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The Impact of Mutual Fund Distributions on After-Tax Returns

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This paper analyzes the impact of mutual fund distributions on after-tax returns. Mutual fund objective and management style are the two most important factors which determine the proportion of the fund's total return that is paid out in distributions. The larger the fund's annual distributions, the greater the amount of return lost to taxes. The correlation between portfolio turnover and after-tax return is examined and found to be low. A measure of effective portfolio turnover is developed to show the real effect of turnover on distributions. Within some mutual fund categories, the investor can increase after-tax returns by one or two percent by selecting funds with low distributions.

I. INTRODUCTION

Investors who save for retirement or estate purposes have a love-hate relationship with mutual fund distributions. Large distributions usually mean the fund is doing well, but if it is a regular mutual fund account, the investor has to pay taxes on these distributions. Taxes reduce the rate at which savings grow. While most investors are aware of the adverse effect that fees and expenses have on the performance of their investments, the impact of taxes on investment return is just as critical. An investor must achieve a certain after-tax return in order to meet investment goals. Unfortunately, available information on mutual fund performance does not consider the impact of taxes on return. The aim of this paper is to analyze the impact of mutual fund distributions on after-tax returns.

Total return from a mutual fund investment is composed of dividend or interest payments and capital gains. The dividend or interest component of return will be referred to as yield. The capital gain component of total return is further divided into realized and unrealized capital gains. Capital gains are realized when a fund sells a security or investment that has increased in value. In order to maintain a tax exempt status, mutual funds must distribute income from dividends and interest and realized capital gains at least annually. In a regular mutual fund account, the investor pays taxes on these distributions at the applicable tax rate. The larger the taxable distributions, the greater the loss of potential return on the savings plan. This loss of potential return because of taxes is referred to as "tax drag."

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Unrealized gains made by a mutual fund show up as increases in the net asset value (NAV) of the fund and are not taxed until the shares are sold. All other things being equal, the taxable investor who saves for retirement or estate purposes is better off if the return received is in the form of unrealized gains. Unrealized gains compound tax-deferred and narrow the difference between before-tax and after-tax returns.

A mutual fund's objective and management style are the most important factors which determine the proportion of the fund's total return that is paid out in distributions. In analyzing distributions and after-tax returns by mutual fund objective, fund categories of aggressive growth, growth, growth and income, balanced, and bond are examined. Funds that invest in stocks will have distributions composed of dividends and realized capital gains. Since stocks realize most of their total return from capital gains, capital gains distributions will be very important in determining after-tax returns in stock funds. These capital gains distributions are usually much less significant in bond funds, where total return and distributions are both directly related to bond yield. The NAV of the bond fund will vary with changes in interest rates, but over the long run the return is based primarily on interest income.

Mutual fund management style is examined based on the size of the capital gains distribution a fund management generates annually relative to other funds with the same objective. The distribution of capital gains is related somewhat to reported portfolio turnover, but more directly to the number of winners the fund management sells during the year.[1] Jeffrey and Arnott (1993) address this issue by focusing on reported portfolio turnover and its potential for creating a tax liability which will drastically reduce the performance of a fund. Although reported portfolio turnover information is readily available, reported turnover does not correlate well with actual mutual fund after-tax performance.

Turnover

Mutual fund turnover can be the result of management strategy or may be caused by flows of investor money into and out of the fund. The taxable investor is concerned with the sale of fund assets which cause capital gains to be realized and distributed to the shareholders. This type of turnover creates a tax liability and diminishes the potential growth of the investment. Most turnover is the result of management strategy. For example, a sector rotation strategy will result in high turnover as the fund management moves from one sector to another in anticipation of economic events. Realized capital gains, and the associated tax liability which reduces after-tax return are not necessarily bad for investors. However, investors should expect that active portfolio managers will do at least as well as passive managers on an after-tax basis.

Turnover is not uniform across a fund's holdings and does not necessarily cause capital gains to be realized. For example, a fund can experience a very high portfolio turnover by frequently trading poorly performing stocks. This type of turnover does not necessitate capital gains distributions, because the stocks that are traded have not appreciated in value. On the other hand, low portfolio turnover that involves selling winners can create very large capital gains distributions.

Turnover can also be caused by net shareholder redemptions. When savings are flowing out of a mutual fund, the fully invested fund must sell assets to redeem shares. If the fund manager chooses to sell assets that have experienced capital gains, net shareholder redemptions can cause capital gains to be realized. It is possible that recent investors in a

fund may have to pay taxes on capital gains distributions for realized gains in which they did not participate because the gains occurred before the investor invested in the fund. If a fund has a strategy that calls for very little turnover, like an index fund, then a significant increase in turnover can be caused by withdrawals from the fund. When management must sell a uniform proportion of all stocks in the fund to maintain the index weighting, this can cause an index fund to realize capital gains that the manager would not ordinarily realize. Other than these forced selloffs, index funds can be expected to have low portfolio turnover and, therefore, low capital gains distributions.

