MARKET CAPITALIZATION AND EARNINGS PERSISTENCE: THE EARNINGS RESPONSE COEFFICIENTS OF TAX GENERATED EARNINGS CHANGES

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(ABSTRACT)

This research tests for persistence in tax generated earnings changes. Earnings persistence is indicated by the capitalization of earnings by securities markets. This research disaggregates accounting earnings and examines the security markets' evaluation of the relative permanence or transience of the component of earnings resulting from revenue law changes. Two proxies for tax generated earnings changes are evaluated though an examination of earnings response coefficients.

The results indicate that tax generated earnings changes are not expected to persist beyond two accounting periods, and may reflect the ability of firms to manage tax earnings.

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INTRODUCTION

Motivation

Prior research into the relationships between accounting earnings and security returns has assumed that earnings are an aggregate representation of discrete cash flows with varying durations. This composite view of earnings has led to the specific assumption that different components of earnings are capitalized into security price at different rates, with rate based on the persistence of the represented cash flows. Purely transient earnings (those present in a single period only) should be capitalized at a rate close to one, while permanent earnings (those which will be repeated to infinity) should be capitalized at a rate close to the price-earnings ratio. In regard to changes in earnings,[1] such an assumption requires both that security markets identify the character [transience or non-transience] of various earnings components, and that the markets arrive at consensus discount periods for the various components. This research extends prior investigations by empirically testing the above assumptions. Specifically, this research identifies a non-transient component of earnings (earnings generated by tax law changes), with the expectation that securities markets capitalize those earnings at a rate between the rate used to capitalize purely transient earnings and the rate used to capitalize permanent earnings.

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[1]Changes in earnings are termed "earnings innovations."

To the extent that the discounted cash flows theory of security valuation is validated, the capitalization rate(s) of tax generated earnings changes are then used to estimate the markets' assessment of the duration of the impact of a change in tax law.

Chapter One of this dissertation describes the nature of the relationship being investigated, in the context of the relevant literature. Chapter Two presents a model of this relationship, and the specific hypotheses being tested. Chapter Three describes the empirical measures used in the research, and the sample selection criteria. Chapter Four presents a discussion of the results of the empirical tests, and Chapter Five contains the conclusions drawn from them. The results of the investigation are summarized in Chapter Six, along with a discussion of the limitations of the study, and the implications of this study's results for future research.

CHAPTER 1

LITERATURE REVIEW AND THEORETICAL DEVELOPMENT

Earnings Response Coefficients and Earnings Persistence

Under the classical firm valuation model, the price of a firm's stock is equal to the present value [PV] of its expected future cash flows. The magnitude of the price response to new information in reported earnings is thus related to revisions of expected cash flows resulting from that information. Price response is therefore dependent on both the magnitude of a change in earnings [earnings innovation], and the degree of *persistence* [or discount period] of the revision.

Market-based information-content research has often focused on the functional relationship between security returns [R] and unexpected earnings [UX]:

$$R = \mathfrak{f}(UX) \quad (1)$$

Such research has repeatedly examined the above functional relationship through regression analysis, where the coefficient of the independent variable (the coefficient of unexpected earnings) represents the marginal response of security price to changes in earnings. That regression coefficient is generally referred to as the earnings response coefficient [ERC].[2] Investigations of the nature of ERCs, and of the earnings on which they depend, have characterized unexpected earnings as being composed of both persistent [UX^P] and transient [UX^T] components:

$$UX = UX^P + UX^T \tag{2}$$

If price is characterized as the present value of future earnings, then a change in the price of security i at time t that corresponds to return R_{it}, and which results from the announcement of unexpected earnings UX, is equal to the sum of the risk adjusted present values of UX^P and UX^T. Miller and Rock [1985] show analytically that valuation [price] changes are a function of earnings persistence - that is, the earnings announcement effect is "proportional to the surprise in earnings, with the proportionality factor being greater the greater the persistence parameter."[3]

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[2]The ERC is generally estimated as the slope coefficient of a simple linear regression of security returns [r] on changes in accounting earnings [ΔE] (e.g., the β coefficient in the regression equation: $r = \alpha + \beta(\Delta E) + \varepsilon$).

[3]Miller and Rock's [1985] equation (10) depicts the earnings announcement effect (the value at time 1 less the expected value at time 1: $V_1 - E(V_1)$) as the capitalization of the earnings surprise [ε_1]. The capitalization rate is: $1+\frac{\gamma}{1+i}$, where i is the firm's risk adjusted discount rate, and γ is the coefficient of persistence. If $\gamma = 1$, the earnings shock is entirely permanent; if $\gamma = 0$, the shock is entirely transitory; and if $0 \leq \gamma \leq 1$ the shock will persist for some finite period. Their model is sufficiently *flexible* to allow for multiplicative effects [$\gamma > 1$] and for negative effects [$\gamma < 0$] as well.

In empirical investigations of earnings persistence, Kormendi and Lipe [1987] examine the relationship between the magnitude of earnings and returns, and expected future cash flows. Kormendi and Lipe estimate the time-series properties of firms' earnings series, and the relationship between changes in those firms' earnings and their stock returns. Earnings persistence is then operationalized through the time series estimation of the present value of revisions in expected future earnings. The authors model a linear relationship between stock returns [*R*] and the product of: one plus the present value of revisions in future earnings [*PVR*], and unexpected earnings [*UX*]:

$$R_{it} = k_{1i} + \left[\alpha_0 + \alpha_1\left(1 + PVR_i\right)\right]\frac{UX_{it}}{P_{it-1}} + \varepsilon_{it} \qquad (3)$$

They find that in general the regression coefficient a_1 equals 1, such that stock returns reflect expectations of both current and discounted future [persistent] earnings.

Easton and Zmijewski [1989] find that earnings response coefficients are significantly, positively associated with a revision coefficient. This revision coefficient is derived from a linear regression of analyst revisions of expected earnings on: 1) the difference between actual and forecast earnings (the current period "earnings forecast error"), and 2) the change in stock price over the period between the earnings announcement and the analyst's revision.[4] The coefficient of

[4]Using Easton and Zmijewski's notation, the revision coefficient [REV] is the change in earnings forecasts for period t+1 or t+2 regressed on: Θ_0 + Θ_1FE + Θ_2PVLVL + u, where FE is the forecast error at time t, PVLVL is the change in security price, and u is a random disturbance term

the earnings forecast error relates current to future earnings, and is highly correlated with ERCs. These results can thus be taken as evidence of the strength of the relationship between changes in stock price, and revisions of expected persistent earnings.

Collins and Kothari [1989] show that ERCs are a function of the risk-free interest rate, and the "riskiness, growth and/or persistence of earnings." In a reverse regression of change in earnings on: 1) stock returns, 2) a risk-return interaction term, and 3) a growth/persistence-return interaction term, the coefficient of the growth/persistence term is significant and negative. Beaver, *et al* (1987) have shown that the returns response coefficient [RRC], should equal the reciprocal of the ERC in a simple regression. Collins and Kothari therefore conclude that ERCs are significantly, positively related to earnings "growth and/or persistence."[5] Together these investigations indicate that 1) Price = PV(Cash Flows), 2) the magnitude of a change in earnings correlates with the rate of earnings capitalization, and 3) ERC = f(earnings growth or persistence).

In research which more directly addresses the disaggregation of accounting earnings implicit in the discounted cash flows hypothesis,

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(Foster's 1977 [Accounting Review 52, 1-21] revision model was also tested). Θ_1 and Θ_2 are the firm specific variables correlated with ERCs, where Θ_1 relates current to future earnings, and Θ_2 proxies for all other information brought to the market during the period between forecast revisions.

[5]Collins and Kothari proxy for growth/persistence with the market equity to book equity ratio.

Freeman and Tse [1992] hypothesize that "the absolute value of unexpected earnings is negatively correlated with earnings persistence." They speculate that analysts will concentrate on predicting persistent earnings, thus decreasing the forecast error associated with predictions of the persistent component of earnings. The unexpected portion of any change in earnings would therefore have a greater probability of being transient in character. It follows that: "both the average persistence of unexpected earnings components and the related price response will decrease as the absolute magnitude of unexpected earnings increases."

Freeman and Tse [1992] model a parsimonious, non-linear relationship between unexpected earnings and security returns, that supports this hypothesis. They regress unexpected returns [UR] on an arctangent transformation of unexpected earnings [UX]:

$$UR = \alpha_0 + \alpha_1 \arctan(\alpha_2 UX_i) + error \quad (4)$$

and test this model against the traditional linear regression:

$$UR = \alpha_0 + \alpha_1 UX_i + error \quad (5)$$

Results of this comparison indicate that the non-linear model has significantly greater explanatory power than the linear model, and that the ERCs for the non-linear model approach composite price-earnings ratios [P/E].

Prior research however, has not focused on the identification of context specific, cross-sectional proxies for the *current*, persistent component of earnings. Neither Kormendi and Lipe [1987] nor Collins and Kothari [1989] attempt to identify the persistent component of current earnings. Freeman and Tse's [1992] non-linear model provides the best "fit" to date, but models only that portion of persistent earnings *missed* by analysts.

Harikumar and Harter [1993] address the identification of current-period persistent earnings, by developing a proxy for persistent earnings in much the same fashion as Collins and Kothari. Harikumar and Harter base their proxy on Tobin's Q,[6] and find a significant relationship between Tobin's Q and earnings persistence. Tobin's Q, however - by definition "the profitability of investment opportunities" - measures potentialities and is not definitive of the persistent *component* of a current earnings innovation. The Harikumar and Harter proxy is thus closer to a probability assessment regarding whether *all* of an earnings innovation is permanent or transient, rather than a disaggregation of that earnings innovation.

Prior research has therefore assumed, but left untested, the hypothesis that persistent (or *non-transient*) earnings innovations are capitalized at a rate greater than the capitalization rate of purely transient earnings. Such an assumption requires both that the market identify the non-transient component of an earnings innovation and that the market arrive at a consensus discount period for that innovation.[7]

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[6]Harikumar and Harter use the Lindenberg and Ross [1981] estimate for Tobin's Q. The Lindenberg and Ross proxy for Tobin's Q is equal to the sum of market value of equity and book value of debt, divided by the replacement cost of assets

[7]The discount period applicable to the capitalization of tax generated earnings changes may estimate not only the expected "life-span" of the tax law, but also the ability of individual firms or industries, to reduce any statute induced disadvantage and/or to increase any statute induced advantage.

This research seeks to determine whether securities markets specifically identified a non-transient earnings shock (i.e., are earnings capitalized as disaggregated components?) and if so, to discern the period over which that non-transient earnings component was capitalized.

Tax Generated Earnings Shocks

Following Easton and Zmijewski [1989] and Freeman and Tse [1992], a proxy for a current, persistent component of earnings may be earnings forecast revisions. From an empirical standpoint however, the identification of when such revisions are capitalized into security prices is problematic. A persistent component of earnings without such event-date identification problems, may however be derivable from changes in earnings resulting from major tax law revisions.

The Tax Reform Act of 1986 [TRA '86] reduced marginal corporate tax rates, yet eliminated the investment tax credit, lengthened depreciable asset lives, imposed a "minimum" tax, limited the deferral of installment sale income, and reduced the deductions for: entertainment expenses, indirect manufacturing costs, and for dividends received from other corporations.[8] This dramatic change in corporate tax accounting (described by Condrell, Tierney, and Siegal [1987] as "···the most sweeping reform in the history of our nation's tax structure") caused a non-transient, exogenous shock to accounting income. The shock was non-transient in that the impact on earnings was expected to extend

[8]See Brinker [1986] for a discussion of the various provisions of TRA '86 and their potential impact on corporations.

beyond one accounting period. The 20 percent alternative minimum tax, coupled with losses of tax credits and lengthened cost recovery periods was intended to raise corporate taxes by $120 billion over the five year phase-in period of the Act. As noted in Auerbach and Poterba [1987], TRA '86 was *designed* to reverse the "erosion" of corporate tax revenues as a percentage of U.S. gross national product, and to raise corporate taxes by $120 billion over the period 1987 to 1991. From a total revenue perspective, TRA '86 was designed to be "revenue neutral," to redistribute tax liability rather than increase it across the board. The $120 billion increase in taxes experienced by corporations under the act, was therefore offset by a $120 billion decrease in individual income taxes [Givoly and Hayn, 1991].

Quoting Congressional Budget Office [CBO] projections, Auerbach and Poterba show that TRA '86 would have its greatest impact in 1987, when corporate rates remained high but many corporate tax preferences were eliminated. In addition, their analysis of the CBO projections shows that the impact of TRA '86 (as indicated by average tax rates as a percentage of gross national product and corporate net assets) would *persist* over time.[9]

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[9]Auerbach and Poterba's [1987] Table 5 shows the projected taxes of non-financial corporations as a percentage of GNP and as a percentage of the net assets of those non-financial corporations [NFCs]. The projections were determined by the Congressional Budget Office and the Joint Committee on Taxation, in constant 1986 dollars, under both TRA '86 and under prior law. The table indicates that the impact of the TRA was expected to be significant and long lasting e.g.., NFC taxes as a percentage of net NFC assets average .54 more (2.92 v. 2.38) under TRA '86 than under prior law. Their Table 6 shows that average corporate tax

Moreover, the TRA would affect firms differentially. Some firms would be expected to experience positive revisions in earnings (e.g., firms investing in "structures" [Kopcke, 1988]) while others would experience declines (e.g., firms purchasing "new," rather than holding "old" equipment [Cutler, 1988]). Anecdotal evidence of the persistence of the TRA '86 induced earnings impact and differential effect can be found in corporate information releases, such as Rubbermaid, Inc.'s announcement of 1988 annual earnings, reported on the *Dow Jones News Wire* in part:

> "Rubbermaid said factors contributing to its improved earnings were better factory utilization, continued emphasis on cost containment, productivity improvement programs and a *lower federal tax rate* [italics added]."[10]

To the extent that these TRA '86 induced earnings shocks are identifiable on a firm specific basis, TRA '86 provides a unique opportunity for the identification of a non-transient earnings shock, and allows for the direct test of the relationship between security returns and earnings persistence. The failure of some research to identify firm specific earnings shocks [see Cutler 1988, Samelson 1992] may in part explain the inability of that research to find much in the way of

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rates were expected to increase by 8.1 percent in 1987, and to maintain a 6.3 percent differential between the old and the new [TRA '86] law over the 1987 to 1991 period.

[10]This item was reported on the *Dow Jones News Wire* on 2/7/89, at 9:00 AM.

significant reactions to TRA '86 events. Research which has developed a firm specific proxy for change in taxes [see Givoly and Hayn 1991] has however, revealed significant market responses to TRA '86 events.

Rates of Earnings Capitalization

Beaver and Morse [1978] show that price-earnings ratios are stable over time, and that those ratios tend not to vary in the long-run with growth or risk.[11] This stability lends empirical support to the Gordon-Shapiro valuation model:

$$P/E = \frac{K}{r-g} \tag{6}$$

where K is the dividend payout ratio, r is the required rate of return, and g is the earnings growth rate .[12] Here, earnings [E] is composed solely of permanent earnings, and the price-earnings ratio [P/E] can be reduced to 1/r, or the present value of a perpetuity.[13] In an efficient market, a

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[11]Although correlations between the P/E ratios of P/E based portfolios exceeded .90 for years 1-3, Beaver and Morse [1978] did find that P/E ratios tend to be mean reverting, and that "differential" growth rates may have some influence on the initial "dissipation" of P/E ratios.

[12]The Gordon-Shapiro model assumes that K, r, and g are constant, and that the cash flow stream is infinite. In an efficient market (when the internal rate of return equals the discount rate), the equality: value of the firm equal to the discounted dividend stream, is equivalent to: value of the firm equal to the discounted earnings of the firm. To the extent that these assumptions are violated, and/or the expectations of K, r, and g misspecified, the equality will not hold.

[13]The Gordon-Shapiro valuation model assumes that all earnings will be paid out to shareholders either as regular or liquidating dividends. See Appendix A for a derivation of this equality.

permanent change in earnings [ΔE^p] should therefore result in a change in price [ΔP] equal to:

$$\Delta P = \Delta E^p \times (1 + 1/r) \quad (7)$$

Bernard and Thomas [1989] and Freeman and Tse [1989] however, present evidence that investors underestimate the relative persistence of earnings innovations in a systematic fashion (In equation (6): the contribution of g to E, and ultimately to P). Freeman and Tse demonstrate further, that persistence is continually re-assessed [confirmed or disaffirmed] on the basis of subsequent earnings. Easton and Zmijewski's [1989] and Mendenhall's [1991] results indicate that analysts also underestimate the serial correlations in earnings.

In light of these results, the expectation that permanent earnings innovations at time t will be capitalized at 1+P/E of time *t*-1, may be empirically misspecified. Instead, 1+P/E would serve empirically as the upper bound on the capitalization of persistent earnings innovations.[14] Given the demonstrated error in both investor and analyst assessments of earnings persistence, the lower bound of the capitalization of persistent earnings would result from the incorrect classification of a persistent earnings innovation as entirely transient. Here the change in price would equal the present value of the single, current period cash flow (a capitalization rate of 1). If the earnings innovation is persistent (i.e., not transient, nor determined to be permanent), the capitalization

[14]Given the presence of capitalized transient earnings in security price, the rate of capitalization of purely permanent earnings would exceed the P/E ratio.

rate would change price by the present value of a finite stream of cash flows.[15] For instance, if the impact on cash flows of TRA '86 is expected to terminate in T years, the capitalization rate of a dollar of tax generated earnings discounted at rate r, would equal:

$$1+\frac{1-1/(1+r)^{T}}{r} \tag{8}$$

It is unlikely that earnings resulting from tax law changes are viewed as permanent earnings changes. These earnings innovations may persist, but only for a finite period. Recent U.S. history reveals a pattern of increasing incidence of major tax law revisions.[16] In the short-run (the phase-in period provided by most statutory changes), firms may shift income between accounting periods to reduce their tax liability [see Scholes, Wilson and Wolfson (1992)]. In the long-run, firms may modify their investment and financing positions to take best advantage of the new statutes.[17] The time period for determining the capitalization rate of tax generated earnings is therefore closer to one than to infinity, yet the expectation that the ratio is greater than 1 still holds.[18]

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[15]The period over which investors are willing to capitalize tax generated earnings is thus empirically estimable from the data.

