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FINANCIAL LEVERAGE CLIENTELES

Theory and Evidence*

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This paper examines the hypothesis that investors will sort themselves out into tax-induced 'financial leverage clienteles' in which the common stocks of highly levered firms will be held by individuals with low personal tax rates, while the shares of firms with little or no leverage will be held by individuals with high personal tax rates. Although the idea of financial leverage clienteles has appeared in the literature before, the immediate motivation for this investigation is a recent paper by Merton Miller. In that paper he argues that under the current U.S. tax structure, personal taxes will offset corporate taxes such that in equilibrium the value of any individual firm will be independent of its use of debt financing. We extend his analysis to show specifically the way in which financial leverage clienteles would come about in his assumed tax environment. We then conduct some direct empirical tests of the leverage clientele hypothesis. These tests can also be viewed as indirect tests of Miller's new proposition on the irrelevance of capital structures. The results of the tests are mixed: The relationship between corporate leverage policies and investors' tax rates is statistically significant, but its magnitude is less than would be predicted by the theory.

1. Introduction

In their landmark paper on the theory of corporate capital structure, Modigliani and Miller (1958) established the proposition that in a perfect capital market the value of any individual firm will be independent of the degree of financial leverage it employs. In their subsequent tax correction paper, M&M (1963) concluded that in a world in which corporate taxes exist, but personal taxes and other market frictions do not, firms can maximize their values by maximizing their use of debt financing. Since the

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appearance of the latter paper, many writers have sought to reconcile the M&M maximum leverage prediction with observed capital structures, the aggregate of which represents debt-to-total-asset ratios only in the range of 20 to 30 percent [Friend (1973)]. Along these lines three largely distinct, but not necessarily mutually exclusive, explanations have been offered.

The first explanation attributes the shortfall of actual from predicted debt usage to the existence of bankruptcy costs [Baxter (1967), Kraus and Litzenberger (1973), and Kim (1978a)]. According to this theory, tax deductible interest payments provide a positive incentive for corporate leverage. However, the increased use of leverage increases the probability of bankruptcy with its attendant costs which, in turn, provides a negative incentive for leverage. Prevailing corporate capital structures reflect an optimal tradeoff between the tax advantages of debt financing and the countervailing effects of potential bankruptcy costs.

The second explanation encompasses the first one but generalizes the analysis to include additional positive and negative incentives for firms to issue risky debt. It views the firm as a contractual arrangement among several classes of security holders, one of which may be the firm's manager [Jensen and Meckling (1976), Ross (1977), Kim and McConnell (1977), Kim, McConnell, and Greenwood (1977), Myers (1978), Black, Miller, and Posner (1978)]. While the unifying theme of this view is that observed capital structures represent an equilibrium reconciliation of the divergent interests of the various claimants to the firm, different contributors to it have focused on different aspects of the problem. In their comprehensive analysis of these issues, Jensen and Meckling (1976) show that agency costs arise from differing incentives among claim holders of the firm and as the ratio of debt to outside equity increases, the agency costs associated with debt will increase, but those associated with outside equity will decline. If the total agency costs (which include bankruptcy costs), as a function of the debt-to-outside-equity ratio, have an interior minimum, the resulting ownership structure will consist of internal equity, outside equity, and debt.

The third explanation attributes the failure of firms to pursue maximum leverage policies to the existence of differential tax treatment of personal income from stocks and bonds and the manner in which it interacts with the (personal and corporate) tax deductibility of interest payments. According to this view, there are some investors for whom the favorable tax treatment of returns from stock (relative to that of returns from corporate bonds) at the personal level more than offsets the favorable tax treatment of interest payments at the corporate level in such a way that these investors would prefer to hold the shares of firms that follow less than maximum leverage policies. Arguments to this effect have been made by Farrar and Selwyn (1967), Black (1971, 1973), Stapleton (1972), and Stiglitz (1973). Recently, Miller (1977) has analyzed this argument in a macroeconomic equilibrium

context. Within that framework, he has posited that under the current U.S. tax structure, the differential personal taxes on the income from stocks and bonds will act as a counterweight to the corporate benefit of tax deductible interest payments such that the tax incentive for corporate leverage will disappear altogether for the individual firm, even though there will still exist a macroeconomic demand for and supply of corporate debt.

In this paper, we take a closer look at one important implication that follows directly from Miller's analysis: that investors will sort themselves out into tax-induced financial leverage clienteles in which the common stocks of firms that adopt highly levered capital structures will be held by individuals in low income tax brackets, while the stocks of firms that follow low leverage policies will be held by individuals in high income tax brackets. The notion that personal taxes will induce financial leverage clienteles was first suggested by Farrar and Selwyn (1967). However, their analysis was not based on an equilibrium valuation framework, and thus their conclusions about leverage clienteles were largely conjectural. Miller (1977), on the other hand, does provide an explicit valuation framework which specifies the equilibrium relationship between firm valuation and financial leverage, and, as a consequence, he provides the foundation for a closer look at the theory of financial leverage clienteles.[1]

In the sections that follow, we extend Miller's analysis to demonstrate more precisely the way in which financial leverage clienteles would evolve in his assumed tax environment. We then offer empirical evidence on their existence. Our tests of the clientele hypothesis represent an indirect test of Miller's proposition. The tests are indirect because we do not test his primary contention that the value of any firm is independent of its capital structure; rather we test some implications that follow from his theory.

2. Financial leverage clienteles

To facilitate our examination of the theory of financial leverage clienteles within Miller's framework, it is useful to recapitulate the key assumptions and the major results of his analysis. First, he assumes that the effective personal tax rate on income from stock, τ_{PS}, is zero.[2] Second, all debt securities, including corporate, personal, and municipal debt, are riskfree and

[1]Although Miller does not demonstrate the way in which leverage clienteles will come about, he does comment briefly on the possibility of their existence:

> Companies following a no-leverage or low-leverage strategy (like I.B.M. or Kodak) would find a market among investors in the high tax brackets; those opting for a high leverage strategy (like electric utilities) would find the natural clientele for their securities at the other end of the scale (p. 269).

[2]Initially Miller assumes that this rate is positive, but sets it equal to zero to carry out his equilibrium analysis.

sold at par.[3] Thus, the income from corporate bonds comes solely from coupon interest payments which are taxed at the ordinary personal income tax rate, τ_{PB}. This tax rate is progressive and extends on either side of the corporate tax rate, τ_C. Third, neither direct tax arbitrage (i.e., borrowing on personal account to buy tax-free municipal bonds) nor indirect tax arbitrage (through the short selling of common stock) is permitted.

