EFFECTS OF POTENTIAL TAX REFORMS ON STOCK MARKET YIELDS

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Effects of Potential Tax Reforms on Stock Market Yields

Introduction and Summary

In 1977, the Administration was developing a major tax reform program, including proposals to alter significantly current methods of taxing corporate income. Among the specific proposals were full taxation of capital gains (as opposed to taxing 50 percent -- currently 40 percent -- of those gains), and reduction of double taxation of corporate income. When preliminary working papers prepared at the Treasury Department found their way into public circulation, some of the proposals raised alarm in sections of the business community over possible negative effects on stock prices and investment. The proposal to tax capital gains at the same rate as ordinary income was singled out for special criticism. Some thought that the expectation of smaller after-tax returns from the sale of appreciated assets would discourage investment in corporate equity.

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The proposals for full taxation of capital gains and relief of double taxation of corporate income in the 1977 working papers were not included in the Administration's 1978 tax reform recommendations and currently are not being considered by either the Administration or Congress. However, structural reform of taxation of capital income remains a concept worthy of study. In this paper, we discuss how the proposals in the 1977 working papers would affect financial markets. In particular, we show that the long-run decline in share values from full taxation of capital gains could be offset by relatively small amounts of either tax relief on dividends or cuts in corporate tax rates.

Currently, dividends received by corporate shareholders are taxed twice--first, through a corporate tax on income from which dividends are paid (48 percent on corporate income in excess of $50,000 in 1977, currently 46 percent on corporate income in excess of $100,000), and then through inclusion of dividends received (with a $100 exemption) in shareholders' taxable income. Two methods of relieving double taxation of corporate income -- both termed partial integration because they apply to dividends, but not retained earnings -- are the "dividend deduction" method and the "gross-up and credit" method. Under the dividend deduction method, corporations are allowed to deduct dividends paid (as

they currently deduct interest payments), making the dividend taxable only to the shareholder. Under the "gross-up and credit" method, the relief is provided at the shareholder level by permitting the shareholder to take a tax credit for the portion of the corporate tax allocable to his dividend, while also including that tax in reported income. In effect, the "gross-up and credit" method converts the tax payment made by corporations on the portion of income paid out as dividends from an extra tax at the corporate level to a withholding tax on dividends creditable to shareholders in the same way taxes withheld against wages are creditable to employees. It can be shown that the dividend deduction and gross-up and credit methods are equivalent in the sense that they enable the corporation to provide the same increase in after-tax income to shareholders.

The Treasury working papers proposed using the gross-up and credit method to provide partial relief from double taxation of corporate income. Partial relief was to be accomplished by providing the shareholder with a tax credit for a fraction of the tax paid at the corporate level--i.e., for less than 46 percent of gross dividends received. In our analysis, we found that, for a typical stock held by a representative investor for an average holding period, the decrease in the expected after-tax yield from full taxation

of capital gains could be offset by partial dividend relief with a withholding rate of only 18.1 percent. (That is, for each 81.9 cents distributed to stockholders, 18.1 cents would be eligible for credit as corporate tax withheld, making the gross distribution equal to $1). If less than 100 percent of capital gains is taxed, less offsetting dividend relief is required to maintain the same after-tax rate of return. Similarly, full taxation of capital gains can be fully offset, at 1977 taxation levels, by a reduction in the corporate tax rate of 5.8 points, to just over 42 percent.

The findings in this paper are similar to those of several leading Wall Street investment analysts who suggested in published reports in 1977 that the proposals in the Treasury working papers would not on the average lower stock prices. Those reports stressed possible changes in the relative returns of different types of assets, noting that stocks held for potential appreciation (growth stocks) would decline in value relative to stocks with relatively high dividend/price ratios (yield stocks) if both full taxation of capital gains and partial integration were implemented. However, the reports did note that the beneficial effects of partial integration on the stock market as a whole would serve to counter the harmful effects of full taxation of capital gains.

This paper expands on the work of the financial analysts by developing a framework of analysis for comparing the effects of changes in dividend taxation and capital gains taxation on stock prices. Quantitative estimates of the likely impact on stock prices of changes in the portion of capital gains taxed are provided, using explicit assumptions about the rate of return investors require to be willing to invest in stocks and about the average period stocks are held, from purchase to sale. The framework of analysis developed in this paper could be used by investment analysts who want to perform the same computations for these or other tax policy changes with different assumptions about the required risk premium on stocks, the tax bracket of the representative shareholder, and the typical holding period.