[16]Recent tax law changes were enacted in 1976, 1978, 1981, 1982, 1984, 1986, 1990, and 1993, with all but RRA '93 having a significant impact on corporate income taxes. The average length of time between these acts is 2.4 years, with 2 revisions in the 1970s, 4 revisions in the 1980s, and 2 already in the 1990s.

[17]Myron Scholes and Mark Wolfson provide a thorough discussion of business tax planning in their book: "Taxes and Business Strategy: A Planning Approach," Prentice-Hall, 1992.

[18]From a more rigorous mathematical standpoint, perhaps it would be better to say the time period is "closer to one year than to 100 or 1,000

In summary, prior research provides some evidence supporting the discounted cash flows theory of security valuation, yet has focused on purely transient (one period), or purely permanent earnings changes. This research tests the market response to an earnings change which is expected to persist beyond one period, but less than infinity.

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years." To the extent that a firm experienced §481 induced changes however, such changes might be viewed as permanent.

CHAPTER 2

MODEL AND HYPOTHESES

Overview

This research identifies a specific, non-transient component of earnings, and measures the rate at which that component is capitalized by security markets. The capitalization rate thus identified indicates the degree to which securities markets assessed the relative persistence of the earnings component, and thus the extent to which that earnings component was disaggregated and capitalized based on expected future cash flows. Firm specific discount rates are then used to estimate the period over which the earnings component was impounded into security price.

The specific earnings component - the tax generated earnings change resulting from the passage of TRA '86 - is estimated in two ways. The first method of estimation is a general model based on the adjustment of expected, period t+1 earnings-before-taxes for the change in effective federal tax rate from time t to time t+1. The second method follows the same form as the first, but replaces the change in effective tax rate with the firm specific estimates of changes in effective tax rates that Mark Starcher developed for *Tax Analysts* in 1986.[19] The resulting

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[19]See the discussion below and the accompanying footnote [28] for a more detailed description of the Starcher analysis procedure.

estimates of change in persistent earnings are then modeled as independent variables in linear regressions on cumulative abnormal security returns. The regression models, hypotheses, and estimation procedures are described below.

Model Specification and Variable Definitions

The linear regression model used to test the transience-permanence hypothesis is :

$$R_{it} = \alpha_0 + \alpha_1 E(\Delta EP) + \alpha_2 \tau_{it} + \alpha_3 U_{it} + \varepsilon_{it} \quad (9)$$

where R_{it} is equal to the cumulative mean-adjusted return on the securities of firm *i* over period *t*, α_0 is the regression intercept, α_1 is the coefficient of expected change in persistent earnings, $E(\Delta EP)$ is the expected change in persistent earnings from period *t*-1 to period *t*, α_2 is the coefficient of the persistent change in earnings resulting from a change in the tax law, τ_{it} is the portion of period *t* expected earnings resulting from a change in tax law, U_{it} is unexpected earnings at time *t*, and ε_{it} is a random error term $N(0,\sigma^2)$.[20] All independent variables are standardized by the average of: the closing security price one day prior to the first event-day and the closing security price one day prior to the

[20]Given the instability of the α_2 coefficient in equation (9), an alternative regression would be: $R_{it} = \alpha_0 + \alpha_1 E(E) + \alpha_2 (P/E)\tau_{it} + \alpha_3 U_{it} + \varepsilon_{it}$, where the upper bound of α_2 would equal 1, and the lower bound E/P [earnings divided by price]. Such a construction would stabilize the upper bound, correcting that deficiency in [9) above, but would destabilize the lower bound in it's stead.

earnings announcement date.[21] The average of two closing prices is used instead of a single closing price because the event window covers a period greater than one year, thus requiring a control for the possibility of stable earnings series coupled with dynamic price series.[22] The result of this standardization is that the regression coefficients can be interpreted as the standardized effect on stock returns of $1 in earnings innovation.

The expected values of the regression coefficients are summarized in Table 1:

Table 1

Regression Parameters and Expected Values

Linear Regression Model	$R_{it} = \alpha_0 + \alpha_1 E(\Delta EP) + \alpha_2 \tau_{it} + \alpha_3 U_{it} + \varepsilon_{it}$
Parameter	Expected Value of the Parameter
α_0	$\alpha_0 > 0$

[21]The independent variables are presented in per-share increments. Therefore standardization by (Price$_1$ + Price$_2$]/2 provides a control for size effects. The incorporation of price from a time subsequent to a return generating event may however, introduce an econometric misspecification into the model. Appendix E reports the [not dissimilar] results when a more traditional standardization procedure is implemented [see footnote 22 below].

[22]Results and analysis for the alternative standardizations: 1) tax generated earnings change and analyst forecast revisions standardized by price one day prior to the event period, and 2) unexpected earnings standardized by price one day prior to the earnings announcement date, are not significantly different from those using the average price standardization described above. The results and analysis utilizing the alternative measures are presented in Appendix E.

(Table 1 Continued)

Parameter	Expected Value of the Parameter
α_1	$\alpha_1 = 0$
α_2	$1 < \alpha_2 < 1+P/E$
α_3	$\alpha_3 > 0$

These expectations assume that: 1) expected earnings are capitalized in the price of securities on trading dates other than the information events identified; 2) investors perceive a change in earnings resulting from a change in tax law as persisting over a period greater than one year; and 3) residual earnings contain persistent and transient components, with the transient portion positively correlated with magnitude.[23] Because α_1 in Equation 9 has an expected value of 0, and because U_{it} may be applicable only in cumulations including the earnings announcement date, the equations:

$$R_{it} = \alpha_0 + \alpha_1\tau_{it} + \alpha_2 U_{it} + \varepsilon_{it} \quad (9'')$$

$$R_{it} = \alpha_0 + \alpha_1\tau_{it} + \varepsilon_{it} \quad (9''')$$

[23]Miller and Rock [1985] show analytically, that price change is proportional to earning shocks, and dependent on the "persistence" parameter: $\Delta P = (EPS_t - E(EPS_t))[1+\gamma/(1+i)]$ where i is the market discount rate and γ is the persistence parameter. Freeman and Tse find evidence that "a linear model heavily weights high-magnitude, low-value transitory earnings at the expense of low-magnitude, high-value permanent earnings." Because of this, the expectation in the linear model is that α_3 will be dominated by transitory earnings and thus be greater than, but not statistically different from $|1|$.

are also tested. Further reference to these specific equations is omitted for ease of exposition; however references to tests on equation (9) should be thought of as equally applicable to equations (9"), (9'").[24]

Hypotheses

1. Security markets recognized the non-transience of changes in earnings that resulted from TRA '86 (earnings are capitalized as disaggregated components). Specifically, the ERC of the tax gain (loss) will reflect a capitalization rate greater than the universal lower bound, 1. In null form the coefficient of τ_{it} [α_2], will be less than or equal to 1 for equation (9) [H_0: $\alpha_1 \leq 1$].
2. The tax-law-generated earnings change will enhance an explanation of the response of security returns to earnings information events (explaining valuation in terms of the sum of component changes in discounted future cash flows is superior to explaining valuation as a function of a single aggregate cash flow). Specifically, for the fiscal year 1987, equation (9) will provide greater explanatory power than will that equation sans the tax generated earnings component (9'):[25]

$$R_{it} = \alpha_0 + \alpha_1 E(\Delta EP) + \alpha_2 U_{it} + \varepsilon_{it} \qquad (9')$$

[24]See Appendix C for a discussion of the applicable tests.
[25]For years other than 1986, 1987 and 1988, the τ variable of equations (9) and (10) is zero rendering equation (9) equal to equation (9'), and equation (10) equal to equation (10'). 1986 is not included in the test because although certain provisions of TRA '86 became effective on 1/1/86, and others on 7/1/86, the major provisions of the act did not become effective until 1987 [Note: the Act did not take *full* effect until 1991].

CHAPTER 3

EMPIRICAL ESTIMATION AND SAMPLE SELECTION

Model Estimation

An expectations model devoid of changes in tax law is necessary for this analysis. Analyst forecast models may [Brown, *et at* (1987a)], or may not [O'Brien (1988)], be more strongly associated with security returns than statistical models, and may or may not include in earnings forecasts a tax change component. Surely however, analysts incorporate more information in earnings forecasts than an historical time series [Brown *et al* (1987b) and Schipper (1991)] and consequently should have forecast earnings changes inclusive of changes in tax liability.[26] Two models of investor expectations of tax induced earnings changes are used in this research. The first is a *sophisticated* approach which requires a derivation of the expected change in earnings before income taxes (from analyst forecast revisions), and the subsequent application of an expected change in tax rate. The second is a *naive* approach in which the expected tax induced change in earnings is set equal to the product

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[26]Whether analysts consider tax law changes in generating earnings forecasts is, as suggested in Scholes, Wilson and Wolfson [1992], a question that might be subject to empirical test. Given the extensive public attention focused on TRA '86 however, the probability of excluding a tax effect is significantly less likely than the probability of its inclusion.

of mean analyst earnings forecasts and an expected change in tax rate.[27]

The first method of estimating expected changes in persistent earnings employs mean analyst forecast revisions [ΔF]. A forecast revision equals the difference between the mean analyst forecast at time t and the mean forecast at time t-1. Both Easton and Zmijewski [1989] and Freeman and Tse [1992] provide evidence of the robustness of analyst forecast revisions as proxies for changes in expected permanent earnings. The calculation of mean analyst forecast revisions [ΔF] is made as in equation (10), where F_{it} is an analyst's forecast of the earnings of firm i at time t, and N represents the total number of forecasts available.

$$\Delta F_i = \frac{1}{N}\sum_{n=1}^{N} F_{it} - \frac{1}{N}\sum_{n=1}^{N} F_{it-1} \tag{10}$$

In this research, sample firms were included in the analysis only if the Institutional Brokers Estimate Service [I/B/E/S] reported earnings forecasts during the event day period (May 1985 through September 1986).[28]

Unlike time-series models of earnings expectations, a change in analysts' forecasts may include the component of expected earnings-

[27]Given that Scholes, Wilson and Wolfson [1992] find some evidence of income shifting over the rate change phase-in period (fiscal year 1987), the expectations model may be slightly misspecified for fiscal year 1988, and the rate differential may be misspecified for both 1987 and 1988.
[28]The minimum period between the first I/B/E/S reported analysts' forecasts for a firm, and the last I/B/E/S reported analysts' forecasts was arbitrarily set at five months. This limit was set so as to include at minimum, one-third of the period required for Congress to create TRA '86.

change attributable to changes in tax law. The determination of expected persistent earnings therefore requires a decomposition of ΔF into the portion resulting from a change in tax law, and the portion attributable to other causes. This decomposition is presented in Appendix B [equation B12], and results in:

$$\Delta F = \Delta E = \Delta EBIT + \tau' + \tau = E^{p} + \tau^{ps} \qquad (11)$$

where the analysts' forecast revision [ΔF]equals the expected change in earnings [ΔE], $\Delta EBIT + \tau'$ equals the portion of an expected change in earnings under prior tax law [E^{p}], and τ^{ps} equals the portion attributable to the change in tax law.

The second method of estimating expected changes in persistent earnings is a *naive* model in which mean analyst earnings forecasts are multiplied by an expectation of the change in tax rate resulting from TRA '86 [equation 13].

$$\tau^{Pn}{}_{i} = \frac{1}{N}\sum_{n=1}^{N} F_{it} \times \Delta T \qquad (12)$$

where τ^{pn} is the tax generated earnings differential, F_{it} is an analyst's forecast of a sample firm's fiscal year 1987 earnings, and ΔT is an expectation of the change in effective tax rate for the firm.

The change in effective tax rate resulting from application of the Tax Reform Act of 1986 is also estimated in two ways. The first proxy for the expected change in effective tax rate is determined from the published annual earnings data for each sample firm subsequent to the commencement of the new tax provisions. Because of the "piggy-back" character of most state income tax formulas[29] effective tax rate for purposes of determining τ^p, is defined as the sum of Federal income taxes (Compustat Item 63) and State income taxes [Compustat item 173], all divided by pretax income (Compustat Item 170). This proxy for the expected, TRA '86 induced, change in effective tax rate is then computed by averaging the firm specific effective tax rates for fiscal years 1984 and 1985, and subtracting the effective tax rate for fiscal year 1987.

The second proxy for the change in effective tax rate resulting from the application of TRA '86 utilizes the estimates Mark Starcher developed for *Tax Analysts* in 1986.[30] This ex-ante assessment of the expected, firm-specific changes in effective federal tax rates resulting from TRA '86 was undertaken for 887 publicly traded firms. The Starcher estimation procedure assumes:

1. A statutory corporate tax rate of 34 percent
2. The repeal of the investment tax credit, and a reduction in the research and investment credit
3. A 5 percent reduction in the value of depreciation deductions
4. A 10 percent minimum tax on certain "preference items" disclosed in the companies' financial statements.

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[29]A "piggy-back" system refers to state income tax formulas which use the results of Federal tax computation formulas as the starting point for computing state income tax.

[30]*Tax Analysts* is a publishing firm based in Arlington, VA, which specializes in providing timely updates and analysis of government tax related activities to the legal and accounting professions. *Tax Analysts'* best known publication is the weekly tax service *Tax Notes*.

In addition, Starcher modified these basic assumptions on an industry by industry basis as required.[31]

This proxy for expected tax-generated earnings change [τ^S] is derived by determining the Starcher expected differential for 1985-to-1987 effective tax rates, and then multiplying that differential times 1987 expected pre-tax earnings. As is the case with the above proxy for the expected change in effective tax rate, τ^S is modeled as: 1) the product of the expected earnings before taxes of firm i at time t [$E(EBIT_{it})$] and the Starcher estimate of the TRA '86 generated rate differential for firm i [S_i],[32]

$$\tau^{ss} = E(EBIT_{it})(S_i) \qquad (13)$$

and 2) the product of the mean analysts' forecast of fiscal 1987 earnings [$E(E_{it})$] and the Starcher expected rate differential

$$\tau^{sn} = E(E_{it})(S_i) \qquad (14)$$

Effective tax rate for purposes of determining τ^S is consistent with Starcher's *Tax Analysts'* derivation of 1985 rates, and is defined as total income taxes (Compustat Item 16) divided by pretax income (Compustat Item 170).

Both of the above proxies for τ assume that (1) the tax consequences of operations are substantially equal across accounting cycles for all firms; (2) firms have not made major, permanent adjustments to their tax

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[31]Starcher [1986]: pp. i-ii.

[32]Increases in the marginal tax rate are positive values, and decreases in marginal tax rate are negative values.

positions during the phase-in period,[33] and (3) the percentage change in tax liability is constant across years for each firm. The regression models described above are estimated using both values of τ: τ^p and τ^s.

Residual earnings, U_{it}, is calculated as actual change in earnings less the expected change in earnings:

$$U_{it} = \Delta E_{it} - E(\Delta E_{it}), \qquad (15)$$

where the expected change in earnings of firm i at time t [$E(\Delta E_{it})$] includes a persistent exogenous shock occurring during the period t-1 to t. Here, the persistent shock is the expected TRA '86 induced earnings change:

$$U_{it} = [(E_t - E_{it-1}) - (E^p + \tau)] \qquad (16)$$

Abnormal returns [ARs] on security i are equal to the sum of the mean-adjusted CRSP daily returns for the day of an information event. For those information events falling on days when the capital markets are closed, abnormal returns are calculated for the first trading day following the event day. Twenty-nine single-day event windows, and one two-day event window are adjusted for mean returns and then cumulated [*CAR*] in this research.

$$R_{ijt} = CAR_{ijt} = \sum_{j=1}^{J} \sum_{t=0}^{T} (r_{ijt} - \bar{r}_{ij}), \qquad (17)$$

where j is the information event, t=0 is the date of the information event, r_{ijt} is the return for firm i on day t of event j, and $\bar{r}_{ij}$ is the mean return of firm i over a 200 day period which includes the 150 days prior to the

[33]See Scholes, Wilson and Wolfson [1992] for an examination of income shifting during the phase-in period.

announcement of Treasury II, and the 50 days subsequent to President Reagan's signing of TRA '86.[34]

$$\bar{r} = \frac{1}{200} \sum_{t-200}^{t-1} r_{it} \tag{18}$$

Mean adjusted returns are used in this research because portfolio based returns [either beta adjusted returns or size adjusted returns] are dependent upon individual securities being valued [in part], independent of general market movements. The specific context of this research, the identification and evaluation of tax-induced valuation revisions, focuses upon an event period in which all firms are being impacted by the same event, and thus firm-specific valuation revisions are not independent of portfolio valuation revisions. Any adjustment for portfolio revisions might, in this case, include [and thus remove], a significant portion of the discrete security revisions which this research is attempting to identify.

The mean returns are calculated over a split period because the length of time from the first event to the last event exceeds one year. It is unlikely that a security's mean return is stable over this time period, thus the average of returns which straddle the event period should

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[34]Brown and Warner [1985] investigate this adjustment for security returns and find it equivalent in terms of the probability of a type I error, to market adjusted returns and risk adjusted returns. In the instant case, the period for calculation of mean returns includes the 150 trading days beginning on and subsequent to November 11, 1984, and the 50 trading days beginning on and subsequent to October 24, 1986.

provide a more reliable estimate of each security's average daily return than would an average based on a single pre-event period.[35]

Event Dates

Published News Releases

Forty single-day event windows, and one two-day event window are cumulated in this research. Potential event dates were initially identified by searching the Wall Street Journal for articles concerning: *tax, industry or sector, effect or impact, and congress, reagan, senate, or reform.* This search resulted in the initial identification of seventy-six potential event dates [one hundred ten including the trading dates (not otherwise identified) following the publication date of each identified *Wall Street Journal* article]. The identified articles were read and the contents of the *Wall Street Journal* on the "following dates" searched, for 1) articles specifically addressing the impact of TRA '86 on broad industry groups and 2) announcements of specific legislative action. This search resulted in the identification of forty event dates, none of which were "following dates."

