The Information Content of Aggregate Book-Tax Differences*

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Abstract

This paper utilizes aggregate temporary book-tax differences to study the aggregate effect of managerial accounting discretion and GAAP-induced earnings distortion. The study finds that aggregate book-tax differences forecast excess market returns. The predictive content of aggregate book-tax differences derives primarily from the inter-temporal shifting of book income rather than that of taxable income. Under SFAS 109, the information content of aggregate book-tax differences for future excess market returns subsumes that of aggregate accruals. A time-series analysis of book-tax differences in relation to investor sentiments, however, rejects the "lean against the wind" hypothesis as a potential explanation for the predictive ability of aggregate book-tax differences. Further analysis provides consistent evidence of a risk-based explanation and traces the information content of book-tax differences to a growth-dependent bias in GAAP earnings that comoves with time-varying risk premia.

Keywords: book-tax difference; GAAP; market returns and macroeconomy; conservative accounting; investment; time-varying risk premia

JEL Classification: E17; E44; G12; G31; M41

1. Introduction

Accounting discretion has been examined extensively in cross-sectional studies, but less is known about it at the aggregate level. For instance, popular cross-sectional abnormal accrual models presume that the effect of reporting discretion cancels out in the aggregate. However, no empirical evidence exists to support this presumption. In fact, agency theory suggests that, by understating the book value of net assets, conservative accounting persists in equilibrium as an efficient contracting mechanism (Watts, 2003; Givoly and Hayn, 2000). While conservatism in the balance sheet may persist, its impact on earnings is inherently reversible (Givoly et al., 2007). Indeed, prior research suggests that conservative accounting causes growth-dependent biases in earnings (e.g., Beaver and Ryan, 2005; Feltham and Ohlson, 1996). In particular, Penman and Zhang (2002) show that conservative accounting results in deflated earnings in periods of increasing investment and inflated earnings in periods of decreasing investment. If such growth-dependent biases in firm-level earnings do not cancel out in the aggregate, the systematic bias component of firm-level earnings is likely to vary with aggregate growth in the economy. Put differently, aggregate earnings distortion resulting from conservative accounting may contain information about the state of the economy and thus comove with time-varying risk premia.

To assess this conjecture, this study investigates the predictive ability of aggregate temporary book-tax differences (henceforth BTDs) for future excess market returns. While pretax income is determined according to generally accepted accounting principles (GAAP), the tax code governs the computation of taxable income. With taxable income serving as a benchmark performance measure, BTDs contain summary information about the impact of GAAP reporting characteristics, such as accounting conservatism and accounting choices, on reported earnings.[1, 2] Indeed, accounting textbooks recommend comparing

[1] Prior to the Statement of Financial Accounting Standards (SFAS) 109, temporary BTDs were defined as the timing differences between pretax income reported in the income statement and taxable income filed with the Internal Revenue Service. Under SFAS 109, BTDs also arise from other temporary differences in the tax bases of assets or liabilities and their reported amounts in the financial statements, e.g., investment tax credits accounted for by the deferred method, and differences between the assigned values and the tax bases of the assets and liabilities recognized in a business combination (FASB, 1992).

[2] In addition to temporary differences, total BTDs include permanent differences. Permanent differences do not create tax assets or liabilities and, therefore, are not related to accounting accruals. Accordingly, the BTDs considered in this paper exclude permanent differences.

pretax income with taxable income to gauge earnings conservatism (e.g., Palepu and Healy, 2008; Revsine et al., 2011), and accounting research employs BTDs as a measure of reporting discretion or earnings quality (e.g., Hanlon, 2005; Hanlon et al., 2005; Phillips et al., 2003).

This study is motivated by recent findings of an association between aggregate accounting performance measures and stock market returns since Kothari et al. (2006). Documenting a negative correlation between aggregate earnings growth and contemporaneous stock market returns, Kothari et al. (2006) suggest that innovations in aggregate earnings comove with discount rate news. Subsequent studies further explore various aspects of the aggregate earnings-return relation.[3] In particular, Hirshleifer et al. (2009) find that aggregate accruals is a positive predictor of stock market returns, and that the negative correlation between aggregate earnings growth and contemporaneous market returns derives primarily from the accrual component rather than the cash flow component of aggregate earnings. In addition to offering a rational pricing interpretation, the authors propose an alternative behavior explanation, suggesting that firms may manage earnings upward in response to market-wide undervaluation—dubbed as the ‘‘lean against the wind’’ hypothesis. Employing various modified Jones (1991) models to explore the "lean against the wind" hypothesis, Kang et al. (2010) find that aggregate discretionary accruals forecast market returns, but aggregate normal accruals do not. Guo and Jiang (2011), however, argue that the predictive ability of aggregate accruals reflects their comovement with the conditional equity premium. Finding a pervasively positive firm-level relation with proxies of the conditional equity premium in both discretionary and normal accruals, Guo and Jiang (2011) raise concerns over the Jones (1991) model classification. They further contend that the Jones (1991) model is inapt to capture any "lean against the wind" aspect of earnings management due to its imposed orthogonality between the estimated normal and discretionary accruals.

[3] For instance, Shivakumar (2007) shows that the negative correlation between aggregate earnings growth and contemporaneous market returns reflects a positive relation between aggregate earnings growth and inflation news. Cready and Gurun (2010) document a negative relation between earnings surprises and aggregate market returns within 3-day earnings announcement windows, suggesting that market participants use earnings information in forming expectations about expected aggregate discount rates. Ball et al. (2009) show that aggregate earnings growth is predictable and that the negative relation in Kothari et al. (2006) may be due to earnings growth being a bad measure for earnings news. Defining earnings news as analyst forecast revisions, Choi et al. (2013) find that aggregate earnings news is positively related to contemporaneous market returns.

Allowing correlated normal and discretionary accruals is critical not only to capturing the "lean against the wind" aspect of earnings management but also to obtaining a better understanding of the positive aggregate accrual-return relation under the rational risk interpretation. By definition, normal accruals are accounting adjustments that reflect fundamental performance and business conditions, whereas abnormal or discretionary accruals are distortions induced by accounting discretion. Following Dechow et al. (2010), this study defines accounting discretion broadly to include not only manipulative accounting choices but also GAAP-induced distortions. The distinction between manipulative accounting choices and an outcome of the GAAP system is important because it suggests an alternative channel that links accounting distortion to the information contents of aggregate earnings or accruals besides earnings manipulation to "lean against the wind". Indeed, prior research suggests a *negative* relation between normal accruals and expected stock returns because firms tend to increase production capacity and inventories when the cost of capital is low (e.g., Cooper et al., 2008; Fairfield et al., 2003; Zhang, 2007). For aggregate accruals to be a *positive* predictor of future market returns, a positive relation between aggregate abnormal accruals and expected market returns must dominate the potentially negative relation between aggregate normal accruals and the aggregate cost of capital. Under the "lean against the wind" hypothesis, aggregate abnormal accruals correlate positively with future market returns if firms report higher earnings in response to an increase in the aggregate cost of capital due to market-wide undervaluation. Alternatively, even in the absence of manipulative accounting choices, a consistent application of conservative accounting to understate the book values of net assets results in *deflated* earnings in periods of increasing investment when the cost of capital is *low* and *inflated* earnings in periods of decreasing investment when the cost of capital is *high* (Penman and Zhang, 2002; Liu et al., 2009). Upon aggregation, the interaction between GAAP accounting conservatism and investment growth also implies a positive relation between aggregate abnormal accruals and expected market returns. In both scenarios, a negative relation between abnormal and normal accruals is plausible because they vary with the cost of capital in opposite directions.

This paper utilizes aggregate BTDs to capture the aggregate effect of managerial accounting choices and GAAP-induced earnings distortion. Unlike cross-sectional abnormal accrual models, the BTDs measure does not restrict the aggregate earnings distortion to zero; neither does it impose independence between abnormal and normal accruals, in contrast to both cross-sectional and time-series abnormal accrual models. Employing the market-wide investor sentiment index constructed by Baker and Wurgler (2006) to gauge the potential mispricing component in stock market movement, the current study offers a direct test of the "lean against the wind" hypothesis. A standard analysis to explore a risk-based interpretation of the aggregate BTDs-return relation is also performed. While prior research is silent on specific mechanisms through which the accrual process generates information about risk in the aggregate stock markets, the current study aims to shed light on this aspect by examining the effect of investment on the time-series relation between GAAP earnings distortion and the expected excess market returns.

The empirical analysis yields a number of key findings. First, aggregate BTDs contain information about future excess returns on the stock market. The predictive power of aggregate BTDs for excess market returns becomes stronger when the impact of changes in the statuary tax rates and inflation is removed, and it remains highly significant when the effect of inter-period tax planning is controlled for. Thus, the predictive content of aggregate BTDs derives primarily from the inter-temporal shifting of GAAP pretax income rather than that of taxable income.

Second, under SFAS 109, the predictive content of aggregate BTDs for future excess market returns subsumes that of aggregate accruals; however, the "lean against the wind" hypothesis, is rejected in both the aggregate and firm-level analyses. While a negative relation between BTDs and investor sentiment exists in periods when investor sentiment is low, the predictive content of aggregate BTDs is due to variations that are unrelated to investor sentiment and is significant only in periods when market-wide sentiment is high. Thus, while firms may have managed earnings to "lean against the wind", such earnings management does not explain the predictive ability of aggregate BTDs for excess market returns.

Further results are consistent with a risk-based explanation for the aggregate BTDs-return relation. The predictive power of aggregate BTDs for excess market returns is largely subsumed by established risk premium proxies. Failing to find a relation between aggregate BTDs and future cash flow news, the study documents a negative relation between changes in aggregate BTDs and contemporaneous excess market returns that is entirely attributable to the common variation shared by changes in aggregate BTDs and changes in the risk premium proxies. Consistent with the notion that equity premium proxies should forecast macroeconomic activities because time-varying risk premia reflect changes in investment opportunity and cost of capital (Chen, 1991), aggregate BTDs forecast future growth in industrial production, GDP, aggregate investment and employment over two- to three-year horizons.

Finally, the predictive power of aggregate BTDs for excess market returns is most evident in industries that experienced rapid growth in the past few decades, i.e., the high-tech, health care, and other services sectors, suggesting that the information content of aggregate BTDs likely reflects their relation with investment growth. Indeed, the asset pricing literature documents that, as firms adjust investment in response to changes in the cost of capital, investment growth correlates negatively with time-varying risk premia (Cochrane, 1991; Cooper and Priestley, 2011).[4] Consistent with the implication of a growth-dependent earnings distortion from GAAP conservative accounting, BTDs correlate negatively with asset growth at both the aggregate and firm levels. This negative correlation is the primary source of the predictive content in aggregate BTDs for one-year-ahead excess market returns.

Taken together, the findings in this study suggest that the information content of aggregate BTDs derives primarily from an interaction of conservative accounting with investment growth in response to shocks in time-varying risk premia. Because tax-motivated investment implies a positive relation between BTDs and asset growth, the results in the current study are consistent with prior research suggesting that tax saving is of secondary importance when investment opportunity is good (e.g., Maydew et al., 1999). The positive relation between aggregate BTDs and future excess market returns documented in this study is also consistent with the finding of a positive cross-sectional relation between deferred tax expenses and future stock returns in Thomas and Zhang (2011). While prior studies focus on the implication of cross-sectional variation in BTDs for firm profitability (e.g., Lev and Nissim, 2004; Hanlon, 2005; and Thomas and Zhang, 2011), the current study links aggregate BTDs to risk in the aggregate stock market .

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[4]A negative cross-sectional relation between investment and future stock returns is also well-documented (e.g., Liu et al., 2009; Cooper et al., 2008; Richardson et al., 2006; Cooper and Priestley, 2011).

The reminder of the paper is organized as follows. Section 2 describes the data and empirical methods. Section 3 examines the tax planning aspect of BTDs and develops a measure that focuses on the GAAP reporting aspect of aggregate BTDs. Section 4 investigates the predictive content of aggregate BTDs in relation to that of aggregate accruals and tests the earnings management hypothesis. Section 5 presents evidence of a risk-based interpretation of the positive relation between aggregate BTDs and one-year-ahead excess market returns. Section 6 explores the implication of conservative accounting and investment growth for the predictive content of aggregate BTDs. Section 7 concludes.

2. Data and Empirical Methods

2.1 Data

The sample used to construct aggregate BTDs and accruals consists of December fiscal year end firms in the Compustat/CRSP Merged database from 1965 to 2010. Consistent with prior tax accounting research (e.g., Hanlon, 2005; Lev and Nissim, 2004; Phillips et al., 2003), the sample excludes financial and utilities firms, firms that incorporated outside the U.S., and firm-years with non-positive total assets. The final sample includes 79,009 annual observations of 8,418 firms with data items available to compute the year end market value and the main variable of interest, the BTDs.

