Tax Rates and Stock Returns: An Empirical Analysis of the Information Content of Corporate Tax Rates

INDRANI D. BASAK AND MICHELLE R. CLAYMAN

INDRANI D. BASAK
Director of Quantitative Research
ibasak@napllc.com

MICHELLE R. CLAYMAN
Managing Partner & Chief Investment Officer
mclayman@napllc.com

INTRODUCTION

This article presents results showing that anomalous corporate tax rates may lead to weaker stock returns. Low effective tax rates are associated with markedly weaker future returns. This phenomenon cannot be explained totally by factors such as beta, book to market, size, momentum, or by the downturn in technology stocks. This implies that, even though the stock market is generally assumed to be "semi-strongly" efficient, financial analysts can pick up important clues on companies' business operations and future stock returns from out-of-the-ordinary tax rates.

Previous articles have analyzed tax rates as indications of aggressive accounting, its relationship with contemporaneous returns, and with future earnings. Our article shows that abnormal tax rates on financial statements may be associated with future stock underperformance, since it frequently signals significant issues in the company's underlying business.

FINANCIAL ANALYSIS, TAX RATES, AND VALUATION

The Tax Rates referred to in this article are the Effective Tax Rates (ETRs), as presented in accounting statements, computed by dividing Income Tax Expense by Pretax Income. We use the prior 3-year average effective tax rates, and periods for any company with zero or negative pretax income were removed from the sample to minimize distortion. Income Tax Expense may be broken down into two components: taxes payable (actual tax return liability) and deferred income tax expense. The deferred income tax asset and liability accounts arise from timing differences (taxes for tax reporting purposes need to be paid on realization of income) or by differences between policies used on accounting and tax reports. An example of the former is asset impairment: asset write-downs on the financial statements do not generate tax deductions until the assets are sold. An example of the latter is depreciation policy: the company may use more aggressive depreciation rules on its tax filings than on its accounting statements.

Large changes in deferred tax liabilities or deferred tax asset accounts can signal that a company is boosting earnings through changes in accounting assumptions. Each year a firm with a deferred tax asset must evaluate if based on available evidence, it is likely that some or all of the deferred tax assets will not be realized. The valuation allowance should be sufficient to reduce the deferred tax asset to the amount likely to be realized (FAS 109). Bauman, Bauman, and Hansley [2000] find

evidence that some companies manage the changes in the valuation allowance as a tool for earnings management.

The ETR may also be affected by accounting for employee stock options.[1] Sullivan [2000] estimates that U.S. corporations in 1999 saved over $20.5 billion in corporate income taxes due to exercise of employee stock options. Yin [2000] analyzes the corporate tax shelter problem evidenced by the recent faster growth of corporate book income relative to taxable income and estimates that a significant portion of the gap between corporate book income and taxable income was attributable to increased stock option activity. Shevlin and Hanlon [2001] find that firms' disclosures are often unclear as to the amount of corporate tax benefits from stock options.

The difference between pretax book income and taxable income is an indication of earnings quality. Revsine, Collins, and Johnson [1998] recommend the calculation of earnings conservatism (EC) ratio as pretax book income/estimated taxable income, where taxable income is current tax expense/statutory tax rate. Joos, Pratt and Young [1999] find that as book-tax differences increase, the value relevance of earnings decline. Book-Tax differences or the EC ratio can be interpreted as aggressive tax planning (Mills [1998]; Mills and Newbury [2000]).

Bauman and Shaw [2002] find that publicly available quarterly effective income tax rate is useful in forecasting future earnings, and suggests that analysts underutilize ETR information in interim disclosures. Abarbanell and Bushee [1997] show that changes in the annual ETR is one of the fundamental analysis signals associated with future earnings. Kumar and Visvanathan [2002] demonstrate that disclosures of changes in deferred tax valuation allowances provide information beyond contemporaneous earnings reports. These research articles indicate that tax rate information can convey signals about the quality of accounting, and can be used to predict future earnings. Our research builds on existing knowledge to answer questions like: "How does the stock market incorporate the information content of tax rates?[2] Do tax rates have an impact on the *future* stock returns of a corporation?" These critical questions provide a motivation for our study to find the linkage between corporate tax rates and future stock performance and the use of ETRs in equity valuation.

Financial analysts attempt to understand each category on company financial statements in order to gain a sense of the underlying business and form a basis to make projections. Most valuation models use forecast cash flow and earnings as critical inputs, whether they be simple multiple models (P/E, Price to Cash Flow, or PEG ratios), dividend discount models, free cash flow, or residual income models. In generating earnings estimates, analysts need to make assumptions about tax rates (often using immediate past history as guidance). This is often, however, the only way in which tax rate analysis is used. Clayman [1995] has shown that the presence of anomalous accounting charges can be used as a tool in valuation analysis. This article presents evidence that abnormal tax rates can be used as a valuation analysis tool.

The remainder of the article is organized as follows: We discuss the data and methodology for the study. Next, we present the distribution of tax rates and our empirical findings. We then analyze the theoretical and accounting reasons why extreme ETRs could be an ominous sign. We follow that with an analysis of the 10-Ks for some companies to identify their unique reasons for having highly abnormal tax rates. Finally, we conclude with our main findings.

DATA AND METHODOLOGY

The sample consists of the S&P 500 constituents on December 31, 1998, 1999, and 2000. We analyzed the relationship between the prior 3-year average ETRs for the index constituents and their subsequent 3, 2, and 1 year returns ending December 31, 2001, respectively. The ETR is as presented in accounting statements, Income Tax Expense divided by Pretax Income. We computed each company's prior 3-year average ETR. Periods for any company with zero or negative pretax income were excluded from the sample to minimize distortion. Sixty percent of companies had ETR in the 30–40% bracket. Stocks with tax rates outside this "middle group" of 30–40% were classified as abnormally high or low tax payers and assigned to "tails" group, further classified as "upper tail" for average ETR more than 40% or "lower tail" for average ETR less than 30%.

