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Book-tax conformity and capital structure

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Abstract We examine the effect of increased book-tax conformity on corporate capital structure. Prior studies document a decrease in the informativeness of accounting earnings for equity markets resulting from higher book-tax conformity. We argue that the decrease in earnings informativeness impacts equity holders more than debt holders because of the differences in payoff structures between debt and equity investments such that increases in book-tax conformity lead to increases in firms' reliance on debt capital. We exploit a natural experiment in the U.S. and find that firms facing an increase in required book-tax conformity increase leverage relative to other firms. We also provide evidence of an increase in the cost of equity (but not of debt) capital for firms facing an increase in required book-tax conformity, relative to control firms, and show that these increases in cost of equity capital are positively associated with an increase in leverage. Our findings are consistent with firms substituting away from equity and toward more debt in the presence of higher book-tax conformity.

Keywords Book-tax conformity · Leverage · Capital structure

JEL codes H20 · H25 · M41

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1 Introduction

We examine the relation between book-tax conformity and corporate capital structure, where book-tax conformity describes the extent to which accounting income (following U.S. GAAP) and taxable income (following the Internal Revenue Code) mirror each other. The recent increase in book-tax differences has led to calls for increases in the conformity between book and taxable income in hopes that such an increase will lower firms' compliance costs, lower tax rates, damp earnings management, and discourage the use of corporate tax shelters and other tax avoidance activities (Yin 2001; Carnahan and Novack 2002; Murray 2002; Desai 2003; Desai 2005; Desai 2006; Graetz 2005; Whitaker 2005; Chan et al. 2010).[1] According to proponents, conformity would lower compliance costs by requiring firms to only prepare one set of books. It would also decrease upward earnings management by requiring that firms pay tax on such increases while decreasing tax shelters and tax avoidance by requiring firms seeking to minimize taxes to also report lower income to shareholders. Such calls have led to proposals for greater conformity by both President Bush and President Obama under their respective frameworks for corporate tax reform (Hanlon et al. 2008; Treasury 2012).

The academic response to calls for increased conformity has mostly focused on the possible unintended consequence of decreased earnings informativeness to equity market participants.[2] For example, Hanlon et al. (2005) find that conforming book income to taxable income would result in an estimated loss of information of about 50%. Using the same setting and a similar sample to the one we use in this paper, Hanlon et al. (2008) find a significant decrease in the informativeness of earnings for firms required to conform taxable income to accounting income relative to firms not required to conform.[3] Consistent with these reduced informativeness results, using an international cross-country setting, Atwood et al. (2010) find a negative relation between book-tax conformity and the persistence of accounting earnings, and Blaylock et al. (2015) find a positive relation between book-tax conformity and earnings management.

Our paper focuses on the possible capital structure implications of these recent academic findings. Because of the asymmetric payoff function of debt investments, debt holders' primary concerns are whether the value of a firm's assets falls below its liabilities (Black and Scholes 1973) and whether the firm has sufficient current and future cash flows to meet its debt obligations (Jensen and Meckling 1976). Therefore debt holders are likely less sensitive to decreases in earnings informativeness than equity holders, whose payoffs are likely more affected by the quality of earnings (Plummer and Tse 1999, Easton et al. 2009). These differences in payoffs suggest that an increase in book-tax conformity might shift the capital structure of U.S. firms toward debt. That such a shift would happen, however, is not inevitable. As Hanlon and

[1] Desai (2003, 2005, 2006), Yin (2001), and Whitaker (2005) all suggest moving the taxable income calculation closer to the book income calculation, that is, conforming or basing tax more on the book rules, which is the setting we study.

[2] Exceptions are McClelland and Mills (2007) and Hanlon and Maydew (2009), who examine tax revenue implications of increased book-tax conformity.

[3] Hanlon et al. (2008) were motivated by the findings in Guenther et al. (1997) that firms required to conform taxable income toward accounting income, relative to firms not required to conform, changed their financial reporting behavior in response to the altered tax incentives by deferring more accrual revenue, accelerating more accrual expenses, or both in the post-TRA '86 period.

Shevlin (2005) point out, firms might voluntarily continue to disclose information about their earnings performance similar to current financial accounting income. Thus an increase in book-tax conformity might have no impact on capital structure, despite causing a decrease in financial statement informativeness. Therefore the relation between book-tax conformity and capital structure is an empirical question.

We exploit the natural experiment created by the enactment of the Tax Reform Act of 1986 (hereafter, TRA '86 or the act) and build on and extend the results in Guenther et al. (1997) and Hanlon et al. (2008), who also exploited this setting. We examine a small sample of unique firms that were required by the TRA '86 to change their computation of taxable income from cash to accrual basis (hereafter, converting firms), therefore increasing their book-tax conformity. Guenther et al. (1997) find that the converting firms changed their financial reporting behavior in that they deferred revenue and accelerated expenses, and Hanlon et al. (2008) show that these changes reduced the informativeness of earnings to equity investors.

Using a difference-in-differences design, we compare the capital structure for converting firms pre/post TRA '86 (the first difference) while simultaneously considering changes in capital structure for nonconverting firms (the second difference). Our research design allows us to control for any other regulatory and tax regime changes happening simultaneously, such as the reduction in the top corporate statutory tax rate, and to mitigate concerns with endogenity in firms choosing their method of calculating taxable income before TRA '86. We find that leverage increased by 6.4% for converting firms following the act's enactment, relative to nonconverting firms in the same four-digit SIC industries as converting firms, while controlling for size, book-to-market ratio, capital intensity, accounting profitability, annual market returns, and marginal tax rates. In additional analyses, we find that converting firms' cost of equity capital increased by 1.1%, relative to nonconverting firms in the post-TRA '86 period, and that the increases in cost of equity capital are positively associated with increases in leverage. We find no significant increase in converting firms' cost of debt, relative to nonconverting firms. These findings are consistent with increases in book-tax conformity increasing firms cost of equity relative to debt capital and firms subsequently substituting away from equity and toward debt.

We believe our study contributes to both the accounting and finance literatures. While many studies consider the effects of corporate taxation on capital structure,[4] we believe ours is the first to examine how the overlap between financial and tax reporting rules affects firms' choices between equity and debt. Our results show a possible unintended consequence of increased conformity, namely, increased reliance on debt in firms' capital structure.

Our findings are particularly relevant given recent tax reform proposals. President Obama's recent framework for business tax reform includes plans to "reduce the gap between book income, reported to shareholders, and taxable income, reported to the IRS" (Treasury 2012, 10). Another key provision in the president's framework calls for a reduction in the bias toward debt, citing concerns over overleveraging in the financial system, especially in times of economic stress (Treasury 2012, 10). Our findings suggest that increasing book-tax conformity could be counterproductive to other measures designed to curtail debt financing. Additionally, proponents of book-tax conformity claim that it will reduce corporate tax avoidance and increase tax revenues.

[4] See Graham (2003) for a review of the literature on capital structure and taxes.

But we find the increased use of tax deductible debt resulting from increased book-tax conformity will reduce corporate tax revenues.

The remainder of the paper is organized as follows. Section 2 describes related literature and develops hypotheses. Section 3 describes our natural experiment, sample selection and data. Section 4 presents our results. Section 5 concludes.

2 Related literature and hypothesis development

2.1 The book-tax conformity debate

There is a long-standing debate among academics and policymakers about the desirability of conforming book income to taxable income. The debate began in earnest in the late 1990s and early 2000s, when there was considerable growth in the gap between pre-tax book income that firms reported to shareholders and taxable income that firms reported to the IRS. As noted by Hanlon et al. (2005), the ratio of pre-tax income to taxable income (calculated by the Treasury Department from confidential tax return data) increased from around 1.25 in the early 1990s to over 1.8 in the late 1990s. The reasons for this divergence are not fully known, but some policymakers and academics speculated that the increase in the book-tax gap was largely the result of two forces. First, a greater proportion of manager pay in the late 1990s was equity-based (stock and stock options), and managers responded by managing earnings upward, presumably to increase stock price (Desai 2003; Yin 2003; Hanlon and Shevlin 2005). Second, a proliferation of tax shelters reduced taxable income, often with no corresponding decrease in book income (Treasury 1999; Wilson 2009; Lisowski 2010).

This belief led to calls to tax firms on their financial accounting income (e.g., Desai 2005; Whitaker 2005) or to at least carefully consider eliminating some of the differences between book and tax reporting (Hamilton and Radziejewska 2003). Proponents of greater book-tax conformity argue that, under a conformed system, firms would have fewer incentives to manage earnings upward, since this would mean higher taxes, and fewer incentives to manage taxable income downward, since this would require them to report lower income to shareholders (Yin 2001; Carnahan and Novack 2002; Murray 2002; Desai 2003; Desai 2005; Desai 2006; Graetz 2005; Whitaker 2005; Chan et al. 2010). These proponents also argue that conformity would result in compliance savings as a result of firms keeping only one set of books instead of two. For example, estimates by Slemrod and Blumenthal (1996) imply a potential savings in aggregate compliance costs of over $2 billion. Following this recent push toward greater conformity, President Bush's Tax Reform Panel considered the proposal to increase the level of book-tax conformity and recommended further study (Hanlon et al. 2008). Hanlon and Heitzman (2010) also note that, when the European Union (EU) adopted IFRS for financial reporting, it seriously considered also adopting IFRS as a common consolidated tax base.[5] Most recently, one of the primary goals of President Obama's 2012

[5] According to Hanlon and Heitzman (2010), 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.

framework for corporate tax reform in the U.S. was to "reduce the gap between book income, reported to shareholders, and taxable income, reported to the IRS" (Treasury 2012, 10). Finally, many recent calls for corporate tax reform include lowering statutory tax rates while broadening the tax base by eliminating deductions and credits so that the proposals remain revenue neutral. Such reforms, if passed, would increase book-tax conformity because of the elimination of these deductions and credits.

2.2 Book-tax conformity evidence

Guenther et al. (1997) examine a sample of firms required to shift from cash-basis tax accounting to accrual-basis tax accounting around TRA '86, with no change in their financial reporting method. (These firms used accrual basis accounting before and after the tax law change for book purposes.) They examine changes in three ratios after TRA '86 for converting firms that they expect to reflect differences in the incentives of cash basis and accrual basis firms: accounts receivable/accounts payable, cash receipts/cash disbursements, and sales/expenses. They provide evidence that converting firms deferred more income (accounts receivable/accounts payable and sales/expenses decreased significantly) after the tax law change, consistent with them responding to tax incentives to defer accrual income.