Following Hanlon (2005), firm-level BTDs (*FBTD*) are computed as the sum of federal and foreign deferred tax expenses (Compustat data items TXDFED and TXDFO, respectively)[5] divided by the statutory tax rate, and then scaled by beginning total assets (item AT). Firm-level accruals are defined as the change in non-cash current assets (item ACT minus item CHE) minus the change in current liabilities (item LCT), excluding the change in short-term debts (item DLC) and the change in taxes payables (item TXP), minus the depreciation and amortization expense (item DP), and then scaled by beginning assets (Hirshleifer et al., 2009; Sloan, 1996). Consistent with prior studies (e.g., Kothari et al., 2006; Hirshleifer et al., 2009), the value-weighted BTDs and accruals (*BTD* and *TACC*, respectively) are constructed using

[5] If TXDFED or TXDFO is missing, we substitute the sum of the two with total deferred income tax (item TXDI) or, if TXDI is missing, with total tax expense (item TXT) minus the current portion of income tax expense (item TXC).

the fiscal year end market values.

Excess market return (*EXRET*) is the holding period return on the Center for Research in Security Prices (CRSP) NYSE/AMEX/NASDAQ value-weighted index less the cumulative risk-free rate of return. Both returns are compounded from May of year t to April of year t+1 to account for the reporting lag of financial accounting information.

The investor sentiment index (*SENT*) in Baker and Wurgler (2006) (available at the website of Jeffrey Wurgler) is employed to gauge waves of investor sentiment that may have caused market-wide mispricing. Baker and Wurgler (2006) remove business cycle information[6] from each of the six proxies shown in prior studies to capture various aspects of investor sentiment, including the closed-end fund discount (Lee et al., 1991), NYSE share turnover (Baker and Stein, 2004), the number and average first-day returns on IPOs (Ritter, 1991), the equity share in new issues (Baker and Wurgler, 2000), and the dividend premium (Baker and Wurgler, 2004). This step reduces the likelihood that the sentiment proxies reflect systematic risk. The investor sentiment index is then constructed based on the first principal component of the six measures and their lags.

The risk premium proxies, including the 3-month Treasury-bill rates (*TBL*), the yield spread between ten-year and one-year Treasury-bonds (*TMS*), the yield spread between the BAA and AAA-rated corporate bonds (*DFY*), and the consumption-wealth ratio (*CAY*) in Lettau and Ludvigson (2001), are downloaded from Amit Goyal's website. The log of net payout yield for nonfinancial firms continuously listed on NYSE, AMEX, or NASDAQ (Boudoukh et al., 2007; *PAYOUT*) are downloaded from Michael R. Roberts' website. The seasonally adjusted industrial production index, US private industry employment, and inflation data are obtained from the Federal Reserve Bank of St. Louis. Real gross domestic product (GDP) and gross private domestic investment data are downloaded from the Bureau of Economic Analysis website.

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[6] The macroeconomics condition variables include growth in industrial production index, growth in consumer durables, nondurables, and services, growth in employment, and a dummy variable for NBER recessions.

2.2 Testing Methods for Time-Series Analysis

The study uses the heteroskedasticity-consistent ordinary least squares (OLS) estimator for time-series regression analysis. When applicable, the calculation of heteroskedasticity-consistent standard errors also adjusts for autocorrelations following the procedure in Newey and West (1987). The number of lags used in correcting autocorrelations is 3.[7]

To address the concern of small sample biases in return predictive regressions (for references, see Stambaugh, 1999), we follow Nelson and Kim (1993) and Hirshleifer et al. (2009) to generate randomization *p*-values for the coefficients of forecasting regressions. The randomization procedure simulates artificial series of returns and the independent variables. The procedure first estimates the return predictive regression and a first-order autoregression for each independent variable under the null of no return predictability. Through randomly sampling the set of residuals without replacement, a series of simulated returns and independent variables are formed by adding the residuals to the fitted values. Estimating the predictive regression with the simulated series produces a set of coefficient estimates. The procedure is repeated 5,000 times to generate a distribution of random coefficients for each independent variable. The randomization *p*-value is computed as the fraction of simulated coefficients that are further away from zero than the actual coefficient estimate.

3. The Tax and Financial Reporting Aspects of the Aggregate BTDs-Return Relation

Changes in taxation and economic conditions affect taxable income and pretax income differently, causing time-series variation in aggregate BTDs. For instance, inflation has a direct impact on BTDs, as the difference between GAAP revenue and taxable revenue varies with the current level of inflation, *ceteris paribus*. Under SFAS 109, changes in corporate statutory tax rates also affect BTDs because deferred tax assets and liabilities must be adjusted to reflect the new statutory rates in the year when the change of tax rates is enacted. The adjustments alter pretax income but do not affect taxable income.[8]

[7] Changing the number of lags from 1 to 4 does not affect the results qualitatively.
[8] Prior to SFAS 109, changes in tax rates did not have a direct impact on BTDs, as firms were required to measure deferred tax assets and liabilities using tax rates applicable in the year the tax deferrals originated (APB, 1967).

In addition, changes in the statutory tax rates and inflation create tax planning incentives to shift taxable or pretax income intertemporally. For instance, Scholes et al. (1992) and Maydew (1997) document various types of income-shifting to subsequent lower-rate years in response to a known schedule of tax rate reduction under the Tax Reform Act of 1986 (TRA 86). In most cases, the tax-saving objective is achieved by shifting taxable income, and many of the shifted items have little impact on pretax income (Scholes et al., 1992). Occasionally, tax considerations also motivate firms to shift pretax income. Because the book income adjustment provision of TAR 1986 requires a firm to include some of the excess of book income over taxable income in its alternative minimum taxable income, firms have incentives to shift pretax income outside the period in which they are subject to the alternative minimum tax (e.g., Dhaliwal and Wang, 1992). Inflation and an expectation of a change in inflation affect tax reporting behaviors as well (Crane and Nourzad, 1986). Moreover, Feldstein (1982) demonstrates that the interaction of inflation and existing tax rules has a substantial impact on investment decisions, which in turn affect the time-series of BTDs due to different regimes governing the financial reporting and tax deductibility of various investments.

This section investigates the impact of inflation and corporate taxation on the aggregate BTDs-return relation with the objective of developing a measure pertaining to the aggregate effect of accounting discretion and GAAP reporting characteristics.[9]

3.1 The Time-series of Aggregate BTDs and One-Year-Ahead Excess Market Returns: a First Look

Fig. 1 plots the value-weighted BTDs (*BTD*), the maximum statutory tax rate, and inflation for the period 1965 to 2010.[10] Compared with the latter half of the sample, *BTD* is entirely positive and notably higher during the period 1965 to 1988, when inflation and the statutory tax rate are both at their historical highs. Corresponding to the high inflation during the 1973 oil and 1979 energy crises and 1986-1988 TRA 86 phase-in, *BTD* also exhibits an upward trend followed by a sharp decline from the early 1970s to the late

[9] Seidman (2010) categorizes factors influencing book-tax differences as GAAP, earnings management, tax law, tax planning, and macroeconomic conditions.
[10] Comparing to that of the value-weighted BTDs shown in figure 1, the equal-weighted BTDs has the lowest and the second lowest values occur in 2001 and 2007, respectively.

1980s.[11] The Chow test in a *BTD* AR (1) model confirms a structural break in 1988, when the TRA 86 phase-in tax rate reductions end (F-statistics of 44.06, p-value < 0.01). Fig. 1 shows that inflation and the statutory tax rate are associated with substantial time-series variation in *BTD*.

A preliminary regression analysis of the time-series relation between *BTD* and one-year-ahead *EXRET*, shown in Table 1, further reveals the confounding effect of inflation and tax rate. While *BTD* is a significantly positive predictor of *EXRET* in both the pre- and post-1988 periods, the forecasting power of *BTD* is much stronger post-1988. Interestingly, the forecasting power of *BTD* is insignificant in the combined sample (1965-2010). Controlling for the levels and changes of inflation and the maximum statutory tax rate in the forecasting regressions, *BTD* becomes highly significant in the pre- and post-1988 periods and in the whole sample (randomization $p = 0.012$, 0.007, and 0.008, respectively); however, the adjusted R^2's in the sub-periods (15% pre-1988; 17% post-1988) are much higher than the adjusted R^2 in the combined sample (5%). These findings are consistent with a structural shift in the time-series relation between *BTD* and *EXRET* that reflects a combination of higher tax rates and unusually high and volatile inflation in the pre-1988 period.[12]

3.2 The Impact of Inflation and Taxation on the Predictive Content of Aggregate BTDs

The fact that tax rates and inflation were at historical highs and the statutory tax rate underwent consecutive and drastic cuts during the first half of the sample period highlights the importance of isolating financial reporting aspect of BTDs from the impact of inflation and corporate taxation. Doing so requires taking into consideration both the mechanical relations in the computation of BTDs and the impact of intertemporal tax planning incentives. Predicting the directional impact of tax-motivated inter-period income shifting on the time series of aggregate BTDs is not straightforward, however, due to the confounding effects of cross-sectional variations in profitability and tax position, changing statutory and

[11] The decline of *BTD* since the late 1980s also reflects the increasingly more conservative financial reporting resulting from many FASB pronouncements that have the effect of an earlier recognition of expenses and losses, or a deferred recognition of revenues (Givoly and Hayn, 2000).
[12] Equal-weighted BTDs are also a significantly positive predictor for *EXRET* in the post-1988 period. Controlling for the levels and changes of inflation and tax rate, the equal-weighted BTDs become significantly positive in both the pre- and post-1988 periods and in the whole sample.

applicable tax rates, and time-varying inflation. To isolate aggregate BTDs from the effect of changing inflation and statutory tax rate, we estimate the regression model below to extract the regression residuals (*RBTD*) as a measure pertaining to the aggregate effect of accounting discretion, while making no directional prediction for the regression coefficients.

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t{*}STR_t + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t \quad (1)$$

Where *BTD* is the value-weighted BTDs; *STR* is the maximum statutory tax rate; *INFL* is the rate of inflation; the prefix Δ denotes annual changes in the variables; *P* is an indicator that takes a value of one if *t* is post-1988, and zero otherwise; and subscript *t* denotes the calendar year in which the variables are measured. By including the indicator *P* and its interaction terms with tax and inflation variables, equation (1) accommodates the structural break not only in the time-series of *BTD* but also in its relation with the levels and changes in inflation and the statutory tax rate.

Table 2 Panel A reports the OLS estimates of equation (1). Not surprisingly, the coefficients on *INFL* and *ΔINFL* are highly significant during the period 1965-1987 but are insignificant in the second half of the sample period. The coefficients on *STR* and *ΔSTR* are significant both pre- and post-1988, but the signs are switched. Together, the inflation and tax rate variables in equation (1) explain more than 70% of the time-series variation in *BTD*.[13]

Fig. 2 plots the predicted (*PBTD*) and the residual (*RBTD*) values from the OLS estimation of equation (1). As expected, *PBTD* tracks large variations in *INFL* (shown in Fig. 1) closely and retains the uprising trend and the subsequent sharp decline observed in *BTD* from the late 1960s to the late 1980s. *PBTD* remains flat in the second half of the sample, except for an increase in 1993, when the maximum statutory tax rate increased from 34% to 35%. By contrast, while the trend in *BTD* prior to 1988 is absent in *RBTD*, the two series move closely together post 1988, with a correlation coefficient of 96%. In short,

[13] By contrast, the adjusted R^2 obtained using firm-level BTDs to replace the aggregate BTDs in equation (1) is 0.3%, suggesting that the levels of and changes in inflation and statutory tax rate only account for a very small portion of the cross-sectional variation in firm-level BTDs.

Fig. 2 suggests that *PBTD* absorbs much of the inflation and tax rate induced variation in *BTD*, leaving *RBTD* a relatively purified measure of the financial reporting aspect of aggregate BTDs.

Fig. 3 depicts time-series relations between the two components of *BTD* and one-year-ahead *EXRET*. A visual comparison suggests there is little comovement in the time series of *PBTD* and that of one-year-ahead *EXRET* (Panel A); by contrast, *RBTD* tracks the movement in one-year-ahead *EXRET* closely, especially in the second half of the sample period (Panel B).

Equation (1) accounts for common factors that affect the time-series of BTDs for all firms. Prior literature, however, suggests complex firm-specific tax planning incentives to shift income intertemporarlly, including but not limited to the presence of NOL (e.g., Maydew, 1997), ownership structure (Chen et al., 2010), and corporate governance (e.g., Desai and Dharmapala, 2006; Armstrong et al., 2012). Additionally, Heltzer (2009) finds that large BTDs reflect not only aggressive financial reporting but also aggressive tax reporting. To address the concern that the predictive ability of aggregate BTDs may reflect an aggregate effect of such firm-specific tax incentives, two additional analyses are performed. First, the sample observations are grouped into two subsamples: firm-years with or without NOL. A firm-year observation is classified as having NOL if the beginning net operating loss carryforwards (item TLCF) are more than 0.5% of the beginning total assets.[14] Using firm-level BTDs to replace the dependent variable in equation (1), we estimate the panel data regression separately for each sub-sample and aggregate the regression residuals by value-weight as an alternative measure of the financial reporting aspect of aggregate BTDs. Using this alternative measure, the results for subsequent analysis are qualitatively unchanged.

