Dividends, Taxes, and Returns: Empirical Evidence

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Taxpayers prefer to accrue capital gains rather than dividends under differential taxation, thus demanding a tax premium on high yield stocks. This indicates a positive relationship between dividend yields and stock returns. This study investigates the tax premium using an after tax version of the capital asset pricing model. Results provide no evidence of a positive relationship between dividend yields and returns. The results prevail even after controlling for firm size and market-to-book equity ratio.

INTRODUCTION

U.S. tax law generally has treated capital gains more favorably than dividends. Under this differential taxation, taxpayers should prefer to accrue capital gains rather than dividends and hence demand a tax premium on relatively high yield stocks. A number of studies (Elton and Gruber, 1970; Kalay, 1982; Eades, Hess, and Kim, 1984; Michaely, 1991) address this issue by investigating the ex-dividend day stock price behavior. These studies, however, can provide only limited evidence because of short-term trading designed to strip a stock of its dividend which can lead to order flow imbalances (Lease, Masulis, and Page, 1991, p. 1524).[1]

Unlike the above studies, Brennan (1970) and Litzenberger and Ramaswamy (1979) examine the issue in the context of asset pricing. They developed an after tax version of the capital asset pricing model (CAPM), in which differential tax treatment leads to optimization in after tax terms, and, thus, stocks with higher yield provide higher expected returns to compensate investors for the higher tax. Empirical evidence, however, is mixed. On the one hand, Litzenberger and Ramaswamy (1979, 1982), Morgan (1982), and Poterba and Summers (1984) report some evidence of the tax premium. On the other hand, Black and Scholes (1974) and Miller and Scholes (1982) find no evidence that dividends are valued differently from capital gains.

The present study investigates the tax premium using an after tax version of the CAPM. It is different from the earlier studies in several important ways. First, a quarterly return interval is used as opposed to a monthly return interval. This is consistent with Miller and Scholes' (1982) argument that a monthly interval is not appropriate because

* The authors wish to thank Dale Domian and Dilip Ghosh for their suggestions on an earlier version of this paper. The authors are grateful to two anonymous referees for valuable comments. Financial support was received from Suffolk University Research Grant Program.

[1] Order flow imbalances arise when buy orders are predominant before ex-dividend days and sell orders are predominant on the ex-dividend days.

0747-5535/96/1600-0003 $02.50

most firms follow a quarterly dividend payment cycle. Second, the empirical model is constructed such that the tax effect is captured without being confounded by the information effect.[2] Third, firm size and market-to-book equity ratio are controlled in the estimation of the tax effect.

Moreover, this study, within the asset pricing framework, examines whether the 1986 Tax Reform Act had any impact on the tax premium.[3] Tax reform abolished the differential tax treatment between realized capital gains and dividends. Although unrealized capital gains still are treated more favorably than dividends, one could expect the tax effect, if any, to be weaker after the tax reform. The study is particularly pertinent because of new changes in tax law. Under the new tax law, the top income tax rate rises to 36 percent while the capital gains tax rate is capped at 28 percent. For those with incomes over $250,000, a 10 percent surtax raises the effective marginal rate to 39.6 percent. This change results in differential taxation on dividends and capital gains for the high income tax bracket. This study can shed some light on the tax premium under the new tax law.

In the estimation of the tax effect, we adopt a sign test, a nonparametric test that is not subject to distribution assumptions. Results indicate that there is no tax premium. Using cross-sectional regressions, we find no positive relationship between dividend yields and stock returns, whereas a significant information effect is detected. These results are consistent with findings reported by Michaely (1991). His sample which is somewhat comparable to ours shows that the mean excess return on the ex-dividend day is indistinguishable from zero, providing no evidence of the tax premium either before or after implementation of the 1986 Tax Reform Act.

While our results are consistent with Michaely's, there are significant differences between the two studies. Most important, Michaely analyzes the ex-dividend day returns. The scope of his study is too narrow to provide evidence on a long-term effect of the tax premium. In contrast, we investigate the potential long-term tax premium in the equilibrium contexts. Furthermore, Michaely does not control for such factors as firm size and market-to-book equity ratio which many (Fama and French, 1992) believe to have important roles in asset pricing. These factors explicitly are controlled in our study.