A related stream of literature relates to how changes in book-tax conformity affect earnings informativeness. While financial reporting standards allow managerial discretion that could decrease earnings informativeness because of manager's incentives to report earnings opportunistically, prior literature finds that accounting earnings summarize information reflected in stock price better than various measures of cash flow and that, on average, managers use their discretion to convey value relevant information to the stock market rather than using it to fool market participants (e.g., Dechow 1994; Subramanyam 1996; Beaver and Engel 1996). These findings are consistent with managers using at least some of their discretion over accounting numbers to signal value relevant information to investors. Therefore, if managers were required to report earnings based on the generally more rigid set of tax rules, they would be more restricted in their ability to signal such private information to investors. Consistent with this line of reasoning, Hanlon et al. (2005) provide evidence that financial statement-based estimates of taxable income in the U.S. are about 50% less informative to equity investors than book income, so the loss of information to investors would likely be significant if tax rules were used as the basis for book income.

Another way to achieve higher book-tax conformity would be to use book income as the tax base that firms use to calculate taxable income and to allow for slight deviations to achieve tax policy goals. The loss of information to investors would likely be smaller under such a scenario because accounting rules could still be set by accounting regulators, such as the FASB, rather than by politicians. However, as Hanlon and Shevlin (2005) point out, the work by George Stigler (1971) on regulatory capture implies that politicians are unlikely to cede their authority to determine taxable income to accounting standard setters and over time financial reporting rules in such a regime would most likely end up resembling the original tax rules. (See also our discussion of IFRS adoption in the European Union in footnote 5.) Furthermore, taxing book income would increase firms' incentive to report lower income to avoid taxes (e.g., many firms use LIFO accounting for inventory, even though it generally results in lower book

income), which adds bias to the reported earnings number as a measure of economic income.

Using the same setting used in this paper, Hanlon et al. (2008) build on the work of Guenther et al. (1997) and develop a model of the relation between returns and earnings adapted from Holthausen and Verrecchia (1988) and Kothari (2001) to show that noise in a signal reduces the price reaction to the signal. They argue that "noise in earnings could increase with conformity because of managers' inability (due to the tax cost of doing so) to convey private information useful to external stakeholders through earnings. If managers are constrained in relaying this private information via earnings, noise in earnings will increase, reducing the ERC. Conversely, if book-tax conformity causes firms to report more accurately, as its proponents suggest, then noise will decrease and the ERC will increase. Our empirical results are consistent with increased book-tax conformity increasing the amount of noise in earnings, reducing its informativeness" (p. 295).

Related to the studies above, another stream of literature considers the effects of book-tax conformity on earnings informativeness in an international setting. Ali and Hwang (2000) compare earnings informativeness across several country-specific factors, including the level of book-tax conformity, and find that earnings are less informative in countries where book-tax conformity is higher. Guenther and Young (2000) find that earnings are more closely related to economic activity in the U.S. and the UK than in Germany, France, and Japan. They argue, among other things, that the U.S. and UK have powerful accounting standard setting bodies that are distinct from the tax authority. They hypothesize and find that earnings more closely reflect economic activity in the U.S. and UK because the accounting standards are relatively independent of the tax standards, thus allowing managers to better convey private information. Finally, Atwood et al. (2010) develop a new measure of book-tax conformity based on the proportion of current tax expense that cannot be explained by pre-tax book income. They examine whether earnings exhibit higher or lower persistence and whether the ability of earnings to predict future cash flows is higher or lower in countries where book-tax conformity is high. They find that earnings are less persistent and less predictive of future cash flows when book-tax conformity is high and conclude that increased book-tax conformity likely reduces earnings quality.

Several studies also consider the likely effects of book-tax conformity on earnings management. Leuz et al. (2003) and Burgstahler et al. (2006) study the relation between various institutions and earnings management in an international setting. Leuz et al. (2003) include an indicator variable for the degree of a country's book-tax conformity and find an insignificant relation between book-tax conformity and earnings management. Burgstahler et al. (2006) use the same approach and find no (a positive) relation between book-tax conformity and earnings management for public (private) firms. They find a more positive relation between book-tax conformity and earnings management among private and public firms when tax rates are high. Finally, Blaylock et al. (2015) find a robust positive relation between book-tax conformity and earnings management in an international setting using the book-tax conformity measure developed by Atwood et al. (2010) and similar earnings management measures as Leuz et al. (2003) and Burgstahler et al. (2006).

Overall, prior evidence suggests that increasing book-tax conformity decreases earnings informativeness because firms are less able to use their discretion to signal

value relevant information to investors, because they respond to tax incentives to defer income, and because those in higher book-tax conformity regimes seem to engage in more earnings management. However, as Hanlon and Heitzman (2010) point out, we know very little about how book-tax conformity affects other corporate decisions.

2.3 Hypothesis development

Prior research provides compelling evidence that higher book-tax conformity leads to lower earnings informativeness. As noted earlier, Guenther et al. (1997) examine firms that were required to convert from the cash basis to the accrual basis for tax purposes after TRA '86 and find that they changed their financial reporting behavior in response to the altered tax incentives by deferring more accrual revenue, accelerating more accrual expenses, or both. Hanlon et al. (2008) find that converting firms had less informative earnings after the change, relative to a group of similar firms that always used the accrual basis for tax purposes. Based on these findings, they conclude that requiring firms to pay taxes on book income leads to less informative earnings, even holding accounting standards constant, because firms' responses to tax incentives increase the amount of noise in earnings as a measure of a firm's true economic income. We report our replication of the Hanlon et al. (2008) results below. In summary, prior literature provides evidence that the changed tax incentives facing converting firms lead to a change in their financial reporting behavior (Guenther et al. 1997) and that this change in behavior increased the noise in reported earnings (Hanlon et al. 2008).

We argue that this decrease in earnings informativeness documented in prior research will result in asymmetrical responses by the capital markets, such that book-tax conformity will lead to an increase in debt in firms' capital structures. Because lenders' primary concerns are whether the value of a firm's assets falls below its liabilities (Black and Scholes 1973) and whether the firm has sufficient current and future cash flows to meet its debt obligations (Jensen and Meckling 1976), they are likely less concerned about losses in the informativeness of earnings brought about by increases in conformity than equity investors (Plummer and Tse 1999; Easton et al. 2009). Consequently, we expect this decrease in earnings informativeness to have no effect on firms' cost of debt. Indeed, Harris et al. (1994) and Guenther and Young (2000) note that European firms generally and German firms in particular, which tend to have higher book-tax conformity than U.S. firms, typically rely more on debt, although they do not perform any empirical tests on this relation. We expect equity investors, however, to demand a higher cost of equity capital. Prior literature finds a decrease in the quality of accounting information when book-tax conformity increases (Hanlon et al. 2005; Hanlon et al. 2008; Atwood et al. 2010). Thus we predict that this decrease in earnings informativeness leads to an increase in the cost of equity, relative to debt, and therefore to an increase in debt financing.

As Hanlon and Shevlin (2005) note, if firms voluntarily disclose the same level of information contained in pre-conformity reporting, they may not necessarily change their capital structures as a result of increased conformity. However, if such disclosures are viewed as being less reliable or less comparable, then we would expect some investors to either leave the market or demand a higher return for equity. Both of these effects would again make equity more expensive relative to debt, due to either less

informative earnings or lower liquidity, and therefore also lead firms to shift their capital structures toward debt.

Based on the arguments above, we hypothesize that firms are likely to respond to information loss resulting from increased conformity by using more debt in their capital structure. We formally state this hypothesis (in alternative form) as follows.

> *Hypothesis 1: As book-tax conformity increases, firms increase the amount of leverage in their capital structure.*

3 Research design, sample selection, and data

3.1 Research design

We employ a natural experiment, previously examined by Guenther et al. (1997) and Hanlon et al. (2008), in which the Tax Reform Act of 1986 required firms with over $5 million in revenues to use the accrual method of accounting for tax purposes.

Our tests examine a set of publicly traded firms that used accrual accounting for book purposes and cash accounting for tax purposes before TRA '86 and were subsequently required to change the calculation of taxable income from the cash method to the accrual method—labelled converting firms. The new legislation resulted in an increase in the level of book-tax conformity for these firms by requiring book and taxable incomes to be computed using the same method of accounting. The requirement to conform book and taxable income under TRA '86 was a reasonably exogenous event, which did not arise as a result of firm behavior. Another key strength of this setting is that the act did not affect financial reporting rules, allowing us to hold those rules constant. A final benefit of using this natural experiment is that the requirement to switch from cash basis to accrual basis accounting only affected a subset of firms, thus allowing us to employ a difference-in-differences design to study the effect of this change in book-tax conformity while controlling for changes in unaffected firms' capital structures due to changes in macroeconomic conditions or industry-wide factors.

In addition to requiring converting firms to compute taxable income using the accrual method, Congress also made several other changes to tax law as part of TRA '86. The top tax rates were lowered for both corporations (from 46% to 34%) and individuals (from 50% to 28%). Offsetting these statutory rate reductions, however, was a widening of the tax base. Among other provisions, Congress repealed the investment tax credit, lengthened the period over which fixed assets were depreciated, included more preference items and adjustments in the calculation of the corporate alternative minimum tax (including a book income adjustment that included 50% of the difference between adjusted pre-tax book income and adjusted taxable income as part of AMTI), and introduced uniform cost capitalization rules that generally required businesses to capitalize a greater portion of the costs associated with inventory and fixed assets to be deducted later when inventory was sold or to be recovered over time through depreciation deductions. The overall effect was an increase in firms' effective tax rates (Shevlin and Porter 1992), due primarily to the broadening of the tax base. Most relevant to our setting, Scholes et al. (2014, Chapter 4) show that debt became relatively more tax-favored for corporations after TRA '86. While the statutory

corporate tax rate was lowered from 46% to 34%, the relative change in personal tax rates on debt and equity (both ordinary and capital gains tax rates) also changed, resulting in debt becoming somewhat more tax-favored post-TRA '86. By using a control sample of companies that were affected by these changes in the tax code but were not required to change their computation of taxable income, our research design allows us to capture the effects of increased conformity on leverage, holding the remaining aspects of the law change constant between treatment and control firms.

