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Taxes, Corporate Financial Policy and Return to Investors

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Introduction and Overview

In a series of papers beginning with [1] and [2], Franco Modigiliani and Merton Miller unsettled both practitioners and students or corporate financial policy by demonstrating that, in the absence of distortions to market processes due to the existence of taxes, the cost of capital to a firm could not be affected by purely financial operations. In a series of subsequent papers [3], [4] and [5], Modigliani and Miller (hereafter abbreviated simply as M-M) expanded their earlier thesis to measure the impact on "optimal" corporate financial policies and capital costs of certain specific aspects of the U. S. tax structure. Throughout M-M's treatment, however, there runs an assumption that the basic arguments established in [1] and [2] are self-evident, and that taxes represent nothing beyond an unwelcome imperfection in otherwise efficiently functioning market processes.

Experience teaching this material to a broad range of students convinces the present authors that the concepts embodied in M-M's analysis are quite subtle and difficult to communicate at an abstract level. They also are difficult to embody in a (more complex) corporate and individual income tax structure. Surprisingly, such pedagogic success as the authors have enjoyed usually arises from discussions of the impact on M-M's argument of the very tax induced distortions that appear most unwelcome to their basic propositions.

Accordingly, an attempt will be made here to accomplish two fairly limited objectives: first, the effect on investment value of different tax structures will be used pedgogically to illustrate the basic theses propounded by Modigliani and Miller; and second, an attempt will be made simultaneously to broaden this structure to one that more closely approximates the combination of corporate, personal income and capital gains taxes encountered in the U. S. today.

The paper proceeds by developing a series of increasingly complex tax structures and examining their impact on a hypothetical corporation's "optimal" debt and dividend policies. Case 1 discusses the no-tax world laid out in [1] by Modigliani and Miller. Case 2 examines the impact on these policies of corporate income taxes alone; essentially the argument presented by M-M in [3]. Case 3 considers the impact on rational debt and dividend decisions of differential personal income and capital gains taxes; considered partially by M-M in [2]. And Case 4 integrates the preceding material by considering corporate, personal income and capital gains taxes simultaneously. A summary completes the exposition.

As always, rational behavior by both corporate and private investors, operating in purely competitive capital markets, is assumed.

Glossary

Before proceeding, however, it will be helpful to define the following terms:

$\tilde{Y}_t$ may be defined as potential personal income (or more explicitly, as net additions to wealth from an investment) available to an investor during time period t, after all interest and taxes, personal as well as corporate, are deducted. Tilde ($\sim$) indicates that $\tilde{Y}_t$ is an uncertain quantity. $\tilde{Y}_t$, of course, is the time stream of payments discounted by a private investor, at the rate ρ, to determine the present value of an anticipated time stream of payments from (let us say, one share of) equity in a particular company,

$$V = \sum_{t=1}^{\infty} \frac{\tilde{Y}_t}{(1+\rho)^t} .$$

$\tilde{X}_t$ is defined as operating income/share, from the company during t. This is assumed to be the raw material, given by the company's <u>real</u> (technological, market and managerial) opportunities, on which both corporate and private financial policies and tax rates must operate to fashion a (perhaps quite different) stream of potential personal income payments, $\tilde{Y}_t$. No specific restrictions are placed either on growth or uncertainty in the distribution of operating incomes over time. In particular, use of the term "risk class" that characterizes so much of M-M's presentation will be avoided. Needless to say, uncertainty about the magnitude and time profile of an operating income stream may affect the rate of time discount,

or the cost of capital ρ, applied by an investor to determine a particular security's value, V.

r is the market rate of interest faced by both private and corporate borrowers, at a particular maturity, in the bond market. The possibility that private and corporate investors may prefer different rate/maturity combinations, as well as the possibility that more favorable terms may be available to the latter, will be ignored (in the finest of academic traditions). r, presumably, can be observed directly at any point in time, and accordingly is not treated here as an uncertain quantity.

