Taxable Income, Future Earnings, and Equity Values

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Abstract

We investigate the ability of a tax-based fundamental—the ratio of tax-to-book income—to predict earnings growth and stock returns and to explain the earnings-price ratio. This tax fundamental reflects both temporary and permanent book-tax differences as well as tax accruals, such as changes in the tax valuation allowance. We find that the tax-to-book income ratio predicts subsequent five-year earnings changes, both before and after the implementation of Statement of Financial Accounting Standards (SFAS) No. 109 in 1993. For the pre-SFAS 109 period, the tax information is unrelated to contemporaneous earnings-price ratios and strongly related to subsequent stock returns. Conversely, for the post-SFAS 109 period, the tax fundamental is strongly related to contemporaneous earnings-price ratios and only weakly related to subsequent stock returns, indicating improvement over time in investors' perceptions of the implications of the tax information for future earnings. Deferred taxes, a component of our tax fundamental and the focus of recent research, exhibit relatively modest ability to predict earnings or stock returns both before and after the implementation of SFAS 109. Finally, throughout the examined period, the taxable income information about future earnings is incremental to that in accruals and cash flows.

Keywords: taxable income; deferred taxes; earnings quality; earnings management; market efficiency.

Data Availability: Data are available from sources identified in the paper.

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I. INTRODUCTION

The recent high-profile cases of failure of reported earnings to reflect economic reality (e.g., in Enron, Global Crossing, Tyco, WorldCom, and Xerox) have focused the attention of investors and policymakers on earnings quality, that is, the extent to which reported earnings reflect sustainable income. Various researchers and commentators draw attention to the gap between reported (book) earnings and taxable income, which has increased during the 1990s (e.g., Patrick 2001; Desai 2002; Manzon and Plesko 2002; Mills et al. 2002), and suggest that taxable income can inform on the quality of earnings. The financial press has pointed out that Enron paid negligible income taxes prior to going bankrupt in 2001, while it had reported billions of dollars of earnings during that period, indicating that Enron's investors overlooked an important indicator of earnings quality—taxable income.[1] The use of taxable income as a benchmark for assessing earnings quality is also suggested in financial analysis texts. Revsine et al. (1999, p. 633), for example, state: "a widening excess of book income over taxable income…represent[s] a potential danger signal that should be investigated, because…[it] might be an indication of deteriorating earnings quality."

Extant research investigates the future earnings implications of three tax-related disclosures: pretax discretionary accruals that affect deferred taxes (temporary differences), discretionary tax accruals (e.g., changes in the tax valuation allowance), and nondeductible pretax accruals (permanent differences). However, most previous studies focus on one of these components (a review of the literature is provided in Section II). Given interactions among the three tax components, to be discussed below, it is instructive to study their aggregate information concerning future earnings. Accordingly, we construct a comprehensive tax fundamental—the ratio of tax-to-book income—which reflects all three tax components, and investigate its predictive ability with respect to future earnings growth. We find that the comprehensive tax

[1] See, e.g., "Tax Dodging: Enron Isn't Alone," *Business Week*, 3/4/02, and "Two Birds, One Stone," *Forbes*, 3/4/02.

fundamental predicts earnings growth up to five years ahead throughout the examined period (1973-2001).[2]

Given the focus of several previous studies on deferred taxes, we compare the relative and incremental information about earnings growth in our comprehensive tax-based fundamental with that of deferred taxes, and find that the latter has a considerably weaker ability to predict earnings growth than does the comprehensive tax-to-book income ratio. Since taxable income is related to cash flows (both abstract from many accruals), we also investigate whether the information in our tax fundamental is incremental to that of cash flows, and provide an affirmative answer to this question.

In performing our tests, we distinguish between the periods before and after the implementation in 1993 of SFAS 109 which, unlike its predecessor (APB 11), incorporates forward-looking information into the tax expense, making it amenable to manipulation. Specifically, SFAS 109 requires firms to recognize a valuation allowance for the deferred tax asset "if, based on the weight of available evidence, it is more likely than not that some portion or all of the deferred tax asset will not be realized." Given the significant accounting change instituted by SFAS 109, it is important to examine the information embedded in the tax-to-book ratio before and after the regulation. Additionally, our long intertemporal (1973-2000) examination of changes in the tax-based information about earnings growth is called for by evidence on the deterioration of earnings quality, particularly in the 1990s (e.g., Lev and Zarowin, 1999), accompanied by a related increasing gap between book and tax income during that period (e.g., Manzon and Plesko, 2002). Our findings indicate that the comprehensive tax fundamental predicts future earnings both before and after the implementation of SFAS 109, and that this predictive ability generally increases over time.

Finally, having documented that the tax-to-book income ratio informs on earnings growth, we examine the extent to which this information is reflected in stock prices. For the pre-

[2] Thus, our study also contributes to the literature that considers how nonearnings information assists investors in assessing the permanence of current earnings (e.g., Penman 1992; Beneish and Vargus 2002).

SFAS 109 (1973-92) period, we find that the tax-based information is not related to contemporaneous earnings-price ratios, but is positively and strongly related to subsequent abnormal (risk-adjusted) stock returns. Conversely, for the post-SFAS 109 period, the tax fundamental is negatively and strongly related to the contemporaneous earnings-price ratio, suggesting that investors became adept in the 1990s to using tax-based (or correlated) information in setting prices. However, even in the recent period, the information in the tax-to-book income ratio is not fully impounded in stock prices, as evidenced by the association between the tax fundamental and subsequent returns. Focusing once more on the deferred taxes component of our comprehensive fundamental, we find little ability of this variable to predict stock returns, both before and after the implementation of SFAS 109.

The paper is organized as follows. Section II provides a literature review and summarizes our contribution. Section III motivates the research questions, and Section IV develops our methodology. Data on the sample and summary statistics are reported in Section V, followed in Section VI by the empirical results. Section VII presents robustness checks, and Section VIII concludes the paper.

II. REVIEW OF PRIOR RESEARCH AND PRESENT CONTRIBUTION

Extensive research examines the extent to which tax disclosures contain information about earnings quality. This literature can be classified into five categories: First, studies that attempt to explain the gap between book and tax income by proxies for managers' incentives to manage earnings (Cloyd et al. 1996; Mills and Newberry 2001).[3] Second, studies documenting a positive relation between the deferred portion of the income tax expense (reflecting temporary book-tax differences) and various proxies for discretionary pretax accruals and transitory earnings (e.g., Chaney and Jeter 1994; Phillips et al. 2002; and Joos et al. 2002).[4] In particular,

[3] As proxies for incentives to manage earnings, Mills and Newberry (2001) use firm type (public versus private), financial leverage (proxy for debt covenants), bonus plan thresholds, and past book income. Similarly, Cloyd et al. (1996) report that public firm managers are less likely than private firm managers to take a conforming book position that would decrease earnings.

Hanlon (2004) establishes, among other things, that book-tax temporary differences indicate the persistence of one-year-ahead earnings. The deferred tax expense is related to discretionary accruals (e.g., depreciation) because discretionary accruals typically increase the difference between future tax and book incomes, thereby triggering deferred tax recognition.

The third category of tax-book studies focuses on the potential management (manipulation) of tax accruals, which affect after-tax earnings. Gleason and Mills (2002), and Nelson et al. (2003) provide evidence consistent with the management of the current portion of the income tax expense through the recognition and reversal of tax cushions.[5] Other studies report that certain firms decrease the deferred portion of the income tax expense to meet earnings thresholds (surpass past earnings, report positive earnings, or meet analysts' forecasts) by reducing the valuation allowance for the deferred tax asset (e.g., Schrand and Wong 2003; Burgstahler et al. 2002; Frank and Rego 2003), or by designating foreign subsidiary earnings as "permanently reinvested" (Krull 2004).

The fourth category of related studies provides evidence of management of pretax accruals that create permanent book–tax differences. For example, firms may manage the expensing of non-tax-deductible intangible assets (e.g., most cases of goodwill), either through the initial valuation of these assets (e.g., overstating in-process R&D to reduce goodwill and its subsequent amortization or impairment), by the specification of amortization period, or by the recognition of write-offs or impairment charges of intangibles. Francis et al. (1996), Jennings et al. (2001), Henning and Shaw (2000), Browning (1997), McGoldrick (1997), and Nelson et al. (2003), among others, provide empirical and anecdotal evidence of such activities, and Dhaliwal et al. (2002) document that changes in the effective tax rate, which are due to permanent

[4] These studies differ, among other things, in the proxies for discretionary accruals and transitory earnings: Phillips et al. (2002) use the proximity of current to past earnings and other earnings management thresholds to indicate discretionary accruals; Joos et al. (2002) focus on the ability of accruals to predict future cash flows; and Chaney and Jeter (1994) examine the ability of deferred taxes to explain contemporaneous stock returns, after controlling for net income.

[5] A tax cushion is a contingent tax liability accrued by the company to absorb future tax payments resulting from IRS claims of tax deficiencies. Changes in the tax cushion are included in the current portion of the income tax expense (see Gleason and Mills 2002).

differences and tax accruals, are negatively associated with firms' incentives to increase reported earnings. In addition, Schmidt (2004) demonstrates that changes in the effective tax rate inform on the persistence of next year's earnings. While the four strands of research outlined above are related to earnings management, a fifth category of related studies uses tax-based proxies to reflect information about firms' operating performance (Lev and Thiagarajan 1993; Shevlin 2002).

We contribute to and complement the extant research record in several dimensions. First, while most previous studies focus on a single tax-related component—either temporary differences, permanent differences, or tax accruals—we construct a tax fundamental (the ratio of tax-to-book income) that encompasses all three components. This is important because various earnings management activities, which may be simultaneously employed by management, exert offsetting effects on individual tax components, thereby weakening their potential to inform on the quality of earnings. For example, a decrease in the tax valuation allowance will decrease deferred taxes and increase net income, whereas a switch from accelerated to straight-line depreciation (pretax accrual) will increase both deferred taxes and net income. Thus, various means of earnings management may exert offsetting effects on deferred taxes, thereby detracting from the ability of this item to inform about the quality of earnings (a theme we return to below).

In addition to obviating offsetting effects, our tax fundamental captures in a single measure all three tax components, creating a potentially powerful earnings quality indicator. The comprehensiveness of our tax fundamental becomes evident in the empirical tests presented below, which document a stronger and enduring predictive ability of the tax fundamental with respect to five-year earnings growth than that of deferred taxes.

Our second contribution to extant research lies in the span of earnings growth prediction by tax variables, relevant to the earnings quality issue. Prior studies have focused on the predictability of next year's earnings. While of importance, financial analysts and many investors are actively engaged in longer term earnings prediction, generally up to five years. We accordingly examine the ability of our tax fundamental to predict five-year earnings growth, controlling for a multitude of variables established by previous researchers as earnings predictors. The tax fundamental fares well in this contest.

Finally, we contribute to the issue of market efficiency with respect to tax-related information. This is an important question, since documentation of market inefficiencies generally lead to consideration of improved disclosure. Indeed, the Senate Banking Committee which has examined the tax aspects of the Enron debacle recommended enhanced corporate disclosure, such as of the company’s taxable income. We opted for a relatively long period (1973-2000) for the market efficiency examination—substantially longer than previous studies—to accommodate various important tax code and accounting changes (e.g., SFAS 109) that took place in the 1980s and 1990s. Our long intertemporal examination paid off by revealing a substantial improvement in investors’ comprehension of tax-related information (perhaps prompted by increasing concerns with earnings management), though not reaching a complete one. The long period examined in this study also enhances our insights concerning the earnings growth prediction, indicating an improvement in the predictive ability of the tax fundamental in the 1990s.

III. REASONS FOR TAXABLE INCOME TO INFORM ABOUT EARNINGS GROWTH

The ratio of taxable to reported income is related to future earnings growth because: (1) it reflects certain types of earnings management activities which are not persistent, (2) it indicates the extent to which reported earnings deviate from their “permanent” level, and (3) it captures differences between GAAP and the tax code which have implications for future earnings, even in the absence of earnings or tax management. We next discuss each of these effects and also point out why the taxable income information is likely to be incremental to that in cash flows and accruals. In the appendix, we demonstrate each of these effects.

Taxable Income and the Management of Accruals

When a firm overstates (understates) current earnings, the expected growth in subsequent reported earnings will be lower (higher) because: (1) overstating current earnings increases the base from which future earnings grow, thereby decreasing future growth; and (2) as earnings over the long run approach net cash inflows, an overstatement of current earnings (that is, shifting future earnings to the present by, say, front-loading revenues from long-term projects) will generally be followed by an understatement of future earnings. In contrast, taxable income typically excludes the discretionary components of accruals which are often used to manage earnings. Bad debt and warranty provisions, depreciation and amortization expenses, restructuring charges, impairment losses, and various other accruals that involve substantial judgment and discretion are either: (1) not tax deductible (e.g., amortization and impairment of most goodwill and other intangible assets),[6] (2) are tax deductible but according to a uniform, IRS-dictated formulas (e.g., depreciation), or (3) are tax deductible only when the underlying event occurs (e.g., a debt write-off). Accordingly, when firms overstate earnings via positive discretionary accruals, taxable income will be lower than earnings, and vice versa when firms understate earnings (negative discretionary accruals). Since, as we argued above, an overstatement (understatement) of current earnings implies a lower (higher) subsequent growth, the ratio of tax-to-book income will predict future earnings changes.