We begin by reviewing the reports of four financial analysts on the impact of the anticipated tax reforms, noting the explicit and implicit assumptions on which the conclusions were based. Then, we describe our own framework for estimating the effect of changes in tax policy on the value of common stock. Tables are presented showing the amount of integration and corporate tax rate cuts required to offset the decrease in after-tax return on the sale of stock from increased taxation of capital gains. The derivation of formulas used to compute the results is presented in Appendix A.

Views of Financial Analysts on Treasury's Preliminary Tax Reform Proposals

It had been assumed in the financial community that the Administration tax reform proposals scheduled to be unveiled in late 1977 would include elimination of the capital gains preference, some form of relief of double taxation of dividends, and reduction of the maximum individual tax rate from 70 percent to 50 percent. Some analysts also anticipated corporate tax rate cuts, an extension of the investment tax credit, and some closing of business tax preferences. Using these assumptions, a number of Wall Street financial analysts studied the probable impact of the prospective tax changes on financial markets.

In general, the analysts were not alarmed by the expected tax changes. All regarded reduction of the double tax on dividends as a net plus for the stock market, and with the exception of Howard Stein of the Dreyfus Corporation 1/, viewed the elimination of the capital gains preference as a net minus. Mostly, they viewed the program as a whole as representing neither a strong plus nor a strong minus for the market.

The reports were focused on the implications of the expected tax changes for relative prices of various assets. There was a general consensus that "yield" stocks would be helped by reduction of double taxation, while "growth" stocks would be hurt by the elimination of the capital gains preference, but there were different opinions about the potential effects on municipal and corporate bond markets.

The only overall negative note in most of the analyses was a fear that, by creating uncertainty, advance publicity about major tax revision proposals may have hurt the stock market, and possibly depressed real investment as well. Generally, the analysts believed some possible ramifications could not be foreseen, even if the details of the program were known. The delay in revealing the Administration's proposal was viewed as making matters even worse.

We briefly summarize below four reports by financial analysts on the prospective tax changes.

Merrill-Lynch 2/

Merrill-Lynch analysts thought the entire package, including full taxation of capital gains and dividend relief, would have little effect on the return on investment in

common stocks. At first, the market would fall because of confusion. In the long run, the principal effect would be a shift from growth stocks to yield stocks. The effects of full taxation of capital gains and partial integration would cancel each other out, leaving the average level of stock market prices unchanged. Reducing the corporate income tax, increasing the investment tax credit, and allowing faster tax depreciation would all have a small positive effect on stock prices, while eliminating DISC (Domestic International Sales Corporations, a tax deferral arrangement available to exporters) and other preferences would have a small negative effect. Lowering the maximum individual tax rate would have a positive effect on both the stock and bond markets.

The Merrill-Lynch analysts estimated the effects on yields of individual stocks of four types of dividend-relief plans: 100 percent partial integration using the exact (i.e., pro-rata) method 3/, 20 percent flat rate partial integration, full integration, and dividend deduction. In all cases, it was assumed that cash dividends would remain fixed. This payout assumption caused the predicted increase in yield to be much lower with the dividend deduction method. However, the study did note that allowing a dividend deduction would create pressures for increased cash dividends.

The Merrill-Lynch analysis of the effects of full taxation of capital gains implicitly assumed that capital gains are realized every year. Because a share of stock typically is sold every 7 to 10 years 4/, giving rise to large benefits from deferral of tax on capital gains, the impact of the capital gains tax is overstated by the Merrill-Lynch method.

Merrill-Lynch analysts expressed concern that the Treasury program might limit capital formation by discouraging investment in growth stocks.

First Boston Corporation 5/

First Boston analysts saw the implications for investment as "not all that clear," even assuming a reasonable guess as to what the Administration program would include.

They recommended a switch from deep discount bonds to current coupons because of the expected elimination of the capital gains preference, and from growth stocks to yield stocks. These were general observations, but were not advanced with great urgency. First Boston analysts suggested a possible switch toward stocks of high tax-rate corporations, on the assumption that the "exact method" of partial integration would be proposed.