D_c, D_p, and D^* are defined as levels of corporate, personal, and desired (or optimal) total debt, respectively, per share of stock in our hypothetical corporation; while

T_c, T_p, and T_g are marginal corporate, personal income and capital gains tax rates faced by particular investors. For simplicity $T_c = .5$ generally is assumed, while personal tax rates, T_p and T_g vary directly, over a wide range, with the level of an investor's taxable income. Despite occasional evidence to the contrary, tax rates are presumed known with certainty and, accordingly, do not carry a tilde ($\sim$).

Case 1: No Taxes, Personal or Corporate

A never-never land, without taxes of any kind, is difficult for persons outside Hollywood to imagine. Nevertheless, it does provide a convenient

structure within which certain aspects of and limitations on the operation of a free market mechanism can be illustrated. In such a world the transformation of an enterprise's operating income stream into a stream of potential personal income payments, or net additions to wealth, can be expressed quite succinctly as,

$$(1) \qquad \tilde{Y} = \tilde{X} - rD_c - rD_p,$$

for any value of t whatever; subscripts, accordingly, are dropped. Alternatively, (1) can be simplified under an assumption that debt is available to corporate and private lenders under identical terms, to the expression that potential income from an investment consists, simply, of operating income less fixed charges on total (corporate plus personal) debt,

$$(2) \qquad \tilde{Y} = \tilde{X} - r(D_c + D_p).$$

Equations (1) and (2) contain no built-in assertion that an optimal debt or dividend policy does or does not exist for a given time stream of operating incomes. Each investor is welcome to his own opinion as to what constitutes an appropriate level of debt for $\tilde{X}$; and as Modigliani and Miller indicate in [1], each may obtain exactly that level no matter what level of corporate debt, D_c, management provides internally. Should an investor prefer greater leverage, personal debt can be added to corporate debt (using shares of equity in the company as collateral, if necessary) until target leverage $D^* = D_c + D_p$ is as great as desired. The investor, accordingly, puts up a smaller fraction of total investment from his own funds and borrows a greater portion of total investment, V, per share. Conversely,

should an investor view corporate debt as excessive, given $\tilde{X}$, he is free to put up more than V dollars per share, and invest the remainder in the company's (or a comparable company's) bonds. Interest payments to the investor on funds loaned, of course, serve to offset deductions from $\tilde{X}$ for unwanted, or non-optimal (from the investor's point of view) corporate debt. The effect of the lending operation, clearly, is to obtain negative personal debt,

$$D_p = D^* - D_c$$

for instances in which

$$D^* < D_c .$$

The point to be made is simply that, if an investor is capable of performing on his own any leveraging (or unleveraging) operation available to a firm, the range of potential personal income alternatives $\tilde{Y}$ obtainable from a given stream of operating incomes $\tilde{X}$ is not affected by the corporation's internal choice of debt policy. As long as such operations are possible, an efficiently operating capital market can charge no premium (or suffer no discount) due solely to a firm's choice of debt policy. However, should differences in tax treatment or other financial opportunities exist between corporate and privately held debt, the spectrum of potential incomes $\tilde{Y}$ available to an investor from $\tilde{X}$ may differ; and corporate financial policies, per se, may command a premium (or a discount) of their own, as we shall observe in Case 2-4, below.

Similar statements are possible concerning a firm's dividend policy, as M-M indicate in [2]. Suppose, for example, that an optimal leverage position, $D^* = D_c + D_p$, has been obtained by a particular investor.

Then, from (2)

$$\tilde{Y} = \tilde{X} - rD^*, \tag{3}$$

and the market value of the firm's shares may be expressed as,

$$V = \sum_{t=1}^{\infty} \frac{\tilde{Y}}{(1+\rho)^t} = \sum_{t=1}^{\infty} \frac{\tilde{X} - rD^*}{(1+\rho)^t} \quad . \tag{4}$$