The companies were divided into quintiles based on 3-year average ETR and their average subsequent stock returns were computed. For the S&P 500 constituents on December 31, 1998 we used the *3*-year stock returns, for the index constituents in 1999 the *2*-year stock returns and for the constituents in 2000 the *1*-year stock returns, all ending December 31, 2001. The quintile analysis was done in three ways 1) including all index constituents for which data on ETR was available 2) excluding the outliers, defined as companies with top and bottom 1% ETR 3) excluding the outliers and the companies belonging to the Information Technology (IT) sector, as defined by the S&P GICS sector classification.

In order to minimize the impact of extreme observations, statistical analysis was done after excluding the top and bottom 1% ETR corporations, and also after excluding the IT companies.

The difference in returns between 1) middle tax payers and the tails 2) lower and upper tail were analyzed using t-tests. Year-wise cross-sectional regressions were run to test the impact of extreme tax rates on ensuing stock returns. Ordinary Least Squares regression and *p*-values computed with White's [1980] heteroskedasticity-consistent variance-covariance estimator was used. The basic regression model was: Returns = $\alpha + \beta_1$ Lower_D + β_2 Upper_D + ε.

Regression, Controlling for Three-Factor Model and Other Parameters

Other regression models were used to control for risk factors documented to have explanatory power for cross-sectional difference in returns such as book-market, size, and beta. We also controlled for short-term momentum and the bursting of the technology bubble.

$$\text{Returns} = \alpha + \beta_1 \text{Lower\_D} + \beta_2 \text{Upper\_D} + \beta_3 \text{BM} + \beta_4 \text{Size} + \beta_5 \text{Beta} + \beta_6 \text{Momentum} + \beta_6 \text{IT\_D} + \varepsilon$$

Returns = Simple total returns, including capital appreciation and dividends

Lower_D = 1 if the prior 3-year average tax rate is less than 30%, and 0 otherwise

Upper_D = 1 if the prior 3-year average tax rate is greater than 40%, and 0 otherwise

Size = Natural log (Market Equity), on the day before index constituent date

BM = Book equity/Market equity, 3 months before index constituent date

Beta = Stock beta on the day before index constituent date, with respect to Market-weighted NYSE index with 52 weekly observations

Momentum = Prior 6-month total stock return ending the day before index constituent date

IT_D = 1 if the company belonged to the IT sector (as per S&P GICs sector classification) on the index constituent date, and 0 otherwise.

EXHIBIT 1
Distribution of Tax Rates

S&P 500 Constituents on	Number of companies	Mean	Median	Mode	Standard Deviation
All companies					
12/31/2000	493	36.36%	35.84%	32.60%	42.57%
12/31/1999	497	38.45%	36.17%	37.33%	28.18%
12/31/1998	494	40.56%	36.02%	35.44%	65.97%
Excluding outliers					
12/31/2000	483	36.02%	35.84%	32.60%	11.51%
12/31/1999	487	36.54%	36.17%	37.33%	10.04%
12/31/1998	484	36.43%	36.02%	35.44%	11.40%
Excluding outliers and I.T. Sector					
12/31/2000	408	36.53%	36.37%	38.83%	10.82%
12/31/1999	429	36.75%	36.47%	37.33%	9.88%
12/31/1998	433	36.56%	36.20%	35.44%	11.13%

Notes:

1. We are reporting the prior 3-year average tax rates as on December 31, 2000, 1999, and 1998. Tax rate is defined as (Total Income Taxes/ Pretax Income).
2. Stock returns are defined as total simple returns consisting of (capital appreciation + dividends).
3. Outliers are defined as companies with the highest 1% and lowest 1% average tax rates.
4. IT refers to companies from the Information Technology sector. We use the Standard & Poor GICS classification to identify the IT sector companies and are controlling for the IT sector so that our results are not biased by the unique stock performance of this sector.
5. Tax information not available for some companies.

THE DISTRIBUTION OF TAX RATES

Exhibit 1 shows the distribution of 3-year average ETRs among S&P 500 constituents at the end of December 1998, 1999, and 2000. The mean tax rate decreased steadily from 40.56% in 1998 to 36.36% in 2000. After deleting the extreme outliers to eliminate distortion from companies with very low pretax book

EXHIBIT 2

Tax Rates and Stock Performance: Quintile Analysis

S&P 500 Constituent Date	Quintile of Tax Rate	Number of companies	Range of tax rates (%)	Stock Returns Ending 12/31/2001
All Companies				
12/31/2000				***1 year stock returns***
	Q1: Highest	99	40.0 to 679.3	1.02%
	Q2	99	37.3 to 40.0	2.74%
	Q3	99	34.5 to 37.3	4.02%
	Q4	99	30.3 to 34.5	-2.38%
	Q5: Lowest	97	-369.1 to 30.2	-8.01%
12/31/1999				***2 year stock returns***
	Q1: Highest	99	40.3 to 464.2	0.16%
	Q2	99	37.4 to 40.2	15.68%
	Q3	99	34.9 to 37.4	12.78%
	Q4	99	30.6 to 34.8	8.72%
	Q5: Lowest	101	-37.5 to 30.4	-2.60%
12/31/1998				***3 year stock returns***
	Q1: Highest	99	40.2 to 1378.4	6.64%
	Q2	99	37.3 to 40.1	12.86%
	Q3	99	34.6 to 37.3	19.02%
	Q4	99	30.5 to 34.6	12.50%
	Q5: Lowest	98	-35.3 to 30.4	-0.14%
Excluding Outliers				
12/31/2000				***1 year stock returns***
	Q1: Highest	97	39.9 to 121.5	0.60%
	Q2	97	37.3 to 39.9	3.19%
	Q3	97	34.5 to 37.3	4.52%
	Q4	97	30.7 to 34.5	-3.11%
	Q5: Lowest	95	1.5 to 30.7	-6.98%
12/31/1999				***2 year stock returns***
	Q1: Highest	97	40.2 to 107.8	0.76%
	Q2	97	37.4 to 40.2	15.32%
	Q3	97	34.9 to 37.3	13.20%
	Q4	97	30.9 to 34.9	8.17%
	Q5: Lowest	99	5.3 to 30.7	-1.09%
12/31/1998				***3 year stock return***
	Q1: Highest	97	40.0 to 112.9	6.13%
	Q2	97	37.3 to 40.0	11.99%
	Q3	97	34.6 to 37.3	19.48%
	Q4	97	30.7 to 34.6	13.17%
	Q5: Lowest	96	1.0 to 30.7	2.10%
Excluding outliers and I.T. Sector				
12/31/2000				***1 year stock returns***
	Q1: Highest	82	40.2 to 121.5	2.61%
	Q2	82	37.7 to 40.1	4.91%
	Q3	82	35.0 to 37.7	8.51%
	Q4	82	30.9 to 35.0	4.33%
	Q5: Lowest	80	4.8 to 30.9	-6.64%
12/31/1999				***2 year stock returns***
	Q1: Highest	86	40.2 to 107.8	3.80%
	Q2	86	37.5 to 40.0	19.17%
	Q3	86	35.1 to 37.5	18.70%
	Q4	86	30.9 to 35.1	16.62%
	Q5: Lowest	85	5.3 to 30.9	10.63%
12/31/1998				***3 year stock returns***
	Q1: Highest	87	40.0 to 112.9	5.28%
	Q2	87	37.5 to 39.9	11.95%
	Q3	87	34.8 to 37.5	15.66%
	Q4	87	30.7 to 34.7	12.32%
	Q5: Lowest	85	1.0 to 30.7	3.42%

