BOOK-TAX DIFFERENCES AND EARNINGS GROWTH

by

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I examine the relation between book-tax differences (BTDs) and earnings growth. Because financial accounting rules afford managers more flexibility and discretion in reporting than tax accounting rules, prior studies suggest that large differences between book and taxable income indicate lower quality (or less persistent) earnings. Lev and Nissim and Hanlon provide evidence that BTDs contain information about future firm performance, but the nature of the causality in this relation is not clear. While BTDs could proxy for earnings quality, they may also reveal underlying economic events or management's private information about future performance or simply predict future reversals in effective tax rates.

I divide total BTDs into their measurable components: temporary (deferred taxes) and non-temporary (permanent differences and tax accruals), and test their relation with the components of net income changes: pretax earnings changes and tax expense changes. I hypothesize that the non-temporary component of BTDs is negatively related

to future changes in tax expense, whereas the temporary component of BTDs is negatively related to changes in future pretax earnings. I also examine the maintained hypothesis that the lower earnings growth for large BTD firms is due to earnings management. I use various proxies from prior literature to identify firms potentially managing earnings and test whether the presence or absence of suspected earnings management activity alters the relation between BTDs and earnings changes.

My results provide compelling evidence that permanent BTDs are related only to future changes in tax expense, and temporary BTDs are related to changes in pretax earnings. These results are robust to multiple sensitivity analyses, including a replication of the sample and methodology of Lev and Nissim. The results also hold in the case of firms not suspected of earnings management. In fact, I find only limited evidence that the results are stronger in the presence of earnings management. Overall, my study suggests that it is only the temporary component of BTDs that is related to future firm performance, with non-temporary differences being related to future tax expense changes, and that these results are primarily due to underlying economic factors, not earnings management.

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CHAPTER I

INTRODUCTION

In this paper I examine the relation between book-tax differences (BTDs) and earnings growth. Prior literature (Lev and Nissim, 2004; Hanlon, 2005) provides evidence that BTDs contain information about future firm performance, but the nature of the causality in this relation is not clear. Lev and Nissim (2004) suggest that BTDs capture earnings management activity, or that tax accounting better captures 'core' earnings. As tax accounting is more closely associated with current cash flows, the magnitude of BTDs could capture the extent to which book income ventures away from its 'permanent' levels. However, to the extent that BTDs capture underlying economic items that are transitory in nature (such as a goodwill write-off or restructuring charge), any relation between BTDs and earnings growth could simply be related to these events. It is also possible that the book-tax difference predicts future variation in effective tax rates (and therefore tax expense).

To examine these issues, I study the effect of the temporary and permanent components of BTDs on future changes in both pretax earnings and tax expense. If BTDs (or one of its components) contains information about the future economic performance of the firm, I expect to find a relation between this measure and future changes in pretax earnings. However, if BTDs (or its components) contains information about future effective tax rates, then I expect to find a relation between this measure and future changes in tax expense. In addition, prior literature is unsettled as to which measure of

BTD better proxies for earnings quality, as Lev and Nissim (2004) and Hanlon (2005) find conflicting results using different BTD measures. By examining the effect of different components of BTDs on earnings growth, my research design reconciles the conflicting findings of previous research, and provides guidance for future work examining the relation between BTDs and future firm performance. Finally, I examine the relation between BTDs and earnings growth in the presence and absence of earnings management. If the BTD/earnings growth relation holds even in the absence of earnings management, this would suggest that any relation between BTDs and earnings growth is due at least in part to mechanical and economic factors rather than opportunistic behavior. Understanding the relation between BTDs and future earnings changes is important because it provides evidence on the usefulness of taxable income in determining firm value.

Book-tax differences arise when different accounting systems are applied to the same set of underlying economic events. Recent research has attempted to determine whether these differences are informative about a firm's earnings characteristics and future performance. Lev and Nissim (2004) suggest that BTDs are related to growth because they reflect earnings management activities that are not persistent or capture the extent to which book earnings deviate from their permanent level. They predict and find that BTDs are positively related to future earnings growth.[1] However, because they

[1] It should be noted that although Lev and Nissim (2004) use the tax to book ratio to capture the impact of total BTDs on earnings growth, their inclusion of the temporary component, deferred taxes, in their tests implies that the coefficient on the tax to book ratio is really capturing the impact of the permanent component of BTDs on earnings growth. I discuss this issue and my approach in the research design section.

measure growth as changes in net income, the growth they document could be related to changes in underlying pretax earnings, or to changes in future income tax expense. To distinguish these two effects, I separate growth in net income into its two components, pretax earnings and tax expense, and separate total BTDs into its two components, permanent and temporary differences. I then examine the effect of the two components of BTDs on the growth of each income component. I find that permanent BTDs are *not* positively related to growth in pretax earnings, but negatively related to changes in tax expense, suggesting that permanent BTDs are more relevant in predicting future effective tax rates than future core earnings growth.

Lev and Nissim (2004) also examine the relation between temporary BTDs (deferred taxes) and earnings growth, and find no evidence of a relation. In contrast, Hanlon (2005) finds evidence of lower earnings persistence for firms with large temporary BTDs. In an effort to reconcile these conflicting results, I examine the relation between temporary BTDs and the two components of earnings growth, pretax earnings and tax expense. Consistent with Hanlon (2005), I find that growth in *pretax income* is negatively related to *temporary* BTDs. My findings, that changes in future tax expense is negatively related to non-temporary BTDs (permanent differences and tax accruals), while growth in pretax income is negatively related to temporary BTDs, provides evidence about which BTD measure is most appropriate in a given research setting, such

as investigations into how market participants use the BTD information in their decision making processes.[2]

A common theme in the BTD literature, and in the public press, is the concept that BTDs proxy for earnings quality or represents earnings management. For example, Rep. Lloyd Doggett (D-Tex.) referred to "a corporate culture of creative accounting and reporting abuses" when he introduced legislation requiring companies to disclose and explain the gap between book and taxable income (Weisman 2002, A01). Phillips, Pincus, and Rego (2003) present evidence that suggests that large BTDs are associated with various measures of earnings management. Hanlon and Krishnan (2006) interpret evidence of higher audit fees for firms with large BTDs as evidence that auditors associate large BTDs with increased risk of earnings management. On the other hand, Tang (2007) and Dhaliwal, Huber, Lee, and Pincus (2008) argue that much of the BTD is due to mechanical or economic differences, unrelated to opportunistic behavior. To better understand the relation between earnings growth and BTDs, I control for various proxies of earnings management. While the relation between growth and BTDs holds for firms with no indication of opportunistic behavior, I find only weak evidence that firm years suspected of earnings management have a stronger growth/BTD relation, suggesting that it is principally underlying economic events, and not earnings management, that is responsible for the relation between earnings growth and book-tax differences.

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[2] Prior literature is unsettled as to the appropriate measure for BTDs. Phillips, Pincus, and Rego (2003) and Joos, Pratt, and Young (2000) focus on temporary differences, Weber (2008) and Dhaliwal, Huber, Lee, and Pincus (2008) focus on total BTDs, while Hanlon and Krishnan (2006) use both. See the following chapter for a discussion of these papers.

This research makes several contributions. First, while prior literature suggests that BTDs are related to future earnings growth, it is not clear whether this growth is related to future changes in core economic performance, future changes in tax expense, or both. I provide evidence that growth in the two components of net income, pretax earnings and tax expense, are related in different ways to BTDs. Second, I address the unsettled question as to which BTD measure best predicts earnings growth. I find that *temporary* differences predict growth in pretax earnings, while *permanent* differences predict earnings growth related to changes in tax expense. These findings also help reconcile the conflicting results of Lev and Nissim (2004) and Hanlon (2005) on the relation between temporary BTDs and earnings growth/persistence. Third, this study answers the call of Graham, Raedy, and Shackelford (2008) and Hanlon and Heitzman (2009) for an examination of the components of BTDs. Although Graham, Raedy, and Shackelford (2008) ultimately desire a study that examines the specific accounts that leads to BTDs and why they are informative, my study is a first step in at least breaking BTDs into their temporary and permanent components, and understanding why and how each component is informative. Hanlon and Heitzman (2009) specifically ask for an examination of Lev and Nissim's (2004) results on non-temporary BTDs, indicating that a better understanding of their results would progress the literature. Finally, I contribute to the debate regarding book-tax conformity. Proponents of bridging the book-tax gap assert that the gap exists due to opportunistic behavior, but my results suggest that the relation between earnings growth and BTDs are more the result of underlying economic events that are manifest in book-tax differences.

The remainder of the paper is organized as follows. The next Chapter highlights related literature. Chapter III develops the hypotheses and Chapter IV discusses the research design. Chapter V describes the sample employed in the empirical tests and Chapter VI presents the results of those tests. Chapter VII presents robustness checks. I provide concluding comments and avenues for future research in Chapter VIII.

CHAPTER II

RELATED RESEARCH

Recent research examines the association between BTDs and earnings quality. Mills and Newberry (2001) find evidence consistent with firms increasing BTDs when the nontax costs of conforming book to tax income outweigh the tax-related costs of non-conformity. Public firms, those with high debt or facing financial distress, as well as those near bonus plan thresholds or with specific earnings patterns were associated with larger BTDs. Their measure of BTDs, the difference between pretax book income and taxable income, is based on firm level tax return data, information generally not available to researchers or investors. In an effort to measure BTDs using publicly available financial statements, two proxies have emerged: temporary differences, based on deferred tax expense, and total differences, computed as the difference between book income and grossed up current tax expense (taxable income). Both measures have been used to measure earnings quality in the presence of BTDs.

Temporary Differences

Using deferred taxes to represent temporary BTDs, Phillips, Pincus, and Rego (2003) find that BTDs are incrementally useful beyond accruals in detecting some types of earnings management. Joos, Pratt, and Young (2000) also examine temporary differences and find that large BTD firms have weaker earnings to returns relations. They interpret their results as suggesting that large temporary BTDs proxy for earnings management, and that investors react to this proxy by not putting as much weight on

earnings in valuation. Hanlon (2005) finds evidence that large temporary BTDs (deferred taxes) are informative about earnings persistence. Specifically, she finds that firms with both large positive and large negative BTDs have less persistent earnings. She also finds evidence that investors interpret large BTDs as a 'red flag,' and reduce their expectation of future earnings persistence for these firm years.

Total Differences

Lev and Nissim (2004) develop a "tax-based fundamental" defined as the ratio of estimated net taxable income to net book income. This ratio captures all book-tax differences, both temporary and permanent, along with tax accruals. They hypothesize and find that higher tax to book ratios are associated with higher levels of future earnings growth. In contrast to the results of Hanlon (2005), they find that deferred taxes, the temporary component of BTDs, are not incrementally useful in predicting earnings growth. Following Lev and Nissim (2004), Weber (2008) also uses total differences (permanent, temporary, and tax accruals) when measuring BTDs, and finds that analysts do not react efficiently to the information in this measure. Dhaliwal, Huber, Lee, and Pincus (2008) also use total BTDs when examining the variability of BTDs, and find that the temporal variation of BTDs is positively related to a firm's cost of capital. In addition, they separate BTD variability into its economic and unexplained components, and find that each is positively associated with cost of capital, suggesting that BTD variability reflects information about both the firm's underlying economic volatility and earnings management activity.

Underscoring the uncertainty in the literature as to which BTD measure is the better proxy for earnings quality, Hanlon and Krishnan (2006) use both temporary differences (deferred taxes) and total differences when testing if auditors use information reflected in BTDs when setting audit fees. After controlling for other predictors of audit fees, they find large BTDs associated with higher audit fees, consistent with BTDs reflecting information about earnings quality and auditors' assessment of the risk associated with auditing such statements. They find this result for both temporary and total BTDs, but because they do not test the two together, it is not clear which (or both) contain incremental information about earnings quality.

Total book tax differences have three components: temporary differences, permanent differences, and tax accruals. As indicated above, temporary differences have been investigated for their impact on earnings persistence and in identifying earnings management. Permanent differences have been examined for their link with abusive tax shelters. For example, Shevlin (2002) discusses the 'ideal' tax shelter as one that reduces taxable income but never reduces book income, leading to permanent differences. However, there has been little research attempting to link permanent BTDs to the quality or growth of book income.

There is growing evidence on the use of the tax accruals component of total BTDs in earnings management. Miller and Skinner (1998), Visvanathan (1998), and Bauman, Bauman, and Halsey (2001) fail to find evidence of earnings management using the valuation allowance account (VAA), but more recently Schrand and Wong (2003) and Frank and Rego (2006) find evidence associating the VAA with earnings management.

Two concurrent studies by Blouin and Tuna (2007) and Gupta and Laux (2008) find evidence of managing the tax contingency accrual (tax cushion). Krull (2004) finds evidence that large international firms use the permanently reinvested earnings (PRE) designation to manage their earnings. In a test for earnings management on aggregate tax accruals, Dhaliwal, Gleason, and Mills (2004) find evidence that suggests firms adjust their effective tax rate from the 3rd to the 4th quarter in order to meet earnings targets.

While the extant literature suggests that tax accruals are used to manage earnings, it should be noted that any impact on earnings from manipulating tax accruals is accomplished via changes in tax expense, not changes in pretax earnings. While the literature suggests that either temporary or total BTDs can proxy for earnings quality, it is not clear how the tax accruals components of total BTDs provide incrementally useful information beyond that already contained in the temporary component in predicting growth in pretax income.[3] It thus is an empirical question as to which BTD measure better predicts earnings growth, and which component of growth (pretax income or changes in tax expense) is related to the BTD. Additionally, most of the BTD literature noted above operates under the maintained hypothesis that any BTD/earnings growth relation is due to earnings management. However, because BTDs can also arise due to underlying economic factors, it is an empirical question as to whether it is earnings management or underlying economic events that drive the relation between BTDs and earnings growth. I take up these issues in the following chapters.

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[3] Changes in the valuation allowance account can predict future changes in pretax earnings, as changes in this account reflect management's perception of the firm's expected future performance. However, changes in the valuation allowance are captured as a deferred tax, and thus empirically will be a temporary difference.

