

# The Value of Tax Efficient Investments: *An Analysis of After-Tax Mutual Fund and Index Returns*

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*It is the duty of a good shepherd to shear his sheep, not to skin them.*

Commenting on taxes and taxation, Tiberius Caesar, 42 BC–AD 37.

In 2005, mutual funds distributed \$129 billion in capital gains to shareholders.<sup>1</sup> Approximately 40% of these distributions were paid to taxable accounts. Shareholders paid federal income tax on these distributions at a rate of 15 to 35% depending on their income class; some also paid state taxes. In the ten-year period ending June 30, 2005, mutual funds on an average returned 9.6% a year. Assuming a 35% tax rate, this annual return was reduced to 7.8%. During the same period, related indices also returned 9.6% per year. However, assuming the indices were actual invested portfolios, taxes reduced the average return to 8.4% per year.

This article examines the impact of taxes on mutual fund and stock index returns. Using after-tax return data from Morningstar, it provides updated insights into the relationship of taxes and after-tax investment returns based on reported investment results. Other studies provide similar evaluation but often use simulated rather than historical data.

Exhibit 1 summarizes the impact of taxes broken down by common manager categories. Tax impact is the amount that pre-tax return is reduced due to taxes (pre-tax return minus after-tax return). These results indicate that

active mutual funds experienced a larger tax impact than related index funds.

Section one of this article compares after-tax mutual fund returns to after-tax index returns and then examines why some investment managers are slow to control the impact of taxes. Section two compares two common metrics used to measure tax efficiency, the tax-efficiency ratio and tax alpha. In section three, we find evidence that tax related portfolio management decisions are integral to creating after-tax excess return. Turnover is identified as a factor that can help control taxes and, if managed properly, can lead to higher after-tax returns.

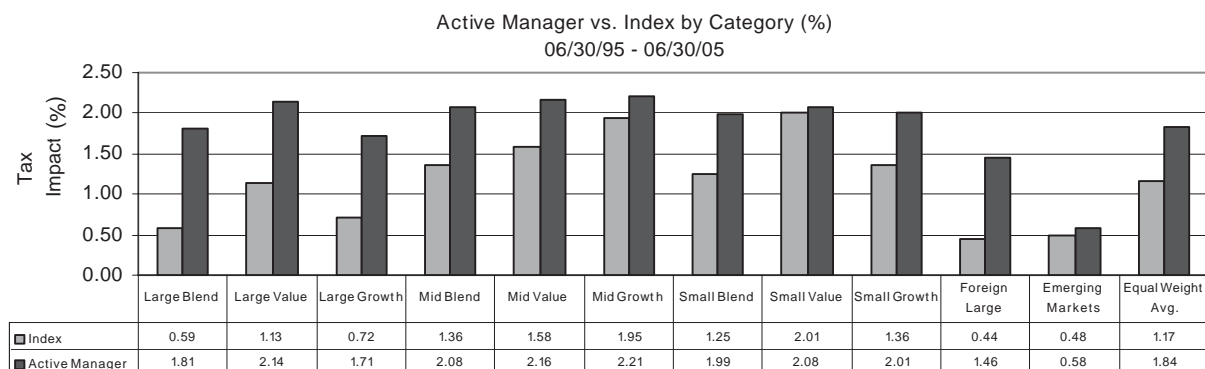
First, before comparing after-tax returns, the article takes a few minutes to review how after-tax mutual funds returns are calculated and discusses two possibilities for establishing a reliable after-tax benchmark.

## BACKGROUND ON DERIVING AFTER-TAX RETURN AND LIMITATIONS

Mutual funds calculate after-tax returns using a methodology outlined in an amendment to the Securities Act of 1933 and Investment Company Act of 1940. This methodology, adopted by the Securities and Exchange Commission in 2001 required mutual funds to present both before and after-tax returns, beginning in 2002. The after-tax return methodology applies to one, five and ten year

## EXHIBIT 1

### Tax Impact on 10-year Annualized Investment Performance



return data and requires reporting of after-tax returns using two provisions: first, after taxes on income and capital gain distributions; and second on full redemption.

The SEC methodology calculates after-tax mutual fund returns by accounting for dividend distributions and the net long-term and short-term capital gains or losses realized from the underlying securities in the portfolio. It then reduces the final portfolio value by the cost of federal income taxes by multiplying each income and capital distribution by the highest individual marginal income tax rates in effect on the reinvestment date. The tax rate used must correspond to the tax character of the distribution. For example, using current tax rates, dividends and long-term capital gains are taxed at 15%, and short-term capital gains and interest income are taxed at 35%.

What the SEC does not discuss is how to *evaluate* after-tax return. To what should we compare after-tax mutual fund returns? Russell, S&P, MSCI and other major indexes commonly serve as a benchmark for pre-tax manager returns. However, after-tax index returns are largely unavailable, because providers of the index methodology are not subject to the SEC rules on after-tax reporting.

Still, there are two viable options to obtain after-tax index returns. One option is to use after-tax index returns of Exchange Traded Index Funds (ETF's) or mutual funds that endeavor to replicate specific indexes. These funds are investable and do fall under the SEC's governance. A second alternative is a modeling approach that estimates after-tax index returns.