income (which might produce a very high ETR), the average ETR was consistently around 36% during the entire period. This difference in the average tax rate calculated by including all companies and that calculated by excluding the outliers indicates the impact of some extreme outliers. An analysis of the tax rates after excluding the technology sector shows that the effects of the "technology bubble" did not account for the disparities in ETR.

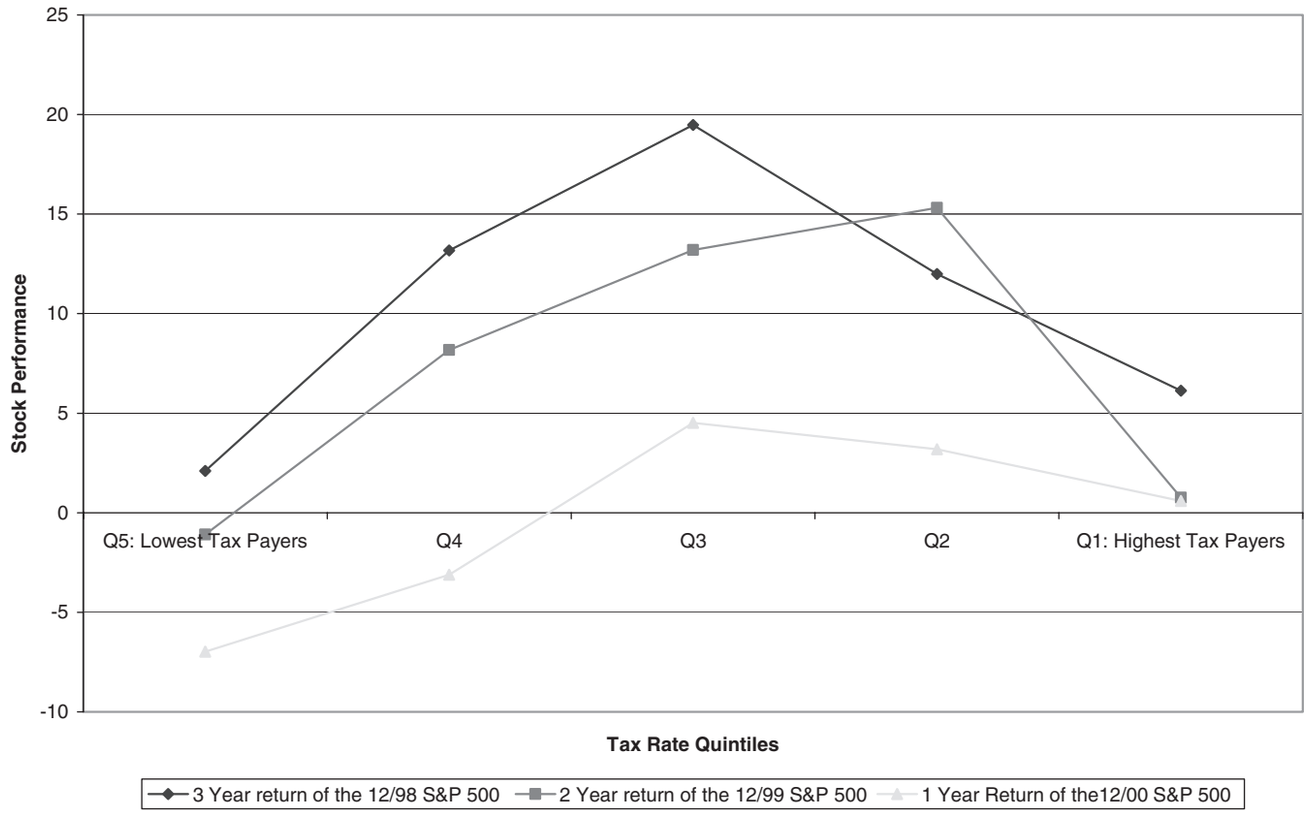
EMPIRICAL RESULTS

The middle quintiles of "normal tax rate" payers had the highest ensuing stock returns for the 1-, 2- and 3-year periods ending December, 2001. The results may be seen in Exhibit 2. Abnormally high and low tax rate companies tend to underperform those paying a normal 30 to 40% tax. This result remains consistent even after adjusting for outliers, and after excluding the IT companies which were particularly hard hit by the declining stock markets subsequent to the run-up of late 1990s. While the stocks of the highest tax rate companies underperform the middle

Notes:

1. We use the prior 3-year average tax rates as on December 12, 2000, 1999, and 1998. Tax rate is defined as (Total Income Taxes/ Pretax Income). Data on 3-year average tax rate not available for some companies.
2. Stock returns are defined as total simple returns consisting of (capital appreciation + dividends).
3. Outliers are defined as companies with the highest 1% and lowest 1% average tax rates.
4. IT refers to companies from the Information Technology sector. We use the S&P GICS classification to identify the IT sector companies and exclude the IT sector so that our results are not biased by the technology downturn.