In this paper the concept of effective portfolio turnover is developed and compared to reported portfolio turnover. Effective portfolio turnover is a derived figure based on the percentage of unrealized capital gains which are realized and distributed on an annual basis. Effective turnover is a surrogate for uniform turnover. For example, if a new growth fund starts the year with a NAV of $10.00, one year later has a capital gain of $1.00 per share, and pays out a capital gains distribution of $0.25 per share then the effective turnover would be 25 percent; the realized capital gain divided by the total capital gain. The fund's NAV would end the year at $10.75. If this fund was fully invested at the beginning of the year, took in no additional funds, and sold 25 percent of each holding at the end of the year and reinvested (uniform turnover), the reported turnover and effective turnover would both be 25 percent.

Uniform turnover does not occur in actual portfolio management. Suppose the fund management reports turnover of 150 percent in the above example. Then the high reported turnover is primarily the result of trading losers. Or if the fund reported a turnover of 15 percent, then the management is selling more winners than losers in its turnover. In either case the reported turnover is not uniform across the portfolio and is different from the effective turnover. Effective turnover is superior to reported turnover as an indicator of fund management behavior that will result in the distribution of capital gains. Below, effective turnover will be derived for a sample of mutual funds and compared with the reported turnover of the funds.

Investment Tax Strategy

To maximize long-term wealth accumulation, the investor should maximize contributions to qualified plans which allow income to be invested on a before-tax basis. Examples include tax-deductible IRAs, 401(k), 403(b), SEP, and Keogh plans. After these programs have been fully used, it is assumed that the investor will invest after-tax dollars into taxable mutual fund accounts or into non-qualified plans that allow distributions to accumulate tax-deferred. The investor must pay taxes on all distributions made by regular mutual funds.

The variable annuity plan (VAP) and non-deductible IRA are two non-qualified tax-deferred accounts available to investors. In these plans distributions accumulate tax-deferred. No taxes are paid until savings are withdrawn. The non-deductible IRA is generally superior to the VAP because of lower expenses, and it should be used first. But since the non-deductible IRA is limited to $2000 per year, many investors will need to invest funds beyond this amount and will use either a VAP, regular mutual fund, or a combination of these vehicles.

The VAP is offered by insurance companies and has an insurance feature that increases the cost of the plan. The insurance feature guarantees that the investor's beneficiary receives at least an amount equal to the net investment in the plan. When participating in a VAP, the

investor can select from several investment alternatives, usually ranging from bond funds to growth funds. The non-deductible IRA has an even greater selection of investment objectives to choose from and minimal or no extra expenses. Both non-qualified plans penalize the investor 10 percent if funds are withdrawn prior to age 59 ½. This could limit their attractiveness for some investors. While the age withdrawal restrictions and the insurance feature of the VAP makes the non-qualified plans not directly comparable to a regular mutual fund account, it is instructive to compare the after-tax return of these alternative savings plans.

The extra expense of variable annuity plans varies widely. *Vanguard* has a plan that adds costs of 0.55 percent per year to fund operating expenses. According to *Morningstar*, total expenses for the average VAP is 2.05 percent.[2] This is twice the total expense of the average Vanguard annuity plan. Aside from the extra expense, VAPs can have some unpleasant features. Some states tax initial and subsequent investments in VAPs. Some states tax payments from the plan if the owner chooses a lump sum distribution. The taxable portion of distributions from VAPs is taxed at ordinary income tax rates which could be a disadvantage for investors in the top tax bracket.

In the following analysis, non-qualified plans and regular mutual funds are compared as long-term savings vehicles. The effect of turnover on after-tax return is analyzed for the regular mutual fund account. In order to make comparisons, an assumed marginal tax rate of 35 percent is used. To simplify the analysis, no distinction is made between income and capital gains tax rates.[3] For the regular taxable mutual fund account, taxes on fund distributions are assumed to be paid in the year of the distribution. For the non-qualified tax-deferred plans, distributions accumulate tax-deferred.

Effective Turnover and After-Tax Return

In the following examples, dividends and interest income and realized capital gains are assumed to be distributed at year end by the mutual fund. The investor then pays taxes on these distributions at the assumed 35 percent rate, and reinvests the remainder. Two different after-tax measures are used to assess investment performance: the after-tax return and the rate of wealth accumulation.

To compute the after-tax return (ATR), taxes are paid on each annual distribution, the after-tax proceeds of the distribution are reinvested, and then taxes are paid on the unrealized capital gain at the end of a selected holding period. The ATR can be used in planning a retirement savings program when the investor is interested in a return net of all taxes. To compute the rate of wealth accumulation (RWA), taxes are paid on each annual distribution, the proceeds are reinvested, but the investment is not sold. An investor accumulating wealth for estate purposes would use this computation since there is no capital gains tax liability for the beneficiaries. The RWA is also useful for retirement planning since most investors plan in terms of accumulating a target amount of wealth which will generate income in their retirement years. If a fund's annual effective turnover rate is 100 percent, there are no unrealized capital gains and these two rates will be equal and can be computed by multiplying total return by one minus the tax rate. Since reinvestment of the after-tax proceeds of the distributions changes the basis for the investment, all other solutions for ATR or RWA must be computed taking each year of the investment process into consideration.