In this setting, individuals may invest in riskfree municipal bonds to earn the tax-free yield r_0. For that reason, the rate of interest on taxable corporate bonds, r, must include compensation for the personal tax burden that these bonds impose on the investor (i.e., $r-r_0$ will be positive). Furthermore, the existence of a progressive personal tax structure means that this compensation must increase as larger quantities of bonds are issued. Only in that way will investors in progressively higher tax brackets be induced to add corporate bonds to their portfolios. Firms will continue to supply bonds only so long as the savings provided by tax-deductible interest payments, $r\tau_C$, exceed the (progressively higher) compensation, $r-r_0$, which they must pay. In equilibrium the two will be equal,

$$r\tau_C = r - r_0,$$

or

$$r_0 = r(1-\tau_C). \tag{1}$$

At that point, there will be no incentive for firms to issue additional debt. Beyond that point the cost would exceed the benefit. In equilibrium, the corporate tax savings from interest deductions will be offset completely by the 'gross-up' of interest payments necessary to induce the marginal investor (i.e., the investor for whom $\tau_{PB}=\tau_C$) to hold corporate debt. In this manner Miller argues that, although there will exist an equilibrium economy-wide, debt-equity choice, corporate leverage will not provide a tax advantage to any particular firm and the value of any firm will be independent of the specific capital structure that it happens to adopt.

We can view the individual investor's portfolio selection problem, in such a capital market and tax setting, as involving three basic elements: First, investors will diversify their portfolios of risky assets. Then, based upon their personal risk preferences, they will lever these portfolios to achieve their desired levels of risk. The total amount of leverage chosen by each investor could include corporate borrowing and lending and/or personal borrowing and lending. As we show later, each investor's personal tax rate will

[3]As it turns out, the assumption of riskless debt is unnecessary. Chen and Kim (1979) show that even with a positive probability of (costless) bankruptcy, Miller's proposition will hold if creditors can recapture at the individual level the tax credits which are lost at the firm level in bankruptcy, or if bankrupt firms do not lose their tax credits.

determine whether the borrowing and/or lending is on corporate or personal account. It is the combination of personal and corporate taxes that gives rise to financial leverage clienteles. Clearly, all three steps are interrelated and the convenient separation of the individual's portfolio selection of risky assets from his risk preferences [as in the Sharpe (1964) and Lintner (1965) Capital Asset Pricing Model] may no longer obtain. While an investigation of the way in which the three basic elements interact to determine the individual investor's portfolio decision is an interesting task in its own right, it is beyond the scope of this paper.[4] The inducement for leverage clienteles can be demonstrated more easily if we examine the impact of taxes in isolation. We do so by comparing the after-tax returns yielded by alternative investment strategies given a fixed dollar amount of *total* borrowing and under the assumption that investors have already obtained adequate diversification. (We comment on this assumption later.)

Consider a firm that has issued consol bonds in the amount B at interest rate r. In the tax environment assumed by Miller, the after-tax cash flow to a stockholder who owns the fraction α of the firm's outstanding shares will be

$$\tilde{Y}_L^S = \alpha(\tilde{X} - rB)(1-\tau_C)(1-\tau_{PS}), \tag{2}$$

where the random variable $\tilde{X}$ denotes the firm's earnings before interest and taxes. Assuming that τ_{PS} is zero and substituting (1) into (2) yields

$$\tilde{Y}_L^S = \alpha[\tilde{X}(1-\tau_C) - r_0 B]. \tag{3}$$

Eq. (3) shows that the after-tax cash flow received by a shareholder of a levered firm whose interest payments are tax deductible at the corporate level (but taxed at the individual level) is equivalent to the cash flow received by a shareholder of the identical levered firm that may issue tax-free bonds (the interest payments of which are not tax-deductible to the firm). Thus, in equilibrium, the effective after-tax interest rate paid by stockholders who borrow through the corporation is the same as the fully tax-exempt rate.[5]

Suppose now that there exists an otherwise identical firm that is all equity financed. The total cash flow to the firm's stockholders will be $\tilde{X}(1-\tau_C)$, if τ_{PS} is zero. If an investor buys the fraction α of this unlevered firm by

[4]In a somewhat different context, Long (1977) provides an extensive analysis of the interrelationship between the tax effect and the diversification effect on individual investor portfolio selection. Although his analysis focuses on a different issue (the dividend issue and the differential tax rates between dividends and capital gains), his framework of analysis may be useful in analyzing the simultaneous effects of taxes, leverage, and diversification on individual portfolios.

[5]This result obtains in equilibrium because the tax savings provided by tax-deductible interest payments will be offset exactly by the compensation that must be paid to the marginal investor in the corporate bond.

borrowing αB on personal account at the interest rate r, then this after-tax cash flow will be

$$\tilde{Y}_U = \alpha[\tilde{X}(1-\tau_C) - rB(1-\tau_{PB})], \tag{4}$$

where $rB\tau_{PB}$ is the tax saving provided by personal leverage.[6] Substituting (1) into (4) yields

$$\tilde{Y}_U = \alpha[\tilde{X}(1-\tau_C) - r_0 B(1-\tau_{PB})/(1-\tau_C)]. \tag{5}$$

Comparing (5) and (3) we see that

$$\tilde{Y}_U \gtreqless \tilde{Y}_L^S \quad \text{as} \quad \tau_{PB} \gtreqless \tau_C. \tag{6}$$

However, in Miller's equilibrium model, the value of any individual firm is independent of its capital structure, so that

$$S_U = S_L + B, \tag{7}$$

where S_U and S_L represent the market values of the common stocks of the unlevered and levered firms, respectively. The personal investment required to obtain the return $\tilde{Y}_U$ is $\alpha S_U - \alpha B$, while the investment required to obtain the return $\tilde{Y}_L^S$ is αS_L. From (7) these two amounts are equal. The total amount of borrowing required in each case is also the same: To obtain $\tilde{Y}_U$ the investor borrowed αB on personal account; to obtain the return $\tilde{Y}_L$ he borrowed αB through the firm. This means that, in equilibrium, for a given dollar amount of investment and a given total leverage position, an investor in a tax bracket greater than the corporate rate will obtain a greater after-tax return by levering on personal account, while an investor in a tax bracket less than the corporate rate will obtain a greater return by borrowing through the corporation. Therefore, with everything else equal, investors in high tax brackets will prefer to hold the shares of unlevered firms, while investors in low tax brackets will prefer to hold the shares of levered firms.[7]

[6]Since lending institutions must pay corporate income taxes at the rate τ_C on their interest income, the default-free personal borrowing rate also should satisfy the equilibrium eq. (1) above.

