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HOW A CLOSED-END FUND CAN OUT-PERFORM ITS OWN STOCK PORTFOLIO

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I. Introduction

The Investment Company Act of 1940, as amended by the Internal Revenue Code of 1954 and 1986, establishes preferential tax treatment for investment companies—typically public corporations investing in security portfolios as their main line of business—as opposed to all other "regular" corporations. While regular corporations are taxed separately from their shareholders, recognized investment companies are allowed to pass through their income to shareholders, largely avoiding separate corporate taxation. The purpose of this privilege is to allow small investors access to the specialized services of large investment funds, without payment of an additional layer of corporate taxes.

In previous studies, financial theorists seek to explain differences in the pricing of equity claims issued by closed-end funds as opposed to open-end ones (also known as mutual funds) [1, 3, 4, 7, 13, 17, 18, 19, 21, 22]. Much of the research is focused on potential tax advantages from "opening up" closed-end funds, where both categories of funds are subject to pass-through tax treatment.

This study explores an alternative tax-related strategy available to closed-end investment companies. This strategy is based on the observation that there is nothing in the law to prevent closed-end investment companies from choosing not to be subject to pass-through tax treatment—a treatment currently preferred by all funds. It is demonstrated that under the tax regimes prevailing before and after the 1986 Tax Reform Act, a closed-end stock fund choosing regular corporate taxation can systematically and substantially out-perform funds holding the same portfolio but subject to pass-through tax treatment. The market value of a closed-end equity fund so taxed can be significantly raised to exceed the sum of market values of the stocks held in its portfolio. The source of additional (private) value is the opportunity to reinvest earnings at a rate of return exceeding the cost of retained earnings. The existence of

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such an opportunity depends on the exogenous tax regime and typical holding period unique to each stock, but also on stock growth rates and the holding period exercised by the fund—two variables over which the fund has full control. Given a positive spread between the rate of return on a given stock and the cost of retention, management can increase the rate of retention, thereby raising the market value of the fund. Only if the spread is sufficiently large, can the fund's market value be raised enough to offset the burden of the additional layer of corporate taxes. Unlike any other regular corporation, a publicly-held closed-end investment company is most likely to be exempt from any penalty due to excess accumulation of earnings under Sections 531 and 532 of the Internal Revenue Code. In particular, Section 533(a) of the Code describes "unreasonable accumulation" as reaching "beyond the reasonable needs of the business," a limitation which cannot be logically applied to a company whose main business is to buy and hold securities.[1] In further support of this argument, it is noted that the IRS has had great difficulties in imposing this penalty on public corporations whose main line of business is not investment in securities. Finally, it is noted that the presumption of tax avoidance by retention (the ultimate rationale for this penalty) is largely eliminated by the parity between the personal tax rates of dividends and capital gains under the 1986 Act. Contrary to this rationale, it is demonstrated here that increased retention by a closed-end fund taxed as a regular corporation would not decrease the burden of the dividend tax, and would add the burden of capital gains tax. Despite the increased rate of capital gains tax under the 1986 Act, it is shown that closed-end equity funds can still gain from switching to regular corporate taxation.

This paper proceeds as follows. A theoretical model is presented in Section II, followed by comprehensive numerical examples in Section III, interpretation in Section IV, and a summary in Section V.

II. The Model

Consider a closed-end investment company holding a portfolio of publicly-traded stocks whose own stock is traded publicly. This investment company (IC) and the typical stock asset (SA) held in its portfolio maintain constant growth rates and debt-equity ratios, and are assumed to behave rationally by resorting to retention of earnings as a first source of equity funds. This investment company chooses to be taxed as a regular corporation, foregoing pass-through tax treatment.

Let:

$\hat{P}$, P = present share price of the IC and SA, respectively;
$\hat{E}$ = post-corporate-tax per-share earnings of the IC, expected at the end of year 1;
$\hat{b}$ = the IC's constant rate of retention (reinvestment) out of $\hat{E}$;
$\hat{D}$, D = per-share dividend of the IC and SA, respectively, expected at the end of year 1, where $\hat{D} = \hat{E}(1 - \hat{b})$;
$\hat{R}$ = IC's average rate of return on incremental investment in its SA;
$\hat{g}$, g = growth rates of earnings, dividends, and price per share for the IC and its SA, respectively, where $\hat{g} = \hat{b}\hat{R}$;
r = post-personal-tax equivalent-risk opportunity rate of return earned by shareholders of both firms, conveniently assumed to be independent of the growth rate;
t^D = average marginal personal tax rate on passive income, including dividends paid by both firms;
k^D = marginal tax rate paid by corporations on dividend income;
t^G = average marginal statutory tax rate paid by individuals on realized capital gains;
k^G = effective marginal tax rate on accrued corporate capital gains, the economic equivalent of the statutory tax rate on realized gains (more on this below).