The First Boston study predicted that eliminating the capital gains preference would cause the market to go down, if all else remained the same. Pressure to pay out dividends would increase, and business confidence, willingness to take risks, and productivity would be damaged. Middle-sized companies in the risk area would be hurt the most.

Analysts believed discount bonds would fall in price, but not very much. In their "worst case" analysis, which assumed that the same types of taxpayers would continue to buy discount bonds, they described a greater than 3.5 point drop of telephone bonds as "mathematically preposterous," regarding a decline of only half a point as more likely. 6/

In contrast, the study predicted that partial integration, all else equal, would cause the market to "take off." Taxable investors would shift from bonds to stock, causing the debt/equity ratio in corporate financial structures to fall. Private pension funds, State and local retirement plans, and foreign investors would sell yield stocks. If TBO (the taxable bond option, a 1978 Administration proposal to permit, but not require, State and local governments to issue taxable debt with a 40 percent Federal interest subsidy) were included, there would be great pressure on State and local retirement funds to buy all taxable issues in their localities. In this event, Treasury would not gain the revenue increase anticipated from excluding tax-exempts from integration.

Using a method similar to that of the Merrill-Lynch study, First Boston analysts examined the impact on after-tax yields of the proposed changes. They also overstated the effects of full taxation of capital gains by assuming that capital gains are realized annually.

First Boston also produced separate sector analyses:

1. Commercial Banks 7/

Banks would gain less from partial integration than other companies because a larger portion of their earnings is from tax-exempt, tax-deferred, or foreign sources and therefore might not be eligible for a dividend credit. As a result, banks would shift to some degree out of foreign investments and out of tax-exempt portfolios. Fixed-income securities in general would become less attractive.

2. Electric Utilities 8/

The "exact method" of partial integration would depress utility stock prices because utility taxes are low. Dividend deduction would not help utilities, according to the analysis, because payout ratios are so high that potential increases in cash dividends are small. The elimination of

the capital gains preference would have a short-term negative effect, but losses would be small because capital gains in utility shares are not sizable. An increase in the ITC would be favorable.

3. Fixed Income Securities 9/

Partial integration would cause a shift from debt to equity, depressing bond prices somewhat. Elimination of the capital gains preference would cause discount bonds to decline in price relative to current coupons (but not that much). If TBO were enacted, the subsidized bonds could be bought by tax-exempts; thus, Treasury would be subsidizing yields to institutions that pay no tax.

The First Boston report outlined other possible impacts and noted how exact provisions of the integration plan might affect markets for municipal bonds and corporate bonds.

In summary, First Boston analysts believed the anticipated Treasury proposals would have no major overall impact on financial asset prices. Most of their analysis was concerned with changes in relative attractiveness among different types of assets (yield stocks vs. growth stocks, stocks vs. bonds, etc.), and they stressed the uncertainty in forecasting price changes.

Dreyfus Corporation 10/

The Dreyfus study concluded that the expected tax reform program would have a very favorable effect on the stock market.

Comparing the dividend yield to the yield on bonds, the latter was found to be higher for practically all stocks. The same comparison was made using dividends projected 5 years in the future. Integration was shown to raise the after-tax yield on stocks significantly. In many cases, this would make the yield on stocks higher than the yield on bonds. Consequently, the study concluded, there would be a large shift of funds into the stock market.

The Dreyfus analyst believed that taxing capital gains as income would not be viewed as a deterrent. In contrast to the Merrill-Lynch and First Boston studies, which assumed that capital gains are realized every year, the Dreyfus study implicitly assumed that capital gains are never realized. Thus, the portion of capital gains included in the tax base would not affect an investor's prospective yield.

The Dreyfus report concluded that "once common stock yields have been improved by the gross-up credits, investors will take in stride the abolition of the capital gains benefit."

Marilyn V. Brown 11/

Brown thought the impact on the economy of combining some form of dividend integration with full taxation of capital gains would be adverse. The program could have no overall effect on share prices if integration offset higher taxes on capital gains. However, the proposal would help yield stocks relative to growth stocks -- a point similar to those stressed in the Merrill-Lynch and First Boston studies. According to Brown, the proposals would help large, stable corporations and hurt companies that need capital to finance expansion.