[7]Although we have assumed that the personal tax rate on income from stock, τ_{PS}, is zero, this assumption is not necessary just to show that there are tax-induced leverage clienteles. Initially (but not in his equilibrium analysis) Miller assumes a positive τ_{PS} and shows that, to an investor with a positive τ_{PS}, the levered firm has the following *personal* value (as opposed to the equilibrium market value) (p. 267):

$$V_L = S_U + [1-(1-\tau_C)(1-\tau_{PS})/(1-\tau_{PB})]B.$$

Although Miller does not show the equilibrium relationship between firm valuation and

Personal taxes will also influence the medium through which investors will choose to *lend*. This influence will be felt in the following way: For any individual, the after-tax cash flow from holding corporate bonds in the amount B will be

$$Y^B = rB(1-\tau_{PB}). \tag{8}$$

If we let $Y_0^B = r_0 B$ be the cash flow from holding an equal dollar amount of tax-free bonds, then from (1),

$$Y^B = Y_0^B(1-\tau_{PB})/(1-\tau_C),$$

and the difference between the two will be

$$Y^B - Y_0^B = r_0 B(\tau_C - \tau_{PB})/(1-\tau_C). \tag{9}$$

It is this difference that Miller (1977, p. 290) has labeled the 'bondholder surplus', and it will be those investors whose tax rates are *less* than the corporate rate who will receive it. That is,

$$Y^B \gtreqless Y_0^B \quad \text{as} \quad \tau_{PB} \gtreqless \tau_C.$$

Consequently, if an investor whose tax rate is less than the corporate rate decides to lend, he will do so by holding corporate bonds, while an investor whose tax rate is greater than the corporate rate will hold tax-free municipals instead.

Miller's concept of the bondholder surplus will also impact in a particular way on corporate leverage decisions. Specifically, it provides an incentive for stockholders to demand extreme corporate financial leverage policies even though the value of a particular firm will be independent of its capital structure. To illustrate this point, consider a low tax bracket investor who

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financial leverage when τ_{PS} is positive, let $V_L^* = S_L^* + B$ be the (unspecified) equilibrium market value of the levered firm. If for an investor the *personal* value of the levered firm is greater than the *equilibrium* market value of the levered firm, he will prefer to hold the shares of the levered firm. That is, an investor for whom

$$S_U + [1-(1-\tau_C)(1-\tau_{PS})/(1-\tau_{PB})]B > S_L^* + B,$$

will prefer to hold the shares of the levered firm. But, from the above condition, it follows that his personal tax rates are $(1-\tau_{PB})/(1-\tau_{PS}) > B/(S_U - S_L^*) \times (1-\tau_C)$. Likewise, an investor whose personal tax rates are such that $(1-\tau_{PB})/(1-\tau_{PS}) < B/(S_U - S_L^*) \times (1-\tau_C)$ will prefer to hold the shares of the unlevered firm. Although this proof of the existence of leverage clienteles may be regarded as more general than the one in the text in that it allows for a positive τ_{PS}, it has little empirical content because the equilibrium market value of the firm is unspecified when τ_{PS} is positive.

has the opportunity to purchase the stock of either of two firms. Firm 1 provides the exact amount of corporate leverage that he desires (according to his personal risk preference), while firm 2, which is otherwise identical to firm 1 (same pre-tax earnings, $\tilde{X}$), provides twice as much leverage. Let the respective market value of firms 1 and 2 be $V_1 = S_1 + B$ and $V_2 = S_2 + 2B$ and let the investor's desired borrowing be αB. The investor may achieve his desired leverage position either by holding the fraction α of S_1 or by holding α of S_2 and α of corporate debt, B. In either case, his net investment will be the same: $\alpha S_1 = \alpha S_2 + \alpha B$ because firm value is independent of capital structure (i.e., $V_1 = V_2$). However, only if the investor's tax rate is the *same* as the corporate rate will the after-tax returns from the two investment strategies be equal. The after-tax cash flow from the investment in the stock of firm 1 will be

$$\begin{aligned}\tilde{Y}_1 &= \alpha(\tilde{X} - rB)(1-\tau_C)\\ &= \alpha[\tilde{X}(1-\tau_C) - r_0 B],\end{aligned}$$

and the cash flow from an investment of αS_2 in the stock of firm 2 plus αB of bonds will be

$$\begin{aligned}\tilde{Y}_2 + Y^{\alpha B} &= \alpha(\tilde{X} - 2rB)(1-\tau_C) + \alpha rB(1-\tau_{PB})\\ &= \alpha[\tilde{X}(1-\tau_C) - r_0 B] + \alpha r_0 B(\tau_C - \tau_{PB})/(1-\tau_C).\end{aligned}$$

The difference in after-tax cash flow between the two strategies is

$$(\tilde{Y}_2 + Y^{\alpha B}) - \tilde{Y}_1 = \alpha r_0 B(\tau_C - \tau_{PB})/(1-\tau_C), \tag{10}$$

which is the same as the bondholder surplus identified in (9). From (10), we see that

$$\tilde{Y}_2 + Y^{\alpha B} \gtreqless \tilde{Y}_1 \quad \text{as} \quad \tau_{PB} \gtreqless \tau_C, \tag{11}$$

from which it follows that investors in low tax brackets will be better off holding the stocks of highly levered firms *even* if that degree of leverage takes them beyond their personal risk tolerances. They can unlever the excess borrowing at the corporate level by holding corporate bonds and, in the process, earn the bondholder's surplus at the expense of the tax-collecting agency.

The condition in (11) also means that investors whose personal tax rates exceed the corporate rate will want corporations to borrow as little as possible. In fact, they will be better off if the corporations they own *lend* by

purchasing debt securities.[8] Such a strategy is, in essence, another scheme for tax avoidance by investors whose tax rates are greater than the corporate rate.[9]

The result of this is that investors whose marginal tax rates exceed the corporate rate will demand firms with zero (or negative) leverage, while investors whose marginal tax rates are less than the corporate rate will demand firms with highly levered capital structures. There will be relatively little demand for firms with capital structures in the 'middle' ranges. If firms are shareholder-wealth-maximizers, they will respond to this demand by specializing their capital structures in one or the other extreme. If, for example, some firm chose a capital structure with 'moderate' debt usage, investors would have an incentive to buy all of its common stock and change its capital structure to whichever one of the extremes fits their personal tax considerations. This will be true even though, in equilibrium, a firm's market value will be independent of the particular capital structure that it adopts.

3. Empirical implications

The foregoing analysis leads to at least three empirically testable implications. First, if the value of any firm is independent of its capital structure, we would not expect to find similar capital structures among firms that are similar on other dimensions – for example, within industry groups. In fact, we would expect just the opposite. Although, for convenience, we ignored the effects of diversification in our analysis of financial leverage clienteles, individuals do demand diversification when they construct their portfolios. It seems reasonable to expect that the achievement of adequate diversification

[8]This provides another incentive for firms to hold marketable securities in addition to the standard transactions and precautionary motives. This result is contrary to Myers and Pogue (1974) and Litzenberger and Van Horne (1978) who have argued that the U.S. tax structure generates a tax disincentive for firms to invest in marketable securities. Myers and Pogue make the argument within the context of the Modigliani and Miller (1963) tax model, which ignores the existence of differential tax treatment of personal income from stocks and bonds. Litzenberger and Van Horne, on the other hand, incorporate the differential personal income taxes but argue that the tax advantage of corporate debt financing persists even in the presence of the differential personal taxes. Kim (1978b) points out that this argument is based on a partial equilibrium analysis and will not hold in a general equilibrium framework (such as Miller's) in which supplies of securities are allowed to change.