Consider first the SA held by the IC. A share of the SA is expected to pay at the end of year t a post-tax dividend of $D(1 - t^D)(1 + g)^{t-1}$, so that the value of all future dividends is $D(1 - t^D)/(r - g)$. Under annual ex-dividend share trading, the capital gains tax expected in year t is $t^G P g(1 + g)^{t-1}$, so that the present share price reflecting dividends and capital gains tax payments is

$$P = \frac{D(1 - t^D)}{r - g} - P\frac{t^G g}{r - g} \qquad (r > g)$$

On the alternative assumption of an i-year shareholding period ($1 \leq i \leq \infty$), the value of capital gains tax payments is modified so that

$$P = \frac{D(1 - t^D)}{r - g} - P\frac{t^G g_i}{r_i - g_i}$$

where $g_i = (1 + g)^i - 1$ and $r_i = (1 + r)^i - 1$. This implicit price expression yields the explicit price formula [23]

$$P = \frac{D(1 - t^D)}{r - g} \cdot \frac{r_i - g_i}{r_i - g_i(1 - t^G)}. \qquad (r > g) \quad (1)$$

To follow the same logic, a share of stock representing a claim on the IC is priced at

$$\hat{P} = \frac{\hat{D}(1 - t^D)}{r - \hat{g}} \cdot \frac{r_j - \hat{g}_j}{r_j - \hat{g}_j(1 - t^G)}. \qquad (r > g) \quad (2)$$

where $j(j \gtrless i)$ is that firm's dominant shareholding period. Based on the relationships

$$\hat{D} = \hat{E}(1 - \hat{b}) \quad (3)$$

$$\hat{E} = D(1 - k^D) + Pg(1 - k^G) \quad (4)$$

we substitute (4) in (3), and (3) in (2), and then set $D = 1$ to obtain[2]

$$P = \frac{1 - t^D}{r - g} \cdot \frac{r_i - g_i}{r_i - g_i(1 - t^G)} \quad (5)$$

$$\hat{P} = \frac{[1 - k^D + Pg(1 - k^G)](1 - \hat{b})(1 - t^D)}{r - \hat{g}} \cdot \frac{r_j - \hat{g}_j}{r_j - \hat{g}_j(1 - t^G)}. \quad (6)$$

Based on the relationships

$$\hat{g} = \hat{b}\hat{R} \quad (7)$$

$$\hat{R} = \frac{D(1 - k^D)}{P} + g(1 - k^G) \quad (8)$$

the value of $\hat{P}$ given by (6) is calculated by setting $D = 1$ in (8), and then performing these substitutions in the following order: (5) in (8), (8) in (7), and (7) in (6).

Inspection of equations (5) − (8) suggests that a general statement may not be made about the relative magnitude of the prices stated by (5) and (6), and thus about the advantage of choosing direct investment in the SA (or, equivalently, indirect investment via a fund subject to pass-through tax treatment) vs. indirect investment through an IC. We show next that under the regime imposed by the 1986 Tax Reform Act, the IC stock can systematically and substantially out-perform the SA held in its portfolio. This is accomplished by choosing a sufficiently high retention ratio to offset the disadvantage of an additional layer of inter-firm taxation. To demonstrate the principle involved, consider first two special cases: one favoring direct investment ($P > \hat{P}$ under $i = j = 1$) and one which may favor either alternative ($P \gtrless \hat{P}$ under $i = j = \infty$), thus inviting a management policy designed to generate abnormal return by choosing the IC alternative.

Special Case I: Non-growth stock under annual trading

On the assumptions of $g = 0$ and $i = j = 1$, (1) is reduced to

$$P = \frac{1 - t^D}{r} \tag{9}$$

and (2) becomes

$$\hat{P} = \frac{(1 - k^D)(1 - \hat{b})(1 - t^D)}{r - \hat{g}}. \tag{10}$$

An expanded version of (10) is obtained by substituting (8) in (7), and (7) in (10):

$$\hat{P} = \frac{(1 - k^D)(1 - \hat{b})(1 - t^D)}{r\left[1 - \dfrac{\hat{b}(1 - k^D)(1 - t^G)}{1 - t^D}\right]}$$

The 1986 Act sets $t^G = t^D$, so that

$$\hat{P} = \frac{(1 - k^D)(1 - \hat{b})(1 - t^D)}{r[1 - \hat{b}(1 - k^D)]}. \tag{11}$$

The SA price in (9) can be restated as

$$P = \frac{(1 - k^D)(1 - \hat{b})(1 - t^D)}{r[1 - k^D - \hat{b}(1 - k^D)]}$$

which is strictly greater than the IC's share price stated by (11) for any $\hat{b}$ $(0 \leq \hat{b} < 1)$. It follows that in this special case direct shareholding dominates indirect holding via an IC.