Brown concluded that the combination of the two measures "would appear to be counter to public policy for it would advantage companies paying dividends today while disadvantaging those providing the economic growth for tomorrow." 12/

Brown presents many examples illustrating the impact different methods of integration and full taxation of capital gains would have on before-tax rates of return required to provide the same net yield to taxpayers in different tax brackets. In her examples, capital gains are treated as if realized every year; a method, also used in the Merrill-Lynch and First Boston studies, that overstates the effects of the proposed changes in capital gains taxes on share values.

Summary

Most of the analysts saw full taxation of capital gains and dividend integration as having offsetting effects on the level of the stock market. Their analyses of the 1977 tax proposals stressed changes in relative share prices, with yield stocks expected to rise in value and growth stocks to decline. The analyses generally are hedged and some fear of increased uncertainty is expressed. Strikingly different from the others, the Dreyfus analysis expected the proposals in the 1977 working papers would have a very favorable effect on the stock market and on investment.

Tax Policy and Stock Prices -- Another Approach to Analysis

The single most striking feature of stock market yields is their great volatility through time. During the period 1971-76, for example, average annual total returns for the 500 stocks included in the Standard and Poors Composite Index varied from -26.5 percent in 1974 to +37.2 percent in 1976. Such fluctuations make forecasting the effect of any tax proposal on common stock yields extremely perilous. Indeed, since most of the year-to-year variation apparently is random with respect to underlying business and financial market

conditions, it may not even be possible to determine the effects of tax policy after the fact. Nonetheless, long-term trends in common stock yields are certainly related to yields of other financial assets, to inflation rates, and to corporate dividend policies. Observation of these less volatile measures should allow inferences about the effect of tax policy on equilibrium common stock yields.

In our analysis, we assume that the equilibrium rate of appreciation for common stocks is determined by (a) the after-tax rate of return from competing financial assets; (b) a premium for the additional risk associated with common stocks; (c) the recent historical ratio of dividends to share prices and; (d) the tax treatment of returns from common stock as coompared with those from other assets.

We compared yields from alternative assets to investors having a 30 percent marginal rate of individual income tax. That tax rate was chosen because tax-exempt bonds typically yield about 30 percent more than fully taxable bonds of comparable quality. Leaving aside common stocks, taxpayers facing rates of 30 percent or more on additions to their portfolios have higher after-tax yeilds from tax-exempt bonds, while those paying lower rates realize greater returns from taxable bonds.

However, because of the preferential treatment of capital gains, the tax treatment of income from common stocks is intermediate between that of fully taxable and tax-exempt securities. This suggests that the "niche" for common stocks is in a range of marginal tax rates around 30 percent. That is, the investor most likely to find common stocks attractive relative to either type of bond is in the 30 percent tax bracket. Such an investor will prefer stocks to tax exempts because before-tax yields on tax exempts are relatively low and will prefer stocks to fully taxable securities because the higher tax on taxable bonds more than wipes out the higher (risk adjusted) before-tax yield.

Table 1 presents data demonstrating an empirically plausible long-run equilibrium consistent with the foregoing discussion.

In this example, after-tax (risk-adjusted) rates of return on common stocks and taxable bonds are equalized at a tax rate of 27 percent. As Table 1 shows, if (as was assumed) a premium of 1.5 percent is sufficient to equalize for risk, then a taxpayer facing a marginal rate of 27 percent will be indifferent between common stock and taxable bonds (both have a 6.34 percent rate of return), while tax-exempt bonds clearly would be inferior (6.0 percent

Table 1

Equilibrium Returns for Different Taxpayers

Type of Asset	Annual Before-Tax Rate of Return	After-Tax Rate of Return		
		27% rate taxpayer	30% rate taxpayer	32% rate taxpayer
Taxable bond	8.57	6.34	6.0	5.57
Common stock (After risk adjustment) 1/	9.5	7.84	7.65	7.50
		(6.34)	(6.15)	(6.0)
Tax-exempt bond	6.0	6.0	6.0	6.0

1/ Assumed differential for risk is 1.5%.

return). On the other hand, tax-exempt bonds and common stocks have equal risk adjusted yeilds when the tax rate is 32 percent. In the range between 27 percent and 32 percent, common stocks have the highest yield; figures for the 30 percent tax rate are shown in the table. The assumptions used in computing the after-tax return on common stock are discussed in the next section.