We focus in this study on the ratio of taxable income to net income as the primary predictor of earnings growth since taxable income is likely to be more informative about future earnings when related to net income rather than to pretax earnings. Recent studies provide evidence of earnings management through the recognition and reversal of tax accruals, which affect the income tax expense (and hence net income) but do not impact pretax earnings. For

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[6] Prior to 1993, goodwill and many other types of acquired intangible assets were not amortizable for tax purposes. Since 1993, most tax-based intangible assets are amortizable over a 15-year period. However, as tax-deductible goodwill arises only in acquisitions in which the tax basis of the target's assets is stepped up, which is rare for freestanding C corporations, most goodwill recognized since 1993 is nondeductible (for discussion, see Scholes et al. 2002, pages 327–328; for empirical evidence, see Ayers et al. 2000). Firms may manipulate the amount of goodwill amortization or impairment either through the initial valuation of goodwill or through its subsequent amortization or impairment. For example, Browning (1997), McGoldrick (1997), and Nelson et al. (2003) report that some firms overstated the amount of in-process R&D (which is expensed in the period of acquisition) in order to reduce the amount of goodwill and its subsequent amortization or impairment. During our sample period, firms were also able to manipulate the amount of goodwill amortization through the selection of amortization period (up to 40 years). In addition, many firms recognized goodwill write-offs or write-downs (Francis et al. 1996), and this practice has become even more common with the implementation of SFAS 121 in 1996 and SFAS 142 in 2002.

example, Schrand and Wong (2003), and Burgstahler et al. (2002) report on earnings management through adjustments to the tax valuation allowance, and Krull (2004) provides evidence of deferred tax management through the designation of foreign subsidiary earnings as permanently reinvested. Gleason and Mills (2002), and Nelson et al. (2003) further suggest that firms manage the current portion of the income tax expense through the recognition and reversal of tax cushions. Such manipulations are reflected in net income but not in pretax income.[7]

Smoothing Taxable Income

Taxable income is not free of manipulation. In fact, there is considerable evidence that firms smooth or otherwise manage taxable income (see Shackelford and Shevlin (2001) for review). However, the means used for the management of taxable income are substantially different from those of managing earnings: Taxable income is often manipulated by the timing of transactions, such as asset sales, while earnings are frequently managed by manipulating accrual estimates. When managing taxable income, firms often reduce their total tax liability by *smoothing* current and future taxable income (e.g., Graham and Smith 1999). Such smoothing implies that current taxable income reflects managers' estimates of future taxable income, which in turn is related to future earnings and cash flows. Thus, a relatively high current taxable income indicates managers' expectations of high subsequent taxable income and, by inference, of high future earnings, thereby enhancing the predictive ability of the tax-to-book income fundamental regarding future earnings. In the appendix, we further discuss and demonstrate this argument.

Differences between GAAP and the Tax Code

We have argued above that earnings management and the smoothing of taxable income imply that the ratio of tax-to-book income informs on future earnings growth. However, the ratio of tax to book income may forecast earnings growth even in the absence of earnings or tax management. In many cases, revenues are recognized in the tax return before they are earned

[7] Reversals of tax cushion reserves reduce current income taxes and therefore decrease our estimate of taxable income (see below). This measurement error in taxable income, however, strengthens rather than weakens our signal, because it further reduces the ratio of taxable-to-net income (in addition to the decrease in the ratio due to the overstatement of net income). In our analysis, a small ratio of taxable-to-net income implies low earnings quality.

(e.g., subscription revenue), and expenses are tax-deducted after they are accrued (e.g., restructuring charge). Consequently, a high ratio of tax-to-book income will forecast large future revenues or small expenses and hence high earnings growth. Moreover, growth companies often experience increases in negative working capital items that are recognized on a cash basis for tax purposes (e.g., warranty liability, allowance for bad debt). Such accruals reduce current earnings but not taxable income, and therefore increase the tax-to-book income ratio, making this ratio a proxy for the future earnings of growth companies.

Taxable Income and Cash from Operations

Like taxable income, cash flows also abstract from accrual estimates, raising the question whether taxable income contains incremental information about future earnings beyond cash flows. Our empirical analysis answers this question affirmatively, but we would like to point out, on *a priori* grounds, several important differences between taxable income and cash flows, related to earnings predictability. While earnings management often involves accruals, it is sometimes conducted by manipulating the cash component of earnings (e.g., Roychowdhury 2002). For example, firms may capitalize expenses or intangible investments (including leases), thereby increasing both earnings and cash from operations, yet not affecting taxable income.[8] Naturally, firms prefer to overstate earnings and cash flow in ways that do not increase taxable income.[9] Thus, a comparison of earnings with cash from operations will not detect common management activities, while the low manipulation commonality between taxable income and earnings enhances the ability of the former to inform on the latter.

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[8] Consider the accounting for internally developed software, for instance. When such software is expensed, it reduces operating cash flows. However, when the software expenditures are capitalized (required, under certain circumstances, by SFAS 86), the charge goes to investing cash flows (see White et al. 1998, p. 116). This type of cash flow manipulation is not limited to intangibles. A particularly egregious earnings and cash flow manipulation related to the capitalization of expenditures is WorldCom's, which by its most recent admission fraudulently capitalized over $7 billion of expenses during 1999–2001.

[9] However, Erickson et al. (2004) find that some firms are willing to incur additional income taxes to inflate reported earnings.

The incremental information in taxable income about future earnings relative to cash flows is not limited to manipulation activities. Unlike cash from operations, taxable income is not affected by the timing of cash flows and so is less volatile than cash from operations (Dechow 1994). Moreover, as mentioned above, firms may deliberately smooth taxable income in order to reduce the present value of income taxes. Such smoothing implies that current taxable income serves as a proxy for "permanent" earnings, enhancing the prediction of subsequent earnings changes. In contrast, firms are less likely to smooth cash from operations, absent benefit from such smoothing.

Summarizing, the ratio of tax-to-book income informs on future earnings growth for various reasons: the reflection of short-lived earnings management, the smoothing of taxable income, and the nature of book-tax differences. However, the tax-to-book ratio may also reflect the effect of factors unrelated to earnings growth. For example, certain book–tax differences, such as from interest on state and municipal bonds and the deduction of dividend income, reduce taxable income relative to earnings while not affecting the latter's quality. Furthermore, some firms may be more efficient than others in sheltering income and deferring taxable income to the future, or may operate in industries where it is easier to defer taxable income (e.g., through depreciation in capital-intensive industries), thereby affecting the tax-to-book ratio without necessarily impacting future earnings growth. Thus, the extent to which taxable income contains information about earnings growth is ultimately an empirical question, to which we now turn.

IV. METHODOLOGY

We open this section by deriving an estimate of taxable income (firms do not disclose this item), followed by the construction of the tax-based fundamentals, and the empirical specifications of our tests.

Estimating Taxable Income

We estimate taxable income by grossing up the current portion of the reported income tax expense:

$$\text{Taxable Income} = \frac{\text{current portion of the income tax expense}}{t}. \quad (1)$$

The parameter *t* is assumed to be cross-sectionally constant and is measured as the top statutory corporate federal tax rate.[10] This estimate of taxable income has been used in previous studies, including Omer et al. (1991), Gupta and Newberry (1997), Manzon and Plesko (2002), Gleason and Mills (2002), and Shevlin (2002), but it contains measurement errors from several sources.[11] First, the assumption that the average tax rate is equal to the top statutory tax rate does not strictly hold. Average tax rates vary in the cross section due to progressive tax schedules (relatively small effect for large firms) and to differences between the U.S. and foreign tax rates (potentially large effect for multinationals). In the robustness tests (Section VII), we report the results of sensitivity analyses indicating that measurement error due to differences between foreign and U.S. tax rates does not appreciably affect our results.

Noise in the taxable income estimate (1) may also arise because the current portion of the income tax expense does not reflect the tax benefits associated with the exercise of nonqualified employee stock options (quite a large effect for many firms; see Hanlon and Shevlin (2002) and Desai (2002)), as well as the tax benefits from other, less common or material items (e.g., tax benefits from dividends paid on unallocated ESOP shares).[12] In addition, current income taxes are reported net of changes in tax cushion reserves, which do not affect taxable income. In the robustness test, we examine the sensitivity of our estimates to these sources of measurement error by: (1) using an alternative estimate of taxable income, based on the amount of income

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[10] Following previous research (e.g., Gleason and Mills 2002), we measure the current portion of the income tax expense as the sum of current federal (Compustat #63) and foreign (#64) income taxes, or, when either of these amounts is missing, as the difference between total income tax expense (Compustat #16) and the deferred portion of the income tax expense (#50). The top statutory corporate federal tax rate was 48% in 1973–1978, 46% in 1979–1986, 40% in 1987, 34% in 1988–1992, and 35% in 1993–2001.

[11] For detailed discussions of measurement error in estimates of taxable income, see Manzon and Plesko (2002), Mills et al. (2002), McGill and Outslay (2002), Hanlon (2003), and Mills and Plesko (2003).

[12] The tax deduction associated with nonqualified options is equal to the value of the options at the time of exercise. Companies account for the tax benefit associated with nonqualified options by increasing contributed capital instead of reducing the current portion of the income tax expense (Hanlon and Shevlin, 2002).

taxes actually paid during the year, and (2) partitioning the sample on SIC codes to compare industries where stock options are more likely to affect our estimates with industries where stock options are relatively immaterial. In both types of sensitivity analysis, we find little effect on the results. Another source of noise is that current income taxes reflect tax credits, such as for R&D, capital expenditures, and foreign taxes, which do not affect taxable income. We address this source of error in the robustness tests by examining firms with low levels of R&D expenditures, investment tax credits, or foreign operations, and once more find no material effect on our inferences.[13]

The Tax-based Fundamentals

Given our estimate of taxable income (Equation (1)), we construct the primary tax-based fundamental (TAX) used in this study:

$$\text{TAX} = \frac{\text{Taxable Income} \times (1-t)}{\text{Net Income}}, \tag{2}$$

where net income is measured as income before extraordinary items (Compustat #18). We multiply taxable income by (1 – t) to make it comparable to net income, which is reported after tax. However, since our analyses are cross-sectional, this adjustment has no effect on the estimates (t is a cross-sectional constant, equal to the top statutory federal tax rate).

Note that,

$$\text{TAX} = \frac{\text{Taxable Income} \times (1-t)}{(\text{Taxable Income} + \text{TEMP}) \times (1-t) + \text{PERM} + \text{Tax Accruals}}, \tag{3}$$

where TEMP denotes temporary differences between pretax book income and taxable income (e.g., depreciation), PERM denotes permanent differences (e.g., goodwill impairment), and Tax Accruals reflect changes in the tax valuation allowance and the tax cushion reserves, as well as

[13] There are several additional sources of measurement error in our estimate of taxable income (see, e.g., Hanlon 2003). The more important ones are: (1) differences in consolidation rules between GAAP and the IRS Code, and (2) the effect of intraperiod tax allocation under GAAP (i.e., income taxes related to discontinued operations and extraordinary items are deducted directly from these items). However, these sources of measurement error do not affect our tax-based fundamental, because our estimate of taxable income pertains to the consolidated financial accounting entity, and we measure earnings as income before discontinued operations and extraordinary items.

the designation of foreign income as permanently reinvested. Since each of these three components (TEMP, PERM, and Tax Accruals) affects net income (the denominator of (3)) but not taxable income (the numerator of (3)), they are reflected in a comprehensive manner by our tax fundamental, TAX.

Prior research has documented that book–tax differences vary across industries (e.g., Mills and Newberry 2001; Manzon and Plesko 2002; Hanlon 2004) due to differences in capital intensity, magnitude of intangible capital, and other industry-related characteristics. We accordingly use *industry-ranked* values of TAX to control for across industry differences, thereby increasing the focus on earnings quality. Specifically, for each year we rank the sample firms by the value of TAX within industries (two-digit SIC code), and define *R_TAX* as a multinomial variable with values between 1 (for firms in the lowest industry quintile of TAX) and 5 (highest quintile).