Special Case II: Non-growth stock with no trading

On the assumptions of $g = 0$ and $i = j = \infty$, (1) is reduced to (9), and (2) becomes

$$\hat{P} = \frac{1 - t^D}{r} \cdot \frac{(1 - k^D)(1 - \hat{b})}{1 - \dfrac{\hat{b}(1 - k^D)}{1 - t^D}}.$$

Equality between this price and that stated by (9) requires that the ratio multiplying $(1 - t^D)/r$ has a value of unity. This condition implies the critical retention ratio

$$\hat{b} = \frac{k^D(1 - t^D)}{t^D(1 - k^D)}.$$

Under the present tax rates $k^D = .34(1 - .7) = .102$ and $t^D = .33$ (or $t^D = .28$), this critical retention ratio is $\hat{b} = .23$ (or $\hat{b} = .29$). A retention policy of $\hat{b} > .23$ (or $\hat{b} > .29$) would generate abnormal return from indirect investment.

For a more systematic examination of the conditions facilitating abnormal return from investing in an IC, we turn next to comprehensive numerical examples based on the tax regimes prevailing before and since the 1986 Act, using feasible parameters not restricted by the constraints $g = 0$ and $i = j = \infty$.

III. Numerical Analysis

Figures 1 and 2 illustrate the effect of the IC's retention policy measured by b on the ratio of share prices in that company vs. its SA, $Q = \hat{P}/P$. Figure 1 is based on conditions prevailing prior to the 1986 Act. The average marginal dividend tax rate paid by individuals, $t^D = .4$, is estimated by Peterson *et al.* [15], and $t^G = .4t^D = .16$ uses the same estimate along with the 60 percent exemption of individual long-term capital gains. The parameter $k^D = (.15)(.46) = .069$ applies the 85 percent exemption of inter-corporate dividends to the maximum marginal corporate income tax rate, .46. The statutory tax rate on long-term capital gains realized by the IC, $k^G = .3$, is used only in Panel 1c. This is the maximum effective rate that would be paid under a full annual portfolio turnover. Lower effective rates of the same tax are used in Panels 1a and 1b to reflect the mitigating effects of deferred realization of gains, portfolio offsets of gains and losses, and year-end tax arbitrage (see fn. 2). The non-tax parameters $i = j = 4$ and $r = .1$ are used in all the numerical examples. The assumption of $i = j = 4$ follows Poterba [16] by relating aggregate stock market value to aggregate annual trading volume. The parity $i = j$ is assumed in the absence of a compelling reason for assuming $i > j$ or $i < j$. Finally, $r = .1$ is an arbitrary but reasonable post-tax rate of return to be earned by individual shareholders. The three panels in Figure 1 are designed to display the partial effects of three decision variables controlled by the IC's management—$\hat{b}$, $\hat{g}$ and k^G—on the relative market price of that company's stock, $\hat{P}/P = Q$. Each of the panels records the effect of $\hat{b}$ on Q for various values of g and a given k^G. Each of the three graphs plotted in each panel describes the effect of $\hat{b}$ on Q, while holding constant g and k^G. To focus on the values surrounding the critical point $Q = 1$, graphs are truncated at $Q = 2$.

Figure 2 reflects conditions prevailing since 1987. The parameters $t^D = t^G = .33$ are used rather than $t^D = t^G = .28$, assuming that the market is dominated by investors who pay the 5 percent surcharge tax at

the margin. The parameter $k^D = (.3)(.34) = .102$ is based on the 70 percent exemption of inter-corporate dividends (starting in 1988) and a marginal corporate income tax rate of .34. As in Figure 1, the effective tax rate on realized corporate capital gains is allowed to vary between zero and the full statutory rate, .34.

The following patterns emerge from Figures 1 and 2.