A firm, clearly, can best serve its own and its stockholders' interests in a tax free (or any other) world by designing investment and dividend policies to maximize market value, V. As M-M point out in [2], investment and dividend policies are wholly interrelated. $\tilde{X}$ can be used either to acquire assets, pay dividends, or purchase shares of the company's stock in the open market. Let us presume that all internal asset acquisitions (investments in the conventional sense) promising rates of return greater than ρ already have been accepted. Residual funds, then, can either be paid out directly to stockholders in the form of dividends or used to acquire shares of the company's stock in the open market. In either case an increase in the stockholders' net worth per share, exactly equal to the amount of the funds so employed, is obtained. In the former case dividends may either be spent directly or reinvested in the company's shares at market value to earn a rate of return, ρ. In the latter case a reduction in the number of shares outstanding causes a proportionate increase in $\tilde{Y} = \tilde{X} - rD^*$, per share, and accordingly, an idential proportionate increase in the

value of each share outstanding.* Should an investor prefer to leave this value in the form of unrealized capital gains his position is identical to that in which dividend payments are received and reinvested in additional shares of the company's stock. Should he, alternatively, prefer to spend these funds or invest them in another type of security, all or a portion of the capital gains accruing from the firm's open market purchases may be realized by selling a proportionate part of his (now more valuable) original holdings.

Once again, then, an investor in a tax free environment <u>on his own</u> can translate marginal corporate funds, $\tilde{R} = \tilde{X} - I$, <u>without cost</u> into potential personal income to spend or reinvest as he wishes, whether paid out directly by the firm as (tax free) dividends, or indirectly as (tax free) capital gains. As M-M demonstrate in [2], therefore, a firm's decision to pay funds as dividends or to retain them for reinvestment at a rate of return ρ, should not affect the range of personal income opportunities available to a shareholder; and, accordingly, should not affect either the value of the firm's shares on the market or its cost of capital.

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*Defining $\tilde{X}$, $\tilde{Y}$, and V as earlier, and further defining funds diverted from operating income (and/or additions to debt) for reinvestment as I, residual funds may be defined as

$$\tilde{R} = \tilde{X} - I.$$

Should all residual funds be paid out as dividends, each investor's net worth from owning the company's shares consists of $V + \tilde{R}$. Alternatively, should $\tilde{R}/V$ of the company's shares be retired through open market purchases, each outstanding share's market value V' may be expected to increase proportionately; i.e.,

$$V' = V(1 + \frac{\tilde{R}}{V}) = V + \tilde{R},$$

as before. Hence, dividends and capital gains can be translated into one another, costlessly, in a tax free environment.

Case 2: Corporate Taxes, No Personal Taxation

As seen from the preceding discussion, rational investors in a no-tax environment presumably would exhibit no preference for the distribution between personal or corporate hands of the total debt obligation D^* held against a particular operating income stream $\tilde{X}$, or for the manner in which potential income payments are distributed by a firm to its owners. As soon as corporate taxes at a rate $0 < T_c < 1$ are introduced and interest payments are admitted as tax deductible expenditures, however, the situation changes abruptly; for potential personal income now consists of operating income less fixed charges on corporate debt after taxes, less personal interest payments; or as,

$$(5) \qquad \tilde{Y} = (\tilde{X} - rD_c)(1 - T_c) - rD_p.$$

The true cost to an investor of a dollar's worth of personal debt,

$$(6) \qquad \frac{\partial \tilde{Y}}{\partial D_p} = -r$$

of course, remains unchanged. As M-M indicate in [3], however, corporate debt service now becomes considerably less expensive, for

$$(6a) \qquad \frac{\partial \tilde{Y}}{\partial D_c} = -r(1 - T_c)$$

is reduced by the magnitude of the tax shield applicable to a deductible business expenditure. Specifically, should marginal corporate tax rates amount to 50% of taxable corporate income, a dollar's worth of corporate debt may be seen from (6) and (6a) to "cost" an investor only half as much as a comparable dollar's worth of personal debt;

$$(7) \qquad \frac{\partial \tilde{Y}}{\partial D_c} = -.5r = .5 \frac{\partial \tilde{Y}}{\partial D_p} .$$

Corporate and personal debt, accordingly, no longer are interchangeable; and a corporation by exploiting its superior borrowing opportunities can, essentially, sell an investor not only the value of its real opportunities $\tilde{X}$, but also the benefits of corporate access to cheap money. Such an opportunity always is valuable to an investor, for it enables the corporation to borrow funds on his behalf at an effective, after-tax rate of interest, $r(1 - T_c)$, while he is free to lend identical, offsetting funds (on his own) at the higher rate, r.