EXHIBIT 3
Tax Rates and Subsequent Stock Performance



quintiles, the lowest tax rate stocks underperform by a greater magnitude. The inverse U-shaped relationship between tax rates and subsequent stock performance—stock returns increase with higher tax rates and peak in the 35 to 40% tax rate, with further increase in tax rates being associated with lower stock returns—is shown in Exhibit 3.

Exhibit 4 shows the statistically significant superior stock performance by the "Middle" group of taxpayers compared to the "Tails" group. The results are consistent for all the three time periods considered. The middle taxpayers (30–40%) always have returns higher than that of the tails (abnormally high or low tax rates) and the difference is statistically significant in every case.

The additional stock returns of middle tax payers relative to extreme tax payers, at 4.7% points over a 1-year horizon, 14.3% points over a 2-year horizon, and 8.8% points over a 3-year horizon, is economically significant. The results are robust to the exclusion of the IT companies. The average additional stock returns for the normal ETR companies is an economically significant 5% points per annum.[3]

Exhibit 5 analyzes the difference in returns of the "Lower" and "Upper" tails. The results indicate that the "Upper" tail always has higher returns, though the difference is statistically significant only for 1-year returns. Abnormally high tax payers tend to do better than the abnormally low taxpayers. The outperformance of the abnormally high ETR companies relative to those with abnormally low ETR is greater over short time horizons (the outperformance is 10.5% points over 1 year, 2.9% point over 2 years, and 1.7% point over 3 years). The results remain broadly similar after excluding the IT companies.

Abnormal taxpayers underperform the normal taxpayers, with the extremely low ETR companies underperforming to a greater extent than the extremely high ETR companies. The greater underperformance of the abnormally low ETR payers relative to that of the abnormally high ETR payers is more acute over shorter holding horizons.

EXHIBIT 4

Stock Returns: Comparison of "Middle" and the "Tails" Tax Payers

S&P 500 constituents on	Number of stocks: Middle	Number of stocks: Tails	Stock Returns: Middle	Stock Returns: Tails	P-Value (Difference in Returns)	Confidence Level
Excluding outliers						
12/31/2000	298	169	1.41%	-3.29%	0.09	10% significance
12/31/1999	271	169	12.89%	-1.44%	0.00	1% significance
12/31/1998	259	151	13.82%	5.00%	0.04	5% significance
Excluding outliers & IT						
12/31/2000	251	142	5.40%	-1.62%	0.02	5% significance
12/31/1999	242	141	18.59%	5.77%	0.00	1% significance
12/31/1998	233	132	12.43%	4.98%	0.07	10% significance

Notes:

1. "Middle" refers to corporations with tax rates in the 30 to 40% bracket while 'Tails' refers to corporations with effective tax rates < 30% or > 40%.
2. Stock returns are from the index constituent date till 12/31/2001. Example for the S&P 500 index constituents on 12/31/00, the stock returns are for the 1-year period ending 12/31/01 and so on.
3. We report the one-tailed *p*-values for the
   Null hypothesis: Stock returns of "Tails" > = Stock returns of "Middle."
   Alternate hypothesis: Stock returns of "Tails" < Stock returns of "Middle."
4. Outliers are defined as companies with the highest 1% and lowest 1% average tax rates.

EXHIBIT 5

Stock Returns: Comparison of "Lower Tail" and "Upper Tail" Tax Payers

S&P 500 constituents on	Number of stocks: Lower Tail	Number of stocks: Upper Tail	Stock returns: Lower Tail	Stock returns: Upper Tail	P-Value (Difference in Returns)	Confidence Level
Excluding outliers						
12/31/2000	77	92	-9.03%	1.51%	0.04	5% significance
12/31/1999	76	93	-3.03%	-0.13%	0.35	Not significant
12/31/1998	68	83	4.06%	5.76%	0.41	Not significant
Excluding outliers & IT						
12/31/2000	59	83	-7.50%	2.56%	0.04	5% significance
12/31/1999	63	78	8.01%	3.97%	0.31	Not significant
12/31/1998	58	74	4.89%	5.05%	0.49	Not significant

Notes:

1. "Lower Tail" includes corporations with tax rates < 30% while "Upper Tail" has tax rates > 40%.
2. Stock returns are from the index constituent date till 12/31/01.
3. We report the one-tailed P-values for the
   Null Ho: Stock returns of "Lower Tail" > = Stock returns of "Upper Tail."
   Alternate Ho: Stock returns of "Lower Tail"< Stock returns of "Upper Tail."
4. Outliers are defined as companies with the highest 1% and lowest 1% average tax rates.

REGRESSION RESULTS

The results of the year-wise regression models are shown in Exhibit 6. Model 1 is the basic regression model: Stock Returns $= \alpha + \beta_1$ Lower_D $+ \beta_2$ Upper_D $+ \varepsilon$. The coefficients of the Lower_D are negative and statistically significant for the 1-and 2-year periods. The size of the Lower_D coefficient is economically significant at −10.45% for 1 year and −15.76% over 2 year (−9.76% over 3 years). This indicates that stocks with abnormally low tax rates economically and significantly underperform stocks with a normal tax rate.

The coefficient of the Upper_D has a negative sign in the 2-and 3-year period, and is close to zero in the 1-year period. The size of the coefficients at −12.70% in the 2-year and −8.06% in the 3-year is economically significant, though it is statistically significant only in the 2-year 1999 test. The sign and size of the Upper_D coefficients indicate that abnormally high taxpayers usually underperform the normal tax payers. The coefficient size of the Upper_D is lower than that of Lower_D, particularly over shorter holding horizons. The regression analysis confirms that abnormal taxpayers underperform average taxpayers, and the underperformance is more marked for the lower taxpayers.

