on assets (Jones 1991; Kothari et al. 2005)

5 Results

5.1 Correlation coefficients

Table 4 displays correlation coefficients (Pearson above, Spearman below) between book-tax conformity and our proxies for earnings management: All correlation coefficients are statistically significant at the 0.01 or better level. The table shows that higher book-tax conformity is associated with a smoother earnings path, after controlling for the volatility of cash flows (Pearson = 0.438, Spearman = 0.426). The correlation between changes in accruals and changes in cash flows (EM2) is lower (i.e., more negative) in high-conformity regimes (Pearson = 0.178, Spearman = 0.251), indicating a positive relation between book-tax conformity and smoothing. The positive correlation between the magnitude of absolute accruals (EM3) and book-tax conformity (Pearson = 0.260, Spearman = 0.266) suggests that conformity leads to greater use of accounting discretion. The probability of reporting a small loss (EM4) is lower in high-conformity regimes (Pearson = 0.168, Spearman = 0.222), consistent with higher book-tax conformity leading to the exercise of greater discretion in financial reporting. The correlations between each

Table 3 Descriptive statistics of sample countries

	Legal origin	Legal tradition	Outside investor rights	Legal enforcement	Ownership concentration	CIFAR index
Australia	English	CD	4	9.5	0.28	80
Austria	German	CM	2	9.4	0.58	62
Belgium	French	CM	0	9.4	0.54	68
Brazil	French	CM	3	6.1	0.57	56
Canada	English	CD	5	9.8	0.4	75
Chile	French	CM	5	6.5	0.45	78
Denmark	Scandinavian	CM	2	10.0	0.45	75
Finland	Scandinavian	CM	3	10.0	0.37	83
France	French	CM	3	8.7	0.34	78
Germany	German	CM	1	9.1	0.48	67
Greece	French	CM	2	6.8	0.67	61
Hong Kong	English	CD	5	8.9	0.54	73
India	English	CD	5	5.6	0.4	61
Ireland	English	CD	4	8.4	0.39	81
Italy	French	CM	1	7.1	0.58	66
Japan	German	CM	4	9.2	0.18	71
Malaysia	English	CD	4	7.7	0.54	79
Mexico	French	CM	1	5.4	0.64	71
Netherlands	French	CM	2	10.0	0.39	74
New Zealand	English	CD	4	10.0	0.48	80
Norway	Scandinavian	CM	4	10.0	0.36	75
Pakistan	English	CD	5	3.7	0.37	73
Philippines	French	CM	3	3.5	0.57	64
Portugal	French	CM	3	7.2	0.52	56
Singapore	English	CD	4	8.9	0.49	79
South Africa	English	CD	5	6.4	0.52	79
South Korea	German	CM	2	5.6	0.23	68
Spain	French	CM	4	7.1	0.51	72
Sweden	Scandinavian	CM	3	10.0	0.28	83
Switzerland	German	CM	2	10.0	0.41	80
Taiwan	German	CM	3	7.4	0.18	58
Thailand	English	CD	2	4.9	0.47	66
United Kingdom	English	CD	5	9.2	0.19	76
United States	English	CD	5	9.5	0.2	76

Table 3 continued

The classification of the legal origin and the legal tradition are based on La Porta et al. (1998). CD (CM) indicates a code-law (common-law) country. The outside investor rights variable is the anti-director rights index created by La Porta et al. (1998), which is an aggregate measure of minority shareholder rights and ranges from zero to five. Legal enforcement is measured as the mean score of three legal variables used in La Porta et al. (1998): (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index. All three variables range from zero to ten. Ownership concentration is measured as the median percentage of common shares owned by the largest three shareholders in the ten largest privately owned nonfinancial firms (La Porta et al. 1998). The CIFAR index is a disclosure index created by the Center for Financial Analysis and Research, which measures the inclusion of certain information items in firms' annual reports (see Bushman et al. 2004 for more details)

of the four individual earnings management variables used to construct the aggregate earnings management index suggest a positive association between earnings management and book-tax conformity across different dimensions of earnings management. In addition, the individual earnings management variables are highly correlated with our aggregate measure of earnings management, supporting the use of a summary measure (Leuz et al. 2003). Table 4 also shows a strong positive correlation between book-tax conformity and our aggregate earnings management variable (Pearson = 0.431, Spearman = 0.426). Finally, we also find a positive and significant univariate correlation (Pearson = 0.174, Spearman = 0.174) between book-tax conformity and DAP. Also, while DAP is positively correlated with the other EM measures, none of the correlations are significant at conventional levels. This result reflects that income increasing (decreasing, bath behavior) earnings management in the right- (left-) hand tail of the earnings distribution is not smoothing. Most importantly and contrary to conventional wisdom, the correlations described above consistently show that book-tax conformity is generally associated with more earnings management, not less.