Based on the high-return/low-yield and low-return/high-yield relationship that is normally found in the market, the following returns were constructed for the major mutual fund investment objectives:

Fund Objective	*Total Return*	*Yield Component*	*Capital Gains Component*
Aggressive Growth	12%	1%	11%
Growth	11%	2%	9%
Growth & Income	10%	4%	6%
Balanced	9%	5%	4%
Taxable Bond	7%	7%	0%
Municipal Bond	5%	5%	0%

These hypothetical returns and yields are meant to approximate long-term market conditions.

Table 1 presents the computations of ATR and RWA for the above investment objectives in a taxable mutual fund and for the two tax-deferred plans. The two tax-deferred plans will be discussed in the next section. For the taxable account, the after-tax returns are computed at various rates of effective turnover. Under the aggressive growth objective at 100 percent turnover the ATR and RWA are both 7.80 percent. This is equal to the total return of 12 percent times one minus the tax rate [12%*(1 – .35) = 7.80%]. As the rate of turnover decreases, the ATR and RWA both increase, with RWA growing at a faster rate since the final tax bite is not taken. The four fund categories which invest in stocks behave in a similar manner, with the riskier funds having the higher returns at any turnover rate. The two bond objectives are not affected by turnover since capital gains are not considered to be part of their total return. The taxable and tax exempt bond funds have an assumed two percent difference in yield which causes the tax exempt bond fund to have the higher after-tax return at the assumed 35 percent tax rate.

Now analyze Table 1 from the point of view of an investor selecting from almost identical growth funds. Both funds have a total return of 11 percent and a dividend yield of

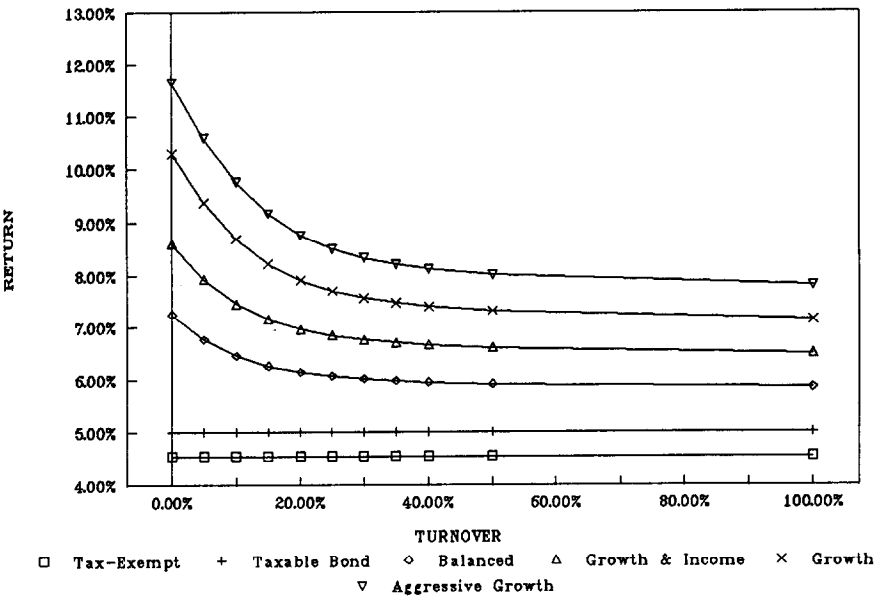

Figure 1. Rate of wealth accumulation

TABLE 1.
After-tax Returns of Selected Investment Objectives

	Objective					
	Aggressive Growth		*Growth*		*Growth & Income*	
Type of Plan	*ATR*	*RWA*	*ATR*	*RWA*	*ATR*	*RWA*
Taxable with Turnover of:						
100%	7.80%	7.80%	7.15%	7.15%	6.50%	6.50%
50%	7.95%	8.01%	7.27%	7.32%	6.57%	6.61%
40%	8.03%	8.12%	7.33%	7.41%	6.61%	6.67%
30%	8.16%	8.32%	7.43%	7.57%	6.67%	6.77%
25%	8.27%	8.50%	7.50%	7.70%	6.71%	6.85%
20%	8.41%	8.76%	7.61%	7.90%	6.78%	6.97%
15%	8.61%	9.16%	7.76%	8.21%	6.86%	7.16%
10%	8.88%	9.76%	7.97%	8.69%	6.99%	7.46%
5%	9.25%	10.59%	8.25%	9.38%	7.17%	7.92%
0%	9.72%	11.65%	8.63%	10.30%	7.41%	8.60%
Tax-Deferred:						
VAP	8.99%	11.00%	8.07%	10.00%	7.17%	9.00%
IRA	9.91%	12.00%	8.99%	11.00%	8.07%	10.00%
	Objective					
	Balanced		*Taxable Bond*		*Tax-Exempt Bond*	
Type of Plan	*ATR*	*RWA*	*ATR*	*RWA*	*ATR*	*RWA*
Taxable with Turnover of:						
100%	5.85%	5.85%	4.55%	4.55%	5.00%	5.00%
50%	5.90%	5.92%	4.55%	4.55%	5.00%	5.00%
40%	5.92%	5.96%	4.55%	4.55%	5.00%	5.00%
30%	5.95%	6.02%	4.55%	4.55%	5.00%	5.00%
25%	5.98%	6.07%	4.55%	4.55%	5.00%	5.00%
20%	6.02%	6.15%	4.55%	4.55%	5.00%	5.00%
15%	6.07%	6.27%	4.55%	4.55%	5.00%	5.00%
10%	6.14%	6.46%	4.55%	4.55%	5.00%	5.00%
5%	6.25%	6.77%	4.55%	4.55%	5.00%	5.00%
0%	6.41%	7.25%	4.55%	4.55%	5.00%	5.00%
Tax-Deferred:						
VAP	6.28%	8.00%	4.55%	6.00%	5.00%	5.00%
IRA	7.17%	9.00%	5.40%	7.00%	5.00%	5.00%