There is, clearly, no a priori limit to the extent to which such a practice can be pushed. More corporate debt (offset by private lending) always will be preferred to less; leading to the now famous M-M conclusion in [3] that, in a world with corporate taxes, any profitable (tax paying) corporation's optimal debt strategy will be, simply, to obtain as much debt as it can.

As we will see in Case 4 [Equation (12)] below, the introduction of personal income taxation (or any personal tax structure that does not distinguish between dividend income and capital gains) does not affect this conclusion; however, the appearance of differential personal income and capital gains taxes does restrict the conclusion's generality.

As in Case 1, above, it is apparent from (5) that the form in which income is distributed to shareholders -- i.e., whether as dividends or capital gains -- should have no effect whatever on the range of potential personal incomes $\tilde{Y}$ available from a given operating income stream $\tilde{X}$. Under the present set of assumptions, therefore, a firm's dividend policy should not affect the market value of its shares.

Case 3: No Corporate Taxes, Differential Personal Income and Capital Gains Taxation

In [1] and [2], Modigliani and Miller brought a bit of turbulence to academic and financial circles by suggesting that, taxes aside, corporate debt and dividend policies should have no effect on either the market value of a firm's shares or its cost of capital. By then going on in [3] to further suggest that the existence of corporate taxes provides an incentive for rational (profit making) firms to carry as much debt as possible, M-M whipped this turbulence into near apoplexy. Taxes, apparently, can have most profound effects on rational corporate financial behavior. Before going on (in Case 4) to discuss the impact on financial policies of the simultaneous existence of corporate, personal income and capital gains taxes, let us complete a portion of the groundwork for that case by considering the impact on financial policies of differential personal income and capital gains taxes, alone. Once again, an optimal set of policies will be considered to be those that maximize the potential personal income $\tilde{Y}$ attainable from a given operating income stream $\tilde{X}$ within a particular tax structure.

Assuming corporate taxes to be non-existent and taxes on personal income to be greater than taxes on capital gains, at least three distinguishable sets of financial strategies would appear to deserve special attention.

1. Let us assume that all corporate earnings are paid out as dividends and taxed immediately as personal income; then

$$(8) \qquad \tilde{Y} = (\tilde{X} - rD_c)(1 - T_p) - rD_p(1 - T_p)$$

which is equivalent to

$$(8a) \qquad \tilde{Y} = [\tilde{X} - r(D_c + D_p)](1 - T_p).$$

2. Should all corporate earnings be translated immediately by the firm into realized capital gains (say, by repurchasing a pro-rata portion of each stockholder's shares), then

$$(9) \qquad \tilde{Y} = (\tilde{X} - rD_c)(1 - T_g) - rD_p(1 - T_p)$$

provides a lower limit to the potential income available to an investor from $\tilde{X}$; and finally,

3. Should all corporate earnings be translated into unrealized capital gains by the firm's open market purchase of its own shares (for those shareholders who prefer not to sell until a future date, say time period, τ), the present value of a given potential personal income may be rewritten as,

$$(10) \qquad \tilde{Y} = (\tilde{X} - rD_c)\left(1 - \frac{T_g}{(1 + \rho)^{\tau}}\right) - rD_p(1 - T_p).$$

The effect on potential personal income of alternative dividend policies within a tax structure that favors capital gains over dividend income is apparent from even the most casual comparison of Eqs. (8), (9), and (10). For any positive level of operating income, corporate and personal debt, rate of return ρ, time horizon τ, and $T_g < T_p$,

$$(11) \qquad (1 - T_p) < (1 - T_g) < \left[1 - \frac{T_g}{(1 + \rho)^{\tau}}\right],$$

and returns subject to taxation as capital gains, clearly, are preferred to comparable returns taxed as regular income. A firm that pays dividends in such an environment, accordingly, increases an investor's tax liability and reduces the personal income attainable from a given earnings stream; with the gap widening [Eq. (10) over (9)] as the date τ at which gains are realized becomes more and more remote.