CHAPTER III

HYPOTHESIS DEVELOPMENT

Lev and Nissim (2004) document a relation between total BTDs and growth in net income. Although their results are robust to a number of sensitivity checks, a fundamental question remains unanswered: What type of growth is associated with total BTDs? Change in net income can be divided into two components: changes in pretax earnings and changes in tax expense[4]. Holding future effective tax rates constant, tax expense is simply a function of pretax earnings, so dividing net income changes into its pretax and tax expense components may appear unnecessary. However, in the setting of examining firms across extremes in book-tax differences, future effective tax rates are not expected to remain constant, and it is an empirical question as to whether any earnings growth/BTD relation is due to changes in pretax income or changes in tax expense. In documenting a relation between total BTDs and growth in net income, Lev and Nissim (2004) measure BTDs as the rank of the tax/book ratio, with taxable income calculated as current tax expense grossed up by the current statutory tax rate. Since the tax rate is constant across firms in a given year, this measure is really just the rank of the ratio of current tax expense to net income (similar to an effective tax rate). This implies that what Lev and Nissim (2004) really find is that firms recording a high (low) rate of current tax

[4] Changes in net income can also be due to discontinued operations and extraordinary items, which are recorded net of tax. However, both in Lev and Nissim (2004) and in this study, income is measured before these items, so that changes in net income can be cleanly divided into the pretax income and tax expense components.

for a given amount of book income are likely to have positive (negative) growth in future net income. The relatively high or low amount of current tax could be due to temporary differences, permanent differences, or tax accruals.[5]

Temporary differences arise when financial accounting and tax accounting record economic events in different time periods. A common example is depreciation, in which total depreciation expense for an asset will be the same over the life of the asset, although in any given year it is unlikely that both the financial and tax systems will record the same expense. These timing differences are measured by the deferred tax expense. Because total tax expense includes both current and deferred tax expense, temporary differences do not affect the total tax expense recorded in the financial statements. Permanent differences are transactions recognized for financial *or* tax purposes, but not both. They *do* impact the overall tax expense recorded in the financial statements. Common examples include goodwill write-downs, restructuring charges, and a portion of dividends received from other firms. Permanent differences can be measured by removing temporary differences from total BTDs.

Lev and Nissim (2004) and Weber (2008) consider tax accruals as a third component of BTDs, as the behavior of this component is different than the other differences. However, short of extensive hand collection, in empirical tests tax accruals will be treated as either temporary or permanent differences. Because the valuation allowance account is captured as a deferred tax, the VAA will be considered empirically

[5] I use the expression '*relatively* high or low amount of current tax' to compare the firm both to its own typical tax levels in a time series, as well as to the typical tax levels faced by firms within the same industry.

(and in my hypotheses) as a temporary difference. Tax accruals such as tax contingencies and permanently reinvested foreign earnings (PRE) will be treated empirically as permanent differences. Each of these BTDs (tax accruals, permanent differences, and temporary differences) has different implications for future earnings changes.

Tax Accruals

Consider a firm with constant underlying earnings and a constant effective tax rate, so that the growth in net income is zero. If the effective tax rate were instead to vary annually through tax accruals (for example, adjustments in the tax contingency account, due either to opportunistic management behavior or underlying economic reasons), future changes in net income would be due to changes in tax expense, unrelated to any change in economic performance. In years with a relatively high tax rate (and expense), future rates would tend to be lower, reducing tax expense and increasing net income, with the opposite occurring in years with a relatively low tax rate. In the case of book-tax differences due to tax accruals, any future earnings growth related to the BTD will be due to tax expense changes, rather than changes in core earnings. Given the wide variation in effective tax rates firms experience from year to year, to the extent these fluctuations are due to tax accruals, there will be a significant BTD/earnings growth relation arising solely from tax expense changes.[6]

As anecdotal evidence for the preceding, consider the book-tax differences and subsequent earnings changes for two large firms in 2004: Johnson and Johnson and Coca-

[6] Although Dyreng, Hanlon, and Maydew (2008) find some evidence of effective tax rate persistence, they find considerable variation in them across firms and across time.

Cola (Table 1). The BTD is measured as taxable income minus book income, as a percentage of assets. Johnson & Johnson had (for its industry and year) a relatively high BTD of 0.009, indicating taxable income exceeded book income by 0.9% of total assets. This was relatively high compared to the industry mean (-0.097), where book exceeded tax by 9.7% of assets. Coke's BTD of -0.073 indicates that book income exceeded taxable income by 7.3% of assets, which was relatively low compared to its industry mean (-0.028), where book exceeded tax by 2.8% of assets. This contrast in BTDs corresponds to relatively higher (lower) earnings changes for Johnson & Johnson (Coke) in the following year, as predicted by prior literature. However, the change in earnings was not due to changes in pretax earnings, but due to substantial reductions (increases) in tax expense for Johnson & Johnson (Coke), as these firms were in the process of

Table 1
Example of Relation between Book-Tax Difference and Future Performance

Firm (2004)	Johnson & Johnson	Coca Cola
BTD as percent of assets	0.9%	-7.3%
Industry mean	-9.7%	-2.8%
Earnings measure		
Δpretax income	1.5%	1.5%
Δtax expense	-2.0%	1.5%
Δnet income	3.5%	0.0%
Industry mean ΔNI	-0.4%	0.1%

BTD is difference between taxable and book income (taxable income minus book income), as a percentage of current year total assets. Taxable income is computed as current tax expense, grossed up by statutory tax rate t, and taken net of tax by multiplying by $(1 - t)$. Change in pretax income, tax expense, and net income is calculated as next year change in that measure as a percentage of current year total assets.

repatriating foreign earnings under the American Jobs Creation Act of 2004. While only a simple example, this suggests that much of the BTD/earnings growth relation may be due in part to variation in tax rates caused by tax accruals.

Table 2 provides additional evidence on the mean reversion of ETRs. I form three portfolios of firms based on a ranking of their BTD in year *t*, with the highest quintile forming the 'High' portfolio, the lowest quintile forming the 'Low' portfolio, and the other quintiles forming the 'Middle' portfolio. I compute the mean effective tax rate (ETR) for firms in each portfolio in the year of their ranking, as well as in each of the five years preceding and after the ranking. Firm-years with the highest ranking of the BTD averaged an ETR of 45% in the year of that ranking, with ETRs dropping to 40% the following year, and retreating to around 36% within five years, while firms with the lowest ranking of BTD averaged an ETR of only 20% in the year of the ranking, climbing to 25% within five years. This suggests that firm-years with high or

Table 2
Means of Effective Tax Rates (ETR)
Across Ranks of BTD for Five Years Prior to and After BTD Ranking

R_BTD	*t*-5	*t*-4	*t*-3	*t*-2	*t*-1	*t*	*t*+1	*t*+2	*t*+3	*t*+4	*t*+5
High	0.39	0.39	0.39	0.40	0.40	0.45	0.40	0.38	0.38	0.37	0.36
Medium	0.36	0.36	0.35	0.35	0.35	0.36	0.36	0.35	0.35	0.34	0.34
Low	0.23	0.22	0.21	0.21	0.20	0.21	0.23	0.24	0.24	0.24	0.25

Time *t* captures mean ETR for all firm years with high relative BTD (upper quintile), low relative BTD (lowest quintile), or medium BTD (middle three quintiles), where R_BTD is the quintile ranking (within an industry and year) of a firm's BTD scaled by assets. BTD is the difference between taxable and book income (taxable income - book income). ETR is measured by scaling total tax expense (current + deferred) by taxable income (pretax income less grossed up deferred taxes). ETR measure is trimmed by deleteing any observation where the ETR measure is greater than 1 or less than -1.

low rankings of BTDs quickly experienced large changes in their ETR, which in turn could significantly affect their future after-tax net income. To the extent these swings in ETRs are caused by tax accruals, the positive relation between tax accruals and future changes in net income will be largely due to the negative relation with future changes in tax expense.

Permanent Differences

The relation between future earnings changes and permanent differences is less clear. Consider a firm with otherwise constant net income, but experiences a one-time charge that results in a permanent book-tax difference (for example, write-off of goodwill). This BTD will result in a relatively high effective tax rate for the level of net income (net income was reduced by the charge, with no corresponding reduction in taxable income). Although all other economic performance is equal, future net income will increase due to the future absence of the one-time charge, this time related to changes in pretax income, not changes in tax expense.[7] Thus, some permanent differences simply capture transitory economic events that naturally affect future earnings changes by failing to repeat. Consider now a firm with otherwise constant net income, but with permanent differences that are not transitory (such as dividends regularly received from another firm, which are largely excluded from taxable income). As long as the permanent difference is constant, there is no reason to expect a change in future net

[7] The argument could be made that future economic performance will not be equal. The write-down of goodwill may well predict future declines in economic performance. Ultimately the impact of transitory permanent differences on future pretax earnings changes is an empirical question.

income from pretax changes or from tax expense variation. In this case, permanent BTDs have no relation to future earnings growth.

The previous examples demonstrate that BTDs generated by tax accruals lead to tax expense changes, while permanent differences may be related to future changes in pretax earnings in either direction, or they may have no relation at all to pretax earnings changes. The third type of BTD, temporary differences, is the most easily separated from the other two (as it is reported as deferred tax), and will be discussed below. Controlling for temporary differences, I propose that the relation between the non-temporary components of BTDs and future earnings changes is due primarily to future changes in tax expense. My first hypothesis is:

> **H1:** There is a negative relation between the non-temporary components of BTDs (tax accruals and permanent differences) and future tax expense.

Temporary Differences

Temporary differences (identified by the deferred tax expense) capture income or expense items that are recognized at different times for book and tax purposes. These timing differences can be useful in identifying managerial discretion in accounting decisions. For example, managers exercise judgment with respect to depreciation periods and methods, revenue recognition, and recording reserve allowances such as bad debt, warranties, and contingencies. To the extent that management exercises its discretion in these matters to inflate (reduce) income for financial reporting purposes, the reversing nature of accruals dictates that any resulting temporary BTDs will be associated with

future declines (increases) in pretax earnings. This is true for at least two reasons. First, all else equal, the earnings in a year following one with inflated earnings will lower by definition. Second, accruals reverse, so to the extent that temporary BTDs capture accrual-based earnings management, the reversal of these managed accruals in a subsequent year will cause future income to be lower.

Management discretion in financial reporting also serves as a signal of management's private information about future firm performance. Consider a firm in distress that provides for a large valuation allowance against its deferred tax assets.[8] This creates a temporary difference reflected in a deferred tax expense, and this temporary difference is informative about future declines in economic performance.[9] Hence, whether temporary differences reflect the discretion in accruals used to manipulate earnings, or rather reveals management's private information through the discretion in accruals, there is reason to expect a negative relation between future earnings and temporary differences. Hanlon (2005) finds that the pretax earnings of firms with large temporary BTDs are less persistent. In contrast, Lev and Nissim (2004) find no relation between net income growth and temporary differences. I predict that *pretax* earnings

[8] As discussed previously, the valuation allowance account is a tax accrual, but because it is measured by deferred taxes, it is treated as a temporary difference, both in the hypothesis development and in the empirical tests.

[9] There are cases where the creation of a deferred tax *asset* would predict future declines in economic performance. For example, consider a firm constant in size, but with changes in its allowance for doubtful accounts or warranty liabilities. These changes will generate deferred tax assets that are also informative about future firm prospects, as it contains information about management's assessment of future collectability of receivables or quality of goods sold. Ultimately it is an empirical question whether deferred tax expense, absent earnings management, predicts higher or lower growth.

growth for firms with large temporary differences will be lower. My second hypothesis is:

H2: Large temporary BTDs (deferred taxes) are negatively related to growth in pretax earnings.

Finding empirical support for H2 suggests that temporary differences are related to future changes in pretax income, but provides no evidence as to the nature of the causality of this relation. As discussed above, manipulated earnings numbers can lead to temporary BTDs that will be related to lower future earnings growth. However, underlying economic events and conditions can also result in temporary BTDs that are related to future earnings growth. In the example noted above, a change in the valuation allowance account results in a change in deferred taxes that is informative about future firm prospects. Similarly, consider a firm with significant unearned revenue that is recognized as income for tax purposes. This will result in a deferred tax asset (a negative deferred tax expense), which will be related to future book revenue (when the previously unearned revenue is recognized). Thus, I predict that even in the absence of earnings management, temporary BTDs, as measured by the deferred tax expense, will be negatively related to growth in pretax earnings, and that the relation between temporary differences and future pretax earnings growth will be stronger in firm-years suspected of earnings management. Addressing the causality of the relation predicted in H2, my third set of hypotheses are:

H3a: In the absence of earnings management, temporary differences are negatively related to pretax earnings growth.

H3b: The negative relation between temporary differences and pretax earnings growth is stronger in the presence of earnings management.

H1 predicts a negative relation between permanent differences and future changes in tax expense. However, finding empirical support for H1 provides no evidence as to the nature of the causality of this relation. As discussed in H1, the non-temporary components of total BTDs are composed of both tax accruals (not including the valuation allowance account) and permanent differences. While it is unclear how permanent differences are used in earnings management, prior research has provided evidence that tax accruals have been used to manage earnings. The manipulation of these accruals do not affect pretax earnings, but only affects tax expense, so I expect that firms suspected of earnings management will have a stronger negative relation between non-temporary BTDs and future tax expense changes. However, even in the absence of earnings management, I expect a negative relation between the non-temporary differences and future tax expense changes as the tax expense mean reverts towards the statutory tax rate. Consider an international firm with constant earnings. For economic reasons (investment opportunities domestically and abroad), the firm in year one repatriates its foreign earnings, resulting in a relatively high amount of current tax expense compared to its book income (and thus a higher BTD). In the following year the firm designates its foreign earnings as permanently reinvested (PRE), escaping the repatriation tax expense, and hence its net income has increased due to a tax expense decrease, all related to the

relatively high BTD from year one. This relation occurs in the absence of earnings management objectives. However, Krull (2004) demonstrates that the PRE designation *is* used to manage earnings, so in the presence of earnings management, I expect the relation between tax accruals and future changes in tax expense to be even stronger. Addressing the causality of the relation predicted in H1, my final set of hypotheses are:

> **H4a:** In the absence of earnings management there is a negative relation between non-temporary BTDs and future tax expense changes.
>
> **H4b:** The negative relation between non-temporary BTDs and future tax expense changes is stronger in the presence of earnings management.