Note: The 20 year after-tax return (ATR) and rate of wealth accumulation (RWA) are presented for six investment objectives based on hypothetical total returns and yields. Included are results using a regular taxable mutual fund account with various rates of effective turnover and two tax-deferred plans; the variable annuity plan (VAP) and a non-deductible IRA.

two percent. The difference between the funds is in the management style as it affects turnover and realized capital gains. Using RWA as the decision rule, a fund with an effective turnover of 10 percent will have a return of 8.69 percent, while a fund with a turnover of 50 percent will have a RWA of 7.32 percent. The point is, an investor's after tax return can be increased by 1.37 percent by selecting a fund with low effective turnover.

The relationship between after-tax return and effective turnover might surprise many investors. A small amount of turnover has a large effect on after-tax return. The non-linear relationship between turnover and after-tax return can readily be seen in Figure 1 where the RWA data is presented. As turnover increases from zero, the returns rapidly decrease towards

the minimum for each investment objective. Half of the extra after-tax return that can be obtained by compounding the unrealized capital gains is lost at turnover rates above 10 percent. At an effective turnover of 50 percent, almost all of this compounding effect is lost. For fund objectives where turnover affects return, we can see the dramatic effect the first 10 or 15 percent rate of effective turnover has on the realized return.

Non-qualified Tax-Deferred Accounts

Included in Table 1 are returns based on an investor pursuing one of the six investment objectives using a non-deductible IRA or a VAP. In order to compare the non-deductible IRA and the VAP to the regular mutual fund account, it is assumed that the investor can open an IRA account at no extra expense and that the extra expense of the VAP will cause a decrease of one percent in total return. Since we are assuming no extra expense using the IRA, the IRA dominates the VAP and regular mutual fund. The VAP, due to the one percent loss in total return because of extra expenses, must be compared to the regular mutual fund on a case by case basis. The VAP is clearly superior to the taxable account in accumulating wealth for estate purposes if the investor prefers either growth and income, balanced, or a bond fund objective. In contrast, if the investor uses an aggressive growth fund or a growth fund, then the VAP is superior for RWA if the comparable taxable fund has an effective turnover greater than one or two percent. Since any investment program will have a few percent effective turnover, the VAP will generally be superior to taxable funds for wealth accumulation over a 20 year period.

The after-tax return (ATR) is the appropriate yardstick to use when comparing the VAP to a taxable account for the investor who will use the accumulated wealth for retirement. For the aggressive growth and growth objectives, the taxable account must have an effective turnover of less than eight percent in order to be superior to the VAP. For the balanced fund and growth and income fund objectives the taxable account must have an effective turnover of less than five percent. As will be shown in the analysis of actual fund performance, very few funds have an effective turnover of less than five percent.

The investment horizon and the amount of the added expense for the VAP are the two important assumptions used in comparing the VAP and taxable account. The VAP returns are below those shown in Table 1 when the extra expense is greater than one percent, and are above Table 1 results when the extra expense is less than one percent. For example, under the bond fund investment objective, the VAP has the same ATR as the taxable mutual fund at a one percent extra expense level. If the extra expenses were 0.6 percent, then the ATR would increase to 4.89 percent, making the VAP superior. These examples assume a twenty year investment horizon. For shorter horizons, the VAP will be less competitive when compared to a taxable account with the same objective.

Growth Stock Example

Before examining actual after-tax mutual fund performance results, an example is presented to demonstrate the dynamics of tax drag and turnover. The example is an investment in a new growth stock mutual fund that will have a total return of 11 percent composed of a dividend yield of two percent and a capital gain of nine percent. This fund will have an initial NAV of $10.00 and an effective turnover of 20 percent. The effective turnover of 20 percent means that the fund will turnover a uniform 20 percent of its holdings which will result in 20 percent of its cumulative unrealized capital gains being realized each year.