Although ETFs and mutual funds can provide an excellent estimate for after-tax index return, they do not have return histories dating back ten or even five

years in some index categories. In addition, fees and transaction costs need to be backed out of their returns to make them comparable to the index they closely replicate. To avoid these problems Stein and Garland [1998] developed a modeling approach that can easily estimate the after-tax return of any index for any time frame, using three readily available factors, pre-tax return, dividend yield, and turnover. This relationship is summarized below:<sup>2</sup>

$$V_{I+1} = (1+r)V_I - t_d dV_I - t_g g[(1+r-d)V_I - C_I]$$

Ending  
After-tax  
Value

Ending  
pre-tax  
Value

Tax Cost  
of  
Dividends

TaxCost of  
Realized  
Capital Gains

Quisenberry [2003] modified the after-tax index model, allowing the index to carry net losses forward, rather than distribute them, thus making it comparable to the tax requirements of mutual fund returns.

The after-tax index model is different from the SEC return methodology in the way it treats an index as a single security rather than a portfolio of individual securities. It also estimates capital gain distributions using turnover at the benchmark level rather than accounting for individual purchases and sales.

Despite these differences, after-tax returns produced by the index model appear to be accurate. To test the after-tax index model, we compared it to several ETFs that had a return history of at least five years. The comparison found that the index model returns were

accurate within 15 bps on average, after adding back ETF fees.<sup>3</sup>

## THE IMPACT OF TAXES

Pre-tax and after-tax active manager returns, shown below, are broken into nine style categories that Morningstar uses for domestic equity managers. The returns are compared to Russell indexes that have the same style definition. To compile the categories, we first screened for all mutual funds that had an after-tax return history of ten years or more.<sup>4</sup> Index funds were filtered out and funds that had multiple share classes were represented by one distinct portfolio, creating a sample that totaled 866 domestic mutual funds. Data on foreign large cap blend managers and emerging markets is also included.

The return summary below does not charge the index for fees, so is not considered attainable. Returns give equal weight to each manager and manager category. The ten-year time period ending in June 30, 2005 is used because it closely aligns with the annual reconstitution of Russell indexes that are used as benchmarks. The mutual fund returns used reflect tax effects on all distributions but do not reflect the tax effects of a shareholder's decision to sell fund shares.

In examining the Morningstar data in Exhibit 1, we found that mutual fund investors in the 35% tax bracket lost an average of 1.84 percentage points per year to taxes over the last ten years. Returns for comparative indexes

during the same time period were reduced an average of 1.17% per year due to taxes. These results were similar to an earlier time period. A study by Peterson et al. [2002] found U.S. equity fund investors in high tax brackets lost an average of about 2.2 percentage points annually to taxes in the 1981–1998 time period.

Consideration of after-tax results is important because in the long-run taxes have a compounding effect on reducing portfolio returns. For example consider one dollar invested for twenty years at an annualized return of 10%; if taxes reduce return by 2% per year it will be worth \$4.95, after-taxes. But if the investor is more tax efficient and taxes reduce annual return by only 1% per year the dollar is worth \$6.04, a full 22% more.

Exhibit 2 further shows that, on an after-tax basis, active managers as a group underperformed indexes by about 63 basis points (bps) per year, averaging a return of 7.80% per year vs. 8.43%. By category, large and mid cap active managers had a hard time keeping up with related indexes, while small cap and emerging market active managers generally performed better than indexes, during the ten year period.

### Tax Management—A Slow Shift, But Significant Opportunity

Despite the impact on investment returns, portfolio managers typically do not focus on the cost of taxes for two reasons:

## EXHIBIT 2

10 Year Returns (%) 06/01/95 - 06/01/05	Pre-Tax			After-Tax		
	Average Fund Returns	Related Index Returns	% of Funds Under-performing	Average Fund Returns	Related Index Returns	% of Funds Under-performing
<b>Manager Category</b>						
Large Blend	8.7	10.2	75	6.9	9.6	91
Large Value	10.1	12.0	84	7.9	10.9	94
Large Growth	7.6	7.4	48	5.9	6.7	72
Mid Blend	11.6	12.9	65	9.5	11.5	69
Mid Value	12.9	14.3	81	10.7	12.7	81
Mid Growth	9.0	9.4	52	6.8	7.5	62
Small Blend	11.8	9.9	33	9.8	8.7	43
Small Value	14.0	13.9	48	11.9	11.9	52
Small Growth	9.0	5.2	13	7.0	3.8	18
Foreign Large	6.0	5.6	42	4.6	5.1	68
Emerging Markets	5.3	4.9	41	4.7	4.4	44
<b>Average (%)</b>	<b>9.6</b>	<b>9.6</b>	<b>53</b>	<b>7.8</b>	<b>8.4</b>	<b>63</b>

Corresponding benchmarks in order: Russell 1000, Russell 1000 Value, Russell 1000 Growth, Russell Midcap, Russell Midcap Value, Russell Midcap Growth, Russell 2000, Russell 2000 Value, Russell 2000 Growth, MSCI EAFE, MSCI EMF

First, investors typically look at pre-tax rather than after-tax returns when evaluating investment options. Funds showing favorable pre-tax performance have a better chance of attracting new clients and retaining existing clients, even if their after-tax return is below average. Dickson [2000] explains that Vanguard and most other fund families generally do not manage for tax ramifications.<sup>5</sup> Most portfolio managers are compensated for pre-tax performance, not after-tax performance, in part because there are few after-tax benchmarks to compare against.