Second, using cash effective or current effective tax rates to proxy for tax planning strategies (e.g., Dyreng et al., 2010; Hanlon, 2005), a value-weighted cash effective tax rate (*CashETR*) and a value-weighted current effective tax rate (*CrtETR*) are employed to evaluate the aggregate effect of firms' tax

[14] Following prior studies (e.g.,Frank et al., 2009), if TLCF is missing in the Compustat database, NOL is set to zero. Mills et al. (2003) raise reliability issues when Compustat data item TLCF is missing, and they recommend considering using current income tax and pretax income to help identify observations with NOL. Following their suggestion, we also define a firm-year as "without NOL" alternatively by applying the following criteria: 1) TLCF is missing or equal to zero; 2) current income tax is non-negative; and 3) pretax income is non-negative. we obtain qualitatively similar results as reported in the text.

planning activities on the predictive ability of aggregate BTDs. The firm-level cash effective tax rate is defined as cash tax paid (item TXPD) divided by pretax income (item PI); and the firm-level current effective tax rate (*FCrtETR*) is defined as the current tax expense (item CTX) divided by pretax income.[15] Because Compustat cash flow statement items are available after 1988, the *CashETR* series is computed only for the period 1988 to 2010.

Panel B of Table 2 reports the OLS regressions of one-year-ahead *EXRET* on *PBTD* and *RBTD*, controlling for *CashETR* or *CrtETR*. By itself, *RBTD* is a highly positive predictor of one-year-ahead *EXRET*, with an adjusted R^2 at 21% for the period 1965 to 2010. Recall that the adjusted R^2 is only 1% when using *BTD* as the predictor for the same period (column 3 of Table 1). The untabulated results reveal that the increase in forecasting power comes primarily from the first half of the sample, whereas for the period 1988 to 2010, the regression estimates when using *RBTD* as the predictor are quite similar to those when *BTD* is used as the predictor of one-year-ahead *EXRET*. By contrast, *PBTD* has negligible predictive power for one-year-ahead *EXRET*. Adding *PBTD* to the forecasting regression does not change the coefficient estimate of *RBTD* but reduces the overall explanatory power of the regression model. *RBTD* remains a highly positive predictor of one-year-ahead *EXRET* when *CrtETR* or *CashETR* is added to the forecasting regression to account for the impact of inter-period tax planning.[16]

In short, the results show that aggregate BTDs forecast one-year-ahead excess market returns. The forecasting power is unlikely due to the impact of inflation, taxation or an aggregate effect of tax planning strategies to shift taxable income intertemporally. Removing inflation- and tax-rate-driven variations, the residual component of aggregate BTDs, denoted as *RBTD*, reveals an even stronger and more consistent predictive power for one-year-ahead excess market returns. In the subsequent analysis, we use *RBTD* as a measure of the aggregate effect of managerial discretion and GAAP-induced earnings distortion to explore

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[15] If item TXC is missing, it is replaced with total tax expense (item TXT) minus deferred tax expense (TXDI). Following Dyreng et al. (2010), the rates are defined only for observation with positive pretax income and are winsorized to fall between 0 and 1. The results are similar when pretax income is adjusted to exclude special items.

[16] Using equal-weighted BTDs as the dependent variable in equation (1) to estimate the fitted and residual components of the equal-weighted BTDs, we obtain results similar to the value-weighted counterparts shown in table 2. For expositional ease, subsequent sections focus on value-weighted aggregate BTDs and their residual values.

behavioral and rational pricing hypotheses proposed in prior studies on the relation between aggregate accounting performance measures and stock market returns.

3.3 Descriptive Statistics

Table 3 presents summary statistics for the main variables over the period 1965-2010. Mean and median *BTD* are both positive, primarily resulting from the first half of the sample. While *BTD* is highly persistent (autocorrelations of 0.89, 0.75, and 0.61 at the first three lags, respectively), *RBTD* is not (autocorrelations of 0.44, -0.04, and -0.32 at the first three lags, respectively). The descriptive statistics of *TACC*, *EXRET*, *SENT*, and the risk premium proxies are consistent with prior studies.

BTD is positively correlated with *TBL*, *PAYOUT*, and *RBTD* with Spearman rank correlation of 0.55, 0.48, and 0.47, respectively. *TACC* and *BTD* are not significantly correlated in the whole sample, but the correlation is significantly positive in the post-SFAS 109 era (untabulated). Similarly, while *TACC* and *BTD* are not significantly correlated with *SENT* in the whole sample, the subsequent analysis in the pre- and the post-SFAS 109 regimes reveals further facets of the relations.

3.4 SFAS 109 and the Concurrent Structural Shift in the Price-Fundamental Relation

Effective since 1993, SFAS 109 brought about significant changes to accounting for income taxes. Prior to SFAS 109, deferred taxes were measured based on matching current period tax expenses with corresponding revenues and expenses. Under SFAS 109, deferred taxes are measured by the net change in tax assets and liabilities that will be settled in the future, where tax assets and liabilities are defined and valued to be consistent with the Statement of Financial Accounting Concepts No. 6, *Elements of Financial Statements* (FASB, 1980). As such, SFAS 109 requires firms to revalue tax assets and liabilities when tax rates change, and it eases the requirements for recognizing NOLs as tax assets while requiring a valuation allowance to be recognized by the amount of benefit that likely will not be realized. Lev and Nissim (2004) and Ayers (1998) find that SFAS 109 enhances the value relevance of deferred taxes. While it is suspected that SFAS 109 introduces additional subjectivity in the valuation of deferred tax assets, empirical evidence on earnings manipulation using the valuation allowance account remains mixed (Graham et al., 2012).

In addition, Curtis (2012) documents a structural change in the time-series relation between fundamental-to-price ratios and stock price movement around 1993. He conjectures that the lack of association post-1993 may be attributable to an increased speculative component in the price movement. Indeed, Ofek and Richardson (2003) and Baker and Wurgler (2007) suggest that the stock market movement became more susceptible to investor sentiment due to the explosion of speculative and difficult-to-value technology stocks in the 1990s.[17]

To account for the change in accounting regime and the concurrent structural shift in the relation between accounting data and stock market returns, we conduct subsequent analyses separately for the pre- and post-SFAS 109 sub-periods when necessary but refrain from ascribing different results between the two regimes to either effect.

4. Aggregate BTDs, Investor Sentiment, and the "Lean Against the Wind" Hypothesis

Hirshleifer et al. (2009) suggest that the positive relation between aggregate accruals and one-year-ahead stock market returns may be due to a manifestation of firms' managing earnings upward in response to market-wide undervaluation, dubbed the "lean against the wind" hypothesis. While Kang et al. (2010) show that the forecasting power of aggregate accruals derives primarily from aggregate discretionary accruals, the finding in itself does not lead to an inference on whether the aggregate effect of earnings management is a response to offset market-wide mispricing. Cohen and Zarowin (2011) argue that if firms manage earnings upward to "lean against the wind", all firms should have positive discretionary accruals when the market return is negative. This argument may be questionable, however, because the negative market return does not necessarily indicate whether the stock market is undervalued. Utilizing the investor sentiment index in Baker and Wurgler (2006) to gauge the mispricing component of market-wide price movement and the residual component of aggregate BTDs, i.e., *RBTD*, to proxy for the aggregate effect of accounting discretion, this section tests three implications of the "lean against the wind" hypothesis. First,

[17] Pástor and Veronesi (2006), however, argue that the price of technology stocks in the 1990s could have been justified by fundamentals that reflect uncertainty about future profitability.

the positive relation between aggregate accruals and one-year-ahead excess market returns reflects the predictive content of *RBTD* for future excess market returns. Second, *RBTD* correlates negatively with investor sentiment when market-wide sentiment is low. Finally, the predictive ability of *RBTD* for excess market returns derives from its negative relation with investor sentiment when investor sentiment is low and underpricing is more likely.

4.1 *The Predictive Abilities of Aggregate BTDs and Aggregate Accruals*

Building on accounting literature that suggests BTDs as a measure of accrual discretion, this subsection evaluates the predictive ability of aggregate accruals for one-year-ahead excess market returns in relation to that of *RBTD* through two alternative decompositions of aggregate accruals. First, we regress *TACC* on *RBTD* and compare the predictive ability of the fitted value ($TACC^F$), which captures the variation in *TACC* that comoves with *RBTD*, with that of the orthoganized residual ($TACC^R$). This decomposition facilitates an assessment of how much of the predictive content in aggregate accruals is attributable to the variation in aggregate accounting discretion as captured by *RBTD*. Alternatively, we divide *TACC* into a "discretionary" component that equals *BTD* and a remaining "normal" component (*TACC*-*BTD*). The advantage of the latter decomposition is that it allows the aggregate "discretionary" and "normal" accruals to be correlated rather than orthogonal. The main disadvantage, however, is that *BTD* is not immune from the impact of changes in inflation and tax rates. Consequently, the second decomposition is less susceptible to the confounding effect of inflation and taxation only for the latter half of the sample, when inflation and the statutory tax rate remain stable.

Panel A of Table 4 reports the results for the pre-SFAS 109 regime. The univariate forecasting regression results show that *RBTD* is a strong and positive predictor of one-year-ahead *EXRET*, but the predictive power of *TACC* is insignificant (randomization $p = 0.144$). When both variables are included in the forecasting regression, the significances of both variables improve: *TACC* becomes marginally significant (randomization $p = 0.094$), and the model explanatory power is greater than when using either variable alone. The results suggest that the predictive content of *TACC*, albeit weak, is distinct from that of

RBTD during this period. Indeed, in the regression of one-year-ahead *EXRET* on $TACC^F$ and $TACC^R$, the coefficient on $TACC^F$ is negative, opposite to the sign of either *TACC* or *RBDT* in the univariate regressions; the coefficient on the orthoganized component, $TACC^R$, is virtually the same as that on *TACC* in the regression of the one-year-ahead *EXRET* on *TACC* and *RBTD*. Similarly, subtracting *BTD* from *TACC*, does not remove the weak predictive power of aggregate accruals for one-year-ahead *EXRET*.

In contrast, during the SFAS 109 regime (Panel B of Table 4), both *RBTD* and *TACC* exhibit strong forecasting power in the univariate regressions of one-year-ahead *EXRET* (t = 3.50 and 3.85, and randomization $p = 0.013$ and 0.033, respectively). The adjusted R^2's are 26% for *RBTD* and 19% for *TACC*. When using *RBTD* and *TACC* together in the forecasting regression, however, both variables become less significant: the randomization *p*-value for *RBTD* decreases to 0.08 and *TACC* becomes insignificant, suggesting that *RBTD* and *TACC* share substantial common variations that comove with one-year-ahead *EXRET* and that the regression model suffers from multicollinearity. In the regression of one-year-ahead *EXRET* on $TACC^F$ and $TACC^R$, the coefficient estimate on $TACC^F$ is significantly positive ($t = 3.63$; randomization $p = 0.02$), while $TACC^R$ is insignificant. When *BTD* and *TACC-BTD* are used in the predictive regression, the coefficient on *BTD* is significantly positive (t = 3.15; randomization $p = 0.02$), but the forecasting power of *TACC-BTD* is negligible. Thus, under SFAS 109, the predictive content of *TACC* derives primarily from the discretionary component as captured by *RBTD* or *BTD*.[18]

Overall, results in Table 4 reveal that the predictive ability of aggregate accruals for one-year-ahead excess market returns primarily derives from the period 1993 to 2010, whereas *RBTD* forecasts excess market returns in both the pre- and post-1993 periods. Under SFAS 109, the predictive content of aggregate BTDs regarding one-year-ahead excess market returns subsumes that of aggregate accruals.

4.2 *Aggregate BTDs and Investor Sentiment*

This subsection explores the time-series relation between *RBTD* and investor sentiment using the

[18] Recall from Fig. 2 that *RBTD* and *BTD* move closely together in the second half of the sample, with a correlation coefficient of 96%.

following regression.

$$RBTD_t = \alpha + \beta_1 SENT_t + \beta_2 H_t * SENT_t + \beta_3 H_t + \varepsilon_t \quad (2)$$

Where *SENT* is the investor sentiment index in Baker and Wurgler (2006); *RBTD* is the residual from equation (1); *H* is an indicator for high-sentiment periods and takes a value of one if *SENT* is above the median value for the period 1965 to 2010, and zero otherwise (Stambaugh et al., 2012);[19] and subscript *t* denotes the calendar year in which the variables are measured.

Table 5 presents the OLS estimates of equation (2). Prior to SFAS 109 (Panel A), *RBTD* correlates positively with *SENT*, opposite to that implied by the "lean against the wind" hypothesis. The relation is not different for high- or low-sentiment periods. In contrast, under the SFAS 109 regime, *RBTD* correlates negatively with *SENT* in low-sentiment periods, but *RBTD* is not significantly associated with *SENT* in high-sentiment periods[20] (Model 2 of Panel B). Thus, during the SFAS 109 regime, firms do seem to manage earnings upward when the market-wide sentiment is low, which is consistent with the prediction of the "lean against the wind" hypothesis.

4.3 *"Lean Against the Wind" and the Predictive Ability of Book-Tax-Differences*

This subsection investigates whether the predictive content of aggregate BTDs derives from its relation with investor sentiment. Although the evidence pertaining to the SFAS 109 regime thus far seems to be consistent with predictions of the "lean against the wind" hypothesis, further investigation is needed to determine whether the positive relation between aggregate BTDs and one-year-ahead *EXRET*, and thus, the positive aggregate accrual-return relation, reflect a manifestation of an aggregate effect of earnings management in response to market-wide underpricing.