TABLE 2.
Growth Stock Fund Example

	Investment Results			
	Year 1	*Year 2*	*Year 5*	*Year 20*
Net Asset Value (After distributions)	$10.72	$11.35	$12.79	$15.26
Dividends Earned and Distributed	0.20	0.21	0.25	0.30
Capital Gain Earned	0.90	0.96	1.11	1.37
Cumulative Unrealized Capital Gain (Before distribution)	0.90	1.68	3.49	6.58
Capital Gain Realized & Distributed (20% of above amount)	0.18	0.34	0.70	1.32
Taxes Paid (35% of combined distributions)	0.13	0.20	0.38	1.59
Shares Owned	1.000	1.023	1.144	2.805
Rate of Wealth Accumulation (RWA)	9.67%	9.43%	8.91%	7.90%
Tax Drag (Total return – RWA)	1.33%	1.57%	2.09%	3.10%
After-Tax Return (ATR) (If sold at the end of year)	7.15%	7.23%	7.41%	7.61%

Note: This table presents investment results for a hypothetical new growth stock mutual fund which has an 11 percent total return composed of a 2 percent dividend yield and a 9 percent capital gain rate. The fund has an initial net asset value (NAV) of $10.00 and an effective turnover rate of 20 percent. The investor buys one share, pays taxes on the distributions, and reinvests the balance of the distribution in new shares.

The results from holding this investment for one, two, five, and 20 years are presented in Table 2. Distributions are reinvested after paying a 35 percent tax. The RWA decreases over time due to the relative increase in realized capital gains. This decrease in RWA results in the tax drag increasing as the holding period increases. After one year, the ATR is equal to the total return times one minus the tax rate [11%*(1 – .35)]. Over time the ATR increases due to the compounding gain from deferring the tax liability. With moderate to high turnover and long holding periods, the significance of the unrealized capital gain and its tax liability is small compared to the overall value of the investment. This causes RWA and ATR to converge over time.

Historical Data

To study the impact of turnover on actual investment results, five years of data on no-load and low-load mutual funds were examined. The data for this analysis was taken from the 1993 AAII Mutual Funds publication.[4] Samples of funds in the following categories were scrutinized; aggressive growth, growth, growth and income, and balanced funds. Funds that were included in the sample had asset size greater than $100 million, a fiscal year ending December 31, and five years of data. The data include before-tax performance results, distributions, net asset value (NAV), and reported portfolio turnover during the five year period ending December 31, 1992. Using this data, after-tax performance results were constructed. Also, the amount of unrealized gain that had accrued at the end of the five year period was computed for each fund.

TABLE 3.
Mutual Fund Objective and After-tax Returns
(1987–1992)

	Investment Objective			
Attribute	*Aggressive Growth*	*Growth*	*Growth & Income*	*Balanced*
Number of Funds	12	25	9	12
Total Return	18.68%	15.84%	14.78%	12.61%
	(4.46%)	(3.41%)	(1.18%)	(1.34%)
Rate of Wealth	15.87%	13.33%	12.15%	9.96%
Accumulation	(4.44%)	(3.67%)	(1.42%)	(1.36%)
(RWA)				
Tax Drag	2.80%	2.51%	2.62%	2.66%
	(0.98%)	(0.96%)	(0.51%)	(0.35%)
Potential Tax Drag	6.54%	5.54%	5.12%	4.37%
	(1.56%)	(1.19%)	(0.40%)	(0.47%)
Percent Tax	44.57%	48.61%	51.82%	61.64%
Drag Used	(19.03%)	(23.27%)	(11.83%)	(11.59%)
Unrealized Capital	37.16%	31.85%	25.29%	18.12%
Gain as Percent of	(14.43%)	(15.11%)	(6.77%)	(5.83%)
Wealth				
Yield	0.36%	1.88%	3.46%	5.49%
	(0.77%)	(0.99%)	(0.75%)	(0.85%)
Size	388	576	1,601	1,425
(Million$)	(366)	(446)	(1,663)	(1,746)
Reported	131.07	102.92	62.25	81.73
Turnover	(65.93)	(131.82)	(47.40)	(104.26)
Effective Turnover	20.0	17.2	15.8	12.0

Note: This table presents information on four different mutual fund categories. The original data is from the 1993 AAII Mutual Funds publication. Averages, with standard deviations in parentheses, are presented for selected fund characteristics. The derived effective turnover is also presented.

The statistics based on this analysis are presented in Table 3. The average for various attributes of the samples are presented with standard deviations in parentheses. The average total return for this period was well above historical norms for the various objective categories. The after-tax return used is the rate of wealth accumulation (RWA); the amount by which an investment in the fund would have changed on an annual basis after paying taxes on the distributions and reinvesting the remainder. The tax drag is the difference between total return and the RWA. The maximum return that could be lost to taxes (100 percent effective turnover) is called the potential tax drag, and is computed by multiplying the total return by the tax rate (35 percent in our analysis). The percent tax drag used is computed by dividing the tax drag by the potential tax drag. The percent tax drag used is a function of the yield and the effective turnover of the fund. The unrealized capital gain as a percent of end-of-period wealth gives an indication of the potential tax liability imbedded in the share price.