CHAPTER IV

RESEARCH DESIGN

To test the relation between the components of BTDs and earnings changes, I first measure the temporary and permanent components of BTDs with the following procedure introduced by Weber (2008): First, I estimate TAX^{DIFF} (total BTDs) as the difference between taxable income and net income, scaled by total assets,

$$TAX^{DIFF} = (\text{taxable income} - \text{net income}) / \text{average assets} \quad (1)$$

where net income is measured as income before extraordinary items (Compustat #18) and average assets is the mean total assets (Compustat #6) over the previous two years. Taxable income is estimated by grossing up current tax expense,

$$\text{Taxable income} = \text{current tax expense} / t * (1\text{-}t) / \text{average assets} \quad (2)$$

where the current portion of the income tax expense is grossed up by t, the top statutory corporate federal tax rate.[10] Taxable Income is multiplied by $(1 - t)$ to make it comparable to Net Income, which is measured after tax.[11] I then estimate TEMP, the temporary component of total BTDs, by grossing up the negative of deferred taxes,

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[10] The top statutory corporate tax rate was 48% in 1973-1978, 46% in 1979-1986, 40% in 1987, 34% in 1988-1992, and 35% in 1993-2006.

[11] The estimate of taxable income contains measurement error from several sources, such as the use of the top statutory tax rate in a progressive system or to represent foreign tax rates, the misalignment of tax expense and benefits for stock options, and tax credits (See Manzon and Plesko (2002), Mills, Newberry, and Trautman (2002), McGill and Outslay (2002), Hanlon (2003) Mills and Plesko (2003),

$$TEMP = - \text{(deferred tax expense)} / t * (1-t) / \text{average assets} \quad (3)$$

where the negative of deferred taxes are grossed up by t, multiplied by $(1 - t)$, and scaled by total assets, making it comparable in measurement to Taxable Income. Because TAX^{DIFF} captures the extent to which taxable income exceeds book income, I use the negative of deferred tax, which otherwise would capture the extent to which book income exceeds taxable income. Finally, I estimate PERM, the non-temporary component of total BTDs (permanent differences and tax accruals), as the difference between TAX^{DIFF} and TEMP.[12]

$$PERM = TAX^{DIFF} - TEMP \quad (4)$$

This procedure captures the extent to which taxable income exceeds book income, breaking this difference into permanent and temporary components.

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and Lev and Nissim (2004) for a discussion of the measurement error in estimates of taxable income). However, Lev and Nissim (2004) use the same estimate of taxable income in the computation of their tax to book ratio (TAX) and find that these errors do not systematically affect the relation between the TAX ratio and growth in net income.

[12] This is a key departure from the Lev and Nissim (2004) methodology due to the difficulty in interpreting their coefficients. Their key variables are R_TAX and R_DEF, the quintile ranks of the tax/book ratio and deferred taxes. Conceptually, TAX captures total BTDs, while DEF captures temporary differences, making DEF a subset of TAX. When both are included in a regression, the coefficient on TAX will capture the effect of permanent differences and tax accruals on growth, while the *sum* of the coefficients on TAX and DEF will reflect the impact of temporary differences. Hence, a lack of significance on DEF alone would not necessarily indicate that temporary differences do not predict earnings growth. However, because TAX is measured as a ratio, while DEF is the temporary component scaled by assets, DEF is no longer strictly a subset of TAX, and the interpretation of the coefficients on these variables (or their ranks) is unclear. My method of splitting the total BTD into its two components provides two variables that are not subsets of each other, but in sum capture the total BTD. The coefficient on PERM now clearly captures the impact of permanent differences and tax accruals, while the coefficient on TEMP relates only to the impact of temporary differences.

I then estimate the relation between the components of BTDs and earning changes with the following equation:

$$\Delta NI = \alpha + \beta_1 PERM + \beta_2 TEMP + \Sigma CONTROLS + \varepsilon \quad (5)$$

where ΔNI is an indicator of future changes in net income. It is alternatively measured as: next year's net income minus current net income (ΔNI_1), average net income over the next three years minus current net income (ΔNI_3), and average net income over the next five years minus current net income (ΔNI_5). Net income is measured as Compustat #18 (income before extraordinary items) scaled by total assets (#6).

Because many BTDs result from accrual estimates, it could be argued that any relation between BTDs and growth simply proxies for the effect that accruals have on earnings growth. To examine whether permanent differences (PERM) or temporary differences (TEMP) contain incremental information relative to accruals and cash flows, I include two related control variables, ACC and CASH[13], estimated as total accruals and total cash from operations, respectively, each scaled by total assets.[14] In this way, the coefficients on PERM and TEMP should capture the information in permanent differences and temporary differences incremental to each other and to accruals about future changes in net income.

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[13] Cash from operations is measured as the difference between income (before extraordinary items) and accruals, where accruals = (Δcurrent assets – Δcash) – (Δcurrent liabilities – Δshort-term debt) – Δdeferred tax liabilities – depreciation.

[14] This is similar in spirit to Lev and Nissim's (2004) CFO measure, the percentage of net income due to cash flows. However, the CFO measure is scaled by net income, which does not allow this cash/accrual measure to compete on an even footing with PERM and TEMP, which are scaled by total assets.

Chan, Karceski, and Lakonishok (2003) and Fama and French (2000) identify several other predictors of earnings growth. Following Lev and Nissim (2004), I add the following control variables: current change in ROA, average change in ROA over three and five years, dividends scaled by assets, the ratios of R&D to sales and capital expenditures to sales, and the current earnings / price (E/P) ratio and book-to-market (BTM) ratio.[15] Current and longer term changes in ROA control for short and long term trends in earnings, and should be positively related to future earnings changes. The level of dividends may reflect management's confidence in future earnings strength, suggesting a positive relation with future earnings changes, or it may signal fewer investment opportunities for the firm, suggesting a negative relation with future earnings changes. The ratios of R&D and capital expenditures to sales controls for expected sales growth due to new investments, but it also identifies growing firms making large investment outlays whose profitability may not improve in the short term, so I do not make a prediction on these variables. The E/P and BTM ratios capture market expectations of future growth. Each has stock price in the denominator, so that higher stock prices (and higher market expectations for earnings growth) will result in lower values for these ratios. Thus I expect an inverse relation between these ratios and future changes in earnings growth.

[15] Lev and Nissim (2004) also include current return on assets, controlling for the tendency of profitability to mean revert. However, I have already captured ROA with the ACC and CASH variables, whose numerators add to total net income, and whose denominator is total assets.

To examine the statistical significance of the relation between the BTD measures and the two components of earnings changes, I estimate the following two additional equations:

$$\Delta PRETAX = \alpha + \beta_1 PERM + \beta_2 TEMP + \Sigma CONTROLS + \varepsilon \quad (6)$$

$$\Delta TAXEXP = \alpha + \beta_1 PERM + \beta_2 TEMP + \Sigma CONTROLS + \varepsilon \quad (7)$$

where $\Delta PRETAX$ captures future changes in pretax earnings, and $\Delta TAXEXP$ captures future changes in tax expense. Following Hanlon (2005), PRETAX is measured as pretax income less minority interest scaled by average total assets. TAXEXP is measured as total income tax expense scaled by total assets. As with the variation on ΔNI, $\Delta PRETAX$ is alternatively measured as: next year's pretax earnings minus current pretax earnings ($\Delta PRETAX_1$), average pretax earnings over next three years minus current pretax earnings ($\Delta PRETAX_3$), and average pretax earnings over next five years minus current pretax earnings ($\Delta PRETAX_5$). The three estimates of TAXEXP are measured in the same way. To the extent permanent and temporary differences are positively related to changes in pretax earnings, the coefficients on PERM and TEMP will be positive in the estimates of equation (6). H2 predicts a positive coefficient on TEMP, as temporary differences (the extent to which taxable income is greater than book income due to timing differences) are predicted to be positively related to future pretax earnings changes.[16] If

[16] Note that H2 predicts a *negative* relation between deferred tax and future pretax earnings. To be consistent with the measurement of PERM and TAX^{DIFF}, which measure the extent to which taxable

the BTD measures are negatively related to changes in tax expense, then the coefficients will be negative when estimating equation (7). H1 predicts a negative coefficient on PERM when estimating equation (7), as the tax accruals component of PERM is expected to be related to declines in tax expense.

If a component of BTDs predicts earnings growth, it could reflect the influence of current earnings management activities on future growth in earnings, or it may simply reflect underlying economic events that generate various levels of BTDs and are related to earnings growth. To examine this issue, I identify firm-year observations where earnings management is suspected and create a dummy indicator (EM) equal to one for these firm years, and zero for firms that have no evidence of earnings management. Similar to Phillips, Pincus, and Rego (2003), I use four different proxies for earnings management: avoiding an earnings decline, avoiding an earnings loss, meeting analysts' forecasts, and high discretionary accruals. Prior work such as Burgstahler and Dichev (1997) indicate that an abnormally high percentage of firms have small earnings increases or slightly positive earnings, suggesting that many firms in these categories are managing their earnings upwards to avoid an earnings decrease or a loss. To identify earnings management based on earnings changes, EM1=1 if the change in net income (Compustat #172) scaled by previous year's beginning market value of equity (#25 x #199) is ≥ 0 and <0.02, and EM1=0 otherwise. To identify earnings management based on avoiding a loss, I compare firms with zero or slightly positive scaled earnings with those that easily

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income exceeds book income, TEMP is the *negative* of deferred taxes scaled by assets, so the expected coefficient on TEMP is *positive*.

attained positive earnings. Specifically, EM2=1 if net income scaled by beginning of year market value is ≥ 0 and <0.02, and 0 otherwise.

Degeorge, Patel, and Zeckhauser (1999) find evidence that suggests earnings management among firms that narrowly beat analysts' forecasts. To identify earnings management with analysts' forecasts, I identify firms that meet or narrowly beat their forecast. Specifically, EM3=1 if the earnings surprise (actual IBES earnings per share – consensus forecast) is ≥ 0 and less than 0.02, and EM3=0 otherwise.[17]

Discretionary accruals have also been proposed as a means of identifying earnings management. I follow the modified Jones model proposed by Dechow, Sloan, and Sweeney (1995) to identify discretionary accruals. I estimate the following equation:

$$\text{Accruals} = \alpha + \beta_1(1/A) + \beta_2(\Delta REV - \Delta REC) + \beta_3(PPE) + \varepsilon \quad (8)$$

where accruals are as measured earlier, A is total assets, ΔREV is change in revenue (Compustat #12), ΔREC is change in receivables (#2), and PPE is property, plant, and equipment (#7), each scaled by total assets (#6). Equation (4) is estimated cross-sectionally each year for each two-digit SIC code. The residuals from this equation are categorized as discretionary accruals, and I then rank the residuals into quintiles. I set the earnings management indicator EM4=1 for firms with the highest quintile rank of discretionary accruals, and 0 otherwise.

[17] In sensitivity tests, I use various other thresholds for 'small' earnings changes, 'slightly' positive earnings, and 'narrowly' beating analysts' forecasts. Results are substantially unchanged.

With these proxies for earnings management, I then re-estimate equations (1), (2), and (3), including the EM dummy alone and interacted with the rank variables for non-temporary BTDs (PERM), temporary BTDs (TEMP), and all control variables:

$$\Delta NI = \alpha + \beta_1 PERM + \beta_2 TEMP + \beta_3 EM + \beta_4 EM*PERM + \beta_5 EM*TEMP + \Sigma CONTROLS + EM*\Sigma CONTROLS + \varepsilon \quad (9)$$

$$\Delta PRETAX = \alpha + \beta_1 PERM + \beta_2 TEMP + \beta_3 EM + \beta_4 EM*PERM + \beta_5 EM*TEMP + \Sigma CONTROLS + EM*\Sigma CONTROLS + \varepsilon \quad (10)$$

$$\Delta TAXEXP = \alpha + \beta_1 PERM + \beta_2 TEMP + \beta_3 EM + \beta_4 EM*PERM + \beta_5 EM*TEMP + \Sigma CONTROLS + EM*\Sigma CONTROLS + \varepsilon \quad (11)$$

where ΔNI, ΔPRETAX, and ΔTAXEXP are alternatively measured over one, three, and five year periods as before, and EM is alternatively identified as suspected earnings management firm-years based on earning changes, earnings levels, analysts' forecasts, or discretionary accruals. I continue to control for growth related variables as discussed earlier, and each independent variable is interacted with the EM dummy. If firms that manage earnings are expected to have less future growth, β_3 will be negative. As predicted by H3a and H4a, if the relation between BTDs and earnings changes is not only an artifact of earnings management, but has underlying economic causes, the coefficient on TEMP in equation (10) will be positive, and the coefficient on PERM in equation (11) will be negative. As predicted by H3b and H4b, if earnings management intensifies the magnitude of the BTD/growth relationship, the coefficient on EM*TEMP in equation (10) will be positive, and the coefficient on EM*PERM in equation (11) will be negative.

CHAPTER V

SAMPLE AND SUMMARY STATISTICS

Sample Selection

I draw my sample from the annual Compustat files for years 1973-2006. I restrict my sample to firms that are incorporated in the U.S. (Compustat FINC=0), are not a financial, utility, or flow-through entity (SIC codes 4000s and 6000s), and have a December year-end (FYR=12). These restrictions are necessary as foreign-incorporated firms face different accounting and tax rules, utilities and financial institutions face different regulatory and reporting rules, and flow-through entities do not pay tax. Requiring a common fiscal year controls for temporal fluctuations in the economy. Because domestic and foreign components of current and deferred tax are not widely available on Compustat before 1973, I begin my sample selection in that year.

To perform my tests, my initial sample includes only observations that have the following data: Total assets (Compustat #6), total income tax (#16), income before extraordinary items (#18), number of shares outstanding (#25), deferred taxes (#50), common equity (#60), and price per share (#199). Due to the difficulty of interpreting BTDs for firms with negative income and taxes, I include only observations with positive net income and tax expense.[18] This selection procedure results in a base sample of 49,956 firm-year observations, representing 6,837 different firms over the 34-year period 1973-2006. To mitigate the influence of extreme observations, I delete from each analysis

[18] In sensitivity tests I relax this restriction, with no change in results.

observations in which any continuous variable lies beyond the highest and lowest 0.5% of the distribution for that variable.[19]

Summary Statistics

Table 3 presents a comparison of means of the independent variables (including the control variables for growth) across high and low quintile ranks of the PERM and TEMP variables. The means are significantly different for all of these variables across different quintiles. This highlights how these firms are fundamentally different from one another depending on their level of permanent or temporary BTDs and the importance of controlling for these growth proxies when determining the impact of BTDs on future earnings growth. Table 4 presents a correlation matrix for these variables. As expected, there is a high degree of correlation between changes in net income, changes in pretax income, and changes in tax expense. As predicted by H2, there is a positive correlation between temporary BTDs and changes in pretax income. In contrast to expectations, there is a *positive* correlation between permanent BTDs and changes in tax expense. However, the high degree of correlation between the dependent and independent variables makes inference difficult in a univariate setting, highlighting the need for multivariate tests.