The variable *R_TAX*, the focus of our analysis, reflects all three tax components: TEMP, PERM, and Tax Accruals. The information about earnings growth embedded in permanent book–tax differences and tax accruals relative to the information in deferred taxes can be evaluated by comparing the predictive ability of *R_TAX* with that of deferred taxes, which we do below. Following Hanlon (2004), we measure the deferred tax fundamental (DEF) as the negative of the ratio of the deferred tax expense to average total assets.[14] Similar to the industry-ranked *R_TAX*, we define *R_DEF* as a multinomial variable that takes values between 1 (lowest quintile of DEF for the industry-year group) and 5 (highest quintile).[15]

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[14] Following previous studies (e.g., Hanlon 2004), we measure deferred taxes as the sum of deferred federal (Compustat #269) and foreign (#270) income taxes, or, when either of these amounts is missing, as total deferred taxes (#50). While we follow Hanlon (2004) and deflate the deferred tax expense by average total assets, Chaney and Jeter (1994) deflate by the market value of equity at the beginning of the year, Phillips et al. (2002) deflate by total assets at the beginning of the year, and Joos et al. (2002) deflate by sales. We obtained similar results to those reported below when deflating deferred taxes by either the market value of equity or total assets at the beginning of the year, or by sales, or net income.

[15] Unfortunately, Compustat data do not allow for the full separation of the three components of TAX (temporary and permanent book–tax differences, and tax accruals), because deferred and current taxes are reported net of tax accruals. (In the footnotes to the financial statements, firms disclose information that allows for the estimation of some tax accruals, but Compustat does not provide this information.)

Finally, to examine whether the tax-based fundamental, *R_TAX*, contains incremental information relative to cash flows, we construct and analyze a cash flow-based, industry-ranked fundamental, *R_CFO*, measured in the same way as *R_TAX*: *R_CFO* is a multinomial variable that takes values between 1 (lowest quintile of the ratio of cash flow from operations to net income for the industry-year group) and 5 (highest quintile).[16]

Specification of our Tests

The following procedure examines the information in our primary tax fundamental, *R_TAX*, about earnings growth. For each sample year *t* (1973-2000), we compute the cross-sectional means of the ratio of earnings in the current and each of the subsequent five years ($t + j$, $j = 0, 1, 2, \ldots, 5$), to total assets in year *t*, for three subsamples of firms: (1) those with *R_T*AX equal to 1 (i.e., firms with a low ratio of tax-to-book income), (2) firms with *R_TAX* between 2 and 4 (intermediate values of tax-to-book income), and (3) firms with *R_TAX* of 5 (high values of tax-to-book income). We then compute the time series mean over the sample years (1973-2000) for each of the three groups of firms, and for each of the six years considered (0 through 5). Finally, we plot the time series means of future earnings (years 1 through 5), divided by current earnings (to reflect growth), for each of the three groups of firms (*R_TAX* = 1, *R_TAX* = 2…4, and *R_TAX* = 5). We perform the same analysis for *R_DEF* and *R_CFO* (deferred taxes and cash flows, respectively). This allows us to visually inspect and compare the earnings growth implications of each of the three fundamentals: *R_TAX*, *R_DEF*, and *R_CFO*.

To examine the statistical significance of the information in each of the three fundamentals, as well as the incremental information in *R_TAX* over *R_DEF* and *R_CFO*, we run cross-sectional regressions of several models nested in the following equation:

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[16] In the primary analysis, we measure cash from operations as the difference between income before extraordinary items (Compustat #18) and accruals, where accruals = (ΔCA – ΔCash) – (ΔCL – ΔSTD) – ΔDTL – Dep. The variable ΔCA = annual change in current assets (Δ#4), ΔCash = change in cash and cash equivalents (Δ#1), ΔCL = change in current liabilities (Δ#5), ΔSTD = change in debt included in current liabilities (Δ#34), ΔDTL = change in the deferred tax liability (Δ#35), and Dep = depreciation and amortization expense (#14). In the robustness checks, we measure cash from operations directly from the cash flow statement.

$$G = a_{indu} + b_1 R\_TAX + b_2 R\_DEF + b_3 R\_CFO + e\ , \qquad (4)$$

where G is a firm-specific indicator of subsequent earnings growth, measured alternatively as: next-year earnings minus current earnings (G_1), average earnings in the subsequent three years minus current earnings (G_2), and average earnings over the subsequent five years minus current earnings (G_3). All three measures are deflated by the current value of total assets. The intercept, a_{indu}, is an industry (two-digit SIC code) fixed effect. To the extent that the fundamentals contain information on earnings growth, we expect the respective coefficients to be positive.

The earnings growth regression (4) includes, in addition to the tax variables, information on cash flows, accruals, and industry membership.[17] However, available research identifies additional predictors of earnings growth (see Chan et al. (2003) and Fama and French (2000) for literature review and evidence on growth determinants). We therefore rerun equation (4) controlling for the following variables: the ratio of earnings to total assets, which serves as a control for mean-reversion in profitability; the current period earnings change divided by total assets, which controls for the effect of one-time earnings items and a short-term trend in earnings; the average changes in earnings over the last three and five years, deflated by total assets, to capture long-term trends in earnings; the ratio of dividends to total assets, controlling for the likelihood of subsequent earnings declines (larger dividends typically imply a lower likelihood); the ratios of R&D and capital expenditures to sales, reflecting expected growth from new investments; and the current earnings-price and book-to-market ratios, reflecting the market expectations of future growth.[18]

[17] Note that since *R_CFO* is measured relative to net income, it reflects the relative magnitudes of both cash flow and accruals (net income equals CFO plus accruals, and thus higher accruals imply a low *R_CFO* value).

[18] As discussed below, we also estimate an earnings growth regression that includes analysts' long-term earnings growth forecasts as a control variable. We omit this variable from the current analysis because it is available only for a subset of sample firms and years. Note also that the inclusion of forward-looking information, such as analysts' forecasts or market-based growth proxies (book-to-market, earnings-price) in the earnings growth regression may dilute the incremental information in *R_TAX* to the extent that market participants are cognizant of the tax information. Nevertheless, a finding that the tax fundamental remains significant even after controlling for these variables would further emphasize the importance of tax-based proxies for earnings quality.

If the tax-based fundamentals do predict earnings growth, that information should either be fully reflected in current stock prices (efficient pricing), or predict subsequent stock returns. Accordingly, we examine the relationship between the tax fundamentals and: (1) the market pricing of current earnings, and (2) subsequent abnormal stock returns. To examine the extent to which contemporaneous stock prices reflect the earnings growth information conveyed by the tax fundamentals, we estimate several models nested in the following equation:

$$E/P^* = a_{indu} + b_1\, GROW + b_2\, LNTA + b_3\, BETA + b_4\, VOL + b_5\, LEV + b_6\, PAY + b_7\, R\_TAX + b_8\, R\_DEF + b_9\, R\_CFO + e. \quad (5)$$

E stands for the firm's reported current earnings (income before extraordinary items, Compustat #18), and *P** is the market value of common equity at the end of the year (Compustat #199 × #25), multiplied by one plus the cumulative stock return of the firm during the first four months of the subsequent year.[19] If the fundamentals contain growth-related information which is priced by investors, their coefficients should be negative (the earnings-price ratio is negatively related to expected earnings growth).

Equation (5) includes the following control variables for the earnings-price ratio: *GROW* is the mean analysts' long-term earnings growth forecast, available in April of the subsequent year (as discussed below, the sample consists of firms with December fiscal year end). The variable *LNTA* is the logarithm of total assets—a size measure. *BETA* measures systematic risk, estimated from monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year (at least 30 return observations are required). Idiosyncratic volatility, *VOL*, is the root-mean-squared error from the *BETA* regression. Financial leverage, *LEV*, is the ratio of total liabilities to total assets, and

[19] We incorporate the cumulative stock return over the four months subsequent to fiscal year-end to assure that the stock price reflects the market reaction to the publication of the annual financial statements. We use P* rather than market capitalization after the publication of the annual report because firms may issue new shares or repurchase shares between the end of the fiscal year and the annual report publication date. Such changes in market capitalization are not directly related to the earnings information and therefore introduce noise. However, we obtained similar results to those reported below using market capitalization after the publication of the annual report, rather than P*.

PAY—dividend payout—is the ratio of common dividends to earnings. The remaining tax and cash flow variables in Equation (5) were defined above.

The motivation for the control variables described above is that the dependent variable in Equation (5)—the earnings–price ratio—reflects the capitalization rate that investors apply to current earnings. Previous research established that this capitalization rate is affected by the firm's cost of equity capital, the dividend payout, long-term earnings growth, and near-term earnings growth (see, Beaver and Morse 1978; Zarowin 1990; Lee 1988; Kennedy et al. 1992; and Dhaliwal et al. 1999), leading us to the choice of controls in (5). The coefficients on the variables of interest—*R_TAX*, *R_DEF*, and *R_CFO*—should capture the near-to-medium term earnings growth implications of these variables (incremental to analysts' long-term growth forecast, *GROW*), as reflected in current stock prices.

Finally, to investigate the possibility that prices do not fully reflect the information in the tax variables, we run a future stock returns model, controlling for the determinants of expected returns identified by prior research (e.g., Fama and French 1992):

$$R = a_{indu} + b_1\, SIZE + b_2\, B/P + b_3\, E/P + b_4\, BETA$$

$$+ b_5\, VOL + b_6\, R\_TAX + b_7\, R\_DEF + b_8\, R\_CFO + e. \qquad (6)$$

In this equation, *R* is the one-year-ahead buy-and-hold stock return (including all distributions to shareholders), measured from the beginning of May of the subsequent year.[20] (For securities that delisted during the one-year holding period, proceeds from the issue are invested in the NYSE, AMEX, and NASDAQ value-weighted index until the end of the holding period.) The variable SIZE is the logarithm of the market value of equity at the end of April of the subsequent year. *B/P* is the book-to-market value of common equity at fiscal year-end. The remaining variables in Equation (6) were defined above. If the fundamentals contain growth-related information which is not *fully* priced by the market, their coefficients should be positive.

[20] We measure stock returns from the beginning of May of the subsequent year to assure that investors had access to the annual reports.

V. SAMPLE AND SUMMARY STATISTICS

The Sample

Similar to prior studies that examined the quality of earnings implications of tax disclosures (e.g., Chaney and Jeter 1994; Phillips et al. 2002; and Hanlon 2004), we restrict our sample to firms that: (1) are incorporated in the U.S. (foreign firms face different tax and financial accounting rules); (2) are not a utility or a depository institution (regulated firms have different reporting requirements and earnings management incentives than nonregulated firms); and (3) are not a mutual fund, trust, REIT, limited partnership, or other flow-through entities (these enterprises do not report income taxes).

To mitigate potential bias from temporal changes in economy-wide conditions, we perform annual cross-sectional analyses, and focus on firms with December fiscal year end. Measurement error is reduced by estimating taxable income and temporary differences based on the federal and foreign components of current and deferred taxes, instead of the respective totals (see footnotes 10 and 14). For many firms, this information is available in Compustat since 1973, and therefore we start our sample period from that year. As our analyses involve the examination of subsequent earnings and returns, and earnings data are at the time of this research available from Compustat through fiscal 2001, the last (base) sample year is 2000.

Our data requirements are as follows: Data items #6 (total assets), #18 (income before extraordinary items), #199 (price per share), #25 (number of shares outstanding), #60 (common equity), #16 (total income taxes), and #50 (deferred taxes) should be available in Compustat's industrial, full-coverage, or research files. Since our primary fundamental is the ratio of taxable income to net income, we restrict the sample to firms with positive earnings in the current year (but, of course, we do not restrict future earnings to be positive). Finally, to mitigate the effect of influential observations, we delete in each analysis observations for which any of the variables (excluding future stock returns) lies outside the 0.5–99.5 percent range of its sample distribution.[21]

The above sample selection criteria (except for the outlier filter which is analysis-specific) result in a sample of 40,372 firm-year observations (5,384 different firms; 28 years, spanning 1973–2000). For the earnings growth analysis, the requirement of availability of subsequent years' earnings reduces the sample to between 37,621 firm-year observations (one-year-ahead earnings, 1973–2000) and 24,055 (five-years-ahead earnings, 1973–1996). For the earnings-price analysis, the requirement of data availability from CRSP to calculate *SIZE*, *BETA*, and *VOL*, and the requirement of availability of *GROW* from I/B/E/S reduce the number of observations to 14,962 during the period 1982–2000 (long-term growth forecasts are available since 1982). For the subsequent returns analysis, the sample contains 33,496 observations during the period 1973–2000.

Summary Statistics: Fundamentals and Firm Characteristics

To examine the characteristics of firms with different levels of the tax fundamental, *R_TAX*, we compute the sample average common-size income statement and balance sheet numbers, as well as the average values of various characteristics of the three portfolios sorted by the industry-ranked *R_TAX*: firms with *R_TAX* equal to 1 (low ratio of tax-to-book income), firms with *R_TAX* between 2 and 4 (intermediate values of tax-to-book income), and firms with *R_TAX* equal to 5 (high tax-to-book income values). We perform a similar analysis for *R_DEF* (deferred taxes) and *R_CFO* (cash flows) portfolios, and report the results in Table 1, Panel A.