The reported turnover shown in Table 3 is the average of the annual reported turnover for the five year period. If a fund with 100 percent turnover literally sold every security and reinvested the proceeds, then all gains accrued in the past would be realized. This is obviously not what happens with most high turnover funds. The correlation between the reported turnover and return lost to taxes for the aggressive growth and growth funds was only 0.250. A high turnover management style does not necessarily lead to large capital gains distribu-

TABLE 4.
Performance Characteristics of Mutual Fund Sample with Growth Objective

Mutual Fund	*Total Return*	*RAW*	*Tax Drag*	*Potential Tax Drag*	*Tax Drag Used*	*Capital Gain*	*Reported Turnover*	*Effective Turnover*	*Div Yield*
Gabelli Growth	21.40%	20.04%	1.36%	7.49%	18.17%	55.95%	60.20%	4.88%	1.41%
T. Rowe Price New Am Gr	20.60%	20.02%	0.58%	7.21%	8.08%	57.96%	39.00%	2.25%	-0.03%
Nicholas Limited Ed	19.60%	18.13%	1.47%	6.86%	21.37%	51.25%	22.80%	8.22%	1.00%
Monetta	21.00%	17.10%	3.90%	7.35%	53. 01%	39.65%	183.20%	36.99%	1.06%
Strong Discovery	20.60%	16.94%	3.66%	7.21%	50.70%	37.54%	662.00%	14.65%	1.06%
Acorn	18.60%	16.10%	2.50%	6.51%	38.34%	41.38%	29.60%	33.22%	1.35%
Fidelity Trend	17.80%	15.68%	2.12%	6.23%	33.98%	42.07%	53.60%	12.61%	1.57%
Gintel	16.50%	14.58%	1.92%	5.78%	33.31%	40.30%	69.40%	4.81%	3.16%
Dreyfus Appreciation	16.00%	14.22%	1.78%	5.60%	31.74%	40.40%	92.40%	11.66%	1.63%
Value Line Fund	17.30%	14.07%	3.23%	6.06%	53.28%	31.11%	111.00%	24.46%	1.75%
Gabelli Asset	16.30%	14.03%	2.27%	5.71%	39.77%	36.57%	52.40%	11.84%	0.80%
Vanguard Index Ext Mkt	15.20%	13.95%	1.25%	5.32%	23.49%	42.42%	13.80%	5.99%	2.47%
Clipper	15.60%	13.29%	2.31%	5.46%	42.36%	34.75%	34.00%	14.72%	2.48%
Vanguard Primecap	14.40%	12.88%	1.52%	5.04%	30.07%	37.86%	16.60%	11.85%	1.03%
Founders Growth	15.30%	12.56%	2.74%	5.36%	51.13%	29.70%	180.20%	17.12%	0.95%
Vanguard Morgan Growth	15.80%	12.45%	3.35%	5.53%	60.49%	25.77%	49.60%	30.86%	2.17%
Columbia Growth	15.70%	12.10%	3.60%	5.50%	65.49%	22.88%	159.40%	35.10%	1.76%
Pennsylvania Mutual	14.40%	12.09%	2.31%	5.04%	45.83%	31.63%	22.60%	19.37%	2.22%
Strong Opportunity	13.50%	11.99%	1.51%	4.73%	31.97%	35.75%	268.60%	5.98%	3.28%
William Blair Growth	16.20%	11.64%	4.56%	5.67%	80.42%	12.57%	31.40%	59.70%	1.34%
T. Rowe Price Cap App	14.00%	10.72%	3.28%	4.90%	67.01%	19.67%	79.20%	25.36%	3.65%
T. Rowe Price Gr Stk	12.50%	10.10%	2.40%	4.38%	54.82%	23.53%	33.80%	34.57%	1.77%
Boston Co. Cap App	10.50%	6.78%	3.72%	3.68%	101.25%	-2.40%	107.60%	56.86%	1.96%
Mathers	9.30%	6.33%	2.97%	3.26%	91.24%	3.73%	186.60%	41.57%	4.53%
T. Rowe Price New Era	7.90%	5.47%	2.43%	2.77%	88.02%	4.24%	14.00%	43.12%	2.50%
Average	15.84%	13.33%	2.51%	5.54%	48.61%	31.85%	103.92%	22.71%	1.88%
Standard Deviation	3.41%	3.67%	0.96%	1.19%	23.26%	15.11%	132.82%	16.06%	0.99%

tions. This is because mutual fund managers do not sell a uniform proportion of their assets. On average, fund managers sell more losers than winners.

In order to relate capital gains distributions to turnover, an effective turnover estimate was derived based on the amount of total return lost to taxes because of realized capital gains. The effective turnover figure is the amount of uniform turnover that would cause the fund category to distribute the amount of capital gains that were distributed over the five year period.[5] Although the derived effective turnover rate is only a small proportion of the average reported turnover rate, it still has a substantial effect since only a small amount of effective turnover creates a large amount of tax drag. The effective turnover for the growth fund category will be examined in detail below.