Short windows are utilized to control for the impact of non-TRA '86 information events. The forty single-day event windows correspond to dates on which the Wall Street Journal published articles specifically addressing the potential impact of the Tax Reform Act across broad

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[35]Mean returns were not adjusted for periods between event dates [as in Samelson 1992], because of the possibility that such adjustments would incorporate into the mean return, price changes resulting from TRA '86 induced valuation revisions.

industry groups. Published articles were required to address either the specifics of any proposed legislation, or specifics and the impact of those specifics on identified industry groups, in order to qualify for inclusion in the data set. The requirement that published *analyses* address the impact of TRA' 86 across several industry groups was imposed to identify those dates on which information releases/analyses useful to investors (for making TRA' 86 induced price revisions), covered a broad market spectrum. Articles which duplicated the content of prior information releases/analyses were deleted from the event group, as were event-day returns for sample firms whose: pre-1987 earnings release(s); dividend announcements (increased, decreased, or special); or ex-dividend dates coincided with event dates.[36]

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[36]The abnormal returns of sample companies whose pre-1987 earnings announcements, dividend change announcements, stock split proposals, or ex-dividend dates coincided with TRA '86 event dates were deleted from the cummulative abnormal returns in the analysis. Earnings announcments, dividend changes, or stock split proposals transmitted on the *Dow Jones News Wire*, or published in the *Wall Street Journal* on either the day prior to, or day of the TRA '86 information event were considered "coincidental" to the information event for the purpose of adjusting cumulative abnormal returns.

Table 2

TRA '86 Legislative History

1) Ways and Means Committee reports out bill	Saturday 11/23/85
2) House of Representatives passes bill	Tuesday 12/17/85
3) Finance Committee reports out bill	Wednesday 5/7/86
4) Senate passes bill	Tuesday 6/24/86
5) Conference Committee reports out bill	Saturday 8/16/86
6) House of Representatives passes bill	Thursday 9/25/86
7) Senate passes bill	Saturday 9/27/86
8) President signs bill into law	Wednesday 10/22/86

The final event window encompasses the day of and the day subsequent to, the 1987 annual-earnings announcement date. These dates are included to incorporate the capital markets response to verification or refutation of the earnings and tax estimates

The mean number of publication event dates used in this analysis was 40.40, or 96% of those possible. The event dates regarding each firm's earnings announcement were included in all data sets, thus a mean of 38.24 of the 40 possible TRA '86 event dates (95%) were included. The mode of this frequency was 38 event dates, and the range was 32 through 40 (inner quartile range: 37 through 39). Only 1% of the sample CARs included 35 or fewer TRA '86 event dates.[37]

TRA '86 Event Period

The event dates identified above, occur within the period June 5, 1985 through September 19, 1986. The beginning of this period was chosen to coincide with the introduction of Treasury II and President Reagan's expressed support for the plan.[38] The end of the period was

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[37]See Tables 5 and 6

[38]The beginning of the period was chosen to coincide with the period subsequent to the Treasury Department's announcement of its "Treasury II" tax plan rather than the announcement of Treasury I [1984] because after an initial flury of congressional activity regarding Treasury I, support for tax reform [even that of President Reagan] dissapated. It was not until the announcement of Treasury II, and Congress' return after the 1984 general election [the spring 1985 session], that serious work on tax reform was undertaken by Congress.

chosen to coincide with the House-Senate conference committee reporting out TRA '86 in its final form.[39]

Cumulative Returns as Dependent Variables

The regression models [below] were estimated for CARs equal to the mean adjusted sum of sample firm returns on: (1) TRA '86 *Published Event* days only, (2) TRA '86 *Published Event* days and earnings announcement days [EAD dates], and (3) the 325 trading days from June 6, 1985 through September 19, 1986.

Discount Period Estimation

Estimation of the discount period T, in the implicit equality:

$$ERC = 1 + \frac{1 - 1/(1+r)^{T}}{r} \tag{19}$$

is made by estimating r on a firm specific basis.[40] Formally, a weighted average cost of capital can be derived from: 1) the average yield on corporation *i*'s long-term [maturities greater than or equal to 1 year] debt

[39]Note: A desire to minimize the impact of non-TRA '86 information responses on the sample data provided the impetus to terminate the event period short of both final Congressional approval and President Reagan's signing of the Act. This somewhat "premature" termination is justified by the assurance of congressional leaders that passage was eminent, and that given passage, there was no realistic prospect of a Presidential veto.

[40]Subscripts indicating firm specificity are dropped here to improve the clarity of the discussion.

[r^d], 2) the yield on corporation *i*'s preferred stock [r^p],[41] and 3) the cost of internal common equity [r^c].[42] The weights [ω] are equal to the proportion of total financing [F][43] attributable to each component above:

$$\omega^d = F^d \Big/ \left(F^d + F^p + F^c\right) = F^d \Big/ F \tag{20a}$$

$$\omega^p = F^p \Big/ \left(F^d + F^p + F^c\right) = F^p \Big/ F \tag{20b}$$

$$\omega^c = F^c \Big/ \left(F^d + F^p + F^c\right) = F^c \Big/ F \tag{20c}$$

The cost of internal common equity can be estimated using equation (6): $\mathrm{P/E} = \frac{\mathrm{K}}{\mathrm{r-g}}$, which can be rewritten $P_0 = \frac{D_1}{r-g}$ or $r = \frac{D_1}{P_0} + g$. Empirically, *g* is modeled as in Harris [1986] as the mean I/B/E/S reported[44] financial analysts' forecasts of five-year growth in earnings per share. The cost of internal common equity [r^c] for firm *i* at time *t* then becomes:

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[41]The cost of preferred equity is assumed equal to the cost of holding preferred stock: $r^p = D_t \big/ P_t$

[42]See Martin, *et al* [1991], pp. 259-69 for a discussion of this technique.

[43]"Total" financing is equal to the sum of: financing from debt [F^d], financing from preferred equity [F^p], and financing from common equity [F^c].

[44] *IBES* is the *Institutional Brokers Estimate System*, a product of the *Lynch, Jones, and Ryan* stock brokerage. The product compiles financial analysts forecasts of earnings per share for two fiscal years into the future, and projected five-year growth rates, for over 2,000 publicly traded corporations. The information is compiled monthly.

$$r^c = r_{it} = \frac{D_{it}}{P_{i,t-1}} + \frac{1}{N}\sum_{n=1}^{N} E(g_{it+1 \to t+5}), \tag{21}$$

where N is the number of analysts providing forecasts for firm i at time t, and $E(g_{t+1 \to t+5})$ represents those analysts' forecasts of five-year growth in earnings per share, and the The weighted average cost of capital [r] is then:

$$r = \left(r^d \omega^d + r^p \omega^p + r^c \omega^c\right) \tag{22}$$

In the instant case however, the ERC reflects only the return on equity. Therefore $\omega^C = 1$ and $r = r^C$.

Sample Selection

Sample firms are all those New York Stock Exchange or American Stock Exchange listed companies with: earnings announcements reported by the Dow Jones News Wire or the Wall Street Journal; annual federal, state and, total taxes, earnings before discontinued operations and extraordinary items, preferred equity, preferred dividends, total long term debt, interest on long term debt, and common shares outstanding on Compustat APST; returns and price data on CRSP; and monthly earnings forecasts, actual earnings and projected growth rates of earnings for the years 1983 through 1987 on I/B/E/S.[45] These data screens yielded a sample of 477 firms. Two-hundred sixty-nine of those sample firms met the additional requirements of: 1) tax-change estimates in Starcher [1986], and 2) event period I/B/E/S earnings forecast revisions separated by at least five months.

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[45]Only those firms with at least five analyst forecasts in each month are included in the sample.

The reliance on those firms contained in the Compustat, CRSP, and I/B/E/S databases, and on those identified by Starcher, means that the sample is neither random nor unbiased with regard to firm size.

Sample firms selection criteria are summarized in Table 3.[46] Furthermore, sample firms were required to have at least two I/B/E/S reported, analysts' fiscal 1987 earnings forecasts during the event day period, and an elapsed time period of five months between the first and last of these forecasts.

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[46]Firms with negative values in both the numerator and denominator of the effective tax rate formula are removed from the sample because the resulting positive value is uninterpretable. Firms with earnings announcements on days in event windows 1 through 8, will be removed from the sample.

Table 3

Data Items and Sources

Earnings Announcement published in the Wall Street Journal, or transmitted over the Dow Jones News Wire	
Compustat APST Pre-Tax Income	Item 170
Compustat APST Income Taxes - Total	Item 16
Compustat APST State Taxes	Item 173
Compustat APST Federal Taxes	Item 63
Daily Returns and Prices on CRSP	
Actual Earnings per Share on I/B/E/S	
Mean I/B/E/S Earnings Forecasts[47]	
Mean I/B/E/S Five-year Growth Forecast	
Compustat APST Interest Expense on Long Term Debt and Compustat APST Long Term	Item 101
Debt (Total)	Item 9
Individual Firm Estimates per Starcher	# 887
Compustat APST Preferred Stock - Carrying Value	Item 130
Compustat APST Dividends - Preferred	Item 19
Compustat APST Common Equity - Total	Item 60
Compustat APST Dividends - Common	Item 21
Compustat APST Common Shares Outstanding	Item 25

[47]In addtion to the two I/B/E/S mean earnings forecasts during the event period [F2 and F3], the last mean earnings forecast prior to the actual 1987 earnings announcement [F1] is also used in the the analysis.

CHAPTER 4

ANALYSIS OF RESULTS

Statistical Analysis

Descriptive Statistics

Mean effective tax rates and their standard deviations, for the years 1984 through 1987, are presented in Table 4 for the 477 and 269 firm samples. As expected, the mean effective tax rate increased over the period, while the range of effective tax rates decreased. These results (presented graphically in Figures 1 and 2), are consistent with the intent Congress expressed regarding TRA '86: that of increasing corporate tax liabilities and imposing a minimum tax on firms with financial accounting income. The range of effective corporate tax rates for the sample groups declined over the period as well. This result is consistent with Congress' method of attaining the above desired results through the elimination or limitation of tax preferences and deductions.

TRA '86 *Publication Events*

The descriptive statistics for the TRA '86 *Publication Event* date CARs [hereafter *event date CARs*], and the mean return data for calculating those CARs are presented in Tables 5 and 6. The 269 firm sample [Table 5] has a mean cumulative abnormal return for the TRA '86 event dates of -8.76 percent, with a maximum of 21.89 percent and a minimum of -51.62 percent. As noted above, the CARs were calculated

Table 4

Descriptive Statistics of 1984 through 1987 Effective Tax Rates by Sample Group

Tax Rate	N	Mean	Std Dev	T: mean =0	Pr > |T|	Max	Median	Min	Q3-Q1
1987	477	0.3106	0.1531	44.314	0.0001	0.9508	0.3209	0.0007	0.2025
1987	269	0.3131	0.1487	34.530	0.0001	0.9508	0.3227	0.0007	0.2008
1986	477	0.3058	0.1780	37.519	0.0001	1.2677	0.3138	-0.0006	0.2236
1986	269	0.3078	0.1897	26.111	0.0001	1.2677	0.3079	0.0098	0.2309
1985	477	0.2507	0.2206	24.814	0.0001	1.8678	0.2688	-1.4573	0.2420
1985	269	0.2497	0.1609	25.447	0.0001	0.7043	0.2688	-0.6667	0.2327
1984	477	0.2568	0.2556	21.947	0.0001	2.4692	0.2771	-2.0155	0.2569
1984	269	0.2489	0.2715	15.008	0.0001	1.6581	0.2785	-2.0155	0.2614

Figure 1

Mean Tax Rate, Standard Deviation and Range
by Year - 269 Firm Sample

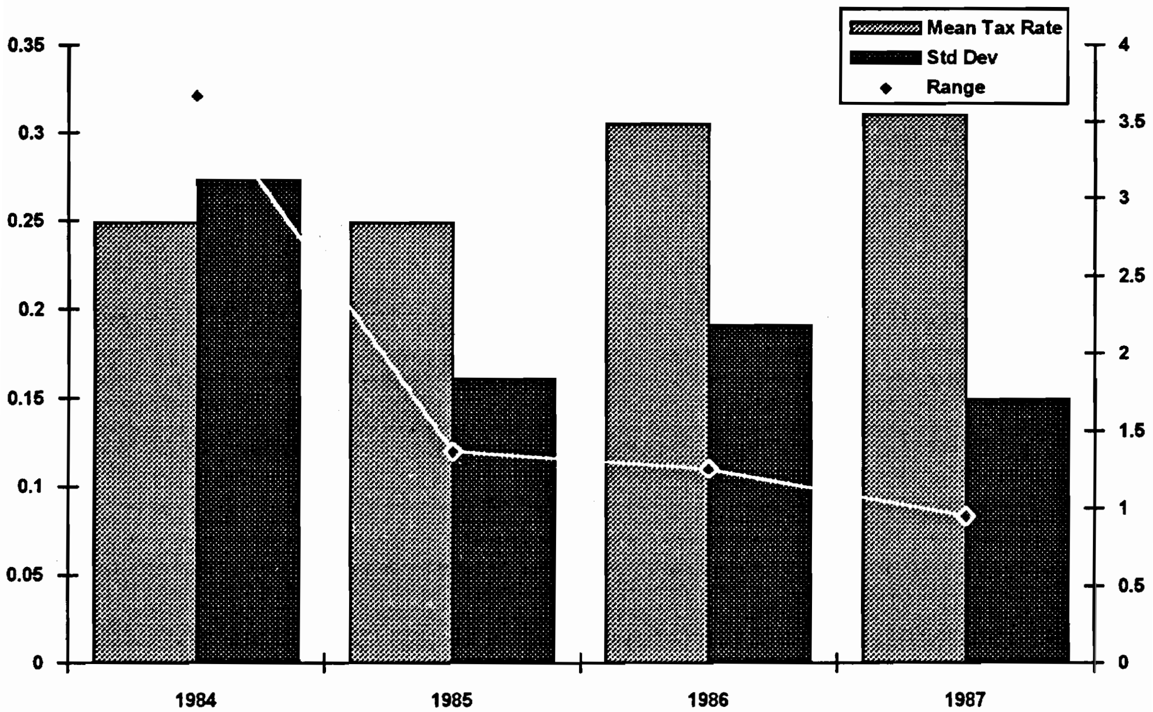
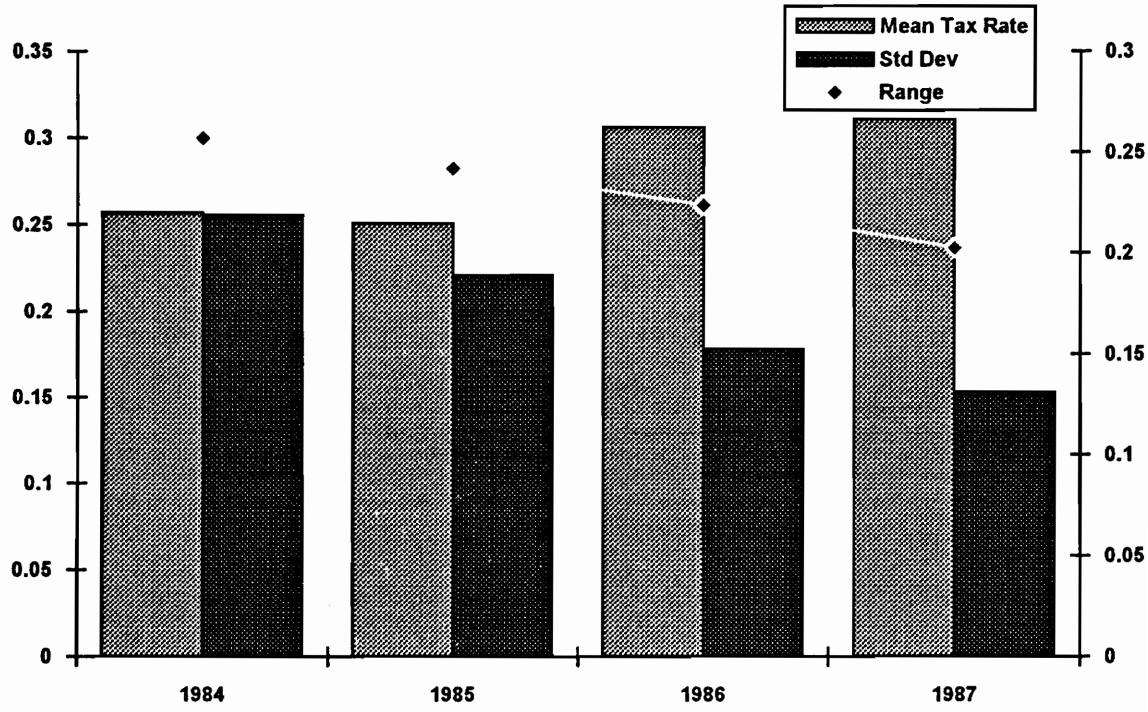


Figure 2

Mean Tax Rate, Standard Deviation and Range
by Year - 477 Firm Sample



by subtracting a firm's mean return (over the period 150 trading days prior to and 50 trading days subsequent to, the event period), from the raw return for each event day for that firm, and then summing those excess returns over the event days included for each firm. The daily, mean returns used to calculate the CARs had a mean of .0012, significantly different from zero at the .0001 level. The maximum mean return was .0035 and the minimum was -.0006. The total mean adjustments made to the raw returns in calculation of the CARs, had a mean of 4.52 percent with a maximum of 12.94 percent and a minimum of -2.17 percent.

The 477 firm sample [Table 6] has a mean cumulative abnormal return for the TRA '86 event dates of -6.53 percent, with a maximum of 30.03 percent and a minimum of -71.38 percent. The daily, mean returns used to calculate the CARs had a mean of .0011, significantly different from zero at the .0001 level. The maximum mean return was .0037 and the minimum was -.0022. The total mean-adjustments made to the raw returns in calculation of the CARs, had a mean of 4.13 percent with a maximum of 13.81 percent and a minimum of -8.45 percent.