The common-size statistics of the portfolios sorted by the three fundamentals are generally consistent with expectations. For example, in the income statement, the ranking of *R_TAX* and *R_DEF* are negatively related to deferred taxes (e.g., low R_TAX has largest deferred taxes) and positively related to current taxes, but the relation with current (deferred)

[21] In the earnings growth and earnings-price analyses (Equations (4) and (5)), we obtain similar results when we apply the outlier filter only to the independent variables. Consistent with most previous studies, we do not apply the outlier filter to stock returns, because they are typically "well behaved." However, we obtained similar results when applying the outlier filter to stock returns too.

taxes is considerably stronger for *R_TAX* (*R_DEF*). Both *R_TAX* and *R_DEF* are negatively related to depreciation and amortization (with the relation stronger for *R_TAX*), and to special items. The fundamental *R_CFO* (right three columns in Table 1), which reflects the magnitude of accruals (negative relation, see footnote 17), is positively related to depreciation and amortization. Turning to the common-size balance sheet, we observe that both tax fundamentals are positively related to current assets and negatively related to capital intensity (PP&E/Assets, which is the primary source of temporary tax differences), while *R_CFO* exhibits the inverse relations with these characteristics. Furthermore, *R_TAX* is negatively related to "other assets" (including goodwill and other intangibles which often create permanent differences), and *R_DEF* is negatively related to the deferred tax liability.

[Table 1 about here]

The bottom set of characteristics in Table 1, Panel A, indicates the average magnitudes of the three fundamentals (TAX, DEF, and CFO) prior to forming the industry-ranked portfolios, and includes capital market information. Interestingly, the relation between the *R_CFO* ranking and the two tax fundamentals is weak (the mean values of TAX and DEF do not vary much across *R_CFO* portfolios), suggesting that the information in the tax fundamentals is largely orthogonal to that in cash flows. All in all, the various characteristics in Panel A of Table 1 behave quite differently across the rankings of *R_TAX*, *R_DEF*, and *R_CFO*, suggesting that each of the three fundamentals potentially provides unique information about earnings growth.

Our sample spans the period 1973–2000, during which major tax and accounting changes took place. In particular, SFAS 109 (effective since 1993) changed the focus of the deferred tax measurement from an income statement approach to a balance sheet orientation, incorporating "soft" estimates in deferred taxes.[22] Accordingly, we conduct our analyses separately for the pre-

[22] Under APB 11 (the predecessor of SFAS 109), deferred taxes were calculated as the product of the statutory tax rate and the amount of timing differences between pretax earnings and taxable income. Under SFAS 109, the measurement of the deferred tax liabilities and assets (and hence the deferred tax expense) is based on the enacted tax rates for future periods, and the measurement of the deferred tax asset is reduced, if necessary, by the amount of tax benefits that, based on available evidence, are not expected to be realized.

and post-SFAS 109 periods. The changes in the tax code during the sample period were numerous and detailed, and we therefore do not partition the sample period on tax regimes. Rather, we provide statistics on the consistency of the results over time within each accounting regime (e.g., the proportion of years with positive *R_TAX* coefficient, and the trends in the coefficient). Table 1, Panel B, presents the average values of TAX and DEF for the different industry-ranked portfolios in each of the accounting and major tax regimes (the latter are defined in terms of the top federal corporate tax rate). Consistent with evidence on the increase in book–tax differences during the 1990s (e.g., Manzon and Plesko 2002), we observe in Table 1 that the average values of TAX (the tax-to-book income ratio) and DEF declined during 1993–2000 relative to 1988–1992. Interestingly, the magnitudes of both TAX and DEF were also small during 1973-1987, a result which has been attributed to tax aggressiveness by corporation (e.g., by the Citizens for Tax Justice Organization).[23] In contrast, references to the large book-tax differences during the 1990s predominantly emphasized earnings management issues (see discussion in Section I).

VI. TEST RESULTS

The Tax Fundamentals and Future Earnings

Figure 1 presents for each of the three fundamentals (*R_TAX*, *R_DEF*, and *R_CFO*), the subsequent five-year cumulative earnings growth for three industry-ranked portfolios: firms with high values of the fundamental (continuous line), firms with intermediate fundamental values (dotted line), and firms with low values of the fundamental (dashed line). Panel A presents the earnings growth trends during the pre-SFAS 109 period (1973–1992), while Panel B reflects the post-SFAS 109 experience (1993–2000). It is evident from the graphs that in both periods low values of *R_TAX* (bottom line of left graph)—depicting large differences between tax and book

[23] The low values of TAX during 1973–1986 also reflect various tax credits, which were reduced or repealed by the Tax Reform Act of 1986. (TRA 1986 repealed the investment tax credit for property placed in service after 1985, and lowered the R&D tax credit to 20 percent.) As discussed in Section III, tax credits result in negative measurement error in the estimate of taxable income. In Section VII, we address this source of measurement error.

income—predicted a sharp and relatively permanent decline in next year's earnings, whereas intermediate and high values of *R_TAX* (top two lines) predicted relatively high and continuous earnings growth over the future five years.[24] Notably, the deferred-tax component (*R_DEF*, center graph) had essentially no ability to predict earnings growth in the pre-SFAS 109 period (the three curves representing different values of *R_DEF* almost converge), and a relatively modest predictive ability in the post-SFAS 109 period. The fundamental *R_CFO* (cash flows) predicted earnings growth in both periods, but with a smaller spread than *R_TAX*.

[Figure 1 about here]

We gain further insight from a regression analysis. Table 2 presents summary measures from annual cross-sectional regressions of several models nested in Equation (4), with three alternative dependent variables: average annual earnings growth over one (G_1,), three (G_2), and five (G_3) years ahead. Panel A (Panel B) presents the pre- (post-) SFAS 109 results. The statistics reported for each set of regressions are the time series means of the annual estimated coefficients and the associated *t*-statistics (the ratio of the mean of the cross-sectional coefficients to its standard error). The first model (top three lines) in each panel provides estimates of the information in *R_TAX* about earnings growth on a stand-alone basis. In both Panels, the regression estimates validate the earnings growth patterns exhibited in Figure 1: *R_TAX* is positively and strongly related to subsequent earnings growth, over one-year (G_1), three-year (G_2), and five-year (G_3) periods, with the estimated coefficients increasing respectively. The estimates of the second model (lines 4–6 from top), which reflect the information in *R_DEF* (deferred tax) about earnings growth, are also consistent with Figure 1: *R_DEF* is unrelated (positively related) to subsequent earnings growth in the pre- (post-) SFAS 109 period. Also consistent with Figure 1, the magnitude and significance of the *R_DEF* coefficients in both panels are substantially smaller than those of the *R_TAX* coefficients.

[24] Note that the average earnings decline of the three lines in year t+1 (the mean earnings across the portfolios in year t+1 is smaller than in year t) is partly due to design: All firms in year t are profitable, whereas in the subsequent five years we allow negative earnings.

[Table 2 about here]

The *t*-statistics in Table 2 are derived from the time-series distributions of the annual coefficients and thus do not directly inform on the ability of *R_TAX* and *R_DEF* to predict earnings growth within each cross-section. To address this issue, we compare the cross sectional R-squared from the *R_TAX* (model 1) and *R_DEF* (model 2) regressions, and find that the average R-squared measures of the *R_TAX* regressions are larger than those of the corresponding *R_DEF* regressions. Moreover, examination of the individual years indicates that these differences are observed consistently over time and are highly significant. For example, when comparing the annual *G1* regressions, R-squared from the *R_TAX* regression is larger than that from the *R_DEF* regression in 26 out of the 28 regressions, and the average difference in R-squared is highly significant (*t*-statistic equal to 8.0).

The third model in each panel (lines 7–9 from top) reflects the incremental information in *R_TAX* and *R_DEF* relative to each other. Interestingly, in both periods, the *R_TAX* coefficients are slightly larger when *R_DEF* is included in the regressions, relative to a stand-alone analysis, whereas the coefficients on *R_DEF* are negative. Since *R_DEF* is a component of *R_TAX*, these results suggest that the other components in *R_TAX* (permanent differences and tax accruals) are at least as relevant as deferred taxes for predicting earnings growth. The fourth model (bottom three lines in each panel) includes all three fundamentals. As expected, *R_CFO* is positively and strongly related to subsequent earnings growth (Sloan 1996). However, the information in *R_CFO* appears largely orthogonal to that in the tax fundamentals, as the coefficients on the tax variables remain essentially unchanged with the introduction of *R_CFO*.

The information in *R_TAX* about earnings growth is not driven by a few individual years. For the one-year earnings growth regression (G_1), for example, the coefficient on *R_TAX* is positive in each of the 28 years examined (1973–2000). The size of the *R_TAX* coefficient, however, is not constant over time: The mean *R_TAX* coefficient in the post-SFAS 109 period is larger than in the pre-SFAS 109 period. Yet, this trend cannot be attributed to SFAS 109, as the coefficients on *R_CFO* are also larger in Panel B than in Panel A. In addition, the annual *R_TAX* coefficients have a strong positive trend within the pre-SFAS 109 period (*p value* = 0.005). Thus, the increase in the tax and cash flow coefficients appears consistent with a general deterioration in the quality of earnings during the late 1980s and 1990s (e.g., Lev and Zarowin 1999), reflecting the increasing importance of earnings quality indicators (such as the tax and cash flow fundamentals) in predicting future earnings.

We next examine whether the information about earnings growth contained in the tax fundamental is incremental to that in established proxies for earnings growth. To this end, we rerun equation (4) with nine control variables (described in the previous section and in footnote to Table 3). Table 3 presents the results of these regressions (for parsimony, the coefficients of the control variables are omitted).[25] The estimates are generally consistent with those reported in Table 2, with the exception that the coefficients and *t*-statistics are generally smaller in Table 3. This is not surprising, given that the control variables reflect certain information on earnings quality (including market-based information). Nevertheless, our main tax fundamental, *R_TAX*, is statistically significant in all the configurations of Table 3, while *R_DEF* is generally insignificant.

[Table 3 about here]

The Tax Fundamentals and the Pricing of Earnings

We next examine whether the capital market pricing of current earnings reflects the information in the tax fundamentals about future earnings. To this end, we run cross-sectional regressions of several models nested in Equation (5), with the contemporaneous earnings-price ratio as the dependent variable. Panel A (Panel B) of Table 4 reports the estimates for the pre- (post-) SFAS 109 period. As expected, *R_CFO* is negatively related to the earnings-price ratio in both periods, suggesting that investors assign a higher valuation to earnings when cash flow is higher. Turning to the tax fundamentals, the coefficients on both *R_DEF* and *R_TAX* are insignificant in the pre-109 period (except when *R_DEF* is run without *R_TAX*). In the post-109

[25] The magnitude and significance of the control variables generally vary across the models. The only exception is the coefficient on the earnings-price ratio which is negative and highly significant in all the regressions.

period, however, both coefficients are negative and significant, but the coefficients of *R_TAX* are larger (in absolute terms) and more significant than those of *R_DEF*. Since *R_DEF* is a component of *R_TAX*, it is evident that the other components in *R_TAX* (permanent differences and tax accruals) were also priced by investors during 1993-2000.

[Table 4 about here]

Similar to the earnings growth analysis (Table 2), the trend in the *R_TAX* annual coefficients cannot be attributed solely to the implementation of SFAS 109, as there is a strong negative trend in the annual coefficients during the pre-109 period (the coefficient on *R_TAX* when all variables are present has a negative trend with *p value* of 0.013 during 1982-1992). We therefore conclude that the forward-looking information in the tax fundamentals was largely ignored by investors in the 1980s, yet was incorporated in prices during the 1990s.

Given the strong positive relation between *R_TAX* and subsequent earnings growth during the 1970s and 1980s (Figure 1, Panel A and Tables 2 and 3, Panel A), the insignificance of *R_TAX* in explaining earnings–price ratios during that period (Table 4, Panel A) is surprising. A possible explanation for this difference in results is sample differences. In particular, the requirement for availability of long-term earnings growth forecasts by analysts (*GROW*) for the earnings–price analysis eliminates all observations for the years 1973–1981, as well as many observations in subsequent years (primarily for small firms with low market-to-book values that are unlikely to be followed by analysts). To examine this explanation we rerun the earnings growth regressions of Tables 2 and 3 using the earnings-price subsample of Table 4. In all cases, we find a positive relation between *R_TAX* and subsequent earnings growth. Thus, the insignificance of *R_TAX* in explaining contemporaneous earnings–price ratios during the 1980s is not due to the sample.[26] Another explanation for the insignificance of the tax fundamentals

[26] The earnings-price and earnings growth regressions also differ in the choice of control variables. In particular, the earnings growth regressions exclude the consensus analysts' long-term earnings growth forecast due to its limited availability. To examine the effect of differences in control variables on the earnings growth regressions, we reestimate Equation (5) with next year's earnings growth (G_1) as the dependent variable instead of the earnings–

during the 1980s, which we examine next, is that investors were largely unaware of the earnings growth implications of the tax-based information during the early sample period.