[19] An exception to this is R&D expenditures. Because I set this variable to zero if missing in Compustat, over half of the observations have zero R&D, and selecting a lower 0.5% to delete is not feasible. I do exclude observations with R&D in the upper 0.5% of the distribution for regressions including this variable.

Table 3
Comparison of Variable Means Across Extremes in BTDs

	PERM			TEMP		
Variable	**Low**	**High**	**Prob (*t*)**	**Low**	**High**	**Prob (*t*)**
PERM	(0.010)	0.042	<0.001	0.009	0.016	<0.001
TEMP	(0.008)	(0.002)	<0.001	(0.027)	0.013	<0.001
ACC	(0.035)	(0.029)	0.001	(0.042)	(0.032)	<0.001
CASH	0.105	0.131	<0.001	0.125	0.109	<0.001
HROA	0.009	0.020	<0.001	0.016	0.009	<0.001
HROA3	0.015	0.031	<0.001	0.025	0.015	<0.001
HROA5	0.018	0.037	<0.001	0.030	0.018	<0.001
DIV	0.022	0.031	<0.001	0.022	0.025	<0.001
RND	0.012	0.021	<0.001	0.014	0.018	<0.001
CAPX	0.075	0.098	<0.001	0.112	0.072	<0.001
EP	0.101	0.110	<0.001	0.108	0.099	<0.001
BTM	0.857	0.732	<0.001	0.760	0.868	<0.001

The categories 'Low' and 'High' refer to lowest and highest quintiles of PERM and TEMP, which are ranked by year and SIC code (2 digit). PERM and TEMP are the permanent and temporary components of total BTDs, and are measured as the extent to which taxable income exceeds book income. Thus, a positive value of PERM (TEMP) reflects permanent (temporary) differences that cause taxable income to exceed book income, while a negative value reflects differences that cause book income to exceed taxable income. For each quintile of observations, means are presented for each independent variable. Prob (*t*) represents probability that means are equal.

Table 4
Correlation Matrix

	ΔNI	ΔPT	ΔTAX	PERM	TEMP	ACC	CASH	HROA	HROA3	HROA5	DIV	RND	CAP	EP
ΔPT	0.834													
	<0.001													
ΔTAX	0.729	0.826												
	0.012	<0.001												
PERM	(0.073)	(0.091)	0.034											
	0.114	0.151	<0.001											
TEMP	0.025	0.078	0.085	0.106										
	<0.001	<0.001	0.034	<0.001										
ACC	(0.038)	(0.118)	(0.042)	0.027	0.113									
	<0.001	0.092	0.043	<0.001	<0.001									
CASH	0.033	(0.176)	0.046	0.335	(0.053)	0.107								
	<0.001	0.111	<0.001	<0.001	<0.001	<0.001								
HROA	(0.028)	(0.130)	0.009	0.201	(0.093)	0.017	0.365							
	0.006	0.146	<0.001	<0.001	<0.001	0.203	<0.001							
HROA3	(0.015)	(0.176)	0.013	0.274	(0.114)	0.095	0.578	0.723						
	0.014	0.231	<0.001	0.051	<0.001	0.101	<0.001	<0.001						
HROA5	(0.029)	(0.210)	(0.013)	0.316	(0.133)	0.117	0.698	0.621	0.919					
	0.027	0.271	<0.001	<0.001	<0.001	0.115	<0.001	<0.001	<0.001					
DIV	0.026	(0.006)	0.052	0.271	0.076	(0.030)	0.463	0.035	0.087	0.114				
	<0.001	<0.001	<0.001	<0.001	0.466	<0.001	<0.001	<0.001	<0.001	<0.001				
RND	(0.013)	(0.013)	(0.003)	0.123	0.110	0.049	0.121	0.012	0.033	0.044	0.089			
	<0.001	<0.001	<0.001	0.067	0.133	0.711	<0.001	<0.001	<0.001	<0.001	0.106			
CAP	0.006	(0.033)	0.012	0.114	(0.222)	(0.240)	(0.051)	0.006	0.014	0.027	(0.020)	(0.098)		
	1.000	<0.001	<0.001	0.358	<0.001	0.070	<0.001	<0.001	<0.001	<0.001	0.366	0.065		
EP	(0.095)	(0.137)	(0.107)	0.151	(0.071)	0.092	0.111	0.146	0.231	0.271	(0.130)	(0.148)	(0.077)	
	<0.001	1.000	0.659	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
BTM	(0.068)	(0.002)	(0.071)	(0.042)	0.034	0.043	(0.348)	(0.131)	(0.204)	(0.251)	(0.259)	(0.141)	(0.104)	0.659
	<0.001	0.659	1.000	<0.001	0.819	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Pearson correlations presented, followed by prob (*t*).

CHAPTER VI

EMPIRICAL RESULTS

The Association between Book-Tax Differences and Earnings Changes

Table 5 presents results from cross-sectional regressions of equations (5), (6), and (7). To control for differences across time and across industries, year and industry (two digit SIC code) fixed effects are included in all tests. The first three columns present results from using net income as the measure of earnings growth. Similar to the findings of Lev and Nissim (2004), I find that PERM is positively and strongly related to subsequent growth in net income over one, three, and five year periods. In contrast to the finding of Lev and Nissim (2004), TEMP is also positively related to changes in net income, although the coefficients on TEMP are significantly smaller than those on PERM.[20] The following three columns of Table 5 present evidence on the association between *pretax* earnings growth and the permanent and temporary components of BTDs. Consistent with H2, TEMP is positively and strongly related to subsequent changes in pretax earnings over one, three, and five year periods, suggesting that the temporary component of BTDs, deferred tax, is negatively related to future changes in pretax earnings.[21] Interestingly, PERM is only weakly related to future pretax earnings change

[20] A test of the difference in coefficients on PERM and TEMP for earnings changes over 1, 3, and 5 years report F-statistics of 2.53, 21.90, and 21.25 ($p=0.11$, <0.001, and <0.001).

[21] Because TEMP is measured as the negative of deferred tax expense, a positive coefficient on TEMP implies a negative relation between deferred tax and future pretax earnings changes.

Table 5

Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.02***	0.05***	0.04***	?	0.04***	0.05***	0.03***	?	0.01***	0.02***	0.02***
		(2.93)	(5.12)	(3.54)		(3.49)	(4.25)	(2.46)		(2.52)	(4.77)	(3.22)
PERM	+	0.18***	0.29***	0.32***	?	0.06**	0.02	-0.06	-	-0.05***	-0.10***	-0.11***
		(9.72)	(11.86)	(9.94)		(2.00)	(0.65)	(-1.64)		(-5.22)	(-7.32)	(-6.14)
TEMP	?	0.14***	0.13***	0.11***	+	0.25***	0.22***	0.20***	+	0.15***	0.13***	0.11***
		(6.04)	(4.29)	(2.86)		(6.59)	(5.15)	(4.40)		(11.60)	(7.67)	(5.19)
ACC	-	-0.02	0.06***	0.13***	-	-0.34***	-0.51***	-0.64***	-	0.01	-0.02	0.01
		(-1.29)	(2.70)	(4.27)		(-12.85)	(-16.87)	(-18.63)		(0.55)	(-1.46)	(0.43)
CASH	?	0.03*	0.12***	0.18***	?	-0.24***	-0.41***	-0.55***	?	0.02***	0.00	0.02
		(1.74)	(5.70)	(6.15)		(-9.31)	(-14.07)	(-16.60)		(2.53)	(0.35)	(1.42)
ΔROA	+	0.00	0.02	0.04	+	0.02	0.03	0.03	+	0.02***	0.03***	0.05***
		(0.19)	(0.74)	(1.44)		(0.73)	(1.04)	(0.74)		(2.54)	(2.42)	(2.87)
ΔROA3	+	-0.04	-0.09*	-0.17***	+	-0.07	-0.02	-0.09	+	0.03*	-0.03	-0.10***
		(-1.19)	(-1.88)	(-2.68)		(-1.18)	(-0.27)	(-1.19)		(1.68)	(-1.13)	(-3.01)
ΔROA5	+	0.06	-0.11***	-0.08	+	-0.06	-0.28***	-0.28***	+	-0.03*	0.01	0.05
		(1.60)	(-2.38)	(-1.26)		(-1.14)	(-4.23)	(-3.67)		(-1.68)	(0.30)	(1.34)
DIV	?	0.01	0.03	0.06	?	0.14***	0.30***	0.41***	?	-0.04***	-0.02	-0.01
		(0.43)	(0.96)	(1.46)		(3.75)	(7.19)	(8.71)		(-2.89)	(-0.99)	(-0.49)
RND	?	-0.06***	-0.04*	0.02	?	-0.07***	-0.04	0.02	?	-0.05***	-0.04***	-0.03*
		(-3.45)	(-1.68)	(0.67)		(-2.48)	(-1.03)	(0.45)		(-4.60)	(-2.87)	(-1.85)
CAP	?	-0.01	0.00	0.00	?	-0.04***	-0.02**	-0.01	?	0.00	0.00	0.00
		(-1.34)	(-0.33)	(0.32)		(-5.19)	(-2.04)	(-1.30)		(-0.43)	(0.38)	(1.15)

Table 5 (continued)

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
EP	-	-0.17***	-0.20***	-0.24***	-	-0.17***	-0.16***	-0.13***	-	-0.10***	-0.15***	-0.17***
		(-14.92)	(-13.74)	(-12.66)		(-9.53)	(-8.11)	(-5.77)		(-16.35)	(-18.31)	(-16.53)
BTM	-	-0.01***	-0.01***	-0.01***	-	-0.02***	-0.02***	-0.02***	-	0.00***	0.00	0.00
		(-7.46)	(-5.42)	(-2.53)		(-7.75)	(-6.76)	(-5.86)		(-3.04)	(-0.47)	(1.13)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.119	0.157	0.149		0.157	0.257	0.330		0.104	0.126	0.141

One year changes in net income, pretax income, and tax expense are calculated as subsequent year measure minus current, scaled by current total assets. Three and five year changes are computed as average of measure in subsequent three or five years less current, scaled by current total assets. PERM and TEMP are the two components of TAXDIFF, the total book-tax difference, computed as taxable income (current tax expense grossed up by the statutory tax rate t, net of tax $(1-t)$) minus net income before extraordinary items, all scaled by total assets. TEMP is the negative of deferred tax expense, grossed up by t, net of tax $(1-t)$, and scaled by total assets. PERM = TAXDIFF - TEMP. Thus PERM and TEMP capture the permanent and temporary components of total BTDs, the extent to which taxable income exceeds book income. ACC is accruals scaled by total assets, computed as Δcurrent assets less Δcash) - (Δliabilities - ΔST debt) - Δdeferred taxes - depreciation. CASH is cash flow from operations scaled by total assets, computed as net income less accruals. ΔROA is current change of return on assets, HROA3 and HROA5 are average change in ROA over three and five years. DIV is current dividends scaled by assets. RND and CAPX are R&D expenditures and capital expenditures, each scaled by sales. EP is the earnings to price ratio. BTM is the book to market ratio. Regressions include year and industry (two digit SIC code) fixed effects. *, **, *** represent statistical significance at the 10%, 5%, and 1% levels (two-tailed test). Sample includes all Compustat firms with a December year end and all necessary variables from 1973 - 2006, excluding banks and utilities, flow-through entities, and firms with foreign incorporation.

in the following year, and there is no evidence of a relation over three or five years.

The final three columns of Table 5 present evidence on the association between changes in tax expense and the permanent and temporary components of BTDs. Consistent with H1, PERM is negatively and strongly related to changes in tax expense over one, three, and five year periods. This result suggests that any relation between permanent BTDs and future earnings changes are due to changes in future tax expense, not changes in the underlying (pretax) earnings of the firm. The final three columns of Table 5 also reveal a positive and significant relationship between TEMP and tax expense changes. This is not unexpected, as TEMP is positively associated with pretax earnings, and increases in pretax earnings should lead to increases in tax expense, *ceteris paribus*.

Impact of Earnings Management on Association between Book-Tax Differences and Earnings Growth

Tables 6-9 examine the impact of earnings management on the documented association between BTDs and earnings changes. I use various proxies for earnings management, including narrowly avoiding an earnings decline (Table 6), narrowly avoiding a loss (Table 7), meeting or narrowly beating analysts' forecasts (Table 8), and a high level of discretionary accruals (Table 9). H3a predicts that even in the absence of earnings management there will be a positive relation between temporary BTDs and changes in pretax earnings, i.e., the coefficient on TEMP is positive when ΔPRETAX is the dependent variable. H3b predicts that earnings management activity will intensify this association, i.e., the interaction of TEMP with an earnings management dummy is positive when ΔPRETAX is the dependent variable. H4a predicts that even in the absence

of earnings management there will be a negative relation between non-temporary BTDs and changes in tax expense (due to the impact tax accruals have on ETR swings), i.e., the coefficient on PERM is negative when ΔTAXEXP is the dependent variable. H4b predicts that earnings management activity will intensify this association, i.e., the coefficient on the interaction of PERM with an earnings management dummy is negative.

I begin by defining earnings management on the basis of annual earnings changes. I define an earnings management dummy EM=1 when the change in earnings (scaled by market value of equity) is greater than or equal to zero, but less than two cents, with EM=0 otherwise. I then include the EM dummy variable alone and interacted with each independent variable as outlined in equations (9), (10), and (11). Table 6 presents the results. Consistent with H3a and H4a, the positive (negative) coefficient on TEMP (PERM) suggests that the relation documented earlier between the BTD measures and ΔPRETAX (ΔTAXEXP) hold even in the absence of earnings management. Inconsistent with H3b and H4b, there is no evidence of statistical significance on the interaction terms of EM with TEMP and PERM. This suggests that the BTD/earnings change relation is not a product of this type of earnings management.