Models 2 to 6 in Exhibit 6 show regressions controlling for beta, book-to-market and size, momentum,

and performance of the IT sector. The results remain the same and abnormal tax rates continue to have explanatory power, independent of the Fama-French factors, momentum and the downturn in the IT sector. The results show the coefficient of the Lower_D to be negative ranging from −6.24 to −8.99% over 1-year, −9.75 to −12.95% over 2-year and always statistically significant. Over the 3-year period, the coefficient of Lower_D is always negative with values between −8.04 to −10.66%, but is not statistically significant. The coefficients for Upper_D are always negative, ranging from −1.05 to −6.01% over 1-year, −11.07 to −13.11% over 2-year, and −7.93 to −8.56% over 3-year, but is statistically significant only for the 2-year.

The results broadly support the Fama–French factors—higher book-market or value companies have higher stock returns. Small size companies have higher stock returns. The momentum factor is usually significantly negative, and stocks with prior high returns tend to have lower subsequent stock returns. The IT_D has a very large negative coefficient of around 20, indicating that over this 1- and 2-year holding ending December, 2001, IT companies underperformed other companies to the extent of around 20%. The IT_D over the 3-year ending December 31, 2001 is positive and results from the fact that average returns for the IT sector within the S&P 500 during this period (December 31, 1998 through 2001) was 46.8%.

We did an additional test to confirm that our results are not driven in any way by the demise of companies in the hi-tech and Internet sectors that peaked in 1999 and 2000 and plummeted in 2001. In Exhibit 7, we run the year-wise regression for the S&P constituents *excluding* the IT companies. Our results remain broadly the same. Our most important conclusion is that while the returns of the highest taxpayers are lower than the returns of the middle group, the returns of the lowest taxpayers are significantly worse.

We next analyzed the signals about the underlying business operations that an abnormal ETR may convey by studying the 10-K reports of some of the lowest and highest ETR companies.

EXHIBIT 6

Impact of Abnormal Tax Rates on Stock Performance (Cross-Sectional Regression of Stock Returns on Tax Rates)

6 A: S&P 500 constituents on 12/31/2000 and one year stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	IT_D	R-square
1	1.41	-10.45	0.09						1.17%
	(0.48)	(0.02)	(0.98)						
2	74.90	-7.97	-2.97	11.31	-7.80	-5.79			14.51%
	(0.00)	(0.05)	(0.49)	(0.08)	(0.00)	(0.02)			
3	77.61	-7.96	-4.81	12.98	-7.64	-8.27	-0.14		16.45%
	(0.00)	(0.04)	(0.27)	(0.04)	(0.00)	(0.00)	(0.00)		
4	4.44	-8.99	-1.05					-19.15	4.93%
	(0.03)	(0.04)	(0.82)					(0.00)	
5	79.66	-6.24	-6.01	9.46	-7.75	-3.83	-0.21	-21.53	19.08%
	(0.00)	(0.10)	(0.16)	(0.14)	(0.00)	(0.21)	(0.00)	(0.00)	
6	2.17	-7.78	-4.86	22.37		-3.09	-0.21	-21.31	13.36%
	(0.58)	(0.05)	(0.28)	(0.00)		(0.33)	(0.00)	(0.01)	

6 B: S&P 500 constituents on 12/31/1999 and two year stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	IT_D	R-square
1	12.74	-15.76	-12.70						2.09%
	(0.00)	(0.01)	(0.03)						
2	55.91	-12.71	-13.11	27.58	-5.33	-6.00			11.21%
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.22)			
3	28.14	-9.75	-11.96	17.59	-2.18	-4.54	-0.40		19.78%
	(0.19)	(0.09)	(0.03)	(0.12)	(0.31)	(0.36)	(0.00)		
4	18.29	-12.95	-11.26					-48.94	13.88%
	(0.00)	(0.02)	(0.05)					(0.00)	
5	33.82	-9.86	-11.56	15.76	-2.61	-2.39	-0.29	-22.50	21.36%
	(0.11)	(0.07)	(0.04)	(0.16)	(0.22)	(0.63)	(0.00)	(0.00)	
6	9.39	-9.90	-11.07	19.76		-3.68	-0.31	-22.52	21.01%
	(0.16)	(0.07)	(0.04)	(0.05)		(0.43)	(0.00)	(0.00)	

WHY EXTREME ETRs COULD BE AN OMINOUS SIGN

Our statistical analysis showed that extreme taxpayers have lower stock returns than companies with normal tax rates in the 30–40% range. Within the group of abnormal tax-rate payers, the returns of the extremely low taxpayers are significantly worse than that of the extremely high ones. A discussion of the tax accounting rules would clarify some of the theoretical reasons behind our conclusion that abnormal tax rates may convey business problems, hidden costs, or aggressive accounting by the company, therefore leading to future stock underperformance.

EXHIBIT 6
Continued

6 C: S&P 500 constituents on 12/31/1998 and three year stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	IT_D	R-square
1	13.82	-9.76	-8.06						0.73%
	(0.00)	(0.16)	(0.18)						
2	32.15	-8.04	-7.93	13.00	-3.21	5.22			2.80%
	(0.20)	(0.25)	(0.18)	(0.27)	(0.17)	(0.31)			
3	30.60	-8.18	-8.00	12.14	-2.98	5.11	-0.03		2.83%
	(0.23)	(0.25)	(0.18)	(0.30)	(0.22)	(0.32)	(0.76)		
4	12.99	-10.14	-8.12					8.23	0.99%
	(0.00)	(0.14)	(0.17)					(0.44)	
5	29.19	-8.82	-8.05	12.30	-2.73	3.28	-0.07	11.61	3.28%
	(0.25)	(0.22)	(0.17)	(0.29)	(0.25)	(0.53)	(0.52)	(0.28)	
6	1.38	-10.66	-8.56	18.14		3.89	-0.10	10.10	3.06%
	(0.85)	(0.14)	(0.15)	(0.06)		(0.45)	(0.40)	(0.36)	

Notes:

1. *P*-values (two-tailed) calculated using the White 1980 heteroschedasticity-consistent standard errors are reported in brackets under the coefficients.
2. The regression models are run after excluding the outliers—the companies with top 1% and bottom 1% tax rates.
3. The control parameters are size, book-market, beta, momentum, dummy for IT sector (IT_Dummy).
   (a) Size is defined as natural logarithm of the market value of equity on December 30 of the constituent year. So for the index constituents on 12/31/2000, we use the market equity on 12/30/2000.
   (b) BM, the book-market is taken as on September 30 of the constituent year. So for the index constituents on 12/31/2000, we use the book-market as on 9/30/2000.
   (c) The stock beta is calculated with respect to the market weighted NYSE index using 52 weekly observations.
   (d) Momentum is defined as the 6 month lagged stock return, as on the day before, for the constituent year. So for the index constituent on 12./31/2000, we take the total stock return between 6/30/2000 and 12/30/2000.
   (e) IT_D = 1, if the company belongs to the IT Sector on the index constituent date, using the Standard and Poors GICS sector classification scheme.
4. There was some collinearity between the IT_D and Size. Hence regression model 6 was run excluding size.

   Regression Model: Stock returns $= \acute{\alpha} + \beta_1$ *Lower_D* $+ \beta_2$ *Upper_D + Control Parameters +* $\acute{\varepsilon}$

   If prior 3-year average tax rates are <30%, then Lower_D = 1, else Lower_D = 0;

   If prior 3-year average tax rates are > 40%, then Upper_D = 1, else Upper_D = 0.

The ETRs used in our analysis is as presented in accounting statements by dividing Income Tax Expense by Pretax Income. Income Tax Expense may be broken down into two components—taxes payable (the actual tax return liability) and deferred income tax expense. Deferred Tax Assets and Liabilities reconcile the tax expense reported to shareholders to the tax actually payable to the tax authorities. The deferred income tax assets and liabilities arises from timing differences between expense and revenue recognition for tax and book purposes or by differences between policies used on accounting and tax reports, as well as from net operating loss (NOL) carryforwards and unused tax credits.

Deferred tax assets arise when costs are deductible under GAAP before they are deductible for tax purposes, or when revenue is recognized for tax purposes but not recognized for GAAP. The firm will pay more taxes than it will report to shareholders, giving rise to deferred tax assets. A deferred tax asset is "prepaid taxes" or a tax paid but not yet reported to shareholders as an expense. The deferred tax asset account represents potential future tax benefits from NOL carryforwards, unused tax credits, and certain kinds of timing difference between expense and revenue recognition for tax and book purposes. NOL carryforwards (could indicate operational problems in the near past) are the most important source of deferred tax assets for many new ventures. The income statement may actually show a "net tax benefit" (negative tax expense) in the year the firm files a tax return with a NOL.

Deferred tax liabilities are recognized for temporary differences that will result in taxable amounts in future years. Deferred tax liabilities arise when costs are deductible for tax purposes before they are deductible under GAAP, or when revenue is recognized in GAAP but not yet for tax purposes. The firm will pay less tax in these years than it will report to shareholders, giving rise to a deferred tax liability or a "tax obligation."

EXHIBIT 7

Impact of Abnormal Tax Rates on Stock Performance: Excluding Information Technology companies

7 A: S&P 500 constituents on 12/31/2000 and one year stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	R-square
1	5.40	-12.90	-2.84					1.87%
	(0.01)	(0.00)	(0.54)					
2	70.24	-8.85	-3.86	6.03	-7.69	2.63		12.54%
	(0.00)	(0.01)	(0.38)	(0.39)	(0.00)	(0.43)		
3	74.35	-7.80	-6.24	6.56	-7.60	1.74	-0.19	15.75%
	(0.00)	(0.02)	(0.16)	(0.32)	(0.00)	(0.58)	(0.00)	

7 B: S&P 500 constituents on 12/31/1999 and two years stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	R-square
1	18.59	-10.58	-14.62					1.98%
	(0.00)	(0.09)	(0.02)					
2	44.43	-9.91	-15.14	15.07	-3.74	1.83		5.17%
	(0.06)	(0.12)	(0.01)	(0.19)	(0.13)	(0.73)		
3	16.98	-8.34	-14.66	11.34	-0.93	0.11	-0.45	9.34%
	(0.48)	(0.18)	(0.01)	(0.33)	(0.70)	(0.98)	(0.00)	

7 C: S&P 500 constituents on 12/31/1998 and two year stock return ending 12/31/2001

Model	Intercept	Lower_D	Upper_D	BM	Size	Beta	Momentum	R-square
1	12.43	-7.54	-7.38					0.57%
	(0.00)	(0.29)	(0.23)					
2	10.65	-5.71	-7.05	9.47	-0.88	5.50		1.38%
	(0.67)	(0.43)	(0.25)	(0.43)	(0.71)	(0.30)		
3	8.27	-6.20	-7.19	7.70	-0.47	5.02	-0.07	1.48%
	(0.75)	(0.41)	(0.24)	(0.51)	(0.84)	(0.34)	(0.56)	

Notes:

1. The regression models in Exhibit 7 are run after excluding companies from the IT sector using the Standard & Poor GICS classification.
2. All other notes are as mentioned in Exhibit 6.

Cross-Sectional Regression of Stock Returns on Tax Rates

Regression Model: Stock returns $= \alpha + \beta_1$ *Lower_D* $+ \beta_2$ *Upper_D + Control Parameters* $+ \varepsilon$

If prior 3-year average tax rates are <30%, then Lower_D = 1, else Lower_D = 0;

If prior 3-year average tax rates are > 40%, then Upper_D = 1, else Upper_D = 0.