Tax Fundamentals and Market Efficiency

We have documented above that *R_TAX* predicted earnings growth throughout the sample period (1973–2000), but that this information was reflected in contemporaneous stock prices only during the 1990s. If investors overlooked the future earnings implications of tax disclosures during the early sample period, *R_TAX* should have been positively associated with *subsequent* stock returns during that period, as investors gradually observed the realization of the earnings growth. Furthermore, although the earnings–price estimates in Table 4 indicate that during the 1990s investors used the *R_TAX* (or correlated) information in setting prices, these regressions cannot reveal whether *all* of the forward-looking information in *R_TAX* was incorporated in contemporaneous prices. Therefore, we now examine the relationship between the tax fundamentals and *subsequent* stock returns in each of the sample sub-periods.

Table 5 reports estimates from cross-sectional regressions nested in Equation (6), which examines the relationship between the fundamentals and subsequent stock returns, along with control variables. As shown, the *R_TAX* coefficient is positive and significant in the pre-SFAS 109 period (Panel A) both before and after the inclusion of *R_DEF* and *R_CFO*, consistent with the estimates in Panel A of Table 4 which indicate that the tax information is not captured in contemporaneous stock prices. The abnormal return differential between high and low *R_TAX* firms in Panel A is approximately 5.6 percent (the product of the *R_TAX* coefficient and the difference between the values of *R_TAX* for the high and low portfolios, namely $0.014 \times [5 - 1]$), compared with 6.4 percent abnormal return for *R_CFO* ($= 0.016 \times [5 - 1]$).

[Table 5 about here]

Table 5, Panel B, presents the results for the post-SFAS 109 period. The coefficients on the tax fundamentals are insignificant in each of the four sets of cross-sectional regressions,

price ratio. We find that *R_TAX* is positive and highly significant, indicating that specification issues are not responsible for the difference between the earnings-price and earnings growth results.

suggesting that during the 1990s stock prices fully reflected the information in *R_TAX* and *R_DEF* about future earnings. However, a closer look at the 1990s' annual regressions reveals an intriguing finding. The insignificance of the *R_TAX* coefficient in Panel B of Table 5 is largely due to a single year—1998—where the coefficient of *R_TAX* is negative and large. The subsequent-year returns for 1998 (the dependent variable) span the period May 1999 through April 2000—the height of the stock market bubble.[27] As shown in Table 6, Panel A, eliminating 1998 from the 1993-2000 period results in a positive and significant *R_TAX* coefficient, though its magnitude is relatively small.

Penetrating deeper into the recent sample period: The stock market bubble of the late 1990s was particularly manifested in high-growth firms with low earnings–price ratios, which typically pay little if any income taxes. These unusual observations may have induced a negative correlation between *R_TAX* and subsequent stock returns. To examine this conjecture, we rerun Equation (6) excluding firms with low earnings–price ratios (in Table 6, Panel B), and high long-term earnings growth forecasts (in Panel C).[28] In both cases we find that the coefficient of *R_TAX*, relating the tax fundamental to future returns, is positive and significant. Thus, it appears that the insignificance of *R_TAX* in the post-SFAS 109 period is due to the stock market bubble of the late 1990s. We therefore conclude that while market efficiency with respect to taxable income information clearly improved over the sample period (the results in Tables 4 and 5), not all of the forward-looking information in the tax fundamentals was captured in contemporaneous stock prices in the 1990s.

[Table 6 about here]

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[27] Liu et al. (2003) find that during 2000 stock prices deviated from fundamentals more than in any of the other years in their sample which covers the period 1987-2002.

[28] Specifically, each year we exclude all firms with earnings-price ratios (long-term earnings growth) in the lower (upper) quartile of the cross-sectional distribution, reconstruct the fundamentals (i.e., rank the fundamentals and form portfolios using the subsamples that exclude low earnings-price or high growth firms), and rerun the regressions.

VII. ROBUSTNESS CHECKS

Measurement Errors in the Taxable Income Estimate

In Section III we discussed sources of measurement error in the taxable income estimate (1). In particular, the assumption of cross-sectionally constant average tax rate may not hold due to differences between U.S. and foreign tax rates. In addition, the reported current tax expense from which we derive the estimate of taxable income does not reflect the tax benefits from the exercise of nonqualified employee stock options (ESOs), and is reported net of tax cushions and tax credits. The following four procedures were used to evaluate the robustness of our findings to these error sources: (1) we use an alternative estimate of taxable income, (2) we exclude from the sample firms with substantial amounts of foreign income, (3) we partition the sample into industries where stock options are less likely and more likely to affect the results, and (4) we exclude firms with large R&D expenditures or investment tax credits, to check for measurement errors due to the deduction of tax credits from current income taxes.

Our alternative estimate of taxable income is calculated as follows:

$$\text{Taxable Income} = \frac{\text{income taxes paid} + \Delta\,\text{accrued income taxes}}{t}\,. \qquad (7)$$

Income taxes paid (reported by companies at the bottom of the cash flow statement, or in the footnotes) is measured as Compustat data item #317. The annual change (Δ) in accrued income taxes (#305) is the amount reported in the operating section of the cash flow statement. Relative to our primary taxable income estimate (1), the alternative (7) has two advantages: It reflects the tax benefits from the exercise of nonqualified ESOs, and it is not affected by tax cushion reserves. However, the estimate (7) has two shortcomings: It contains measurement error because it is based on income taxes paid during the year (including payments applicable to prior years), and the cash flow statement information required to calculate this estimate has only been available since 1988. Rerunning our analyses with estimate (7) rather than (1), we find that none of our inferences discussed above is affected, although the coefficients on *R_TAX* in the various regressions are slightly smaller and less (but still) significant. Thus, it appears that measurement error due to the inclusion of prior-years' tax payments in estimate (7) distorts the information in the taxable income estimate more than the omission of tax benefits from employee stock options and the inclusion of tax cushions in estimate (1).[29]

To further examine the potential effect of measurement error in estimate (1) due to the absence of tax benefits from the exercise of ESOs, we partition the sample to industries where ESOs are relatively immaterial, to be compared with industries where options play an important role. Based on the evidence in Huson et al. (2001, p. 597, Table 1), we identify the sample firms from industries with SIC codes 30–39 and 70–89 as having a potentially large tax benefit from the exercise of options ("large-option benefits sample"), and all other sample firms as less likely to have significant tax benefits from options ("small-option benefits sample"). Rerunning the regressions, we find that the ability of *R_TAX* to predict future earnings growth is similar for the two subsamples, but that the information in *R_TAX* about future earnings is impounded in the stock prices of "large-option benefits" firms in a more timely manner than in "small options benefits" firms. That is, *R_TAX* has a stronger relationship with contemporaneous earnings–price ratios, and consequently a weaker relation with subsequent returns, for large-option firms than for small-option companies. Apparently, investors in high-growth industries (overlapping with large-option firms), which are often characterized by low earnings quality, pay more attention to earnings quality indicators such as taxable income. Furthermore, for firms in such industries, the mere existence of some taxable income may provide a strong signal with respect to earnings growth.

Another source of measurement error in our estimate of taxable income (1) arises from the use of the U.S. federal tax rate in converting the current portion of the income tax expense to estimated taxable income. For multinational firms, the current portion of the income tax expense

[29] Alternatively, it could be that the measurement error in the taxable income estimate (1) due to omission of tax benefits from the exercise of ESOs actually improves the information in *R_TAX*. This may be the case because pretax earnings do not reflect the cost of option grants (during our sample period, essentially all firms used the intrinsic value method in accounting for ESO grants). In other words, the overstatement of the taxable income estimate (due the use of overstated current taxes) may offset the overstatement of reported earnings (due to the omission of the cost of option grants).

includes foreign taxes, which are generally based on different rates than the U.S. rate. To assess the effect of this source of measurement error, we rerun the analyses excluding firms with relatively large amounts of foreign income. Specifically, we exclude from the sample firm-year observations for which the ratio of the absolute value of "pretax income-foreign" (#273) to the sum of that amount and the absolute value of "pretax income-domestic" (#272) exceeds 20 percent. We find that the estimates from the sample excluding firms with large foreign income are similar to those from the full sample, indicating that measurement error in estimated taxable income due to differences between foreign and U.S. tax rates do not have a significant effect on our inferences.

Finally, to assess the potential effects of measurement error in our taxable income estimate (1) due to R&D and investment tax credits, we rerun the analysis excluding from the sample in each year firms with ratios of R&D expenditures (#46), or investment tax credit (income account, #51) to total revenues in the upper quartile of the distribution.[30] We find that removing these firms from the sample generally increases the significance of *R_TAX* relative to the various analyses reported earlier. In particular, the *R_TAX* coefficient from the subsequent stock return regressions of Equation (6) for the post-SFAS 109 period is now positive and highly significant (this coefficient is insignificant for the total sample, see Table 5, Panel B). This result provides further support for the inference that market prices did not fully reflect the forward-looking information in the tax fundamental even in the 1990s.[31]

Measurement Error in Cash from Operations

In the primary analysis, we measured cash from operations as the difference between earnings and accruals, and followed Sloan (1996) by measuring accruals as the annual change in balance sheet items. Collins and Hribar (2002) argue that the balance sheet approach to measuring accruals introduces an error into the accrual estimates (and therefore into cash from

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[30] Missing values of R&D or investment tax credit were set to zero.

[31] We also ran the analysis adjusting current income taxes directly for the investment tax credit and found unchanged results.

operations), primarily due to mergers and acquisitions and discontinued operations. As a robustness check, we reestimate all the regressions that involve *R_CFO*, measuring cash from operations directly from the statement of cash flows (Compustat #308). As this data item is available from Compustat only since 1988, we focus on the post SFAS 109 period. We find that the regression estimates with the new measure of cash flow are very similar to those reported in Section VI.

To assure that we allow cash from operations to compete with taxable income on equal grounds, we deflated both variables in the primary analysis by net income. As noted in footnote 17, this approach implies that *R_CFO* reflects both cash flow and accruals information. However, prior studies that examine accruals (cash from operations) typically use average total assets (stock price) as the deflator (e.g., Sloan 1996, Desai et al., 2002). Accordingly, we rerun all the analyses using two alternative ratios instead of cash flow-to-net income: (1) accruals-to-average assets, or (2) cash flow-to-price. In both cases, we obtained results similar to those reported above.

Controlling for Cash from Operations Using a Portfolio Approach

In the primary analysis, we examine the incremental information in the tax fundamental over cash flow in a regression context. To provide further evidence, we perform a portfolio analysis similar to that of Collins and Hribar (2000), which was aimed at distinguishing the accruals anomaly from the post-earnings announcement drift. Specifically, in each sample year we partition the observations by quintiles on both the tax and cash flow dimensions, and calculate the subsequent-year abnormal stock returns for the following portfolios:[32]

1) Low *R_CFO* and Low *R_TAX*
2) Low *R_CFO* and High *R_TAX*
3) High *R_CFO* and Low *R_TAX*
4) High *R_CFO* and High *R_TAX*

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[32] Abnormal stock returns are measured as the residual from cross-sectional regressions of raw returns on an intercept, market beta, book-to-market ratio, and firm size.

Where "low" and "high" (R_CFO or R_TAX) refer to the lowest and highest quintiles, respectively. The time series means of the portfolios' subsequent abnormal returns are:

	High *R_TAX*	Low *R_TAX*
High *R_CFO*	3.5%	0.2%
Low *R_CFO*	–0.6%	–6.2%

Thus, similar to the regression findings in Section VI, the results of this portfolio analysis suggest that both *R_CFO* and *R_TAX* provide incremental information relative to each other about future stock returns.

Transitory Earnings

Research has documented a substantial increase in the frequency and magnitude of negative special items in the late 1980s and 1990s (e.g., Elliott and Hanna 1996). As the fundamentals *R_TAX* and *R_CFO* are measured relative to net income, the special items trend may have affected the future earnings and value implications of these fundamentals. Accordingly, we rerun all the previous analyses excluding firms with large negative values for the sum of Compustat's "special items" and "nonoperating income/expense excluding interest."[33] In all cases, we obtained similar results to those reported above and hence conclude that the effect of special items on our findings is of secondary order.

Total Earnings versus Earnings per Share

In the primary analysis, we have focused on predicting growth in total earnings. However, such growth is less relevant to existing shareholders when it is associated with an increase in the number of outstanding shares. In particular, if the percentage growth in the number of shares is greater than that of total earnings, earnings per share will decline. This situation often occurs following mergers and acquisitions, which result in large earnings increases and comparable or even larger increases in outstanding shares. To address this concern,

[33] Specifically, each year we exclude all firms with transitory items in the lower quartile of the cross-sectional distribution, reconstruct the fundamentals (i.e., rank the fundamentals within each industry and form portfolios using the subsamples that exclude transitory earnings firms), and rerun the regressions.

we rerun the earnings-growth analysis (Equation (4)) substituting earnings per share (basic, excluding extraordinary items, #58) for total earnings, and deflate EPS by total assets per share as of the end of the current year (both variables adjusted for stock splits and stock dividends). The results of this test are similar to those of the primary analysis, suggesting that share transactions have little impact on our estimates. As an additional check for the effect of mergers and acquisitions, we rerun Equation (4) excluding firms whose total assets increased annually by 20 percent or more (highly likely as a result of mergers), and again find qualitatively similar results to those reported in Table 2.

