Taxes and Dividends

The Impact of Personal Taxes on Corporate Dividend Policy and Capital Structure Decisions

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■ In their pioneering work on the theory of corpora-
tion finance, Modigliani and Miller (MM) [31] and
Miller and Modigliani [28] establish the proposition
that, in a perfect capital market, a firm's value is inde-
pendent of its financing decisions and dividend policy.
In a follow-up paper, Modigliani and Miller [32] show
that with corporate tax deductibility of interest pay-
ments, a firm can maximize its value by increasing the
amount of debt in its capital structure. In a later paper,
Miller [26] adds personal income taxes in the MM tax
framework and reestablishes the irrelevance of capital
structure in the absence of "leverage related" costs. He
shows that when the market for corporate debt is in
equilibrium, the marginal personal tax premium de-
manded by bondholders offsets the marginal corporate

interest tax shields. Thus, no optimal debt ratio exists
for an individual firm, while there is an equilibrium
debt-equity ratio for the corporate sector as a whole.

Implied in Miller's model (see [26, footnote 22]),
but explicitly demonstrated by Miller and Scholes [29],
is the irrelevance of dividend policy for firm valuation.
Given the tax advantage of capital gains over ordinary
dividend income, which may suggest a zero dividend
payout ratio as the optimal corner solution, Miller and
Scholes demonstrate that many individuals do not have
to pay more than the capital gains rate on dividends.
This is possible because the dividends may be trans-
formed into a tax deferred annuity through "dividend
laundering." As a result, according to Miller [26] and
Miller and Scholes [29], shareholders should be indif-
ferent to the firm's choice of capital structure and
dividend policy.

The post-Miller studies have focused on the im-
plications of positive leverage-related costs and per-

sonal taxes on equity income for corporate capital structure decisions as well as dividend policy. Several studies have successfully demonstrated that Miller's capital structure irrelevance proposition can be easily overturned as "leverage related" costs are recognized. (See Taggart [37], Barnea, Haugen, and Senbet [3], Kim [22], and Modigliani [30] for the recognition of bankruptcy/agency costs in Miller's model, and De-Angelo and Masulis [12] for the introduction of loss of nondebt tax shields.) Bradley, Jarrell, and Kim [9] document empirical results in support of the existence of optimal (or target) financial leverage.

The empirical evidence on the dividend irrelevance proposition is mixed. While Black and Scholes [6] support the irrelevance proposition by demonstrating that the pretax rate of return is independent of dividend payout ratios, Litzenberger and Ramaswamy [24, 25] report the opposite results. Poterba and Summers [35] also present empirical evidence contradicting the irrelevance of dividend policy based on British data. Buser and Hess [10] and Trzcinka [39] empirically observe that marginal bondholder's tax rates and the corporate tax rate are not the same as Miller predicted, which may be interpreted as indirect evidence of the dividend relevance proposition. Using the Internal Revenue Service Statistics of Income sample of 1979 returns, Peterson, Peterson, and Ang [34] report that the marginal and effective tax rates on dividend income are higher than the statutory tax rate on capital gains. Despite empirical evidence indicating dividend related anomalies, Miller [27, p. s466] suggests that the rationality-based market equilibrium models are still alive and well, and further suggests that behavioral/cognitive elements may be in the core of the observed reality.[1]

I. The Relation Between Corporate Leverage and Dividend Policy

Following the theoretical framework developed by Kim, Lewellen, and McConnell [23] and Kim [22], two types of investors are introduced in Miller's [26] world. The first group of investors achieves the desired leverage by borrowing through levered firms. The second group achieves the desired leverage by borrowing on their personal accounts.

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[1]See Haugen and Senbet [19] for an excellent review of recent studies which modify or generalize the Miller equilibrium to resolve many tax-related anomalies related to dividend policy and capital structure decisions.

Consider a levered firm that maintains a dividend payout ratio of $(1 - r) \times 100\%$, where r denotes an earnings retention ratio. Corporate earnings are assumed to translate into capital gains (e.g., through the open market purchase by a firm of its own common stocks). The after-tax cash flow to the shareholders $(\widetilde{Y}_L)$ is

$$\widetilde{Y}_L = r(\widetilde{X} - iD)(1 - T_c)(1 - T_g) + (1 - r)(\widetilde{X} - iD)(1 - T_c)(1 - T_d), \quad (1)$$

where

$\widetilde{X}$ = the firm's operating income;
i = the market interest rate on debt;
D = the amount of corporate debt;
T_c = the corporate income tax rate;
T_d = the personal income tax rate on dividend income;
T_g = the present value of personal income tax rate on future capital gains; and
r = the earnings retention ratio.