5.2 Multivariate results

In Table 5, we regress our aggregate earnings management variable on book-tax conformity, controlling for factors that could confound this relation. Model (1) presents ordinary least squares (OLS) estimates for a regression of aggregate earnings management on book-tax conformity with no control variables. The coefficient on book-tax conformity suggests a statistically significant positive relation between book-tax conformity and earnings management (coefficient = 0.338, p value <0.01). The R^2 indicates that book-tax conformity and an intercept alone explain close to 20 % of the overall variation in earnings management across countries. In model (2), we add controls for outside investor rights and legal environment, as Leuz et al. (2003) show that these variables are negatively associated with earnings management, and obtain a similar coefficient on our book-tax conformity variable (coefficient = 0.324, p value <0.01). Consistent

Table 4 Correlation coefficients

	Book-tax conformity	EM1 (+)	EM2 (+)	EM3 (+)	EM4 (+)	Aggregate earnings management (+)	DAP (+)
Book-tax conformity		0.438	0.178	0.260	0.168	0.431	0.174
		<0.0001	0.001	<0.0001	0.001	<0.0001	0.004
EM1 (+)	0.426		0.441	0.480	0.215	0.792	0.095
	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	0.120
EM2 (+)	0.251	0.598		0.129	0.049	0.505	0.086
	<0.0001	<0.0001		0.014	0.350	<0.0001	0.163
EM3 (+)	0.266	0.478	0.295		0.134	0.632	0.000
	<0.0001	<0.0001	<0.0001		0.011	<0.0001	0.995
EM4 (+)	0.222	0.286	0.122	0.114		0.401	0.032
	<0.0001	<0.0001	0.020	0.030		<0.0001	0.597
Aggregate earnings management (+)	0.426	0.789	0.723	0.638	0.503		0.065
	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.288
DAP (+)	0.174	0.095	0.086	0.000	0.032	0.065	
	0.004	0.120	0.163	0.995	0.597	0.288	

This table reports correlation coefficients (Pearson above, Spearman below) for 374 country-year observations (267 country-year DAP observations). The numbers in italics are p values. Book-tax conformity is the amount of variation in current tax expense that cannot be explained by the variation in pre-tax earnings, income from foreign operations, and dividends (see Atwood et al. 2010). EM1 is the country's median ratio of the firm-level standard deviations of operating income and operating cash flow (both scaled by average total assets). The cash flow from operations is equal to operating income minus accruals, where accruals are calculated as (Δtotal current assets − Δcash) − (Δtotal current liabilities − Δshort-term debt − Δtaxes payable) − depreciation expense. EM2 is the country-year's Spearman correlation between the change in accruals and the change in cash flow from operations (both scaled by average total assets). EM3 is the country-year's median ratio of the absolute value of accruals and the absolute value of the cash flow from operations. EM4 is the number of "small losses" divided by the number of "small profits" for each country-year. A firm-year observation is classified as a small loss if net earnings before extraordinary items (scaled by average total assets) are in the range [−0.01,0]. A firm-year observation is classified as a small profit if net earnings before extraordinary items (scaled by average total assets) are in the range [0,0.01]. All earnings management variables are ranked so that higher values indicate more earnings management. The aggregate earnings management score is the average rank across all four measures, EM1–EM4. As with the book-tax conformity measure, we convert the ranks for aggregate earnings management into percentiles by subtracting 1 and dividing by $n − 1$, where n is the number of countries in the sample in a given year. DAP is discretionary accruals calculated from a cross-sectional modified Jones model with lagged return on assets (Jones 1991; Kothari et al. 2005), measured at the country-year level

with Leuz et al. (2003), outside investor rights and legal enforcement are associated with less earnings management, as they limit insiders' ability to acquire private benefits of control.