Our difference-in-differences research design allows us to use converting firms as their own control (i.e., we measure changes in converting firms' leverage from before to after TRA '86) as the first difference by comparing the converting firms' leverage before and after the change. This first difference in the research design mitigates any self-selection issues in firms' decision to choose cash or accrual basis accounting before TRA '86. That is, there could be differences in the types of firms that chose the cash method of accounting versus those that chose the accrual method pre-TRA '86. However, because each firm in the converting group acts as its own control in our empirical tests, the factors that lead to the choice to use cash accounting in the computation of taxable income should not explain any changes in converting firms' capital structure.

By using a control group of firms not changing their method of calculating taxable income as the second difference, we also control for the macroeconomic effects of TRA '86 and firms' preference for debt relative to equity. In summary, our approach allows us to study the same firm under two different conformity regimes, essentially giving us a within-firm test while also controlling for time-dependent industry and macroeconomic effects on leverage in a between-firm setting.

We use the following model to estimate the effect of book-tax conformity on leverage using our natural experiment:

$$\begin{aligned} Leverage_{it} = {} & a_0 + a_1 Converting_{it} + a_2 Post_{it} \\ & + a_3 Converting_{it} * Post_{it} + a_k Controls_{k,it} + e_{it}, \end{aligned} \tag{1}$$

where *Leverage* is the book value of debt divided by the market value of assets (i.e., the sum of book value of debt and market value of equity). *Converting* is an indicator set to 1 if a firm was required to switch from the cash method to the accrual method for tax purposes and 0 otherwise. *Post* is an indicator variable set to 1 if the year of the observation is post-TRA '86 (1988–1992) and 0 otherwise (i.e., if the observation is from 1981 to 1985). We exclude 1986 and 1987 because some firms were likely starting to change their behavior in anticipation of the law taking effect.

We use the following control variables in eq. (1): the inverse of market value of assets, book-to-market ratio, PP&E, return on assets, annual stock return, and pre-interest marginal tax rate estimates from Blouin et al. (2010).[6] Descriptions of these variables are available in Appendix A. Because our econometric identification is time-dependent, we do not include year fixed effects.

Coefficients for eq. (1) are estimated by ordinary least squares, and standard errors are clustered by firm and year. Our coefficient of interest is α_3, the incremental leverage effect for converting firms after TRA '86, relative to the leverage of converting firms

[6] We use the Blouin et al. (2010) estimates of marginal tax rates to maximize sample size but obtain similar results using pre-interest marginal tax rate estimates from John Graham's website (see Graham 1996).

before TRA '86 and relative to the leverage of nonconverting firms before and after the act. Based on our discussion in section 2, we expect α_3 to be positive, consistent with an increase in book-tax conformity leading to an increase in leverage.[7] If converting firms increase disclosure in a credible manner, then we should observe a statistically insignificant coefficient on α_3 (Hanlon and Shevlin 2005). By controlling for the denominator of *Leverage* (i.e., the inverse of market value of assets), we ensure that the coefficient on *Converting*Post* is driven by changes in the numerator of *Leverage* (i.e., debt), rather than by changes in the denominator. Size could also relate to the collateral value of assets, which could affect leverage (Myers and Majluf 1984). Controlling for book-to-market accounts for agency costs associated with growth opportunities, which could lead to different levels of debt (Myers 1984), while controlling for PP&E accounts for nondebt tax shields, which could reduce the incentive to use leverage (DeAngelo and Masulis 1980). We control for return on assets and annual stock returns because prior literature suggests profitable firms face different agency costs in issuing debt (Myers and Majluf 1984). Including the pre-tax marginal tax rate controls for differences in tax planning costs and activities (Graham 2000).

3.2 Sample selection and data

Guenther et al. (1997) begin with a sample of 94 firms identified as using accrual accounting for book income and cash accounting for tax purposes before TRA '86. Hanlon et al. (2008) further reduce this sample by deleting firms with missing data, firms with fiscal year-end changes, and firms that have 1985 sales of $5 million or less, because they were not required to change accounting methods under TRA '86, and firms without necessary data for both 1985 and 1988. Our sample of 53 converting firms (i.e., *Converting* = 1) consists of Hanlon et al.'s (2008) sample, minus three firms with missing data. Following prior literature, we conduct our study from 1981 to 1992, where observations from 1986 and 1987 are eliminated from the sample, giving us pre and post periods of 5 years each.[8]

Our control sample (i.e., *Converting* = 0) follows Guenther et al. (1997) and Hanlon et al. (2008), consisting of all US-incorporated firms (FIC = USA) in the intersection between Compustat XpressFeed and CRSP that use the accrual method for both book *and* tax purposes during the entire period of the study. We also require control firms to be of the same four-digit SIC code as our treatment firms. Similar to the converting sample, we eliminate nonconverting firms with missing data, those with 1985 sales of $5 million or less, and those without necessary data for both 1985 and 1988. All continuous variables are winsorized at the 1st and 99th percentiles by year to mitigate any effects of outliers.[9]

[7] The terms "converting firms" and "nonconverting firms" relate specifically to the computation of taxable income. A key benefit of our setting is that all firms (i.e., converting and nonconverting) use the accrual method of accounting to compute book income, regardless of the tax regime. Thus, while book-tax conformity increases for converting firms and stays the same for nonconverting firms, the accrual method of accounting is used for all firms both before and after TRA '86.

[8] The five-year pre and post periods reflect a trade-off of wanting sufficient sample observations with concern over confounding events as the sample period increases.

[9] To ensure our regression results are not driven by influential observations, we also eliminate influential observations using the DFFITS statistic (Belsley et al., 1980). After doing so, we find nearly identical results for our leverage and cost of capital tests. We also find similar results after using robust regressions and after eliminating observations with large studentized residuals.

4 Results

4.1 Descriptive statistics

Table 1 displays descriptive statistics for our sample, classified into four groups: converting firms before TRA '86, converting firms afterward, nonconverting firms before, and nonconverting firms afterward. Our sample of converting firms resembles the sample used by Hanlon et al. (2008). We have slightly fewer observations in both the pre- and post- periods due to additional data requirements. Converting firms have mean assets of $189 and $273 million in the pre- and post-TRA '86 periods, respectively, compared to $164 million and $271 million for Hanlon et al. (2008). Annual stock returns in our converting sample are 25% and 13%, respectively, compared to 21.3% and 10.1% for Hanlon et al. (2008). Our sample of nonconverting firms (n = 4186) is larger than the sample (n = 3126) of Hanlon et al. (2008) due to Compustat backfilling. However, our control firms are relatively similar in size (*Assets* = $751 million and $1153 million versus $803 million and $1069 million) and returns (*Annual stock return* = 15% and 15% versus 15.9% and 14.2%) compared to Hanlon et al. (2008).[10]

Table 1 also displays significance levels for tests of means and medians between samples. As predicted by Hypothesis 1, tests of means and medians show that *Leverage* increased for converting firms after TRA '86. Table 1 also shows that there is little change in *Leverage* for nonconverting firms in the post-TRA '86 period (plotted in Fig. 1, Panel A). In Fig. 1, Panel B, we also examine the aggregate change in unscaled debt for both converting and nonconverting firms. To do so, we sum unscaled debt for all firm-year observations in the pre- and post-TRA '86 periods for the two sets of firms and then compute the percentage change in leverage from pre- to post-TRA '86. After doing so, we find that converting firms increased leverage by 166%, while nonconverting firms increased leverage by 48%.[11]

Consistent with prior literature, we find that converting firms are smaller on average than nonconverting firms both before and after TRA '86. We also find that converting firms experience higher asset growth. Book-to-market is higher for nonconverting firms in the pre-TRA '86 period, but there is no significant difference in the post period. When comparing converting and nonconverting firms Pre-TRA '86, we find that converting firms are less capital intensive, while we find little support for differences in accounting and stock returns. We control for each of these elements in our multivariate tests. We also conduct further sensitivity checks with respect to size and growth differentials and find similar results (section 4.4).

[10] Guenther et al. (1997) report means and medians of sales, assets, and inventory/assets separately across the converting and control firms but pooled across pre and post. Guenther et al. report mean assets for the converting firms of $191 million, which is comparable to our pooled mean of assets. However, the mean assets of $199 million of Guenther et al. for the control firms is much smaller than in Hanlon et al. and our sample.

[11] Unscaled aggregate debt increases from $8.820 billion to $23.467 billion for converting firms and from $350.464 billion to $518.563 billion for nonconverting firms. We note that there are nine times as many firms in the nonconverting sample, compared to the converting sample, and that nonconverting firms are generally larger, which explains the scale difference in aggregate debt.

Table 1 Descriptive statistics

Variable	N	Mean	50th	Std Dev	difference in means (1)–(2)	difference in means (1)–(3)	difference in medians (1)–(2)	difference in medians (1)–(3)
(1) Conforming firms before conversion (*Converting* = 1 and *Post* = 0)								
Leverage	195	0.234	0.168	0.221	**-0.094**	**-0.040**	**-0.081**	**-0.046**
Assets ($)	195	189	102	233	**-84**	**-562**	-30	-18
Book-to-market	195	0.627	0.544	0.409	-0.051	**-0.111**	**-0.062**	**-0.052**
PP&E	195	0.308	0.220	0.262	-0.018	**-0.088**	-0.032	**-0.062**
Return on assets	195	0.085	0.094	0.104	**0.040**	0.012	**0.015**	-0.003
Annual stock return	195	0.255	0.084	0.713	**0.121**	**0.102**	0.044	0.032
Marginal tax rate	195	0.434	0.447	0.040	**0.120**	**0.014**	**0.115**	-0.004
ΔE	201	0.000	0.011	0.100	**-0.052**	0.000	0.003	0.004
Cost of debt	182	0.120	0.115	0.060	**0.013**	-0.008	**0.016**	**-0.006**
Cost of equity	59	0.145	0.144	0.031	**0.022**	**-0.016**	**0.024**	**-0.010**
Bmkt	59	1.109	1.159	0.502	-0.003	0.014	0.052	0.052
Bsmb	59	1.100	1.140	0.867	**0.537**	**0.527**	**0.659**	**0.666**
Bhml	59	-0.403	-0.435	0.626	-0.211	**-0.185**	-0.248	**-0.300**
ln(Dispersion)	59	-2.677	-2.749	1.089	-0.080	**-0.288**	-0.004	**-0.243**
ln(LTG)	59	0.200	0.183	0.081	**0.038**	**0.021**	**0.025**	**0.033**
(2) Conforming firms after conversion (*Converting* = 1 and *Post* =1)								
Leverage	230	0.328	0.249	0.287				
Assets ($)	230	273	132	515				
Book-to-market	230	0.678	0.607	1.018				
PP&E	230	0.326	0.252	0.311				
Return on assets	230	0.045	0.079	0.133				
Annual stock return	230	0.134	0.040	0.607				
Marginal tax rate	230	0.314	0.332	0.058				
Δ E	229	0.052	0.008	0.368				
Cost of debt	223	0.107	0.099	0.064				
Cost of equity	74	0.123	0.120	0.024				
Bmkt	74	1.112	1.107	0.318				
Bsmb	74	0.563	0.481	0.620				
Bhml	74	-0.192	-0.188	0.989				
ln(Dispersion)	74	-2.597	-2.745	1.074				
ln(LTG)	74	0.162	0.158	0.042				
(3) Non-conforming firms before conversion (*Converting* = 0 and *Post* = 0)								
Leverage	1771	0.274	0.214	0.241				
Assets (S)	1771	751	121	1585				
Book-to-market	1771	0.737	0.597	0.576				
PP&E	1771	0.397	0.282	0.340				
Return on assets	1771	0.073	0.097	0.132				
Annual stock return	1771	0.153	0.052	0.586				
Marginal tax rate	1771	0.420	0.451	0.074				
Δ E	1831	0.000	0.007	0.193				
Cost of debt	1678	0.128	0.121	0.059				
Cost of equity	347	0.162	0.154	0.041				