Note that T_g does not represent a nominal capital gains tax rate. Rather, it explicitly recognizes the fact that capital gains are not taxed until realized. For the first group of investors who are investing in the levered firm, the effective after-tax interest cost of corporate debt is obtained by differentiating Equation (1) with respect to corporate debt (D):

$$\frac{d\widetilde{Y}_L}{dD} = -i(1 - T_c)[r(1 - T_g) + (1 - r)(1 - T_d)]. \quad (2)$$

Suppose an otherwise identical firm exists which is unlevered. The second group of investors buys its shares while borrowing on personal accounts. The after-tax cash flow to this group of investors $(\widetilde{Y}_U)$ is

$$\widetilde{Y}_U = r\widetilde{X}(1 - T_c)(1 - T_g) + (1 - r)\widetilde{X}(1 - T_c)(1 - T_d) - iD(1 - T_b), \quad (3)$$

where T_b is the personal income tax rate on bond income and iDT_b is the personal interest tax shields. The effective cost of personal debt for the second group of investors is

$$\frac{d\widetilde{Y}_U}{dD} = -i(1 - T_b). \quad (4)$$

A comparison of Equation (2) with (4) yields

$$\left[\frac{d\tilde{Y}_L}{dD}\right] \begin{array}{c} > \\ = \\ < \end{array} \left[\frac{d\tilde{Y}_U}{dD}\right]$$

as

$$1 - \frac{(1 - T_c)\{1 - [(1 - r)T_d + rT_g]\}}{(1 - T_b)} \begin{array}{c} > \\ = \\ < \end{array} 0, \qquad (5)$$

where Equation (5) represents the gain from corporate leverage generalized by the introduction of differential personal taxes. The introduction of differential personal taxes yields the following relation between the financially levered firm's value and unlevered firm's value:

$$V_L = V_U + \left[1 - \frac{(1 - T_c)\{1 - [(1 - r)T_d + rT_g]\}}{(1 - T_b)}\right]D. \quad (6)$$

To explain Equation (6), define a personal tax rate on income from common stock, T_{ps}, as a weighted average of the present value of capital gains tax rate and the dividend tax rate. Since the appropriate weights are the payout ratio and retention ratio, it follows:

$$T_{ps} = (1 - r)T_d + rT_g. \qquad (7)$$

A substitution of Equation (7) into (6) yields Miller's valuation formula.

$$V_L = V_U + \left[1 - \frac{(1 - T_c)(1 - T_{ps})}{(1 - T_b)}\right]D. \qquad (8)$$

To attain equilibrium, the tax-induced financial leverage clientele effect is invoked (Kim et al. [23] and Harris, Roenfeldt, and Cooley [18]). Specifically, the leverage clientele hypothesis states that investors in low tax brackets earn government tax subsidies on corporate debt financing by holding levered firms' common stocks. Investors in high tax brackets, on the other hand, would rather lever themselves on personal accounts because the marginal personal interest tax shields, iT_b, is greater than the marginal corporate interest tax shields, $iT_c[r(1 - T_g) + (1 - r)(1 - T_d)]$, given $T_b > T_c[r(1 - T_g) + (1 - r)(1 - T_d)]$. Note that the demarcation point between low and high tax brackets is defined by Equations (2) and (4).

If it is assumed that all the earnings are paid out as dividends ($r = 0$), then the gain from corporate leverage as defined by Equation (6) is reduced to

$$\left[1 - \frac{(1 - T_c)(1 - T_d)}{(1 - T_b)}\right]D. \qquad (9)$$

In contrast, for those firms retaining all the earnings ($r = 1$), the leverage gain is defined as

$$\left[1 - \frac{(1 - T_c)(1 - T_g)}{(1 - T_b)}\right]D. \qquad (10)$$

Peterson et al. [34] document, on the basis of the 1979 tax returns compiled by the Internal Revenue Service, that the average marginal tax rate on dividend income was approximately 40%. This rate is clearly higher than the statutory rate on capital gains income. Additionally, T_g introduced in this study represents the present value of capital gains tax rate. Thus, even after the Tax Reform Act of 1986, which made the nominal capital gains tax rate equal to the dividend tax rate, T_g still remains lower than T_d. It is, therefore, concluded that $T_d > T_g$, from which it follows:

$$\left[1 - \frac{(1 - T_c)(1 - T_d)}{(1 - T_b)}\right]D > \left[1 - \frac{(1 - T_c)(1 - T_g)}{(1 - T_b)}\right]D. \quad (11)$$

This implies that the gains from leverage are greater when all earnings are paid out as dividends than when all earnings are retained. Thus, firms with high payout ratios will borrow more than firms with low dividend payout ratios. This constitutes a testable hypothesis: firms with high payout ratios tend to be debt financed, while firms with low payout ratios tend to be equity financed. Therefore, it can be predicted that dividend payout ratio and leverage ratio are positively correlated.

II. Empirical Methodology and Test Results

A. Data and Methodology

The sample consists of 508 firms with complete records of the variables included in this study for the 19-year period from 1969–1987. Each firm's fiscal year ended in December.[2] The data source is the Standard and Poor's Compustat Annual Industrial Data File. Using 19-year averages of financial leverage and dividend policy measures for each of 508 sample firms, the simple cross-sectional correlations between dividend

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[2]A fiscal year ending in December is required to maintain the consistency in the computation of the variables selected for the study.

payout ratio and debt ratio and between dividend yield and debt ratio are found to range from 0.46 and 0.66.

Although these simple correlations are consistent with the theoretical prediction, there are many variables which may affect a firm's leverage and dividend policies, positively or negatively. Thus, it is necessary to isolate the impact of these variables before one can be assured that the correlations between financial leverage and dividend policy measures are meaningful. Once the impacts of the variables affecting financial leverage and dividend policies are isolated, the correlations may increase or decrease depending on the role of each variable in determining the two policies.