Deferred tax assets are subject to a realizability test—if the firm's forecast of future accounting earnings suggest it will have insufficient income before taxes to benefit from the deferred tax assets, it must create a deferred tax valuation allowance, effectively writing down the deferred tax asset. SFAS 109 requires evaluation and adjustment of the tax valuation allowance at the end of each accounting period. For growing firms using consistent accounting principles and subject to consistent tax rates, originating deferred tax entries will typically exceed reversing tax entries and the related deferred tax accounts will generally increase. Firms with flat or negative growth would be expected to show decreases in the related deferred tax accounts.[4]

Adjustment in the deferred tax asset or liability account is reported as a component of tax expense for the period. Large increases in deferred tax liabilities and/or large decreases in deferred tax assets, if not accompanied by corresponding changes in fundamentals, may signal attempts by the company to increase reported earnings by changing accounting assumptions.[4] This component of the tax expense—deferred income tax expense—which often accounts for the abnormal ETR, could actually be a proxy for aggressive accounting by the firm. It is interesting to note that in a new study the IRS has found the gap between the income that corporations report to shareholders and to the IRS grew by more than 70% in the late 1990s.[5]

Tax benefits from exercise of stock options (SFAS 123), was another reason for extremely low tax rates.[1] Extensive use of stock options, through its effect on ETR[6] and real shareholder costs,[7] could also lead to the empirical relationship between abnormal ETR and lower stock returns.

ANALYSIS OF 10-K: REASONS FOR ABNORMALLY LOW TAX RATES FOR SOME S&P 500 COMPANIES

An analysis of the 10-K reports for some of the companies with the lowest tax rate companies for 2000, 1999,

and 1998 shows some commonality of reasons for their low tax rates, as listed below:

(1) Poor current operating cash flows and profits;
(2) Heavy losses in prior years resulting in loss carryforwards;
(3) Tax benefits relating to the exercise of stock options;
(4) Special items such as withdrawal from partnerships;
(5) Tax credits (e.g. for research and development);
(6) Non-U.S. operations or favorable tax treaties;
(7) Changes in deferred tax liability or asset accounts. If these are unaccompanied by corresponding changes in company fundamentals, they may signal attempts to increase reported earnings by changing accounting assumptions.[4]

U.S. Airways had ETRs of 4.4% in 1996 and −52.5% (tax refund) in 1997, leading to very low 3-year average tax rates in 1998 and 1999. The main reasons for the low tax rates were the high amount of NOL carryforwards dating back to 1994 losses, and a 1996 reduction in the federal valuation allowance it was applying to its deferred tax assets. This latter was the most significant item and might indicate aggressive accounting. Computer Sciences had a negative tax rate of −36.4% (tax refund) in 1998, making ensuing 3-year average tax rate calculations lower than other firms, mainly due to an item labeled "Special items/tax benefits associated with partnership withdrawals." MedImmune had negative tax rates in 1998 and 1999 and 0% tax rates in 1996 and 1997. The 1998 deferred tax benefit of $47.4 million resulted from the reversal of the valuation allowance against its deferred tax assets, where the main component of the deferred tax assets was NOLs. At December 31, 1999, the Company had consolidated NOLs of approximately $351 million. It also included $93.8 million related to the exercise of employee stock options.

For each of the 5 years ending 2000, Enron's tax rate was consistently lower than the statutory rate. It was particularly low in 1997 (−54.9% or negative taxes paid) and 1999 (7.8%). The largest difference between the statutory and effective tax rates came from asset and stock sale differences and Equity earnings. The Equity earnings category represents earnings from affiliates reflected in the financial statement on which no tax was due since these earnings were not actually received. The Income Tax expense decreased in 1997 as a result of reduction in deferred tax liability. The company had an alternative minimum tax (AMT) credit carryforward as well as a NOL carryforward. Foreign subsidiaries cumulative undistributed earnings also lowered the tax rate since they were deemed to be indefinitely invested outside the U.S.

REASONS FOR ABNORMALLY HIGH TAX RATES FOR SOME S&P 500 COMPANIES

Global Crossing, Qwest Communications, and Cendant showed up in the lists of highest tax rate companies during 1998–2000. Global Crossing, incorporated in Bermuda, had a tax rate of 107.8% in 1999. Bermuda does not impose a statutory income tax and the provision for income taxes relates to income of subsidiaries located in jurisdictions with income taxes. In 1999, the deferred tax liabilities increased by $469.1 million, with $376.9 million of the increase being due to depreciation. The company expensed much higher depreciation in its tax books, resulting in a much lower actual cash tax payment than the taxes reported to shareholders. The discrepancy between the tax payment and the tax expense shown to shareholders resulted in the large increase in the deferred tax liability on the financial statements. The company minimized actual cash outflow from tax payments, but if the tax book depreciation was closer to economic reality, then net income might be overstated on its financial statements. A similar story applies to Qwest Communications with a reported tax rate of 164.3% in 2000, primarily due to large amounts of deferred taxes. The main reasons given for the high tax rate were Goodwill amortization and non-deductible merger-related charges. There was a large increase in deferred tax liabilities, mainly due to intangible assets (rose to $1.4 billion in 2000 from zero in 1999) from Qwest's merger with U.S. West. Greater write-offs of Goodwill on the tax books minimized the company's actual cash tax bill and led to increases in deferred liabilities. Cendant had a high tax rate of 74.2% in 1997, primarily due to non-deductible merger-related costs (increased the tax rate by 29.1% points), and amortization on non-deductible goodwill (increased the tax rate by 4.3% points). It should be noted that both Qwest and Cendant grew by aggressive acquisitions, with subsequent write-downs. High tax rates prior to those write-downs may have been red flags.

CONCLUSION

The study of the 3-year average ETRs of S&P 500 constituents on December 31, 1998, 1999, and 2000

and their subsequent 3-, 2- and 1-year stock returns ending December 31, 2001 revealed insights with important applications in stock selection. Around 60% of companies pay taxes in the 30–40% range. There is a negative U-shaped relationship between tax rates and subsequent stock returns. Stock returns increase with higher tax rates and peak in the 35–40% tax bracket, and then decline with further increases in the tax rate. It implies a negative correlation between abnormal tax rates and stock returns. Extreme tax rate companies underperform those with a tax rate in normal 30–40% range. Stock returns of low tax rate companies were by far the worst, significantly underperforming both the middle tax rate group and the high tax rate group of stocks. Abnormally high taxpayers underperform more over medium to long-term time horizons, while abnormally low taxpayers underperform over all time horizons. Abnormally high or low tax rates may signal problems in companies' financial health. It is therefore important for financial analysts to realize that anomalous tax rates, by signaling information about a company's underlying business and/or aggressive accounting, can significantly affect future stock returns and should be recognized in the stock valuation process.