Transformations of Variables

Influential observations are a potential concern in any analysis that involves accounting numbers, especially when expressed in ratios. In the primary analysis, we dealt with this issue by deleting outliers and measuring the fundamentals (*R_TAX*, *R_DEF*, and *R_CFO*) by industry ranks. We now examine the potential impact of outliers by rerunning the analyses using: (1) the actual values of TAX, DEF, and CFO instead of the industry ranks, and (2) by running rank regressions (i.e., measuring all the regression variables in ranks). In both cases, we find the results to be generally consistent with those reported above, indicating that influential observations and our procedures for handling them do not seem to have an appreciable impact on our findings.

VIII. SUMMARY AND CONCLUSIONS

This study examines the information in estimated taxable income about equity values and future earnings growth, incremental to cash flows and other growth control variables. The results indicate that the ratio of tax-to-book income predicts earnings growth for up to five years ahead, both before and after the implementation of SFAS 109 in 1993, with a general increase over time in predictive ability. For the early sample period (1973-1992), the taxable income information is not reflected in contemporaneous stock prices and consequently is strongly related to subsequent stock returns. However, for the recent sample period (1993-2000), the ratio of tax-to-book income is strongly related to contemporaneous earnings-price ratios, and only weakly related to subsequent stock returns. It appears, therefore, that during the 1990s investors became increasingly adept at using the forward-looking information in taxable income (or correlated information) in securities valuation. Perhaps, the increasing gap in the 1990s between taxable and reported income alerted investors to the information embedded in the former about the quality of the latter.

We extend prior research on several dimensions. First, we construct and analyze a comprehensive tax-based fundamental which captures the three underlying tax components: temporary differences, permanent differences, and tax accruals, while most previous studies have focused on one of these components (for example, Hanlon (2004) demonstrates the ability of deferred taxes to predict next year earnings). Second, we examine the information in the tax fundamental about earnings growth of up to five years ahead, while prior studies have either focused on the prediction of near-term earnings or used price as a proxy for expected earnings. Third, we examine market efficiency with respect to the tax-based information over an extended period of 28 years. Fourth, we compare the predictive-ability of our tax indicator with that of deferred taxes, which was the focus of much recent research, and find that the comprehensive indicator is superior to deferred taxes in predicting earnings growth. We also demonstrate that the predictive ability of the tax fundamental is incremental to that of cash flow, accruals, and various other variables that have been shown to predict earnings growth. Finally, we document changes over time in the future earnings implications of the tax-based information as well as in the market response to this information.

From a policy perspective, our findings suggest the consideration of a requirement that public companies disclose their taxable income. This issue was commented on favorably by the Senate Joint Committee on Taxation (2003) in its investigation of Enron. The fact that corporate taxable income plays an important role in macroeconomic statistics adds weight to this disclosure recommendation. For example, in the absence of firm-specific taxable income data, the Bureau of Economic Analysis estimates "corporate profits" (a key indicator in the National

Income and Product Accounts) from *aggregate* taxable income data obtained from the IRS. Firm-specific taxable income information may, therefore, improve both investor and policymakers' decisions. Of course, our recommendation is based on a partial analysis of one aspect of the public disclosure of taxable income (the prediction of earnings growth). A comprehensive analysis of this issue should consider possible costs to the disclosing companies, and perhaps the effects of such disclosure on the integrity of tax compliance.

APPENDIX
Taxable Income and Future Earnings – Further Discussion and Demonstrations

This appendix elaborates on and demonstrates the arguments made in Section III regarding the potential information in taxable income about future earnings growth.

Incentives to Smooth Taxable Income

The incentives to smooth taxable income are related to the convexity of the present value of income taxes in taxable income, which is due to: (1) progressive tax schedules, (2) provisions of the alternative minimum tax and the investment tax credit, and (3) the asymmetry in the tax treatment of income and losses (delays in obtaining the tax benefits associated with losses and the expiration of unexploited tax losses). This convexity implies that firms will smooth taxable income over time because, according to the Jensen inequality, the expected value of a convex transformation (present value of income taxes) of a random variable (taxable income) is larger than the value of the transformation applied to the expected value of the variable. That is, holding the average level over time of taxable income constant, the lower the volatility of taxable income, the lower the present value of income taxes. Figure 2 provides a two-period demonstration of this argument. Graham and Smith (1999) provide further discussion and empirical evidence on this issue.

[Figure 2 about here]

Taxable Income and Expected Earnings Changes

Let E^R denote reported earnings, E^U denote unmanaged earnings, and E^M denote the effect of earnings management on reported earnings. Thus,

$$E^R = E^U + E^M. \qquad \text{(A.1)}$$

Unmanaged earnings, in turn, consist of a permanent component (E^P) and a periodic economic shock to earnings (E^S). Substituting these two components into (A.1) yields the following:

$$E^R = E^P + E^M + E^S.$$

Note that if firms smooth earnings,

$$\text{Cov}(E^M, E^S) < 0.$$

Similarly, reported taxable income (T^R) consists of a permanent (T^P), periodic economic shock (T^S) and managed (T^M) components:

$$T^R = T^P + T^M + T^S.$$

We are interested in the extent to which a comparison of reported taxable income (T^R) with reported earnings (E^R) may inform on future earnings changes, that is, on $E^P - E^R$. Note that,

$$T^R - E^R = T^P + T^M + T^S - E^R = (T^P - E^P) + (T^M + T^S) + (E^P - E^R).$$

If, over the long run, taxable income and earnings are similar (i.e., abstracting from permanent differences), $T^P = E^P$, and therefore:

$$\underbrace{T^R - E^R}_{\text{current indicator of future earnings changes}} = \underbrace{T^M + T^S}_{\text{unobserved measurement error}} + \underbrace{E^P - E^R}_{\text{expected earnings change based on all (public and private) information}} \quad \text{(A.2)}$$

Examination of relationship (A.2) yields the following observations. First, the only requirement for $T^R - E^R$ (taxable income minus reported income) to inform on future earnings changes is that the unobserved measurement error $T^M + T^S$ is not equal to $-(E^P - E^R)$ in all states of nature. But $-(E^P - E^R) = E^M + E^S$. Thus, taxable income will inform on future earnings growth as long as shocks to taxable income and the managed component of taxable income are not exactly identical to their earnings counterparts (earnings shocks and earnings management, respectively). This supports two arguments made in Section III: (1) taxable income informs on earnings growth because the means and motivations for managing taxable income are generally different from those of managing earnings (thus $T^M \neq E^M$); and (2) due to differences between GAAP and the tax code, transitory effects on taxable income are different from those affecting earnings (i.e., $T^S \neq E^S$). More generally, the information in $T^R - E^R$ about future earnings decreases in the correlation between $T^M + T^S$ and $E^M + E^S$. That is, taxable income is more informative about future earnings if it reflects different economic shocks and is being managed differently from reported earnings.

The second observations from (A.2) is that, all else equal, the information in $T^R - E^R$ (tax relative to book income) decreases in the variance of $T^M + T^S$, which in tum decreases in the extent to which taxable income is smoothed (since smoothing implies that $\text{Cov}(T^M, T^S) < 0$). At the extreme, perfect smoothing of taxable income implies that $T^M = -T^S$, so $T^R - E^R = E^P - E^R$, and thus $T^R - E^R$ is a perfect indicator of future earnings changes.

The above two observations also demonstrate the potential advantages of taxable income over cash flow in predicting future earnings. If the motivations for managing cash flow are similar to those of managing earnings, or if cash flows are more likely than taxable income to contain transitory items, or are less likely to be smoothed, taxable income will provide incremental information about future earnings growth even after controlling for the information in cash flows and accruals, as our evidence indeed indicates.

Finally, we note that the existence of permanent book–tax differences does not change any of the above observations. Permanent differences may either strengthen or weaken the information in $T^R - E^R$, depending on their variability and correlations with $T^M + T^S$ and $E^P - E^R$.

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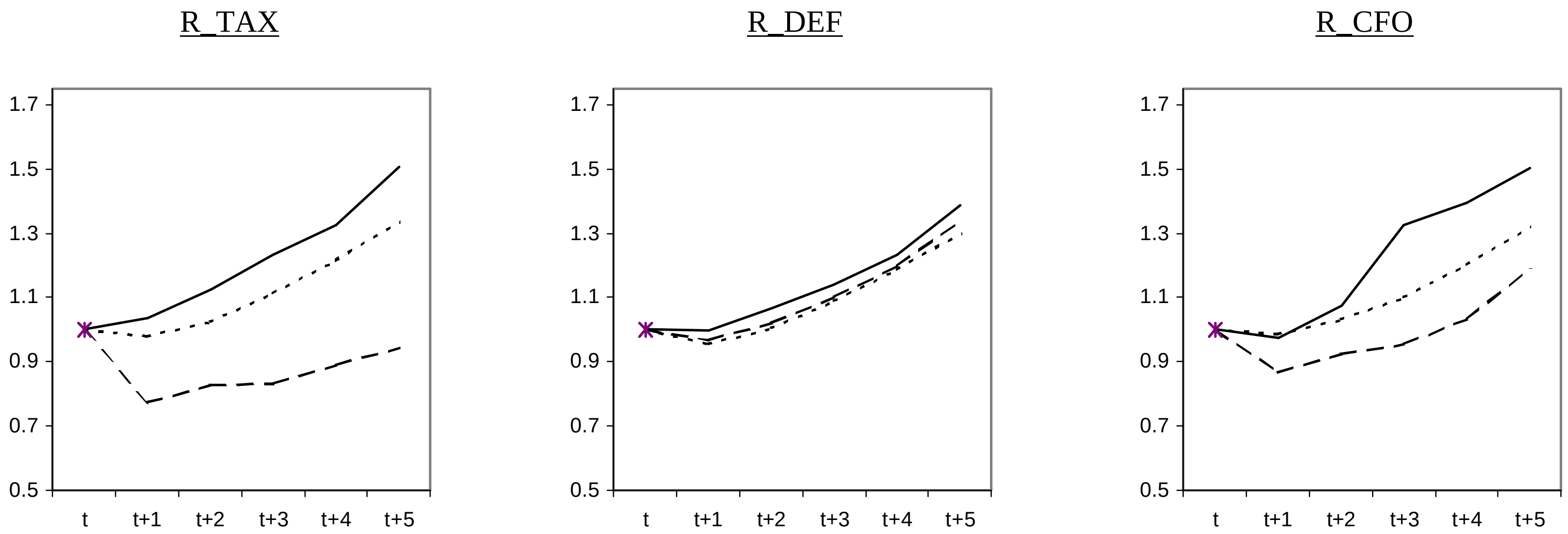
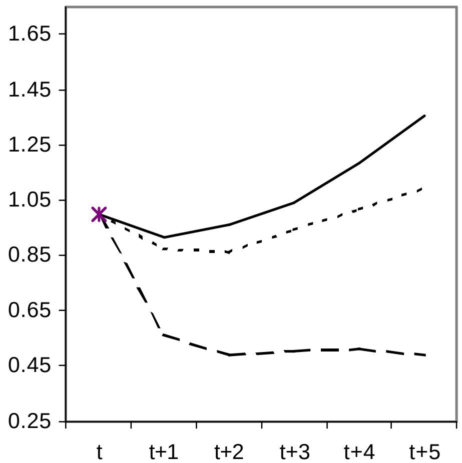
FIGURE 1
Five-Year Earnings Growth
for Portfolios of Firms Sorted by Tax and Cash Flow Fundamentals

Panel A: Pre-SFAS 109 (1973–1992)

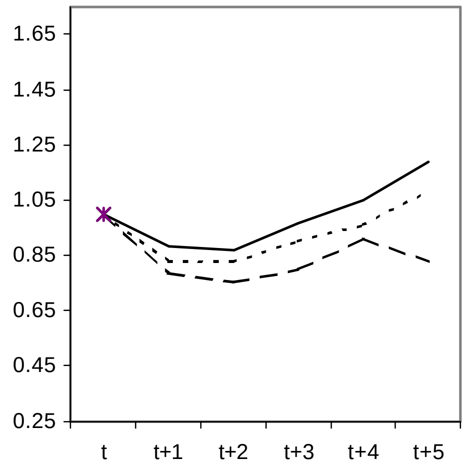


Panel B: Post-SFAS 109 (1993–2000)