Table 1 (continued)

Bmkt	347	1.094	1.107	0.470
Bsmb	347	0.573	0.474	0.871
Bhml	347	-0.218	-0.135	0.728
ln(Dispersion)	347	-2.389	-2.506	1.026
ln(LTG)	347	0.178	0.150	0.088

(4) Non-conforming firms after conversion (*Converting* = 0 and *Post* = 1)

					difference in means (4)–(3)	**difference in means (4)–(2)**	**difference in medians (4)–(3)**	**difference in medians (4)–(2)**
Leverage	2415	0.28	0.21	0.26	0.010	**-0.044**	-0.002	**-0.037**
Assets ($)	2415	1153	126	3376	**402**	**881**	6	-6
Book-to-market	2415	0.73	0.59	1.15	-0.009	0.051	-0.006	-0.016
PP&E	2415	0.37	0.23	0.40	**-0.022**	**0.048**	**-0.057**	-0.027
Return on assets	2415	0.02	0.07	0.20	**-0.049**	-0.021	**-0.025**	**-0.007**
Annual stock return	2415	0.15	0.05	0.61	0.000	**0.019**	-0.005	0.008
Marginal tax rate	2415	0.30	0.33	0.08	**-0.125**	-0.019	**-0.123**	**-0.003**
ΔE	2365	0.04	0.01	0.33	**0.036**	-0.017	**0.002**	0.001
Cost of debt	2203	0.11	0.10	0.08	**-0.018**	0.003	**-0.021**	0.001
Cost of equity	750	0.13	0.12	0.03	**-0.032**	**0.006**	**-0.030**	**0.005**
Bmkt	750	1.13	1.10	0.40	0.036	0.018	-0.003	-0.003
Bsmb	750	0.52	0.47	0.81	-0.056	-0.046	0.000	-0.007
Bhml	750	-0.33	-0.27	1.19	**-0.114**	-0.141	**-0.138**	-0.085
ln(Dispersion)	750	-2.54	-2.61	1.12	**-0.155**	0.053	**-0.109**	0.131
ln(LTG)	750	0.17	0.15	0.07	-0.009	0.008	0.002	-0.006

Table 1 displays descriptive statistics for our main analysis. *Leverage* is total debt divided by the market value of assets. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. *Assets* ($) is the market value of assets. *Book-to-market* is book value of equity divided by the market value of equity. *PP&E* is net property, plant, and equipment divided by the market value of assets. *Return on assets* is income before extraordinary items divided by the market value of assets. *Annual stock return* is the 12-month buy-and-hold stock return. *Marginal tax rate* is an estimate of firms' pre-interest marginal tax rate estimate obtained from Blouin et al. (2010). *ΔE* is the change in earnings before extraordinary items from year *t-1* to year *t*. *Cost of debt* is total debt interest expense divided by average debt. *Cost of equity* is the implied cost-of-equity capital for firm *i* in June of year *t*, calculated as the average of four implied cost-of-equity capital estimates: *Rg*, *Rct*, *Roj*, and *Rmpeg* (see Appendix B for computation details). *Bmkt*, *Bsmb*, and *Bhml* are factor loadings following Fama and French (1996), using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*. *ln(Dispersion)* is the log of the standard deviation of analyst estimates for year *t* earnings divided by the consensus forecast for year *t* earnings. *ln(Growth)* is the log of Institutional Brokers' Estimate System (I/B/E/S) analyst consensus long-term growth in earnings per share forecast reported in June of year *t*. If long-term growth forecast is not available, *ln(Growth)* equals the two-year-ahead earnings forecast divided by the one-year-ahead forecast minus one

4.2 Correlations

Table 2 reports Pearson correlation coefficients for our sample. We find a positive and significant correlation between *Converting***Post* and *Leverage* (coefficient = 0.043, *p*-value =0.004 respectively). Somewhat surprising, we observe a negative correlation between *Leverage* and pre-interest *Marginal tax rate*, although we find an insignificant

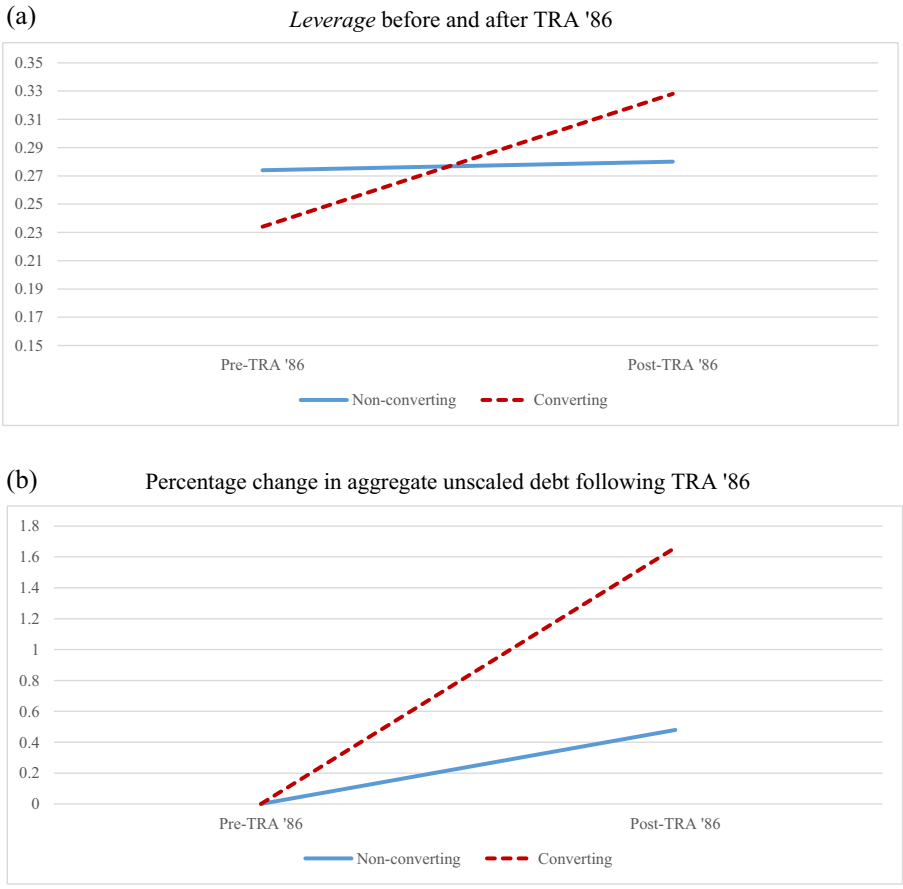

Fig. 1 Leverage Before and After TRA '86. Panel A: *Leverage* before and after TRA'86. Panel B: Percentage change in aggregate unscaled debt following TRA'86. This figure plots changes in leverage from the pre- to post-TRA '86 periods for converting and nonconverting firms. Panel A uses a scaled measure of leverage, where *Leverage* is total debt divided by the market value of assets. Panel B sums up total debt by converting and nonconverting groups and examines the percentage change between pre and post TRA '86

association between the two in multivariate tests (Table 3), indicating that this bivariate association is likely driven by differences in size or other control variables.

4.3 Multivariate results

Table 3 presents coefficient estimates for eq. (1). Given our model, the intercept represents the conditional expectation of *Leverage* for a nonconverting firm before TRA '86, holding constant assets, book-to-market, PP&E, return on assets, annual stock return, and marginal tax rate. Adding the coefficient on *Converting* to the intercept gives the conditional expectation of *Leverage* for a converting firm before TRA '86, while adding the coefficient on *Post* to the intercept gives the conditional expectation of *Leverage* for a nonconverting firm after TRA '86. Finally, we arrive at the conditional expectation of *Leverage* for converting firms after TRA '86 by adding

Table 2 Correlations

Variable	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) *Leverage*	0.01	**0.03**	**0.04**	0.01	**0.19**	**0.38**	**-0.14**	**-0.24**	**-0.08**	**0.06**	**-0.07**	**0.28**	**0.07**	**0.07**	**0.20**	**0.34**	**-0.24**
(2) *Converting*		-0.02	**0.72**	**-0.06**	-0.02	**-0.05**	**0.03**	0.02	**0.06**	0.01	-0.02	**-0.06**	-0.01	**0.10**	0.00	-0.04	0.03
(3) *Post*			**0.20**	**0.05**	0.00	-0.02	**-0.14**	-0.01	**-0.62**	**0.07**	**-0.12**	**-0.40**	0.04	**-0.07**	-0.03	**-0.05**	**-0.08**
(4) *Converting*Post*				**-0.04**	-0.01	**-0.03**	0.00	-0.01	**-0.08**	**0.03**	**-0.03**	**-0.11**	0.00	0.00	0.03	-0.02	-0.04
(5) *1 / Assets*					**0.23**	**0.12**	**-0.36**	**-0.14**	**-0.31**	**0.03**	**0.06**	**0.20**	0.02	**0.23**	0.03	**0.17**	**0.08**
(6) *Book-to-market*						**0.38**	0.01	**-0.16**	0.01	**0.06**	0.00	**0.36**	**0.08**	**0.08**	**0.09**	**0.33**	**-0.26**
(7) *PP&E*							**-0.13**	**-0.23**	**-0.07**	**0.07**	-0.02	**0.33**	**0.13**	-0.01	**0.18**	**0.43**	**-0.28**
(8) *Return on assets*								**0.21**	**0.46**	**0.23**	0.00	**-0.09**	-0.04	-0.03	**0.09**	**-0.35**	**-0.11**
(9) *Annual stock return*									**0.08**	**0.15**	-0.01	**-0.15**	0.02	**0.07**	**0.06**	**-0.12**	**0.08**
(10) *Marginal tax rate*										**-0.09**	**0.08**	**0.30**	**-0.09**	**0.05**	-0.04	**-0.08**	**0.06**
(11) ΔE											0.00	**-0.08**	0.00	**0.05**	0.04	**-0.07**	0.00
(12) *Cost of debt*												**0.07**	**-0.07**	-0.04	-0.01	-0.02	-0.01
(13) *Cost of equity*													**0.12**	**0.14**	-0.02	**0.38**	**0.11**
(14) *Bmkt*														**-0.10**	**0.24**	**0.18**	**0.16**
(15) *Bsmb*															**0.13**	**0.14**	**0.16**
(16) *Bhml*																**0.13**	**-0.24**
(17) *ln(Dispersion)*																	-0.01
(18) *ln(LTG)*																	