ENDNOTES

[1]Under SFAS 123, firms may choose either the Intrinsic method or Fair Value method of accounting for stock options. The older Intrinsic method has been more popular since it allows management the opportunity to reward employees without any recorded expense at the time. If the exercise price is above the stock price on the grant date, the company's income statement will be unaffected. Further, upon exercise of the options, the company earns a tax deduction equal to the difference between the exercise price and the market price on the exercise date for each of the shares purchased leading to lower ETR and a higher net income.

[2]"Tax Rates" in the article mean the prior 3-year average ETRs as defined in the first page of the article and in the Data and Methodology section.

[3]5 % is the average *annualized* difference in returns between the middle and the abnormal taxpayers. It is calculated as the average of the following six numbers: 4.70% for 1 year, 6.91% annualized over 2 years (14.3% for 2 years), 2.85% annualized over 3 years (8.8% for 3 years), and the excluding IT sector 7% for 1 year, 6.21% annualized over 2 years (12.8% over 2 years), and 2.44% annualized over 3 years (7.5% over 3 years).

[4]Understanding the Tax Footnote (1/15/02) by the Center for Financial Research and Analysis, Inc (CFRA)

[5]As per The Wall Street Journal July 16, 2002. The report found that the pretax book income for active corporations grew from $753 billion in 1996 to $817 billion in 1998 while net income for tax purposes actually fell during the period from $660 to $658 billion.

[6]The Wall Street Journal October 10, 2000 article "Cisco, Microsoft Get Income-tax Break on Gains From Employee Stock Options" reports that in fiscal year 2000, Cisco received a tax benefit of around $2.5 billion from the exercise of employees' stock options. As a result, the company paid little federal income taxes while reporting $2.67 billion in profits.

[7]There are real costs for shareholders associated with use of stock options. Stock options lead to earnings dilution. Also, options are usually exercised in periods of excellent stock performance, and repurchases made to cover for expected options exercise may occur at periods of high stock prices and be detrimental to the firm's financial health. There are opportunity costs by way of foregone cash in issuing shares at a discounted rate via stock options.

REFERENCES

Abarbanell, Jeffrey, S., and Brian J. Bushee. "Fundamental Analysis, Future Earnings, and Stock Prices." *Journal of Accounting Research*, Vol. 35, No. 1 (Spring 1997), pp. 1-24.

Bauman, C., M. Bauman, and R. Halsey. "Do Firms use the Deferred Tax Valuation Allowance to Manage Earnings?" Working paper, University of Wisconsin-Milwaukee, 2000.

Bauman, Mark, and Kenneth R. Shaw. "Interim Income Tax Data and Earnings Prediction." SSRN Working Paper, March 2002, http://ssrn.com/abstract=305704

BusinessWeek, May 20, 2002. "How to Spot Tax Tinkering".

Center for Financial Research and Analysis. "Understanding the Tax Footnote." Center for Financial Research and Analysis, Inc, 1/15/2002.

Center for Financial Research and Analysis. "Accounting for Deferred Tax Assets." Center for Financial Research and Analysis, Inc, 9/29/2000.

Center for Financial Research and Analysis. "The Costs of Employee Stock Options." Center for Financial Research and Analysis, Inc, 8/6/2001.

Clayman, Michelle, R. "One-Time Charges: Never Having to Say you're Sorry." *Financial Analysts Journal*, (September-October 1995), Vol. 51, No. 5, pp. 57-60.

Clifford Lee. "Is Your Stock Addicted to Write-offs?" (March 21, 2001), Fortune.

Fama, Eugene F., and Kenneth R. French. "The Cross-Section of Expected Stock Returns." *Journal of Finance*, 47 (1992), pp. 427-465.

Fama, Eugene F., and Kenneth R. French. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics*, 33 (1993), pp. 3-56.

Jegadeesh, Narasimhan, and Sheridian Titman. "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency." *Journal of Finance*, 48 (1993), pp. 65-91.

Joos, P., J. Pratt, and S. Young. "Book-Tax Differences and the Value Relevance of Earnings." Working paper, Indiana University, Bloomington, 1999.

Kumar, K.R., and G. Visvanathan. "The Information Content of the Deferred Tax Valuation Allowance: An Event Study of News Disclosures of Valuation Allowance Changes." Working paper Series, SSRN. (September 2002) http://ssrn.com/abstract=314728

Mills, L. "Book-Tax Differences and the Internal Revenue Service Adjustments." *Journal of Accounting Research* (Autumn 1998), pp. 343-356.

Mills, L. and K. Newberry. "The Influence of Tax and Non-Tax Costs on Book-Tax Reporting Differences: Public and Private Firms." Working paper, University of Arizona, Tuscon [2000].

Revsine, l., D. Collins.,W.B. Johnson. Financial Reporting and Analysis." Upper Saddle River, NJ: Prentice Hall [1998].

Shevlin, Terry J., and Michelle Hanlon. "Accounting for the Tax benefits of Employee Stock Options and Implications for Research." Working paper, University of Washington, April 2001.

Sullivan, M. "Let the Good Times Roll: Options and Tax-free Profits." Tax Notes, May 29, (2000), pp. 1185-1204.

White, G.I., A.C. Sondhi, and D. Fried. *The Analysis and Use of Financial Statements*, 2nd ed. John Wiley & Sons, Inc. 1997.

White, H. "A Heteroskedasticity Consistent Covariance Matrix Estimator and a Direct Test of Heteroskedasticity." *Econometrica*, (May 1980), pp. 817-838.

Yin, George K. "How Much of the Recent Evidence of a Corporate Tax Shelter Problem is Explained by Increased Stock Option Activity?" Working paper series, SSRN, July 21, 2000.