Because each country enters the sample more than once, we employ in model (3) heteroscedasticity-robust standard errors clustered by country and add year fixed

Table 5 Aggregate earnings management and book-tax conformity

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Intercept	0.348	0.793	0.781	0.959	1.007
	[0.020]***	[0.047]***	[0.112]***	[0.329]***	[0.250]***
Book-tax conformity	0.338	0.324	0.326		0.295
	[0.035]***	[0.028]***	[0.055]***		[0.045]***
Outside investor rights		−0.060	−0.060	0.001	−0.016
		[0.006]***	[0.015]***	[0.020]	[0.015]
Legal enforcement		−0.030	−0.030	−0.024	−0.022
		[0.005]***	[0.010]***	[0.013]*	[0.008]***
Ownership concentration				0.502	0.429
				[0.187]**	[0.127]***
Legal tradition				0.102	0.048
				[0.066]	[0.043]
Median firm size				−0.016	−0.027
				[0.024]	[0.019]
Median capital intensity				−0.268	−0.289
				[0.182]	[0.130]**
Fraction of mfg. firms				0.327	0.209
				[0.180]*	[0.116]*
Median GDP				−0.005	0.015
				[0.025]	[0.019]
Median inflation				−0.020	−0.015
				[0.007]***	[0.006]**
CIFAR index				−0.006	−0.008
				[0.003]**	[0.002]***
Year fixed effects	No	No	Yes	Yes	Yes
Error clustering	No	No	Country	Country	Country
R^2	0.185	0.431	0.433	0.487	0.592
Nobs	362	362	362	362	362

Aggregate earnings management is created by averaging the ranks of all four earnings management measures, EM1–EM4 (all EM variables are ranked such that higher values indicate more earnings management, see Table 4), where EM1–EM4 are measured at the country-year level. As with the book-tax conformity measure, we convert the ranks for aggregate earnings management into percentiles by subtracting 1 and dividing by $n − 1$, where n is the number of countries in the sample in a given year. Book-tax conformity is the amount of country-year variation in current tax expense that cannot be explained by the variation in pre-tax earnings, income from foreign operations, and dividends (see Atwood et al. 2010). The outside investor rights variable is the anti-director rights index created by La Porta et al. (1998), which is an aggregate measure of minority shareholder rights and ranges from zero to five. Legal enforcement is measured as the mean score of three legal variables used in La Porta et al. (1998): (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index. All three variables range from zero to ten. Ownership concentration is measured as the median percentage of common shares owned by the largest three share-holders in the ten largest privately owned nonfinancial firms (La Porta et al. 1998). Legal tradition is one for code law countries and zero for common law countries. Firm size is country-year median of total US\$ sales (in millions). Capital intensity is the country-year median ratio of long-term assets over average total assets. The fraction of manufacturing firms is the percentage of firm-year observations with SIC 2000–3999, computed at the country-year level. GDP is the gross domestic product (in billions), computed at the country-year level. Inflation is the country's annual percentage change in consumer prices. The CIFAR index is a disclosure index created by the Center for Financial Analysis and Research (see Bushman et al. 2004 for more details). Standard errors are in brackets

***, **, and * significance at the 10, 5, and 1 % levels, respectively (two-tailed)

effects to the regression.[21] After adding year fixed effects, we continue to find a positive and statistically significant relation between earnings management and book-tax conformity (coefficient = 0.326, p value <0.01).

In models (4) and (5), we control for several other potential determinants of earnings management, including ownership concentration, legal tradition, firm size, capital intensity, the fraction of manufacturing firms, GDP, inflation, and disclosure intensity (as measured by the CIFAR index).[22] In model (4), we exclude the book-tax conformity measure so as to derive a baseline estimate of the model R^2, which is 0.487. After including these additional controls but excluding book-tax conformity, we continue to find a negative and statistically significant relation between earnings management and legal enforcement, consistent with the findings of Leuz et al. (2003). The inclusion of these additional controls makes the coefficient on investor rights insignificant. Model (5) adds the book-tax conformity measure increasing the R^2 to 0.592. Book-tax conformity continues to be positively associated with earnings management (coefficient = 0.295, p value <0.01). That is, we find that a one standard deviation increase in book-tax conformity is associated with a 0.294 standard deviation increase in aggregate earnings management. We believe these results are economically significant.