Relative Importance of Price Appreciation and Dividends

The before-tax common stock yield of 9.5 percent used in the example (Table 1) was computed by combining appreciation in share prices and periodic dividend distributions to shareholders. The relative importance of these two components of any projected equilibrium yield is very important for the analysis of the effects of tax policy for two reasons. First, a preferential tax rate applies only to appreciation. Second, the tax applied to appreciated assets is deferred until realization, while the tax on dividends is current. Thus, the effect on stock prices of a policy tradeoff between increased taxation of capital gains and varying degrees of dividend integration depends directly on the proportion of expected share price appreciation in the total return. Failure to take account of this relationship is the principal weakness of the studies by independent financial analysts summarized above.

To project the average expected rate of share appreciation in equilibrium we appeal to relatively stable historical relationships. (See appenedix B). In recent years, the ratio of size of dividends to corporate share prices has been about 4.0 percent. If this rate continues, an average annual price appreciation of 5.3 percent is required to produce a 7.65 percent total yield under present tax law. 13/ In the projected equilibrium, the average share of stock is therefore one having the following characteristics:

average annual before-tax total yield	= .095,
average dividend-to-price ratio	= .040,
average annual expected rate of price appreciation	= .053,
average number of years between purchase and sale of a share	= 8.0, and
average annual after-tax yield at a 30 percent rate of tax	= .0765.

This projected equilibrium has a ratio of price appreciation to total yield (.56) that is consistent with historical averages going back as much as 50 years and that exactly equals the average over the 25 year-period 1951-76, 14/ as shown in appendix B.

Tax Policy Tradeoffs between Capital Gains Treatment and Dividend Integration.

A policy to tax capital gains at full rates would reduce the annual after-tax yield on the average common stock just described from 7.65 percent to 6.97 perent (see appendix A). After adjustment for risk, this yield is less than that available from bonds at any tax rate. Shareholders paying marginal tax rates above 30 percent would obtain higher yields from tax-exempt bonds. Similarly, for taxpayers facing rates below 30 percent, yields from the average stock would fall below those from taxable bonds or high-dividend stocks. The equilibrium price of the average share and, for the same reasons, of low-dividend growth stocks, would fall relative to bonds and high-dividend stocks.

A similar approach is appropriate for evaluating policies for relief of double taxation of dividends. Initially, the rate of return would rise from dividend-paying

stocks and in equilibrium their prices would rise relative to bonds and growth stocks. Tax policy will determine the size of this adjustment according to the share of corporate taxes allowed to be regarded by shareholders as withholding.

For example, in the simplest dividend relief system, the shareholder could be allowed to count a fixed percentage (x percent) of the declared dividend as tax withheld by the corporation on his behalf. If this amount were 20 percent, each dollar of declared dividend would consist of 80 cents of cash distribution from the corporation and 20 cents of withheld tax. A corporation that now pays 80 cents per share could pass the full amount of tax relief to shareholders by henceforth declaring a dividend of $1. This would leave the cash dividend (and the corporate cash flow) unchanged while having the effect of adding 20 cents to before-tax income of the shareholders. This corporate behavior is assumed in the following analysis, although it would, of course, not be required. For the average common stock described earlier, the rate of withholding for dividends that just compensates for full capital gains taxation, leaving after-tax return unchanged, is 18.1 percent 15/ (see appendix A).

Table 2 shows five alternative tax programs that simultaneously would reduce the capital gains preference (relative to 1977 law) and the double taxation of dividends, but would leave unchanged the yield from an average share of common stock for a taxpayer facing a 30 percent marginal rate. 16/

The trade-offs shown in table 2 imply that average common stock prices should increase if full capital gains taxation were accomplished by partial integration with an average rate of dividend withholding in excess of 18.1 percent. Similarly, if the portion of capital gains included in taxable income were increased only from 50 to 60 percent, partial integration with withholding rates as low as 5 percent would bring a net increase in average stock yields. 17/

Any program that combines an increased capital gains tax and dividend relief will, of course, favor dividend-paying stocks relative to growth stocks. Therefore, a policy to leave average share yields unchanged would result in higher equilibrium prices for stocks having relatively high ratios of dividend to total yield. Conversely, such a policy would produce lower prices for those stocks having relatively high appreciation as a share of total yield.