Table 2 displays Pearson correlation coefficients for the full sample. *p*-values are listed in italics. *Leverage* is total debt divided by the market value of assets. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. *1/Assets* is 1 divided by the market value of assets. *Book-to-market* is book value of equity divided by the market value of equity. *PP&E* is net property, plant, and equipment divided by the market value of assets. *Return on assets* is income before extraordinary items divided by the market value of assets. *Annual stock return* is the 12-month buy-and-hold stock return. *Marginal tax rate* is an estimate of firms' pre-interest marginal tax rate estimate obtained from Blouin et al. (2010). ΔE is the change in earnings before extraordinary items from year *t-1* to year *t*. *Cost of debt* is total debt interest expense divided by average debt. *Cost of equity* is the implied cost-of-equity capital for firm *i* in June of year *t*, calculated as the average of four implied cost-of-equity capital estimates: *Rg*, *Rct*, *Roj*, and *Rmpeg* (see Appendix B for computation details). *Bmkt*, *Bsmb*, and *Bhml* are factor loadings following Fama and French (1996), using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*. *ln(Dispersion)* is the log of the standard deviation of analyst estimates for year *t* earnings divided by the consensus forecast for year *t* earnings. *ln(Growth)* is the log of Institutional Brokers' Estimate System (I/B/E/S) analyst consensus long-term growth in earnings per share forecast reported in June of year *t*. If long-term growth forecast is not available, *ln(Growth)* equals the two-year-ahead earnings forecast divided by the one-year-ahead forecast minus one

Table 3 Book-tax conformity and leverage

$$Leverage_{it} = \alpha_0 + \alpha_1 Converting_i + \alpha_2 Post_t + \alpha_3 Converting_i{*}Post_t + \alpha_4 1/Assets_{it} + \alpha_5 Book\text{–}to\text{–}market_{it} + \alpha_6 PP\&E_{it} + \alpha_7 Return\ on\ assets_{it} + \alpha_8 Annual\ stock\ return_{it} + \alpha_9 Marginal\ tax\ rate_{it} + \varepsilon_{it} \quad (1)$$

Panel A: Tests of H1 using full sample

	Coefficient	Std. Err.	t-Stat
Intercept	0.219	0.041	5.29 ***
Converting	-0.013	0.027	-0.47
Post	0.007	0.014	0.46
*Converting*Post*	0.064	0.020	3.22 ***
1 / Assets	-0.374	0.134	-2.79 **
Book-to-market	0.018	0.016	1.09
PP&E	0.225	0.038	5.88 ***
Return on assets	-0.131	0.044	-3.00 **
Annual stock return	-0.063	0.018	-3.41 ***
Marginal tax rate	-0.042	0.083	-0.50
N	4,611		
R^2	0.188		

Panel B: Test of H1 using propensity score matched sample

	Coefficient	Std. Err.	t-Stat
Intercept	0.441	0.080	5.49 ***
Converting	-0.002	0.033	-0.06
Post	-0.051	0.030	-1.67
*Converting*Post*	0.058	0.032	1.81 **
1 / Assets	-0.935	0.315	-2.97 **
Book-to-market	0.016	0.039	0.40
PP&E	0.237	0.062	3.82 ***
Return on assets	-0.190	0.057	-3.32 ***
Annual stock return	-0.058	0.033	-1.79
Marginal tax rate	-0.550	0.193	-2.85 **
N	844		
R^2	0.166		

Table 3 displays multivariate regression estimates for our natural experiment. Panel A uses our full sample, while Panel B uses a propensity score matched sample. Standard errors are clustered by firm and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, for one-sided tests examining H1 and for two-sided tests for the remaining variables. *Leverage* is total debt divided by the market value of assets. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. *1/Assets* is 1 divided by the market value of assets. *Book-to-market* is book value of equity divided by the market value of equity. *PP&E* is net property, plant, and equipment divided by the market value of assets. *Return on assets* is income before extraordinary items divided by the market value of assets. *Annual stock return* is the 12-month buy-and-hold stock return. *Marginal tax rate* is an estimate of firms' pre-interest marginal tax rate estimate obtained from Blouin et al. (2010)

the intercept to the coefficients on *Post*, *Converting*, and *Converting*Post*. Therefore the coefficient on *Converting*Post* represents changes in *Leverage* for converting firms over-and-above changes in *Leverage* for nonconverting firms.

Table 3, Panel A, estimates eq. (1) for our full sample. The estimated coefficient on *Converting* (coefficient = −0.013, *p*-value >0.10) is insignificant, consistent with no difference in *Leverage* between both sets of firms in the pre-TRA '86 period. The coefficient on *Post* is insignificant (coefficient = 0.007, *p*-value >0.10), suggesting control firms did not exhibit changes in *Leverage* after TRA '86. The coefficient on *Converting*Post* is positive and significant (coefficient = 0.064, *p*-value <0.01), consistent with converting firms increasing *Leverage* relative to nonconverting firms. The coefficients on most of the control variable are significant in the expected direction. The coefficient on *1/Assets* is negative, consistent with larger firms having higher leverage ratios. The coefficient on *PP&E* is positive and significant (coefficient = 0.225, *p*-value <0.01). The coefficients on *Return on assets* and *Annual stock return* are negative and significant (coefficient = −0.131, *p*-value <0.05, coefficient = −0.063, *p*-value <0.01, respectively). The coefficient on *Book-to-market* is insignificant, suggesting it has little impact on our results, despite the significant difference in means between converting and nonconverting firms.

Table 3, Panel B, estimates eq. (1) for a reduced sample using propensity score matching. We use propensity score matching to ensure greater comparability between our samples of treatment and nontreatment firms. To do so, we match each treatment firm (i.e., *Converting* = 1) to the nontreatment firm with the closest propensity score. Propensity scores are computed in 1985, so that the matching is unaffected by the exogenous event. As a result, our sample is reduced to 844 observations.[12] After estimating eq. (1) using a propensity score matched sample, we continue to find a statistically significant increase in leverage for converting firms relative to matched firms (coefficient = 0.058, *p*-value <0.05). Overall, we find that converting firms experienced approximately between a 5.8 and 6.4% increase in leverage following TRA '86, relative to nonconverting firms, consistent with Hypothesis 1.

Prior literature finds that firms generally underuse debt tax shields (e.g., Graham 2000; Blouin et al. 2010). Thus an increase in leverage may move firms toward a more optimal capital structure. In untabulated analysis, we examine how much more interest firms could incur before their marginal tax rate begins to decrease, similar to the kink analysis of Blouin et al. (2010).[13] A kink above 1 indicates that firms could increase debt and interest deductions before the marginal tax rate would begin to decline below the top statutory tax rate.[14] We find that kink is lower for converting firms before TRA '86, suggesting these firms were less likely to benefit from debt from a tax standpoint (*Converting* = −0.653, *p*-value <0.01). We also find that nonconverting firms

[12] We use the following model to calculate propensity scores:

$$Converting_i = \beta_1 1/Assets_{it} + \beta_2 Book\text{-}to\text{-}market_{it} + \beta_3 PP\&E_{it} + \beta_4 Return\ on\ assets_{it} + \beta_5 Annual\ stock\ return_{it} + \beta_6 Marginal\ tax\ rate_{it} + \varepsilon_{it}.$$

Following matching, we find no differences in means between converting and nonconverting groups for the included covariates indicating covariate balance.

[13] We thank Jennifer Blouin for supplying us with kink data.

[14] Unconditionally, the mean for *Kink* equals 0.784 for converting firms before TRA '86 and 0.942 afterward. The mean for *Kink* equals 1.255 for nonconverting firms before TRA '86 and 1.235 afterward.

experienced an increase in kink following the act (*Post* = 0.702, *p*-value <0.01). However, we do not find that kink changed significantly for converting firms relative to nonconverting firms following TRA '86 (*Converting*Post* = 0.171, *p*-value =0.260). Thus, even though the converting firms significantly increased their leverage, from a tax perspective, the kink results suggest converting firms did not move toward a more optimal capital structure following an increase in conformity.

In untabulated analysis, we examine the likelihood that the converting firms become distressed as a result of the increase in leverage. To do this, we create an indicator variable for distressed firms that we set equal to one for firms with an Altman (1968) z-score less than 1.81 and zero otherwise. Altman found that firms with z-scores of 1.81 and lower eventually faced bankruptcy in his sample. We regress this indicator variable on *Converting*, *Post*, *Converting*Post*, and all control variables from Table 3. The estimated coefficient on *Converting*Post* is 0.072 (*p*-value <0.05), suggesting that converting firms' likelihood of becoming distressed in the post-TRA '86 period increased 7.2%, relative to control firms (and compared to a base of 19.8% of all sample firms being in the distress zone). This finding is consistent with the increase in leverage documented above. Finally, we examine univariate survival rates of firms to the end of our sample period, 1992, 5 years after TRA '86. We find that 40 of the 53 converting firms (75%), compared to 364 of the 533 control firms (68%), survived to the end of 1992. The difference in percentage survival rates is not significant at conventional levels (*p*-value <0.28). We also examine the same difference in survival rates in a multivariate setting, controlling for the set of covariates from Table 3, and find that the difference in survival rates is even smaller (i.e., 5.4% instead of 7%, *p*-value <0.39).[15] Thus, although the Altman Z-scores decreased for the converting firms, this decrease did not lead to economically nor statistically significant differences in survival rates, suggesting overall that the increase in leverage of the converting firms did not dramatically increase nontax costs.