To be consistent with the extant theoretical and empirical literature on the determinants of corporate leverage and dividend policy (e.g., [7, 9, 12, 18, 23, 38], among others), the following five attributes are selected to control their effects: *(i)* growth potential, *(ii)* earnings variability, *(iii)* nondebt tax shields, *(iv)* firm size, and *(v)* profitability.

(i) Growth Potential The more rapid the rate at which a firm is growing, the greater is the need for funds to finance expansion. The greater the future need for funds, the more likely is the firm to retain earnings rather than pay them out as dividends. At the same time, the firm is expected to rely on debt financing to maintain its debt ratio as the equity base increases due to the large retention of its earnings. Therefore, the growth potential of the firm becomes a critical factor which determines both dividend policy and financing policy. As an indicator of the growth attribute, the annualized compound growth rate in total assets is used.

(ii) Earnings Variability Earnings variability is closely related to both leverage ratios and dividend ratios. With greater stability in earnings, the firm can incur a greater fixed charge of debt obligation without exposing itself to an unacceptable level of default risk. For example, the stability of earnings of electric utilities has enabled them to borrow more than other industries. As to the dividend policy, a firm with stable earnings can predict its future earnings with a greater accuracy. Thus, such a firm can commit to paying a larger portion of its earnings as dividends with less risk of cutting its dividends in the future. Announcements of dividend cuts have adverse impact on the firm value. For example, Eades, Hess, and Kim [13] document a drop of 7–8% in the firm's value on such announcements. Earnings variability is computed as the standard deviation

of annual operating income, scaled by the book value of total assets.

(iii) Nondebt Tax Shields DeAngelo and Masulis [12] propose a substitution effect between nondebt and debt tax shields. Specifically, they argue that a large amount of investment-related nondebt tax shields (e.g., depreciation deductions and investment tax credits) reduces the value of corporate interest tax shields and hence discourages firms from borrowing. The proposed negative relationship between leverage and nondebt tax shields, however, has not been supported by recent empirical studies. (See Boquist and Moore [7], Bradley, Jarrell and Kim [9], and Titman and Wessels [38], among others.) Nondebt tax shields are computed as the annual average of the sum of depreciation, investment tax credit, and tax loss carryforward divided by total annual net sales.

(iv) Firm Size A large, well-established firm has easy access to capital markets, while a small, new firm does not. Because the easy accessibility to capital markets means greater flexibility and the ability to raise funds on short notice, a large firm can afford to have a higher dividend payout ratio than a small firm. The relation between the size of a firm and its debt ratio is not clearly established, although Ben-Zion and Shalit [5] observe that size is an important determinant of the relative riskiness of a firm. A recent study by Titman and Wessels [38] reports a positive relation between size and debt-to-book value of equity but no significant relationship between size and debt-to-market value of equity. Firm size is proxied by the annual average of the natural log of equity measured in book value. The selection of equity over total assets is motivated by Titman and Wessels.

(v) Profitability The past profitability of a firm should be an important determinant of its capital structure. With a large amount of retained earnings available, a firm may prefer retained earnings financing to borrowing. This conjecture is consistent with Myers' [33] pecking order hypothesis, which suggests that firms' preferred means of raising capital is in the following order: first, from retained earnings; second, from debt financing; and third, from new equity. Profitability also has an important bearing on the firm's dividend policy. A profitable firm tends to pay a larger portion of its earnings as dividends. To measure the profitability attribute, the average of the return on assets (ROA) is computed.

To isolate the intertwining effects of the above five attributes on dividend policy and capital structure deci-

sions, the following cross-sectional regression models are estimated:

$$Leverage\ Ratio_i = a_1X_{1i} + a_2X_{2i} + a_3X_{3i} + a_4X_{4i}$$
$$+ a_5X_{5i} + e_i, \qquad (12)$$

and

$$Dividend\ Ratio_i = b_1X_{1i} + b_2X_{2i} + b_3X_{3i} + b_4X_{4i}$$
$$+ b_5X_{5i} + u_i, \qquad (13)$$

where

X_{1i} = the growth attribute of firm i;
X_{2i} = the variability attribute of firm i;
X_{3i} = the nondebt tax shields of firm i;
X_{4i} = the size of firm i;
X_{5i} = the profitability attribute of firm i; and
e_i and u_i are random error terms.

Note that the intercept term is suppressed to zero in order to capture the leverage ratio and/or dividend ratio net of the effects of the five attributes in the residuals, to be estimated as the regression lines are fitted. Financial leverage is measured by annual averages of the two ratios: the ratio of long-term debt to the sum of long-term debt and book value of equity, and the ratio of long-term debt to the sum of long-term debt and market value of equity.[3] Dividend policy is also measured by annual averages of the two ratios: the dividend payout ratio and the dividend yield computed by dividend per share divided by year-end closing price per share.

The 19-year study period is divided into three subperiods, depending upon the changes in tax laws affecting corporate and personal taxes: (i) First Subperiod, 1969–1975; (ii) Second Subperiod, 1976–1980; and (iii) Third Subperiod, 1981–1987. From 1969–1975, the most important piece of tax legislation was the Tax Reform Act of 1969. This Act restricted the liberal deduction of interest on investment indebtedness, but provided for equal treatment of dividends and capital gains. (See Peterson et al. [34, pp. 267–270].) Compared with numerous drastic changes in the tax law between 1976 and 1987, the impact of the Tax Reform Act of 1969 was rather mild.