Table 2

Dividend Relief/Capital Gains Tradeoff

Rate of Inclusion of Capital Gains	Rate of Creditable Dividend Withholding necessary to leave after-tax yield unchanged
100%	18.1%
90%	15.0%
75%	10.3%
67%	6.7%
60%	4.8%
50%	0.0%

Table 3 shows, for example, that a tax program that combines full taxation of capital gains and dividend withholding of at least 28.6 percent would increase equilibrium stock prices for all shares that have equilibrium dividend price ratios of at least 2.57.

Other Policy Tradeoffs with Increased Taxation of Capital Gains

An analysis similar to the foregoing can be applied to other tax proposals that might, on the average, fully compensate shareholders for increased taxation of capital gains. For example, if the rate of dividend payout per dollar of after-tax corporate earnings is not changed, then an increase in corporate after-tax income due to reduction in the corporate tax should result in a proportionate increase in both the dividend price ratio and the expected rate of share appreciation. Corporate tax reduction thereby could increase before-tax total yields to shareholders enough to reestablish the total yield after tax.

Table 3

Effect of Payout Ratio on
Dividend Relief/Capital Gains Tradeoff

Average annual rate of share price appreciation	Dividend price ratio	Rate of creditable dividend withholding necessary to leave after-tax total yield unchanged at 7.65%
5.3%	4.0%	18.1%
6.0%	3.7%	23.2%
6.5%	2.57%	28.6%
7.5%	1.37%	46.4%

Consider again the prospect of full inclusion of capital gains as ordinary income. According to the previous analysis this change would immediately reduce the after-tax yield of the average common share from 7.65 perent to 6.97 percent. A 9 percent increase in both the dividend price ratio and the rate of price appreciation is sufficient to restore the after-tax rate of return to 7.65 percent for a shareholder subject to a 30 percent marginal rate of tax. This tax reduction could have been accomplished in 1977 by reducing the corporate tax rate 5.8 percentage points (from 48 percent and 42.2 percent). 18/

Table 4 shows the policy tradeoff between increased inclusion of capital gains in taxable income and reduction in corporate tax rates. Each policy combination would leave unchanged expected after-tax yield for a 30 percent rate taxpayer and the equilibrium share price unchanged for the average share of common stock.

Conclusions

The principal purpose of this analysis has been to illustrate the complementarity between proposals to reduce the capital gains preference and to relieve the double

Table 4

Corporate Tax Cut/Capital Gains Tradeoff

Rate of Inclusion of Capital Gains in Taxable Income Percent	Corporate Tax Rate Reduction Necessary to Leave Common Stock Yield Constant (No. of percentage points)
60	1.3
66 2/3	2.1
75	3.1
85	4.6
100	5.8

taxation of dividends. It shows, for one plausible estimate of the average performance of common stock, that in 1977 a relatively modest amount of partial integration (a withholding rate of approximately 18 percent) could have fully compensated for full taxation of capital gains. It also shows that, for any level of capital gains inclusion, there is a companion program of double-tax relief that will raise equilibrium prices for most common stocks. As an alternative, reduction of the corporate income tax also could offset any depressing effect of increased capital gains taxation on stock market yields.

Obviously, one could make different estimates of the characteristics of common stock in market equilibrium, which could alter the quantitative results. Therefore, the analytical framework shown here can be used by stock market analysts who might have different expectations about prospective equilibrium yields.

FOOTNOTES

1/ See Stein (1977).

2/ See Hoffman, Resnick, and Ho (1977).

3/ In the "exact" or "pro-rata" method of partial integration, the "gross-up" allowed to shareholders of a corporation depends on the ratio of corporate taxes paid to the corporation's "economic income." In effect, corporate preferences are denied "pro-rata" with the share of economic income distributed. For a discussion of how partial integration with preferences "phased out" might work, see McLure and Surrey (1977).