I next examine earnings management defined as avoidance of losses. I define EM=1 when net income scaled by market value of equity is greater or equal to zero, but less than two cents. I include the EM dummy variable alone and interacted with each independent variable as outlined in equations (9), (10), and (11). Table 7 presents the results. Consistent with H3a and H4a, the positive (negative) coefficient on TEMP (PERM) suggests that the relation documented earlier between the BTD measures and

Table 6

Examining Effect of EM on BTD Coefficients: Small Earnings Changes

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.02***	0.05***	0.04***	?	0.04***	0.05***	0.04***	?	0.01***	0.03***	0.02***
		(3.25)	(5.35)	(3.74)		(3.77)	(4.38)	(2.59)		(3.01)	(5.10)	(3.51)
PERM	+	0.21***	0.33***	0.36***	?	0.09***	0.04	-0.04	-	-0.06***	-0.10***	-0.11***
		(9.97)	(11.90)	(9.95)		(2.52)	(1.05)	(-0.98)		(-4.79)	(-6.70)	(-5.61)
TEMP	?	0.14***	0.15***	0.14***	+	0.25***	0.23***	0.23***	+	0.16***	0.14***	0.12***
		(5.43)	(4.34)	(3.24)		(5.84)	(4.72)	(4.41)		(11.14)	(7.31)	(5.03)
ACC	-	-0.04*	0.02	0.05	-	-0.40***	-0.61***	-0.74***	-	0.00	-0.04***	-0.03
		(-1.92)	(0.59)	(1.54)		(-12.85)	(-17.03)	(-18.27)		(0.21)	(-2.86)	(-1.53)
CASH	?	0.01	0.08***	0.11***	?	-0.30***	-0.51***	-0.65***	?	0.02	-0.02	-0.02
		(0.43)	(2.98)	(3.09)		(-9.92)	(-14.71)	(-16.55)		(1.52)	(-1.58)	(-0.80)
EM	-	-0.01***	-0.01*	-0.01	-	-0.01**	-0.01	0.00	-	0.00***	-0.01**	0.00
		(-2.49)	(-1.80)	(-1.55)		(-2.12)	(-0.99)	(-0.32)		(-2.73)	(-2.19)	(-1.60)
EM*PERM	+	-0.12***	-0.17***	-0.20***	?	-0.11*	-0.10	-0.11	-	0.01	0.01	0.00
		(-2.99)	(-3.32)	(-2.82)		(-1.65)	(-1.33)	(-1.34)		(0.58)	(0.25)	(-0.05)
EM*TEMP	?	-0.01	-0.06	-0.11	+	-0.01	-0.01	-0.08	?	-0.07***	-0.05	-0.05
		(-0.26)	(-0.87)	(-1.24)		(-0.09)	(-0.13)	(-0.78)		(-2.41)	(-1.28)	(-1.00)
EM*ACC	?	0.05	0.09*	0.17***	?	0.16***	0.24***	0.25***	?	0.00	0.06**	0.09***
		(1.33)	(1.72)	(2.48)		(2.70)	(3.58)	(3.26)		(-0.04)	(2.18)	(2.52)
EM*CASH	?	0.07*	0.09*	0.16***	?	0.18***	0.25***	0.25***	?	0.02	0.07***	0.10***
		(1.86)	(1.86)	(2.43)		(3.09)	(3.87)	(3.42)		(0.96)	(2.73)	(2.69)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.122	0.162	0.155		0.160	0.263	0.336		0.107	0.129	0.146

EM is a dummy for earnings management, where EM=1 if the change in earnings (scaled by market value of equity) is greater than or equal to zero, but less than two cents, with EM=0 otherwise. EM is interacted with all independent variables (many omitted for parsimony). All other variables, methodology, and sample are as reported in Table 5.

Table 7

Examining Effect of EM on BTD Coefficients: Narrowly Avoiding a Loss

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.02***	0.05***	0.04***	?	0.04***	0.05***	0.03***	?	0.01***	0.02***	0.02***
		(2.84)	(5.15)	(3.49)		(3.55)	(4.38)	(2.47)		(2.45)	(4.79)	(3.20)
PERM	+	0.18***	0.28***	0.32***	?	0.06*	0.01	-0.07*	-	-0.06***	-0.10***	-0.11***
		(9.34)	(11.50)	(9.81)		(1.87)	(0.28)	(-1.86)		(-5.26)	(-7.39)	(-6.07)
TEMP	?	0.12***	0.10***	0.08**	+	0.22***	0.19***	0.18***	+	0.14***	0.12***	0.09***
		(4.88)	(3.17)	(1.97)		(5.67)	(4.40)	(3.78)		(10.52)	(6.70)	(4.32)
ACC	-	-0.01	0.06***	0.13***	-	-0.35***	-0.52***	-0.64***	-	0.01	-0.02	0.01
		(-0.85)	(2.69)	(4.28)		(-12.87)	(-16.58)	(-17.98)		(0.64)	(-1.52)	(0.40)
CASH	?	0.03**	0.12***	0.18***	?	-0.25***	-0.42***	-0.55***	?	0.02***	0.00	0.02
		(1.98)	(5.53)	(6.06)		(-9.51)	(-13.88)	(-16.03)		(2.46)	(0.16)	(1.35)
EM	-	0.00	-0.01*	0.00	-	-0.02**	-0.04***	-0.01	-	0.00	-0.01	0.00
		(0.10)	(-1.92)	(-0.30)		(-2.11)	(-3.65)	(-1.05)		(-0.30)	(-1.18)	(0.02)
EM*PERM	+	0.44***	0.42***	0.34	?	0.49***	0.63***	0.65**	-	0.10	0.16*	0.07
		(3.49)	(2.72)	(1.51)		(2.43)	(2.84)	(2.30)		(1.40)	(1.85)	(0.59)
EM*TEMP	?	0.45***	0.58***	0.56***	+	0.78***	0.78***	0.73***	?	0.20***	0.29***	0.31***
		(3.82)	(3.94)	(2.89)		(4.09)	(3.49)	(2.87)		(3.03)	(3.41)	(2.92)
EM*ACC	?	0.00	0.33**	0.38*	?	0.33*	0.45**	0.43**	?	0.03	0.16*	0.13
		(0.00)	(2.24)	(1.94)		(1.92)	(2.28)	(1.97)		(0.53)	(1.87)	(1.24)
EM*CASH	?	0.04	0.38***	0.42**	?	0.36**	0.49***	0.44**	?	0.05	0.18**	0.14
		(0.41)	(2.66)	(2.22)		(2.15)	(2.60)	(2.11)		(0.90)	(2.23)	(1.34)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.127	0.160	0.151		0.162	0.261	0.333		0.107	0.129	0.143

EM is a dummy for earnings management, where EM=1 when net income scaled by market value of equity is greater or equal to zero, but less than two cents, with EM=0 otherwise. EM is interacted with all independent variables (many omitted for parsimony). All other variables, methodology, and sample are as reported in Table 5.

ΔPRETAX (ΔTAXEXP) hold even in the absence of earnings management. Inconsistent with H4b, there is no apparent relation between the interaction of EM with PERM on ΔTAXEXP, suggesting that this type of earnings management does not drive the negative relation between non-temporary BTDs and tax expense changes. However, I do find support for H3b, as there is a positive and significant relation between ΔPRETAX and the EM*TEMP interaction. This suggests that while even in the absence of earnings management temporary differences are associated with future changes in pretax income, the management of earnings to avoid a loss increases the intensity of this relation.

I next define EM=1 when the earnings surprise (actual EPS, as reported by IBES, less the consensus forecast) is greater than or equal to zero but less than two cents. Table 8 presents the results. As in the case of earnings changes, I find support for H3a and H4a. The documented relations between the BTD components and the components of earnings changes hold even in the absence of earnings management. Also as in the case of earnings changes, I fail to find support for H3b and H4b, suggesting that earnings management around analysts' forecasts is not the main contributor to the relation between BTD and earnings changes.

Finally, I set the earnings management indicator EM=1 for firms with the highest quintile rank of discretionary accruals, and then use this indicator alone and interacted with all each independent variable as outlined in equations (9), (10), and (11). Results are presented in Table 9. As in the previous tests, I find support for H3a and H4a. Controlling for earnings management, there continues to be a positive and significant relation between TEMP and ΔPRETAX, and a negative and significant relation between PERM

Table 8
Examining Effect EM on BTD Coefficients: Analysts' Forecasts

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.03***	0.06***	0.05***	?	0.05***	0.07***	0.05***	?	0.02***	0.03***	0.03***
		(4.44)	(6.30)	(4.89)		(4.15)	(5.25)	(3.54)		(3.66)	(5.95)	(4.09)
PERM	+	0.13***	0.11***	0.02	?	-0.05	-0.11***	-0.33***	-	-0.08***	-0.14***	-0.20***
		(5.25)	(3.49)	(0.58)		(-1.22)	(-2.45)	(-6.22)		(-5.83)	(-7.53)	(-8.26)
TEMP	?	0.16***	0.10***	0.03	+	0.25***	0.16***	0.05	+	0.14***	0.10***	0.07***
		(5.54)	(2.82)	(0.66)		(5.38)	(2.99)	(0.76)		(8.60)	(4.68)	(2.43)
ACC	-	-0.08***	-0.07**	0.00	-	-0.42***	-0.64***	-0.70***	-	-0.04***	-0.09***	-0.07***
		(-3.78)	(-2.31)	(0.03)		(-11.84)	(-16.15)	(-15.16)		(-3.02)	(-5.79)	(-2.99)
CASH	?	-0.04*	0.00	0.05	?	-0.33***	-0.54***	-0.62***	?	-0.02	-0.07***	-0.05**
		(-1.95)	(-0.08)	(1.47)		(-9.62)	(-14.15)	(-13.95)		(-1.44)	(-4.38)	(-2.22)
EM	-	-0.01	-0.01*	-0.01	-	-0.01	-0.02*	-0.02*	-	-0.01**	-0.01***	-0.01***
		(-1.41)	(-1.86)	(-1.46)		(-1.20)	(-1.79)	(-1.88)		(-2.22)	(-3.43)	(-2.77)
EM*PERM	+	0.03	0.18**	0.34***	?	0.09	0.15	0.22	-	0.03	0.16***	0.17***
		(0.46)	(2.19)	(3.06)		(0.78)	(1.20)	(1.48)		(0.77)	(3.19)	(2.67)
EM*TEMP	?	-0.08	-0.04	0.02	+	-0.14	-0.19	-0.08	?	0.01	0.00	0.05
		(-0.90)	(-0.43)	(0.13)		(-1.02)	(-1.24)	(-0.44)		(0.28)	(0.02)	(0.61)
EM*ACC	?	0.02	0.11	0.27***	?	-0.09	-0.02	0.00	?	0.01	0.10**	0.19***
		(0.22)	(1.35)	(2.55)		(-0.78)	(-0.16)	(0.02)		(0.21)	(2.15)	(3.06)
EM*CASH	?	0.10	0.17**	0.32***	?	0.03	0.09	0.13	?	0.05	0.14***	0.23***
		(1.51)	(2.17)	(3.18)		(0.33)	(0.80)	(1.00)		(1.36)	(3.10)	(3.85)
Observations		8,096	6,759	5,704		5,767	4,426	3,449		8,083	6,751	5,699
R^2		0.143	0.189	0.195		0.173	0.297	0.358		0.130	0.162	0.179

EM is a dummy for earnings management, defined by earnings surprises (the difference between the latest consensus forecast and actual earnings per share). EM=1 if the earnings surprise is greater than or equal to zero, but less than two cents per share, with EM=0 otherwise. EM is interacted with all independent variables (many omitted for parsimony). All other variables, methodology, and sample are as reported in Table 5.

Table 9

Examining Effect of EM on BTD Coefficients: Discretionary Accruals

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.02***	0.05***	0.04***	?	0.04***	0.05***	0.03***	?	0.01***	0.02***	0.02***
		(3.06)	(5.19)	(3.67)		(3.51)	(4.28)	(2.52)		(2.55)	(4.87)	(3.31)
PERM	+	0.15***	0.27***	0.29***	?	0.03	0.04	-0.04	-	-0.05***	-0.08***	-0.10***
		(7.47)	(10.17)	(8.33)		(0.97)	(1.05)	(-0.98)		(-4.03)	(-5.70)	(-5.17)
TEMP	?	0.17***	0.13***	0.12***	+	0.27***	0.23***	0.22***	+	0.16***	0.13***	0.13***
		(6.65)	(3.96)	(2.89)		(6.78)	(5.05)	(4.52)		(11.09)	(7.38)	(5.63)
ACC	-	-0.05***	0.04	0.11***	-	-0.36***	-0.53***	-0.62***	-	0.00	-0.04***	-0.02
		(-2.38)	(1.53)	(3.29)		(-12.23)	(-15.65)	(-16.16)		(0.06)	(-2.94)	(-1.01)
CASH	?	0.00	0.10***	0.15***	?	-0.26***	-0.43***	-0.55***	?	0.02*	-0.01	0.00
		(0.23)	(4.28)	(4.88)		(-9.51)	(-13.70)	(-15.26)		(1.94)	(-1.02)	(0.10)
EM	-	-0.01*	-0.01	-0.01*	-	0.00	-0.01	0.00	-	0.00	-0.01***	-0.01**
		(-1.89)	(-1.50)	(-1.88)		(-0.58)	(-0.93)	(-0.55)		(-0.61)	(-2.39)	(-2.07)
EM*PERM	+	0.12***	0.10	0.16*	?	0.18**	-0.09	-0.15	-	-0.05**	-0.10***	-0.05
		(2.42)	(1.64)	(1.96)		(2.17)	(-0.93)	(-1.50)		(-1.98)	(-2.87)	(-0.98)
EM*TEMP	?	-0.15***	0.00	-0.10	+	-0.15	-0.08	-0.17	?	-0.04	-0.03	-0.14***
		(-2.36)	(0.06)	(-0.95)		(-1.45)	(-0.63)	(-1.27)		(-1.17)	(-0.69)	(-2.39)
EM*ACC	?	0.18***	0.19***	0.20***	?	0.16**	0.16*	0.02	?	0.04	0.13***	0.16***
		(3.97)	(3.16)	(2.55)		(2.23)	(1.91)	(0.21)		(1.41)	(3.91)	(3.69)
EM*CASH	?	0.18***	0.17***	0.20***	?	0.18***	0.18**	0.05	?	0.04	0.13***	0.15***
		(3.99)	(2.94)	(2.46)		(2.60)	(2.19)	(0.60)		(1.45)	(3.69)	(3.38)
Observations		12,412	10,549	9,005		9,119	7,132	5,624		12,391	10,532	8,994
R^2		0.124	0.161	0.153		0.160	0.259	0.335		0.105	0.129	0.144

EM is a dummy for earnings management, where EM=1 when observation is in the highest quintile of discretionary accruals, with EM=0 otherwise. Discretionary accruals are the residual from the following model: Accruals $=\alpha + \beta1(1/A) + \beta2(\Delta REV-\Delta REC) + \beta3(PPE) + \varepsilon$. EM is interacted with all independent variables (many omitted for parsimony). All other variables, methodology, and sample are as reported in Table 5.

and ΔTAXEXP. Inconsistent with H3b, I find no evidence of a stronger relation between TEMP and ΔPRETAX in the presence of earnings management. However, consistent with H4b, I now find a negative and significant relation between ΔTAXEXP and the EM*PERM interaction term for the one year and three periods. This finding suggests that firms with large, income-increasing discretionary accruals experience an especially large relation between non-temporary BTDs and future tax expense changes.