The Tax Reform Act of 1976 made it possible to shelter dividend income from taxes, as discussed by Miller and Scholes [29]. Another important piece of tax legislation passed in the second subperiod was the Revenue Act of 1978. Its main purpose was to stimulate the economy and to avoid a potential recession. The key corporate tax provisions were: (i) the reduction of the corporate tax rate from 48% to 46% and (ii) reestablishment of the investment tax credit which was repealed in 1969.

The third subperiod witnessed a wide range of changes in corporate and personal tax laws. The Economic Recovery Act (ERTA) of 1981 was designed to spur the U.S. economy out of the recession of the late 1970s and 1980. A few of ERTA's key provisions were: (i) the accelerated cost recovery system (ACRS), (ii) safe harbor leasing, and (iii) research and development tax credits. The Reagan administration, however, realized that ERTA caused a massive reduction in federal revenue. As a result, the Tax Equity and Fiscal Responsibility Act of 1982 was introduced to scale down the generous tax provisions of ERTA, including the repeal of the safe harbor leasing provisions, increasing the ACRS useful lives of assets, etc. In 1984, Congress passed the third major tax bill of the 1980s, the Deficit Reduction Act of 1984 (DEFRA). The goal of DEFRA was to further reduce the federal deficit by repealing or postponing many of the tax reduction measures previously enacted in ERTA.

The final bill of the Reagan presidency was the Tax Reform Act of 1986 (TRA) which introduced sweeping changes in the structure of the tax system. Corporate tax rates were reduced from 46% to 34%. However, significant deductions and credits had been eliminated. For example, the investment tax credit was repealed, and the ACRS provisions, first adopted in 1981 and scaled back in 1982 and 1984, were further reduced. The TRA of 1986 also reduced the top individual statutory tax rate from 50% to 28%, while the $100 dividend exclusion was eliminated. Less favorable tax treatment was introduced on capital gains, making dividend income more attractive relative to capital gains.[4]

Strictly from the tax standpoint, the first subperiod may be characterized as a "stable" tax period without drastic changes, while the third subperiod may be de-

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[3]Other debt ratios such as total liabilities or interest-bearing debt over the total assets or market value of the firm are also examined. The resulting regressions and correlation tests are similar to those reported in the study.

[4]See Ben-Horim, Hochman, and Palmon [4] for an excellent analysis of the impact of the TRA of 1986 on corporate financial policy. See also Higgins [21] for an overview of the changes in the U.S. tax laws over the last two decades.

Exhibit 1. Descriptive Statistics of Variables Selected

	Whole Period (1969–1987)		First Subperiod (1969–1975)		Second Subperiod (1976–1980)		Third Subperiod (1981–1987)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Leverage $(B)^a$	0.331	0.186	0.334	0.210	0.327	0.196	0.332	0.178
Leverage $(M)^b$	0.325	0.200	0.328	0.220	0.342	0.221	0.310	0.194
Dividend Payout Ratio	0.450	0.166	0.450	0.190	0.416	0.193	0.479	0.184
Dividend Yield	0.050	0.024	0.047	0.024	0.055	0.027	0.050	0.030
Growth Rate	0.109	0.051	0.113	0.070	0.131	0.075	0.090	0.089
Variability	0.041	0.029	0.030	0.024	0.027	0.023	0.032	0.021
Nondebt Tax Shields	0.058	0.042	0.057	0.042	0.051	0.040	0.065	0.062
Size	6.182	1.658	5.580	1.688	6.229	1.665	6.764	1.659
Profitability	0.063	0.032	0.062	0.037	0.070	0.044	0.058	0.031

^{a}Leverage (B) = *long-term debt/(long-term debt + book value of equity)*.
^{b}Leverage (M) = *long-term debt/(long-term debt + market value of equity)*.

scribed as a "turbulent" tax period. The second subperiod may be placed between the two extremes. Hence, the regression results from the first subperiod can be compared with those from the second and third subperiods to evaluate corporate responses to the changes in the tax law.

In order to minimize potential biases caused by the year-to-year fluctuations in all variables, the sample average of annual observations of each variable is estimated in each of the three subperiods. In the absence of proper names, the residuals to be measured from Equations (12) and (13) are referred to as adjusted leverage ratio and adjusted dividend ratio. To examine the relation between financial leverage and dividend policy, the cross-sectional correlation coefficients between adjusted leverage ratio and adjusted dividend ratio are estimated for the entire study period and for the three subperiods.

Exhibit 1 presents descriptive statistics of leverage ratios, dividend ratios, and the five independent variables selected. The first column summarizes means and standard deviations for the whole period from 1969–1987. The remaining three columns report summary statistics for the three subperiods. Descriptive statistics of some variables over the three subperiods provide interesting insights into the corporate response to the changes in tax legislation. Although tax benefits under the accelerated cost recovery system and investment tax credits had been gradually restricted, sample firms enjoyed on average 6.5 cents of nondebt tax shields per one dollar of net sales in the third subperiod, as op-

posed to 5.7 cents in the first subperiod. In contrast, financial leverage as measured in book value did not show any significant shift over time. Financial leverage, measured in market value, declined slightly from 32.8% in the first subperiod to 31.0% in the third subperiod. Both dividend payout ratio and dividend yield showed an increase of 6.4% from the first subperiod to the third subperiod. The growth rate in total assets, as well as the profitability, declined over time, while the size variable increased substantially. Earnings variability increased slightly, from 0.030 in the first subperiod to 0.032 in the third subperiod.