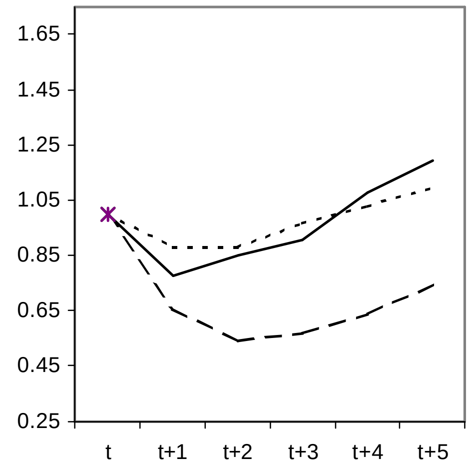
R_TAX



R_DEF

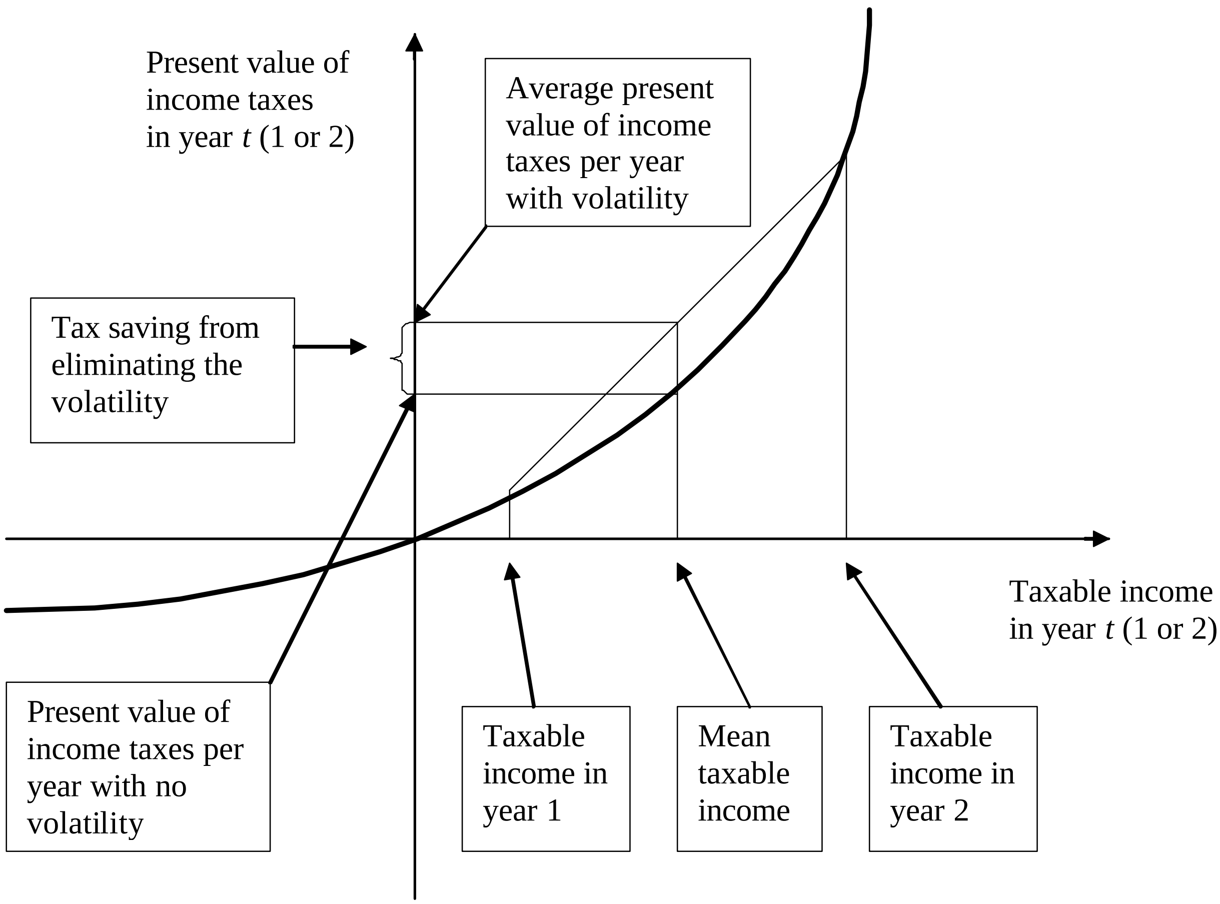


R_CFO



Each figure presents the average cumulative earnings growth from year *t* to year *t* + *j* (*j* = 1, 2, …, 5) for three portfolios: High values for the fundamental (continuous line), normal values (dotted line), and low values (dashed line). The title of each figure identifies the fundamental used to construct the portfolios. R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amount of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, and CFO is calculated as the ratio of cash from operations to net income.

FIGURE 2
The Convexity of Income Taxes and the Smoothing of Taxable Income



This figure provides a two-period illustration of the argument that the convexity of the present value of income taxes in taxable income implies that firms may benefit from smoothing their taxable income. As shown, if instead of reporting a volatile taxable income over time ("taxable income in year 1" and "taxable income in year 2") the firm reports the same amount of taxable income each year ("mean taxable income"), then the present value of income taxes per year (the value of the tax function for "mean taxable income") will be smaller than the average of the present values of income taxes in years 1 and 2 (the mean of the values of the tax function for "taxable income in year 1" and "taxable income in year 2").

TABLE 1
Characteristics of Firms Sorted by Tax and Cash Flow Fundamentals

Panel A: Full sample

	R_TAX			R_DEF			R_CFO		
	1 (low)	2-4	5 (high)	1 (low)	2-4	5 (high)	1 (low)	2-4	5 (high)
Common-size income statement:									
Sales	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cost of goods sold	68.22%	66.46%	66.62%	66.24%	67.13%	66.37%	67.20%	65.94%	69.28%
SG&A expense	17.94%	16.90%	18.40%	16.36%	17.23%	18.89%	18.87%	17.10%	16.84%
Depreciation and amortization	4.94%	4.30%	3.80%	4.63%	4.33%	4.01%	3.07%	4.31%	5.61%
Operating income	8.90%	12.33%	11.18%	12.77%	11.31%	10.73%	10.86%	12.65%	8.27%
Interest expense	3.37%	2.37%	2.16%	2.42%	2.64%	2.21%	2.52%	2.24%	3.42%
Other income	1.32%	0.89%	0.73%	1.04%	0.93%	0.86%	0.91%	0.91%	1.04%
Special items	0.23%	0.08%	–0.23%	0.24%	0.06%	–0.16%	0.04%	0.08%	–0.05%
Deferred taxes	1.01%	0.57%	–0.24%	2.10%	0.41%	–0.77%	0.38%	0.56%	0.43%
Current taxes	0.32%	3.15%	4.32%	2.18%	2.81%	3.65%	2.59%	3.32%	1.58%
Earnings	5.75%	7.21%	5.44%	7.35%	6.45%	6.34%	6.33%	7.53%	3.83%
Common-size balance sheet:									
Current assets	44.19%	46.27%	50.86%	43.30%	46.57%	50.80%	53.96%	46.11%	41.93%
PP&E	33.44%	33.24%	28.88%	35.96%	32.35%	29.30%	25.15%	33.39%	36.45%
Other assets	22.37%	20.50%	20.26%	20.74%	21.09%	19.91%	20.89%	20.51%	21.62%
Total assets	100%	100%	100%	100%	100%	100%	100%	100%	100%
Income taxes payable	0.54%	1.37%	1.95%	1.11%	1.26%	1.77%	1.08%	1.48%	1.07%
Other current liabilities	21.56%	20.01%	22.50%	20.21%	20.53%	22.18%	22.84%	19.78%	22.03%
Deferred tax liability	2.74%	3.15%	2.44%	4.56%	2.68%	2.19%	1.90%	3.17%	3.20%
Other liabilities (primarily debt)	31.10%	25.74%	24.49%	26.40%	27.22%	24.22%	26.36%	25.09%	31.17%
Common equity	44.07%	49.73%	48.61%	47.73%	48.31%	49.65%	47.82%	50.49%	42.54%
Total liabilities and equity	100%	100%	100%	100%	100%	100%	100%	100%	100%
Other characteristics:									
Asset turnover	1.1680	1.2510	1.3526	1.1918	1.2494	1.3363	1.2801	1.2616	1.2106
Assets (in Millions of $)	1085.2	1686.8	1635.5	1372.4	1663.9	1444.1	1111.9	1670.8	1669.5
TAX	–0.0074	0.6554	1.4520	0.3990	0.6596	1.0577	0.6750	0.6802	0.7182
DEF	–0.0090	–0.0053	0.0032	–0.0207	–0.0035	0.0090	–0.0034	–0.0049	–0.0034
CFO	2.4609	1.6860	2.4971	1.7277	1.9996	2.1948	–1.6117	1.5529	6.8599
Book/Price	1.0188	0.8398	0.8835	0.8170	0.8972	0.8901	0.8751	0.8140	1.1041
Earnings/Price	0.1003	0.1041	0.0963	0.1049	0.1016	0.0999	0.0991	0.1071	0.0877
Size (log of market cap)	11.153	12.034	11.873	12.000	11.801	11.826	11.277	12.119	11.500
Beta	1.1064	1.0797	1.0865	1.1190	1.0742	1.0931	1.1190	1.0779	1.0819
Volatility	0.1324	0.1050	0.1083	0.1098	0.1104	0.1120	0.1260	0.1045	0.1163
Earnings growth forecasts	0.1736	0.1647	0.1614	0.1707	0.1622	0.1689	0.1879	0.1630	0.1541

Panel B: Statistics for tax fundamentals by tax and accounting regimes

	R_TAX			R_DEF			R_CFO		
	1 (low)	2-4	5 (high)	1 (low)	2-4	5 (high)	1 (low)	2-4	5 (high)
1973–1978 (pre-SFAS 109, *t* = .48):									
TAX	0.1038	0.6619	1.1303	0.4262	0.6595	0.8373	0.6611	0.6694	0.5749
DEF	–0.0107	–0.0056	0.0004	–0.0195	–0.0043	0.0050	–0.0044	–0.0057	–0.0050
1979–1986 (pre-SFAS 109, *t* = .46):									
TAX	–0.1561	0.4814	1.1335	0.2645	0.4783	0.7496	0.4578	0.5242	0.4076
DEF	–0.0125	–0.0095	0.0000	–0.0282	–0.0067	0.0065	–0.0072	–0.0092	–0.0058
1987 (pre-SFAS 109, *t* = .40):									
TAX	0.0208	0.6652	1.5546	0.4387	0.6741	1.1426	0.6875	0.7183	0.7563
DEF	–0.0076	–0.0043	0.0055	–0.0195	–0.0025	0.0114	–0.0020	–0.0033	–0.0030
1988–1992 (pre-SFAS 109, *t* = .34):									
TAX	0.0570	0.7870	1.8997	0.5193	0.7936	1.4580	0.8719	0.8126	1.0479
DEF	–0.0053	–0.0014	0.0066	–0.0136	–0.0004	0.0118	–0.0001	–0.0007	–0.0004
1993-2000 (post SFAS 109, *t* = .35):									
TAX	0.0140	0.7410	1.7192	0.4329	0.7555	1.2704	0.7782	0.7568	0.9254
DEF	–0.0067	–0.0035	0.0062	–0.0188	–0.0018	0.0126	–0.0011	–0.0027	–0.0017

The numbers reported in each cell are the time series mean of the portfolio (cross-sectional) means. R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amount of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. The number of observations varies across characteristics (but not within each common size statement).

TABLE 2
Cross-sectional Regressions of Future Earnings Growth on Tax and Cash Flow Fundamentals

$$G = a_{indu} + b_1 R\_TAX + b_2 R\_DEF + b_3 R\_CFO + e$$

Panel A: Pre-SFAS 109 (1973-1992)

G	*Mean b_1*	*t-stat b_1*	*Mean b_2*	*t-stat b_2*	*Mean b_3*	*t-stat b_3*	*Mean R^2*	*Mean N*
G1	0.354	10.364					0.093	1,144
G2	0.461	12.499					0.105	1,028
G3	0.545	15.253					0.116	918
G1			0.030	1.011			0.086	1,144
G2			0.039	0.928			0.096	1,028
G3			0.026	0.524			0.107	918
G1	0.394	10.312	–0.119	–4.553			0.095	1,144
G2	0.513	11.420	–0.148	–3.179			0.107	1,028
G3	0.612	14.610	–0.196	–3.784			0.119	918
G1	0.406	11.225	–0.120	–4.409	0.183	4.539	0.099	1,144
G2	0.524	11.943	–0.147	–3.113	0.266	6.479	0.112	1,028
G3	0.618	14.460	–0.197	–3.733	0.177	4.026	0.121	918

Panel B: Post SFAS 109 (1993-2000)

G	*Mean b_1*	*t-stat b_1*	*Mean b_2*	*t-stat b_2*	*Mean b_3*	*t-stat b_3*	*Mean R^2*	*Mean N*
G1	0.534	8.531					0.078	1,583
G2	0.599	11.739					0.063	1,350
G3	0.779	7.013					0.064	1,112
G1			0.175	2.094			0.071	1,583
G2			0.184	2.763			0.055	1,350
G3			0.190	2.546			0.054	1,112
G1	0.568	9.370	–0.079	–0.918			0.080	1,583
G2	0.639	9.796	–0.093	–1.172			0.063	1,350
G3	0.855	7.145	–0.178	–2.794			0.065	1,112
G1	0.565	9.499	–0.071	–0.841	0.334	3.877	0.086	1,583
G2	0.640	9.976	–0.080	–1.013	0.395	4.734	0.068	1,350
G3	0.849	7.012	–0.158	–2.779	0.296	6.155	0.066	1,112

G_1 – G_3 are alternative measures of subsequent earnings changes, divided by the current level of total assets and expressed in percentage form. G_1 is measured as subsequent year earnings minus current earnings, G_2 is average earnings in the subsequent three years minus current earnings, and G_3 is average earnings in the subsequent five years minus current earnings. a_{indu} is an industry fixed effect (two digit SIC code). R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amount of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. The *t*-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error.