Descriptive statistics for the independent variables in the t^P regressions are presented in Table 7. The mean change in tax rate (DRATE = (Actual 1984 + Actual 1985)/2) - Actual 1987, for the 269 firm sample was an increase of 4.30 percent. The extreme values of DRATE were a decline in tax rate of 41.7 percent and an increase in tax rate of 84.97 percent. The inner quartile range of DRATE was 12.26 percent, or

Table 5

Descriptive Statistics for Security Returns -269 Firm Sample

	Mean	**Std Dev**	**T: mean =0**	**Pr > |T|**	**Max**	**Median**	**Min**	**Q3-Q1**
325 Day CARs	-0.1195	0.4666	-4.199	0.0001	0.9999	-0.0545	-3.1966	0.3707
42 Day CARs	-0.0819	0.1383	-9.7161	0.0001	0.2710	-0.069	-0.5189	0.1645
40 Day CARs	-0.0876	0.1220	-11.780	0.0001	0.2189	-0.080	-0.5162	0.1528
Mean Returns	0.0012	0.0008	25.911	0.0001	0.0035	0.0012	-0.0006	0.0009
TRA' 86 Event Days (n)	38.242	1.3581	323.43	0.0001	40	38	32	2
Total Mean Adj	0.0452	0.0208	25.414	0.0001	0.1294	0.0441	-0.0217	0.0365

Table 6

Descriptive Statistics for Returns - 477 Firm Sample

	Mean	Std Dev	T: mean =0	Pr > |T|	Max	Median	Min	Q3-Q1
325 Day CARs	-0.0834	0.4365	-4.172	0.0001	0.9999	-0.017	-3.1966	0.3952
42 Day CARs	-0.0613	0.1381	-9.7031	0.0001	0.3147	-0.053	-0.6006	0.1507
40 Day CARs	-0.0653	0.1277	-11.173	0.0001	0.3003	-0.059	-0.7138	0.1456
Mean Returns	0.0011	0.0008	28.871	0.0001	0.0037	0.001	-0.0022	0.0009
TRA' 86 Event Days(n)	38.382	1.2903	463.45	0.0001	40	39	32	1
Total Mean Adj	0.0413	0.0230	28.279	0.0001	0.1381	0.039	-0.0845	0.0362

the median of -1.2 percent plus or minus 6.13 percent. The mean τ^{pn} (DRATE x (I/B/E/S mean earnings forecast)/Price) was -$.0045. The maximum was $.0387, and the minimum was -$.0896. The mean τ^{ps} (DRATE x (I/B/E/S forecast earnings before taxes)/Price) was -$.0183. The maximum was $.0478, and the minimum was -$1.4751. The mean value of τ^{sn} was -$.0012. The maximum was $.0212, and the minimum value was -$.0797. The mean value of τ^{ss} was -$.0011. The maximum was $.0242, and the minimum was -$.1249.

The mean change in tax rate for the 477 firm sample was an increase of 3.95 percent. The extreme values of DRATE were a decline in tax rate of 84.88 percent and an increase in tax rate of 84.97 percent. The inner quartile range of DRATE was 13.04 percent, or the median of -1.26 percent plus or minus 6.52 percent. The mean τ^{pn} was -$.0052, the maximum was $.0550, and the minimum was -$.1715. The mean τ^{ps} value was -$.0190, the maximum was $.0672, and the minimum was -$1.9076.

Descriptive statistics for the forty TRA '86 event day returns are presented in Tables 8 and 9. The mean returns were less than zero on twenty-one of the forty days, and greater than zero on the remaining nineteen days for the 269 firm sample. Mean returns were negative on twenty-two days and positive on 18 days for the 477 firm sample. The mean event day returns were significantly different from zero at the .05 level, on thirty-one of the forty days for both samples. Of the thirty-one significant returns in the 269 firm sample, sixteen were positive and fifteen were negative. The composition of the thirty-one significant returns for the 477 firm sample revealed fifteen positive and sixteen negative. On the one day for which the two samples had opposite signs [Day 10], neither mean was significantly different from zero [p=.65 and p=.69 for the 269 and 477 samples respectively). The Pearson correlations between the event day returns, and the proxies for expected change in tax rate (DRATE and SDRATE), are presented in Table 11.

Table 10 shows the Pearson Correlations between DRATE (and its components), SDRATE, and the TRA '86 event day CARs.[48] Note that the TRA '86 event day CARs are significantly correlated with both the pre-1987 effective tax rates, and with the change in tax rate fostered by the Tax Act. The relationship between the event day CARs and the actual effective tax rate in 1987 is however, not significant. Taken together, these correlations support the assertion that: returns on the identified event dates are in fact responses to information releases regarding the impact of tax reform on the cash flows of the sample firms.

Table 11 presents the Pearson correlations between the event day returns, and the proxies for expected change in tax rate. The DRATE proxy is positively correlated with event day returns on twenty-nine of the forty event days. Of the seven days with returns negatively correlated with DRATE, none is significant at the .10 level or lower. Of the twenty-

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[48]Note that the construction of DRATE is such that an increase in effective tax rate results in a negative sign for the DRATE variable, while a decrease in effective tax rate results in a positive DRATE. The expected sign of the correlation between DRATE and the 1987 effective tax rate would thus be negative while the expected sign of the correlation between DRATE and the pre-1987 effective tax rates would be positive.

Table 7

Descriptive Statistics for the Independent Variables

in the τ^p and τ^s Regressions

	N	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Median	Min	Q3-Q1
DRATE	**269**	-0.043	0.157	-4.352	0.0001	0.417	-0.012	-0.849	0.122
	477	-0.039	0.158	-5.460	0.0001	0.848	-0.012	-0.849	0.130
EPS Forecast Revision	**269**	-0.917	1.522	-9.883	0.0001	2.490	-0.440	-8.850	1.440
	477	-0.740	1.344	-12.02	0.0001	3.540	-0.350	-8.850	1.070
τ^{pn}	**269**	-0.006	0.022	-4.424	0.0001	0.048	-0.001	-0.171	0.013
	477	-0.005	0.021	-5.444	0.0001	0.055	-0.001	-0.171	0.014
τ^{ps}	**269**	-0.024	0.154	-2.639	0.0088	0.060	-0.001	-1.907	0.019
	477	-0.019	0.119	-3.488	0.0005	0.067	-0.001	-1.907	0.020
τ^{sn}	**269**	-0.000	0.014	-1.130	0.2595	0.034	0.002	-0.092	0.013
τ^{ss}	**269**	-0.000	0.019	-0.590	0.5553	0.052	0.003	-0.144	0.017

Table 8

Excess Returns for TRA '86 Event Days
Descriptive Statistics for 269 Firm Sample

	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Median	Min	Q3-Q1
Day 1	0.0024	0.0124	3.2045	0.0015	0.0397	0.0021	-0.052	0.0125
Day 2	-0.000	0.0133	-0.488	0.6256	0.0887	-0.0014	-0.035	0.0138
Day 3	0.0033	0.0142	2.5480	0.0114	0.0602	0.0023	-0.049	0.0163
Day 4	-0.006	0.0133	-8.129	0.0001	0.0332	-0.0063	-0.053	0.0146
Day 5	0.0419	0.0138	3.1206	0.0020	0.0419	0.0010	-0.034	0.0154
Day 6	-0.005	0.0135	-7.192	0.0001	0.0519	-0.0064	-0.039	0.0145
Day 7	-0.015	0.0125	-20.26	0.0001	0.0168	-0.0158	-0.062	0.0155
Day 8	0.0017	0.0127	2.2681	0.0241	0.0431	0.0004	-0.035	0.0127
Day 9	-0.001	0.0146	-2.029	0.0434	0.0756	-0.0017	-0.057	0.0150
Day 10	-0.000	0.0146	-0.442	0.6584	0.0842	-0.0004	-0.041	0.0143
Day 11	0.0015	0.0121	2.0740	0.0390	0.0414	-0.0000	-0.046	0.0134
Day 12	-0.001	0.0129	-1.687	0.0927	0.0423	-0.0015	-0.060	0.0113
Day 13	0.0018	0.0152	2.0378	0.0425	0.0942	-0.0005	-0.053	0.0142
Day 14	-0.005	0.0144	-6.311	0.0001	0.1071	-0.0055	-0.063	0.0129
Day 15	0.0008	0.0156	0.8972	0.3704	0.0578	-0.0006	-0.055	0.0170
Day 16	0.0107	0.0192	9.1612	0.0001	0.1098	0.0092	-0.052	0.0192
Day 17	-0.005	0.0162	-5.720	0.0001	0.0638	-0.0062	-0.068	0.0182
Day 18	-0.006	0.0147	-7.382	0.0001	0.0537	-0.0062	-0.053	0.0185
Day 19	0.0058	0.0219	4.3961	0.0001	0.0951	0.0035	-0.133	0.0214

Table 8 - Continued

	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Media n	Min	Q3-Q1
Day 20	-0.009	0.0174	-8.787	0.0001	0.0673	-0.010	-0.058	0.0167
Day 21	-0.012	0.0211	-9.993	0.001	0.1222	-0.010	-0.075	0.0226
Day 22	0.0030	0.0173	2.8430	0.0048	0.0637	0.0016	-0.049	0.0179
Day 23	-0.004	0.0161	-4.262	0.0001	0.0490	-0.004	-0.056	0.0169
Day 24	-0.001	0.0140	-1.362	0.1742	0.0513	-0.001	-0.069	0.0149
Day 25	0.0047	0.0164	4.7766	0.0001	0.0561	0.0049	-0.065	0.0174
Day 26	0.0025	0.0185	2.2568	0.0248	0.1567	0.0009	-0.067	0.0155
Day 27	0.0027	0.0167	2.6974	0.0074	0.0540	0.0025	-0.090	0.0156
Day 28	-0.005	0.0128	-7.283	0.0001	0.0361	-0.004	-0.047	0.0163
Day 29	-0.000	0.0128	-1.163	0.2457	0.0631	-0.001	-0.061	0.0146
Day 30	0.0005	0.0154	0.5994	0.5494	0.0577	-0.000	-0.087	0.0144
Day 31	0.0041	0.0146	4.6239	0.0001	0.0890	0.0035	-0.054	0.0154
Day 32	0.0080	0.0172	7.6492	0.0001	0.1132	0.0065	-0.074	0.0165
Day 33	0.0005	0.0188	0.4943	0.6215	0.1254	-0.000	-0.058	0.0152
Day 34	0.0029	0.0187	2.5912	0.0101	0.0689	0.0009	-0.066	0.0200
Day 35	-0.015	0.0207	-12.16	0.0001	0.0726	-0.015	-0.201	0.0184
Day 36	-0.004	0.0146	-5.280	0.0001	0.0478	-0.004	-0.053	0.0176
Day 37	-0.013	0.0196	-10.95	0.0001	0.0828	-0.012	-0.120	0.0225
Day 38	-0.013	0.0185	-11.73	0.0001	0.0634	-0.014	-0.104	0.0235
Day 39	-0.005	0.0166	-5.234	0.0001	0.0760	-0.005	-0.073	0.0175
Day 40	-0.000	0.0177	-0.725	0.4687	0.0750	0.0000	-0.052	0.0179

Table 9

Excess Returns for TRA '86 Event Days
Descriptive Statistics for 477 Firm Sample

	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Median	Min	Q3-Q1
Day 1	0.0027	0.0097	4.217	0.0001	0.0661	0.0023	-0.100	0.0134
Day	-0.000	0.0141	-0.332	0.7395	0.0884	-0.0010	-0.047	0.0147
Day 3	0.0022	0.0175	2.7951	0.0054	0.1065	-0.0002	-0.076	0.0181
Day 4	-0.006	0.0147	-9.236	0.0001	0.0558	-0.0059	-0.066	0.0159
Day 5	0.0028	0.0147	4.2879	0.0001	0.0545	0.0019	-0.041	0.0161
Day 6	-0.006	0.0158	-9.192	0.0001	0.0811	-0.0068	-0.109	0.0157
Day 7	-0.014	0.0158	-19.56	0.0001	0.0718	-0.0135	-0.105	0.0182
Day 8	0.0022	0.0157	3.1016	0.0020	0.1582	-0.0001	-0.055	0.0131
Day 9	-0.001	0.0153	-1.552	0.1213	0.0756	-0.0013	-0.064	0.0155
Day 10	0.0002	0.0148	0.3972	0.6914	0.0842	-0.0006	-0.041	0.0150
Day 11	0.0029	0.0149	4.2965	0.0001	0.1468	0.0013	-0.046	0.0153
Day 12	-0.000	0.013	-1.158	0.2472	0.0568	-0.0013	-0.060	0.0133
Day 13	0.0027	0.0162	3.6984	0.0002	0.0942	-0.0002	-0.053	0.0151
Day 14	-0.004	0.0153	-6.357	0.0001	0.1071	-0.0052	-0.061	0.0140
Day 15	0.0013	0.0162	1.7721	0.0770	0.0578	0.0002	-0.072	0.0171
Day 16	0.0107	0.0213	10.937	0.0001	0.1317	0.0087	-0.058	0.0211
Day 17	-0.004	0.0173	-6.131	0.0001	0.0638	-0.0053	-0.070	0.0201
Day 18	-0.004	0.0182	-5.705	0.0001	0.1673	-0.0048	-0.091	0.0174
Day 19	0.0063	0.0221	6.2766	0.0001	0.1540	0.0041	-0.133	0.0213

Table 9 - Continued

	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Median	Min	Q3-Q1
Day 20	-0.010	0.0170	-14.08	0.0001	0.0673	-0.0114	-0.073	0.0188
Day 21	-0.010	0.0199	-11.62	0.0001	0.1222	-0.0084	-0.075	0.0222
Day 22	0.0045	0.0168	5.9653	0.0001	0.0699	0.0025	-0.049	0.0196
Day 23	-0.003	0.0160	-4.139	0.0001	0.0650	-0.0020	-0.056	0.0171
Day 24	-0.000	0.0136	-1.059	0.2898	0.0513	-0.0009	-0.069	0.0143
Day 25	0.0046	0.0158	6.3530	0.0001	0.0561	0.0036	-0.065	0.0172
Day 26	0.0018	0.0166	2.3960	0.0170	0.1567	-0.0000	-.0067	0.0151
Day 27	0.0014	0.0157	2.0710	0.0389	0.0596	0.0009	-0.090	0.0156
Day 28	-0.004	0.0140	-6.229	0.0001	0.0817	-0.0034	-0.049	0.0156
Day 29	-0.001	0.0133	-1.702	0.0894	0.0631	-0.0012	-0.066	0.0143
Day 30	0.0002	0.0152	0.3229	0.7468	0.0657	-0.0008	-0.087	0.0152
Day 31	0.0048	0.0150	7.1093	0.0001	0.0890	0.0039	-0.054	0.0161
Day 32	0.0070	0.0171	8.9439	0.0001	0.1132	0.0049	-0.074	0.0167
Day 33	0.0011	0.0184	1.3034	0.1930	0.1254	-0.0003	-0.070	0.0164
Day 34	0.0040	0.0182	4.8523	0.0001	0.0689	0.0033	-0.078	0.0204
Day 35	-0.014	0.0194	-15.50	0.0001	0.0726	-0.0130	-0.201	0.0208
Day 36	-0.002	0.0155	-3.202	0.0015	0.0551	-0.0015	-0.053	0.0174
Day 37	-0.010	0.0202	-11.38	0.0001	0.0828	-0.0097	-0.120	0.0234
Day 38	-0.013	0.0194	-15.13	0.0001	0.0634	-0.0139	-0.105	0.0236
Day 39	-0.005	0.0174	-7.285	0.0001	0.0760	-0.0060	-0.073	0.0184
Day 40	-0.000	0.0178	-0.397	0.6915	0.0750	0.0000	-0.052	0.0180

Table 10
Correlations Between Rate Change Proxies, Rates, and TRA '86 Event Day CARs

Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0

	DRATE 477	**DRATE 269**	**SDRATE**	**Tax Rate 1987**	**Tax Rate 1986**	**Tax Rate 1985**	**Tax Rate 1984**
DRATE 477	1.0000 0.0						
DRATE 269	*** ***	1.0000 0.0					
SDRATE	*** ***	0.3713 0.0001	1.0000 0.0				
Tax Rate 1987	-0.4771 0.0001	-0.1036 0.0899	0.2099 0.0005	1.0000 0.0			
Tax Rate 1986	0.2543 0.0001	-0.0900 0.1408	0.4339 0.0001	0.3677 0.0001	1.0000 0.0		
Tax Rate 1985	0.4069 0.0001	-0.1467 0.0160	0.6227 0.0001	0.3852 0.0001	0.5230 0.0001	1.0000 0.0	
Tax Rate 1984	0.4697 0.0001	-0.0393 0.5209	0.3247 0.0001	0.3565 0.0001	0.2896 0.0001	0.3986 0.0001	1.0000 0.0
TRA '86 CARs (477)	0.2007 0.0001	*** ***	*** ***	-0.0214 0.6410	0.1275 0.0053	0.1120 0.0143	0.1483 0.0012
TRA '86 CARs (269)	*** ***	0.2055 0.0007	0.1769 0.0036	-0.0064 0.9162	0.1643 0.0069	0.1447 0.0175	0.1707 0.0055

nine returns positively correlated with DRATE, fifteen are significant at less than the .10 level. The SDRATE proxy is positively correlated with event day returns on twenty-six of the forty event days (twelve significant at less than .10), and negatively correlated on the remaining fourteen days (three significant at less than .10).

Correlations of DRATE [both 477 and 269] and SDRATE, with individual event day returns are presented in Table 11. The two proxies have correlation coefficients with the same sign on twenty-six of the event days (twenty-two positive, four negative) for the 269 firm sample, and on twenty-three of the event days for $DRATE^{477}$ and $SDRATE^{269}$ [nineteen positive, four negative]. A comparison of the DRATE proxies for the two samples shows that the sign of the correlations with individual event day returns were opposite in only three instances [none significant at conventional levels.