AFTER TAX CAPM

The Sharpe-Lintner CAPM ignores the presence of taxes in arriving at a single period equilibrium solution:

(1) $E(R_{jt}) - R_{ft} = \beta_{jt}(E(R_{mt}) - R_{ft})$,

where:

$E(.)$ = Expectation operator;
R_{jt} = Return on stock j at time t;

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[2] For the information effect of dividends, see Bhattacharya (1979, 1980), Aharony and Swary (1980), and Eades (1982).

[3] For detailed discussions of the 1986 Tax Reform Act, see Cutler (1988) and Robin (1991).

R_{ft} = Risk-free rate of return at time t;
β_{jt} = Beta coefficient of stock j at time t; and
R_{mt} = Return on the market portfolio at time t.

Equation (1) implies that investors are indifferent toward receiving income in the form of capital gains or dividends. By contrast, Brennan (1970) incorporates taxes in his derivation of the equilibrium return:

(2) $E(R_{jt}) - R_{ft} = \beta_{jt}(E(R_{mt}) - R_{ft}) - \beta_{jt}T(E(Y_{mt}) - R_{ft}) + T(Y_{jt} - R_{ft})$,

where:

T = $(T_d - T_g)/(1 - T_g)$;
T_d = Weighted average of investors' marginal tax rates on dividends;
T_g = Weighted average of investors' marginal tax rates on capital gains;
Y_{mt} = Dividend yield on the market portfolio at time t; and
Y_{jt} = Dividend yield on stock j at time t.

Litzenberger and Ramaswamy (1979) develop a similar model, which allows for progressive tax rates, margin constraints, and income-related constraints on borrowing:

(3) $E(R_{jt}) - R_{ft} = Z_t + \beta_{jt}(E(R_{mt}) - R_{ft} - Z_t) - \beta_{jt}K(E(Y_{mt}) - R_{ft}) + K(Y_{jt} - R_{ft})$,

where:

Z_t = The excess return on a zero beta portfolio of which the dividend yield is equal to the risk free rate.

In equation (3), K represents the weighted average of investors' marginal tax rates less the weighted average of the investors' ratios of the shadow price on the income-related borrowing constraint and the expected marginal utility of mean portfolio return. Therefore, equation (2) is a special case of equation (3).

METHODOLOGY AND DATA

METHODOLOGY

For empirical analysis, both equations (2) and (3) can be written as

(4) $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + u_{jt}$.

To estimate equation (4), earlier studies (Litzenberger and Ramaswamy, 1979; Miller and Scholes, 1982; Poterba and Summers, 1984) adopt a three step procedure: First, the beta coefficient of each stock is estimated based on the conventional market model. Then cross-sectional returns are regressed on the estimated betas and dividend yields. This step is repeated each period using the updated beta estimates and dividend yields. As a final step, the averages of the cross-sectional regression coefficients are calculated. The above procedure may not be appropriate, however, when *ex post* data are used. To illustrate, consider a certain period in which the *ex post* market return is less than the risk free rate. In this case, the predicted sign for α_1 would be negative, rather than positive.[4] Thus, calculating the average of α_1 would not be meaningful. Moreover, with any information effect, the coefficient α_2 would be overestimated (Miller and Scholes, 1982).

This study suggests a different approach. Allowing for the potential information effect, the error term u_{jt} can be separated into two parts such that $u_{jt} = \alpha_3(Y_{jt} - E(Y_{jt})) + e_{jt}$, where α_3 is a market revaluation coefficient relating the unexpected dividend yield to stock returns. The first part represents the abnormal returns associated with the unexpected dividend yield, and the second part is a pure error term. Thus, equation (4) can be rewritten as

$$(5)\ R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + e_{jt}.$$

Beta coefficients are estimated over the prior 60 months using the conventional market model.[5] These estimated betas along with dividend yields and unexpected dividend yields are used to estimate equation (5) for each period. Instead of calculating the averages of the coefficient estimates, we conduct sign tests to examine whether the coefficients have the predicted signs.[6] Sign tests are unbiased and consistent even when the coefficients are not normally distributed (Conover, 1980). In addition, outliers cannot be a concern for sign tests.