The tax drag is fairly uniform across investment objective categories, ranging from 2.51–2.80 percent. Since total return decreases from aggressive growth to balanced funds, the potential tax drag also decreases. This results in the aggressive growth funds having the lowest percent tax drag used and the balanced funds the highest. The primary cause of tax drag varies by fund objective. The aggressive growth funds have very low yields, and the tax drag is caused almost entirely by realized capital gains. The balanced funds have high yields which contribute over 70 percent of the calculated tax drag with the remainder due to realized capital gains. It is important to note the variance in the tax drag is relatively low for balanced funds and high for growth funds. This indicates that funds with low tax drag are more easily found in the growth fund categories.

Growth Funds

Due to their high total returns and low yields, growth funds are frequently used by investors desiring to maximize wealth accumulation over a long-term investment horizon. The five year performance results for the growth fund sample are presented in Table 4. The funds are ranked by RWA in descending order. The effective turnover estimate presented in this table is derived by computing the capital gain distributed using the NAV at the beginning of the five year period as the basis. An effective turnover is computed for each year. The number reported in Table 4 is the average for the five year period. This reported number is biased upward somewhat since the unrealized capital gain is not being considered.[6]

The top three funds had low turnover and low amounts of return lost to tax drag. The next two funds, Monetta and Strong Discovery, had high turnover and a relatively large tax drag. Two funds, T. Rowe Price New America Growth and Strong Discovery, were tied for third with a total return of 20.60 percent. But the after-tax returns of these two funds differs by more than three percent. This large difference in after-tax results is due to the difference in effective turnover and dividend yield. Strong Discovery realized large capital gains in 1991 and 1992 which caused it to have a high tax drag. This large difference in after-tax return is important information to the investor selecting between these two funds for use in a taxable savings plan.

William Blair Growth Shares had the largest tax drag, 4.56 percent, but a reported turnover that was well below average for this group. The effective turnover, however, is the highest in this group of funds. The fund's management turned an above average total return into a below average after-tax performance by consistently realizing their capital gains. Over the five year period this fund had a total of $5.92 in capital gains, of which $4.74 were realized and distributed. The NAV increased from $8.21 to $9.39, making their unrealized capital gains the fourth lowest in the growth fund sample. This fund is a good example of

why the prospective investor cannot be guided by low reported turnover in seeking to avoid tax drag. For the growth fund sample, the correlation between return lost to taxes and reported portfolio turnover is 0.277 while the correlation between return lost to taxes and effective turnover is 0.680.

The after-tax returns and tax drag data provided in Table 4 are useful when an investor is selecting a fund from a particular objective category for a taxable savings plan. In this case, tax drag, along with the fees and expenses of the fund needs to be considered, and in most cases minimized. If savings are going into a tax-deferred plan, then the tax drag can be ignored. When an investor splits savings between tax-deferred and taxable accounts, funds with high tax drag should be placed in tax-deferred vehicles, and funds with low tax drag in taxable funds.

Undistributed Income and Capital Gains

Usually a tax liability is associated with earned income or realized capital gains. But this is not the case for an investor who has to pay taxes on income or capital gains that provide no increase in wealth. At the time of purchase, the share price of a mutual fund may reflect undistributed income, capital gains, and unrealized appreciation of securities. Any income or capital gains from these amounts which are later distributed are fully taxable in a taxable plan. Investors in stock mutual funds are advised to make large purchases after a fund makes its major annual distribution in order to avoid incurring the tax liability associated with this distribution. Even if an investor makes purchases after the annual distribution, net shareholder redemptions or management decisions can result in the fund liquidating positions, and realizing capital gains in which the new investor did not participate.

The following example is used to demonstrate nonparticipant capital gain tax risk. Assume an investor makes an investment in an index fund with a NAV of $20, 50 percent of which represents unrealized capital gains. The investment is made just before a market drop of 10 percent, which in turn leads to other investors redeeming 20 percent of the shares of the fund. These redemptions cause turnover which results in 20 percent of the remaining capital gain of $9 to be realized. Later, the investor will receive a capital gain distribution of $1.80 which creates a tax liability of $0.63 (assumed tax rate of 35%) that causes a loss of 3.15 percent ($0.63/$20.00) on the original investment. Thus, this investor will lose 10 percent because of the market decline plus 3.15 percent due to the tax liability. The investor can avoid the tax liability by redeeming the shares prior to the fund's distribution date, but the 10 percent market loss is realized when this is done.

While this example might be considered extreme, an investor in a mutual fund is at some risk of paying taxes on gains in which he or she did not participate. This can occur in bull markets when managers realize gains for market timing purposes or other tactical reasons. It is difficult for the long range investor in stock mutual funds to avoid this risk. One way is to invest in funds which have little or no unrealized gains. Funds of this type include new funds, funds that have done poorly in the past, or funds that have a history of taking their gains quickly. This is not a very attractive group of funds from which to pick.

A method of minimizing the nonparticipant capital gain tax risk when using funds with large unrealized capital gains is to only invest in funds that have a relatively long record of asset growth. This type of fund will have accumulated shares over a long period of time, and will be able to initially sell shares with the highest cost basis, typically the last purchased. When this type of fund is forced to sell assets due to net redemptions, a LIFO approach will

minimize realized capital gains. Fund managers are aware of the tax consequences of their turnover and, hopefully, are motivated to keep their taxable shareholders happy by minimizing tax drag.