First, each of the eighteen graphs has an intercept smaller than unity. A mere transfer through the IC of income generated by the SA is disadvantageous, since the IC must pay an additional layer of corporate taxes. This disadvantage is readily demonstrated in the special case of a non-growth SA, a conservative case shown below to be most favorable to the IC's shareholders. Under $g = 0$, the SA's share price stated in (5) is reduced to $P = (1 - t^D)/r$. This price is strictly greater than $\hat{P} = (1 - k^D)(1 - t^D)/r$, the IC's share price based on (6) subject to $\hat{b} = 0$.

Second, the IC's relative price, Q, increases with $\hat{b}$ at an increasing rate. Under certain conditions, that ratio assumes the critical value $Q = 1$ at a low retention rate and reaches astronomical values before $\hat{b}$ reaches unity.

Third, under the pre-1987 tax system, the partial effect of g on Q is negative. This effect may be reversed under the post-1987 system. The summary results in Table 1 show the partial effect of g on Q by comparing the three critical values of $\hat{b}$ (where $Q = 1$) associated with the three growth rates used in each panel. For example, in panel 1a the critical retention rates are $\hat{b} = .11$ for $g = 0$, $\hat{b} = .31$ for $g = .05$, and $\hat{b} = .45$ for $g = .08$. This pattern is reversed in Panel 2a, where the critical retention rates are $\hat{b} = .23$ for $g = 0$, $\hat{b} = .19$ for $g = .05$, and $\hat{b} = .17$ for $g = .08$. (The respective critical retention rates under $t^D = t^G = .28$ are provided in parentheses: .29, .23, and .19). As viewed by the IC's management, the SA's growth rate, g, is a decision variable; management is free to select stocks of higher or lower growth rates.

Fourth, the partial effect of k^G on Q is negative. This is confirmed by the positive effect of k^G on the critical $\hat{b}$ reported in Table 1. The only exception to this rule occurs under $g = 0$, where the effect of k^G on Q vanishes. As seen by management, k^G is a decision variable, not a parameter. Although the statutory tax rate on inter-firm capital gains is a parameter, the effective tax rate can be reduced by deferring trading and other means [see fn. 2].

Overall, the patterns emerging from Figures 1 and 2 clearly indicate that the IC has ample opportunity to make its stockholders earn systematically and substantially more than they would by investing directly in the stock market, or by holding shares of an equity fund which is subject to pass-through tax treatment.

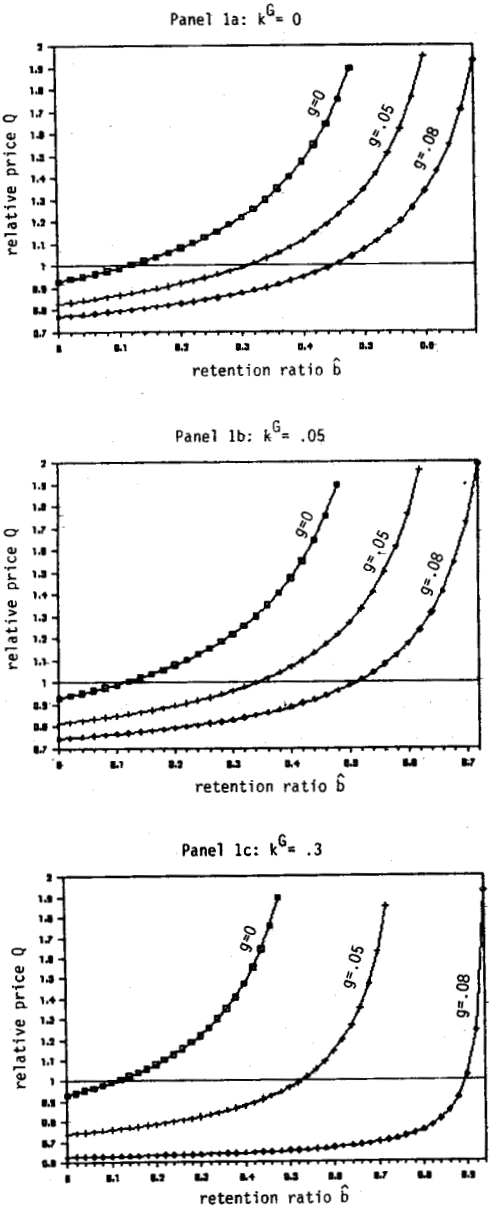
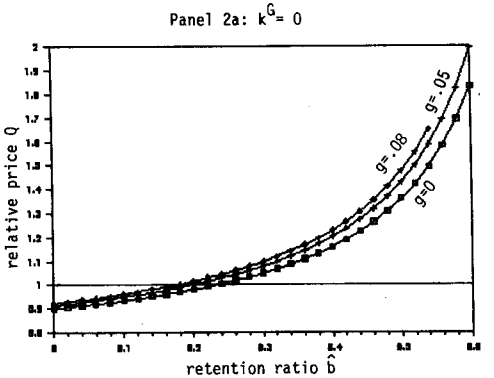
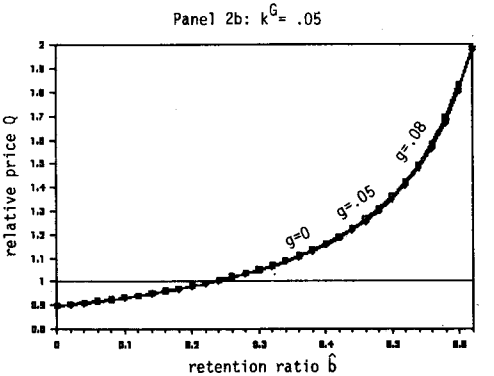