Table 11

Correlations Between Event Day Abnormal Returns
and Change in Tax Rate
Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0

Panel 1

	N	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
DRATE	477	0.0286 0.5323	-0.0099 0.8288	-0.0477 0.2983	-0.0029 0.9496	0.0909 0.0472	0.0080 0.8615
DRATE	269	0.0090 0.8829	0.0524 0.3912	-0.0049 0.9357	-0.0361 0.5554	0.1094 0.0731	0.0655 0.2838
SDRATE	269	-0.0021 0.9716	0.1396 0.0220	-0.0821 0.1791	-0.0413 0.4998	0.1107 0.0697	0.0254 0.6777

Panel 2

	N	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
DRATE	477	-0.0023 0.9586	0.0836 0.0681	-0.0266 0.5615	0.0351 0.4442	0.0767 0.0939	0.0021 0.9636
DRATE	269	0.0201 0.7427	0.1131 0.0638	-0.1097 0.0723	0.0003 0.9960	0.0817 0.1814	0.0251 0.6818
SDRATE	269	0.2002 0.0010	0.1238 0.0424	0.0150 0.8062	0.0107 0.8602	0.1080 0.0769	-0.0370 0.5447

Panel 3

	N	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18
DRATE	477	0.0038 0.9339	0.0834 0.0688	0.0746 0.1035	0.0942 0.0396	0.0791 0.0843	0.0097 0.8327
DRATE	269	0.0610 0.3186	0.0497 0.4169	0.0798 0.1916	0.0877 0.1511	0.0908 0.1374	0.0243 0.6916
SDRATE	269	0.1284 0.03352	0.1386 0.0229	0.1023 0.0938	0.0463 0.4495	-0.1747 0.0040	0.0085 0.8890

Table 11 - Continued
Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0

Panel 4

	N	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24
DRATE	477	-0.0526 0.2515	0.0082 0.8571	0.0965 0.0.51	0.0116 0.8000	0.0500 0.2754	0.0944 0.0393
DRATE	269	-0.0312 0.6100	0.0109 0.8578	0.0576 0.3459	0.0603 0.3242	0.0544 0.3741	0.0328 0.5921
SDRATE	269	0.0904 0.1392	0.0672 0.2717	-0.7593 0.2145	0.0075 0.9021	-0.0909 0.1370	-0.0359 0.5574

Panel 5

	N	Day 25	Day 26	Day 27	Day 28	Day 29	Day 30
DRATE	477	0.0731 0.1079	-0.0385 0.4012	0.0991 0.0303	0.0753 0.1004	-0.0197 0.6671	0.0881 0.0544
DRATE	269	0.0626 0.3059	-0.0494 0.4189	0.1601 0.0085	0.0359 0.5572	-0.0532 0.3848	0.0702 0.2511
SDRATE	269	0.1854 0.0023	0.0387 0.5267	-0.1128 0.8538	0.0170 0.7805	0.0451 0.4610	0.1026 0.0930

Panel 6

	N	Day 31	Day 32	Day 33	Day 34	Day 35	Day 36
DRATE	477	0.0650 0.1563	-0.0356 0.4371	-0.0213 0.6419	-0.0337 0.4626	0.0758 0.0978	0.0213 0.6426
DRATE	269	0.0560 0.3594	-0.365 0.5503	0.0277 0.6506	-0.0068 0.9104	0.0251 0.6812	0.0424 0.4885
SDRATE	269	0.1141 0.0616	-0.1557 0.0105	0.0680 0.2663	-0.0364 0.5520	-0.0072 0.9061	-0.1094 0.0730

Table 11 - Continued
Pearson Correlation Coefficients / Prob > |R| under Ho: Rho=0

Panel 7

	N	Day 37	Day 38	Day 39	Day 40
DRATE	**477**	0.0852 0.0629	0.0940 0.0401	0.0472 0.3033	0.0803 0.2599
DRATE	**269**	0.0569 0.3525	0.0588 0.3363	0.0120 0.8446	0.0641 0.2945
SDRATE	**269**	0.0677 0.2684	0.1528 0.0121	0.0434 0.4781	-0.0179 0.7697

Tests of Hypotheses

Hypothesis (1)

The first hypothesis was tested using a t-test of $\alpha_1 \leq 1$. This was done by constructing confidence limits for the regression parameters, and by calculating T values for adjusted coefficients. The coefficients of τ were adjusted by subtracting one from each of those coefficients. The results of the linear regressions and the tests on the τ coefficient [α_1] are presented in Tables 12 through 17.

The α_1 coefficients in the linear regressions of TRA '86 induced earnings change on TRA '86 event-day CARs [Table 12] were positive in all of the sample regressions, and significantly different from zero in five of the six [the N=269, $\tau=\tau^{ps}$ sample had a T value of 1.081, for H_0: $\alpha_1=0$]. The coefficients of τ were however, greater than one in only four of the sample regressions [α_1 was less than one for both the N=269, and the N=477 $\tau=\tau^{ps}$ models].

The α_1 coefficients were then adjusted by subtracting one from the values [$\alpha_1 - 1$] and confidence bounds and T values were computed for the adjusted values [Table 13]. The value one was less than the lower confidence bound in only the τ^{sn} model [at p = .10]. The adjusted coefficient was greater than the lower bound in the remaining five models. In no instance was the T value for H_0: $(\alpha_1 - 1) \leq 1$ sufficient to reject the null hypothesis at the p = .05 level.

Table 14 presents the results of the linear regressions: $CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$, where CAR_i includes the mean adjusted TRA '86 event day returns, and the mean adjusted return for the dates of and subsequent

Table 12

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N	Independent Variable	α_0	α_1	T for H_0: $\alpha_1 = 0$	F Value	Adj. R^2
269	τ^{pn}	-0.0817	1.2911	2.894	8.374	0.026
269	τ^{ps}	-0.0863	0.0707	1.081	1.168	0.000
269	τ^{sn}	-0.0852	1.9688	3.169	10.046	0.032
269	τ^{ss}	-0.0862	1.2177	2.704	7.313	0.023
477	τ^{pn}	-0.0591	1.3918	4.111	16.899	0.032
477	τ^{ps}	-0.0633	0.1276	1.957	3.828	0.005

Table 13

Confidence Bounds[49] and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value $(\alpha_1 - 1)$
269	τ^{pn}	1.2911	0.5549	0.7191	0.6524
269	τ^{ps}	0.0707	-0.0372	-0.0131	-14.2016
269	τ^{sn}	1.9688	0.9439	1.1725	1.559
269	τ^{ss}	1.2177	0.4747	0.6404	0.4835
477	τ^{pn}	1.3918	0.8332	0.9578	1.1573
477	τ^{ps}	0.1276	0.0200	0.0440	-13.3677

[49]The confidence interval bounds were computed using the formula $\beta_1 \pm \tau_{\frac{\alpha}{2}} \sigma_\varepsilon / \sqrt{S_{xx}}$. T values of 1.645 and 1.282 were used in the computations because the intent of the test was "one-tailed" i.e., the intent was to determine whether the lower bound of the confidence interval exceeded a value of one.

Table 14

Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	**Independent Variable**	α_0	α_1	**T for H_0: α_1 = 0**	**F Value**	**Adj. R^2**
269	τ^{pn}	-0.0763	1.2249	2.411	5.814	0.017
269	τ^{ps}	-0.0807	0.0621	0.8370	0.701	-0.001
269	τ^{sn}	-0.0796	1.8939	2.676	7.162	0.022
269	τ^{ss}	-0.0806	1.0913	2.128	4.527	0.013
477	τ^{pn}	-0.0547	1.4852	4.055	16.446	0.031
477	τ^{ps}	-0.0593	0.1333	1.889	3.569	0.005

Table 15

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	1.2249	0.3867	0.5736	0.4428
269	τ^{ps}	0.0621	-0.0603	-0.0330	-12.6361
269	τ^{sn}	1.8939	0.7262	0.9866	1.2630
269	τ^{ss}	1.0913	0.2450	0.4337	0.1781
477	τ^{pn}	1.4852	0.8809	1.0157	1.3249
477	τ^{ps}	0.1333	0.0168	0.0428	-12.2806

Table 16

Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_0	α_1	T for $H_0: \alpha_1 = 0$	F Value	Adj. R^2
269	τ^{pn}	-0.12439	-1.93047	-1.070	1.145	0.0005
269	τ^{ps}	-0.11288	0.14655	0.561	0.314	-0.0026
269	τ^{sn}	-0.11793	-1.94356	-0.771	0.594	-0.0015
269	τ^{ss}	-0.11750	-1.64199	-0.903	0.816	-0.0007
477	τ^{pn}	-0.08572	-0.35558	-0.278	0.077	-0.0019
477	τ^{ps}	-0.08112	0.19714	0.810	0.656	-0.0007

Table 17

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	-1.9304	-4.9069	-4.2464	-1.6245
269	τ^{ps}	0.1465	-0.2848	-0.1886	-3.2640
269	τ^{sn}	-1.9435	-61043	-5.1761	-1.1673
269	τ^{ss}	-1.6419	-4.6420	-3.1559	-1.4530
477	τ^{pn}	-0.3555	-2.4696	-1.9981	-1.0580
477	τ^{ps}	0.1971	-0.2046	-0.1150	-3.2972

to the announcement of 1987 earnings [EAD CARs]. As in the analysis above, the τ coefficients were positive in all of the sample regressions, significantly different from zero in five, and greater than one in four of the six.

The confidence bounds for the adjusted α_1 parameters [Table 15] are less than one in five of the instances [only the N=477, τ^{pn} model had a lower bound less than one [at the p = .10 level]. As in the regressions on non-EAD CARs, none of the T values for H_0: $(\alpha_1 - 1) \leq 1$ was sufficient to reject the null hypothesis at the p = .05 level.

Tables 16 and 17 present the results of the simple regressions of τ on the 326 day TRA '86 and EAD CARs. The lower confidence bounds for the α_1 parameters were below one in all of the regressions, and the sign of the α_1 coefficients was negative in each case.

The results of the multiple linear regressions on tax generated earnings changes and unexpected earnings, where CAR_i includes the EAD CARs as well as TRA '86 CARs are presented in Tables 20 and 21, and the results where CAR_i included the 326 Day (long window) TRA '86 CARs and the EAD CARs are presented in Tables 22 and 23. The results of these regressions mirror those reported for the simple linear regressions of τ on abnormal returns. Somewhat surprisingly, the addition of an unexpected earnings term to the regressions on TRA '86 event and EAD CARs generated statistically significant coefficients in only the N=477 regressions.[50]

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[50]In each instance the coefficient was "statistically significant at approximately the p = 0.05 level.

Table 18

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample: N	τ	α_0	α_1	α_2	T for $H_0: \alpha_1 = 0$	T for $H_0: \alpha_2 = 0$	F Value	Adj. R^2
269	τ^{pn}	-0.0817	1.2862	0.2148	2.879	0.564	4.335	0.024
269	τ^{ps}	-0.0862	0.0703	0.2315	1.073	0.600	0.762	-0.001
269	τ^{sn}	-0.0852	1.9498	0.1120	3.116	0.293	5.049	0.029
269	τ^{ss}	-0.0861	1.2032	0.1554	2.660	0.406	3.727	0.019
477	τ^{pn}	-0.0586	1.3818	0.3195	4.079	0.970	8.919	0.032
477	τ^{ps}	-0.0628	0.1254	0.3394	1.922	1.017	2.432	0.006

Table 19

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	t^{pn}	1.2862	0.5512	0.7134	0.6406
269	t^{ps}	0.0703	-0.0375	-0.0137	-14.1826
269	t^{sn}	1.9498	0.9206	1.1477	1.5181
269	t^{ss}	1.2032	0.4590	0.6232	0.4493
477	t^{pn}	1.3818	0.8245	0.9475	1.1270
477	t^{ps}	0.1254	0.0181	0.0418	-13.3945

Table 20

Linear Regressions of Earnings Components on
TRA '86 Event-Day, and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample: N t	**a_0**	**a_1**	**a_2**	**T for $H_0: a_1 = 0$**	**T for $H_0: a_2 = 0$**	**F Value**	**Adj. R^2**
269 N/A	-0.0817	***	0.4682	***	1.071	1.147	0.000
269 t^{pn}	-0.0762	1.2148	0.4482	2.391	1.034	3.443	0.017
269 t^{ps}	-0.0806	0.0612	0.4644	0.826	1.062	0.914	-0.000
269 t^{sn}	-0.0795	1.8340	0.3516	2.576	0.808	3.903	0.021
269 t^{ss}	-0.0805	1.0542	0.3977	2.048	0.912	2.678	0.012
477 N/A	-0.0601	***	0.6689	***	1.854	3.439	0.005
477 t^{pn}	-0.0537	1.4655	0.6253	4.009	1.760	9.808	0.035
477 t^{ps}	-0.0582	0.1291	0.6472	1.833	1.798	3.409	0.010

Table 21

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	1.2148	0.3791	0.5635	0.4229
269	τ^{ps}	0.0612	-0.0608	-0.0338	-12.6497
269	τ^{sn}	1.8340	0.6628	0.9212	1.1714
269	τ^{ss}	1.0542	0.2076	0.3944	0.1055
477	τ^{pn}	1.4655	0.8641	0.9968	1.2733
477	τ^{ps}	0.1291	0.0133	0.0388	-12.3620

Table 22

Linear Regressions of Earnings Components on
326 Day TRA '86 and EAD Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample: N τ	α_0	α_1	α_2	T for $H_0: \alpha_1 = 0$	T for $H_0: \alpha_2 = 0$	F Value	Adj. R^2
269 N/A	-0.1145	***	2.8319	***	1.848	3.415	0.008
269 τ^{pn}	-0.1236	-1.9951	2.8647	-1.111	1.870	2.326	0.009
269 τ^{ps}	-0.1119	0.1414	2.8231	0.543	1.840	1.851	0.006
269 τ^{sn}	-0.1174	-2.4525	2.9879	-0.972	1.939	2.180	0.008
269 τ^{ss}	-0.1167	-1.9180	2.9603	-1.057	1.926	2.267	0.009
477 N/A	-0.7671	***	4.2393	***	3.446	11.878	0.022
477 τ^{pn}	-0.0788	-0.4895	4.2539	-0.386	3.454	6.003	0.020
477 τ^{ps}	-0.0741	0.1700	4.2107	0.706	3.420	6.182	0.021

Table 23

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample N	**Independent Variable**	α_1	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_1 - 1)**
269	τ^{pn}	-1.9951	-4.9583	-4.2974	-1.6678
269	τ^{ps}	0.1414	-0.2848	-0.1922	-3.2640
269	τ^{sn}	-2.4525	-6.6146	-5.6863	-1.3687
269	τ^{ss}	-1.9180	-4.9123	-4.2451	-1.6080
477	τ^{pn}	-0.4895	-2.5807	-2.1143	-1.1753
477	τ^{ps}	0.1700	-0.2275	0.4788	-3.4950

Examination of the results for $CAR_i = \alpha_0 + \alpha_1 U_i + \varepsilon_i$ (lines 1 and 6 in Table 20), reveals that for the N=269 sample, unexpected earnings were not a significant predictor of returns at any conventional level. The U_i variables in the N=477 regressions, while significant at conventional levels, provided no evidence as to the increased explanatory power of a disaggregated earnings model.

Lower confidence bounds for the τ coefficients in the multiple regressions of τ and U on the sum of TRA '86 and EAD CARs, were below the value one in all six models. This outcome once again resulted in a failure to reject H_0: $\alpha_1 \leq 1$. A comparison of the adjusted R^2 values in Table 20 with those in Table 14 reveals that with the exception of the N=477 sample, the addition of the U_i variable resulted in a [perhaps insignificant] *decline* in explanatory power.

Results of tests of hypothesis (1) on the full [Equation 9] model are presented in tables 24 through 29. In regressions on each of the three CARs models presented above,[51] the value of the coefficient of expected change in earnings was indistinguishable from zero [at the p = .05 level] as expected [Table 1]. The coefficient of τ was greater than zero, however as above, the null hypothesis H_0: $\alpha_2 \leq 1$ could not be rejected except at lower confidence levels [p = .10 or greater], and then for only the N=269,

[51] 1) CARs equal to TRA '86 event days (Tables 24 and 25), 2) CARs equal to TRA '86 event and EAD days (Tables 26 and 27), and 3) CARs equal to 326 day TRA '86 and EAD days (Tables 28 and 29).