5.3 Individual measures

We also provide multivariate results for each individual earnings management measure in Table 6. The results are consistent with the univariate results reported above. Specifically, we find a positive relation between book-tax conformity and each individual earnings management measure in the multivariate setting. Specifically, we obtain coefficient estimates of 0.466 (p value <0.01), 0.245 (p value <0.01), 0.300 (p value <0.01), and 0.167 (p value <0.05) for EM1, EM2, EM3, and EM4, respectively. These findings are consistent with book-tax conformity increasing earnings smoothing (EM1 and EM2), overall accrual management (EM3), and small loss avoidance (EM4). Thus we find that book-tax conformity is associated with higher levels not only of smoothing (as in Lang et al. 2012) but also with higher levels of earnings management more generally.

5.4 Upwards earnings management

We also consider the relation between book-tax conformity and upwards earnings management directly. Some of the arguments for conformity specifically focus on

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[21] Since our earnings management and book-tax conformity variables are ranked by year, adding year fixed effects to the model should have little impact on our test results. Nevertheless, we include year fixed effects to capture yearly variation in our control variables that might vary from year to year.

[22] In studying the relation between earnings persistence and book-tax conformity, Atwood et al. (2010) also control for earnings variability and find that it has no significant effect on the relation between earnings persistence and book-tax conformity. We omit earnings variability from our set of control variables because it likely over-controls for the effect we are trying to capture (e.g., earnings variability is the numerator in calculating EM1). However, in untabulated results we find that the coefficient on book-tax conformity is still positive and significant (coefficient = 0.241, p value < 0.01) even after controlling for earnings variability.

the desire to constrain upwards earnings management via higher book-tax conformity or argue that the widening book-tax gap is caused specifically by upwards earnings management. In Table 6, we employ the same models as above to test for a relation between book-tax conformity and discretionary accruals—our proxy for upwards earnings management. We find a positive and statistically significant relation between book-tax conformity and DAP, consistent with the positive univariate correlation reported in Table 4. The results are again economically significant. Using model estimates from the last column of Table 6, we find that a one standard deviation increase in book-tax conformity is associated with a 0.170 standard deviation increase in DAP. Overall, these findings are inconsistent with the claim that higher book-tax conformity is associated with less upwards

Table 6 Individual measures of earnings management and book-tax conformity

	EM1 (+)	EM2 (+)	EM3 (+)	EM4 (+)	DAP
Intercept	1.429	0.220	2.587	−0.207	0.186
	[0.447]***	[0.399]	[0.473]***	[0.432]	[0.326]
Book-tax conformity	0.466	0.245	0.300	0.167	0.170
	[0.065]***	[0.073]***	[0.091]***	[0.063]**	[0.081]**
Outside investor rights	−0.057	0.008	−0.031	0.015	0.009
	[0.024]**	[0.026]	[0.026]	[0.024]	[0.014]
Legal enforcement	−0.043	−0.034	−0.011	0.001	−0.009
	[0.014]***	[0.013]**	[0.013]	[0.015]	[0.012]
Ownership concentration	0.392	0.644	0.363	0.316	0.144
	[0.186]**	[0.213]***	[0.252]	[0.225]	[0.135]
Legal tradition	0.034	0.081	0.071	0.005	−0.064
	[0.068]	[0.060]	[0.065]	[0.067]	[0.044]
Median firm size	0.009	−0.004	−0.121	0.009	0.022
	[0.023]	[0.027]	[0.040]***	[0.024]	[0.016]
Median capital intensity	−0.081	−0.054	−0.843	−0.179	−0.062
	[0.198]	[0.204]	[0.190]***	[0.189]	[0.175]
Fraction of mfg. firms	−0.102	0.327	0.035	0.575	0.192
	[0.162]	[0.180]*	[0.309]	[0.162]***	[0.091]**
Median GDP	0.018	0.057	−0.021	0.003	−0.026
	[0.028]	[0.030]*	[0.024]	[0.031]	[0.016]
Median inflation	−0.025	−0.012	−0.022	−0.001	0.016
	[0.007]***	[0.008]	[0.009]**	[0.008]	[0.007]**
CIFAR index	−0.012	−0.005	−0.016	0.002	0.003
	[0.004]***	[0.003]*	[0.004]***	[0.003]	[0.003]
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Error clustering	Country	Country	Country	Country	Country
R^2	0.638	0.340	0.560	0.100	0.101
Nobs	362	362	362	362	267