Figure 1: SA vs. IC Before 1987
($r = .1$, $i = j = 4$, $t^D = .4$, $t^G = .16$, $k^D = .069$)





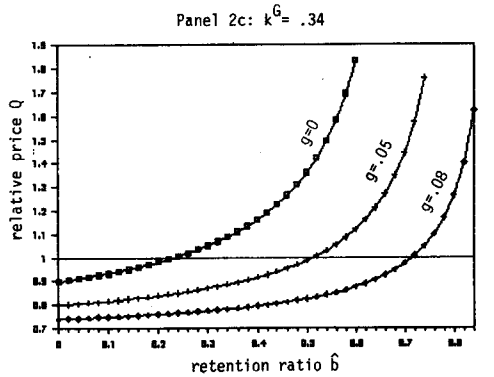


Figure 2: SA vs. IC After 1987
($r = .1$, $i = j = 4$, $t^D = t^G = .33$, $k^D = .102$)

TABLE I: Critical Retention Rates

Pre-1987 System				Post-1987 System			
$r=.1$, $i=j=4$, $t^D=.4$, $t^G=.16$, $k^D=.069$				$r=.1$, $i=j=4$, $t^D=t^G=.33$, $k^D=.102$			
Figure	k^G	g	Critical b	Figure	k^G	g	Critical b(*)
1a	0	0 .05 .08	.11 .31 .45	2a	0	0 .05 .08	.23 (.29) .19 (.23) .17 (.19)
1b	.05	0 .05 .08	.11 .34 .51	2b	.05	0 .05 .08	.23 (.29) .24 (.28) .24 (.28)
1c	.3	0 .05 .08	.11 .52 .90	2c	.34	0 .05 .08	.23 (.29) .51 (.66) .72 (.92)

(*)Note: Numbers in parentheses are valid under $t^D = t^G = .28$.

IV. Interpretation

The source of gain. The source of abnormal return for the IC is not the avoidance or deferral of the dividend tax that would be paid under direct holding of the SA. The prices stated in (5) and (6) are both homogeneous in $(1 - t^D)$, indicating that, regardless of the retention rate, the same proportion of future dividends, and therefore of value, belongs to the government. Moreover, the IC's shareholders bear a proportionately heavier tax burden than those investing directly in the SA, due to the additional layer of taxes paid on inter-corporate dividends and capital gains. What then is the source of advantage for the IC's shareholders? The answer lies in the opportunity to reinvest the entire earnings at a rate of return exceeding the IC's equity cost of capital. Beyond some critical retention rate, this advantage may exceed the disadvantage of the additional layer of taxes.

To illustrate the principle involved, consider the hypothetical case of a one-year holding period by individual investors and the IC. In this scenario, the rate of return earned by direct holding in the SA is (note: $D = 1$)

$$r = \frac{1 - t^D}{P} + g(1 - t^G) \tag{12}$$

and that earned by the IC is

$$f = \frac{1 - k^D}{P} + g(1 - k^G). \tag{13}$$

For funds raised by IC retention, the opportunity cost is $r/(1 - t^G)$,[3] and based on (12)

$$\frac{r}{1 - t^G} = \frac{D}{P} \cdot \frac{1 - t^D}{1 - t^G} + g. \tag{14}$$

We are now ready to compare the rate of return in (13), with the cost of equity capital in (14). Under the pre-1987 tax law,