4.4 Alternative specifications

We estimate several alternative specifications of eq. (1) to verify the robustness of our results. The coefficient on *Converting*Post* for each of these specifications is reported in Table 4. First, we examine an alternative specification of *Leverage*. Prior literature examines both book leverage (i.e., scaled by book value of assets) and market leverage (i.e., scaled by market value of assets). Because we conduct our tests using market leverage, changes in stock prices, which drive the denominator for market leverage, may be driving our results. This possibility is unlikely, given that we control for the inverse of market value of assets and stock return; however, we also examine whether our results are robust to using book leverage and find similar results (coefficient = 0.071, *p*-value <0.05). These results further ensure that our main results are not driven by changes in the market value of assets.

Second, we ensure that our results are not driven by differences in investment between converting and nonconverting firms. Table 1 shows that assets grow at a

[15] We note the general economic stability of our post-TRA '86 period complicates the interpretation of this "no result," as it becomes more difficult to observe increases in bankruptcy in the absence of negative economic shocks.

Table 4 Alternative empirical specifications

$$Leverage_{it} = \alpha_0 + \alpha_1 Converting_i + \alpha_2 Post_t + \alpha_3 Converting_i * Post_t + \alpha_4 1/Assets_{it} + \alpha_5 Book\text{–}to\text{–}market_{it} + \alpha_6 PP\&E_{it} + \alpha_7 Return\ on\ assets_{it} + \alpha_8 Annual\ stock\ return_{it} + \alpha_9 Marginal\ tax\ rate_{it} + \varepsilon_{it} \quad (1)$$

		Leverage
H1: α3		**(+)**
Converting*Post	**Coeff**	**Std Err**
Baseline model (Table 3)	0.064	0.020 ***
Different specification of *Leverage*:		
Scaling total debt by book value of assets	0.071	0.031 **
Investment as an alternative explanation:		
Controlling for additional investment measures (i.e., *Capex*, *R&D*, *Inventory*)	0.060	0.032 **
Differences in size and asset growth as an alternative explanation:		
Controlling for firm-level growth in assets	0.049	0.020 **
Controlling for annual percentage changes in sales	0.064	0.020 ***
Deleting large control firms	0.048	0.020 **
Median regression	0.052	0.024 **
Differences in capital structure due to scaling as an alternative explanation:		
Using the log of unscaled total debt	0.355	0.195 **
Differences in tax planning as an alternative explanation:		
Controlling for effective tax rates, intangible assets, foreign income	0.048	0.020 **
Control variables	Yes	

Table 4 displays estimates for eq. (1) under alternative scenarios (see section 4.4). Standard errors are clustered by firm and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively, for one-sided tests examining H1. *Leverage* is total debt divided by the market value of assets. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. Control variables (see Table 3) are included but not reported

faster rate from before TRA '86 to after for converting firms. If converting firms experience greater investment growth than nonconverting firms while choosing to finance such incremental investment with debt, then our results may be being driven by investment rather than book-tax conformity. We attempt to control for this alternative explanation in our main specification by controlling for both size and a proxy for investment opportunities (i.e., book-to-market ratio). However, in robustness tests, we further address this possibility. To proxy for actual investment we further control for capital expenditures, research and development expenses, and inventory levels. After doing so, we find similar results to those reported in Table 3 (coefficient = 0.060, *p*-value <0.05).

Third, we address differences in size and asset growth rate of converting versus nonconverting firms. While we addressed above the possibility that differences in size and growth rate could be a proxy for higher investment, it could be that this growth is a result of other factors that could also be associated with leverage. To mitigate concerns that our results are driven by an unknown correlated omitted variable that is correlated

with the growth rate of assets and leverage, we directly control for the firm-level growth in assets from before to after TRA '86. Specifically, we compute average assets for both pre- and post-TRA '86 periods. We then compute the firm-level percentage growth rate from the pre period to the post and include this variable as an additional control in our multivariate tests. After doing so, we again find similar results (coefficient = 0.049, p-value <0.05), suggesting that our results are not driven by a correlated omitted variable that is correlated with asset growth. As a further control, we also control for annual percentage changes in sales to account for possible growth in sales that might lead to changes in asset growth and possibly leverage. Again, we find similar results (coefficient = 0.064, p-value <0.01). We also conduct our analysis using a sample of smaller control firms (i.e., first and second quintiles of market value of assets) and again find similar results (coefficient = 0.048, p-value <0.05). Finally, while Table 1 indicates that asset means are quite different between converting and nonconverting firms, median values are quite comparable. Therefore we estimate a median regression for eq. (1) and find similar results (coefficient = 0.052, p-value <0.01).

Fourth, to ensure our results are not driven by scaling leverage, we estimate eq. (1) substituting the natural log of total debt for our scaled measure of leverage. We continue to find a positive and significant coefficient on *Converting*Post*, suggesting our results are not driven by using a scaled version of *Leverage*.

Fifth, it could be that our leverage results are driven by changes in the relative attractiveness of the firms' other tax planning activities for the converting firms, making some more costly than others. Specifically, it is possible that converting firms, which were growing, were forced generally to recognize and be taxed on revenue earlier under accrual tax rules than under cash tax rules. Consequently, it became more attractive for converting firms to use more tax shields including debt as a result of this change in tax accounting rules. We believe this alternative explanation of our results is unlikely for two reasons. First, we expect changes in the attractiveness of using tax shields to affect the marginal tax rate, which is already included as a control in our multivariate tests. Nevertheless, we also control for additional variables that proxy for other tax planning activities (i.e., effective tax rate, intangible assets, and foreign income) and again find similar results (coefficient = 0.048, p-value <0.05). Second, while an increase in book-tax conformity could lead to in increase in the value of tax shields, it is unclear why such an increase in book-tax conformity would also lead to a decrease in ERCs (as documented by Hanlon et al. 2008) if converting firms were simply issuing more debt to respond to a change in tax incentives.

4.5 Additional analysis—intermediate links between book-tax conformity and leverage

As noted above, we predict that increased book-tax conformity decreases earnings informativeness (Hanlon et al. 2008). We further predict that this decrease in earnings informativeness increases the cost of equity capital relative to debt, which leads to an increase in firms' use of leverage. The links in this theory are summarized in the following diagram:

BTC (Link 1) > Earnings Informativeness (Link 2) > Cost of Capital (Link 3) > Leverage.

While Hypothesis 1 links book-tax conformity to leverage, in additional analysis we consider the other links in this theory. We begin by replicating Hanlon et al. (2008) using the following model:

$$R_t = \alpha + \beta_1 Converting + \beta_2 Post_t + \beta_3 \Delta E_t + \beta_4 Converting*\Delta E_t + \beta_5 Post_t*\Delta E_t + \beta_6 Converting*Post_t + \beta_7 Converting*Post_t*\Delta E_t + \varepsilon_t, \quad (2)$$

where R_t is the annual stock return beginning 4 months after the end of fiscal year *t-1*, ΔE_t is the change in earnings before extraordinary items from year *t-1* to year *t*, and other variables are previously defined.

We predict that converting firms' earnings response coefficients will decrease relative to control firms after TRA '86 consistent with the findings of Hanlon et al. (2008). The results of our replication are reported in Table 5. Due to Compustat backfilling, we have a larger sample ($N = 4626$) than Hanlon et al. (2008) ($N = 3576$). Overall, for the control firms in the pre-period, we observe slightly smaller earnings response coefficients (0.455) than Hanlon et al. (2008) (0.763). However, we find very similar differences between converting firms and control firms both before and after TRA '86. Our coefficient estimate for $Converting*\Delta E_t$ is 1.741, compared to 1.712 in Hanlon et al. (2008). Most importantly, our coefficient estimate for $Converting*Post_t*\Delta E_t$ is negative and statistically significant (coefficient = −1.748, p-value < 0.001), consistent with the findings of Hanlon et al. (2008) (coefficient = −1.740, p-value =0.001). Thus we observe a similar decrease in earnings informativeness for converting firms as Hanlon et al. (2008) in the post-TRA '86 period.

We then examine changes in the cost of equity capital for converting firms relative to nonconverting firms. We estimate the cost of equity as a function of changes in conformity and a set of controls following Dhaliwal et al. (2006). We estimate the following model:

$$Cost\ of\ equity_{it} = a_0 + a_1 Converting_i + a_2 Post_t + a_3 Converting_i*Post_t + a_4 Bmkt_{it} + a_5 Bsmb_{it} + a_6 Bhml_{it} + a_7 ln(Dispersion)_{it} + a_8 ln(LTG)_{it} + e_{it}, \quad (3)$$

where *Cost of equity* is the implied cost-of-equity capital for firm *i* in June of year *t*, calculated as the average of four implied cost-of-equity capital estimates: *Rg*, *Rct*, *Roj*, and *Rmpeg*. *Rg* is the implied cost-of-equity capital estimate following Gebhardt et al. (2001); *Rct* is the implied cost-of-equity estimate following Claus and Thomas (2001); *Roj* is the implied cost-of-equity capital estimate following Gode and Mohanram (2003); and *Rmpeg* is the implied cost-of-equity capital following Easton (2004). Like Dhaliwal et al. (2005) and Dhaliwal et al. (2006), we use the average of these four estimates. *Bmkt*, *Bsmb*, and *Bhml* are estimates from the Fama and French (1996) three-factor model to adjust for systematic risk. *ln(Dispersion)* is the log of the standard deviation of analyst estimates for year *t* earnings divided by the consensus forecast for year *t* earnings. *ln(LTG)* is the Institutional Brokers' Estimate System (I/B/E/S) analyst consensus long-term growth in earnings per share forecast reported in June of year *t*. If long-term growth forecast is not available, *ln(LTG)* equals the two-year-ahead earnings forecast divided by the one-year-ahead forecast minus one. *Converting* and *Post* are as

Table 5 Replication of Hanlon et al. (2008)

$$Annual\ stock\ return_{it} = \alpha + \beta_1 Converting_i + \beta_2 Post_t + \beta_3 \Delta E_{it} + \beta_4 Converting_i * \Delta E_{it} + \beta_5 Post_t * \Delta E_{it} + \beta_6 Converting_i * Post_t + \beta_7 Converting_i * Post_t * \Delta E_{it} + \varepsilon_{it}$$