Table 6 continued

EM1 is the country's median ratio of the firm-level standard deviations of operating income and operating cash flow (both scaled by average total assets). EM2 is the country-year's Spearman correlation between the change in accruals and the change in cash flow from operations (both scaled by average total assets). EM3 is the country-year's median ratio of the absolute value of accruals and the absolute value of the cash flow from operations. EM4 is the number of "small losses" divided by the number of "small profits" for each country-year. A firm-year observation is classified as a small loss if net earnings before extraordinary items (scaled by average total assets) are in the range $[-0.01,0]$. A firm-year observation is classified as a small profit if net earnings before extraordinary items (scaled by average total assets) are in the range $[0,0.01]$. EM1–EM4 are ranked so that higher values indicate more earnings management. As with the book-tax conformity measure, we convert the ranks for EM1–EM4 into percentiles by subtracting 1 and dividing by $n - 1$ where n is the number of countries in the sample in a given year. Discretionary accruals (DAP) are calculated from a cross-sectional modified Jones model with lagged return on assets measured at the country-year level. Book-tax conformity is the amount of country-year variation in current tax expense that cannot be explained by the variation in pre-tax earnings, income from foreign operations, and dividends (see Atwood et al. 2010). The outside investor rights variable is the anti-director rights index created by La Porta et al. (1998), which is an aggregate measure of minority shareholder rights and ranges from zero to five. Legal enforcement is measured as the mean score of three legal variables used in La Porta et al. (1998): (1) the efficiency of the judicial system, (2) an assessment of the rule of law, and (3) the corruption index. All three variables range from zero to ten. Ownership concentration is measured as the median percentage of common shares owned by the largest three shareholders in the ten largest privately owned nonfinancial firms (La Porta et al. 1998). Legal tradition is one for code law countries and zero for common law countries. Firm size is country-year median of total US$ sales (in millions). Capital intensity is the country-year median ratio of long-term assets over average total assets. The fraction of manufacturing firms is the percentage of firm-year observations with SIC 2000–3999, computed at the country-year level. GDP is the gross domestic product (in billions), computed at the country-year level. Inflation is the country's annual percentage change in consumer prices. The CIFAR index is a disclosure index created by the Center for Financial Analysis and Research (see Bushman et al. 2004 for more details). Standard errors are in brackets

***, **, and * significance at the 10, 5, and 1 % levels, respectively (two-tailed)

earnings management. We interpret these findings as being consistent with the explanation of Erickson et al. (2004) and others that, at least in some settings, when managers are forced to choose between managing earnings or managing taxes, they choose to manage earnings. In our setting, this earnings management is likely aided by the fact that, as shown in prior literature, higher book-tax conformity decreases earnings informativeness, making it potentially more difficult for investors and others to detect earnings management.

5.5 Additional analysis

We verify the sensitivity of the positive relation between book-tax conformity and earnings management variables along several dimensions. First, we check how robust our results are to using alternative scalars. Like Atwood et al. (2010), we scale all financial variables by average total assets in our reported results. However, we obtain similar results when we scale all financial variables by lagged assets, following Leuz et al. (2003), or when we scale all financial variables by sales.

Second, we examine whether our results are robust to different aggregation schemes. We conduct our analysis on a country-year level to maximize variation in

book-tax conformity. Thus our reported tests attempt to strike a balance between the research designs used by Atwood et al. (2010) (i.e., at the firm-year level) and by Leuz et al. (2003) (i.e., at the country level). To alleviate concerns over data aggregation, we also conduct our main analysis at both the firm-year and country levels, and all inferences remain the same.

Third, we assure that our results are not driven by any single country by estimating the relation between book-tax conformity and earnings management after removing each country from our sample. We find that our results are not sensitive to excluding any one country. China and Indonesia are included in Atwood et al. (2010) but are excluded from our sample due to missing data from La Porta et al. (1998) (China) or the CIFAR index (Indonesia). However, given the prior literature on Chinese firms and book-tax conformity, we also estimate our tests including China and Indonesia and removing these controls and obtain qualitatively similar results (untabulated), suggesting that our exclusion of the two countries does not materially affect our conclusions.