Table 24

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta EP) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.077	0.174	1.257	0.167	0.963	2.807	0.437	3.198	0.024
269 τ^{ps}	-0.081	0.199	0.066	0.177	1.088	1.020	0.456	0.904	-0.00
269 τ^{sn}	-0.078	0.261	2.030	0.035	1.442	3.239	0.093	4.073	0.033
269 τ^{ss}	-0.079	0.248	1.251	0.084	1.365	2.762	0.220	3.114	0.023
477 τ^{pn}	-0.051	0.314	1.413	0.268	2.218	4.185	0.817	7.636	0.040
477 τ^{ps}	-0.056	0.290	0.125	0.293	2.016	1.928	0.880	2.987	0.012

Table 25

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N	Independent Variable	α_2	Lower 95% Bound	Lower 90% Bound	T-Value (α_2 - 1)
269	τ^{pn}	1.2574	0.5183	0.6831	0.5746
269	τ^{ps}	0.0668	-0.0413	-0.0172	-14.2311
269	τ^{sn}	2.0301	0.9972	1.2276	1.645
269	τ^{ss}	1.2515	0.5039	0.6707	0.5552
477	τ^{pn}	1.4130	0.8559	0.9801	1.2230
477	τ^{ps}	0.1254	0.0180	0.0420	-13.4381

Table 26

Linear Regressions of Earnings Components on
TRA '86 Event-Day, and EAD Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.072	0.168	1.187	0.403	0.814	2.330	0.922	2.513	0.016
269 τ^{ps}	-0.075	0.192	0.057	0.412	0.925	0.780	0.935	0.894	-0.00
269 τ^{sn}	-0.073	0.249	1.910	0.279	1.209	2.675	0.636	3.094	0.022
269 τ^{ss}	-0.074	0.234	1.099	0.330	1.134	2.132	0.753	2.216	0.013
477 τ^{pn}	-0.047	0.253	1.490	0.584	1.653	4.081	1.643	7.474	0.039
477 τ^{ps}	-0.053	0.227	0.129	0.611	1.464	1.835	1.695	2.992	0.012

Table 27

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_2	Lower 95% Bound	Lower 90% Bound	T-Value (α_2 - 1)
269	τ^{pn}	1.1870	0.3463	0.5338	0.3672
269	τ^{ps}	0.0579	-0.0646	-0.0372	-12.6761
269	τ^{sn}	1.9108	0.7323	0.9954	1.2752
269	τ^{ss}	1.0999	0.2485	0.4384	0.1937
477	τ^{pn}	1.4907	0.8880	1.0224	1.3400
477	τ^{ps}	0.1291	0.0130	0.0388	-12.3771

Table 28

Linear Regressions of Earnings Components on
326 Day TRA '86 and EAD Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1\, E(\Delta EP) + \alpha_2\, \tau_i + \alpha_3\, U_i + \varepsilon_i$$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.101	0.9198	-2.147	2.6173	1.263	-1.194	1.696	2.086	0.012
269 τ^{ps}	-0.090	0.8445	0.1269	2.5946	1.158	0.487	1.678	1.682	0.008
269 τ^{sn}	-0.096	0.8050	-2.204	2.7534	1.102	-0.871	1.771	1.859	0.009
269 τ^{ss}	-0.096	0.8065	-1.761	2.7307	1.105	-0.968	1.761	1.920	0.010
477 τ^{pn}	-0.060	0.8190	-0.408	4.1213	1.538	-0.322	3.343	4.802	0.023
477 τ^{ps}	-0.055	0.8261	0.1699	4.0794	1.553	0.706	3.310	4.938	0.024

Table 29

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta EP) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$$

Sample N	**Independent Variable**	α_2	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_2 - 1)**
269	τ^{pn}	-2.1470	-5.1135	-4.4518	-1.7504
269	τ^{ps}	0.1269	-0.3028	-0.2069	-3.3520
269	τ^{sn}	-2.2046	-6.3815	-5.4499	-1.2659
269	τ^{ss}	-1.7610	-4.7632	-4.0935	-1.5174
477	τ^{pn}	-0.4082	-2.4982	-2.0319	-1.1118
477	τ^{ps}	0.1699	-0.2269	-0.1384	-3.4504

τ^{sn} and n=477 τ^{pn} models [Table 27]. As in the Equation 9" regressions [Tables 18 through 23], the unexpected earning variable [*U*] provided statistically significant[52] contributions to the model in only the N=477 regressions. In the 326 day TRA '86 and EAD regressions however, the coefficient was positive and significantly different than zero in all of the regressions. In the N=477 regressions, the coefficient of U_i was significantly greater than one.[53]

Hypothesis (2)

The second hypothesis is tested by analyzing the F values and R^2 values for the alternative specifications. The results of the alternative specifications are summarized in Table 30 below. Given the lack of explanatory power of expected earnings in the N=268 sample, it is of no surprise that the addition of τ provides significant improvement to the model sans the τ variable, and further analysis of the N=269 model is omitted.

The N=477 model, in the τ^{pn} specification, has an α_2 parameter estimate greater than one, significant contributions by both the mean forecast revision and unexpected earnings, and a threefold increase in explanatory power when the τ variable is included in the regressions.

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[52]T values for the coefficient of the U_i variable were 1.643 and 1.695 for the N=477, τ^{pn} and N=477 τ^{ps} models respectively.
[53]T values for H_0: $(\alpha_3-1) \leq 1$ were 2.49 and 2.53 for the τ^{ps} and τ^{pn} samples respectively.

Table 30

Linear Regressions of Earnings Components on
TRA '86 and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	**T for H_0: $\alpha_1 = 0$**	**T for H_0: $\alpha_2 = 0$**	**T for H_0: $\alpha_3 = 0$**	**F Value**	**Adj. R^2**
269 τ^{pn}	-0.072	0.168	1.187	0.403	0.814	2.330	0.922	2.513	0.016
269 τ^{ps}	-0.075	0.192	0.057	0.412	0.925	0.780	0.935	0.894	-0.00
269 τ^{sn}	-0.073	0.249	1.910	0.279	1.209	2.675	0.636	3.094	0.022
269 τ^{ss}	-0.074	0.234	1.099	0.330	1.134	2.132	0.753	2.216	0.013
269 na	-0.076	0.200	***	0.413	0.964	***	0.939	1.038	.0003
477 τ^{pn}	-0.047	0.253	1.490	0.584	1.653	4.081	1.643	7.474	0.039
477 τ^{ps}	-0.053	0.227	0.129	0.611	1.464	1.835	1.695	2.992	0.012
477 na	-0.055	0.227	***	0.632	1.460	***	1.752	2.790	0.008

With regard to the two-day earnings announcement returns however, there is no evidence that the disaggregation of unexpected earnings into a tax component and a non-tax component provided an increase in explanatory power. The evidence seems to indicate that while the opposite was not true (i.e., the disaggregation did not decrease the power of the model [Table 31]), the forecast revision did decrease the power of the model at the expense of the explanatory power in the unexpected earnings variable.

The Subsequent analysis using firm-specific costs of capital was conducted to estimate the period over which investors discounted tax generated earnings changes. The derivations of T [from Equation 19] are presented for the α_2 coefficients of τ from Table 27 in Table 32.[54] These derivations result in an average capitalization period of 1.5 years. One of the derivations resulted in a time estimate greater than two years. This indicates that the impact of the Tax Reform Act of 1986 would be felt in sample-firm cash flows over a relatively short period of time.

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[54]Only those models which generated α_2 values greater than one are used in the derivations.

Table 31

Linear Regressions of Earnings Components on
EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	**T for H_0: $\alpha_1 = 0$**	**T for H_0: $\alpha_2 = 0$**	**T for H_0: $\alpha_3 = 0$**	**F Value**	**Adj. R^2**
477 τ^{pn}	0.004	-0.042	0.086	0.276	-0.879	0.764	2.497	2.502	0.009
477 τ^{ps}	0.003	-0.043	0.005	0.278	-0.911	0.261	2.513	2.327	0.008
477 na	-0.058	0.290	***	0.314	2.011	***	0.941	2.607	0.006
477 τ^{pn}	0.005	***	0.091	0.269	***	0.802	2.443	3.368	0.009
477 τ^{ps}	0.004	***	0.005	0.271	***	0.260	2.457	3.077	0.008
477 na	0.004	***	***	0.272	***	***	2.469	6.097	0.010

Table 32

Time Period Over Which Tax Induced Earnings Change is Capitalized into Price

Sample N	Independent Variable	α_2	Capitalization Period (years)
269	τ^{pn}	1.1870	1.2
269	τ^{sn}	1.9108	2.1
269	τ^{ss}	1.0999	1.1
477	τ^{pn}	1.4907	1.6
Mean Capitalization Period			1.5

CHAPTER 5

CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS FOR FUTURE RESEARCH

Conclusions

The results presented above, indicate that security markets assessed the impact of TRA '86 to be in large part limited to a single period. While the coefficients of the tax generated earnings change were consistently greater than one [with the exception of the τ^{ps} model], the inability to reject the null hypothesis that those coefficients were equal to one may provide evidence of earnings management, or rather the *expectation* that firms will manage earnings to relieve the new tax burden.

Alternatively, the results may indicate that while some fixed amount of tax generated earnings change is *unmanageable* [coefficients greater than one], the bulk of the tax generated change will elicit corporate actions to correct [in the case of a tax increase] or enhance [in the case of a tax decrease] the tax effect [coefficients not significantly different from one].[55] Similar to the explanation of the non-linear unexpected earnings - returns relationship presented in Freeman and Tse [1992], the "average

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[55]Results presented in Appendix D indicate that when the empirical model is restricted to conform more closely to the theoretical model, the coefficients of the tax change variable are significantly greater than one.

persistence" of tax generated earnings changes, may "decrease as the absolute magnitude of [the tax generated earnings change] increases."

Sensitivity to Alternative Specifications

To the extent that the above proxies for τ are misspecified in their assumption that: 1) the tax consequences of operations are substantially equal across accounting cycles for all firms; 2) that firms have not made major, permanent adjustments to their tax positions during the phase-in period; and 3) that the percentage change in tax liability is estimable ex-ante, for each firm, the coefficient of the tax change variable will be smaller. To the extent that expectations of changes in income resulting from tax law changes are impounded in security prices over periods not included in the event windows, the coefficient of the tax change variable will be biased downward.[56] Likewise, to the extent that earnings resulting from changes in tax law are capitalized over time periods less than one year (i.e., assumption 2 above is invalid), are not accurately estimated by securities markets, or that any price response is in reality a response to changes in personal rather than corporate tax rates,[57] the

[56]Although Downs and Hendershott [1987] predict a 10 to 13 percent increase in equity values in response to TRA '86, Cutler [1988], in examining stock market response to Congressional passage of the TRA, found "··· little evidence of a pervasive reaction to [the] tax news." Cutler's results led him to question "··· what the tax news meant to the market, and whether the news was efficiently incorporated in stock prices."

[57]Bolster and Janjigian [1991], in an examination of market response to tax reform and dividend policy, find that investors may have "anticipated the final terms [of TRA '86] as early as June [1986]" (i.e., that personal

identification of τ as non-transient may be erroneous. In addition, the capitalization of t at or near P/E, assumes the distribution of tax burden (benefit) to equity holders.

Finally, the models tested assume a linear relationship between tax rate change and earnings capitalization. This last assumption may be of particular importance, in light of: (1) the evidence presented in Scholes, Wilson, and Wolfson [1992] that firms shifted income between accounting periods in response to TRA '86, (2) that specific provisions of the tax law change (e.g., uniform capitalization rules) may have *loaded* into 1987 tax liabilities, and (3) the explanations put forth by Freeman and Tse [1992] regarding non-linearities in the unexpected earnings - returns relationship.

The ability to shift income [and its resulting tax costs], coupled with a front loading transition scheme, may have generated a non-linear earnings-returns relationship similar to that found by Freeman and Tse [1992]. Appendix D presents results for regressions of models 9, 9" and 9'" where the regression intercept has been forced to zero to both provide conformity with the theoretical model and to measure the slope of the regression curve near the origin (data points corresponding to tax generated earnings changes of *lower* absolute magnitude).

Given the potential problems inherent in an *event study* of this type, it is not surprising that the results are less than conclusive. The data

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tax rates on: 1) capital gains income would increase; and 2) ordinary income would decrease).

does however, provide weak support for the notion that changes in earnings are capitalized at rates consistent with the expected time horizon of the change, and support for the earnings management hypothesis of income taxation. Extensions of this research over periods of *future* tax law revisions would eliminate some of the event identification problems inherent in this particular research. Any increase in the certainty of event identification, might lead to more conclusive evidence regarding both the discounted cash flows theory of security valuation, and the earnings management hypothesis regarding income taxation. Additional research focused on the identification of alternative *non-transient* earnings changes [as is the focus of this research], would expand the empirical evidence regarding theories of security valuation.

CHAPTER 6

SUMMARY

Summary

The research described above extends recent investigations of earnings response coefficients, by investigating the relationship between earnings persistence and the pricing of securities by capital markets. TRA '86 provides a unique opportunity for the identification of a non-transient component of current earnings. The research described, by analyzing the capitalization of that earnings component over specific event dates, subjects to empirical test the relationship between capital markets response and the underlying theory upon which prior ERC research is based (i.e., that earnings components are capitalized at the present-value discount factor consistent with the expected duration of those components).

The hypotheses tested include: 1) that security markets specifically recognized the non-transient component of changes in earnings that resulted from TRA '86, and 2) that the tax-law-generated earnings change will enhance an explanation of the response of security returns to earnings information events. In addition, a model for estimating the firm specific discount period of earnings capitalization is presented.

The results of this research, while inconclusive regarding the [Congressional] expected time horizon of earnings impact, indicate that tax generated earnings changes are capitalized consistent with an expectation that management will act to counteract any negative tax impact [an *earnings management* hypothesis].

Two possible extensions of this research are: 1) estimation of the specific discount period that securities markets attach to tax generated earnings shocks in general, i.e., What is the estimated, *average life* of a tax law? and 2) an investigation of the timing of analyst incorporation of tax-generated earnings shocks into forecasts.

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APPENDIX A

Derivation of $P/E = \frac{K}{r-g}$

Definitions and relationships in the Dividend Valuation Model:

p_t = price of one share of common stock at time t

d_t = dividends per share of common stock at time t

e_t = earnings per share at time t

f = retention ratio, i.e., the fraction of e retained [assumed constant]

k = payout ratio, i.e., the fraction of e paid out in dividends = (1-f)

r_t = discount rate at time t, also equal to the firm's cost of capital

i = internal rate or return

g = growth rate of earnings [assumed constant]

According to the Dividend Valuation Model as presented in Francis [1980], the value of a share of a firms stock is hypothesized to be equal to the present value of the dividend stream. If that stream is expected to be infinite, the value of the firm is:

$$p_0 = \frac{d_1}{1+r} + \frac{d_2}{(1+r)^2} + \frac{d_3}{(1+r)^3} + \cdots + \frac{d_\infty}{(1+r)^\infty} = \sum_{t=1}^{\infty} \frac{d_t}{(1+r)^t} \qquad \text{(A1)}$$

Dividends are related to earnings by equating them with the payout ratio times earnings:

$$d_t = (1-f)e_t = ke_t \tag{A2}$$

Retained earnings are reinvested at the internal rate of return, so growth in earnings is equal to the product of the retention ratio and the internal rate of return:

$$fi = g \tag{A3}$$

Thus earnings at time t is a function of the retention ratio, the internal rate of return and prior earnings:

$$e_t = (1+fi)^t e_0 = (1+g)^t e_0 \tag{A4}$$

[Note: this equality requires *all* earnings to be persistent in character].

Dividend growth can thus be seen as dependent upon earnings:

$$d_t = (1-f)(1+fi)^t e_0 = (1-f)(1+g)^t e_0 = (1-f)e_t \tag{A5}$$

Substituting (A5) into (A1) yields:

$$p_0 = \sum_{t=1}^{\infty} \frac{(1-f)(1+fi)^t e_0}{(1+r)^t} = \sum_{t=1}^{\infty} \frac{(1+fi)^t d_0}{(1+r)^t} = \sum_{t=1}^{\infty} \frac{(1+g)^t d_0}{(1+r)^t} \tag{A6}$$

Since d_0 is a constant, (A6) can be rewritten :

$$p_0 = d_0 \sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+r)^t} = d_0 \left[\frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \frac{(1+g)^3}{(1+r)^3} + \cdots \right] \tag{A7}$$

Multiplying (A7) by [(1+*r*)/(1+*g*)] yields:

$$p_0 \frac{1+r}{1+g} = d_0 \left[1 + \frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \frac{(1+g)^3}{(1+r)^3} + \cdots \right] \tag{A8}$$

Subtracting (A7) from (A8) yields:

$$p_0\left(\frac{1+r}{1+g}-1\right)=p_0\left(\frac{(1+r)-(1+g)}{1+g}\right)=p_0\left(\frac{r-g}{1+g}\right)=d_0 \tag{A9}$$

Multiplying the terms in (A9) by [(1+g)/(r-g)], and substituting with (A2) yields:

$$p_0=d_0\frac{(1+g)}{(r-g)}=\frac{d_1}{r-g}=\frac{e_1(1-f)}{r-g}=\frac{e_1k}{r-g} \tag{A10}$$

Dividing both sides of (A10) by e_t yields the Gordon-Shapiro valuation model:

$$\frac{p_0}{e_1}=\frac{k}{r-g} \tag{A11}$$

Since the rate of earnings growth equals the product of the retention ratio and the internal rate of return [$g = fi$], if the cost of capital equals the internal rate of return [r=i], then (A10) can also be rewritten as:

$$p_0=\frac{e_1(1-f)}{r(1-f)}=\frac{e_1}{r} \tag{A12}$$

This shows that the capitalization of dividends is equivalent to the capitalization earnings, and that the price-earnings ratio can be reduced to the present value of a perpetuity:

$$\frac{p_0}{e_1}=\frac{1}{r} \tag{A13}$$

As noted in Francis [1980], this derivation is dependent on the absence of external financing, a constant discount rate, growth rate and internal rate of return, a perpetual stream of earnings, $r > g$, and a fixed dividend policy.