Overall, the evidence presented in Tables 6-9 suggests that the relation between temporary differences and future pretax earnings changes, as well as the relation between permanent differences and future tax expense changes, are primarily due to underlying economic events. I find only limited evidence supporting the notion that the BTD/earnings growth relation is due to earnings management.

CHAPTER VII

ROBUSTNESS AND SENSITIVITY TESTS

Reconciliation with Lev and Nissim (2004)

There are several departures in my research design from that employed by Lev and Nissim (2004). For comparability with their results, I repeat my tests, using their methodology and sample period.[22] There are three key independent variables in their tests: R_TAX, R_DEF, and R_CFO, which are the quintile rank of the tax to book ratio, deferred taxes, and cash flows from operations.[23] The tax to book ratio, TAX, is calculated as the ratio of taxable to book income, where both net income and taxable income are measured as previously described. DEF is the negative of deferred tax expense scaled by average total assets. As the ratio of tax to book income, a higher value of TAX indicates more taxable income, and as the negative of the ratio of deferred tax to average assets, a higher value of DEF indicates fewer deferrals and thus greater taxable income. CFO captures the relative amount of net income coming from cash flow, as opposed to accruals, measured as the difference between net income and accruals, scaled

[22] Among the differences between my tests and that of Lev and Nissim (2004) include a shorter sample period (their cutoff year is 2000), an inclusion of firms with negative measures of tax expense, computing coefficients and test statistics based on the Fama and MacBeth (1973) methodology of presenting the average of the annual coefficients, multiplying dependent variables by 100, and running ranked regressions instead of using the underlying values.

[23] Because BTDs can vary across industries due to differences in capital intensity, R&D expenditures (and credits), and other industry-related differences, industry-ranked values of these variables are used, ranking firms each year within their two digit SIC code.

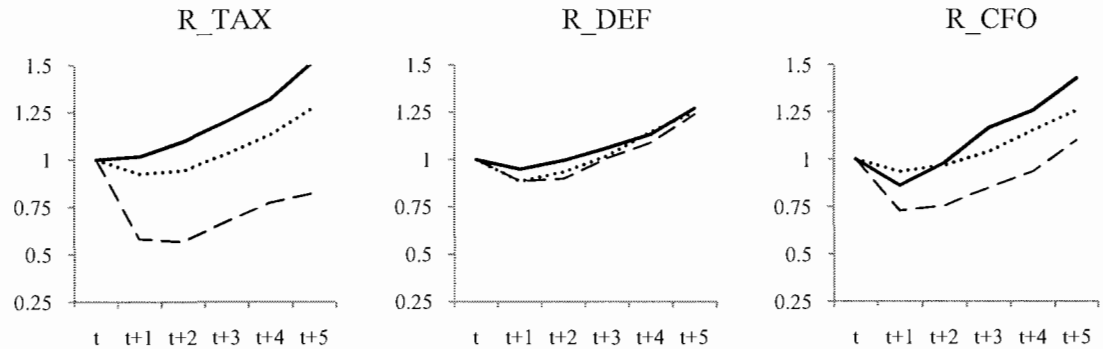
by net income. A higher (lower) rank of this variable indicates a greater share of earnings coming from cash flows (accruals).

Figure 1 presents initial evidence on the relation between BTDs and future earnings growth. For each measure of BTD (total differences: R_TAX, and temporary differences: R_DEF) as well as for the cash flow measure (R_CFO) I form three portfolios, based on the relative measure of the ranked variable. A continuous line follows the growth in earnings for firms with the highest quintile of the ratio, a dotted line for those with intermediate values, and a dashed line following the growth of earnings for firms in the lowest quintile. Thus, the solid lines represent growth for firms with high levels of taxable income in relation to book income, high levels of currently taxable income in relation to tax-deferred income, and high levels of income from cash flows in relation to income from accruals. Panel A presents results for growth in total net income, as in Lev and Nissim (2004).[24] Similar to the patterns in their study, I find that firm-years with relatively high taxable income (high income from cash flows) experience significantly greater growth in net income compared to firms with relatively lower taxable income (more income from accruals). There does not appear to be any significant difference in net income growth for various levels of deferred taxes, the proxy for temporary BTDs. However, in Panel B, I find evidence that portfolios with higher tax/book ratios (high R_TAX) have significantly lower *pretax* earnings growth than those with smaller ratios, while the portfolio of high R_DEF firms shows some evidence of

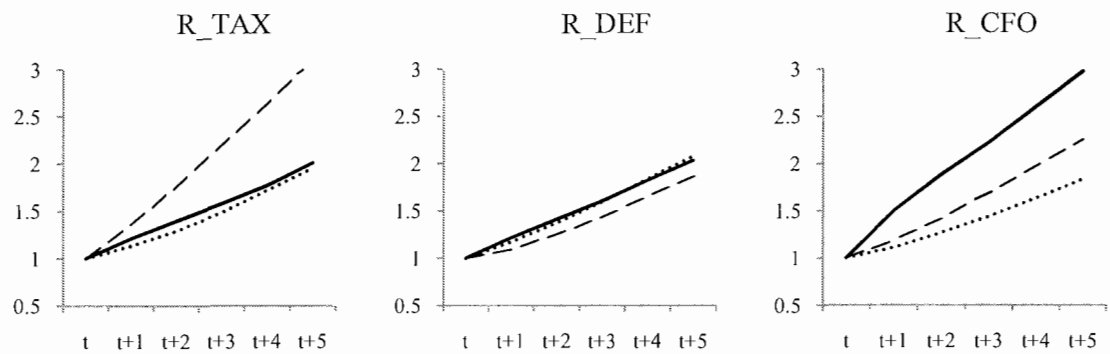
[24] Lev and Nissim (2004) present two sets of graphs, pre and post SFAS 109 (1993). However, the patterns are similar for both periods both in their study and in mine, so for conciseness, I present both periods together. The same holds true for multivariate results, where results are similar in both periods, so I again present both periods together.

Figure 1
Five-Year Growth in Net Income and its Components for Portfolios of Firms Sorted by BTD and Cash Flow Measures

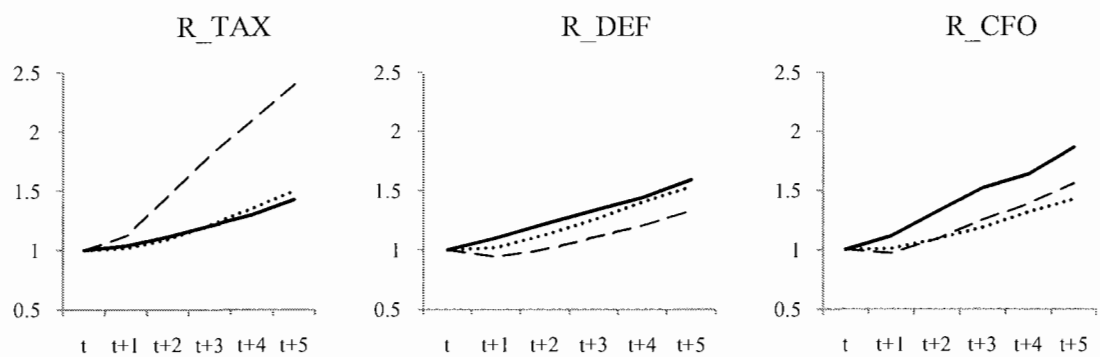
Panel A: Growth in Net Income



Panel B: Growth in Pretax Income



Panel C: Growth in Income Tax Expense



Each figure represents cumulative growth from year t to year $t+j$ (j=1, 2, …, 5) for three portfolios: a solid line for firm-years in the highest quintile (industry-year) of the BTD or cash flow measure, dashed line for those in the lowest quintile, and dotted line for all other observations. TAX is the ratio of tax to book income, scaled by earnings, DEF is the negative of the ratio of deferred tax to average assets, and CFO is the ratio of cash from operations to net income.

higher pretax growth. Panel C shows that firm-years with relatively high taxable income (high R_TAX) experience significantly smaller increases in tax expense, contributing to their overall growth advantage in net income. This provides preliminary evidence that the earnings growth found by Lev and Nissim (2004) for firms with high tax to book income is due to future changes in tax expense, and not due to growth in underlying pretax earnings. It also provides initial evidence that temporary differences contain information about future growth in pretax earnings.

Further insight into the relationships between TAX, DEF, and CFO and the components of earnings changes can be gleaned from a multivariate examination. The first three columns of Table 10 replicate the results of Lev and Nissim (2004), estimating the following equation:

$$\Delta NI = \alpha + \beta_1 R\_TAX + \beta_2 R\_DEF + \beta_3 R\_CFO + \Sigma CONTROLS + \varepsilon \quad (12)$$

where all variables are as described above, and the control variables are the same as in the main tests, with the exception that ACC and CASH are replaced by their aggregate, ROA. Similar to the findings of Lev and Nissim (2004), I find that R_TAX is positively and strongly related to subsequent growth in net income over one, three, and five year periods. R_CFO is also positively and strongly associated with growth in net income. Also consistent with the findings of Lev and Nissim (2004), there is no statistically significant relation between R_DEF and growth in net income. The next three columns of Table 10 present evidence on the association between *pretax* earnings growth and R_TAX, R_DEF, and R_CFO, replacing ΔNI in equation (7) with ΔPRETAX. In contrast with the findings on net income growth, but consistent with H2, R_DEF is

Table 10
Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth: Lev and Nissim (2004) Methodology

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	1.30***	2.38***	2.63***	?	0.24	1.67**	0.76	?	0.75***	1.68***	2.21***
		(3.44)	(4.68)	(3.07)		(0.27)	(2.28)	(1.02)		(2.53)	(5.11)	(4.32)
R_TAX	+	0.24***	0.21***	0.20***	?	0.10	-0.13***	-0.32***	-	-0.07***	-0.18***	-0.20***
		(4.27)	(4.33)	(3.05)		(1.29)	(-2.87)	(-3.86)		(-2.76)	(-6.28)	(-5.20)
R_DEF	?	0.01	0.04	0.00	+	0.25***	0.45***	0.42***	?	0.20***	0.24***	0.21***
		(0.24)	(0.71)	(-0.02)		(2.80)	(7.34)	(5.58)		(5.22)	(6.77)	(5.81)
R_CFO	-	0.16***	0.19***	0.20***	-	0.35***	0.35***	0.34***	-	0.06***	0.06**	0.06*
		(4.05)	(4.28)	(3.68)		(4.90)	(6.58)	(4.22)		(3.83)	(2.32)	(1.72)
ROA	-	7.90***	14.74***	27.37***	-	-6.67	-22.74***	-38.21***	-	2.31	6.88***	10.21***
		(2.68)	(4.20)	(4.95)		(-1.34)	(-5.53)	(-6.54)		(1.01)	(2.62)	(2.75)
ΔROA	+	0.63	2.62	5.75	+	0.50	7.08	6.09	+	0.99	3.19	4.28*
		(0.18)	(0.60)	(1.02)		(0.08)	(1.11)	(0.78)		(0.47)	(1.59)	(1.66)
ΔROA3	+	2.30	-1.48	-15.44	+	11.23	13.78	-6.71	+	4.17	-1.77	-9.05
		(0.27)	(-0.16)	(-1.48)		(0.97)	(1.31)	(-0.67)		(1.02)	(-0.30)	(-1.25)
ΔROA5	+	-10.87	-13.81	-12.11	+	-41.08***	-59.09***	-48.83***	+	-5.27	-4.88	-0.53
		(-1.20)	(-1.50)	(-1.04)		(-3.06)	(-5.82)	(-4.52)		(-0.99)	(-0.86)	(-0.07)
DIV	?	-5.34*	-4.96	-3.45	?	3.74	19.34***	36.57***	?	-2.48	-7.08***	-5.42*
		(-1.72)	(-1.06)	(-0.48)		(0.63)	(3.21)	(3.79)		(-1.12)	(-3.34)	(-1.72)
RND	?	-6.81*	-2.05	3.47	?	-5.68	3.38	8.70	?	-3.91*	-2.41	-2.20
		(-1.85)	(-0.53)	(0.80)		(-1.15)	(0.65)	(1.47)		(-1.91)	(-1.17)	(-0.82)
CAP	?	-0.31	-0.45	-0.35	?	-2.18**	-0.46	-0.95	?	0.09	-0.21	0.39
		(-0.47)	(-0.62)	(-0.40)		(-2.30)	(-0.58)	(-1.41)		(0.26)	(-0.55)	(0.92)

Table 10 (continued)

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
EP	-	-19.25***	-23.42***	-27.60***	-	-17.06***	-15.31***	-7.24**	-	-9.94***	-14.14***	-17.11***
		(-7.53)	(-8.13)	(-7.29)		(-4.49)	(-4.37)	(-2.24)		(-7.85)	(-13.08)	(-10.22)
BTM	-	-0.92***	-1.03***	-0.97***	-	-1.74***	-2.15***	-2.36***	-	-0.37***	-0.37***	-0.32*
		(-4.69)	(-5.26)	(-3.49)		(-6.78)	(-8.63)	(-6.82)		(-3.38)	(-2.98)	(-1.86)
Observations		497	458	420		366	311	264		496	457	420
R^2		0.270	0.288	0.294		0.306	0.390	0.464		0.244	0.284	0.295

Table 10 contains the same dependent variables as Table 5, but multiplied by 100 to express in percentage points (as in Lev and Nissim, 2004). R_TAX is the quintile rank (within industry and year) of the tax/book ratio, where taxable income is as previously defined. R_DEF is the quintile rank of the negative of deferred tax expense scaled by total assets. R_CFO is the quintile rank of cash flow from operations scaled by net income, where cash flow from operations is as defined earlier. All other independent variables are as previously defined. All regressions include industry fixed effects (two-digit SIC code). Coefficients, number of observations, and R^2 are the mean from a series of annual regressions, and the associated t-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error (Fama and MacBeth, 1973). *, **, *** represent statistical significance at the 10%, 5%, and 1% levels (two-tailed test). Sample includes all Compustat firms with a December year end and all necessary variables from 1973 - 2000, excluding banks and utilities, flow-through entities, and firms with foreign incorporation.

positively associated with pretax earnings growth, while R_TAX has either no statistical association with pretax earnings changes or has a significant negative association. The final three columns of Table 10 examine the association between R_TAX, R_DEF, and R_CFO with changes in tax expense, replacing ΔNI in equation (7) with ΔTAXEXP. Consistent with H1, R_TAX is negatively and strongly associated with changes in tax expense. These results suggest that the positive relation Lev and Nissim (2004) find between the tax to book ratio and earnings growth is due to changes in tax expense, not changes in underlying pretax earnings. Interestingly, there is a positive and significant relation between R_DEF and ΔTAXEXP, indicating higher tax expense changes for firms with large temporary BTDs. This increase in tax expense is set against the increase in pretax income for large DEF firms, and the two together may explain why there is no significant relation between R_DEF and changes in net income.