Recent studies, however, show that sustainable underpricing is unlikely in a market with well-informed investors and that overpricing is more prevalent than underpricing due to short-sale impediments. In particular, Yu and Yuan (2011) document that a positive mean-variance tradeoff emerges in low-

[19] Defining high- and low-sentiment periods by the sign of the Baker and Wurgler (2006) investor sentiment index, we obtain similar results to those reported in the paper.
[20] The sum of coefficient estimates $\beta_1 + \beta_2$ from equation (2) is not statistically different from zero.

sentiment periods though not in high-sentiment periods. Exploring the long-short strategy based on well-documented anomalies, Stambaugh et al. (2012) further demonstrate that, while the short portfolios are more profitable following high sentiment periods, the long portfolio returns bear no relation to investor sentiment. For the "lean against the wind" hypothesis to stand for a behavioral explanation of the positive aggregate accrual-return relation, the evidence must identify a response to market-wide underpricing as the source of the predictive content in aggregate discretionary accruals. In other words, the predictive ability of *RBTD* must derive from its relation to the market-wide investor sentiment during low-sentiment periods. The data, however, reveal quite the opposite.

Employing the fitted value of *RBTD* from equation (2) to capture the common variation in *RBTD* and *SENT*, we estimate a regression of one-year-ahead *EXRET* on the fitted and residual components of *RBTD* ($RBTD^{F\_S}$ and $RBTD^{R\_S}$, respectively) for the low- and high-sentiment periods, separately. Table 6 reports the results during the SFAS 109 regime.[21] Consistent with Baker and Wurgler (2007), *SENT* is negatively correlated with one-year-ahead *EXRET* (Row 1). While $RBTD^{R\_S}$ is a significantly positive predictor for one-year-ahead *EXRET*, the forecasting power of $RBTD^{F\_S}$ is negligible (Row 2). Thus, the predictive content of *RBTD* derives mainly from variations that are unrelated to investor sentiment. Moreover, *RBTD* exhibits no forecasting power in low-sentiment periods (Row 3), while the forecasting power of *RBTD* comes predominantly from high-sentiment periods (t = 3.2; randomization p-value = 0.003; adjusted R^2 = 63%; Row 4). Further analysis reveals that the predictive ability of *RBTD* in high-sentiment periods derives primarily from its residual component $RBTD^{R\_S}$, whereas $RBTD^{F\_S}$ has negligible predictive power in both high- and low-sentiment periods (Rows 5 and 6).

Overall, the results in Table 6 show that the negative association between *RBTD* and investor sentiment during low-sentiment periods does not explain the predictive ability of *RBTD* for one-year-ahead *EXRET*. Contrary to the prediction of the "lean against the wind" hypothesis, the predictive content of

[21] Untabulated results for the pre-SFAS 109 regime include the following. First, consistent with the findings in Burger and Curtis (2010), investor sentiment does not forecast one-year-ahead *EXRET* during this period. Second, similar to the results during the SFAS 109 regime, the predictive content of *RBTD* is due to variations that are unrelated to investor sentiment and is significantly only in periods when market-wide sentiment is high.

RBTD reflects variations that are unrelated to investor sentiment and is significantly only in periods when market-wide sentiment is high.

4.4 *Firm-Level Analysis of the "Lean Against the Wind" Hypothesis*

The earnings management hypothesis implies that the aggregate accrual-return relation originates from a firm-level reporting decision to "lean against the wind". Thus, another way to test the earning management hypothesis is to assess whether the predictive ability of aggregate BTDs can be attributed to the aggregate effect of a negative correlation between firm-level BTDs and market-wide sentiment during the low sentiment periods. For this purpose, a firm-level analysis employs a subsample of firms with at least 10 annual observations during the period 1993-2010. To avoid potential distortion from outliers, firm-level BTDs (*FBTD*, defined in Section 2.1) are winsorized at the top and bottom 0.5%.

Table 7 describes the firm-level relations between BTDs and the market-wide sentiment as well as the contribution of the relations to the predictive content of aggregate BTDs for one-year-ahead excess market returns. Panel A of Table 7 reports summary statistics of parameter estimates from the firm-level regressions of *FBTD* on *SENT, H,* and an interaction of the two variables. The mean coefficient on *SENT* is significantly negative at -0.017 (Fama-MacBeth t = –5.36). The mean coefficient on the interaction term is significantly positive at 0.018, but the sum of the coefficients on *SENT* and the coefficients on interaction term is not significant. The results suggest that the relation between firm-level BTDs and market-wide sentiment is pervasively negative in periods when investor sentiment is low but is insignificant in periods when investor sentiment is high.

However, the relation between *FBTD* and *SENT* does not result in any significant predictive content in the aggregate. Panel B of Table 7 compares the predictive abilities of the value-weighted fitted and residual *FBTD* from the firm-level regressions in Panel A with the predictive ability of *BTD* for one-year-ahead *EXRET* in low- and high-sentiment periods.[22] Similar to the results obtained in the main sample, the

[22] *BTD* in Panel B of table 7 is the value-weighted *FBTD* for the subsample of observations used in the firm-level analysis. Unlike *RBTD*, the aggregate residual component of BTDs, *FBTD* is not immune to changes in tax rate or inflation. Nonetheless, the firm-level analysis focuses on the SFAS 109 regime, when both the tax rate and inflation were stable. Thus, the impact of changes in tax rate or inflation is likely negligible during the period 1993-2010.

predictive ability of the value-weighted BTDs using observations of the subsample derives primarily from periods when market-wide sentiment is high (Rows 1 and 2). Neither the value-weighted fitted *FBTD* nor the value-weighted residual *FBTD* has significant forecasting power for one-year-ahead *EXRET* in low-sentiment periods (Row 3). In high-sentiment periods, only the value-weighted residual *FBTD* is significantly positive in the forecasting regression of one-year-ahead *EXRET* (Row 4).

To summarize, during the SFAS 109 regime, both the aggregate and firm-level BTDs tend to move against investor sentiment when the market-wide sentiment is low but are not related to investor sentiment during high-sentiment periods. Nevertheless, the predictive content of aggregate BTDs is due to variations in aggregate and firm-level BTDs that are unrelated to investor sentiment and is significant only in periods when market-wide sentiment is high.

5. The Risk Explanation for the Aggregate BTDs-Return Relation

This section adopts three standard approaches to investigate whether the predictive ability of aggregate BTDs for excess market returns reflects the information content of aggregate BTDs regarding risk in the aggregate economy. First, we evaluate the predictive ability of aggregate BTDs for one-year-ahead excess market returns in relation to well-established risk premium proxies, including the T-bill rates, the term spread, the default premium (Campbell, 1987; Fama and French, 1989), the net payout yield (Boudoukh et al., 2007), and the consumption-wealth ratio (Lettau and Ludvigson, 2001).

Second, the log-linear approximate asset pricing framework of Campbell (1991) implies that current period market returns relate positively with aggregate cash flow news and negatively with shocks in discount rates. The untabulated analysis reveals that *RBTD* is unrelated to one- or two-year-ahead changes in aggregate earnings or cash flows. Thus, if *RBTD* comoves positively with the equity premium, an increase in *RBTD* would correspond to a rise in discount rates and a decline in the current market prices, causing a negative relation between changes in *RBTD* and contemporaneous market returns. Following Hirshleifer et al. (2009) and Kothari et al. (2006), we assess whether *RBTD* correlates positively with the equity risk premium by testing whether changes in *RBTD* correlate negatively with contemporaneous excess market returns and whether the relation, if any, reflects the common variation in changes in *RBTD* and changes in the risk premium proxies.

Finally, the asset pricing literature posits that equity premium proxies should forecast macroeconomic activities because time-varying risk premia reflect changes in investment opportunity and cost of capital (e.g., Chen, 1991; Liew and Vassalou, 2000; Lettau and Ludvigson, 2002; and Chen and Zhang, 2011). To substantiate a risk-based explanation for the aggregate BTDs-return relation, we explore the information content of aggregate BTDs for future growth in industrial production, GDP, aggregate investment and employment.

The analyses are performed for both the pre- and post-SFAS 109 periods. In view of recenct findings that suggest mispricing has been of greatest concern since the 1990s (e.g., Ofek and Richardson, 2003; Curtis, 2012), the discussion focuses on the SFAS 109 regime for ease of exposition. The results for the pre-SFAS regime are summarized in footnotes and are available upon request.

5.1 Predictive Relations

Panel A of Table 8 presents the estimation results for the predictive regressions of one-year-ahead *EXRET* on *RBTD* and the risk premium proxies, including the T-bill rates (*TBL*), the term spread (*TMS*), the default premium (*DFY*), the net payout yield (*PAYOUT*), and the consumption-wealth ratio (*CAY*). The analysis starts by showing that *RBTD* is a significantly positive univariate predictor of one-year-ahead *EXRET* (randomization $p = 0.01$). By contrast, *RBTD* becomes only marginally significant (randomization $p = 0.07$) when the risk premium proxies are controlled for, suggesting that the risk premium proxies subsume much of the predictive content in *RBTD* during the SFAS 109 regime.[23]

Because *PAYOUT* is a price deflated variable susceptible to the confounding effect of potential misevaluation (see, e.g., Shanken and Tamayo, 2012), we drop this variable and use the remaining risk premium proxies to evaluate whether changes in risk premia explain a contemporaneous relation between

[23] For the period 1965-1992, *RBTD* becomes insignificant when the risk premium proxies are controlled for, and a significantly negative contemporaneous relation between *EXRET* and changes in *RBTD* is entirely explicable by the changes in the risk premium proxies.

excess market returns and changes in *RBTD*.

5.2 Contemporaneous Relations

Panel B of Table 8 presents the analysis of the contemporaneous relation between excess market returns and changes in *RBTD*. Consistent with *RBTD* comoving positively with the equity premium, changes in *RBTD* (Δ*RBTD*) correlates negatively with contemporaneous *EXRET* (Row 1 of Panel B-2).

To explore whether the negative contemporaneous relation reflects a positive relation between Δ*RBTD* and changes in the risk premium proxies, we decompose Δ*RBTD* into a component that comoves with changes in the risk premium proxies as the fitted value from the regression of Δ*RBTD* on Δ*TBL*, Δ*TMS*, Δ*DFY*, and Δ*CAY*, and an orthogonal component as the regression residual. A second-stage regression is then employed to compare the explanatory power of the two components for contemporaneous excess market returns. To evaluate the potential impact of mispricing on the relation between changes in aggregate BTDs and excess market returns, we compare the explanatory power of the two components obtained with and without including Δ*SENT* in the first-stage regressions.

Panel B-1 shows the results of the first stage regressions. In the regression of Δ*RBTD* on changes in the risk premium proxies, Δ*CAY* is significantly positive and the changes in the risk premium proxies explain 1.6% of the total variation in Δ*RBTD* (Model 1). Adding Δ*SENT* as an additional explanatory variable increases the adjusted R^2 substantially; while the coefficient on Δ*CAY* remains positive, Δ*RBTD* varies negatively with Δ*SENT* (Model 2). However, the negative association between Δ*RBTD* and Δ*SENT* does not appear to contribute to the negative contemporaneous relation between Δ*RBTD* and *EXRET*.

Specifically, the fitted value of Δ*RBTD* on changes in the risk premium proxies is significantly negative, but the residual component is insignificant (Row 2 of Panel B-2). While this is also true for the fitted and residual Δ*RBTD* from regressing Δ*RBTD* on changes in both the risk premium proxies and investor sentiment (Row 3 of Panel B-2), the fitted Δ*RBTD* from Model 1 of Panel B-1 has stronger explanatory power than that from Model 2 of Panel B-1 (t = -3.30 versus -2.43, respectively). Compared with that of the decomposition by fitting Δ*RBTD* on changes in the risk premium proxies alone, the explanatory power for *EXRET* of the decomposition by fitting $\Delta RBTD$ on changes in both the risk premium proxies and the market-wide sentiment also deteriorates, with the second-stage regression adjusted R^2 decreasing from 42% for the fitted and residual $\Delta RBTD$'s from Model 1 of Panel B-1 to 19% for those from Model 2 of Panel B-1. Taken together, the results in Panel B suggest that the negative contemporaneous relation between *EXRET* and $\Delta RBTD$ is due to a positive relation between $\Delta RBTD$ and changes in the risk premium proxies rather than the negative relation between $\Delta RBTD$ and $\Delta SENT$.[24]

5.3 Aggregate BTDs and Future Growth in Macroeconomic Activities

To examine the relation between *RBTD* and future macroeconomic activities, we regress one- to three-year-ahead growth rates in real industrial production, real GDP, aggregate employment in the private sector, and real gross private domestic investment, respectively, on current period *RBTD* and growth in real industrial production. The results shown in Table 9 suggest that, during the SFAS 109 regime, *RBTD* is a significantly positive predictor of two- and three-year growth rates in real GDP and real aggregate private investment and is a significantly positive predictor of three-year growth rates in industrial production and total employment in the private sector.[25]

In short, the findings in this section suggest that the information content of *RBTD* for excess market returns primarily reflects its comovement with time-varying risk premia.

6. Conservative Accounting, Investment Growth, and the Information Content of Aggregate BTDs

To gain insight into the mechanism through which aggregate BTDs convey information about time-varying risk premia, this section sets out to show that the predictive ability of BTDs is most evident in industries that experienced rapid growth in the past four decades. The results suggest that the information content of aggregate BTDs likely reflects the tax and/or the financial reporting consequences of firm growth. Indeed, the asset pricing literature documents that, as firms adjust investment in response to changes in the

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[24] Alternative specifications for innovations in *RBTD*, investment sentiment, and the risk premium proxies using AR1 errors of the corresponding variables give similar results to those reported in Panel B of table 8.