TABLE 3
Cross-sectional Regressions of Future Earnings Growth on Tax and Cash Flow Fundamentals, Controlling for Common Predictors of Earnings Growth

$$G = a_{indu} + b_1 R\_TAX + b_2 R\_DEF + b_3 R\_CFO + \sum_{j=1}^{9} g_j PRED_j + e$$

Panel A: Pre-SFAS 109 (1973-1992)

G	*Mean b_1*	*t-stat b_1*	*Mean b_2*	*t-stat b_2*	*Mean b_3*	*t-stat b_3*	*Mean R^2*	*Mean N*
G1	0.160	4.905					0.175	871
G2	0.192	3.833					0.200	792
G3	0.223	5.166					0.210	715
G1			0.036	1.300			0.173	871
G2			0.045	1.340			0.197	792
G3			0.063	1.423			0.209	715
G1	0.174	4.671	–0.033	–1.085			0.176	871
G2	0.203	3.463	–0.030	–0.726			0.202	792
G3	0.230	4.183	–0.023	–0.418			0.212	715
G1	0.172	4.648	–0.028	–0.904	0.198	6.871	0.181	871
G2	0.199	3.405	–0.023	–0.563	0.224	6.364	0.205	792
G3	0.222	4.016	–0.012	–0.224	0.201	5.069	0.214	715

Panel B: Post SFAS 109 (1993-2000)

G	*Mean b_1*	*t-stat b_1*	*Mean b_2*	*t-stat b_2*	*Mean b_3*	*t-stat b_3*	*Mean R^2*	*Mean N*
G1	0.278	4.454					0.144	1,019
G2	0.333	5.448					0.125	875
G3	0.495	10.993					0.105	746
G1			0.170	2.143			0.143	1,019
G2			0.238	5.601			0.124	875
G3			0.164	2.308			0.101	746
G1	0.247	3.653	0.063	0.722			0.146	1,019
G2	0.270	2.941	0.127	1.738			0.126	875
G3	0.524	8.044	–0.055	–0.618			0.106	746
G1	0.251	3.783	0.062	0.709	0.186	1.881	0.150	1,019
G2	0.275	3.163	0.128	1.794	0.250	2.616	0.130	875
G3	0.516	6.442	–0.040	–0.427	0.322	3.587	0.109	746

G_1 – G_3 are alternative measures of subsequent earnings changes, divided by the current level of total assets and expressed in percentage form. G_1 is measured as subsequent year earnings minus current earnings, G_2 is average earnings in the subsequent three years minus current earnings, and G_3 is average earnings in the subsequent five years minus current earnings. a_{indu} is an industry fixed effect (two digit SIC code). R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amount of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. PRED1 through PRED9 are the following predictors of earnings growth: The ratio of earnings to total assets; the current period earnings change divided by total assets; the average changes in earnings over the last three and five years deflated by total assets; the ratio of dividends to total assets; the ratios of R&D and capital expenditures to sales; the earnings-price ratio; and the book-to-market ratios. The *t*-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error.

TABLE 4
Cross-sectional Regressions of Earnings–Price Ratios on Tax and Cash Flow Fundamentals and Control Variables

$$E/P^* = a_{indu} + b_1\,GROW + b_2\,LNTA + b_3\,BETA + b_4\,VOL + b_5\,LEV + b_6\,PAY + b_7\,R\_TAX + b_8\,R\_DEF + b_9\,R\_CFO + e$$

Panel A: Pre-SFAS 109 (1982-1992)

	GROW	*LNTA*	*BETA*	*VOL*	*LEV*	*PAY*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–13.752	0.347	–0.216	4.867	1.335	–2.185	–0.083			0.380	535
t-statistic	–10.783	4.244	–0.815	2.022	4.627	–9.407	–1.364				
Mean coefficient	–13.643	0.359	–0.256	5.599	1.181	–2.156		–0.114		0.378	535
t-statistic	–11.527	4.245	–0.977	2.305	4.276	–9.799		–3.500			
Mean coefficient	–13.772	0.358	–0.204	5.715	1.466	–2.145	–0.061	–0.070		0.385	535
t-statistic	–10.832	4.259	–0.772	2.525	4.833	–9.527	–0.731	–1.145			
Mean coefficient	–14.421	0.363	–0.176	6.153	1.728	–2.059	–0.063	–0.077	–0.222	0.392	535
t-statistic	–10.819	4.312	–0.686	2.694	5.515	–9.208	–0.814	–1.350	–8.400		

Panel B: Post SFAS 109 (1993-2000)

	GROW	*LNTA*	*BETA*	*VOL*	*LEV*	*PAY*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–14.938	–0.329	–0.343	7.294	2.599	–1.795	–0.288			0.328	911
t-statistic	–14.370	–2.437	–2.439	4.221	2.920	–9.192	–11.349				
Mean coefficient	–15.015	–0.343	–0.327	8.314	2.656	–1.766		–0.259		0.326	911
t-statistic	–14.109	–2.496	–2.288	4.870	2.995	–9.589		–5.960			
Mean coefficient	–14.935	–0.334	–0.326	7.732	2.586	–1.751	–0.213	–0.145		0.331	911
t-statistic	–14.340	–2.448	–2.314	4.513	2.930	–9.224	–8.520	–2.994			
Mean coefficient	–15.629	–0.325	–0.319	8.401	2.863	–1.633	–0.212	–0.148	–0.284	0.341	911
t-statistic	–13.649	–2.379	–2.408	5.331	3.190	–8.316	–8.483	–2.887	–5.619		

E is reported earnings (income before extraordinary items). P* is the market value of common equity at the end of the fiscal year, multiplied by one plus the cumulative stock return during the first four months of the subsequent fiscal year. E/P* is measured in percentage points (e.g., if E = 1 and P = 20, E/P is recorded as 5). a_{indu} is an industry fixed effect (two digit SIC code). GROW is mean analysts' long-term earnings growth forecast measured in April of the subsequent year (all sample firms have December fiscal year end). LNTA is the log of total assets. BETA—systematic risk—is estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL—idiosyncratic volatility—is the root-mean-squared error from the BETA regression. LEV—financial leverage—is the ratio of total liabilities to total assets. PAY—dividend payout—is the ratio of common dividends to earnings. R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amount of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. The *t*-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error.

TABLE 5
Cross-sectional Regressions of One Year Ahead Stock Return on Tax and Cash Flow Fundamentals and Control Variables

$$R = a_{indu} + b_1\ SIZE + b_2\ B/P + b_3\ E/P + b_4\ BETA + b_5\ VOL + b_6\ R\_TAX + b_7\ R\_DEF + b_8\ R\_CFO + e$$

Panel A: Pre-SFAS 109 (1973-1992)

	SIZE	*B/P*	*E/P*	*BETA*	*VOL*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–0.017	0.028	0.347	–0.006	–0.200	0.013			0.155	978
t-statistic	–2.855	1.696	3.907	–0.557	–0.970	3.913				
Mean coefficient	–0.018	0.023	0.365	–0.006	–0.265		0.004		0.151	978
t-statistic	–2.930	1.437	3.908	–0.572	–1.307		3.283			
Mean coefficient	–0.017	0.029	0.345	–0.006	–0.192	0.013	–0.001		0.155	978
t-statistic	–2.850	1.704	3.945	–0.594	–0.946	3.551	–0.855			
Mean coefficient	–0.019	0.018	0.390	–0.005	–0.203	0.014	–0.001	0.016	0.160	978
t-statistic	–3.071	1.131	4.336	–0.470	–0.991	3.851	–0.743	6.010		

Panel B: Post SFAS 109 (1993-2000)

	SIZE	*B/P*	*E/P*	*BETA*	*VOL*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–0.006	0.030	0.264	0.002	–0.227	0.003			0.135	1,378
t-statistic	–0.646	1.592	0.802	0.063	–0.460	0.673				
Mean coefficient	–0.006	0.030	0.257	0.002	–0.234		0.001		0.135	1,378
t-statistic	–0.623	1.594	0.790	0.057	–0.463		0.371			
Mean coefficient	–0.006	0.030	0.262	0.002	–0.228	0.002	0.000		0.136	1,378
t-statistic	–0.626	1.573	0.798	0.065	–0.469	0.435	0.051			
Mean coefficient	–0.007	0.020	0.316	0.004	–0.200	0.003	0.001	0.017	0.138	1,378
t-statistic	–0.706	0.984	0.958	0.114	–0.407	0.486	0.161	3.380		

The annual return (R) is measured from May 1 of the subsequent year. a_{indu} is an industry fixed effect (two digit SIC code). SIZE (logarithm of market value of equity) is measured at the end of April of the subsequent year. B is book value at fiscal year-end (all sample firms have December fiscal year end). P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). BETA—systematic risk—is estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL—idiosyncratic volatility—is the root-mean-squared error from the BETA regression. LEV—financial leverage—is the ratio of total liabilities to total assets. PAY—dividend payout—is the ratio of common dividends to earnings. R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amounts of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. The *t*-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error.

TABLE 6
Cross-sectional Regressions of Next Year's Stock Return on Tax and Cash Flow Fundamentals and Control Variables For Sub-samples of the Post SFAS 109 Period (1993-2000)

$$R = a_{indu} + b_1\ SIZE + b_2\ B/P + b_3\ E/P + b_4\ BETA + b_5\ VOL + b_6\ R\_TAX + b_7\ R\_DEF + b_8\ R\_CFO + e$$

Panel A: Excluding the base year 1998 (stock return May 1999 through April 2000)

	SIZE	*B/P*	*E/P*	*BETA*	*VOL*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–0.007	0.025	0.588	–0.020	–0.625	0.007	–0.001	0.015	0.135	1,366
t-statistic	–0.588	1.109	2.702	–0.874	–2.184	2.213	–0.239	2.817		

Panel B: Excluding firms with small earnings–price ratios

	SIZE	*B/P*	*E/P*	*BETA*	*VOL*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–0.003	0.025	0.379	–0.006	–0.086	0.015	–0.004	0.020	0.135	1,034
t-statistic	–0.255	1.283	1.439	–0.236	–0.257	4.927	–0.717	3.996		

Panel C: Excluding firms with high long-term growth

	SIZE	*B/P*	*E/P*	*BETA*	*VOL*	*R_TAX*	*R_DEF*	*R_CFO*	R^2	*N*
Mean coefficient	–0.005	–0.019	0.697	0.005	0.174	0.015	–0.003	0.015	0.209	686
t-statistic	–0.382	–0.852	2.336	0.314	0.275	2.251	–0.936	3.238		

The annual return (R) is measured from May 1 of the subsequent year. a_{indu} is an industry fixed effect (two digit SIC code). SIZE (logarithm of market value of equity) is measured at the end of April of the subsequent year. B is book value at fiscal year-end (all sample firms have December fiscal year end). P is market value of common equity at fiscal year-end. E is earnings (income before extraordinary items). BETA—systematic risk—is estimated using monthly stock returns and the CRSP value-weighted returns (including all distributions) during the five years that end in April of the subsequent year. VOL—idiosyncratic volatility—is the root-mean-squared error from the BETA regression. LEV—financial leverage—is the ratio of total liabilities to total assets. PAY—dividend payout—is the ratio of common dividends to earnings. R_TAX is a multinomial variable that takes values between 1 (lowest quintile of TAX for the industry-year group) and 5 (highest quintile), where TAX is measured as the ratio of taxable-to-net income. Thus, for example, firms with high values for R_TAX are those with relatively large amounts of taxable income relative to earnings, holding constant industry and time-specific factors. R_DEF and R_CFO are calculated similarly, except that DEF is equal to the negative of the ratio of deferred taxes to average total assets, while CFO is calculated as the ratio of cash from operations to net income. The *t*-statistics are calculated as the ratio of the mean cross-sectional coefficient to its standard error.