4/ According to data compiled from 1973 tax returns, the average holding period for each share of corporate stock sold is about 7 years. However, this understates the "true average" holding period because some shares are held indefinitely.

5/ Summarized by Drill (1977).

6/ See also Senft (1977). One example he cites is of a $5 coupon bond with 25 years to maturity. If the interest rate is 8 percent, the capital gains rates is 30 percent for the marginal investor, and the ordinary income tax rate is 48 percent, this bond will yield the same after-tax return as a new bond, at a price of $73. If the capital gain tax preference were eliminated, the price of the discount bond would fall to $70.85, a drop of 2.15 basis points.

7/ See Weiant, Garvin, and Asher (1977).

8/ See Barnes (1977).

9/ See Senft (1977).

10/ See Stein (1977).

11/ See Brown (1978).

12/ Brown (1978), page 8.

13/ This is the after-tax rate of return for an individual who is taxed at a marginal rate of 30 percent, has no minimum tax liability, plans to reinvest all dividends in

the same stock, and to sell all of these shares at the end of 8 years. See appendix A for a derivation. For nontaxable shareholders, reinvestment of dividends would produce an annual return of (1.04 x 1.053-1) = .095. This is the amount of "before-tax total yield."

14/ These figures refer to the nominal yield on share purchases. The expected real yield will, of course, be lower if there is anticipated inflation. However, inflation also lowers the real yield on alternative financial assets, including taxable and tax-exempt bonds. Because under current law taxes are levied on nominal rather than real returns, the tax policy changes considered here would have the same effect on relative asset valuations for any anticipated rate of inflation.

15/ Note that for versions of dividend relief other than the simple fixed-percentage gross-up and credit, this rate is the average withholding per dollar of gross dividends. For any given ratio of price appreciation to dividend yield in the total yield from stock, there may be a feasible amount of dividend tax relief that will just equal, in present value terms, any increased tax on capital gains.

16/ If individual tax rates were also reduced, higher equilibrium returns would prevail for all taxable investment. A similar tradeoff between stocks and bonds would still be applicable, however.

17/ Again, these results assume no change in cash distributions to shareholders. The tendency for share prices to increase would be reinforced by any tendency for corporations to increase dividend payout.

18/ Estimated corporate income tax receipts under 1977 law was $71.9 billion at 1976 levels of income. Income of corporations after tax was $108.0 billion. An increase in after-tax income of 9 percent, to $117.7 billion, would require a tax reduction of $9.7 billion. On a taxable corporate income base of $168.5 billion, this result would require a tax reduction of 5.8 percentage points. This ignores the small percentage of corporate income for which the marginal tax rates were the normal rates of 20 percent and 22 percent in 1976.

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Appendix A

<u>Calculation of the annual after-tax yield on corporate shares</u>.

Let g = annual rate of appreciation of price per share

d = annual ratio of dividend to price, and

t = individual income tax rate.

Then for each share purchased at time 0, the total value of shares at time 1, after reinvestment of dividends paid at time 1, is:

$$[(1+g) + (1+g)d(1-t)] = (1+g)[(1+d(1-t)] \tag{1}$$

For simplicity, let after-tax dividends be:

$$d(1-t) = Z \tag{2}$$

then, the value of shares at time 1 is:

$$V_1 = (1+g)\ (1+Z) \tag{3}$$

For the purpose of computing capital gains, the basis in stock owned at time 1 (B_1) is the sum of: (a) the original share at its purchase price and (b) the reinvested dividend at its purchase price. This amount is:

$$B_1 = 1+(1+g)Z \tag{4}$$

The capital value of shares and their basis at time 2 are:

$$V_2 = (1+g)(1+g)(1+Z)+Z(1+g)^2 = [(1+g)(1+Z)]^2 \tag{5a}$$

and

$$B_2 = 1+(1+g)Z + (1+g)^2 (1+Z)Z \tag{5b}$$

These results can be generalized to n periods as:

$$V_n = [(1+g)(1+Z)]^n \tag{6a}$$

and

$$B_n = 1+ \sum_{i=1}^{n} (1+g)^i(1+Z)^{i-1}Z = 1+Z(1+g) \sum_{i=1}^{n} [(1+g)(1+Z)]^{i-1} \tag{6b}$$

Again, for simplicity, define

$$(1+g)\ (1+Z) = r, \tag{7}$$

which maybe interpreted as the yield before the capital gains tax.