[9]If short selling is allowed, the high-tax-bracket investor can achieve the same effect by short selling the levered firm. For example, by short selling the fraction α of S_L, borrowing αB on personal account, and using the proceeds to buy α of S_U, the investor can obtain an additional tax shelter of $\alpha r_0 B(\tau_{PB}-\tau_C)/(1-\tau_C)$ with a zero net investment. This indirect tax arbitrage will leave the investor's total leverage position unchanged. Similarly, the investor whose tax rate is less than the corporate rate can earn an additional surplus of $\alpha r_0 B(\tau_C-\tau_{PB})/(1-\tau_C)$ by undertaking the opposite transaction (i.e., by short selling α of S_U and using the proceeds to buy α of S_L and B). Again, this can be accomplished with no net investment and without changing his total leverage position. If these indirect tax arbitrage opportunities were available to every investor with no limit, in equilibrium all investors' personal tax rates would be identical to the corporate rate.

would require diversification across industries [King (1966) and Meyers (1973)]. If so, we would expect to find firms in the same industry having different capital structures. Otherwise, investors might not be able to obtain *both* adequate diversification and their desired amount of corporate leverage. To the extent that firms in the same industry tend to have similar capital structures and capital structures differ systematically across industries, the existence of financial leverage clienteles would not be consistent with the achievement of adequate diversification.

The second implication follows directly from the notion of leverage clienteles. If investors do specialize their portfolios according to the leverage policies of the firms held, holding other factors constant, we would expect to find a systematic (negative) cross-sectional relationship between corporate capital structures and stockholder tax rates. Specifically, we would expect to find that firms following low leverage policies have stockholders in high tax brackets and that firms following high leverage policies have stockholders in low tax brackets.

The third implication follows from Miller's concept of the 'bondholder surplus'. We have shown that this should cause investors to demand shares only of either highly levered firms or firms with very little or no leverage. Firms will respond to this demand by adopting only capital structures at one or the other extreme. Thus, we would expect to observe a bimodal distribution of corporate leverage ratios with one mode centered at zero and the other centered around some high, but theoretically unspecified, level. Stockholders of firms at the lower mode would be expected to have personal tax rates which are greater than the corporate rate, while the reverse should be true of owners of firms at the higher mode.

It is to the second and third empirical issues that we direct our attention. Our analysis has demonstrated that both are implications of Miller's macroeconomic equilibrium valuation model, which rests on a particular set of assumptions about the U.S. tax structure. As such, evidence as to their presence or absence provides an indirect test of his model. While positive findings would *not* constitute proof that Miller is correct, they would be highly supportive of his position. Similarly, although negative findings would *not* allow us to reject his proposition, they would at least raise some doubts. In any event, the presence of leverage clienteles, or their absence, should be of significant interest to financial managers and to students of corporate capital structure theory. Positive findings would suggest that financial managers should 'tailor' their leverage policies to suit shareholders' tax-induced demands, while negative findings would suggest that such concerns are unfounded.[10]

[10]Financial managers will be concerned about leverage because there are transactions costs associated with portfolio revision. If portfolio revisions were costless, investors could costlessly reconstitute their portfolios following a capital structure change and their wealth

4. The data

The leverage ratios of a large sample of publicly traded corporations, and the marginal personal income tax rates and demographic characteristics of a sample of the stockholders of these companies, comprise the evidence to be examined.

The second set of data arises from an empirical study of individual investors currently being conducted at Purdue University and the University of Utah. Through the cooperation of a large national retail brokerage house, a lengthy record of the securities transactions of a large random sample of the firm's customers was obtained. This record covers the seven-year period from January 1964 through December 1970 and encompasses some 300,000 securities trades. The firm also made available the account balance statements as of December 1970 for the group of customers sampled in order that securities held in 'street-name' could be included. From these data, it was possible to reconstruct the common stock portfolios of each of the accounts as of the end of 1970. Details of the data base and procedures are provided in Schlarbaum, Lewellen, and Lease (1978a, 1978b).

Information on the demographic characteristics and income levels of the investors was obtained from a questionnaire survey. Just under 1,000 replies were received (representing a 40% response rate from a total of 2,506 investors to whom the questionnaire was sent), and each was matched to the associated end-of-1970 account portfolio. Comparisons of the attributes of the resulting sample with those of the overall population of American stockholders reveal it to be a highly representative one [Lease, Lewellen, and Schlarbaum (1974)]. In order to obtain at least three observations on the tax rates of the stockholders of each company, it was decided to examine only those firms whose shares were included in the portfolios of at least three investors. This screening procedure produced a list of 1,140 companies held by a total of 887 investors. Many of the securities, of course, appear in substantially more than three portfolios.[11] Table 1 summarizes the key features of the investor sample, and table 2 contains summary data on the firm sample.

Two year-end-1970 measures of financial leverage were obtained for each

would remain unchanged. In the presence of transactions costs associated with portfolio revision, financial managers will weigh whatever benefits derive from a capital structure change against the transactions costs which such a change imposes upon the firm's current shareholders.

[11]There were 1,869 different securities held by the 914 investors in the aggregate sample. The level of coverage of the associated portfolios included in our reduced list, however, is substantially greater than the ratio 1,140/1,869 would suggest. Thus, there were 7,514 separate securities *positions* observable in the 914 portfolios, and the 1,140 stocks that appeared in three or more of these account for 6,217, or 83%, of the total. By dollar value, the corresponding coverage is 92% of the aggregate portfolios. The 27 investors who were 'lost', of course, are those who owned shares in companies for which there were not at least two other owners in the sample.

Table 1

Attributes of the investor sample ($N = 887$).

Age		Marital status	
Under 21	<1%	Married	80%
21–34	3%	Unmarried	20%
35–44	11%		
45–54	28%	Employment status	
55–64	26%		
65 and over	32%	Employed	68%
($\mu = 59$; $\sigma = 12$)		Unemployed[a]	32%
Sex		Annual family income	
Male	80%	Under $5,000	1%
Female	20%	$5,000–$9,999	8%
		$10,000–$14,999	16%
Education level		$15,000–$19,999	14%
		$20,000–$24,999	19%
Less than H.S.	11%	$25,000–$49,999	25%
H.S. graduate	13%	$50,000–$99,999	13%
Some college	23%	$100,000 and over	4%
Bachelor's degree	31%	($\mu = \$35{,}104$; $\sigma = \$32{,}811$)	
Master's/LLB	15%		
Doctorate	7%	Family size	
($\mu = 15$ years; $\sigma = 3$ years)		One	16%
		Two	43%
		Three or more	41%
		($\mu = 2.6$; $\sigma = 0.8$)	

[a]Housewives, retired persons, other unemployed.

firm on the list, either from the *Value Line* statistical tapes or from *Moody's* manuals.[12] The first is the ratio of total-debt-to-total-capital, and the second is the ratio of long-term-debt-to-long-term-capital. Both are in book value terms. In arriving at total debt, the current portion of long-term debt and any notes payable were added to long-term debt. Non-interest-bearing items such as accounts payable, tax accruals, and other deferred liabilities were excluded. Long-term capital was taken to be the sum of: long-term debt, the book value of common and preferred stock, capital surplus, and retained earnings. Total capital was defined as long-term capital plus notes payable and the current portion of long-term debt. Of course, each of these measures

[12]The need to compile some fair portion of the data by hand from *Moody's* obviously increased the desirability of limiting the sample to companies appearing in at least three portfolios. There were, parenthetically, no statistically significant differences between the leverage ratios of firms that were held by exactly three investors and those held by four or more; nor between those in the three-and-four category vs. five-and-above. This would indicate that there is unlikely to be any bias introduced by our elimination of the two-and-under portion of the list as well. Certainly, there is no a priori reason to believe so.