Fourth, we test whether our results are affected by the adoption of IFRS by many countries during the period of our study, which could impact book-tax conformity because it represented a significant change to many countries' accounting standards. However, the effect of IFRS adoption on book-tax conformity ex ante depends on the extent to which IFRS differs from local GAAP in the pre-IFRS period.[23] We test for the extent to which the book-tax conformity measure is affected by IFRS adoption using the following model:

$$BTC_{it} = \alpha + \beta_1 * CONTROLS_{it} + \beta_2 * IFRS\_D_{it} + \beta_3 * GAAPDIF_i + \beta_4 \\ * IFRS\_D_{it} * GAAPDIF_i + \varepsilon_{it} \tag{3}$$

where $IRFS\_D_{it}$ is an indicator variable equal to one for countries that have adopted IFRS in the years after IFRS adoption and zero otherwise, and $GAAPDIF_i$ is a measure of the differences between IFRS and local GAAP on several key dimensions (see Bae et al. 2008 for a complete description of this measure) prior to IFRS adoption. In untabulated tests, β_2, β_3, and β_4 are all insignificant, suggesting that the adoption of IFRS had little measurable impact on the book-tax conformity of countries within our sample, even when local GAAP differed significantly from IFRS prior to IFRS adoption. Including these variables in our main model [the model used in column (4) of Table 5] does not change any of the inferences reported above: we continue to find a positive and statistically significant relation between book-tax conformity and earnings management. Finally, because most countries formally adopted IFRS in 2005, we re-estimate model 1 separately for the periods 1996–2004 and 2005–2007 and again obtain similar inferences as those reported

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[23] Whether moving from local GAAP to IFRS increases or decreases book-tax conformity also depends on how conformed local GAAP was to the tax rules before and after the change. We can only capture the differences between local GAAP and IFRS in this test. If a country used reported GAAP income as the basis for calculating taxes both before and after IFRS adoption, it would not matter how different local GAAP was from IFRS in the pre-IFRS period; book-tax conformity would be high both before and after IFRS adoption. While somewhat surprising, we interpret the insignificant coefficient on β_4 below as evidence that the positive relation between book-tax conformity and earnings management above is unlikely to be driven by IFRS adoption.

above for both periods. We conclude that the adoption of IFRS by many countries during our sample period is not driving our results.

Fifth, we consider alternative measures of book-tax conformity. While Atwood et al. (2010) validate their continuous measure and show that it subsumes the traditional conformity dummy first reported in Hung (2001), we consider two additional validity checks. Using tax summaries provided in *Corporate Taxes: A Worldwide Summary* (Price Waterhouse 1995), Skaife and LaFond (2012) identify whether inventory or depreciation conformity is required at the country level for 20 countries in our sample.[24] Using these data, we find a positive and significant correlation between our measure of book-tax conformity and a dummy indicating inventory conformity (Pearson = 0.27, p value <0.01) and a positive and significant correlation between our conformity measure and a dummy indicating depreciation conformity (Pearson = 0.20, p value <0.01). These correlations confirm the validation efforts in Atwood et al. (2010) and show that our measure indeed captures required book-tax conformity at the country level. We also estimate the results from Table 5 using these two alternative measures of required conformity and continue to find a positive and significant relation between book-tax conformity and earnings management in both cases.[25]

Sixth, we consider the possibility that our measure of book-tax conformity is also affected by earnings management. While earnings management could affect our measure of required conformity, we believe this is unlikely to be a problem given our results. Managers' discretionary choices must have different effects on book and taxable income (i.e., they must be book-tax nonconforming) to affect our measure of book-tax conformity. However, nonconforming earnings management should increase the root mean squared error of Eq. (1), as pre-tax book income would explain less variation in income tax expense when managers engage in nonconforming earnings management. Consequently, more nonconforming earnings management biases the tests against finding a positive relation between book-tax conformity and earnings management.