The estimate of α_1 is predicted to be positive (negative) if the *ex post* market return is greater (less) than the risk free rate. The coefficient α_2 is supposed to capture the tax effect on valuation of dividends without the confusion of the information effect. With the tax effect, it should be positive regardless of the relative magnitudes of the *ex post* market return and risk free rate. The coefficient α_3 captures the information effect, if any, and is predicted to be positive.[7]

DATA

In this study, a quarterly return interval is used. We define the first quarter as three months from February to April, the second quarter, from May to July, and so on. This is to reflect most firms' dividend payment cycle. For instance, the majority of firms announce and pay first quarter (of the calendar year) dividends during the three month period from February to April. Dividends are limited to quarterly cash dividends, taxable as ordinary income. For a firm to be included in the sample, its dividend announcement

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[4] *Ex ante* the expected market return is always greater than the risk free rate, and thus the estimate of α_1 should be positive. *Ex post*, however, the market return can be lower than the risk free rate. As a result, the coefficient estimate of beta can be negative; that is, the higher the beta, the lower the return.

[5] For equation (5), quarterly betas are preferred over monthly betas. The estimation of quarterly betas, however, creates a problem. For instance, to get 60 quarterly observations, 15 years of data are needed. Considering the beta nonstationarity, a 15 year period is too long. Instead, we use monthly betas for equation (5).

[6] While we only report nonparametric test results, results using parametric tests are qualitatively the same.

[7] Being greater (less) than expected dividends, actual dividends have a positive (negative) effect on returns. For detail, see Aharony and Swary (1980), Kwan (1981), and Miller and Scholes (1982).

and ex-dividend day should fall in the same quarter, and the dividend should be paid only once in that quarter. Thus, the firm should have only one quarterly dividend announcement date and one ex-dividend day during the quarter. Also, the firm must pay quarterly dividend only once in the previous quarter. (The above criteria are adopted in order to estimate the information effect and the tax effect simultaneously.) The sample covers the period from the second quarter of 1982 to the third quarter of 1990. This sample period is chosen such that it includes equal lengths of time before and after the 1986 Tax Reform Act.

Quarterly stock returns R_{jt} are derived from the CRSP monthly returns file. We measure dividend yield Y_{jt} by dividing a firm's quarterly dividend by the share price at the beginning of the quarter. Quarterly dividends and share prices are obtained from the CRSP daily master file. The 90 day T-bill rate is used as a proxy for risk free rate R_{ft}. The most difficult measurement is the unexpected dividend yield, $Y_{jt} - E(Y_{jt})$. There is no unanimously accepted model for it. Following Aharony and Swary (1980) and Kane, Lee, and Marcus (1984), we use a naive model:

(6) $Y_{jt} - E(Y_{jt}) = (D_{jt} - D_{jt-1})/P_{jt}$,

where:

D_{jt} = Dividend on stock j for quarter t; and
P_{jt} = Price of stock j at the beginning of quarter t.

Aharony and Swary (1980) and Kwan (1981) report that this model forecasts better than several other models.

The final sample contains 16,593 firm-quarters. Panel A of Table 1 reports descriptive statistics on the sample. The average quarterly return is 4.22 percent (16.88 percent on the annual base), indicating a strong equity market during the sample period. The average beta is approximately 1.02, reasonably close to one. The average quarterly dividend yield is about 0.97 percent (equivalent to 3.88 percent on the annual base). The unexpected dividend yield is low, with its average of below 0.01 percent. Considering corporate dividend policy, however, this is not surprising. In the sample, more than 80 percent of the firms paid the same amount of dividends for the current quarter as for the previous quarter. For instance, 475 of 528 firms paid exactly the same amount of dividends for the first and second quarters of 1982.

Panel B of Table 1 displays the correlations among the variables. The correlation coefficient between stock return and each of dividend yield and unexpected yield is positive with a reasonably low p-value. This seems to be consistent with the dividend-related tax effect and with the information effect. The correlation coefficient measures a simple bivariate relation between two variables, however, thus not indicating the relationship of the two with other factors controlled. It is of interest to note that stock return is not significantly related to beta; the correlation coefficient is 0.005, but its p-value is 0.48. This result is mainly attributable to the fact that the relation between the two is dependent upon the relative size of *ex post* market return with respect to the risk free rate. Among the independent variables, unexpected dividend yield has no significant correlation with