Table 2

Characteristics of the sample corporations ($N = 1140$).

A. Industry category	
Aircraft and aerospace	15
Airlines	19
Banks/savings and loans	27
Broadcasting and motion pictures	16
Chemicals	48
Construction and building materials	51
Consumer electronics and appliances	48
Department, drug, and jewelry stores	29
Electric utilities	70
Finance, leasing, and mortgage companies	22
Foods/beverages/liquor/tobacco	68
Gas utilities and pipelines	35
Hotel and motel chains	8
Industrial and farm equipment	96
Insurance companies	16
Medical, photographic and scientific equipment	81
Metal products/aluminum/iron and steel	45
Mining and smelting	54
Motor vehicles and parts	22
Musical instruments/toys/sporting goods	14
Office equipment	32
Paper and wood products	27
Petroleum	76
Pharmaceuticals	21
Publishing and printing	20
Railroads	22
Restaurant chains	12
Retail food chains	13
Rubber/plastics/glass	19
Soaps and cosmetics	13
Telecommunications	15
Textiles/shoes/apparel	34
Trucking and shipping	18
Other/unclassifiable	34
B. Exchange where traded	
NYSE	894
ASE	164
OTC/regional	82
C. Size (by total capitalization)	
Less than $25 million	115
$25–$50 million	131
$50–$100 million	198
$100–$250 million	234
$250–$500 million	171
$500–$1000 million	132
$1.0–$2.5 billion	125
$2.5–$5.0 billion	23
Over $5.0 billion	11

represents only one point estimate in a time series of data. However, the available evidence does indicate that corporate capital structures tend to be relatively stable over time [Ang (1976) and Scott and Martin (1975)], and we know of no reason why year-end 1970 capital structures would be unusual.

The variable of primary interest in our analysis is the individual investor's marginal personal tax rate on ordinary income. Estimates of these rates for the investors in the sample were derived from the information on the income levels obtained from the questionnaire survey described earlier. The respondents in the survey were asked to specify, for his or her household unit, the 'average annual income received over the last three years, before taxes and any deductions', and to report income from all sources, including wages, salaries, pensions, rents, and investment earnings.[13] The form of the response was a check in one of the income categories listed in table 1. In deriving an estimate of each individual's marginal tax rate, it was assumed that the category he or she checked represented what would be termed 'Adjusted Gross Income' (AGI) on the standard federal personal income tax form. The investor was then assigned the mean *taxable* income identified from IRS *Statistics of Income* data for 1970 to have been reported by individuals in the relevant AGI bracket. After accounting for marital status, the investor's marginal tax rate was estimated to be the marginal rate applicable to the investor's assigned taxable income in 1970. For example, if an unmarried investor checked the $15,000–$19,999 income bracket on the questionnaire, and *Statistics of Income* tabulations indicated that after deductions and exemptions the mean taxable income in that AGI class was $13,000 in 1970, the investor's tax rate was estimated to be the marginal ordinary rate applicable to a single person with $13,000 of taxable income. If the investor were married, the 1970 joint-return tax schedule would be used instead. Table 3 displays the resulting distribution of imputed marginal tax rates for the sample. A desirably wide dispersion on those rates is apparent.[14]

In the statistical analyses that follow, each individual investment position in a security is treated as one observation. The 1,140 companies included in the 887 sampled portfolios yielded 6,217 such observations. For each of these positions we recorded: (a) the two financial leverage measures of the firm involved, (b) the market value of the position as of December 1970, (c) the estimated marginal tax rate of the associated investor, and (d) six other demographic characteristics of that stockholder. These characteristics encompass age, sex, marital status, family size, educational level, and employment

[13]The questionnaire was administered in mid-1972. Hence, the three-year period covered would span 1969 through 1971. The objective of asking for a three-year average income was to eliminate any possible unusual experiences for a particular single year.

[14]The uneven pattern in table 3 is caused by two phenomena. First, the use of income categories, rather than actual incomes, to impute the tax rates tends to cause clustering of the estimates. Second, the actual schedule of tax rates itself jumps in discrete increments and the number of increments within each successive five-percent category varies.

Table 3
Distribution of imputed marginal tax rates of the investor sample ($N = 887$).

Tax rate	Relative frequency
Under 20%	5.3%
20%–24%	17.6%
25%–29%	22.8%
30%–34%	6.3%
35%–39%	24.1%
40%–44%	3.2%
45%–49%	0.2%
50%–54%	14.7%
55% and above	5.9%
($\mu = 34\%$; $\sigma = 12\%$).	

status. They are included in the analysis both to allow us to hold constant other factors that may influence personal portfolio decisions as well as to search for additional possible interactions between corporate leverage policies and shareholder characteristics.

5. Statistical tests

The first issue to be examined empirically derives from Miller's notion of a bondholder surplus. It has two aspects, as we have shown. One is that opportunities for increased income by stockholders will induce firms to adopt capital structures that employ either a high degree of financial leverage or none at all. The other is that the common stock of those firms that adopt highly-levered capital structures should be held by individuals whose personal marginal tax rates are less than the corporate rate, while the ownership of those forms with no financial leverage should be concentrated among individuals subject to marginal tax rates greater than the corporate rate. We might classify this joint prediction as the 'strong form' of the financial leverage clientele hypothesis.

The second empirical question is whether there exists a negative relationship between corporate leverage policies and stockholder marginal personal tax rates. That is, we would expect to observe at least some relationship between personal tax rates and corporate leverage ratios even if firms do not specialize their leverage policies at the extremes. This might be considered the 'weak form' of the leverage clientele hypothesis.