APPENDIX B

Derivation of τ^p:

Earnings equal the product of earnings before taxes and the difference of one and the effective tax rate:

$$E_t = EBIT_t(1 - T_t) \qquad \text{(B1)}$$

The change in earnings from period *t*-1 to *t* is therefore:

$$\Delta E = E_t - E_{t-1} = EBIT_t(1 - T_t) - EBIT_{t-1}(1 - T_{t-1}) \qquad \text{(B2)}$$

If the effective tax rate is constant over the period *t*-1 to *t*, then (B2) can be reduced to:

$$\Delta E = E_t - E_{t-1} = (EBIT_t - EBIT_{t-1})(1 - T) \qquad \text{(B3)}$$

If however, the effective tax rate is expected to change over the period (i.e., $T_t \neq T_{t-1}$), then equation (B2) can be rewritten:

$$\Delta E = E_t - E_{t-1} = EBIT_t(1) - EBIT_t(T_t) - EBIT_{t-1}(1) + EBIT_{t-1}(T_{t-1}) \qquad \text{(B4)}$$

Simplifying and rearranging yields:

$$\Delta E = (EBIT_t - EBIT_{t-1}) + (EBIT_{t-1}(T_{t-1}) - EBIT_t(T_t)) \qquad \text{(B5)}$$

where the change in earnings is equal to the sum of: the change in earnings before taxes [$\Delta EBIT$]:

$$\Delta EBIT = (EBIT_t - EBIT_{t-1}) \qquad \text{(B6)}$$

and the change in taxes on those earnings [$\Delta\Theta$]:

$$\Delta\Theta = (EBIT_{t-1}(T_{t-1}) - EBIT_t(T_t)) \qquad \text{(B7)}$$

Expressing ΔE in the simplified notation of equations (B6) and (B7) yields:

$$\Delta E = \Delta EBIT + \Delta\Theta \qquad \text{(B8)}$$

Equation (B7) can be further decomposed into the change in taxes (resulting from the change in earnings), under prior tax law:

$$\tau' = (EBIT_{t-1} - EBIT_t)(T_{t-1}) = EBIT_{t-1}(T_{t-1}) - EBIT_t(T_{t-1}) \qquad \text{(B9)}$$

and the change in taxes (resulting from the change in earnings), attributable to tax law shocks:

$$\tau = EBIT_t(T_{t-1}) - EBIT_t(T_t) = EBIT_t(T_{t-1} - T_t) \qquad \text{(B10)}$$

Expanding equation (B8) yields:

$$\Delta E = \Delta EBIT + \tau' + \tau \qquad \text{(B11)}$$

where $\Delta EBIT + \tau'$ equals the portion of an expected change in earnings under prior tax law, and τ equals the portion attributable to the change in tax law. Using the notation in the *Model Estimation* section above, yields:

$$\Delta EBIT + \tau' = \text{EP} \qquad \text{(B12)}$$

$$\tau = \tau\text{P} \qquad \text{(B13)}$$

Combining equations (B12) and (B13) yields:

$$\Delta E = \text{EP} + \tau\text{P} \qquad \text{(B14)}$$

APPENDIX C

Simplifying Assumptions and Alternative Models

Equation (9):

$$R_{it} = a_0 + a_1 E(DEP) + a_2 t_{it} + a_3 U_{it} + e_{it} \quad (9)$$

may be simplified under the following conditions:

1) If the expected change in earnings is impounded in stock price on some date(s) other than those identified as TRA '86 event dates, then the expected value of the a_1 coefficient becomes zero. Equation (9) can thus be written in more parsimonious fashion as:

$$R_{it} = a_0 + a_1 t_{it} + a_2 U_{it} + e_{it} \quad (9'')$$

2) If the cumulative abnormal returns [dependent variable] does not contain abnormal returns for the period over which unexpected earnings are capitalized, then the U_{it} variable has a value of zero. Combining conditions (1) and (2) therefore yields:

$$R_{it} = a_0 + a_1 t_{it} + e_{it} \quad (9''')$$

Hypothesis (1): that the tax gain (loss) will be capitalized at a rate greater than the universal lower bound: 1. In null form: the coefficient of t_{it}: a_2, will be less than or equal to 1, will thus be tested on equations: (9), (9") and (9"').

Hypothesis (2): that for fiscal year 1987, equations including the variable t_{it} will provide greater explanatory power than will those equations sans the tax generated earnings component can also be tested after modifying (9') for conditions (1) and (2) above:

(9') Condition (1): $R_{it} = a_0 + a_1 U_{it} + e_{it}$ versus

$R_{it} = a_0 + a_1 t_{it} + a_2 U_{it} + e_{it}$

(9') Condition (2): $R_{it} = a_0 + a_1 E(DE^p) + e_{it}$ versus

$R_{it} = a_0 + a_1 E(DE^p) + a_2 t_{it} + e_{it}$

APPENDIX D

Conformity to Theoretical Constraints in the Earnings - Response Relationship

The discounted cash flows theory of security valuation would posit that a change in expected earnings equal to zero, would result in a change in security price equal to zero. Following this construction, a zero change in tax rate would yield a zero change in price *due to the change in tax rate.* Likewise, a positive/negative change in tax rate, offset by a corollary negative/positive change in earnings, would result in a valuation revision equal to zero.

This research is focused on the relationship between changes in effective tax rate, and the resulting valuation revisions entered by securities markets. It is clear therefore, that a plot of the theoretical relationship between security returns and tax generated earnings changes should pass through the origin on an XY graph.

To impose conformity with the theoretical model on the sample data, regressions were run which limited the intercept to a value of zero. Results are provided below for the τ^{pn}, τ^{sn} and τ^{ss} models. The τ^{ps} model is excluded due to its lack of explanatory power [consistent with the analysis in Chapter Four], as are regressions on the 326 day and two day earnings announcement CARs.

The coefficients of τ were greater than one for the N=477: τ^{pn}, and N=269: τ^{pn}, τ^{sn} and τ^{ss} models. Unlike the Chapter Four regressions however, H_0: $\beta_1 \leq 1$ [where β_1 is the coefficient of the τ variable], was rejected in every instance except in the τ^{SS} model (where the lower confidence bounds were close to, but not greater than one).

The test of Hypothesis two [that addition of a tax component improves the explanatory power of the earnings - returns model] generates results consistent with those presented in Chapter Four (an improvement is found), with the exception that the earnings-forecast-revision coefficient is significant and positive in each instance [Table D13].[57]

Table D1 presents the results for zero intercept - linear regressions of tax generated earnings changes on TRA '86 event day cumulative abnormal returns. Table D2 presents the confidence bounds for the coefficients of the tax change variables. Tables D3 and D5 report the regression results when unexpected earnings and earnings forecast revisions are added to the model [sequentially], and Tables D4 and D6 present the confidence bounds for the independent variables in those regressions.

Tables D7 through D12 present the results for CARs equal to TRA '86 and EAD event days. The results are consistent with those presented for the TRA '86 events only.

Restricting the regression model to conform to the zero intercept of the theoretical model, reveals an improved *fit* between the earnings response coefficient and the expectation that tax generated earnings changes are non-transient. The model describing *sophisticated* investor

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[57]The forecast revision variable was not significant when the intercept was unconstrained.

behavior however, failed to provide evidence of non-transience in tax generated earnings changes, and may reflect sophistication in the form of knowledge regarding the ability of firms to manage their taxable income.

Table D14 presents the derivations of T for the coefficients of τ as in Table 32 above.[58] The analysis using firm-specific costs of capital was conducted to estimate the period over which investors discounted tax generated earnings changes. The time period of the capitalization [T] as indicated by the magnitude of the coefficients of τ, averaged 2.1 years, and are 1.7 years, 2.9 years, 1.7 years, and 2.0 years for the τ^{pn}, τ^{sn}, τ^{ss} and τ^{pn} models respectively. These derivations are consistent with the expectation that the Tax Reform Act of 1986 would impact corporate earnings for a period greater than one year.

The conclusions of the analysis using the constrained model are: 1) that earnings changes resulting from changes in tax law are capitalized into price at rates which reflect non-transience in the earning changes, and 2) that tax induced earnings changes, as reflected in the capitalization of those changes, are on average, expected to persist over a finite time horizon.

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[58]The values of the coefficients used in these derivations are taken from the *full* regression model: $CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$ on event day, and EAD cummulative abnormal returns [Tables D12 and D13]. As in Chapter Four - Table 32, time periods are derived only for those models where the coefficient of τ was greater than one.

Table D1

Linear Regressions of Earnings Components on
Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N τ	α_0	α_1	**T for** $H_0: \alpha_1 = 0$	**F Value**	**Adj.** R^2
269 τ^{pn}	0.0	2.2041	4.569	20.879	0.0688
269 τ^{sn}	0.0	2.5197	3.671	13.477	0.0443
269 τ^{ss}	0.0	1.5970	3.088	9.534	0.0307
477 τ^{pn}	0.0	1.9404	5.870	34.456	0.0655

Table D2

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
Linear Regressions of Earnings Components on
Event-Day Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	2.2041	1.4106	1.5857	2.496
269	τ^{sn}	2.5197	1.3906	1.6398	2.327
269	τ^{ss}	1.5970	0.7462	0.9339	1.154
477	τ^{pn}	1.9404	1.3966	1.5166	2.844

Table D3

Linear Regressions of Earnings Components on Event-Day Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample N τ	α_0	α_1	α_2	T for $H_0: \alpha_1 = 0$	T for $H_0: \alpha_2 = 0$	F Value	Adj. R^2
269 τ^{pn}	0.0	2.2043	0.4020	4.566	0.738	10.694	0.0672
269 τ^{sn}	0.0	2.4948	0.2095	3.612	0.377	6.788	0.0413
269 τ^{ss}	0.0	1.5780	0.2749	3.038	0.493	4.875	0.0280
477 τ^{pn}	0.0	1.9297	0.7961	5.853	1.916	19.161	0.0708

Table D4

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	2.2043	1.4101	1.5853	2.494
269	τ^{sn}	2.4948	1.3587	1.6094	2.164
269	τ^{ss}	1.5780	0.7236	0.9121	1.112
477	τ^{pn}	1.9297	1.3874	1.5070	2.820

Table D5

Linear Regressions of Earnings Components on
Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	0.0	0.9580	1.7276	0.0339	5.423	3.697	0.065	17.690	0.156
269 τ^{sn}	0.0	1.0965	2.5877	-0.218	6.346	4.012	-0.418	18.613	0.164
269 τ^{ss}	0.0	1.0974	1.6631	-0.153	6.301	3.425	-0.292	16.953	0.151
477 τ^{pn}	0.0	0.8036	1.7550	0.4901	6.177	5.506	1.216	26.490	0.138

Table D6

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N	**Independent Variable**	α_2	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_2 - 1)**
269	τ^{pn}	1.7276	0.9588	1.1285	1.557
269	τ^{sn}	2.5877	1.5266	1.7608	2.461
269	τ^{ss}	1.6631	0.8642	1.0405	1.365
477	τ^{pn}	1.7550	1.2307	1.3464	2.368

Table D7

Linear Regressions of Earnings Components on
Event-Day and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N **τ**	**α_0**	**α_1**	**T for H_0: $\alpha_1 = 0$**	**F Value**	**Adj. R^2**
269 τ^{pn}	0.0	2.0901	4.041	16.332	0.0539
269 τ^{sn}	0.0	2.5186	3.440	11.831	0.0387
269 τ^{ss}	0.0	1.5347	2.780	7.731	0.0244
477 τ^{pn}	0.0	1.9786	5.691	32.387	0.0617

Table D8

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on
Event-Day and EAD Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N	**Independent Variable**	**α_1**	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_1 - 1)**
269	τ^{pn}	2.0901	1.2393	1.4271	2.107
269	τ^{sn}	2.5186	1.3141	1.5799	2.073
269	τ^{ss}	1.5347	0.6267	0.82714	0.9687
477	τ^{pn}	1.9786	1.4067	1.5329	2.814

Table D9

Linear Regressions of Earnings Components on
Event-Day and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	T for $H_0: \alpha_1 = 0$	T for $H_0: \alpha_2 = 0$	F Value	Adj. R^2
269 τ^{pn}	0.0	2.0903	0.6569	4.044	1.126	8.808	0.0549
269 τ^{sn}	0.0	2.4631	0.4668	3.3346	0.789	6.218	0.0373
269 τ^{ss}	0.0	1.4976	0.5363	2.705	0.902	4.269	0.0237
477 τ^{pn}	0.0	1.9639	1.0948	5.679	2.513	19.531	0.0721

Table D10

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on Event-Day and EAD Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	2.0903	1.2400	1.4276	2.109
269	τ^{sn}	2.4631	1.2522	1.5194	1.987
269	τ^{ss}	1.4976	0.5867	0.7877	0.8986
477	τ^{pn}	1.9639	1.3950	1.5206	2.787

Table D11

Linear Regressions of Earnings Components on Event-Day and EAD Cumulative Abnormal Returns

$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	**T for H_0: $\alpha_1 = 0$**	**T for H_0: $\alpha_2 = 0$**	**T for H_0: $\alpha_3 = 0$**	**F Value**	**Adj. R^2**
269 τ^{pn}	0.0	0.8928	1.6461	0.3138	4.658	3.247	0.553	13.559	0.122
269 τ^{sn}	0.0	1.0253	2.5500	0.0664	5.472	3.646	0.117	14.577	0.131
269 τ^{ss}	0.0	1.0256	1.5771	0.1360	5.430	2.995	0.239	12.979	0.117
477 τ^{pn}	0.0	0.7053	1.8106	0.8262	5.108	5.351	1.931	22.405	0.118

Table D12

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on Event-Day and EAD Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N	**Independent Variable**	α_2	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_2 - 1)**
269	τ^{pn}	1.6461	0.8120	0.9961	1.274
269	τ^{sn}	2.5500	1.3995	1.6534	2.2162
269	τ^{ss}	1.577	0.7109	0.9020	1.096
477	τ^{pn}	1.8106	1.2540	1.3768	2.395

Table D13

Linear Regressions of Earnings Components on
Event Day and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	0.0	0.892	1.646	0.313	4.658	3.247	0.553	13.559	0.122
269 τ^{sn}	0.0	1.025	2.550	0.066	5.472	3.646	0.117	14.577	0.131
269 τ^{ss}	0.0	1.025	1.577	0.136	5.430	2.995	0.239	12.979	0.117
269 na	0.0	1.009	***	0.268	5.271	***	0.465	14.548	0.091
477 τ^{pn}	0.0	0.705	1.810	0.826	5.108	5.351	1.931	22.405	0.118
477 na	0.0	0.867	***	0.503	6.494	***	1.211	23.150	0.085

Table D14

Time Period Over Which Tax Induced Earnings Change is Capitalized into Price

Sample N	Independent Variable	α_2	Capitalization Period (years)
269	τ^{pn}	1.646	1.7
269	τ^{sn}	2.550	2.9
269	τ^{ss}	1.577	1.7
477	τ^{pn}	1.810	2.0
Mean Capitalization Rate			2.1

APPENDIX E

Alternative Standardization of Independent Variables

Because the events incorporated in this analysis took place over a long [326 trading days] period, standardization of the regression variables by the average of the beginning and ending trading prices may mask the true effect of TRA '86 information events on sample security returns. In an effort to control for this possibility, the following analysis standardizes: the independent variables τ and $E(\Delta E^p)$ with the security price one day prior to the beginning of the TRA '86 event period, and U with the security price one day prior to the earnings announcement date. The results are not dissimilar to those presented in Chapter Four.

The mean τ^{pn} (DRATE x (I/B/E/S mean earnings forecast)/Price) was -\$.0047, and the mean τ^{ps} (DRATE x (I/B/E/S forecast earnings before taxes)/Price) was -\$.0175 for the 269 firm sample. The mean value of τ^{sn} was -\$.0016 and the mean value of τ^{ss} was -\$.0017. For the 477 firm sample, the mean τ^{pn} -\$.0048 and the mean τ^{ps} was -\$.0153. Table E1 shows the descriptive statistics for the independent variables in the t^p and t^s regressions.

Table E1

Descriptive Statistics for the Independent Variables

in the τ^p and τ^s Regressions

	N	Mean	Std Dev	T: mean = 0	Pr > |T|	Max	Median	Min	Q3-Q1
DRATE	**269**	-0.043	0.157	-4.352	0.0001	0.417	-0.012	-0.849	0.122
	477	-0.039	0.158	-5.460	0.0001	0.848	-0.012	-0.849	0.130
EPS Forecast Revision	**269**	-0.917	1.522	-9.883	0.0001	2.490	-0.440	-8.850	1.440
	477	-0.740	1.344	-12.02	0.0001	3.540	-0.350	-8.850	1.070
τ^{pn}	**269**	-0.004	0.017	-4.508	0.0001	0.049	-0.000	-0.086	0.011
	477	-0.004	0.018	-5.827	0.0001	0.079	-0.000	-0.111	0.011
τ^{ps}	**269**	-0.017	0.104	-2.764	0.0061	0.063	-0.001	-1.375	0.016
	477	-0.015	0.083	-4.032	0.0001	0.081	-0.001	-1.375	0.018
τ^{sn}	**269**	-0.001	0.012	-2.146	0.0327	0.019	0.001	-0.093	0.010
τ^{ss}	**269**	-0.001	0.017	-1.652	0.0997	0.029	0.002	-0.107	0.015

Hypothesis 1

As presented above, the first hypothesis was tested using a t-test of $\alpha_1 \leq 1$. This was done by constructing confidence limits for the regression parameters, and by calculating T values for adjusted coefficients. The coefficients of τ were adjusted by subtracting one from each of those coefficients. The results of the linear regressions and the tests on the τ coefficient [α_1] are presented in Tables E2 through E7.

The α_1 coefficients in the linear regressions of TRA '86 induced earnings change on TRA '86 event-day CARs [Table E2] were positive in all of the sample regressions, and significantly different from zero in five of the six [the N=269, $\tau=\tau^{ps}$ sample had a T value of 0.816, for H_0: $\alpha_1=0$]. The coefficients of τ were however, greater than one in only four of the sample regressions [α_1 was less than one for both the N=269, and the N=477 $\tau=\tau^{ps}$ models].

The α_1 coefficients were then adjusted by subtracting one from the values [α_1 - 1] and confidence bounds and T values were computed for the for the adjusted values [Table E3]. The adjusted coefficient was greater than the lower bound in all of the six models. In no instance was the T value for H_0: $(\alpha_1-1) \leq 1$ sufficient to reject the null hypothesis at the either p = .05 or p = .10 level.