[25] For the period 1965-1992, *RBTD* is a significantly positive predictor of three-year growth rates in real GDP, real aggregate private investment, and industrial production when the current period's T-bill rate and statuary tax rates are also included in the forecasting regression to control for the effect of changing interest and tax rates during this period.

cost of capital, investment varies negatively with fluctuations in the equity risk premium (e.g., Cochrane, 1991; Cooper and Priestley, 2011).[26] A positive relation between aggregate BTDs and the equity premium is plausible if BTDs correlate *negatively* with investment.

The remainder of the section proceeds to analyze the aggregate BTDs-investment relation and its contribution to the predictive content of aggregate BTDs for one-year-ahead excess market returns. Because any growth-dependent earnings distortion captured in aggregate BTDs must originate from an aggregate effect of the tax or financial reporting consequences of firm-specific growth, firm-level analysis is also performed to address potential "data snooping" concerns.

6.1 Sector Level Evidence

To uncover variations in the predictive ability of aggregate BTDs for excess market returns across industries, the sector-level analysis groups sample firms into five sectors based on their Standard Industrial Classification (SIC) codes and the Fama-French 5 industry definition downloaded from Kenneth French's website. A sector-level residual BTDs (*RSBTD*) is computed, similarly to the computation of *RBTD*, as the residual from the regression of sector-level value-weighted BTDs on the independent variables in equation (1). Table 10 presents the forecasting regressions of the one-year-ahead sector-level value-weighted excess returns (*EXRET_S*) and value-weighted excess market returns (*EXRET*), respectively, on *RSBTD*. The results show that *RSBTD* is a significantly positive predictor for one-year-ahead *EXRET_S* (Panel A) and one-year-ahead *EXRET* (Panel B) in the high-tech, health and other services sectors during the period 1965-2010. For consumer product or manufacture industries, however, the forecasting power of *RSBTD* is negligible. The results suggest that the information content of BTDs is likely associated with firm growth.

6.2 Aggregate BTDs, Aggregate Investment, and Expected Excess Market Returns

Because BTDs summarize temporary differences between book and tax incomes, they may correlate with investment through two alternative mechanisms. First, a growth-dependent bias in book

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[26] Arif and Lee (2013) argue that the negative aggregate investment and future market return relation reflects the influence of investor sentiments on aggregate investment. A thorough investigation of whether aggregate investment is efficient is beyond the scope of the current study.

income resulting from GAAP conservatism causes a *negative* relation between BTDs and investment. Defining conservative accounting as a systematic undervaluation of the book value of net assets, Penman and Zhang (2002) illustrate that increasing investment in assets that are subject to conservative accounting deflates current earnings by creating earnings reserves; reducing investment releases these reserves and thus inflates earnings.[27] Second, tax-motivated investments beget a *positive* relation between BTDs and investment, *ceteris paribus*. The q-theory of investment suggests that tax considerations affect investment decisions because the opportunities to accelerate deductions and defer tax payments increase the net present value of investment projects (Summers et al., 1981).[28] Extant empirical work, however, fails to establish a link between tax incentives and aggregate investments (Hanlon and Heitzman, 2010). Cross-sectional evidence is also mixed. For instance, while House and Shapiro (2008) document a large increase of investment in response to the bonus depreciation for qualified assets in 2002 and 2003 tax bills, Neubig (2006) and Edgerton (2012) suggest that firms are not enthusiastic about tax incentives that provide accelerated depreciation deductions. Graham et al. (2012) note that corporate investments are less responsive to tax incentives that produce temporary differences than incentives that produce permanent differences, because only permanent differences can reduce effective tax rate.

Because the tax code generally allows faster recovery deductions than implied by economic depreciation, depreciation tends to be higher for tax purposes than for financial reporting purposes in the early years of depreciable assets' lives (Manzon and Plesko, 2001). Historically, more rapid depreciation for tax purposes than for financial reporting purses is the primary source of deferred tax liability, but the role of depreciation has become less important since the 1990s (Desai, 2003; Poterba et al., 2011). The rise of the high-tech, health care and services sectors over the past four decades changes the nature of firm

[27]Besides accelerated depreciation, LIFO for inventory, and immediate expensing of R&D and advertising investments, conservative accounting also manifests itself through loss and bad debt provisions, the accrual of warranty and employee benefit liabilities, asset write-downs, an immediate and complete recognition of negative events, and a delayed and gradual recognition of positive events, etc. (Givoly and Hayn, 2000). LIFO for inventory and immediate expensing of R&D and advertising investments do not create temporary book-tax differences.

[28] Noting a mutual influence in financial and tax reporting, Watts (2003) suggests that the incentive to defer taxable income to reduce the present value of taxes may contribute to financial reporting conservatism. Such mutual influence is not captured in the BTDs measure, however, because BTDs do not capture income-shifting via book-tax conforming accounting choices (see, e.g., Badertscher et al., 2009).

growth, with acquiring innovations, market share and talents gaining ever increasing importance. Meanwhile, financial reporting has become more conservative as GAAP evolves with many FASB statements that have the effect of an earlier recognition of expenses and losses or a deferred recognition of revenues and gains (Givoly and Hayn, 2000). The combined effect of the two may cause more deflated earnings with increasing investment for book purposes than that for tax purposes.

For instance, investment in the high-tech, health and other services sectors is often accompanied by a boost in hiring, which increases the accrued employee benefit liabilities and expenses for book purposes but tax deductions are allowed only when the benefits are paid. Besides Greenfield investments, firm growth in these sectors is often achieved through mergers and acquisitions (M&As). Prior to the adoption of SFAS 141(R) in 2009, restructuring charges that the acquirer expected to incur were recognized as a liability at the acquisition date but were not tax deductible until payments were made, which results in recognition of deferred tax assets and decreases BTDs in periods of M&As (Poterba et al., 2011). A recent example of greater financial reporting conservatism that is likely to interact with firm growth is the implementation of SFAS 123(R) since 2006, which requires companies to use deferred tax accounting for stock-based compensations. Under SFAS 123(R), most equity awards give rise to deferred tax assets and hence decrease BTDs, because compensation cost is recognized at fair value of the instruments awarded over the service periods but the tax deduction is allowed only when a taxable event occurs, e.g., when a non-qualified option or stock appreciation right is exercised; when a restricted share vests; or when a restricted stock unit is delivered.

In short, conservative accounting and tax considerations affect the relation between BTDs and investment in opposite directions. If the joint effect of conservative accounting and investment growth on pretax income dominates the time-series relation between BTDs and investment, aggregate BTDs should correlate negatively with aggregate investment. Conversely, if the BTDs-investment relation primarily reflects an impact of growth in depreciable assets on depreciation deductions, a positive relation between aggregate BTDs and aggregate investment relation would emerge.

Following Cooper et al. (2008) and Cooper and Priestley (2011), we measure firm-level investment as the annual growth rate in total assets (*FAG*). To test for an aggregate BTDs-investment relation and its contribution to the predictive content of aggregate BTDs for excess market returns, we regress *RBTD* on the value-weighted asset growth measure (*AG*) and evaluate the predictive ability of the fitted and residual *RBTD* for one-year-ahead *EXRET*. The results for the period under SFAS 109 are shown in Table 11.[29]

Consistent with prior findings (e.g., Cochrane, 1991; Arif and Lee, 2013), *AG* is a negatively predictor of one-year-ahead *EXRET* (Model 1 in Panel A-1). *RBTD* correlates negatively with *AG* (t = -3.63; Model 1 in Panel A-2), suggesting that the joint effect of conservative accounting and investment growth dominates the aggregate BTDs-investment relation. Moreover, the predictive power of *RBTD* for one-year-ahead *EXRET* derives primarily from the fitted value of *RBTD* on *AG*, while the residual *RBTD* is only marginally significant (randomization $p = 0.027$ versus 0.096, respectively; Row 1 in Panel B).

To control for the confounding effect of tax planning, we include the aggregate current effective tax rate (*CurETR*) in the regression of *RBTD* on *AG*. In view of omitted variable bias, we also include the value-weighted ROA (*ROA*) as an additional control. The results in Panel A-2 indicate that the coefficient on *AG* remains significantly negative in the regression of *RBTD* on *AG*, *CurETR* and *ROA*, while neither of the latter two variables is significant. Adding additional control variables to the regression of *RBTD* on *AG* does not increase the explanatory power of the fitted *RBTD* for one-year-ahead *EXRET* (Row 2 in Panel B).

The fact that aggregate BTDs correlate negatively with aggregate investment and that the negative relation is the main source of the predictive content of aggregate BTDs for one-year-ahead excess market returns suggests that the information content of aggregate BTDs derives primarily from an interaction between aggregate investment and conservative accounting.

6.3 Firm-Level BTDs-Investment Relation and the Predictive Ability of Aggregate BTDs

Because any growth-dependent earnings distortion captured in aggregate BTDs must originate

[29] The analysis is only conducted in the post-SFAS 109 period because the untabulated results reveal that *AG* is not a significant predictor for one-year-ahead *EXRET* during the period 1965-1992.

from an aggregate effect of the tax or financial reporting consequences of *firm-specific* growth, this section analyzes firm-level BTDs-investment relations and their contribution to the predictive content of aggregate BTDs. For this purpose, we decompose firm-level BTDs (*FBTD*) into the fitted and residual components from firm-level regressions of *FBTD* on asset growth (*FAG*). A value-weighted average is computed for each component—the value-weighted fitted *FBTD* captures the aggregate effect of variations in *FBTD* resulting from firm-specific asset growth, while the value-weighted residual *FBTD* contains the remaining common variation in firm-level BTDs.[30] To control for the effect of tax considerations on firm-level BTDs and to alleviate omitted variable bias, we also consider adding firm-level current effective tax rate (*FCurETR*) and firm-level ROA (*FROA*) in the regression of *FBTD* on *FAG*.

The firm-level analysis employs a subsample of firms with at least 10 annual observations during the period 1993-2010. The variables used in the firm-level regressions are winsorized at the top and bottom 0.5% to avoid potential distortion from outliers. Panel A of Table 12 reports summary statistics of the firm-specific estimates. Consistent with the results at the aggregate level, the mean coefficient on *FAG* is significantly negative (Fama-MacBeth t = –2.19; Panel A-1) in the regression of *FBTD* on *FAG*, suggesting that the growth-dependent earnings distortion resulting from conservative accounting dominates the firm-level time-series relation between BTDs and asset growth. Panel B of Table 12 shows that the value-weighted fitted *FAG* has strong forecasting power for one-year-ahead *EXRET* (randomization $p = 0.04$). By contrast, the value-weighted residual *FAG* is a marginally significant predictor of one-year-ahead *EXRET* (randomization $p = 0.08$). Adding *FCurETR* and *FROA* to the firm-level regressions substantially increases the significance of the mean coefficient on *FAG* (Fama-MacBeth t = –10.05; Panel A-2). While the mean coefficient on *FROA* is highly positive, the mean coefficient on *FCurETR* is insignificant. Thus, the impact of conservative accounting on the firm-level BTDs-investment relation is more evident when profitability and tax incentives are controlled for. While the value-weighted fitted *FBTD* on *FAG*, *FCrtETR* and *FROA*

[30] Unlike the decomposition of aggregate BTDs, the value-weighted fitted *FBTD* is not orthogonal to the value-weighted residual *FBTD* because the fitted and residual values are obtained from firm-level regressions of *FBTD* on firm-specific asset growth, i.e., the residual of one firm may be corrected with the fitted value of another firm before aggregation.

is a highly significant predictor for one-year-ahead *EXRET*, the predictive ability of the value-weighted residual is negligible (Rows 4 and 5 of Panel B, respectively). Comparing the R^2's of the predictive regressions of one-year-ahead *EXRET* on the valued-weighted fitted *FBTD*'s from models A-1 and A-2 (21% and 29%, respectively) with the R^2 of the predictive regression of one-year-ahead *EXRET* on *BTD* (33%) suggests that the aggregate effect of the negative firm-level relation between BTDs and asset growth appears to be the primary source of the predictive content of aggregate BTDs.

In short, the firm-level results suggest that the predictive content of aggregate BTDs for one-year-ahead excess market returns primarily reflects an aggregate effect of the interaction between conservative accounting and firm-level investment growth.

7. Conclusion

This paper utilizes aggregate temporary book-tax differences to study the aggregate effect of managerial accounting discretion and GAAP-induced earnings distortion. The study finds that aggregate BTDs forecast excess market returns. The predictive content of aggregate BTDs derives primarily from the inter-temporal shifting of book income rather than that of taxable income. Under SFAS 109, the information content of aggregate BTDs for future excess market returns subsumes that of aggregate accruals. However, the "lean against the wind" hypothesis is rejected in both aggregate and firm-level analysis. While a negative relation between BTDs and investor sentiment exists in periods when investor sentiment is low, the predictive content of aggregate BTDs derives primarily from variations that are unrelated to investor sentiment and is only significant in periods when market-wide sentiment is high. Further results suggest that the predictive ability of aggregate BTDs reflects a positive relation between aggregate BTDs and time-varying risk premia. Consistent with the notion that equity premium proxies should forecast macroeconomic activities, aggregate BTDs forecast future growth in industrial production, GDP, aggregate investment and employment over two- to three-year horizons.