5.1. *Tests of the strong form*

One of the empirical predictions of the strong form of the hypothesis is

that the distribution of corporate leverage ratios will be bimodal with one mode centered at zero and the other at some high level. Unfortunately for empirical purposes, the higher mode is unspecified theoretically. Figs. 1 and 2 are histograms of the total and long-term leverage ratios, respectively, of the firms included in our sample. Both distributions are in fact bimodal, and the

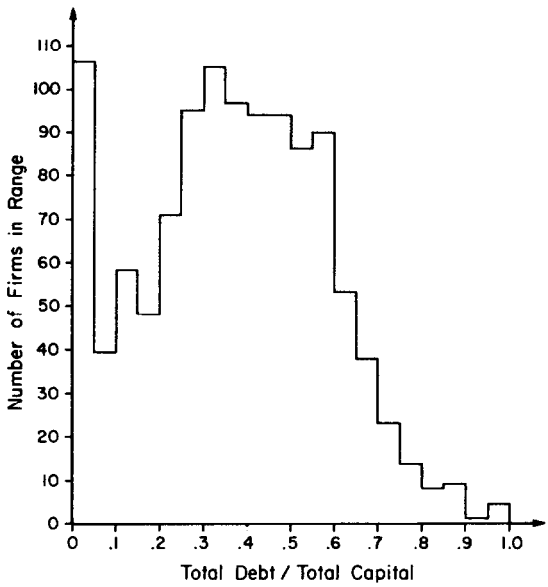

Fig. 1. Ratio of total debt to total capitalization: Frequency distribution for sample corporations.

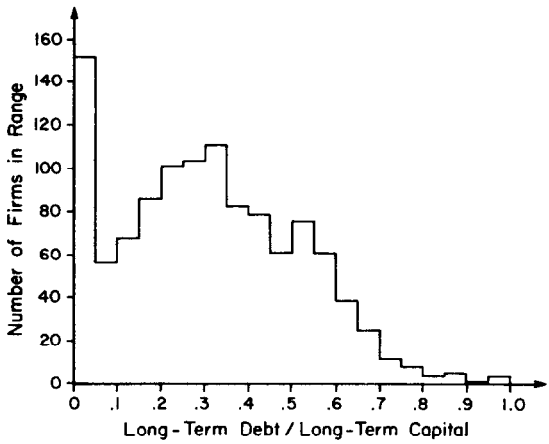

Fig. 2. Ratio of long-term debt to long-term capitalization: Frequency distribution for sample corporations.

left-hand mode of each is indeed close to zero. On the other hand, the two upper modes are only in the 30 to 35 percent debt range. Thus while both distributions give evidence of bimodality, the right-hand mode of each seemingly falls short of what traditionally has been considered to be a 'high' leverage ratio. As is evident, the upper modes of the distributions are not especially pronounced, and approximately three-fifths of the observations in each are almost evenly distributed between 0.20 and 0.60. Nevertheless, the distributions *are* bimodal, and the theory does not indicate the exact location of the upper mode.

Table 4

Corporate leverage extremes and stockholder marginal personal tax rates.

Leverage measure	Mean marginal tax rate of stockholders of firms in: Lower leverage mode[a]	Upper leverage mode	*F*-statistic[b]
A. *For upper leverage mode defined as debt to capital ratios of 0.20 or greater*			
Total debt ratio	35.1%	34.2%	1.69[c]
Long-term debt ratio	35.0%	34.2%	1.74[c]
B. *For upper leverage mode defined as 0.30 or greater*			
Total debt ratio	35.1%	34.1%	1.83[c]
Long-term debt ratio	35.0%	34.2%	1.67[c]
C. *For upper leverage mode defined as 0.40 or greater*			
Total debt ratio	35.1%	33.9%	2.06[c]
Long-term debt ratio	35.0%	33.8%	2.35[d]
D. *For upper leverage mode defined as 0.50 or greater*			
Total debt ratio	35.1%	33.5%	2.58[d]
Long-term ratio	35.0%	33.4%	2.73[d]

[a]Defined as debt to capital ratios of 0.05 or less.
[b]For differences between upper-mode and lower-mode mean tax rates.
[c]Significant at 0.05 level.
[d]Significant at 0.01 level.

The strong form of the hypothesis also provides the prediction that firms in the low (high) leverage mode will be owned by investors in marginal tax brackets which exceed (are less than) the corporate tax rate. Several tests of this possibility are summarized in table 4. In each instance, the 'lower' mode is defined to include firms with debt to capital ratios less than 0.05. Because the location of the upper mode is less obvious, several alternative specifications are used. The mean tax rates displayed in the table are the average of the marginal tax rates of all investment positions in the firms in the various

leverage categories.[15]

The table documents three points. First, in all cases the mean marginal tax rates of investors who hold stocks in the upper and lower 'modes' *are* significantly different at the 0.05 level or better. Second, the difference is in the right direction. Third, even though in each of the comparisons the mean tax rates are statistically different, in no case is the difference as much as 2 percent. This is somewhat disappointing, given that the strong form of the theory would predict not only that the tax rates of the stockholders of firms with little leverage will be greater than the tax rates of the stockholders of firms with high leverage, but in fact that their rates should be greater than the marginal corporate rate of 48 percent. Clearly there is no evidence of the latter. The data as a whole provide only modest support at best for the 'strong form' of the leverage clientele hypothesis.

5.2. *Tests of the weak form*

To examine the cross-sectional relationship between leverage policies and shareholder marginal tax rates we adopted the following procedure: The 1,140 companies in the sample were ranked from lowest to highest according to their total leverage ratios. The sample was then divided into deciles, with the ten percent of the companies with the lowest ratio in the first decile, the next ten percent in the second decile, and so on. The mean leverage ratios and the tax rates of the associated shareholders were computed for each decile, as were the means of the other six demographic characteristics of those investors. The resulting statistics are displayed in table 5.

As the table indicates, the mean leverage ratios ranged from a low of two percent in the first decile to a high of seventy-two percent in the last one. The number of investment positions in the various deciles ranged from a low of 369 in the ninth to a high of 722 in the tenth. Thus, although there is some variation in the number of positions across deciles, each contains a meaningfully large number.

The table reveals almost no variation in average investor tax rates among the deciles, and there is little indication of a systematic negative relationship between those rates and corporate leverage policies.[16] A similar conclusion

[15]Accordingly, the marginal tax rates of every investor who held a position in any of the 106 companies whose capital structures fell in the zero-to-five percent range of total-debt-to-total-capital were averaged in arriving at the 35.1 percent personal tax rate shown in the table for that segment of the sample. Because the unit of observation is the individual investment position, of course, a particular investor's tax rate would be included more than once in this averaging process if he or she owned more than one security.

[16]Additionally, the standard deviation of the estimated tax rates for each of the deciles varies little from the standard deviation of 12.4% computed for the total sample.

Table 5

Corporate total debt to total capital ratios and stockholder characteristics.