The magnitude of the loss, of course, varies between individual shareholders according to their marginal tax liabilities, being less severe under U. S. tax schedules for low income than high income investors. The loss, however, is very real and always present. For anyone whose security holdings and taxable income are at all significant, the tax loss resulting from a firm's failure to divert earnings to the extent possible from dividends to capital gains is likely to far outweigh the convenience and lower transactions costs obtained through the payment of dividends. This conclusion, as we shall see in Case 4, continues to hold in more realistic tax environments.

The impact of differential income and capital gains taxes on optimal debt policy, on the other hand, is less clear-cut in the present environment. As indicated in (8a), the original M-M proposition [1] that personal and corporate debt are freely interchangeable -- and therefore, cannot affect a firm's market value or cost of capital -- clearly extends to untaxed, dividend paying corporations.

As soon as capital gains are generated in the present tax environment, through corporate retention or the open market purchase of securities, however, Modigliani and Miller's conclusions in [1] and [3] may be challenged;

for corporate debt service now is deductible only from returns subject to capital gains taxation, while personal debt enjoys a higher personal income tax shield [(9) and (10)]. In keeping with a general strategy that deductible expenses should be incurred by taxable entities (persons or corporations) whose marginal tax liabilities (and, accordingly, tax shields) are greatest, and that returns on investment should be disbursed to the extent possible in the form (dividends or capital gains) subject to the smallest tax liability, a rational corporate management should hold no internal debt and pay no dividends.

Before tacking this proposition to a public bulletin board, however, let us examine the tradeoff between a corporate income tax's inducement to hold internal debt (analyzed in Case 2, and by M-M in [3]) and a differential personal income and capital gains tax's inducement to transfer debt to private hands, by examining all three elements of the U. S. tax structure in Case 4, below.

Case 4: Taxes on Corporate and Personal Incomes, and Personal Capital Gains

As seen in Cases 2 and 3, a rational set of corporate financial policies may depend crucially on the tax environment which conditions both a corporation and its investors. The apparent sensitivity of "optimal" debt policies to the existence of corporate taxes is set forth in Case 2; as is the sensitivity of both debt and dividend policies to preferential tax treatment for capital gains, in Case 3. An attempt will be made here to tie-up the bundle by examining the impact on potential personal income of both corporate and personal taxes under each of three alternative sets of corporate and personal financial strategies:

1. Corporate earnings are paid out entirely as dividends, and taxed as personal income (the situation examined by M-M in [3]). Accordingly,

$$(12) \qquad \tilde{Y} = [(\tilde{X} - rD_c)(1 - T_c) - rD_p](1 - T_p).$$

2. Corporate earnings are translated into capital gains (say, through the open market purchase by a firm of its own securities), with all gains being realized immediately by investors and taxed at capital gains rates. Accordingly,

$$(13) \qquad \tilde{Y} = [(\tilde{X} - rD_c)(1 - T_c)](1 - T_g) - rD_p(1 - T_p),$$

which is equivalent to

$$(13a) \qquad \tilde{Y} = [(\tilde{X} - rD_c)(1 - T_c) - rD_p](1 - T_g) + rD_p(T_p - T_g).$$

And finally,

3. Corporate earnings are translated into capital gains as before, but are realized and taxed at a later date, during time period τ. The present value of such a return, clearly, may be written as,

$$(14) \qquad \tilde{Y} = [(\tilde{X} - rD_c)(1 - T_c)]\left(1 - \frac{T_g}{(1+\rho)^{\tau}}\right) - rD_p(1 - T_p),$$

or as

$$(14a) \qquad \tilde{Y} = [(\tilde{X} - rD_c)(1 - T_c) - rD_p]\left(1 - \frac{T_g}{(1+\rho)^{\tau}}\right) + rD_p\left(T_p - \frac{T_g}{(1+\rho)^{\tau}}\right).$$