Firm Fixed Effects

The results presented in Table 5 are based on cross sectional regressions of a multi-year, multi-firm panel, with both year and industry fixed effects. Because some of the relations I predict between the BTD components and the components of earnings changes are mechanical in nature, it could be argued that a time series regression is more appropriate. To test this, I replace the industry fixed effects with firm fixed effects and rerun equations (5), (6), and (7). Table 11 presents the results. While the basic findings are unchanged, there are some interesting differences. Most notably, the coefficients and t-stats for the relation between PERM and ΔTAXEXP are significantly more negative, which is not surprising given the mechanical relationship predicted between these

Table 11
Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth: Firm Fixed Effects

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.20***	0.07*	0.02	?	0.04	0.03	0.03	?	0.13***	0.00	0.01
		(4.82)	(1.73)	(1.35)		(0.81)	(0.67)	(1.43)		(5.63)	(-0.10)	(1.55)
PERM	+	0.20***	0.19***	0.16***	?	-0.10***	-0.27***	-0.42***	-	-0.19***	-0.33***	-0.39***
		(8.11)	(6.67)	(4.41)		(-2.37)	(-6.52)	(-10.10)		(-12.80)	(-18.97)	(-19.04)
TEMP	?	0.16***	0.09***	0.06*	+	0.21***	0.13***	0.09***	+	0.13***	0.05***	0.00
		(6.40)	(3.38)	(1.74)		(5.16)	(3.22)	(2.42)		(9.04)	(2.99)	(0.10)
ACC	-	-0.26***	-0.43***	-0.59***	-	-0.82***	-1.27***	-1.51***	-	-0.15***	-0.31***	-0.44***
		(-10.08)	(-14.79)	(-16.50)		(-19.79)	(-30.59)	(-35.87)		(-10.30)	(-17.80)	(-20.74)
CASH	?	-0.22***	-0.40***	-0.57***	?	-0.74***	-1.22***	-1.49***	?	-0.13***	-0.29***	-0.43***
		(-8.73)	(-13.84)	(-16.25)		(-18.34)	(-30.05)	(-36.23)		(-9.34)	(-17.29)	(-20.88)
ΔROA	+	0.04***	0.03	0.08***	+	0.05*	0.01	0.07***	+	0.03***	0.02*	0.05***
		(2.56)	(1.51)	(3.21)		(1.73)	(0.37)	(2.42)		(2.67)	(1.85)	(3.63)
ΔROA3	+	0.01	0.05	-0.02	+	-0.01	0.06	-0.04	+	0.05**	0.03	-0.01
		(0.16)	(1.13)	(-0.42)		(-0.25)	(0.99)	(-0.75)		(2.16)	(1.05)	(-0.32)
ΔROA5	+	0.13***	0.12***	0.26***	+	0.24***	0.21***	0.32***	+	0.02	0.07***	0.15***
		(3.20)	(2.60)	(4.73)		(3.81)	(3.38)	(4.99)		(0.71)	(2.70)	(4.81)
DIV	?	0.02	0.27***	0.42***	?	0.07	0.26***	0.34***	?	0.00	0.10***	0.26***
		(0.61)	(5.98)	(7.52)		(1.12)	(4.32)	(5.66)		(-0.07)	(3.89)	(7.87)
RND	?	-0.06	-0.02	0.09	?	-0.13*	-0.16***	-0.03	?	-0.06***	-0.02	0.02
		(-1.54)	(-0.36)	(1.64)		(-1.91)	(-2.33)	(-0.42)		(-2.46)	(-0.70)	(0.60)
CAP	?	-0.01**	-0.02***	-0.01	?	-0.04***	-0.04***	-0.03***	?	-0.01*	-0.01**	0.00
		(-2.02)	(-2.45)	(-0.99)		(-4.42)	(-4.23)	(-3.12)		(-1.69)	(-2.29)	(0.15)
EP	-	-0.20***	-0.23***	-0.25***	-	-0.26***	-0.22***	-0.21***	-	-0.12***	-0.16***	-0.16***
		(-14.77)	(-14.44)	(-13.38)		(-11.63)	(-10.44)	(-9.88)		(-15.54)	(-16.94)	(-14.48)
BTM	-	-0.02***	-0.01***	0.00	-	-0.03***	-0.02***	-0.01**	-	0.00***	0.00	0.00***
		(-10.33)	(-4.69)	(-0.29)		(-8.21)	(-5.66)	(-2.06)		(-4.07)	(0.78)	(2.62)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.333	0.491	0.583		0.388	0.597	0.725		0.286	0.436	0.521

This table is identical to Table 5 except that industry fixed effects have been replaced by firm fixed effects.

variables and the focus on within-firm changes induced by using firm fixed effects. Interestingly, the relation between PERM and ΔPRETAX is now negative and significant. This finding is consistent with the economic expectation of lower pretax earnings changes for firms with large, non-deductable expenses. For example, firms with large non-deductable expenses such as goodwill write-offs or restructuring charges will have higher values of PERM, and these expenses may predict future declines in economic performance, and thus lower future pretax earnings.

Negative Income and Tax Expense

My base sample does not include firms with negative earnings or tax expense in the current year. This is consistent with prior literature and is due to the difficulty of interpreting tax variables and future earnings changes for firms with losses. To examine the sensitivity of my results to the exclusion of these firms, I relax this restriction, increasing my sample size to 79,263 firm year observations across 9,351 firms. Results are presented in Table 12. I continue to find support for H1 and H2, namely, PERM is negatively related to ΔTAXEXP, and TEMP is positively related to ΔPRETAX. Interestingly, the relation between PERM and ΔTAXEXP is much more negative, suggesting that loss firms with large non-temporary BTDs experience much greater swings in their future effective tax rates.

Ranked Regressions and Measurement of Cash from Operations

Prior literature on the relation between BTDs and future firm performance has tended to use rankings of the BTD variables instead of their underlying values. Although I delete observations with extreme values from my sample, it is still possible that my

Table 12

Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth: Including Firms with Negative Income and Tax

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.03***	0.05***	0.04***	?	0.04***	0.06***	0.03*	?	0.01**	0.02***	0.01***
		(3.16)	(4.85)	(2.98)		(3.01)	(4.34)	(1.89)		(2.32)	(4.39)	(2.45)
PERM	+	0.31***	0.42***	0.42***	?	0.00	-0.07***	-0.15***	-	-0.11***	-0.15***	-0.17***
		(17.16)	(19.43)	(15.29)		(0.04)	(-2.65)	(-4.99)		(-13.28)	(-13.98)	(-12.51)
TEMP	?	-0.36***	-0.62***	-0.60***	+	0.37***	0.39***	0.52***	+	0.43***	0.49***	0.50***
		(-9.71)	(-13.61)	(-10.06)		(7.33)	(6.86)	(8.18)		(25.56)	(21.38)	(17.52)
ACC	-	-0.01	-0.03	0.00	-	-0.34***	-0.54***	-0.71***	-	-0.04***	-0.09***	-0.06***
		(-0.55)	(-1.45)	(-0.06)		(-13.50)	(-18.79)	(-22.26)		(-4.99)	(-7.94)	(-3.91)
CASH	?	0.05***	0.03	0.05	?	-0.24***	-0.44***	-0.63***	?	-0.02***	-0.07***	-0.05***
		(2.72)	(1.18)	(1.64)		(-9.81)	(-16.04)	(-20.75)		(-3.11)	(-6.65)	(-3.33)
ΔROA	+	-0.03	-0.03	-0.04	+	0.02	-0.03	-0.03	+	0.01	0.01	0.01
		(-1.59)	(-1.34)	(-1.64)		(0.74)	(-1.24)	(-0.94)		(1.28)	(0.63)	(0.51)
ΔROA3	+	-0.12***	-0.06	-0.04	+	-0.16***	0.00	-0.04	+	0.00	-0.08***	-0.09***
		(-3.11)	(-1.36)	(-0.68)		(-3.00)	(0.00)	(-0.65)		(-0.07)	(-3.75)	(-3.13)
ΔROA5	+	-0.11***	-0.19***	-0.21***	+	-0.13***	-0.32***	-0.26***	+	-0.06***	0.00	-0.04
		(-2.86)	(-4.15)	(-3.55)		(-2.63)	(-5.59)	(-4.06)		(-3.73)	(0.17)	(-1.51)
DIV	?	0.00	0.09***	0.15***	?	0.09***	0.32***	0.51***	?	-0.03***	0.02	0.03
		(-0.06)	(2.61)	(3.30)		(2.34)	(7.30)	(10.45)		(-2.34)	(1.18)	(1.28)
RND	?	-0.05***	0.05**	0.06**	?	-0.09***	-0.03	0.02	?	-0.01	-0.01	0.00
		(-2.97)	(2.23)	(2.01)		(-3.41)	(-0.91)	(0.57)		(-1.01)	(-0.49)	(0.14)
CAP	?	-0.02***	-0.01***	-0.01	?	-0.04***	-0.02***	-0.01**	?	0.00***	0.00	0.01*
		(-4.26)	(-2.72)	(-1.03)		(-7.56)	(-3.77)	(-2.21)		(-2.55)	(-0.41)	(1.82)
EP	-	-0.01***	-0.03***	-0.03***	-	-0.03***	-0.06***	-0.05***	-	-0.02***	-0.01***	-0.01***
		(-4.32)	(-8.98)	(-5.95)		(-5.51)	(-9.44)	(-7.15)		(-11.21)	(-8.25)	(-6.28)
BTM	-	-0.02***	-0.02***	-0.02***	-	-0.02***	-0.02***	-0.02***	-	-0.01***	-0.01***	0.00***
		(-16.02)	(-14.87)	(-10.05)		(-15.35)	(-11.87)	(-9.47)		(-11.44)	(-8.63)	(-6.62)
Observations		14,735	12,470	10,561		10,853	8,417	6,564		14,706	12,447	10,540
R^2		0.154	0.216	0.167		0.215	0.356	0.434		0.126	0.136	0.138

This table is identical to Table 5 except that the sample has been expanded to include firms with negative income and negative tax expense.

findings are partially due to exceptionally large or small values of PERM and TEMP, or to a skewed distribution of these variables. To test the sensitivity of my finding to this possibility, I repeat my tests using the quintile rankings of PERM, TEMP, ACC, and CASH, and present the results in Table 13.[25] There are no meaningful differences from the previous tests. Another concern is the calculation of the ACC and CASH variables. ACC are total accruals, based upon the Balance Sheet, and CASH, cash flows from operations, is the difference between net income and ACC. As a robustness check, I use the measure of CASH from the Statement of Cash Flows (Compustat #308), and estimate ACC as the difference between net income and CASH. Since data on the Statement of Cash Flows is only generally available since 1988, I rerun my main tests using a restricted sample beginning in 1988, and compare this with tests using the variables based on the Statement of Cash Flows. Results (untabulated) find no significant change to my findings using the alternative measures of cash flows and accruals.

Absolute Values

Prior literature has suggested that a possible reason why BTDs predict earnings changes is that taxable income is a more reliable indicator of firm performance, and that the farther book income ventures away from this 'true' measure, the lower the quality of earnings. If this is true, it suggests that the sign of the BTD does not matter, only the magnitude of the difference. To explore this, I rerun my tests using the absolute values of PERM and TEMP. Results are presented in Table 14. While there appears to be a positive relation between PERM and changes in tax expense (which results in net income

[25] As in Lev and Nissim (2004), dependent variables are multiplied by 100 to express in percentage points, as the coefficients on ranked variables are very small for presentation purposes otherwise.