To illustrate the mechanism though which aggregate BTDs convey information about risk in the aggregate stock market, the study further documents that the predictive content of aggregate BTDs derives primarily from an aggregate effect of earnings distortions induced by the interaction between investment growth and conservative accounting.

Building on prior research that links accounting conservatism with equity valuation (e.g., Feltham and Ohlson, 1996; Zhang, 2000; ; Beaver and Ryan, 2005), this study offers an alternative perspective to the growing literature on the relation between aggregate accounting data and stock mark returns. The findings of the study provide aggregate evidence for the debate on whether conservatism is a desired feature of GAAP (for references, see, Watts, 2003; Kothari et al., 2010). While Penman and Zhang (2002) raise concerns about possible mispricing in the cross-section due to investors failing to appreciate the earnings implication of the interaction between investment growth and conservative accounting, this study illustrates that aggregate earnings distortion induced by conservative accounting and investment growth contains information about risk in the aggregate stock market.

The findings in the study also add a layer of support to the notion that increasing book-tax conformity may result in a loss of informativeness of financial reports. While prior research documents a deterioration of cash flow news in earnings as book-tax conformity increases (e.g., Atwood et al., 2010; Hanlon et al., 2008), this study shows that time-series variation in BTDs is informative regarding risk in the economy. To the extent that book-tax conforming conservatism is not captured in the BTDs, this study is limited in power to detect aggregate earnings distortions from conservative accounting of investment growth that are informative regarding time-varying risk premia.

Like most time-series studies of the relation between aggregate accounting data and stock market returns, the study is also limited by the short data series available. While firm-level analysis and simulated data are employed to address potential econometric issues with small sample estimates, future research is needed to generalize the inferences outside the sample period.

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Fig. 1—Aggregate book-tax differences, statutory corporate tax rate and inflation, 1965-2010. *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database. Firm-level book-tax differences are scaled by beginning total assets before aggregation. *STR* is the maximum statutory corporate tax rate. *INFL* is the rate of inflation, defined as the annual growth rate in seasonally adjusted consumer price index.

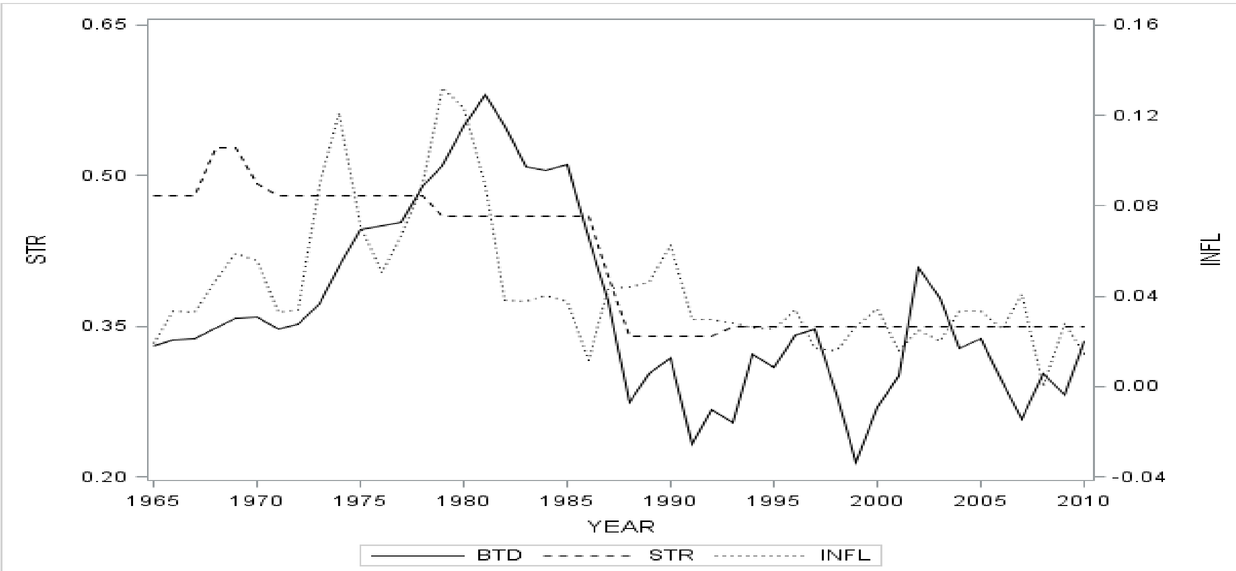


Fig. 2—Predicted and residual aggregate book-tax differences, 1965-2010. *PBTD* is the predicted value and *RBTD* is the residual from the following regression.

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t{*}STR_t + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t \quad (1)$$

where, *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix Δ denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured.

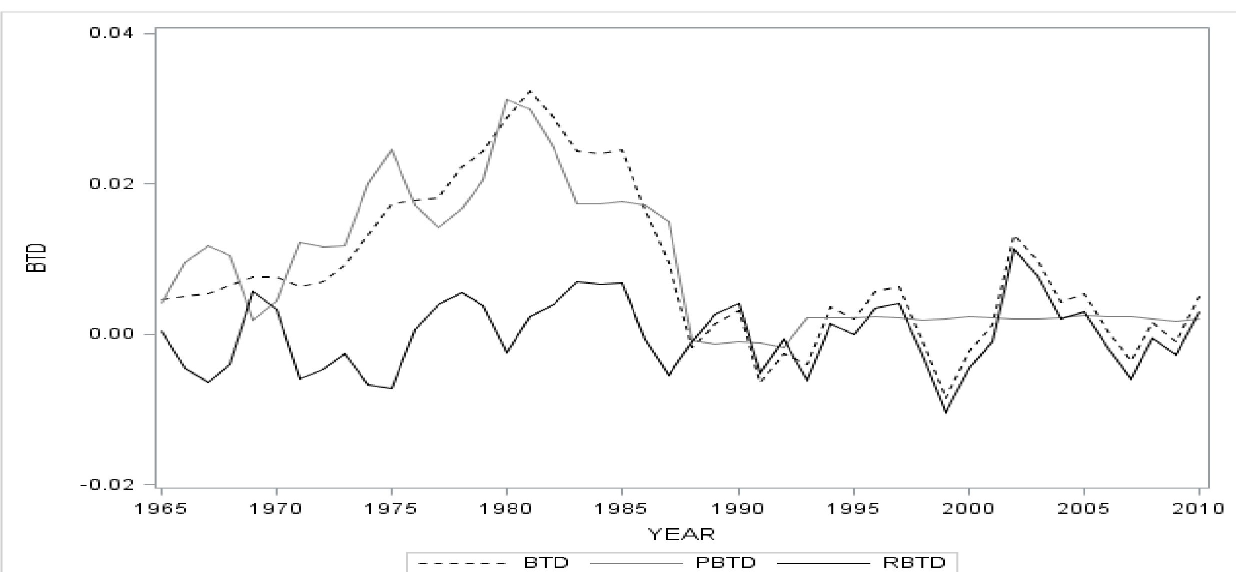
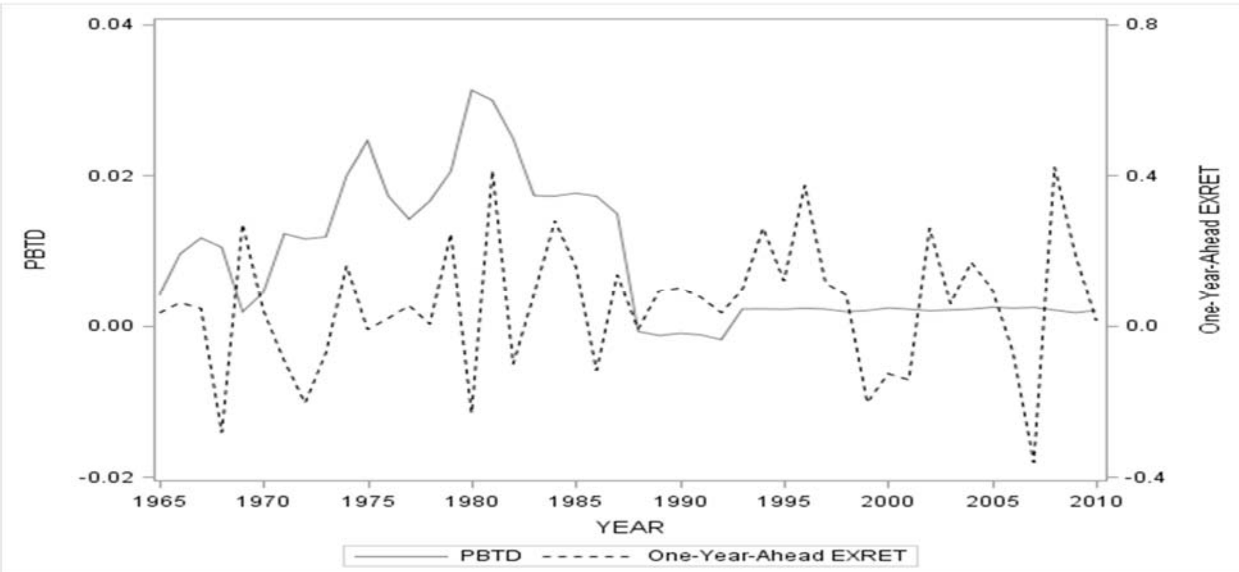


Fig. 3—The predicted (residual) aggregate book-tax differences and one-year-ahead excess market returns (*EXRET)*. To compute one-year-ahead *EXRET*, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. *PBTD* is the predicted value and *RBTD* is the residual from the following regression.

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t * STR_t + \beta_7 P_t * \Delta STR_t + \beta_8 P_t * INFL_t + \beta_9 P_t * \Delta INFL_t + \varepsilon_t \quad (1)$$

where, *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix *Δ* denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured.

Panel A. Predicted book-tax differences and one-year-ahead excess market return



Panel B. Residual book-tax differences and one-year-ahead excess market return

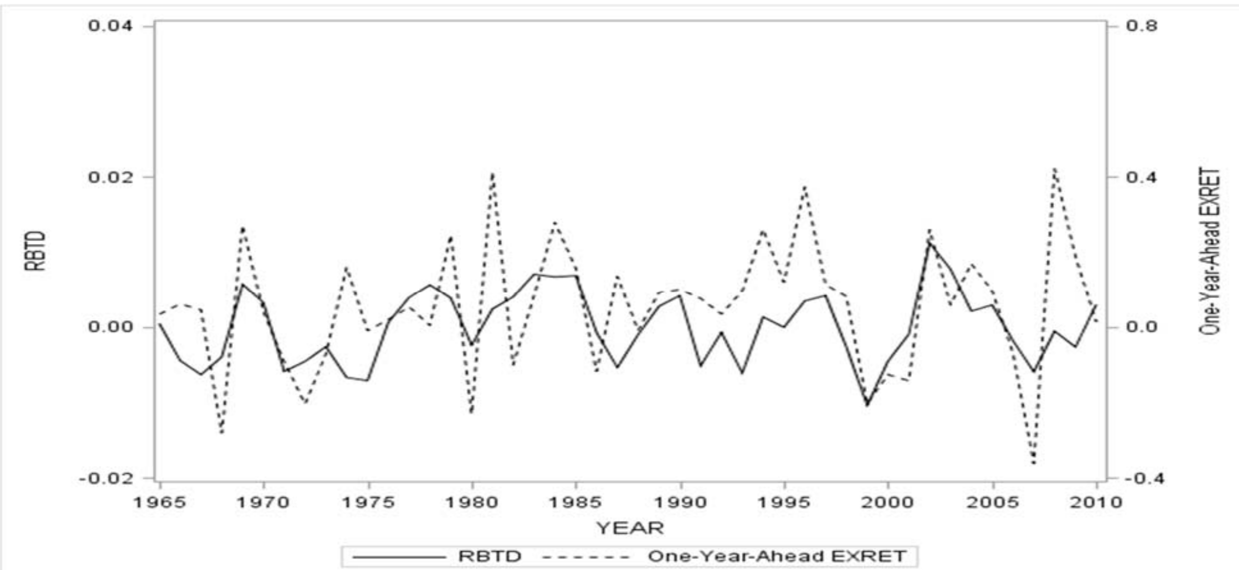


Table 1

Forecasting One-Year-Ahead Excess Market Returns using Value-Weighted Book-Tax Differences

	1965-1987	1988-2010	1965-2010	1965-1987	1988-2010	1965-2010
	(1)	(2)	(3)	(4)	(5)	(3)
BTD	5.384*	17.9***	3.040	15.114**	19.443***	8.846***
	(2.19)	(3.16)	(1.48)	(2.94)	(3.44)	(3.28)
	[0.089]	[0.009]	[0.132]	[0.012]	[0.007]	[0.008]
STR				3.697	-18.069**	-0.984**
				(2.75)	(-1.12)	(-2.39)
				[0.123]	[0.045]	[0.030]
ΔSTR				-6.422*	1.568	-1.308
				(-4.68)	(2.83)	(-1.03)
				[0.053]	[0.285]	[0.235]
INFL				-1.235	-6.138**	-0.917
				(-0.95)	(-0.87)	(-0.96)
				[0.282]	[0.045]	[0.253]
ΔINFL				2.327	1.081	1.136
				(1.83)	(0.36)	(1.12)
				[0.208]	[0.353]	[0.276]
Intercept	-0.046	0.046	0.029	-1.91**	6.509	0.42
	(-1.11)	(1.25)	(0.88)	(-2.90)	(1.12)	(2.65)
Adj. R^2	0.036	0.223	0.010	0.152	0.173	0.053