	Corporate leverage deciles									
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
A. *Parameters of the leverage deciles*										
Number of firms	114	114	114	114	114	114	114	114	114	114
Number of stockholder investment positions	569	626	607	677	654	613	719	661	369	722
Mean debt to capital ratio	0.02	0.13	0.22	0.29	0.35	0.40	0.46	0.52	0.59	0.72
B. *Mean values of stockholder characteristics*										
Marginal tax rate[a]	35%	35%	34%	35%	35%	35%	34%	34%	33%	34%
Age (years)	61	60	62	61	61	60	60	60	61	60
Sex (m = 1; f = 0)	0.77	0.78	0.79	0.77	0.80	0.80	0.80	0.81	0.80	0.86
Marital status (m = 1; u = 0)	0.78	0.75	0.79	0.77	0.77	0.77	0.77	0.79	0.80	0.80
Family size	2.5	2.6	2.5	2.5	2.5	2.5	2.6	2.5	2.7	2.6
Education (years)	15	15	15	15	15	15	15	15	15	15
Employment status (e = 1; u = 0)	0.66	0.66	0.60	0.66	0.66	0.65	0.67	0.69	0.66	0.73
[a]Standard deviations of tax rates:	12.3	12.3	12.4	12.3	12.3	12.7	12.6	12.1	12.0	12.7

applies to the six demographic characteristics of the investors as well.[17] Table 6 presents the corresponding results for leverage deciles defined by long-term-debt-to-long-term-capital ratios, and it leads to corresponding conclusions. The overall impression that emerges from the data is that firms do not attract distinct groups of investors on the basis of their debt-to-capital ratios.

5.3. *Value-weighted and reduced-sample tests*

While the simple averaging of the tax rates gives little indication of a systematic relationship between the leverage policy adopted by a particular company and the tax rates of its stockholders, some additional probing of the data may be appropriate in two respects. The first is that in the preceding computations, each investment position was given equal weight. While the lack of a tax clientele effect on that basis would imply that the tax rates of stockholders of individual firms vary widely, it could still be that a greater proportion of a firm's shares are held by investors whose tax demands are best accommodated by the firm's particular leverage policy. Thus, a weighting of shareholder tax rates by the market values of the investment positions may yield a different result.[18]

The second is that the marginal tax rates used have been estimated from questionnaire replies which designated only income *brackets* rather than specific income levels. This procedure could mask to an extent some actual underlying tax rate differences among individuals, at least in certain income brackets which span several marginal rates. Thus, although we do find considerable dispersion in the imputed rates, and although each investor's particular marital status is recognized in arriving at those rates, there could be a degree of homogenization inherent which may dilute our findings. To guard against this possibility all investors that had estimated tax rates

[17]Note that the means of the demographic characteristics reported in table 5 are different from the means reported in table 1. Even when the means in table 5 are weighted by the number of positions in each decile, the weighted averages are still not the same as the means in table 1. This is due to the weighting by individual positions in table 5 and the fact that different investors have a different number of investment positions. For example, the higher average ages in table 5 in comparison with table 1 reflect the fact that older investors tend to have a greater variety of securities in their portfolios [Lewellen, Lease, and Schlarbaum (1977)].

[18]In this weighting scheme the value-weighted tax rate for each decile k was computed as

$$T_k = \sum_{i=1}^{N_k} S_{ki} T_{ki} / S_k,$$

where S_{ki} is the amount of funds invested in position i (i.e., stock price multiplied by the number of shares held); T_{ki} is the estimated tax rate of the investor holding position i; and $S_k = \sum_{i=1}^{N_k} S_{ki}$, $k = 1, \ldots, 10$, where N_k is the total number of positions in decile k.

Table 6

Corporate long-term debt to long-term capital ratios and stockholder characteristics.

	Corporate leverage deciles									
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
A. *Parameters of the leverage deciles*										
Number of stockholder investment positions	443	675	650	592	712	665	664	649	456	711
Mean debt to capital ratio	<0.01	0.07	0.15	0.22	0.28	0.33	0.40	0.46	0.55	0.68
B. *Mean values of stockholder characteristics*										
Marginal tax rate[a]	35%	35%	34%	34%	34%	35%	34%	35%	33%	34%
Age (years)	60	61	61	60	62	60	60	59	61	60
Sex (m = 1; f = 0)	0.81	0.76	0.78	0.78	0.77	0.82	0.80	0.84	0.77	0.85
Marital status (m = 1; u = 0)	0.80	0.75	0.77	0.79	0.76	0.79	0.76	0.81	0.78	0.81
Family size	2.6	2.5	2.5	2.6	2.4	2.6	2.5	2.7	2.6	2.5
Education (years)	15	15	15	15	15	15	15	15	15	15
Employment status (e = 1; u = 0)	0.70	0.66	0.62	0.64	0.66	0.65	0.69	0.69	0.62	0.73
[a]Standard deviations of tax rates:	12.7	12.2	12.2	12.3	12.4	12.2	12.7	12.7	11.7	12.8

between 30 percent and 48 percent were deleted from the sample.[19] This procedure yields a reduced sample which contains only those investors with estimated tax rates at the extremes and it should magnify any leverage clientele effect that might be present in the data. Value-weighted as well as equal-weighted mean tax rates were computed for the reduced sample.[20]

Table 7 summarizes the results of the value-weighted and reduced sample computations across the deciles for both measures of corporate leverage. The equal-weighted, total-sample mean tax rates from tables 5 and 6 are included for comparison.[21] Not surprisingly, the value-weighted mean tax rates are higher than the corresponding equal-weighted means, since higher-income investors tend to have larger portfolios.

A close inspection of table 7 shows a mild indication that in value-weighted mean tax rates for both the total and reduced samples decline as leverage ratios increase. Nevertheless, in no case is the difference in the mean tax rates between the top and bottom deciles greater than six percentage points. These results are consistent with our results in table 4 which showed only a slight but statistically significant difference between the marginal tax rates of the owners of companies at the extrene leverage modes.

5.4. Regression results

The question of the degree of association between shareholder tax rates and corporate leverage policies, of course, can be addressed directly by means of regression analysis. Table 8 displays the outcome of such a regression wherein the total debt-to-capital ratio of the firm represented by each of the 6,217 end-of-1970 investment positions in our sample is the dependent variable. The marginal personal tax rate and other demographic attributes of the individual who held that position are the independent variables.

The coefficients of five of the seven independent variables are statistically significant at the 0.05 level or better, but the overall R^2 is less than 1 percent. While the coefficient of the tax rate variable is significant and of the correct sign, its magnitude indicates that an increase in an investor's personal tax rate from zero to 70 percent (a range that encompasses the spectrum of actual personal tax rates) is associated with an increase of only 0.05 in the leverage ratio of the corporations in the investor's portfolio of common stocks. A relationship that slight has to be interpreted as somewhat less than strongly supportive of the financial leverage clientele hypothesis. Additional

[19]Deletion of investors with estimated tax rates in the 30 to 48% range reduced the number of investment positions by approximately one-third and the number of corporations to 1,025.

[20]In the 'reduced' samples, the companies remaining were reclassified into a new set of deciles by their respective leverage ratios. Each such decile, therefore, contains either 102 or 103 firms, i.e., one-tenth of the remaining 1,025. All contain at least 250 investment positions.

[21]While the averages across deciles for the other demographic characteristics of the investors are not listed here, the figures turned out to look very much like those in tables 5 and 6.

Table 7

Corporate leverage and shareholder marginal tax rates: Supplemental analyses.