From (12), (13a) and (14a) the advantage to investors of returns in the form of capital gains rather than dividends should be clear. For any positive operating income, rate of interest, return on equity, holding period τ, level of debt, marginal tax liability (personal or corporate), whatever, the existence of preferential tax treatment for capital gains, $T_g < T_p$, guarantees that both gross and net personal income can be improved by shifting returns to investors, to the extent possible, from dividends to capital gains. The fact that

$$(15) \qquad (1 - T_p) < (1 - T_g) < \left(1 - \frac{T_g}{(1 + \rho)^{\tau}}\right)$$

in Eqs. (12), (13a) and (14a), respectively, is sufficient by itself to guarantee that a given gross personal cash flow $[(\tilde{X} - rD_c)(1 - T_c) - rD_p]$ results in larger incomes $\tilde{Y}$ through capital gains than dividends. The addition of an extra fillip to the tax shield for interest charges on any personal debt rD_p that may be present,

$$(16) \qquad 0 < (T_p - T_g) < \left(T_p - \frac{T_g}{(1 + \rho)^{\tau}}\right),$$

serves only to reinforce this extension to the real world of Case 3's conclusion that, in general, one's best return on capital is that which is subject to the least taxation.

A similar line of reasoning regarding debt policy, that debt should be held by the party subject to the highest marginal tax rate (and, thereby the greatest tax shield), leads us to conclude in Case 2 where only corporate income is taxed, that all debt should be held by corporations; and in Case 3

where (under enlightened dividend policies) corporate income may be subject to effective taxation only as capital gains, that all debt should be held by individuals. In the real world environment postulated here, both (opposing) forces are operative, and the result predictably is less easy to generalize.

Under (12), where all earnings are paid out as dividends, the inducement of favorable capital gains taxes to shift debt from corporate to private hands does not come into play; and the "maximum debt" strategy proposed by M-M in [3] holds strictly. Its validity can be demonstrated most handily by differentiating (12) with respect to corporate and personal debt to obtain the full after tax cost implications of each. From.

$$(17) \qquad \frac{\partial \tilde{Y}}{\partial D_c} = -r(1 - T_c)(1 - T_p)$$

and

$$(17a) \qquad \frac{\partial \tilde{Y}}{\partial D_p} = -r(1 - T_p)$$

the fact that corporate debt always is less expensive than personal debt for a dividend paying firm becomes apparent immediately.

As soon as capital gains taxation enters the picture, however, this comforting generality disappears, and the relative values of personal and corporate tax shields depend crucially on the array of marginal tax rates, T_c, T_p, and T_g faced by individual investors. Differentiating (13) with respect to corporate and personal debt,

$$(18) \qquad \frac{\partial \tilde{Y}}{\partial D_c} = -r(1 - T_c)(1 - T_g)$$

and

$$(18a) \qquad \frac{\partial \tilde{Y}}{\partial D_p} = -r(1 - T_p)$$

the sensitivity of each to an investor's marginal personal tax rate is directly apparent (assuming capital gains taxes to vary directly with, although less rapidly than, taxes on personal income). At low personal income tax rates corporate debt, enjoying the benefit of an "extra" tax shield (18) clearly is less expensive than personal debt. Assuming capital gains taxes to increase more slowly than personal income taxes, however, the relative advantage of corporate over personal debt holdings tends to narrow until, eventually, a break-even point occurs.

For illustrative purposes, let us assume a structure of rates that at least roughly approximate those in the United States today. Setting

$$T_c = .5$$

$$T_g = \begin{cases} .5T_p, & \text{for } 0 \leq T_p \leq .5 \\ .25, & \text{for } .5 \leq T_p, \end{cases}$$

the implicit after tax cost of personal debt may be seen [from (18a) and Figure 1] to be a simple, linearly declining function of an investor's marginal tax rate. Until capital gains taxes hit their 25% ceiling (at a 50% marginal income tax bracket), the cost of corporate debt also may be seen [from (18) and Figure 1] to decline, albeit at half the rate for personal debt. At this point, of course, a discontinuity occurs; for as