This table reports the OLS regression estimates of forecasting one-year-ahead value-weighted excess market returns. *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; the prefix *Δ* denotes annual changes in the variables. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 2

Aggregate Book-Tax Differences, Impact of Inflation and Statutory Tax Rate, and the Forecasting of Excess Market Returns

Panel A. Aggregate book-tax differences and the impact of inflation and statutory income tax rate

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFLt + \beta_5 P_t + \beta_6 P_t{*}STR_t + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t \quad (1)$$

Intercept	*STR*	*ΔSTR*	*INFL*	*ΔINFL*	*P*	*P*STR*	*P*ΔSTR*	*P*INFL*	*P*ΔINFL*	Adj-R^2
0.125***	-0.247***	0.224**	0.148***	-0.147***	-0.270***	0.663***	-0.233**	-0.113	0.128	0.719
(3.38)	(-3.41)	(2.14)	(3.67)	(-3.70)	(-2.94)	(2.73)	(-2.13)	(-0.79)	(1.11)	

Panel B. Forecasting excess market return with fitted and residual values of aggregate book-tax differences

Model	Sample Period	Intercept	*PBTD*	*RBTD*	*CrtETR*	*CashETR*	Adj-R^2
(1)	1965-2010	0.055***		17.224***			0.213
		(2.94)		(4.84)			
		--		[0.000]			
(2)	1965-2010	0.064**	-1.079	17.224***			0.198
		(2.24)	(-0.55)	(4.66)			
		--	[0.351]	[0.000]			
(3)	1965-2010	0.053		17.250***	0.007		0.195
		(0.34)		(4.25)	(0.02)		
		--		[0.002]	[0.431]		
(4)	1988-2010	-0.086		20.556***		0.532	0.228
		(-0.69)		(4.00)		(1.30)	
		--		[0.006]		[0.307]	

Panel A reports the OLS estimates of equation (1). *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if t is post 1988, and zero otherwise; the prefix *Δ* denotes annual changes in the variables; subscript t denotes the calendar year in which the variables are measured.

Panel B reports the OLS regression of one-year-ahead excess market returns on the predicted and residual components of aggregate BTDs. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. *PBTD* and *RBTD* are the predicted and residual values, respectively, from the regression in Panel A; *CrtETR*, is the value-weighted current effective tax rate, defined as current tax expense divided by pretax income, *CashETR*, is the value-weighted cash effective tax rate, defined as cash tax paid divided by pretax income. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3

Descriptive Statistics

	RBTD	*BTD*	*TACC*	*EXRET*	*SENT*	*TBL*	*TMS*	*DFY*	*CAY*	*PAYOUT*
Panel A. Summary statistics and autocorrelations										
Mean	0.000	0.009	-0.045	0.055	0.012	0.054	0.017	0.001	-0.001	-2.227
Median	0.000	0.006	-0.046	0.060	-0.015	0.052	0.018	0.011	-0.005	-2.191
Std Dev	0.005	0.010	0.016	0.174	1.040	0.031	0.017	0.051	0.023	0.222
Autocorrelations										
Lag 1	0.442	0.888	0.492	-0.152	0.706	0.786	0.534	-0.313	0.818	0.724
Lag 2	-0.043	0.753	0.140	0.013	0.256	0.502	0.075	-0.105	0.672	0.603
Lag 3	-0.322	0.614	0.088	-0.123	-0.012	0.323	-0.204	0.042	0.623	0.427
Panel B. Spearman correlations										
BTD	0.469									
TACC	0.079	0.232								
EXRET	0.144	-0.014	-0.131							
SENT	0.206	0.083	-0.071	0.104						
TBL	0.191	0.547	0.288	-0.094	0.316					
TMS	0.149	-0.071	-0.551	0.143	-0.030	-0.493				
DFY	0.093	0.167	-0.056	0.269	0.040	-0.045	0.337			
CAY	0.190	-0.165	-0.262	0.046	0.131	0.189	0.264	-0.195		
PAYOUT	0.200	0.484	0.372	-0.254	-0.166	0.539	-0.098	-0.031	0.023	

The table reports summary statistics for the main variables over the period 1965 to 2010. *RBTD* is the residual from the following regression.

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t * STR_t + \beta_7 P_t * \Delta STR_t + \beta_8 P_t * INFL_t + \beta_9 P_t * \Delta INFL_t + \varepsilon_t$$

where, *BTD* is the value-weighted temporary book-tax differences for a sample of US incorporated firms on the Compustat/CRSP Merged database; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix Δ denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured.

TACC is the value-weighted total accruals; *EXRET* is excess market return over the period May of year t to April of year t+1; *SENT* is the investor sentiment index in Baker and Wurgler (2006); *TBL* is the 3-month Treasury-bill rates; *TMS* is the yield spread between ten-year and one-year Treasury-bonds; *DFY* is the yield spread between the BAA and AAA-rated corporate bonds; *CAY* is the consumption-wealth ratio in Lettau and Ludvigson (2001), *PAYOUT* is the nature log of aggregate net payout yield for all nonfinancial firms continuously listed on NYSE, AMEX, or NASDAQ.

Table 4

Forecasting One-Year-Ahead Excess Market Returns: Aggregate Accruals versus Aggregate BTDs

Model	Intercept	*RBTD*	*TACC*	$TACC^F$	$TACC^R$	*BTD*	*TACC-BTD*	Adj. R^2
Panel A. Pre-SFAS 109 regime (1965-1992)								
(1)	0.042***	14.195**						0.150
	(2.93)	(3.08)						
	--	[0.017]						
(2)	0.144***		2.485					0.018
	(3.45)		(2.46)					
	--		[0.144]					
(3)	0.164***	15.124**	2.972*					0.199
	(4.00)	(3.34)	(3.20)					
	--	[0.013]	[0.094]					
(4)	-1.817***			-45.415**	2.972*			0.199
	(-3.14)			(-3.25)	(3.20)			
	--			[0.018]	[0.085]			
(5)	0.106***					6.016*	2.632*	0.022
	(2.81)					(1.57)	(2.05)	
	--					[0.056]	[0.086]	
Panel B. SFAS 109 regime (1993-2010)								
(1)	0.075*	21.131**						0.256
	(1.77)	(3.50)						
	--	[0.013]						
(2)	0.386***		5.944**					0.188
	(3.43)		(3.85)					
	--		[0.033]					
(3)	0.263*	15.854*	3.606					0.283
	(1.80)	(1.83)	(1.56)					
	--	[0.082]	[0.173]					
(4)	0.830***			14.442***	3.606			0.283
	(4.09)			(3.63)	(1.56)			
	--			[0.018]	[0.162]			
(5)	0.230					19.474**	3.661	0.271
	(1.37)					(3.15)	(1.48)	
	--					[0.024]	[0.162]	

This table reports the OLS regression estimates of forecasting one-year-ahead excess market returns with aggregate accruals and BTDs. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. *RBTD* is the residual from the following regression:

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t {*} STR_t + \beta_7 P_t {*} \Delta STR_t + \beta_8 P_t {*} INFL_t + \beta_9 P_t {*} \Delta INFL_t + \varepsilon_t$$

Where, *BTD* is the value-weighted temporary book-tax differences; *STR* (*ΔSTR*) is the level (change) of maximum statutory corporate tax rate; *INFL* (*ΔINFL*) is the level (change) of inflation; *t* denotes the calendar year in which the variables are measured; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise.

TACC is the value-weighted total accruals; $TACC^F$ and $TACC^R$ are the fitted and the residual values from regression of *TACC* on *RBTD*, respectively. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5

Aggregate Boon-Tax Differences and Investor Sentiment

Model	Intercept	*SENT*	*H * SENT*	*H*	Adj. R^2
Panel A. Pre-SFAS 109 Regime (1965-1992)					
(1)	0.000	0.002**			0.158
	(0.09)	(2.33)			
(2)	-0.001	0.000	0.001	0.001	0.106
	(-0.60)	(0.25)	(0.98)	(0.46)	
Panel B. SFAS 109 Regime (1993-2010)					
(1)	0.001	-0.004**			0.155
	(0.38)	(-2.64)			
(2)	-0.002	-0.019***	0.017***	0.001	0.31
	(-1.63)	(-6.35)	(5.73)	(0.59)	

This table reports the OLS regression estimates of *RBTD* on investor sentiment. *RBTD* is the residual from the following regression:

$BTD_t = \alpha + \beta_1 STRt + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t{*}STRt + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t$

Where, *BTD* is the value-weighted temporary book-tax differences; *STR* (*ΔSTR*) is the level (change) of maximum statutory corporate tax rate; *INFL* (*ΔINFL*) is the level (change) of inflation; *t* denotes the calendar year in which the variables are measured; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise.

SENT is the investor sentiment index in Baker and Wurgler (2006); *H* is an indicator for high-sentiment periods and takes a value of one if investor sentiment index of the year is above the median value for the sample period 1965 to 2010, and zero otherwise. Heteroskedasticity-consistent standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6

Aggregate BTDs, Investor Sentiment, and the Predictive Content of Aggregate BTDs (1993-2010)

Sentiment	Row	Intercept	*SENT*	*RBTD*	$RBTD^{F\_S}$	$RBTD^{R\_S}$	N	Adj. R^2
	(1)	0.092**	-0.150*				18	0.104
		(2.60)	(-4.65)					
			[0.065]					
	(2)	0.075*			16.993	24.275**	18	0.216
		(1.78)			(2.00)	(3.73)		
					[0.142]	[0.026]		
LOW	(3)	0.163**		0.724			9	-0.142
		(3.41)		(0.11)				
				[0.417]				
HIGH	(4)	0.046		38.843***			9	0.625
		(0.97)		(3.20)				
				[0.003]				
LOW	(5)	0.159**			3.423	-3.673	9	-0.305
		(3.28)			(0.34)	(-0.27)		
					[0.140]	[0.168]		
HIGH	(6)	0.048			40.115	38.776***	9	0.562
		(0.68)			(1.54)	(2.72)		
					[0.223]	[0.007]		

This table reports the OLS regressions of one-year-ahead excess market returns on the fitted and residual values of *RBTD* on investor sentiment. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. *RBTD* is the residual from the following regression:

$BTD_t = \alpha + \beta_1 STRt + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t {*} STRt + \beta_7 P_t {*} \Delta STR_t + \beta_8 P_t {*} INFL_t + \beta_9 P_t {*} \Delta INFL_t + \varepsilon_t$,

where, *BTD* is the value-weighted temporary book-tax differences; *STR* (*ΔSTR*) is the level (change) of maximum statutory tax rate; *INFL* (*ΔINFL*) is the level (change) of inflation; *t* is the calendar year; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise. *SENT* is the investor sentiment index in Baker and Wurgler (2006); $RBTD^{F\_S}$ and $RBTD^{F\_S}$ are the fitted and the residual values, respectively, from the regression of *RBTD* on *SENT*, *H*, and an interaction term of *SENT* and *H*, where *H* is an indicator for high-sentiment periods. Heteroskedasticity-consistent standard errors, with Newey-West autocorrelation adjustment when applicable, are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 7

Firm-Level BTDs, Investor Sentiment, and the Predictive Content of Aggregate BTDs (1993-2010)

Panel A. Firm-level book-tax differences and investor sentiment

Parameter Estimates	Mean Estimate	Median Estimate	Number of Sign. Positive	Number of Sign. Negative	Fama-MacBeth t-statistics
		$FBTD_{i,t} = a_i + b_{1i}\ SENT_t + b_{2i}\ H_t * SENT_t + b_{3i}\ H_t + e_{i,t}$			
Intercept	-0.003***	-0.000	135	157	-3.66
b_{1i}	-0.017***	-0.009	84	193	-5.36
b_{2i}	0.018***	0.012	178	97	5.17
b_{3i}	0.002	0.000	120	64	1.42
		Average Adj. R^2 = 0.016, No. of firms = 1,719			

Panel B. Forecasting one-year-ahead *EXRET* with value-weighted fitted and residual *FBDT's*

Sentiment	Row	Intercept	*BTD*	*Value-weighted Fitted FBTD*	*Value-weighted Residual FBTD*	Adj. R^2
LOW	(1)	0.149**	3.516			-0.117
		(3.18)	(0.69)			
			[0.299]			
HIGH	(2)	-0.079	41.412***			0.685
		(-1.50)	(3.20)			
			[0.005]			
LOW	(3)	0.143**		5.737	0.640	-0.282
		(2.70)		(0.75)	(0.07)	
				[0.112]	[0.321]	
HIGH	(4)	-0.017		-5.500	45.290**	0.806
		(-0.56)		(-0.32)	(5.80)	
				[0.395]	[0.013]	

This table presents regression analysis of the relations between firm-level BTDs and market-wide investor sentiment and the aggregate effect of the firm-level relations on the predictive ability of aggregate BTDs. Panel A reports the firm-level time-series regression estimates of book-tax differences (*FBTD*) on investor sentiment. *SENT* is the investor sentiment index in Baker and Wurgler (2006); *H* is an indicator for high-sentiment periods, and the subscript *i* denote firm. Panel B reports the OLS regression estimates of forecasting one-year-ahead excess market returns (*EXRET*) using value-weighted fitted and residual values from firm-level regressions of *FBTD* on *SENT*, *H*, and an interaction term of *SENT* and *H* (as in Panel A of this table). To compute one-year-ahead *EXRET*, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2.