B. Regression Results

The estimates of regression coefficients in Equations (12) and (13) are presented in Exhibit 2. For the most part, the estimated coefficients show the predicted results. For example, the profitability attribute consistently showed a negative effect on both measures of financial leverage, indicating that the higher the profitability, the smaller the debt financing.

The positive coefficient estimates for nondebt tax shields indicate that the larger the nondebt tax shields, the larger the debt ratios. This result contradicts the DeAngelo and Masulis [12] tax shield hypothesis; however, it is consistent with the observations reported by Boquist and Moore [7], Bowen, Daley, and Huber [8], and Bradley et al. [9].

A positive effect of the growth attribute on financial leverage had been anticipated. Firms with high growth tend to retain their earnings for reinvestment. The

Exhibit 2. Regression Results

Period	Variability	Size	Growth	Nondebt Tax Shields	Profitability	R^2
			Independent Variables			
			Panel A. Leverage (B), Dependent Variable			
First Subperiod	0.651	0.049	0.580	1.961	-2.456	
	(2.14)[**][a]	(18.12)[*]	(5.70)[*]	(11.34)[*]	(11.41)[*]	0.86
Second Subperiod	0.839	0.048	0.483	1.802	-2.366	
	(2.63)[*]	(20.77)[*]	(5.41)[*]	(10.44)[*]	(14.14)[*]	0.85
Third Subperiod	0.053	0.059	0.378	0.445	-2.487	
	(0.17)	(27.48)[*]	(4.95)[*]	(3.90)[*]	(11.87)[*]	0.85
Whole Period	0.193	0.052	0.962	1.278	-3.026	
	(0.75)	(21.58)[*]	(7.72)[*]	(8.04)[*]	(12.90)[*]	0.87
			Panel B. Leverage (M), Dependent Variable			
First Subperiod	1.641	0.056	0.245	1.705	-2.945	
	(4.87)[*]	(18.78)[*]	(2.17)[**]	(8.89)[*]	(12.34)[*]	0.86
Second Subperiod	1.676	0.058	0.217	1.679	-2.813	
	(4.53)[*]	(21.54)[*]	(2.10)[**]	(8.39)[*]	(14.50)[*]	0.83
Third Subperiod	0.281	0.060	0.284	0.445	-3.045	
	(0.87)	(26.97)[*]	(3.56)[*]	(3.73)[*]	(13.89)[*]	0.82
Whole Period	0.796	0.058	0.747	1.099	-3.609	
	(2.80)[*]	(21.77)[*]	(5.45)[*]	(6.28)[*]	(13.97)[*]	0.85
			Panel C. Dividend Payout Ratio, Dependent Variable			
First Subperiod	-0.365	0.058	-0.607	1.778	1.430	
	(1.01)	(18.20)[*]	(5.04)[*]	(8.68)[*]	(5.61)[*]	0.87
Second Subperiod	-0.515	0.062	-0.167	1.026	-0.066	
	(1.25)	(20.73)[*]	(1.45)	(4.59)[*]	(0.31)	0.83
Third Subperiod	-0.373	0.068	-0.222	0.188	0.324	
	(0.94)	(24.75)[*]	(2.25)[**]	(1.28)	(1.20)	0.86
Whole Period	-0.574	0.058	-0.196	1.023	1.007	
	(1.81)	(19.63)[*]	(1.28)	(5.24)[*]	(3.50)[*]	0.88
			Panel D. Dividend Yield, Dependent Variable			
First Subperiod	0.162	0.006	-0.073	0.188	0.014	
	(3.32)[*]	(14.88)[*]	(4.49)[*]	(6.77)[*]	(0.41)	0.79
Second Subperiod	0.044	0.009	-0.028	0.132	-0.101	
	(0.77)	(21.19)[*]	(1.77)	(4.25)[*]	(3.35)[*]	0.81
Third Subperiod	-0.176	0.009	-0.022	-0.004	-0.098	
	(3.00)[*]	(22.60)[*]	(1.51)	(0.20)	(2.47)[*]	0.77
Whole Period	-0.018	0.008	-0.018	0.119	-0.056	
	(0.38)	(17.89)	(0.81)	(4.18)[*]	(1.34)	0.81

[*]Significant at the 0.01 level.
[**]Significant at the 0.05 level.
[a]Figures in parentheses are t-statistics.

increase in their equity bases justifies debt financing as the firms try to maintain their target debt ratios.

The firm-size attribute shows a positive effect on both measures of financial leverage. A similar observa-

tion was reported by Titman and Wessels [38]. Earnings variability also shows a positive effect on financial leverage, which is surprising[5] since a negative relationship is the norm between the two.[6]

The growth attribute negatively affects two measures of dividend policy. The estimated coefficients are not always significant, but the signs are consistently negative. This observation supports the hypothesis that high-growth firms prefer a low payout ratio or a low dividend yield.