Table 1—Sample Data

Panel A: Descriptive Statistics

	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Return	16593	0.0422	0.1665	-0.7317	3.9525
Beta	16593	1.0185	0.4184	-0.2250	2.8664
Dividend Yield	16593	0.0097	0.0062	0.0001	0.0465
Unexpected Yield	16593	0.0000	0.0013	-0.0430	0.0438
Firm Size	16593	1413.6865	3371.0492	4.1600	59392.0000
Market-to-Book Equity Ratio	15214	1.7517	8.0482	-37.9700	688.8800

Panel B: Pearson Correlation Coefficients (p-values in parentheses)

	Return	Beta	Dividend Yield	Unexpected Yield	Firm Size
Beta	0.005				
	(0.48)				
Dividend Yield	0.054	-0.470			
	(0.00)	(0.00)			
Unexpected Yield	0.090	0.015	0.023		
	(0.05)	(0.75)	(0.61)		
Firm Size	-0.014	-0.041	0.035	0.033	
	(0.06)	(0.00)	(0.00)	(0.48)	
Market-to-Book Equity Ratio	-0.011	-0.002	-0.047	0.064	0.022
	(0.14)	(0.72)	(0.00)	(0.36)	(0.00)

Return is measured as a quarterly return. Beta is estimated using monthly returns for the previous 60 months. Dividend yield is measured by dividing a firm's quarterly dividend by the share price at the beginning of the quarter. Unexpected yield is calculated as a dividend innovation over share price. Firm size is proxied by the market value of common equity and is reported in millions. Market-to-book equity ratio is the ratio of the market value of common shares to the book value of common shares

either beta or dividend yield, indicating that a firm's decision on dividend change is independent of its dividend yield and systematic risk. The correlation between beta and dividend yield is highly significant, however: the correlation coefficient is -0.470 with its p-value less than 0.01. This confirms the empirical findings by earlier studies (Malkiel, 1963; Sharpe and Sosin, 1976) that lower yield stocks tend to have higher systematic risk.

EMPIRICAL RESULTS

We begin this section by reporting the results of regressing returns on systematic risk:

(7) $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + w_{jt}$,

where:

w_{jt} = A disturbance term.

We estimate equation (7) to examine whether beta alone significantly contributes to explaining the *ex post* returns across firms. The GLS (Amemiya, 1985) results are presented in Table 2 for each quarter during the sample period. Table 2 shows that, for 20

Table 2 - GLS Regression Results, $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + w_{jt}$

Time Period (Yr/Qr)	Number of Observations	Market Return	T-Bill Rate	Parameter Estimates α_0	α_1
1982/2	528	-0.0690	0.0301	-0.032	-0.050
1982/3	526	0.2715	0.0208	0.221	0.064
1982/4	557	0.1046	0.0199	0.070	0.039
1983/1	511	0.1406	0.0206	0.218	-0.044
1983/2	469	0.0150	0.0218	-0.020	0.046
1983/3	484	0.0050	0.0226	0.078	-0.109
1983/4	534	0.0089	0.0222	0.015	-0.005
1984/1	524	-0.0164	0.0235	-0.067	0.014
1984/2	497	-0.0474	0.0250	0.013	-0.082
1984/3	518	0.1169	0.0257	0.076	0.004
1984/4	518	0.0954	0.0207	0.059	0.029
1985/1	506	0.0133	0.0207	0.066	-0.089
1985/2	484	0.0731	0.0180	0.058	0.001
1985/3	499	0.0005	0.0179	0.051	-0.075
1985/4	487	0.1231	0.0178	0.099	0.009
1986/1	491	0.1174	0.0164	0.134	-0.022
1986/2	465	0.0074	0.0151	0.120	-0.142
1986/3	483	0.0401	0.0133	-0.013	0.041
1986/4	494	0.1196	0.0136	0.003	0.079
1987/1	485	0.0520	0.0141	-0.057	0.077
1987/2	479	0.1038	0.0144	0.016	0.054
1987/3	500	-0.2070	0.0156	-0.099	-0.155
1987/4	498	0.0332	0.0146	0.069	-0.011
1988/1	513	0.0372	0.0144	-0.029	0.103
1988/2	482	0.0467	0.0163	0.006	0.027
1988/3	480	0.0308	0.0180	0.030	-0.027
1988/4	478	0.0725	0.0201	-0.021	-0.049
1989/1	454	0.0505	0.0216	0.021	0.016
1989/2	461	0.1210	0.0205	0.072	0.004
1989/3	465	-0.0118	0.0194	0.001	-0.050
1989/4	484	-0.0299	0.0191	0.008	-0.080
1990/1	483	0.0092	0.0195	-0.071	0.049
1990/2	461	0.0770	0.0193	-0.010	0.022
1990/3	295	-0.1409	0.0183	0.014	-0.183