Heteroskedasticity-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 8

Aggregate BTDs and the Risk Premium Proxies (1993-2010)

Panel A. Forecasting one-year-ahead excess market returns

Model	Intercept	*RBTD*	*TBL*	*TMS*	*DFY*	*CAY*	*PAYOUT*	Adj. R^2
(1)	0.075*	21.131**						0.256
	(1.77)	(3.50)						
	--	[0.013]						
(2)	0.303	18.143*	0.840	1.136	9.476	2.947	0.157	0.344
	(0.35)	(2.07)	(0.17)	(0.17)	(1.05)	(3.31)	(0.71)	
		[0.069]	[0.451]	[0.417]	[0.302]	[0.191]	[0.296]	

Panel B. Contemporaneous regressions

B-1. Regressions of changes in RBTD on changes in the risk premium proxies and investor sentiment

Model	Intercept	$\Delta SENT$	ΔTBL	ΔTMS	ΔDFY	ΔCAY	Adj. R^2
(1)	0.001		-0.105	-0.099	-0.293	0.248**	0.016
	(0.73)		(-0.38)	(-0.46)	(-0.89)	(2.46)	
(2)	0.001	-0.004**	-0.046	-0.119	-0.379	0.296*	0.157
	(0.86)	(-2.34)	(-0.19)	(-0.53)	(-0.97)	(2.03)	

B-2. Contemporaneous excess market return regressions

Row	Intercept	$\Delta RBTD$	Fitted $\Delta RBTD$	Residual $\Delta RBTD$	Adj. R^2
(1)	0.079*	-13.183**			0.087
	(1.80)	(-2.34)			
(2) B-1 Model (1)	0.086*		-49.394**	-1.293	0.420
	(1.91)		(-3.30)	(-0.17)	
(3) B-1 Model (2)	0.082*		-29.369**	-2.160	0.189
	(1.84)		(-2.43)	(-0.33)	

This table reports regression analysis of the time-series relations among excess market returns (*EXRET*), *RBTD*, and the equity risk premium proxies. Panel A presents the predictive regressions of one-year-ahead *EXRET* on *RBTD* and the risk premium proxies. Panel B describes the contemporaneous regressions: B-1 presents the regressions of changes in *RBTD* on changes in the risk premium proxies and investor sentiment; and B-2 reports the regressions of *EXRET* on $\Delta RBTD$ and its components (the fitted and residual values in row 2 of Panel B-2 are estimates from model 1 of Panel B-1, and those in row 3 of Panel B-2 are from model 2 of Panel B-1).

To compute *EXRET*, the market and risk-free rate of returns in year t are cumulated over the period May of year t to April of year t+1. *RBTD* is the residual from the following regression:

$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t{*}STR_t + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t$,

where *BTD* is the value-weighted BTDs; *STR* is the maximum statutory tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix Δ denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured. *TBL* is the 3-month Treasury-bill rates; *TMS* is the yield spread between ten-year and one-year Treasury-bonds; *DFY* is the yield spread between the BAA and AAA-rated corporate bonds; *CAY* is the consumption-wealth ratio in Lettau and Ludvigson (2001), *PAYOUT* is the nature log of aggregate net payout yield for all nonfinancial firms continuously listed on NYSE, AMEX, or NASDAQ; *SENT* is the investor sentiment index in Baker and Wurgler (2006). Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 9

Forecasting Macroeconomic Activities (1993-2010)

	t ~ t+1	t ~ t+2	t ~ t+3
	(1)	(2)	(3)
Panel A. Growth rate in real industry production			
RBTD	1.018	4.693	7.498**
	(1.10)	(1.58)	(2.53)
IPG	0.294	0.262	1.456**
	(1.25)	(0.59)	(2.50)
Adj. R^2	-0.017	0.017	0.227
Panel B. Growth rate in real GDP			
RBTD	0.330	2.356*	3.749**
	(0.57)	(1.95)	(2.49)
IPG	0.182*	0.302*	0.859**
	(1.98)	(1.81)	(2.36)
Adj. R^2	0.079	0.181	0.286
Panel C. Growth rate in real private investment			
RBTD	3.014	12.516**	17.084**
	(1.11)	(2.40)	(3.01)
IPG	0.370	0.262	2.435
	(0.71)	(0.30)	(1.69)
Adj. R^2	-0.070	0.068	0.165
Panel D. Growth rate in total employment in the private sector			
RBTD	0.077	1.825	4.318**
	(0.18)	(1.40)	(2.50)
IPG	0.337***	0.417*	1.031***
	(3.73)	(2.12)	(4.33)
Adj. R^2	0.390	0.180	0.374

This table reports the results from regressing one- to three-year-ahead growth rates in real industrial production, real GDP, aggregate employment in the private sector, and real gross private domestic investment, respectively, on current period *RBTD* and growth in real industrial production (*IPG*). *RBTD* is the residual from the following regression:

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t * STR_t + \beta_7 P_t * \Delta STR_t + \beta_8 P_t * INFL_t + \beta_9 P_t * \Delta INFL_t + \varepsilon_t$$

where, *BTD* is the value-weighted temporary book-tax differences; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix Δ denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured. *IPG* is the annual growth in real industry production index. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 10

Forecasting Sector- and Market-Level Excess Returns using Sector-Level BTDs (1965-2010)

	Cnsmr	Manuf	HiTec	Hlth	Other
	(1)	(2)	(3)	(4)	(5)
Panel A. Predicting one-year-ahead excess sector returns					
			$EXRET\_S_{t+1} = \alpha + \beta RSBTD_t + \varepsilon_t$		
RSBTD	7.580*	4.853	10.407***	6.444**	14.178**
	(1.33)	(1.34)	(2.20)	(2.35)	(2.62)
	[0.078]	[0.141]	[0.004]	[0.023]	[0.021]
R^2	0.048	0.027	0.160	0.101	0.088
Panel B. Predicting one-year-ahead excess market returns					
			$EXRET_{t+1} = \alpha + \beta RSBTD_t + \varepsilon_t$		
RSBTD	2.838	4.859	8.680***	8.481***	10.230**
	(0.59)	(1.22)	(4.92)	(4.74)	(2.41)
	[0.264]	[0.172]	[0.001]	[0.002]	[0.048]
R^2	0.008	0.023	0.181	0.201	0.067

The table describes predictive regressions of one-year-ahead sector- and market-level value-weighted excess returns (*EXRET_S* and *EXRET*, respectively) using the residual component of the sector-level value-weighted book-tax differences. To compute one-year-ahead excess returns, holding period sector/market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. *RSBTD* is the residual from sector-level regressions below.

$$SBTD_{s,t} = \alpha + \beta_{s,1}STR_t + \beta_{s,2}\Delta STR_t + \beta_{s,3}INFL_t + \beta_{s,4}\Delta INFL_t + \beta_{s,5}P_t + \beta_{s,6}P_t*STR_t + \beta_{s,7}P_t*\Delta STR_t + \beta_{s,8}P_t*INFL_t + \beta_{s,9}P_t*\Delta INFL_t + \varepsilon_{s,t}$$

where, *SBTD* is the value-weighted temporary book-tax differences for industry sectors, classified based on Fama-French 5 industry classification; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix *Δ* denotes annual changes in the variables; subscript *s* denotes industry section and subscript *t* denotes the calendar year in which the variables are measured. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 11

The Aggregate BTDs-Investment Relation and the Predictive Content of Aggregate BTDs (1993-2010)

Panel A. Aggregate BTDs and aggregate asset growth

Model	Intercept	*AG*	*CrtETR*	*ROA*	Adj. R^2
A-1. Forecasting one-year-ahead excess market returns					
(1)	0.228***	-0.73**			0.224
	(4.21)	(-4.27)			
	--	[0.024]			
(2)	0.277	-0.741**	-0.039	-0.295	0.114
	(0.52)	(-2.11)	(-0.04)	(-0.07)	
	--	[0.038]	[0.437]	[0.471]	
A-2. Time-series relation between aggregate BTDs and aggregate investment					
(1)	0.004	-0.018**			0.200
	(1.78)	(-3.63)			
(2)	0.023	-0.015**	-0.057	-0.018	0.250
	(1.18)	(-2.70)	(-1.56)	(-0.23)	

Panel B. Forecasting one-year-ahead excess market returns

Row	Intercept	Fitted *RBTD*	Residual *RBTD*	Adj. R^2
(1) A-2 Model (1)	0.075	40.326**	14.84*	0.298
	(1.96)	(3.22)	(2.21)	
	--	[0.027]	[0.096]	
(2) A-2 Model (2)	0.075	26.39*	17.875*	0.219
	(1.67)	(2.54)	(2.03)	
	--	[0.062]	[0.093]	

This table reports regression analysis of the time-series relations among *RBTD*, aggregate asset growth, and one-year-ahead excess market returns. Panel A-1 describes the predictive regressions of one-year-ahead excess market returns using aggregate assets growth, aggregate current effective tax rate and aggregate ROA. *AG* is the value-weighted annual growth rate of total assets; *CrtETR*, is the value-weighted current effective tax rate; and *ROA* is the value-weighted ROA. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2.

Panel A-2 describes the regressions of *RBTD* on *AG*, *CrtETR* and *ROA*. *RBTD* is the residual from the following regression:

$$BTD_t = \alpha + \beta_1 STR_t + \beta_2 \Delta STR_t + \beta_3 INFL_t + \beta_4 \Delta INFL_t + \beta_5 P_t + \beta_6 P_t{*}STR_t + \beta_7 P_t{*}\Delta STR_t + \beta_8 P_t{*}INFL_t + \beta_9 P_t{*}\Delta INFL_t + \varepsilon_t$$

where, *BTD* is the value-weighted temporary book-tax differences; *STR* is the corporate maximum statutory income tax rate; *INFL* is the rate of inflation; *P* is an indicator that takes a value of one if *t* is post 1988, and zero otherwise; the prefix *Δ* denotes annual changes in the variables; subscript *t* denotes the calendar year in which the variables are measured.

Panel B reports predictive regressions of one-year-ahead excess market returns on the fitted and the residual values from the regressions in Panel A-2. The fitted and residual values in Row 1 of Panel B are estimates from Model 1 of A-2, and those in Row 2 of Panel B are from Model 2 of Panel A-2.

Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 12

Firm-Level BTDs-Investment Relation and the Predictive Content of Aggregate BTDs (1993-2010)

Panel A. Firm-level BTDs and asset growth

	Mean Estimate	Median Estimate	Number of Sign. Positive	Number of Sign. Negative	Fama-MacBeth t-statistics
A-1. $FBTD_{i,t} = a_i + b_i FAG_t + e_{i,t}$					
Intercept	0.000	0.000	190	93	0.78
FAG	-0.007**	-0.000	209	243	-2.19
Average Adj. R^2 = 0.086; Number of firms = 1,719					
A-2. $FBTD_{i,t} = a_i + b_{1i} FAG_t + b_{2i} FCrtETR_t + b_{3i} FROA_t + e_{i,t}$					
Intercept	0.016***	0.006	428	93	14.34
FAG	-0.038***	-0.005	118	270	-10.05
FCrtETR	-0.025	-0.061	35	652	-0.23
FROA	0.185***	0.101	644	67	23.2
Average Adj. R^2 = 0.384; Number of firms = 1,719					

Panel B. Forecasting one-year-ahead excess market return

Model	Intercept	*BTD*	*Value-weighted Fitted FBTD*	*Value-weighted Residual FBTD*	R^2
(1)	0.010	22.649***			0.333
	(0.22)	(3.64)			
		[0.009]			
(2) A-1	-0.005		37.559**		0.213
	(-0.12)		(3.32)		
			[0.043]		
(3) A-1	0.064			14.747*	0.134
	(1.34)			(1.86)	
				[0.076]	
(4) A-2	-0.006		25.535***		0.287
	(-0.13)		(4.85)		
			[0.006]		
(5) A-2	0.079			15.884	0.055
	(1.67)			(1.01)	
				[0.198]	

This table presents regression analysis of firm-level time-series relations between BTDs and asset growth and the aggregate effect of the firm-level relations on the predictive ability of aggregate BTDs. Panel A reports the firm-level time-series regression estimates of BTDs on asset growth, current effective tax rate, and ROA. *FBTD* is firm-level temporary book-tax-differences; *FCrtETR*, is firm-level current effective tax rate, defined as current tax expense divided by pretax income; *FROA* is firm-level ROA. To be included in this subsample, a firm must have at least 10 annual observations over the period 1993 to 2010. Panel B reports the OLS regression estimates of forecasting one-year-ahead excess market returns using value-weighted fitted and residual values from the firm-level regressions in Panel A of this table. To compute one-year-ahead excess market returns, holding period market and risk-free rates of returns are cumulated over the period May of year t+1 to April of year t+2. Newey-West heteroskedasticity- and autocorrelation-consistent standard errors are reported in round brackets; randomization *p*-values calculated following Nelson and Kim (1993) are reported in square brackets. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.