Table 13
Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth: Ranked Regressions

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	2.16***	4.02***	3.41***	?	4.36***	4.83***	2.98**	?	1.21***	2.35***	1.94***
		(2.86)	(4.35)	(2.91)		(3.75)	(3.74)	(2.04)		(2.82)	(4.49)	(3.04)
R_PERM	+	0.13***	0.19***	0.23***	?	-0.02	-0.09	-0.18***	-	-0.08***	-0.10***	-0.13***
		(4.20)	(4.97)	(4.56)		(-0.40)	(-1.58)	(-2.89)		(-4.59)	(-4.82)	(-4.57)
R_TEMP	?	0.15***	0.13***	0.11**	+	0.27***	0.27***	0.23***	+	0.16***	0.14***	0.13***
		(5.18)	(3.54)	(2.19)		(5.59)	(5.02)	(3.87)		(9.76)	(6.86)	(4.84)
ACC	-	-0.18***	0.03	0.13*	-	-0.56***	-0.52***	-0.58***	-	-0.06**	-0.02	0.02
		(-3.96)	(0.48)	(1.82)		(-7.92)	(-6.51)	(-6.39)		(-2.22)	(-0.76)	(0.46)
CASH	?	0.04	0.36***	0.48***	?	-0.21***	-0.13	-0.26***	?	0.02	0.09***	0.12***
		(0.74)	(5.76)	(5.79)		(-2.72)	(-1.52)	(-2.62)		(0.80)	(2.45)	(2.76)
ΔROA	+	-0.20	1.29	3.57	+	2.69	3.93	2.88	+	2.44***	3.10***	4.60***
		(-0.12)	(0.57)	(1.20)		(0.94)	(1.16)	(0.74)		(2.54)	(2.44)	(2.81)
ΔROA3	+	-4.93	-10.30**	-19.50***	+	-3.63	7.65	5.86	+	2.74	-2.46	-9.94***
		(-1.40)	(-2.22)	(-3.12)		(-0.63)	(1.11)	(0.73)		(1.39)	(-0.94)	(-2.91)
ΔROA5	+	4.80	-8.21**	-0.76	+	-28.34***	-71.22***	-87.26***	+	-1.08	0.39	5.68*
		(1.54)	(-2.00)	(-0.14)		(-5.72)	(-11.99)	(-12.66)		(-0.62)	(0.17)	(1.88)
DIV	?	-0.15	3.63	9.79***	?	-2.41	-0.96	2.61	?	-1.35	-1.07	0.04
		(-0.07)	(1.34)	(2.69)		(-0.73)	(-0.25)	(0.60)		(-1.14)	(-0.70)	(0.02)
RND	?	-7.40***	-6.26***	-0.65	?	-9.35***	-7.37**	-2.98	?	-4.21***	-3.02**	-2.35
		(-4.00)	(-2.63)	(-0.20)		(-3.08)	(-2.12)	(-0.76)		(-4.06)	(-2.24)	(-1.36)
CAP	?	-0.87**	-0.56	-0.22	?	-3.71***	-1.75**	-1.36	?	-0.17	0.15	0.48
		(-1.97)	(-1.02)	(-0.30)		(-5.39)	(-2.31)	(-1.56)		(-0.68)	(0.47)	(1.21)
EP	-	-17.67***	-20.68***	-24.88***	-	-19.26***	-19.51***	-16.26***	-	-10.33***	-14.79***	-16.87***
		(-15.65)	(-14.56)	(-13.35)		(-10.90)	(-9.89)	(-7.38)		(-16.23)	(-18.29)	(-16.43)
BTM	-	-1.06***	-1.02***	-0.74***	-	-1.07***	-0.61***	-0.38	-	-0.25***	0.02	0.18
		(-8.20)	(-6.26)	(-3.39)		(-5.27)	(-2.71)	(-1.46)		(-3.37)	(0.21)	(1.46)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.113	0.146	0.141		0.144	0.233	0.295		0.098	0.121	0.139

Equivilent to Table 5, with PERM, TEMP, ACC, & CASH replaced by their quintile ranks, and dependent variables multiplied by 100.

Table 14
Regressions of Future Earnings Changes on BTD Measures and Other Indicators of Growth: Using Absolute Values of BTDs

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.03***	0.05***	0.04***	?	0.04***	0.05***	0.04***	?	0.01***	0.02***	0.02***
		(3.87)	(5.26)	(3.55)		(3.66)	(4.37)	(2.56)		(2.84)	(4.59)	(2.96)
PERM	+	-0.16***	-0.23***	-0.28***	?	-0.03	-0.09***	-0.01	-	0.09***	0.08***	0.04*
		(-7.55)	(-8.68)	(-7.89)		(-0.98)	(-2.49)	(-0.13)		(7.06)	(5.36)	(1.78)
TEMP	?	0.03	-0.02	0.00	+	0.02	-0.07	-0.11**	?	0.02	0.03*	0.01
		(1.07)	(-0.48)	(0.05)		(0.42)	(-1.29)	(-1.98)		(1.36)	(1.68)	(0.35)
ACC	-	-0.01	0.07***	0.15***	-	-0.32***	-0.49***	-0.62***	?	-0.01	-0.01	0.03
		(-0.56)	(3.10)	(4.92)		(-11.01)	(-15.54)	(-17.26)		(-1.38)	(-0.88)	(1.50)
CASH	?	0.04**	0.13***	0.20***	?	-0.22***	-0.39***	-0.53***	?	0.00	0.01	0.04***
		(2.06)	(5.90)	(6.74)		(-7.95)	(-12.85)	(-15.34)		(0.21)	(0.71)	(2.48)
ΔROA	+	0.03	0.01	0.05*	+	0.05	0.01	0.05	+	0.03***	0.03**	0.04**
		(1.41)	(0.59)	(1.72)		(1.62)	(0.36)	(1.34)		(2.56)	(2.21)	(2.15)
ΔROA3	+	0.00	0.00	-0.03	+	0.00	0.01	-0.08	+	0.02	-0.01	-0.04
		(-0.01)	(0.02)	(-0.52)		(0.04)	(0.16)	(-1.03)		(0.94)	(-0.25)	(-1.20)
ΔROA5	+	-0.03	-0.21***	-0.25***	+	-0.15***	-0.32***	-0.31***	+	-0.02	-0.03	-0.03
		(-0.93)	(-4.32)	(-3.85)		(-2.56)	(-4.70)	(-3.94)		(-0.78)	(-1.04)	(-0.84)
DIV	?	-0.02	0.01	0.03	?	0.11***	0.30***	0.44***	?	-0.01	-0.01	-0.01
		(-0.75)	(0.42)	(0.66)		(2.71)	(6.51)	(8.49)		(-0.85)	(-0.43)	(-0.28)
RND	?	-0.07***	-0.04*	0.02	?	-0.06**	0.00	0.06	?	-0.04***	-0.03*	-0.01
		(-3.56)	(-1.81)	(0.52)		(-2.03)	(0.06)	(1.47)		(-3.83)	(-1.83)	(-0.63)
CAP	?	-0.01***	-0.01	0.00	?	-0.04***	-0.02***	-0.01	?	-0.01**	0.00	0.00
		(-2.54)	(-1.62)	(-0.70)		(-6.16)	(-2.71)	(-1.46)		(-2.02)	(-0.59)	(0.75)
EP	-	-0.18***	-0.21***	-0.24***	-	-0.19***	-0.16***	-0.13***	-	-0.11***	-0.15***	-0.17***
		(-15.33)	(-14.47)	(-12.78)		(-10.53)	(-7.98)	(-5.90)		(-16.66)	(-18.28)	(-15.95)
BTM	-	-0.01***	-0.01***	-0.01***	-	-0.02***	-0.01***	-0.01***	-	0.00***	0.00	0.00
		(-7.81)	(-5.01)	(-2.40)		(-7.06)	(-6.27)	(-5.15)		(-2.42)	(0.39)	(1.56)
Observations		12,210	10,392	8,895		8,940	7,004	5,537		12,193	10,374	8,883
R^2		0.117	0.145	0.142		0.150	0.255	0.323		0.093	0.115	0.129

This table is identical to Table 5 except that PERM and TEMP have been replaced by their absolute value.

declines), there is little evidence that the magnitude of permanent differences is associated with future changes in pretax income. There is also no evidence of a relation between the magnitude of temporary differences and any measure of earnings changes. I find little support for the notion that the magnitude of BTDs is associated with future earnings changes.

Foreign Operations

Throughout this study I find support for H1, that permanent BTDs are negatively related to future changes in tax expense. I hypothesize this is true because tax accruals can cause large swings in effective tax rates. A large tax accrual that can generate this result is PRE, the designation of foreign earnings as permanently reinvested. To test if PRE is driving the relation between PERM and ΔTAXEXP, I designate a dummy variable equal to one if a firm has foreign income, and zero otherwise. I then include this variable in equations (5), (6), and (7) and interact it with each BTD measure as well as with each control variable. Table 15 presents the results. The negative coefficient on PERM when examining changes in tax expense suggests that even for firms without foreign operations there is a negative relation between other tax accruals and tax expense changes. The negative coefficient on the interaction of the foreign operations dummy with PERM when examining changes in tax expense suggests that PRE strengthens the PERM-ΔTAXEXP relation, in harmony with H1.

Earnings Management

The definitions of earnings management in Tables 6-9 include several choices in research design. In an attempt to discern the sensitivity of my result to design choices, I

Table 15
Examining Effect of Foreign Operations on BTD Coefficients

	Change in Net income				Change in Pretax Income				Change in tax expense			
	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years	Sign	1 year	3 years	5 years
Intercept	?	0.02***	0.04***	0.04***	?	0.04***	0.05***	0.03***	?	0.01**	0.02***	0.02***
		(2.63)	(4.67)	(3.29)		(3.40)	(4.22)	(2.48)		(2.09)	(4.40)	(3.12)
PERM	+	0.21***	0.33***	0.40***	?	0.08**	0.07	0.03	-	-0.03**	-0.08***	-0.06***
		(8.89)	(10.89)	(9.74)		(2.13)	(1.59)	(0.54)		(-2.15)	(-4.44)	(-2.74)
TEMP	?	0.07***	0.04	0.02	+	0.16***	0.14***	0.17***	?	0.12***	0.11***	0.08***
		(2.48)	(1.14)	(0.32)		(3.57)	(2.78)	(3.06)		(7.53)	(5.04)	(2.91)
ACC	-	0.00	0.10***	0.17***	-	-0.33***	-0.47***	-0.61***	-	0.03***	0.02	0.02
		(0.19)	(3.52)	(4.37)		(-10.12)	(-12.47)	(-14.42)		(2.53)	(1.01)	(0.99)
CASH	?	0.05***	0.15***	0.19***	?	-0.23***	-0.38***	-0.53***	?	0.05***	0.04***	0.03
		(2.52)	(5.52)	(5.24)		(-7.44)	(-10.33)	(-12.93)		(4.03)	(2.40)	(1.59)
ForOps	+	0.01***	0.01***	0.00	+	0.01	0.00	0.00	+	0.00***	0.00	0.00
		(2.87)	(2.59)	(0.80)		(1.19)	(0.27)	(-0.37)		(2.86)	(1.39)	(-0.10)
F*PERM	+	-0.08**	-0.14***	-0.22***	?	-0.06	-0.16**	-0.24***	-	-0.08***	-0.07***	-0.12***
		(-2.02)	(-2.95)	(-3.41)		(-0.99)	(-2.27)	(-3.13)		(-3.62)	(-2.49)	(-3.49)
F*TEMP	?	0.15***	0.17***	0.19***	?	0.21***	0.19**	0.06	?	0.06**	0.05	0.07
		(3.34)	(2.81)	(2.46)		(2.81)	(2.14)	(0.63)		(2.30)	(1.37)	(1.63)
F*ACC	?	-0.09***	-0.14***	-0.15***	?	-0.07	-0.17***	-0.12*	?	-0.07***	-0.09***	-0.05
		(-2.57)	(-3.08)	(-2.41)		(-1.19)	(-2.64)	(-1.73)		(-3.51)	(-3.43)	(-1.42)
F*CASH	?	-0.08***	-0.10***	-0.07	?	-0.03	-0.12*	-0.06	?	-0.06***	-0.08***	-0.03
		(-2.51)	(-2.40)	(-1.17)		(-0.55)	(-1.93)	(-0.86)		(-3.45)	(-3.35)	(-1.05)
Observations		12,459	10,592	9,039		9,152	7,159	5,642		12,438	10,575	9,028
R^2		0.124	0.164	0.156		0.161	0.263	0.339		0.108	0.130	0.145

ForOps is a dummy variable equal to one if foreign income (Compustat #273) is non-missing, and zero otherwise. All independent variables are interacted with this dummy (most interaction terms and control variables omitted for parsimony). All other variables, methodology, and sample are as reported earlier in Table 5.

rerun the tests reported in those tables with the following adjustments (results untabulated): First, my initial definition of 'narrowly' achieving an earnings target is set at 0.02. I also use 0.01 and 0.005, with results fundamentally unchanged. Additionally, prior literature, such as Phillips, Pincus, and Rego (2003), define earnings management as the contrast between firms that narrowly make an earnings target vs. those that narrowly miss. As an alternative to the results in Tables 6 and 8, I define the EM dummies in this way (beat by 0.02 or less vs. miss by .02 or less). Results are substantially unchanged, although some of the coefficients in support of H3a and H4a begin to lose their significance. These results could be due to lack of power, as a significant number of observations are lost with this narrow definition of earnings management.

CHAPTER VIII

CONCLUSION

I examine the relation between book-tax differences and earnings growth. While prior literature such as Lev and Nissim (2004) find evidence of a relation between total BTDs and earnings growth, I find evidence consistent with temporary differences (deferred taxes) being negatively related to growth in pretax earnings, while non-temporary difference are positively related to earnings growth only because they are negatively related to tax expense changes. Additionally, I find these results even in the absence of situations when earnings management is suspected, suggesting that the relation between BTDs and earnings growth is not a result solely attributable to earnings management, but that underlying economic events and ETR fluctuations significantly contribute to the relation. In fact, I find only weak evidence that earnings management contributes to the relation between temporary BTDs and changes in pretax earnings or the relation between permanent BTDs and changes in tax expense.

The findings in this paper contribute to our understanding of how various measures of BTDs relate to future earnings growth. It answers the call of Graham, Raedy, and Shackelford (2008) and Hanlon and Heitzman (2009) for investigation into the components of BTDs. It bridges the conflicting results of two seminal papers on the relation between BTDs and future performance, as Hanlon (2005) finds a relation between temporary BTDs and earnings persistence, while Lev and Nissim (2004) find

temporary BTDs to be unrelated to future earnings changes. Understanding how temporary BTDs map into future pretax earnings growth and permanent BTDs map into future tax expense changes can be a useful distinction for researchers investigating investor or analyst reaction to BTDs, or when attempting to use BTDs as a measure of earnings quality.

There are several avenues available for future research. Ayers, Jiang, and Laplante (2009) find that taxable income is more informative among firms they identify with 'low earnings quality' and less informative among firms designated as 'tax planners'. Future work could consider the impact of their measures on the BTD/earnings growth relation I have documented in this paper. Additionally, many studies examining the impact BTDs have on market participants define BTDs with the tax/book ratio. Because my findings suggest that the different components of BTDs imply different things about future economic performance, the breakdown of BTDs into its components may reveal how well market participants understand these differences. Finally, the results on earnings management are somewhat surprising and subject to various limitations. Future work using more refined measures of earnings management will perhaps yield results more consistent with the existing literature and the hypotheses developed in this paper.

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