R_{jt} denotes quarterly stock return, β_{jt} denotes beta coefficient, and w_{jt} is an error term. The CRSP index and the 90 day T-bill rate are used as proxies for the market return and the risk free rate, respectively

(14) of 34 quarters, the *ex post* market return proxied by the CRSP value-weighted index is greater (less) than the risk free rate. The sign test results in Table 3 show that the estimate of α_1 is positive for 16 of the 20 quarters in which the *ex post* market return is greater than the risk free rate. For 11 of the 14 quarters in which the *ex post* market return is less than the risk free rate, the coefficient estimate is negative. Thus, the coefficient α_1 has the predicted sign at the 5 percent level in either case. These results support the role of beta in the cross-sectional return explanation.

The results of estimating equation (5) are reported in Table 4, with the sign test results in Table 5. For convenience, equation (5) is reproduced below:

$$(5)\ R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + e_{jt}.$$

The coefficient estimates of beta (α_1) are virtually the same as those in Table 2, confirming the role of beta. The estimate of α_2, however, is positive for nine quarters before

Table 3—Sign Test for the Null Hypothesis, $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + w_{jt}$

	Total Observations	Number of Predicted Signs	Critical Value
Market Return > Risk Free Rate	20	16	14
Market Return < Risk Free Rate	14	11	10
1982/2–1990/3	34	27	22

Critical values are based on one-tailed tests because predicted signs are known

Table 4—GLS Regression, $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + e_{jt}$

Time Period (Yr/Qr)	Number of Observations	Parameter Estimates α_1	α_2	α_3
1982/2	528	-0.064	-2.302	5.784
1982/3	526	0.067	0.769	8.984
1982/4	557	0.026	-2.294	2.230
1983/1	511	-0.052	-1.716	11.542
1983/2	469	0.053	0.971	11.072
1983/3	484	-0.082	5.415	0.953
1983/4	534	0.020	6.976	3.116
1984/1	524	0.023	2.262	-0.805
1984/2	497	-0.084	-1.019	21.930
1984/3	518	0.025	5.074	5.798
1984/4	518	0.037	1.901	14.297
1985/1	506	-0.081	1.636	-2.821
1985/2	484	-0.007	-2.323	14.118
1985/3	499	-0.060	3.672	11.104
1985/4	487	0.009	-1.372	21.409
1986/1	491	-0.045	-3.901	23.881
1986/2	465	-0.109	4.439	46.849
1986/3	483	0.063	4.061	-13.252
1986/4	494	0.077	-0.121	11.090
1987/1	485	0.035	-6.052	15.290
1987/2	479	0.010	-4.656	22.569
1987/3	500	-0.068	9.344	5.643
1987/4	498	0.005	1.547	27.407
1988/1	513	0.086	-1.535	6.212
1988/2	482	0.068	3.423	5.578
1988/3	480	-0.025	0.158	16.469
1988/4	478	0.062	1.107	3.394
1989/1	454	-0.038	-4.292	1.730
1989/2	461	0.020	1.479	20.396
1989/3	465	-0.059	-0.478	6.885
1989/4	484	-0.081	-0.210	12.130
1990/1	483	0.029	-1.651	0.486
1990/2	461	-0.025	-3.861	7.108
1990/3	295	-0.204	-1.652	0.638

R_{jt} denotes quarterly stock return, β_{jt} denotes beta coefficient, Y_{jt} denotes dividend yield, and the term, $Y_{jt} - E(Y_{jt})$, represents unexpected dividend yield

1986; only six quarters after 1986. These statistics are below the 5 percent critical value, providing no evidence that dividend yield is related positively to return. This implies that there is no significant dividend-related tax effect on the quarterly basis either before or after the 1986 tax reform during the sample period. Finally, the estimate of α_3 is positive for

Table 5—Sign Tests, $R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + e_{jt}$