The Index Fund

One of the funds included in the growth and income sample is the *Vanguard Index Trust-500*. This fund is designed to mimic the returns of the *S&P 500 Index* by investing, using index weighting factors, in the index companies. The *Vanguard Index Trust-500* had the lowest amount of return lost to taxes in the growth and income sample (1.65%), the lowest reported turnover (10%), and an effective turnover of only 4.2 percent. The average effective turnover rate for this fund group was 15.8 percent. These results mean that over a 20 year period *Vanguard Index Trust-500* will beat the average growth and income fund in a VAP if the VAP plan has total expenses greater than 1.19 percent. Recall that the average total expense for a VAP fund is 2.05 percent. The *Vanguard Index Trust-500*, with 1992 annual expenses of 0.19 percent, and less than five percent effective turnover, certainly sets the standard in the growth and income objective category.

In keeping with its low tax drag, the *Vanguard Index Trust-500* fund accumulated unrealized capital gains of 37 percent in the five year period. Since inception, the NAV of the fund has gone from $10 to $40.97. The new investor might be concerned about the risk of paying tax on prior gains because of the large unrealized capital gain imbedded in the NAV, but this risk is minimized due to the constant growth in fund assets over the last 12 years. During this period the fund has been continuously buying shares of the companies in the index. If redemptions force a sale of a percentage of these shares, the LIFO approach will result in minimal capital gains being realized.

II. SUMMARY AND CONCLUSIONS

Paying taxes on distributions from mutual funds reduces the rate at which savings grow. When taxes are deferred, compounding increases the ultimate after-tax return. In order to achieve savings goals, investors need to realize certain after-tax results. Unfortunately, after-tax performance results are not reported by most of the services that report on mutual fund performance.

Reported mutual fund turnover has been suggested as an indicator of potential loss of return due to taxes on distributions. The results described in this paper show that reported turnover has a low correlation with computed after-tax returns. This lack of correlation is the result of mutual fund managers selling more losers than winners. High reported turnover does not necessarily mean that a fund manager is realizing past capital gains.

The five year historical results reported on above show that a mutual fund can have above average before-tax returns, but below average after-tax returns. These results also show that up to three percent difference in after-tax performance can be attributed to fund management style. It is important that investors focus on the impact that distributions and taxes have on their savings plans in order to maximize after-tax return.

It is common for an investor to have some savings in qualified tax-deferred plans and the remainder in taxable savings plans. It is also common for investors to diversify among different risk categories. The strategy to use in this situation is to have investments with high

tax drag in the tax-deferred plan and investments with low tax drag in the taxable plan. Since average tax drag is relatively consistent across fund categories, more detailed information on the alternative funds is needed to optimize this decision. The data presented in Table 4 show that low tax drag funds are in the growth fund category. It is unlikely that a low tax drag bond fund exists due to the high level of distributions required of this type of fund. Without a detailed analysis, the investor is probably better off having the bond or fixed income portion of savings in the tax-deferred plan. Taxable plans would usually be the better place for stock funds.

Since investors do not have adequate information to minimize taxes and maximize wealth accumulation, it is recommended that mutual fund reporting services provide an after-tax return based on a typical, but standardized tax rate. The rate of wealth accumulation (RWA) is recommended as the standard after-tax return. This return can easily be provided, along with the total return, for five and 10 year historical periods.

NOTES

1. Reported portfolio turnover is defined as the lower of purchases or sales divided by average net assets.

2. *Morningstar* is an independent mutual fund rating service. They cover over 3000 mutual funds and provide both print and electronic subscription service to investors.

3. In 1994, married-filing-jointly taxpayers with income between $36,000 and $89,150 have a marginal tax rate on income of 28 percent and a tax rate on long term capital gains of 28 percent. Investors in the highest tax brackets face a marginal tax rate of 39.6 percent on income, but the rate on capital gains remains at 28 percent. Since most states also have income taxes, the rate of 35 percent used in the following examples typifies an investor with a marginal federal tax rate of 28 percent living in a state with moderate to high state income tax rates.

4. Since only funds with a size larger than $100 million were used, there is a survivorship bias in these results. For example, the AAII average growth fund realized a 14.8 percent return over the five year period compared to this study's growth fund sample average of 15.8 percent. This paper's historical analysis is not meant as a general examination of mutual fund performance. Its purpose is to analyze reported turnover and after-tax results. For a recent review of studies on mutual fund performance and market efficiency see Ippolito (1993).

5. Effective portfolio turnover estimates for the various categories of funds were derived by modeling the mutual fund category attributes. The inputs to the model were average total return, unrealized capital gains, and yield.

6. The average effective annual turnover reported in Table 4 (22.71%), is greater than the derived figure reported in Table 3 (17.2%). The database used for this study was limited to five years. Computing annual effective turnover for a fund over part of its existence will result in over estimating the effective turnover due to unrealized capital gains imbedded in the NAV at the beginning of the study period.

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