Mixed results are observed for earnings variability and profitability. The signs of the estimated coefficients of the two attributes are not consistent from one subperiod to another. However, the size attribute shows a consistent positive effect on both dividend policy measures. The larger a firm is, the higher the dividend payout ratio (or yield). Nondebt tax shields show a positive effect on the two measures of dividend policy. Although one exception is noted for the third subperiod regression with dividend yield introduced as the dependent variable, the estimated coefficient is not significant.

Given the regression results for the three subperiods, the Chow [11] and Fisher [17] test has been conducted to test equality of regressions. The purpose is to examine whether the first subperiod regression results, obtained during a "stable" tax period, adequately predict capital structure decisions and dividend policies in the second and third subperiods. Panel A of Exhibit 3 reports the results of the equality test on the first and second subperiod regressions. Panel B reports the results of the equality test on the first and third subperiod regressions. Note from Panel A that the null hypothesis that two subperiod regressions are equal cannot be rejected when the two measures of financial leverage are used as dependent variables. The reduc-

Exhibit 3. Tests of Equality of Subperiod Regressions

Dependent Variable	Calculated F-Value
Panel A. Test of Equality on First and Second Subperiod Regressions[*]	
Leverage (B)	0.75
Leverage (M)	0.37
Dividend Payout Ratio	12.15[*]
Dividend Yield	7.07[*]
Panel B. Test of Equality on First and Third Subperiod Regressions[*]	
Leverage (B)	23.01[*]
Leverage (M)	24.23[*]
Dividend Payout Ratio	13.35[*]
Dividend Yield	15.67[*]

[*]The critical F-values are 3.02 and 2.21 at significance levels of 0.01 and 0.05, respectively. The degrees of freedom for the critical F-value are 5 and 1006. The null hypothesis that two regressions are equal is rejected at the 0.01 level, as the calculated F-values exceed 3.02.

tion in corporate tax rates from 48% to 46% and the reintroduction of investment tax credit under the Revenue Act of 1978 did not significantly affect corporate capital structure decisions.

When the two measures of dividend policy are introduced as the dependent variables, however, the large estimated F-values suggest that regressions for the first and second subperiods are not the same. Recall that the Tax Reform Act of 1976 made Section 163 (d) of the Internal Revenue Code relevant to the types of tax sheltering of dividend income outlined by Miller and Scholes [29]. Although Feenberg [16] warns that only a small portion of taxpayers could engage in such a dividend laundering, it is interesting to note that the two subperiod regressions are not the same.

Panel B indicates that regressions from the first and third subperiods are not the same, no matter which dependent variables are used for capital structure decisions and dividend policy. This is not surprising in light of the numerous and substantial changes of the tax laws in the 1980s. Many consequences of the Tax Reform Act of 1986 remain to be seen and should present interesting challenges for future studies.

Exhibit 4 summarizes the results of the correlation analysis for the entire sample of 508 firms. Panel A reports the estimated simple correlation coefficients between leverage and dividend ratios without adjusting for the impacts of other variables. Panel B presents the coefficients between adjusted leverage and dividend

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[5]In the presence of the unusual results obtained for the coefficient estimates of earnings variability, another proxy variable has been tried. The substitute variable is the standard deviation of earnings per share divided by the year-end price per share. The regression results are similar to those summarized in Exhibit 2 and, more importantly, the sign of the estimated coefficients remains unchanged.

[6]Bradley et al. [9] reported a negative relation between leverage and variability. Two important differences are noted between variability defined in their paper and this paper's definition: first, Bradley et al. used the standard deviation of the first difference in annual earnings before interest, depreciation, and taxes divided by the average value of total assets, while our definition does not introduce the first difference; second, Bradley et al. uses the market value of equity to measure total assets, while in contrast, we use the book value of total assets.

Exhibit 4. Correlation Between Financial Leverage and Dividend Policy Measures

	Period	The Entire Sample (508 Firms)		Sample Without Utilities (386 Firms)	
		Dividend Payout Ratio	Dividend Yield	Dividend Payout Ratio	Dividend Yield
		Panel A. Before Adjustment			
Leverage (*B*)	First Subperiod	0.398*	0.498*	-0.069	0.125**
	Second Subperiod	0.486*	0.581*	-0.115**	0.109**
	Third Subperiod	0.392*	0.581*	0.003	0.152*
	Whole Period	0.491*	0.638*	-0.085	0.177*
Leverage (*M*)	First Subperiod	0.373*	0.578*	-0.022	0.310*
	Second Subperiod	0.474*	0.628*	-0.067	0.260*
	Third Subperiod	0.387*	0.623*	0.006	0.201*
	Whole Period	0.455*	0.662*	-0.090	0.285*
		Panel B. After Adjustment			
Leverage (*B*)	First Subperiod	0.423*	0.551*	0.094	0.310*
	Second Subperiod	0.486*	0.553*	0.113**	0.255*
	Third Subperiod	0.447*	0.572*	0.133*	0.205*
	Whole Period	0.604*	0.668*	0.270*	0.407*
Leverage (*M*)	First Subperiod	0.428*	0.632*	0.166*	0.465*
	Second Subperiod	0.479*	0.606*	0.151*	0.380*
	Third Subperiod	0.444*	0.636*	0.137*	0.259*
	Whole Period	0.586*	0.701*	0.296*	0.510*

*Significant at the 0.01 level.
**Significant at the 0.05 level.

policy measures after the effects of the five attributes have been isolated. The estimated coefficients are all positive and significant at the 0.01 level. Interestingly, the correlations between adjusted leverage and dividend ratios are, in most cases, higher than those reported without adjustment. The results are consistent no matter which subperiod is studied. Thus, the test results strongly support the theoretical prediction of a positive relationship between leverage and dividend policy measures.