Seventh, we examine whether our results are driven by different tax rates across countries, since firms in countries with low tax rates are less worried about the tax implications of managing book earnings. As noted above, Burgstahler et al. (2006) find a stronger link between book-tax conformity and earnings management among public firms when tax rates are high. To address this possibility, we include the highest statutory tax rate minus the average statutory tax rate in the sample for each country in each year as a control variable.[26] We also interact book-tax conformity with the demeaned top statutory rate to examine whether book-tax conformity has a stronger effect on earnings management in higher-tax-rate countries. After doing so, we continue to find a positive and significant association between book-tax conformity and earnings management (coefficient = 0.299, p value <0.01), while

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[24] We thank Hollis Skaife for providing us with country-level data on required inventory and depreciation conformity.

[25] Results from these alternative tests are available upon request.

[26] We demean the book-tax conformity and statutory tax rate variables to enhance the interpretability of the main effects as well as the interaction between these variables (Burks et al. 2013).

the coefficient on statutory tax rates is not statistically significant (coefficient = −0.0011, p value >0.10). The coefficient on the interaction between book-tax conformity and statutory tax rates is positive as expected but is not statistically significant (coefficient = 0.0037, p value >0.10)

Eighth, we provide an estimate of the robustness of our main results with respect to correlated omitted variables. Required country-level book-tax conformity is likely correlated with other institutional features such as code law versus common law, the level of legal enforcement, investor protections, etc. To the extent we can identify and measure these variables, we include them as controls in our model. However, because book-tax conformity is likely a choice variable for the country, we cannot be sure we have identified and included all the determinants of book-tax conformity that could also be correlated with earnings management. Thus we address concerns over correlated omitted variables by estimating the smallest correlation such a confounding variable would have to have with both earnings management and with book-tax conformity to invalidate our statistical inferences. Frank (2000) derives an estimate to assess the robustness of multivariate regression coefficients in the presence of potential correlated omitted variables, known as the impact threshold for a confounding variable (denoted as ITCV). This approach has been previously used in the accounting literature (e.g., Larcker and Rusticus 2010). Thus, while we cannot control for every possible confounding effect, we can estimate how strong such an effect would have to be to invalidate our results and inferences. The ITCV is defined as the lowest product of the partial correlation between y and the confounding variable *and* the partial correlation between x and the confounding variable that would cause the observed statistical relation between x and y to become statistically insignificant. As shown in Table 7, using our main regression model for aggregate earnings management, we find an ITCV of 0.227 for book-tax conformity.[27] This value implies that a potential correlated omitted variable would need to have a correlation of at least 0.476 (0.227^0.5) (*after* considering our control variables) with *both* book-tax conformity and aggregate earnings management to cause the positive correlation between book-tax conformity and aggregate earnings management to become statistically insignificant. Given that proponents of book-tax conformity claim that increasing book-tax conformity would lead to a decrease in earnings management, we further calculate the minimum impact threshold that a potential correlated omitted variable would need to have to cause the relation between book-tax conformity and earnings management to become negative *and* statistically significant. As shown in Table 7, a correlated omitted variable would need to have an impact factor of at least 0.309 (an implied correlation of at least 0.556 with book-tax conformity and earnings

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[27] $ITCV = \left(\sqrt{(1 - r_{x \cdot z}^2)(1 - r_{y \cdot z}^2)}\right)\left(\frac{t^2 + t\sqrt{d}}{-(n-q-1)} + \left[\frac{-d - t\sqrt{d}}{-(n-q-1)}\right]r_{y \cdot x|z}\right)$ where $r_{x \cdot z}^2$ is the R^2 from a regression of x on all other control variables (0.2503); $r_{y \cdot z}^2$ is the R^2 from a regression of y on all other control variables (0.487); t is the critical value from a T distribution (we use a t value of 1.96, where alpha = 5 % two-tailed); n is the number of observations (362); q is the number of independent variables included in the model (22 including the year dummy variables); $r_{y \cdot x|z}$ is the partial correlation between x and y holding constant all control variables (0.433); and $d = t^2 + (n - q - 1)$. For more details on the calculation of ITCV see Frank (2000).