Panel A: Replication of Hanlon et al. (2008) Table 3 Panel A

	(a) Hanlon et al. (2008)		(b) Replication	
	Estimate	*p*-value	Estimate	*p*-value
Intercept	0.158	0.128	0.142	0.160
Converting	0.054	0.112	0.076	0.133
Post	-0.032	0.756	-0.012	0.908
ΔE	0.763	0.000	0.455	0.000
ConvertingΔE	1.712	0.001	1.741	0.000
PostΔE	-0.268	0.094	-0.101	0.333
*Converting*Post*	-0.100	0.024	-0.128	0.042
*Converting*Post*ΔE	-1.740	0.001	-1.748	0.000
N	3,576		4,626	
R^2	0.069		0.043	

Panel B: Replication of Hanlon et al. (2008) Table 3 Panel B

Separate Group Coefficients

		Hanlon et al. (2008)	Replication
Control Pre	β_3	0.763	0.455
Converting Pre	$\beta_3 + \beta_4$	2.475	2.195
Control Post	$\beta_3 + \beta_5$	0.495	0.353
Converting Post	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	0.467	0.346

Coefficient Differences between Groups

	Hanlon et al. (2008)		diff	Replication		diff
Converting Pre vs Control Pre	2.475	0.763	1.712	2.195	0.455	1.741
Converting Post vs Converting Pre	0.467	2.475	-2.008	0.346	2.195	-1.849
Control Post vs Control Pre	0.495	0.763	-0.268	0.353	0.455	-0.101
Converting Post vs Control Post	0.467	0.495	-0.028	0.346	0.353	-0.008

Table 5 displays our replication of Hanlon et al. (2008). Standard errors are clustered by firm and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. *Annual stock return*$_t$ is the annual stock return beginning 4 months after the end of fiscal year *t-1*. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. ΔE is the change in earnings before extraordinary items from year *t-1* to year *t*

previously defined. We predict a positive coefficient on α_3, consistent with cost of equity capital increasing for converting firms relative to nonconverting firms in the post-TRA '86 period. The results of estimating eq. (2) are presented in Table 6, Panel A. We observe a positive and statistically significant coefficient on α_3 (coefficient = 0.011, *p*-value <0.05). Thus we estimate that converting firms' cost of equity

capital increase by 1.1% relative to nonconverting firms in the post-TRA '86 period or about 7.6% of their pre-TRA cost of equity.[16, 17] This result is consistent with our hypothesis that increasing book-tax conformity increases the cost of equity capital, which in turn leads to an increase in leverage.

We also examine the relation between book-tax conformity and the cost of debt using the following model:

$$\begin{aligned} Cost\ of\ debt_{it} = {} & a_0 + a_1 Converting_i + a_2 Post_t + a_3 Converting_i{*}Post_t \\ & + a_4 1/Assets_{it} + a_5 Book{-}to{-}market_{it} + a_6 PP\&E_{it} \\ & + a_7 Return\ on\ \text{assets}_{it} + a_8 Annual\ stock\ return_{it} \\ & + a_9 Marginal\ tax\ rate_{it} + e_{it}, \end{aligned} \tag{4}$$

where *Cost of debt* is total interest expense divided by average debt (Francis et al., 2005). All other variables are as previously defined. We make no prediction on the sign of α_3 in this model. If converting firms experienced an increase (decrease) in the cost of debt, then we expect α_3 to be positive (negative), while if there is no relation between book-tax conformity and the cost of debt we expect α_3 to statistically insignificantly from zero. The results of estimating eq. (3) are presented in Table 6, Panel B. The estimated coefficient on α_3 is positive (0.005) but statistically insignificant (t-stat = 0.57).[18]

Finally, we examine the relation between cost of equity and leverage. We expect that firms with higher cost of equity capital will use more leverage, ceteris paribus. To test this prediction, we regress *Leverage* on *Cost of equity* and additional control variables. Note that, in these tests, we omit *Post* because we are not predicting a change in the relation between the cost of equity and leverage before and after TRA '86—we are documenting a positive association between cost of equity and leverage in our sample firms. In untabulated analysis, as expected, we find no difference in the slope coefficient on cost of equity before and after TRA '86. We report the results in Table 7. Panel A presents the results for all sample firms, and Panel B presents the results for converting firms only. In Panel A, we observe a positive (0.736) and statistically significant (p-value <0.01) coefficient on *Cost of equity* consistent with firms using more leverage when their cost of equity is higher. In Panel B, we continue to observe a positive (1.500) and statistically significant (p-value <0.01) coefficient on *Cost of equity* when we limit the sample to converting firms only. This result is consistent with those converting firms that had larger increases in their cost of equity also having larger increases in leverage consistent with our theory.

[16] We obtain 7.6% by dividing the increase in cost of equity for treatment firms relative to control firms (i.e., 1.1%) divided by pre-TRA cost of equity for treatment firms (i.e., 14.4%).

[17] For comparison purposes, we examine the magnitude of a change in the implied cost of equity capital surrounding an increase in noise as proxied by an internal control deficiency. Ashbaugh-Skaife et al. (2009) document an increase in the implied cost of equity of 93 basis points for firms first disclosing an internal control deficiency. They also find a decrease in the average cost of equity of 116 basis points around the release date of an unqualified SOX 404 opinion for firms most likely to report ICDs. We document a 111 basis point increase on average for our converting firms.

[18] We acknowledge that, because measures of cost of debt derived from interest expense capture interest on all debt, rather than new debt, such proxies result in tests that are lower in power relative to tests using interest rates on new debt (which we do not have). However, we try to increase the power of the cost of debt test by limiting our post-TRA '86 sample to its last year and find very similar results.

Table 6 Book-tax conformity and the cost of capital

Panel A: Book-Tax Conformity and the Cost of Equity

$$Cost\ of\ equity_{it} = \alpha_0 + \alpha_1 Converting_i + \alpha_2 Post_t + \alpha_3 Converting_i{*}Post_t + \alpha_4 Bmkt_{it} + \alpha_5 Bsmb_{it} + \alpha_6 Bhml_{it} + \alpha_7 ln(Dispersion)_{it} + \alpha_8 ln(LTG)_{it} + \varepsilon_{it}$$

	Coefficient	Std. Err.	t-Stat
Intercept	0.172	0.011	16.13 ***
Converting	-0.017	0.004	-4.19 ***
Post	-0.031	0.007	-4.22 ***
*Converting*Post*	0.011	0.005	2.39 **
Bmkt	0.009	0.003	3.48 ***
Bsmb	0.004	0.001	3.29 ***
Bhml	-0.004	0.001	-2.78 **
ln(Dispersion)	0.011	0.001	9.86 ***
ln(LTG)	0.015	0.018	0.82
N	1,230		
R^2	0.322		

Panel B: Book-Tax Conformity and the Cost of Debt

$$Cost\ of\ debt_{it} = \alpha_0 + \alpha_1 Converting_i + \alpha_2 Post_t + \alpha_3 Converting_i{*}Post_t + \alpha_4 1/Assets_{it} + \alpha_5 Book{-}to{-}market_{it} + \alpha_6 PP\&E_{it} + \alpha_7 Return\ on\ assets_{it} + \alpha_8 Annual\ stock\ return_{it} + \alpha_9 Marginal\ tax\ rate_{it} + \varepsilon_{it}$$

	Coefficient	Std. Err.	t-Stat
Intercept	0.111	0.010	11.42 ***
Converting	-0.008	0.008	-1.07
Post	-0.013	0.005	-2.60 **
*Converting*Post*	0.005	0.008	0.57
1 / Assets	0.088	0.053	1.64
Book-to-market	0.000	0.003	-0.15
PP&E	-0.007	0.007	-0.95
Return on assets	-0.006	0.020	-0.28
Annual stock return	-0.002	0.002	-0.80
Marginal tax rate	0.042	0.025	1.70 *
N	4,286		
R^2	0.021		

Table 6 examines the effect of book-tax conformity on the cost of capital. Panel A examines the effect of conformity on the cost of equity, while Panel B examines the effect of conformity on the cost of debt. Standard errors are clustered by firm and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

Panel A: *Cost of equity* is the implied cost-of-equity capital for firm *i* in June of year *t*, calculated as the average of four implied cost-of-equity capital estimates: *Rg*, *Rct*, *Roj*, and *Rmpeg* (see Appendix B for computation details). *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. *Bmkt*, *Bsmb*, and *Bhml* are factor loadings following Fama and French (1996), using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*. *ln(Dispersion)* is the log of the standard deviation of analyst estimates for year *t* earnings divided by the consensus forecast for year *t* earnings. *ln(Growth)* is the log of Institutional Brokers' Estimate System (I/B/E/S) analyst consensus long-term growth in earnings per share forecast reported in June of year *t*. If long-term growth forecast is not available, *ln(Growth)* equals the two-year-ahead earnings forecast divided by the one-year-ahead forecast minus one

Panel B: *Cost of debt* is total debt interest expense divided by average debt. *Converting* is a dummy indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income. *Post* is a dummy variable indicating the post-1986 period. *1/Assets* is 1 divided by the market value of assets. *Book-to-market* is book value of equity divided by the market value of equity. *PP&E* is net property, plant, and equipment divided by the market value of assets. *Return on assets* is income before extraordinary items divided by the market value of assets. *Annual stock return* is the 12-month buy-and-hold stock return. *Marginal tax rate* is an estimate of firms' pre-interest marginal tax rate estimate obtained from Blouin et al. (2010)

Table 7 Leverage and the cost of equity

$$Leverage_{it} = \alpha_0 + \alpha_1 Cost\ of\ equity_{it} + \alpha_2 1/Assets_{it} + \alpha_3 Book\text{-}to\text{-}market_{it} + \alpha_4 PP\&E_{it} + \alpha_5 Return\ on\ assets_{it} + \alpha_6 Annual\ stock\ return_{it} + \alpha_7 Marginal\ tax\ rate_{it} + \varepsilon_{it}$$

Panel A: Leverage and Cost of Equity (both Converting and Non-converting Firms)

	Coefficient	Std. Err.	t-Stat
Intercept	0.067	0.042	1.60
Cost of equity	0.734	0.178	4.13 ***
1 / Assets	-3.013	0.647	-4.66 ***
Book-to-market	0.112	0.013	8.97 ***
PP&E	0.267	0.032	8.38 ***
Return on assets	-0.097	0.096	-1.01
Annual stock return	-0.011	0.014	-0.84
Marginal tax rate	-0.253	0.092	-2.74 **
N	1,446		
R^2	0.421		