$$f = \frac{1 - .069}{P} + g(1 - .3) = \frac{.931}{P} + .7g$$

$$\frac{r}{1 - t^G} = \frac{1}{P} \cdot \frac{1 - .4}{1 - .16} + g = \frac{.714}{P} + g$$

where $f \gtrless r/(1 - t^G)$. According to this result, a gainful relationship $f > r/(1 - t^G)$ is attainable in SAs of sufficiently high payout ratios (low growth rates). A positive rate differential (indicated by positive slopes in Figures 1 and 2) is only a necessary condition for a beneficial investment through an IC. There must also exist an IC retention ratio below $\hat{b} = 1$ that would translate a favorable rate differential into a positive value differential. A small favorable rate differential may not be sufficient to fully offset the proportional cost of the extra layer of taxes at any $\hat{b} < 1$. (note that all the graphs in Figures 1 and 2 have slopes allowing the IC to attain and exceed $Q = 1$ at some $\hat{b} < 1$.)

Under the post-1987 tax law,

$$f = \frac{1 - .102}{P} + g(1 - .34) = \frac{.898}{P} + .66g$$

$$\frac{r}{1 - t^G} = \frac{1}{P} \cdot \frac{1 - .33}{1 - .33} + g = \frac{1}{P} + g$$

where $f < r/(1 - t^G)$ indicates no opportunity for gainful indirect investment. This situation is reversed in Figure 2, where the more realistic assumption of $i = j = 4$ is used along with an IC holding period of $t \geq 1$. (A further advantage for the IC would be created by a drop in t^G and k^G, currently proposed by the Republican candidate for the presidency.)

Diversification by the IC. The results presented above can be readily interpreted in the context of an IC holding a diversified stock portfolio. The issue at hand is not fundamentally different from that of post-tax diversification as treated by Elton and Gruber [11, 12] and Choi and Yaari [8] following Brennan [6]. The IC must choose an optimal stock portfolio based on subjective post-tax risk-return parameters which differ from those dominating the stock market. Our results show a negative or positive partial effect of g on Q, meaning preference for stocks with a high or low

dividend payout ratio, respectively. The precise tax penalty or bonus associated with growth, dQ/dg, depends on the pure tax parameters t^D, t^G, and k^D, the parameter/variable k^G, and the market parameters i and j. To determine the optimal portfolio, the effect dQ/dg must be evaluated numerically before its substitution in the post-tax diversification model.

V. Summary

This paper shows that closed-end equity funds can dramatically increase their value by choosing regular corporate taxation over pass-through tax treatment currently preferred by all public funds. Under the tax regimes prevailing before and after the 1986 Tax Reform Act, this change in tax treatment would allow the fund to maintain a market value exceeding the value of its own stock portfolio, or that of funds subject to pass-through tax provisions which hold the same portfolio. The extent of this advantage would increase by increasing the fund's retention ratio, by changing the portfolio composition in favor of stocks of low or high growth rates, and by decreasing the portfolio turnover to mitigate the burden of the interfirm capital gains tax. It is further shown that the source of gain from switching to regular corporate taxation is not the avoidance of dividend tax by the fund's shareholders, but the opportunity to reinvest all earnings at a rate of return exceeding the fund's cost of retention.

Endnotes

*We are indebted to Mark Buono for thoughtful comments, and to Ira Greenberg for sharing his knowledge of the tax law.

1. The reader who is familiar with the law will notice that Section 533(b) explicitly states that investment companies are covered by Sections 531 and 532. This reference is most likely aimed at closely-held companies, not public corporations.

2. The capital gains tax rate k^G is already adjusted for the effect of deferred realization. We show elsewhere [14] that this effective tax rate is correctly calculated from the statutory rate imposed on realized gains, k_s^G, by

$$k^G = k_s^G[(r - g)/g][g_t/(r_t - g_t)]$$

where t is the IC's holding period for the SA. This formulation may overstate the effective tax rate by ignoring opportunities for avoiding this tax via gain and loss offsets in diversification [9, 20] and a year-end tax arbitrage [2, 10]. The same comment applies to the statutory rate t^G used in (5) and (6).

3. This standard result is derived here by restating (2) [using (3) and (7)] as

$$\hat{P} = \frac{(1 - \hat{b})(1 - t^D)}{r - \hat{b}\hat{R}(1 - t^G)}$$

and then differentiating by $\hat{b}$ and setting the equation $d\hat{P}/d\hat{b} = 0$. The solution of this equation for $\hat{R}$ gives the cost of equity funds, i.e., the critical rate of return above which incremental investment increases $\hat{P}$.

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