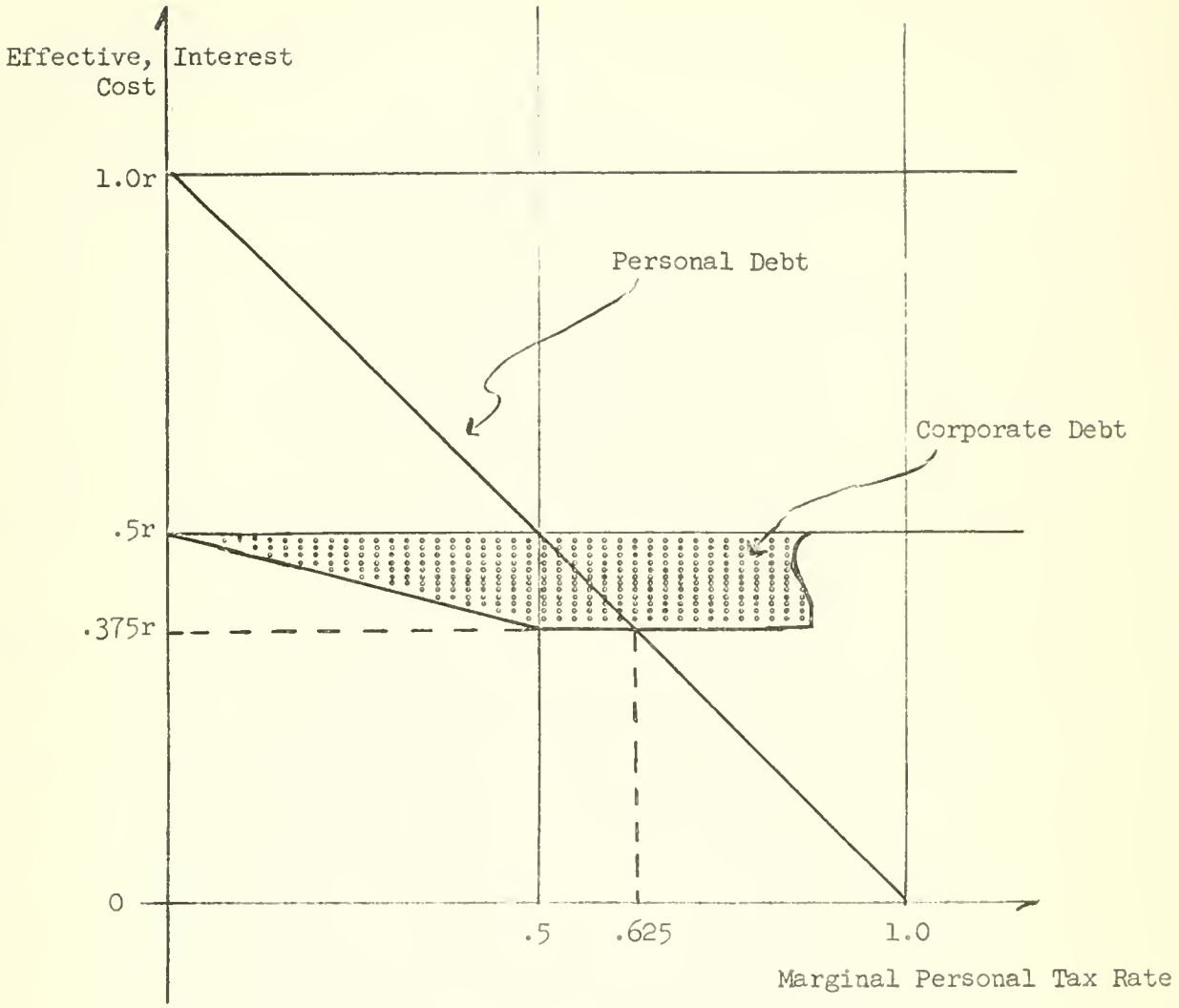

Figure 1

capital gains tax rates "top-out" the true after tax cost of deductible corporate expenditures "bottoms-out." The cross-over point at which [from (18), (18a), and Figure 1] corporate and personal debt become equally costly occurs under such a schedule at marginal personal tax rates of 62 $\frac{1}{2}$%; rather close to the current 70% ceiling.