The study sample includes 122 utility firms. Since utilities tend to have both high financial leverage and high dividend payout ratio, it is reasonable to suspect that the positive correlations observed for the whole sample may be attributed to utility firms. To test this finding, the correlation coefficients between dividend and leverage measures are re-estimated using only 386 industrial firms after excluding 122 utilities from the sample. The last two columns of Exhibit 4 present the results.

Without adjustment (Panel A), none of the estimated correlations between financial leverage and pay-out ratio is significantly different from zero at the 0.01 level, while all of the estimated correlations between leverage and dividend yield are significantly positive. The estimated correlations increase substantially after adjustment using regression analyses. The last two columns of Panel B show that the correlations are positive and significant after the effects of the five attributes have been isolated. All but two of the estimated coefficients are significant at the 0.01 level.[7]

III. Conclusion

Wide cross-sectional variations have been observed in corporate financial leverage and dividend policy. Miller's equilibrium model has been extended to obtain a theoretical prediction of a positive relation between financial leverage and dividend policy measures. This analysis integrates two separate notions of clientele effects; the tax-induced dividend clientele effect

[7]Two exceptions are the coefficients estimated between financial leverage measured in book value and dividend payout ratio in the first and second subperiods.

and financial leverage clientele effect. Under the dividend clientele effect, a negative relation exists between shareholder tax rates and dividend yields or dividend payout ratios. Empirical support has been documented by Elton and Gruber [14], Elton, Gruber, and Rentzler [15], and Litzenberger and Ramaswamy [24, 25]. Under the financial leverage clientele effect, as demonstrated by Kim et al. [23], Kim [22], and Harris et al. [18], an inverse relationship also exists between shareholder tax rates and financial leverage. The combination of two tax-induced clientele effects establishes a positive relation between financial leverage and dividend ratios. This positive relation has been noted by Ang and Peterson [2]. They provide empirical evidence which may be interpreted as mild support of the two clientele effects.

This intuitively appealing logical development, however, is not without problems. For example, Haugen, Senbet, and Talmor [20] suggest that investors can easily separate the dividend income and capital gains components of a stock's return. The dividend stripping transactions can make the dividend clientele unnecessary. Sarig and Scott [36] question the validity of financial leverage clientele in standard portfolio theory in which only the after-tax cash flows matter for shareholders. They further suggest that the empirically observed leverage clienteles are simply indirect evidence supporting the existence of dividend clienteles.

Both arguments, however, can be valid only when perfect arbitrage is possible. Transaction costs, the lack of options written on all stocks (in the case of dividend stripping outlined by Haugen et al. [20]), and the lack of substitute securities with a perfect correlation but with differing debt ratios (in the case of Sarig and Scott's [36] arbitrage argument) will prevent perfect arbitrage. Without perfect arbitrage, there will be clientele effects. A recent paper by Allen and Jaffe [1] provides theoretical support of the financial leverage clientele effect. They demonstrate that the sequencing of trading and voting among shareholders is not as crucial as perceived by Sarig and Scott.

The empirical results compiled here strongly support the hypothesized relationship between leverage and dividend ratios. The simple unadjusted correlations between the two variables for the entire sample period range from 0.46 to 0.66. After adjustment using regression analyses, the correlations become even more positive, to the range of 0.59 to 0.70, and more significant.