Table E4 presents the results of the linear regressions: $CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$, where CAR_i includes the mean adjusted TRA '86 event day returns, and the mean adjusted return for the dates of and subsequent

Table E2

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N	**Independent Variable**	α_0	α_1	**T for H_0: $\alpha_1 = 0$**	**F Value**	**Adj. R^2**
269	τ^{pn}	-0.0817	1.0002	2.396	5.741	0.017
269	τ^{ps}	-0.0855	0.0573	0.816	0.667	-0.001
269	τ^{sn}	-0.0837	1.6712	2.947	8.686	0.027
269	τ^{ss}	-0.0846	1.1015	2.596	6.739	0.021
477	τ^{pn}	-0.0591	1.1289	3.634	13.207	0.025
477	τ^{ps}	-0.0628	0.1174	0.715	2.941	0.004

Table E3

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value $(\alpha_1 - 1)$
269	τ^{pn}	1.0002	0.3135	0.4650	0.0005
269	τ^{ps}	0.0573	-0.0582	-0.0327	-13.4061
269	τ^{sn}	1.6712	0.7384	0.9442	1.1830
269	τ^{ss}	1.1015	0.4035	0.5575	0.2393
477	τ^{pn}	1.2890	0.6179	0.7306	0.4151
477	τ^{ps}	0.1174	0.0047	0.0296	-12.8826

Table E4

Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_0	α_1	T for H_0: $\alpha_1 = 0$	F Value	Adj. R^2
269	τ^{pn}	-0.0760	0.9708	2.059	4.240	0.012
269	τ^{ps}	-0.0797	0.0503	0.636	0.404	-0.002
269	τ^{sn}	-0.0777	1.7308	2.703	7.307	0.023
269	τ^{ss}	-0.0788	1.0734	2.239	5.012	0.014
477	τ^{pn}	-0.0545	1.2300	3.674	13.501	0.025
477	τ^{ps}	-0.0585	0.1273	1.725	2.977	0.004

Table E5

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	0.9708	0.1952	0.3663	-0.0618
269	τ^{ps}	0.0503	-0.0799	-0.0512	-11.9853
269	τ^{sn}	1.7308	0.6775	0.9099	1.1413
269	τ^{ss}	1.0734	0.2847	0.4588	0.1531
477	τ^{pn}	1.2300	0.6793	0.8008	0.6871
477	τ^{ps}	0.1273	0.0059	0.0327	-11.8177

Table E6

Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_0	α_1	T for H_0: $\alpha_1 = 0$	F Value	Adj. R^2
269	τ^{pn}	-0.1019	-2.7570	-1.619	2.621	0.006
269	τ^{ps}	-0.1139	0.0918	0.322	0.103	-0.0034
269	τ^{sn}	-0.1186	-1.8547	-0.795	0.631	-0.0014
269	τ^{ss}	-0.1181	-1.4953	-0.859	0.738	-0.0010
477	τ^{pn}	-0.0884	-0.8857	-0.740	0.547	-0.0010
477	τ^{ps}	-0.0819	0.1395	0.534	0.285	-0.0015

Table E7

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86
and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	-2.7570	-5.5583	-4.9401	-2.2063
269	τ^{ps}	0.0918	-0.3778	-0.2742	-3.1811
269	τ^{sn}	-1.8547	-5.6946	-4.8474	-1.2229
269	τ^{ss}	-1.4953	-4.3583	-3.7266	-1.4338
477	τ^{pn}	-0.8857	-2.8558	-2.4211	-1.5747
477	τ^{ps}	0.1395	-0.2904	-0.1956	-3.2923

to the announcement of 1987 earnings [EAD CARs]. As in the analysis above, the τ coefficients were positive in all of the sample regressions, significantly different from zero in five, and greater than one in four of the six.

The confidence bounds for the adjusted α_1 parameters [Table E5] are less than one in all six of the instances. As in the regressions on non-EAD CARs, none of the T values for H_0: $(\alpha_1-1) \leq 1$ was sufficient to reject the null hypothesis at the p = .05 or p = .10 level.

Tables E6 and E7 present the results of the simple regressions of τ on the 326 day TRA '86 and EAD CARs. The lower confidence bounds for the α_1 parameters were below one in all of the regressions, and the sign of the α_1 coefficients were negative in all but the τ^{ps} case.

The results of the linear regressions: $CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$, where CAR_i is equal to the TRA '86 event days are presented in Tables E8 and E9. The results where CAR_i includes the EAD CARs as well as TRA '86 CARs are presented in Tables E10 and E11, and the results where CAR_i includes the 326 Day (long window) TRA '86 CARs and the EAD CARs are presented in Tables E12 and E13. The results of these regressions mirror those reported for the simple linear regressions of τ on abnormal returns. As would be expected, the inclusion of an unexpected earnings term [U_i] added nothing to the regressions on TRA '86 event day CARs. The results for H_0: $(\alpha_1-1) \leq 1$ were likewise unaffected.

Somewhat surprisingly, the addition of an unexpected earnings term to the regressions on TRA' 86 event and EAD CARs generated statistically significant coefficients[59] in only the N=477 regressions. Examination of the results for $CAR_i = \alpha_0 + \alpha_1 U_i + \varepsilon_i$ (lines 1 and 6 in Table E10), reveals that for the N=269 sample, unexpected earnings were not a significant predictor of returns at any conventional level. The U_i variables in the N=477 regressions, while significant at conventional levels, provided no evidence as to the increased explanatory power of a disaggregated earnings model.

Lower confidence bounds for the τ coefficients in the multiple regressions of τ and U on the sum of TRA '86 and EAD CARs, were below the value one in all six models. This outcome once again resulted in a failure to reject H_0: $\alpha_1 \leq 1$. A comparison of the adjusted R^2 values in Table E20 with those in Table E14 reveal virtually no change in explanatory power.

Results of the tests of hypothesis [1] on the full [Equation 9] model are presented in tables E14 through E19. In the regressions on each of the three CARs models presented above, the value of the coefficient of expected change in earnings was indistinguishable from zero [at the p = .05 level] as expected. The coefficient of τ was greater than zero, however as above, the null hypothesis H_0: $\alpha_2 \leq 1$ could not be rejected except at lower confidence levels [p = .10 or greater], and then only for the N=269 τ^{sn} and N=477 models [Table E17]. As in the Equation 9" regressions [Tables E8 through E13], the unexpected earning variable [U] provided

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[59]In each instance the coefficient was "statistically significant" at approximately the p = 0.05 level.

Table E8

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample: N	**τ**	**α_0**	**α_1**	**α_2**	**T for $H_0: \alpha_1 = 0$**	**T for $H_0: \alpha_2 = 0$**	**F Value**	**Adj. R^2**
269	τ^{pn}	-0.0816	1.0021	0.2646	2.398	0.581	3.033	0.014
269	τ^{ps}	-0.0854	0.0572	0.2545	0.813	0.554	0.486	-0.003
269	τ^{sn}	-0.0837	1.6557	0.1335	2.902	0.294	4.371	0.024
269	τ^{ss}	-0.0845	1.0899	0.1721	2.558	0.378	3.430	0.017
477	τ^{pn}	-0.0585	1.1323	0.4027	3.645	1.059	7.166	0.025
477	τ^{ps}	-0.0622	0.1159	0.3733	1.692	0.971	1.942	0.003

Table E9

Confidence Bounds[60] and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	t^{pn}	1.0021	0.3146	0.4663	0.0050
269	t^{ps}	0.0572	-0.0586	-0.0330	-13.3909
269	t^{sn}	1.6557	0.7172	0.9243	1.1494
269	t^{ss}	1.0899	0.3890	0.5436	0.2111
477	t^{pn}	1.1323	0.6214	0.7342	0.4262
477	t^{ps}	0.1159	0.0281	0.0032	-12.9007

[60]The confidence interval bounds were computed using the formula $\beta_1 \pm \tau_{\frac{\alpha}{2}} \sigma_\varepsilon / \sqrt{S_{xx}}$. τ values of 1.645 and 1.282 were used in the computations because the intent of the test was "one-tailed" i.e., the intent was to determine whether the lower bound of the confidence interval exceeded a value of one.

Table E10

Linear Regressions of Earnings Components on
TRA '86 Event-Day, and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample: N	t	a_0	a_1	a_2	T for H_0: a_1 = 0	T for H_0: a_2 = 0	F Value	Adj. R^2
269	N/A	-0.0804	***	0.5211	***	1.009	1.018	0.000
269	t^{pn}	-0.0757	0.9746	0.5294	2.067	1.031	2.652	0.012
269	t^{ps}	-0.0795	0.0500	0.5197	0.631	1.005	0.707	-0.002
269	t^{sn}	-0.0776	1.6846	0.3964	2.618	0.773	3.946	0.021
269	t^{ss}	-0.0786	1.0437	0.4406	2.070	0.857	2.871	0.013
477	N/A	-0.0594	***	0.7199	***	1.738	3.021	0.004
477	t^{pn}	-0.0533	1.2363	0.7358	3.702	1.800	8.402	0.030
477	t^{ps}	-0.0575	0.1245	0.7040	1.689	1.702	2.943	0.008

Table E11

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	0.9746	0.1991	0.3702	-0.0539
269	τ^{ps}	0.0500	-0.0803	-0.0516	-11.9898
269	τ^{sn}	1.6846	0.6260	0.8596	1.0639
269	τ^{ss}	1.0437	0.2525	0.4271	0.0909
477	τ^{pn}	1.2363	0.6869	0.8082	0.7076
477	τ^{ps}	0.1245	0.0033	0.0300	-11.8771

Table E12

Linear Regressions of Earnings Components on
326 Day TRA '86 and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$

Sample: N τ	α_0	α_1	α_2	**T for** $H_0: \alpha_1 = 0$	**T for** $H_0: \alpha_2 = 0$	**F Value**	**Adj.** R^2
269 N/A	-0.1140	***	2.5308	***	1.850	3.639	0.009
269 τ^{pn}	-0.1271	-2.7319	3.5076	-1.612	1.901	3.130	0.015
269 τ^{ps}	-0.1124	0.0895	3.5283	0.315	1.903	1.863	0.006
269 τ^{sn}	-0.1178	-2.2855	3.7000	-0.980	1.990	2.300	0.009
269 τ^{ss}	-0.1170	-1.7425	3.6652	-1.004	1.975	2.324	0.009
477 N/A	-0.0765	***	4.8559	***	3.350	11.220	0.021
477 τ^{pn}	-0.0806	-0.8442	4.8450	-0.712	3.340	5.858	0.020
477 τ^{ps}	-0.0747	0.1197	4.8405	0.463	3.335	5.708	0.019

Table E13

Confidence Bounds and T-Values for H_0: $\alpha_1 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 \tau_i + \alpha_2 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_1	Lower 95% Bound	Lower 90% Bound	T-Value (α_1 - 1)
269	τ^{pn}	-2.7319	-5.5196	-4.9045	-2.2021
269	τ^{ps}	0.0895	-0.3778	-0.2747	-3.2048
269	τ^{sn}	-2.2855	-6.1211	-5.2747	-1.4092
269	τ^{ss}	-1.7425	-4.6086	-3.9786	-1.5866
477	τ^{pn}	-0.8442	-2.7936	-2.3634	1.5563
477	τ^{ps}	0.1197	-0.3058	-0.2119	-3.4026

Table E14

Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.077	0.152	0.981	0.212	0.850	2.342	0.462	2.261	0.013
269 τ^{ps}	-0.081	0.171	0.054	0.196	0.947	0.771	0.423	0.623	-0.00
269 τ^{sn}	-0.077	0.235	1.736	0.047	1.315	3.030	0.103	3.498	0.027
269 τ^{ss}	-0.078	0.222	1.139	0.092	1.240	2.667	0.201	2.804	0.019
477 τ^{pn}	-0.052	0.282	1.158	0.338	2.028	3.740	0.890	6.179	0.031
477 τ^{ps}	-0.056	0.263	0.117	0.312	1.869	1.717	0.813	2.466	0.009

Table E15

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on
TRA '86 Event-Day Cumulative Abnormal Returns)
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N	Independent Variable	α_2	Lower 95% Bound	Lower 90% Bound	T-Value (α_2 - 1)
269	τ^{pn}	0.9810	0.2920	0.4440	-0.0452
269	τ^{ps}	0.0543	-0.0616	-0.0360	-13.4168
269	τ^{sn}	1.7361	0.7935	1.0015	1.2847
269	τ^{ss}	1.1398	0.4365	0.5917	0.3272
477	τ^{pn}	1.1589	0.6491	0.7616	0.5128
477	τ^{ps}	0.1173	0.0049	0.0297	-12.9133

Table E16

Linear Regressions of Earnings Components on
TRA '86 Event-Day, and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.072	0.146	0.954	0.479	0.724	2.019	0.924	1.940	0.010
269 τ^{ps}	-0.075	0.165	0.047	0.463	0.812	0.595	0.887	0.691	-0.00
269 τ^{sn}	-0.071	0.229	1.763	0.312	1.136	2.725	0.602	3.064	0.022
269 τ^{ss}	-0.073	0.213	1.091	0.363	1.055	2.260	0.701	2.286	0.014
477 τ^{pn}	-0.048	0.221	1.257	0.685	1.476	3.765	1.673	6.342	0.032
477 τ^{ps}	-0.053	0.200	0.125	0.657	1.322	1.705	1.587	2.548	0.009

Table E17

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on TRA '86 Event-Day and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$$

Sample N	Independent Variable	α_2	Lower 95% Bound	Lower 90% Bound	T-Value (α_2 - 1)
269	τ^{pn}	0.9544	0.1769	0.3484	-0.0965
269	τ^{ps}	0.0472	0.0545	0.0833	-12.0060
269	τ^{sn}	1.7630	0.6989	0.9337	1.1796
269	τ^{ss}	1.0917	0.2972	0.4725	0.1899
477	τ^{pn}	1.2571	0.7079	0.8291	0.7701
477	τ^{ps}	0.1255	0.0044	0.0312	-11.8712

Table E18

Linear Regressions of Earnings Components on
326 Day TRA '86 and EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.104	0.9222	-2.859	3.1912	1.269	-1.686	1.716	2.628	0.017
269 τ^{ps}	-0.091	0.8414	0.0753	3.2410	1.153	0.265	1.734	1.687	0.007
269 τ^{sn}	-0.097	0.7825	-2.018	3.4126	1.069	-0.861	1.817	1.915	0.010
269 τ^{ss}	-0.096	0.7879	-1.565	3.3820	1.078	-0.898	1.805	1.937	0.010
477 τ^{pn}	-0.062	0.7897	-0.770	4.6655	1.481	-0.650	3.209	4.464	0.022
477 τ^{ps}	-0.056	0.8072	0.1240	4.6555	1.514	0.480	3.201	4.580	0.022

Table E19

Confidence Bounds and T-Values for H_0: $\alpha_2 \leq 1$
(Linear Regressions of Earnings Components on 326 Day TRA '86 and Earnings Announcement Cumulative Abnormal Returns)

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$$

Sample N	**Independent Variable**	α_2	**Lower 95% Bound**	**Lower 90% Bound**	**T-Value (α_2 - 1)**
269	τ^{pn}	-2.8591	-5.6485	-5.0330	-2.2758
269	τ^{ps}	0.0753	-0.3922	-0.2890	-3.2537
269	τ^{sn}	-2.0181	-5.8747	-5.0237	-1.2874
269	τ^{ss}	-1.5656	-4.4325	-3.7999	-1.4722
477	τ^{pn}	-0.7702	-2.7189	-2.2889	-1.4944
477	τ^{ps}	0.1240	-0.3009	-0.2071	-3.3904

statistically significant[61] contributions to the model in only the N=477 regressions. In the 326 day TRA '86 and EAD regressions however, the coefficient was positive and significantly different than zero in all of the regressions. In the N=477 regressions, the coefficient of U_i was significantly greater than one.

Hypothesis (2)

The second hypothesis was tested by analyzing the F values and R^2 values for the alternative specifications. The results of the alternative specifications are summarized in Table E20 below. Given the lack of explanatory power of expected earnings in the N=269 sample, it is of no surprise that the addition of τ provides significant improvement to the model sans the τ variable, and further analysis of the N=269 model is omitted.

The N=477 model, in the τ^{pn} specification, has an α_2 parameter estimate greater than one, significant contributions by both the mean forecast revision and unexpected earnings, and a threefold increase in explanatory power when the τ variable is included in the regressions.

With regard to the two-day earnings announcement returns however, there is no evidence that the disaggregation of unexpected earnings into a tax component and a non-tax component provided an increase in explanatory power. The evidence seems to indicate that while the opposite was not true (i.e., the disaggregation did not decrease the

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[61]T values for the coefficients of the U_i variables were 1.67 and 1.59 for the N=477, τ^{pn} and N=477 τ^{ps} models respectively. T values for Ho: $(\alpha_3 - 1) \leq 1$ were 2.52 and 2.51 for the τ^{ps} and τ^{pn} samples respectively.

power of the model [Table E21), the inclusion of a forecast revision term did decrease the power of the model at the expense of the explanatory power in the unexpected earnings variable.

Table E20

Linear Regressions of Earnings Components on
TRA '86 and EAD Cumulative Abnormal Returns

$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i \text{ v.}$$
$$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_3 U_i + \varepsilon_i$$

Sample N τ	α_0	α_1	α_2	α_3	T for H_0: $\alpha_1 = 0$	T for H_0: $\alpha_2 = 0$	T for H_0: $\alpha_3 = 0$	F Value	Adj. R^2
269 τ^{pn}	-0.072	0.146	0.954	0.479	0.724	2.019	0.924	1.940	0.010
269 τ^{ps}	-0.075	0.165	0.047	0.463	0.812	0.595	0.887	0.691	-0.00
269 τ^{sn}	-0.071	0.229	1.763	0.312	1.136	2.725	0.602	3.064	0.022
269 τ^{ss}	-0.073	0.213	1.091	0.363	1.055	2.260	0.701	2.286	0.014
269 na	-0.076	0.200	***	0.413	0.964	***	0.939	1.038	.0003
477 τ^{pn}	-0.048	0.221	1.257	0.685	1.476	3.765	1.673	6.342	0.032
477 τ^{ps}	-0.053	0.200	0.125	0.657	1.322	1.705	1.587	2.548	0.009
477 na	-0.055	0.227	***	0.632	1.460	***	1.752	2.790	0.008

Table E21

Linear Regressions of Earnings Components on
EAD Cumulative Abnormal Returns
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_2 \tau_i + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_1 E(\Delta E^p) + \alpha_3 U_i + \varepsilon_i$ v.
$CAR_i = \alpha_0 + \alpha_3 U_i + \varepsilon_i$

Sample N τ	α_0	α_1	α_2	α_3	**T for H_0: $\alpha_1 = 0$**	**T for H_0: $\alpha_2 = 0$**	**T for H_0: $\alpha_3 = 0$**	**F Value**	**Adj. R^2**
477 τ^{pn}	0.004	-0.042	0.103	0.310	-0.894	0.977	2.376	2.371	0.008
477 τ^{ps}	0.003	-0.044	0.009	0.307	-0.930	0.425	2.356	2.110	0.006
477 na	-0.058	0.290	***	0.314	2.011	***	0.941	2.607	0.006
477 τ^{pn}	0.005	***	0.107	0.300	***	1.016	2.310	3.159	0.009
477 τ^{ps}	0.004	***	0.010	0.297	***	0.436	2.287	2.733	0.007
477 na	0.004	***	***	0.272	***	***	2.469	6.097	0.010

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