Should the realization (and therefore the taxation) of capital gains be postponed, of course, the relative advantage of corporate over personal debt is reduced. Replacing T_g in (18) by $T_g/(1+\rho)^{\gamma}$ and moving from $\gamma = 0$ at the one extreme (where all gains are realized and taxed immediately) to $\gamma = \infty$ at the other (where the payment of capital gains taxes is forgiven entirely, presumably by the taxpayer's death), the effective minimum interest cost on corporate debt increases from .375r to .5r; and the marginal tax rate at which corporate and private debt become freely interchangeable drops from $62\frac{1}{2}\%$ to 50%.

Summary

Economists generally do not believe in magic; while financial analysts, apparently, often do. The original set of papers by Modigliani and Miller [1] and [2] are designed to emphasize the lack of magic inherent in the debt and dividend policies chosen by a firm to "package" operating incomes $\tilde{X}$ into personal incomes $\tilde{Y}$ in a tax free environment. An attempt is made here to present M-M's basic argument in more concrete terms by illustrating in Case 1 that, in the absence of taxes, the range of potential personal income alternatives available to an investor from a given operating income stream is not affected by a firm's decision to package marginal income in the form of dividends or capital gains, or by the location of (personal vs. corporate) debt holdings. Any firm's value in such an environment, presumably, depends entirely on the market's evaluation of the character of operating income flows, $\tilde{X}$; which in turn are determined by "real," as distinct from financial, considerations.

As soon as taxes enter the picture, however, M-M are required to back off from their initial propositions, for a firm by selecting a financial strategy sells an investor not only its stream of "real" operating incomes $\tilde{X}$, but also a set of tax liabilities and interest tax shields that depend directly on its financial decisions. By holding debt internally, for example, a firm in the corporate tax environment postulated here in Case 2 and by M-M in [3], can provide private investors with a supply of cheap money that cannot be reproduced externally. Similarly in Case 3, returns to investors in the form of capital gains offer an investor reduced tax liabilities on the one hand and, on the other, corporate debt that is more expensive than private debt. Financial packages that are optimal for any firm, clearly, can be defined easily in either environment; and certainly would be of real value to an investor. Accordingly, such policies can be expected to affect both the value of a firm's shares and its cost of capital.

The more realistic tax environment postulated in Case 4 is less hospitable than either Cases 1, 2, or 3, in that, unlike Case 1, a firm's financial policies clearly do affect investment values, and unlike Cases 2 and 3, debt policies may have different effects on different investors. An optimal (zero) dividend policy continues to exist, however, as in Case 3.

Some qualitative conclusions concerning the types of investors for whom personal vs. corporate debt may appear desirable, however, are possible. From Case 4 lower income investors would appear to prefer corporate leverage, while higher income investors would appear to prefer private leverage. Depending on an investor's anticipated holding period γ, a break-even marginal tax bracket, at which corporate and private debt are interchangeable, will occur somewhere in the range between 50 and 62 $\frac{1}{2}$%.

How a particular firm's decision to reduce or acquire internal debt will affect its market value and cost of capital, therefore, remains an empirical question. By increasing corporate debt a firm presumably will increase its attractiveness to smaller investors (and more important, perhaps, to the institutional investors who channel funds from such persons into the capital markets). Lower debt firms, on the other hand, should be especially attractive to larger shareholders whose personal portfolios may contain considerable leverage.

These conclusions may not be particularly attractive to persons who seek definitive, universal answers to questions of optimal financial policies. Until "management science" can obtain greater insight into the characteristics of operating income streams $\tilde{X}$ that have special appeal for particular types of investors, however -- and that, accordingly, may benefit most from particular financial strategies -- a certain amount of creative artistry will continue to be needed in the design of optimal corporate financial policies.

It may be appropriate, therefore, to close on the following whimsical note:

"We men of science may be momentarily daunted,
But this unending search for Truth
Will drive us on to eventual victory."

Terry and the Pirates
January 1947

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