Table 7 Impact threshold for a confounding/suppressing variable

	(1) ITCV	(2) ITCV implied correlations	(3) ITSV	(4) ITSV implied correlations	(5) ρ(X,BTC)	(6) ρ(X,Y)	(7) Impact$_{Raw}$	(8) ρ(X,BTC |Z)	(9) ρ(X,Y | Z)	(10) Impact
Book-tax conformity	0.227	0.476	−0.309	0.556						
Outside investor rights					−0.020	−0.429	0.008	0.227	0.001	0.000
Legal enforcement					−0.039	−0.298	0.012	−0.044	−0.165	0.007
Ownership concentration					0.115	0.380	0.044	0.091	0.279	0.025
Legal tradition					0.230	0.404	0.093	0.260	0.207	0.054
Median firm size					0.099	0.112	0.011	0.105	−0.060	−0.006
Median capital intensity					0.105	0.017	0.002	0.000	−0.135	0.000
Fraction of mfg. firms					0.179	0.428	0.076	0.158	0.225	0.036
Median GDP					−0.280	−0.116	0.033	−0.226	−0.025	0.006
Median inflation					−0.121	−0.048	0.006	−0.145	−0.254	0.037
CIFAR index					0.009	−0.497	−0.005	0.087	−0.206	−0.018
Mean					0.028	−0.005	0.028	0.051	−0.013	0.014
Max					0.230	0.428	0.093	0.260	0.279	0.054
Robustness to % bias = 0.754										

This table assesses the impact of possible correlated omitted variables (or unobservable confounding variables) on the results reported in Table 5 (column 4), following Frank (2000). Column (1) reports the impact threshold for a confounding variable (ITCV), which is the lowest product of the partial correlation between aggregate earnings management and the confounding variable and the partial correlation between BTC and the confounding variable that makes the coefficient on BTC statistically insignificant at the 5 % level. Column (2) reports the minimum correlation a confounding variable must have between aggregate earnings management and BTC to make the coefficient on BTC insignificant. Column (3) reports the impact threshold for a suppressing variable (ITSV), which is the lowest product of the partial correlation between aggregate earnings management and the suppressing variable and the partial correlation between BTC and the suppressing variable that makes the coefficient on BTC negative and statistically significant. Column (4) is the minimum correlation a suppressing variable must have between aggregate earnings management and BTC to make the coefficient on BTC negative and statistically significant. Column (5) reports raw Pearson correlations between BTC and the control variables. Column (6) reports raw Pearson correlations between aggregate earnings management and each control variable. Column (7) is the raw impact of each control variable, defined as the product of the raw correlation between BTC and the control variable and the correlation between aggregate earnings management and the control variable. Column (8) reports the partial Pearson correlation between BTC and each control variable. Column (9) reports the partial Pearson correlation between aggregate earnings management and each control variable. Column (10) is the partial impact of each control variable. Robustness to % bias is the percentage of bias that must be present for true coefficient on BTC to be insignificant

management) to make the relation between book-tax conformity and earnings management negative and significant (again, *after* considering our control variables). Given that our main regression model explains nearly 60 % of the variation in our earnings management variable and that the strongest impact factor among our included control variables is 0.054, we conclude that our main results are reasonably robust to potential correlated omitted variables.

6 Conclusion

There is an ongoing debate in the policy arena and in the accounting literature about the costs and benefits of increasing book-tax conformity. Calls to tax firms on book income or to eliminate many of the differences between book income and taxable income are predicated partly on the belief that higher book-tax conformity would reduce opportunistic managerial reporting of accounting numbers. Opponents respond that book-tax conformity would be more difficult to achieve than proponents suggest and that increasing the level of book-tax conformity would lead to less informative financial statements (and in particular, earnings).

We contribute to this debate by testing the assumption that higher book-tax conformity is associated with lower earnings management. Using an international panel of firms across 34 countries from 1996 to 2007, we test the claim that higher book-tax conformity is associated with less earnings management. If higher levels of book-tax conformity are associated with a sufficiently large reduction in earnings management, investors could be better off with higher book-tax conformity even though they would lose some information from conforming the two income measures. However, our evidence suggests that higher levels of book-tax conformity are not necessarily associated with less earnings management. In fact, we find that higher levels of book-tax conformity are associated with higher, not lower, overall levels of earnings management across the world. We further find no evidence that higher book-tax conformity is associated with less upwards earnings management. We conclude that one of the primary asserted benefits of conforming book and taxable income, more truthful financial reporting, is unlikely to be large as previously thought.

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