	Total Observations	Number of Predicted Signs	Critical Value
Panel A: Test The Null Hypothesis That α_1 Has No Predicted Sign			
Market Return > Risk Free Rate	20	14	14
Market Return < Risk Free Rate	14	10	10
1982/2 - 1990/3	34	24	22
Panel B: Test The Null Hypothesis That α_2 Has No Predicted Sign			
1982/2–1985/4	15	9	11
1987/1–1990/3	15	6	11
1982/2–1990/3	34	17	22
Panel C: Test The Null Hypothesis That α_3 Has No Predicted Sign			
1982/2–1990/3	34	31	22

Critical values are based on one-tailed tests because predicted signs are known

31 quarters, well above the 5 percent critical value. Thus, the results provide evidence of the information effect but not of the tax effect.

One may argue that the above results are driven by other factors. Recently, Fama and French (1992) find that the two most crucial factors associated with cross-sectional returns are firm size and market-to-book equity ratio. Based on their findings, it can be argued that the results in Table 4 mask the effects of firm size and market-to-book equity ratio on returns, particularly because dividend yield in general is related to firm size and market-to-book equity ratio. Table 1 shows that dividend yield is related positively to firm size, proxied by the market value of equity, and is related inversely to market-to-book equity ratio; that is, firms with relatively low equity value and high market-to-book equity ratio tend to have lower dividend payouts. To address this issue, firm size and market-to-book equity ratio are controlled:

$$(8)\ R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt}-R_{ft}) + \alpha_3(Y_{jt}-E(Y_{jt})) + \alpha_4 LSIZE_{jt} + \alpha_5 MKB_{jt} + e_{jt},$$

where:

LSIZE = The natural logarithm of equity value; and
MKB = Market-to-book equity ratio.

The equity value is derived from the CRSP daily master file, and the market-to-book equity ratio is derived from the COMPUSTAT tape. Because the market-to-book equity ratio data are not available for several firms, the sample size is reduced. Equation (8) is estimated on the basis of 15,214 firm-quarters.

Tables 6 and 7 present the regression results. It is clear that the Table 4 results prevail even after controlling for firm size and market-to-book equity ratio. This indicates that the estimation results in Table 4 are not attributable to the effects of firm size or market-to-book equity ratio.

Table 6—GLS Regression,
$R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + \alpha_4 LSIZE_{jt} + \alpha_5 MKB_{jt} + e_{jt}$

Time Period (Yr/Qr)	Number of Observations	Parameter Estimates α_1	α_2	α_3	α_4	α_5
1982/2	469	-0.068	-1.709	4.662	-0.024	0.006
1982/3	466	0.071	-0.710	15.262	0.005	-0.028
1982/4	491	0.033	-2.029	1.575	-0.031	-0.010
1983/1	454	-0.056	0.404	11.943	-0.033	0.013
1983/2	415	0.045	1.767	17.955	-0.026	0.001
1983/3	434	-0.081	4.538	1.836	0.005	-0.008
1983/4	481	0.019	6.151	2.531	-0.007	-0.018
1984/1	468	0.009	2.623	-4.456	0.001	0.001
1984/2	445	-0.087	1.084	27.073	-0.008	0.023
1984/3	466	0.027	5.318	1.444	0.004	-0.001
1984/4	468	0.036	1.952	14.140	-0.001	0.001
1985/1	455	-0.080	1.794	-3.959	0.006	0.001
1985/2	438	-0.005	-3.082	10.170	0.004	0.001
1985/3	453	-0.063	2.928	14.739	0.001	-0.006
1985/4	442	0.013	-1.597	32.291	-0.001	0.012
1986/1	450	-0.048	-2.807	19.679	-0.006	0.010
1986/2	426	-0.105	4.962	53.281	-0.001	0.001
1986/3	454	0.064	2.962	-20.360	0.010	-0.012
1986/4	465	0.068	-1.168	26.508	0.008	-0.001
1987/1	448	0.043	-5.261	19.641	-0.010	0.000
1987/2	433	-0.008	-5.187	20.003	0.009	-0.001
1987/3	454	-0.102	8.379	8.312	0.023	-0.001
1987/4	468	0.002	0.767	29.197	-0.007	-0.009
1988/1	478	0.085	-1.678	22.715	-0.036	-0.002
1988/2	448	0.069	3.969	15.049	-0.002	0.002
1988/3	452	-0.031	0.182	14.432	0.013	-0.000
1988/4	458	0.066	2.084	3.260	0.001	0.007
1989/1	433	-0.040	-4.193	1.740	-0.002	-0.001
1989/2	435	0.009	1.680	16.705	0.025	0.001
1989/3	436	-0.058	-0.157	6.291	-0.001	0.001
1989/4	465	-0.084	-0.241	12.430	0.006	-0.000
1990/1	463	0.031	-1.833	0.357	-0.001	0.000
1990/2	434	-0.029	-3.486	10.326	0.012	0.002
1990/3	269	-0.242	-2.310	15.539	0.026	-0.000