	Mean marginal tax rates of shareholders of firms in leverage deciles[a]									
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
A. *Equal-weighted investment positions*										
Firms categorized by total debt ratios										
a. Total sample	35%	35%	34%	35%	35%	35%	34%	34%	33%	34%
b. Reduced sample	35	34	34	34	34	35	33	34	31	33
Firms categorized by long-term debt ratios										
a. Total sample	35	35	34	34	34	35	34	35	33	34
b. Reduced sample	35	34	33	33	34	34	34	34	34	32
B. *Value-weighted investment positions*										
Firms categorized by total debt ratios										
a. Total sample	40%	39%	38%	40%	38%	39%	36%	38%	36%	38%
b. Reduced sample	38	42	40	40	40	41	36	40	36	39
Firms categorized by long-term debt ratios										
a. Total sample	42	39	38	38	39	38	37	39	36	38
b. Reduced sample	41	40	41	40	39	41	36	40	36	38

[a]Decile #1 contains firms with the lowest ratios of debt to capital.

regressions using the corporate long-term debt ratio as the dependent variable, and using both the full and reduced samples of tax rates and demographic characteristics as the independent variables, yielded similar results.

Table 8

Regression results: Corporate total debt to total capital ratios vs. shareholder characteristics.[a]

Independent variable	Estimated coefficient ($\times 10^{-2}$)	Standard error ($\times 10^{-2}$)	t-statistic
Constant term	45.69	2.72	16.82[c]
Shareholder characteristics			
Sex	2.38	0.72	3.31[c]
Educational level	−0.31	0.08	−3.74[c]
Employment status	1.30	0.64	2.00[b]
Marginal tax rate	−6.81	2.19	−3.11[c]
Age	−0.07	0.03	−2.28[b]
Family size	−0.13	0.24	−0.56
Marital status	0.14	0.76	0.18

[a]Variables listed in stepwise entry order: $R^2 = 0.008$, $N = 6217$, $F = 7.51$.
[b]Denotes significance at 0.05 level.
[c]Denotes significance at 0.01 level.

6. Commentary and conclusions

Our concern here has been with the way in which personal taxes may influence individual investors' portfolio choices and their demands for equity and debt securities. We were specifically concerned with the notion of stockholder financial leverage clienteles and the consequent implications for corporate leverage policies. The motivation for the analysis was the recent paper by Miller (1977), who argued that, in equilibrium, the traditional theoretical tax advantage of corporate debt financing will be offset by the effects of personal taxes, such that the value of any individual firm will be independent of the degree of financial leverage it happens to adopt. His conclusions were based on the assumptions that personal taxes on the returns from corporate debt are progressive at rates which extend on either side of the corporate rate and that the personal tax rate on the returns from common stock is effectively zero.

We adopted the tax setting assumed by Miller and extended his analysis to demonstrate the way in which tax-induced financial leverage clienteles would come about in his equilibrium context. Individuals would be able to realize higher after-tax returns for a *given* amount of personal investment and a *given* amount of leverage by specializing their common stock holdings in firms whose capital structures meet their personal tax demands. In particular,

investors in high tax brackets would prefer to hold the stocks of corporations with little or no leverage, and obtain their desired degree of leverage by borrowing on personal account; investors in low tax brackets would prefer to borrow through the firm by owning shares in highly-leveraged companies. The empirical predictions of our analysis are that individuals in high tax brackets will demand firms that follow low leverage policies while individuals in low tax brackets will demand firms that follow high leverage policies. Firms will respond to these demands by employing either zero leverage or large amounts of leverage in their capital structures, with the result that the distribution of corporate leverage ratios will be bimodal and that the stocks of firms in the lower (upper) mode will be held by individuals in high (low) tax brackets.

We then examined empirically the distribution of corporate leverage ratios of a large sample of firms and the relationship between these leverage policies and the estimated personal tax rates and other demographic characteristics of the stockholders of the companies. The results of the analysis were somewhat ambiguous. There was some evidence of a bimodal distribution of corporate leverage ratios and of a slight relationship between corporate leverage policies and stockholder personal tax rates. However, the overall impression that emerged from the analysis was not strongly supportive of the leverage clientele hypothesis.

There could be several explanations for these findings. One, obviously, is that our test procedures were inadequate. However, given the wide assortment of tests performed and the similarity of the results among them, that seems unlikely.[22] Alternatively, it could be that leverage clientele tendencies *are* present in the market, but that they are overwhelmed by other factors. If an investor emphasizes a certain kind of stock in his portfolio, he is likely to end up with a less well-diversified portfolio than he would otherwise have. Thus, the sort of portfolio specialization that leverage clienteles require is not without cost. The cost is poor portfolio diversification if investors do specialize in firms with particular leverage policies, and the cost would be especially high if firms within industry categories typically adopt similar capital structures.

A third potential explanation, of course, is that Miller's assumed tax environment may not be entirely accurate. The difference between the effective tax rates on investors' personal income from stocks (dividends and

[22]Another possible explanation, of course, is that measurement errors in the questionnaire survey, from which the tax rates were estimated, will reduce our ability to detect significant clienteles. The literature of survey research shows that individuals at the lower end of the income-and-wealth scale tend to overstate the level of their earnings and assets, whereas the reverse is true for individuals at the other end of the scale [Ferber (1965) and Lansing and Morgan (1971)]. Thus, it is possible that our tax rate estimation procedure would pick up less spread in the income figures on the questionnaire replies than is actually present in the sample. Seemingly, however, the procedure used in table 7 wherein we deleted the 'middle' tax rate investors would offset this bias to a large extent.

realized capital gains) and from corporate bonds (interest receipts and realized capital gains) may not in fact be sufficiently great so as to negate the benefit of the tax deductibility of corporate interest payments.

There is also the completely opposite possibility, although it leads to the same conclusion about the benefits of corporate debt financing. It may be that *none* of the returns from holding corporate securities are really subject to any significant personal taxes in the first place. In a recent paper Miller and Scholes (1978) have argued that investors can effectively avoid paying taxes on dividend income entirely. To the extent that the same argument can be applied to interest income, and to the extent that the effective capital gains tax on both stocks and bonds is relatively small in present value terms, we revert to the case wherein the personal income from all securities is taxed at the same (implicitly zero) rate which was the basis of the Modigliani–Miller (1963) tax model. Accordingly, there would still exist a valuation benefit for corporate leverage and we would still need other factors – e.g., bankruptcy costs and agency costs (which include bankruptcy costs) – to explain firms' observed debt financing policies.

Although we cannot settle these issues here, it is tempting to draw inferences about Miller's equilibrium theory based on our results. Unfortunately, we have not conducted a direct test of that theory. We have shown, however, that one of the major implications that follow from it is not strongly supported by our data. While it is not entirely clear what this means for Miller's model, it does seem clear at least that financial managers should not be especially concerned about tailoring their firms' capital structure policies to specific shareholder tax groups nor, by extension, about disrupting such a clientele if they decide to change those policies.

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