Then,

$$V_n = r^n \text{ and} \tag{8a}$$

$$B_n = 1+\frac{Zr}{(1+Z)} \sum_{i=0}^{n} r^{i-1} = 1+\frac{Zr}{(1+Z)}\frac{(r^n-1)}{r-1} \tag{8b}$$

If all shares that have accumulated are to be sold after n years, then the shareholder will realize an amount $\hat{V}_n$ of after-tax capital gain. This result may be written:

$$\hat{V}_n = V_n - xt(V_n-B_n) = r^n(1-xt)+xt\left[\frac{rZ}{1+Z}\frac{(r^n-1)}{r-1} + 1\right] \tag{9}$$

where x is the share of capital gains to be included in taxable income. We wish to compare alternative programs in terms of the average annual after-tax yield per share, y, which is given by:

$$y = \hat{V}_n^{1/n}-1. \tag{10}$$

As an illustration, this paper's conclusion that full taxation of capital gains can be fully offset by an 18.1 percent gross-up and credit for dividends is derived here in detail. The initial parameters are:

$$g = 0.053,$$

$$d = 0.04,$$

$$t = 0.3,$$

$$n = 8, \text{ and}$$

$$x = 0.5.$$

Therefore,

$$Z = (1-0.3)(0.04) = 0.028,$$

and

$$r = (1.028)(1.053) = 1.0825.$$

Hence,

$$V_n = (1.0825)^8 = 1.8853,$$

which is the accumulated value, before capital gains tax, of the original one share after reinvestment of dividends. From equation (6b), the basis in this stock is:

$$B_n = 1 + \frac{(.028)(1.0825)}{1.028} \frac{(1.8853-1)}{1.0825-1} = 1.3164.$$

Capital gains tax is, therefore,

$$xt(V_n-B_n) = (0.5)(0.3)(1.8853 - 1.3164) = 0.0853,$$

and after-tax accumulated value is:

$$1.8853 - .0853 = 1.80.$$

This gives an annual, after-tax yield (see equation 10) of:

$$y = (1.8)^{.125}-1 = 0.0765,$$

the prescribed equilibrium rate of return.

If capital gains are fully included in taxable income,

$$xt(V_n - B_n) = (1.0)(.3)(1.8853 - 1.3164) = 0.1707$$

and

$$\hat{V}_n = 1.8853 - 0.1707 = 1.7146.$$

Thus,

$$y = (1.7146)^{.125} - 1 = 0.0697.$$

By trial and error, using equation (7), we found that restoring the total after-tax yield to 0.0765 requires that the after-tax dividend yield increase from 0.028 to 0.0342. Under partial dividend integration, the relationship of the rate of dividend withholding, w, to the new after-tax dividend yield, Z, is:

$$\hat{Z} = \frac{Z}{1-w}$$

or

$$w = 1 - (Z/\hat{Z}).$$

In this example, then

$$w = 1 - \frac{.028}{.0342} = .181,$$

the dividend withholding rate (or gross-up fraction) that will just restore the total after-tax yield from the average share.

Appendix B

Historical Relationship of Price Appreciation and Total Return for Corporate Stocks 1/

Period :	Total return	Price appreciation	Appreciation/ total return
1926 - 76	9.2	4.3	.53
1936 - 76	10.1	4.6	.55
1946 - 76	10.6	6.5	.61
1951 - 76	10.8	6.0	.56
1956 - 76	7.8	4.1	.53
1966 - 76	5.0	2.7	.54
1971 - 76	6.4	0.9	.14
Projected equilibrium 2/	9.5	5.3	.56

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1/ Derived from data published in Roger G. Ibbotson and Rex A. Sinquefield, Stocks, Bonds, Bills, and Inflation: The Past (1926-1976) and the Future (1977-2000), Financial Analysts Research Foundation, 1977. These averages are based upon the Standard and Poor's Composite Index.

2/ Total return before tax is derived by multiplying the assumed dividend/price ratio by the expected rate of appreciation, (1.04)(1.053) = 1.095.