R_{jt} denotes quarterly stock return, β_{jt} denotes beta coefficient, Y_{jt} denotes dividend yield, and the term, $Y_{jt} - E(Y_{jt})$, represents unexpected dividend yield. $LSIZE_{jt}$ is natural logarithm of equity value, and MKB_{jt} is market-to-book equity ratio

As a robustness check of the above results, we form 50 equally sized portfolios each quarter according to dividend yield and reestimate equations (5) and (8).[8] Results are virtually the same and are not reported. In any case, beta plays an important role in cross-sectional return variation, and there is a substantial information effect. But there is no evidence of a positive relationship between dividend yields and returns.

CONCLUSION

While the empirical results are subject to the usual limitations due to the selection criteria and methodology, they support the role of beta in explaining returns across firms. We find evidence of the information effect as well, but we find no evidence of the tax

[8] This portfolio approach in general is believed to reduce measurement errors (if any) of the variables.

Table 7—Sign Tests,
$R_{jt} - R_{ft} = \alpha_0 + \alpha_1\beta_{jt} + \alpha_2(Y_{jt} - R_{ft}) + \alpha_3(Y_{jt} - E(Y_{jt})) + \alpha_4 LSIZE_{jt} + \alpha_5 MKB_{jt} + e_{jt}$

	Total Observations	Number of Predicted Signs	Critical Value
Panel A: Test The Null Hypothesis That α_1 Has No Predicted Sign			
Market Return > Risk Free Rate	20	13	14
Market Return < Risk Free Rate	14	10	10
1982/2–1990/3	34	23	22
Panel B: Test The Null Hypothesis That α_2 Has No Predicted Sign			
1982/2–1985/4	15	10	11
1987/1–1990/3	15	6	11
1982/2–1990/3	34	18	22
Panel C: Test The Null Hypothesis That α_3 Has No Predicted Sign			
1982/2–1990/3	34	31	22
Panel D: Test The Null Hypothesis That α_4 Has No Predicted Sign			
1982/2–1990/3	34	17	22
Panel E: Test The Null Hypothesis That α_5 Has No Predicted Sign			
1982/2–1990/3	34	16	22

Critical values are based on one-tailed tests because predicted signs are known

premium based on the quarterly cross-sectional regressions. This holds true not only after, but also before, the 1986 tax reform. These results are consistent with Michaely's (1991) findings. In his study of the ex-dividend day return behavior during the comparable period, Michaely also reports no evidence of the tax premium even before the tax reform. Therefore, it seems fair to conclude that, in the equilibrium contexts, investors are indifferent between dividend income and capital gains.

There are several possible explanations for the above results. First, the effect of the tax premium could be negated by short-term trading designed to capture dividends. Second, dividend yield could be correlated with some other unknown factors that should be considered in the cross-sectional return variation. Perhaps most importantly, the stock market could be dominated by institutional investors (e.g., pension funds, mutual funds). Because their performance is measured and rewarded based on before tax terms, the institutional investors have incentives to maximize the before tax returns of their portfolios. Consequently, individual investors' tax preferences are ignored. Besides, even if the institutional investors want to take into account individual investors' tax concerns, it is practically impossible to reflect them on the portfolio management. During the last two decades, the ownership of institutional investors has increased dramatically following passage of the Employee Retirement Income Security Act of 1974. By the year 2000 pension funds alone are expected to hold 50 percent of all corporate equity in the United States (*Business Week*, May 18, 1987). Considering the active role of these institutional investors in the equity market, the failure to find the tax premium may not be surprising.

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