References

1. F. Allen and J.F. Jaffe, "Tax Clientele and Miller Model with Incomplete Markets," Rodney L. White Center Working Paper, University of Pennsylvania, May 1988.
2. J.S. Ang and D.R. Peterson, "Optimal Debt Versus Debt Capacity: A Disequilibrium Model of Corporate Debt Behavior," in *Research in Finance, Volume VI,* 1986, pp. 51–72.
3. A. Barnea, R.H. Haugen, and L.W. Senbet, "An Equilibrium Analysis of Debt Financing Under Costly Tax Arbitrage and Agency Problems," *Journal of Finance* (June 1981), pp. 569–581.
4. M. Ben-Horim, S. Hochman, and O. Palmon, "The Impact of the 1986 Tax Reform Act on Corporate Financial Policy," *Financial Management* (Autumn 1987), pp. 29–35.
5. U. Ben-Zion and S.S. Shalit, "Size, Leverage, and Dividend Record as Determinants of Equity Risk," *Journal of Finance* (September 1975), pp. 1015–1026.
6. F. Black and M. Scholes, "The Effects of Dividend Yield and Dividend Policy on Common Stock Prices and Returns," *Journal of Financial Economics* (May 1974), pp. 1–22.
7. J.A. Boquist and W.T. Moore, "Inter-Industry Leverage Differences and the DeAngelo-Masulis Tax Shield Hypothesis," *Financial Management* (Spring 1984), pp. 5–9.
8. R.M. Bowen, L.A. Daley, and C.C. Huber, Jr., "Evidence on the Existence and Determinants of Inter-Industry Leverage Differences," *Financial Management* (Winter 1982), pp. 10–20.
9. M. Bradley, G.A. Jarrell, and E.H. Kim, "On the Existence of an Optimal Capital Structure: Theory and Evidence," *Journal of Finance* (July 1984), pp. 857–878.
10. S. Buser and P. Hess, "Empirical Determinants of the Relative Yields on Taxable and Tax-Exempt Securities," *Journal of Financial Economics* (December 1986), pp. 335–356.
11. G.C. Chow, "Tests of Equality Between Sets of Coefficients in Two Linear Regressions," *Econometrica* (July 1960), pp. 591–605.
12. H. DeAngelo and R. Masulis, "Optimal Capital Structure Under Corporate and Personal Taxation," *Journal of Financial Economics* (March 1980), pp. 3–29.
13. K.M. Eades, P.J. Hess and E.H. Kim, "Market Rationality and Dividend Announcements," *Journal of Financial Economics* (December 1985), pp. 581–604.
14. E. Elton and M. Gruber, "Marginal Stockholder Tax Rates and the Clientele Effect," *Review of Economics and Statistics* (August 1974), pp. 259–269.
15. E. Elton, M. Gruber, and J. Rentzler, "The Ex-Dividend Day Behavior of Stock Prices: A Re-Examination of the Clientele Effect: A Comment," *Journal of Finance* (June 1984), pp. 551–556.
16. D. Feenberg, "Does the Investment Interest Limitation Explain the Existence of Dividend?," *Journal of Financial Economics* (September 1981), pp. 265–269.
17. F.M. Fisher, "Tests of Equality Between Sets of Coefficients in Two Linear Regressions: An Expository Note," *Econometrica* (March 1970), pp. 361–366.
18. J.M. Harris, Jr., R.L. Roenfeldt, and P.L. Cooley, "Evidence of Financial Leverage Clienteles," *Journal of Finance* (September 1983), pp. 1125–1132.
19. R. A. Haugen and L.W. Senbet, "Corporate Finance and Taxes: A Review," *Financial Management* (Autumn 1986), pp. 5–21.
20. R.A. Haugen, L.W. Senbet, and E. Talmor, "Debt, Dividends, and Taxes: Equilibrium Conditions for Simultaneous Tax Neu-

trality of Debt and Dividend Policies," in *Research in Finance, Volume VI,* 1986, pp. 1–27.

21. M.M. Higgins, "An Empirical Analysis of the Relationship between Corporate Effective Tax Rates and Book Effective Tax Rates with An Analysis of the Financial Characteristics That Influence Corporate Effective Tax Rates," Ph.D. Dissertation at The University of Tennessee, August 1989.

22. E.H. Kim, "Miller's Equilibrium, Shareholder Leverage Clienteles, and Optimal Capital Structure," *Journal of Finance* (May 1982), pp. 301–319.

23. E.H. Kim, W.G. Lewellen, and J.J. McConnell, "Financial Leverage Clienteles: Theory and Evidence," *Journal of Financial Economics* (March 1979), pp. 83–109.

24. R.H. Litzenberger and K. Ramaswamy, "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence," *Journal of Financial Economics* (June 1979), pp. 163–195.

25. ————, "The Effects of Dividends on Common Stock Prices: Tax Effects or Information Effects," *Journal of Finance* (May 1982), pp. 429–444.

26. M.H. Miller, "Debt and Taxes," *Journal of Finance* (May 1977), pp. 261–274.

27. ————, "Behavioral Rationality in Finance: The Case of Dividends," *Journal of Business* (October 1986), pp. s451–s468.

28. M.H. Miller and F. Modigliani, "Dividend Policy, Growth and the Valuation of Shares," *Journal of Business* (October 1961), pp. 411–433.

29. M.H. Miller and M. Scholes, "Dividends and Taxes," *Journal of Financial Economics* (December 1978), pp. 333–364.

30. F. Modigliani, "Debt, Dividend Policy, Taxes, Inflation, and Market Valuation," *Journal of Finance* (May 1982), pp. 255–273.

31. F. Modigliani and M.H. Miller, "The Cost of Capital, Corporation Finance and Theory of Investment," *American Economic Review* (June 1958), pp. 261–297.

32. ————, "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review* (June 1963), pp. 433–443.

33. S. Myers, "The Capital Structure Puzzle," *Journal of Finance* (July 1984), pp. 575–592.

34. P.P. Peterson, D.R. Peterson, and J.S. Ang, "Direct Evidence on the Marginal Rate of Taxation on Dividend Income," *Journal of Financial Economics* (June 1985), pp. 267–282.

35. J.M. Poterba and L.H. Summers, "New Evidence that Taxes Affect the Valuation of Dividends," *Journal of Finance* (December 1984), pp. 1397–1415.

36. O. Sarig and J. Scott, "The Puzzle of Financial Leverage Clienteles," *Journal of Finance* (December 1985), pp. 1459–1467.

37. R.A. Taggart, "Taxes and Corporate Capital Structure in an Incomplete Market," *Journal of Finance* (June 1980), pp. 645–659.

38. S. Titman and R. Wessels, "The Determinants of Capital Structure Choice," *Journal of Finance* (March 1988), pp. 1–19.

39. C. Trzcinka, "The Pricing of Tax-Exempt Bond and the Miller Hypothesis," *Journal of Finance* (September 1982), pp. 907–923.

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