Panel B: Leverage and Cost of Equity (Converting Firms Only)

	Coefficient	Std. Err.	t-Stat
Intercept	0.116	0.125	0.92
Cost of equity	1.500	0.637	2.36 **
1 / Assets	-2.970	1.862	-1.60
Book-to-market	0.071	0.048	1.48
PP&E	0.339	0.091	3.71 ***
Return on assets	-0.305	0.169	-1.80
Annual stock return	-0.008	0.024	-0.33
Marginal tax rate	-0.546	0.218	-2.51 **
N	174		
R^2	0.439		

Table 7 displays multivariate regression estimates for the relation between leverage and the cost of equity (Panel A for converting and nonconverting firms, Panel B for converting firms only). Standard errors are clustered by firm and year. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. *Leverage* is total debt divided by the market value of assets. *Cost of equity* is the implied cost-of-equity capital for firm *i* in June of year *t*, calculated as the average of four implied cost-of-equity capital estimates: *Rg*, *Rct*, *Roj*, and *Rmpeg* (see Appendix B for computation details). *1/Assets* is 1 divided by the market value of assets. *Book-to-market* is book value of equity divided by the market value of equity. *PP&E* is net property, plant, and equipment divided by the market value of assets. *Return on assets* is income before extraordinary items divided by the market value of assets. *Annual stock return* is the 12-month buy-and-hold stock return. *Marginal tax rate* is an estimate of firms' pre-interest marginal tax rate estimate obtained from Blouin et al. (2010)

Overall, the results of our additional analysis of each of the links in our theory are consistent with the theory. Specifically, book-tax conformity relates negatively to earnings informativeness, is positively related to the cost of equity but not debt capital,

and cost of equity capital is positively associated with leverage. These findings are consistent with our argument that firms increase their use of debt due to an increased cost of equity relative to debt when faced with higher book-tax conformity.

5 Conclusion

Our paper is motivated by the current debate over book-tax conformity in the U.S. Calls to increase book-tax conformity are predicated on the perceived benefits of conforming book and taxable incomes. However, recent academic papers focus on the negative effects conformity would have on accounting information. We draw from this literature and examine the capital structure consequences of increasing book-tax conformity. Our findings suggest that firms substitute away from equity in the presence of greater conformity.

Our findings matter for at least three reasons. First, they suggest that financial reporting rules interacting with tax rules, here increased book-tax conformity, have real effects on firms' financing decisions. Second, they contribute to the debate about the likely effects of increasing the level of book-tax conformity in the U.S. Namely, increasing book-tax conformity will result in firms increasing their use of debt relative to equity. This is of particular concern given recent policy proposals to not only increase book-tax conformity but also decrease the use of tax-advantaged leveraged (Treasury 2012). Third, while proponents of book-tax conformity claim that that increasing conformity will increase tax revenues by decreasing tax avoidance, our findings suggest the increased use of tax deductible debt resulting from increased book-tax conformity will mitigate any expected increase in tax revenues. We believe our findings should be of interest to policymakers in weighing benefits and costs associated with higher conformity in the U.S.

Our study is not without limitations, as it employs a small sample from 1981 to 1992. However, to the extent we capture a causal mechanism with our difference-in-differences design, we believe our results should generalize to a larger and more recent sample. Finally, while we believe the increase in leverage we document for converting firms following TRA '86 is indeed an unintended consequence, we do not believe increases in leverage are necessarily undesirable. We do, however, believe policy proposals attempting to not only increase conformity but also to decrease leverage (such as recent proposals from Treasury) to be potentially at odds. Notwithstanding this, we leave it up to readers to evaluate the overall desirability of potential increases in leverage resulting from greater mandatory conformity.

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Appendix A

Table 8 Variable definitions

Variable*	Description	Computation
Converting	Variable indicating firms that were required to convert from cash basis to accrual basis accounting in computing taxable income in TRA '86	1 if converting firm, 0 otherwise
Post	Variable indicating the post-1986 period	1 if observation is post 1986, 0 otherwise
Leverage	Total debt divided by market value of assets.	(dlc + dltt)/(prcc_f*csho + dlc + dltt)
1/Assets	1/market value of assets.	1/(prcc_f*csho + dlc + dltt)
Book-to-market	Book value of equity divided by the market value of equity.	ceq/(prcc_f*csho)
PP&E	Net property, plant, and equipment divided by the market value of assets.	ppent/(prcc_f*csho + dlc + dltt)
Return on assets	Pretax income minus interest expense, divided by market value of assets.	(pi – xint)/(prcc_f*csho + dlc + dltt)
Annual stock return	12-month buy-and-hold stock return.	(1 + ret. [CRSP])^12–1
Marginal tax rate	Marginal tax rate before interest	See Blouin et al. (2010)
Rg	Cost of equity capital estimate from Gebhardt et al. (2001)	See description in Appendix B
Rct	Cost of equity capital estimate from Claus and Thomas (2001)	See description in Appendix B
Roj	Cost of equity capital estimate from Gode and Mohanram (2003)	See description in Appendix B
Rmpeg	Cost of equity capital estimate from Easton (2004)	See description in Appendix B
ΔE	Change in earnings	(Ib – ib_lag1)/(csho_lag1*prcc_f_lag1)
Cost of debt	Average interest rate on debt	xint/[(dlc + dltt + dlc_lag1 + dltt_lag1)/2]
ln(LTG)	Analyst two-year-ahead forecast growth	two-year-ahead ltg[I/B/E/S] divided by the one-year-ahead ltg[I/B/E/S] minus one
ln(Dispersion)	Dispersion of analyst forecasts	log of the standard deviation of analyst estimates [I/B/E/S] for year *t* earnings divided by the consensus forecast for year *t* earnings [I/B/E/S].
Bmkt	Fama and French (1996) market factor loadings	See Fama and French (1996). Factor loadings are obtained using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*.
Bsmb	Fama and French (1996) size factor loadings	See Fama and French (1996). Factor loadings are obtained using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*.
Bhml	Fama and French (1996) value factor loadings	See Fama and French (1996). Factor loadings are obtained using monthly return data from the 48 months prior to the beginning of the calendar year *t* for a specific stock *i*.

*All variables are from Compustat XpressFeed unless stated otherwise

Appendix B. Cost of Equity Capital Measures

Gebhardt et al. (2001) estimate a residual income model using analyst earnings forecasts in years t + 1 and t + 2, long-term growth forecasts for year t + 3 earnings, and terminal value estimates. Earnings forecasts beyond year three are estimated assuming the year t + 3 return on equity (ROE) reverts to the industry median ROE by year t + T ($T = 12$).

$P_t = B_t + \frac{\text{FROE}_{t+1}-r_g}{(1+r_g)}B_t + \frac{\text{FROE}_{t+2}-r_g}{(1+r_g)^2}B_{t+1} + TV$, where FROE_{t+i} is forecasted ROE in period t + i and equals $\text{FEPS}_{t+i}/\text{B}_{t+i-1}$ for years one through three, and B_{t+i} is year t + i book value of equity divided by the number of common shares outstanding in June of year t + i. Using clean surplus accounting, $\text{B}_{t+i} = \text{B}_{t+i-1} + \text{FEPS}_{t+I}\times(1\text{-k})$. FEPS is forecasted earnings per share and FEPS_1 and FEPS_2 equal the one-year- and two-year-ahead consensus EPS forecasts in I/B/E/S in June of year t. FEPS_3 equals the three-year-ahead EPS forecast, if available; otherwise FEPS_3 is FEPS_2 × (1 + long-term growth forecast). k is expected dividend payout ratio (dividends per share divided by earnings per share in year t − 1). If EPS ≤ 0, then k equals 6% of total assets at the beginning of year t. TV, the terminal value, is calculated as:

$$TV = \sum_{i=3}^{T-1}\frac{\text{FROE}_{t+i}-r_g}{(1+r_g)^i}B_{t+i-1} + \frac{\text{FROE}_{t+T}-r_g}{r_g(1+r_g)^{T-1}}B_{t+T-1}$$

Claus and Thomas (2001) use the following residual income model:

$$P_0 = B_0 + \frac{ae_1}{(1+r_{ct})} + \frac{ae_2}{(1+r_{ct})^2} + \frac{ae_3}{(1+r_{ct})^3} + \frac{ae_4}{(1+r_{ct})^4} + \frac{ae_5}{(1+r_{ct})^5} + \frac{ae_5(1+g)}{(r_{ct}-g)(1+r_{ct})^5}$$

ae_t is year t expected abnormal earnings equal to $\text{FEPS}_t - r_{ct} \times \text{B}_{t-1}$. For years three through five, FEPS_{t+i} equals the consensus EPS forecast, if available; otherwise $\text{FEPS}_{t+i} = \text{FEPS}_{t+i-1}$ × (1 + long-term growth forecast). B_{t+i} equals $\text{B}_{t+i-1} + \text{k} \times \text{FEPS}_{t+i}$, assuming k = 0.5. g, the growth in abnormal earnings beyond t + 5, equals the yield on the 10-year Treasury note minus 3%.

Gode and Mohanram (2003) use a model based on Ohlson and Juettner-Narouth (2005):

$$r_{oj} = A + \sqrt{A^2 + \frac{EPS_t}{P_{t-1}}\left(g-\left(r_f-0.03\right)\right)},$$

where $A = 0.5\left(\left(r_f-0.03\right)+\frac{DPS_{t+1}}{P_t}\right)$, $g = \frac{(\text{FEPS}_{t+2}-\text{FEPS}_{t+1})}{\text{FEPS}_{t+1}}$, r_f = yield on a 10-year Treasury note, and DPS = dividends per share ($\text{DPS}_{t+1} = \text{DPS}_0$). This model assumes that g (short-term growth) decays asymptotically to a perpetual growth rate ($r_f - 0.03$) and requires that FEPS_{t+1} and FEPS_{t+2} be positive.

Easton (2004) uses a modified PEG ratio (PE ratio divided by the short-term rate of earnings growth, modified to include expected dividends in the estimate of short-term growth):

$P_0 = \frac{\left(EPS_{t+2}+r_{\text{mpeg}}DPS_{t+1}-EPS_{t+1}\right)}{r_{\text{mpeg}}{}^2}$, where $\text{EPS}_2 \geq \text{EPS}_1 > 0$ and $\text{DPS}_{t+1} = \text{DPS}_0$. This model constrains $\text{EPS}_2 \geq \text{EPS}_1 > 0$ so the solution has two real roots, one of which is positive.

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