Second, investors often hire mutual fund managers expecting the decisions they make to outperform the benchmark enough on a pre-tax basis to cover the cost of higher taxes. In this approach, higher taxes are seen as a by-product of higher returns. Focusing on pre-tax return works well in some cases. For example, as shown in Exhibit 2 on the previous page, small cap and emerging market managers on average provided shareholders with enough pre-tax return to cover the higher taxes they incurred, and after-tax, performed better than their related index. This relationship did not hold true for large and mid cap managers. On average, funds in these categories did not provide enough pre-tax return to offset the impact of taxes.

## EVALUATING A MANAGER'S TAX MANAGEMENT SKILL

When evaluating active managers, we used two measures of tax management: the tax efficiency ratio, followed by tax alpha.

The tax efficiency ratio is a commonly used measure that shows how much investment return the investor will keep after paying taxes. The ratio is simply after-tax return divided by pre-tax return. An investor who buys a fund with a tax efficiency ratio of .80 will keep 80% of his annual return but give-up 20% in taxes.

Using ten-year data as of June 30, 2005, we found the average tax efficiency ratio for fund managers was 78%. Growth managers were less tax efficient than value managers, averaging 76%, compared to value managers, at 80%. Similarly, Brunel [2000] found the average tax efficiency of Morningstar's large cap fund universe (ending in year 2000) at about 80%. However, in contrast to current data, Brunel found value stocks to be less tax efficient than growth stocks.

In the long-run, consistent with Brunel's findings, we would expect value stocks to create a *higher* tax cost for investors. First, value stocks pay out higher dividends

than growth stocks, and second, some value managers are forced to realize more capital gains when value stocks become fully valued and are no longer part of their universe. For example, a value manager who purchased Apple Computer for its fundamental value a few years ago may no longer justify holding the now growth-oriented stock and be forced to realize capital gains. Growth managers typically have much lower dividend yields and may be less likely to be forced to realize capital gains.

This disparity between expected and actual tax efficiency of growth funds might be attributed to the high capital gains that growth managers realized during the late 90's. Notably, in 2001 and 2002, growth stocks produced negative returns, but tax laws do not allow mutual funds to distribute their losses, forcing any tax benefit to be deferred.

Looking forward, in the near-term, growth funds as a group may be more tax efficient than usual since it appears they carry an unusually large amount of undistributed losses. Using annual turnover and pre-tax return we estimate the average loss carry-forward for growth funds is currently about 20% of their total market value, while value funds on average we estimate have a 6% loss carry-forward. This large carry forward for growth funds is largely due to their 38% decline on average over 2001 and 2002. The last time this happened was in 1973-74, when the average growth fund declined by nearly 50%.<sup>6</sup>

Brunel considers an actively managed equity portfolio with a tax efficiency ratio of 90 to 95% to be tax efficient. Given a 90% criterion, only 12% of the fund managers in our sample would be considered tax efficient by his definition.

The tax efficiency ratio is a useful assessment of a manager's tax management skill. However, a problem occurs when after-tax or pre-tax return approaches zero, making the ratio inaccurate. For example, in 2004, the Scudder Development Fund had a pre-tax return of 2% and after tax return of 0.2%. In this case Scudder's tax efficiency ratio is only 10%. While it is true that shareholders in this example will only keep 10% of their pre-tax return it is not representative of the manager's tax management ability. In addition, the tax efficiency ratio does not inherently provide a comparison to a benchmark. To make this comparison we use tax alpha.

## Tax Alpha

Stein [1998] first suggested the use of tax alpha as a measure of value added through tax management. To find

## EXHIBIT 3

### 10 Year Annualized Return (%)

06/30/95 - 06/30/05

	Pre-tax	After-tax
Vanguard Tax Managed Appreciation Fund	9.75	9.50
Russell 1000 Index	10.16	9.57
<b>Alpha</b>	<b>-0.41</b>	<b>-0.07</b>

tax alpha Stein's method starts by calculating traditional pre-tax and after-tax excess return (alpha). Using these traditional measures, Exhibit 3 shows that the Vanguard Tax Managed Fund underperformed the Russell 1000 Index both before and after-tax.

But there is more to Vanguard's return than initially apparent. By subtracting pre-tax alpha from after-tax alpha, Stein isolates the value a manager adds through tax management, he calls this excess return tax alpha.

Tax alpha leads an investor to think of total alpha as a combination of alpha from stock selection and alpha from tax management and can be expressed as:

$$\alpha_{\text{total}} = \alpha_{\text{pre-tax}} + \alpha_{\text{tax management}}$$

$$\alpha_{\text{total}} = -0.41 + 0.34 = -0.07$$

This method makes it apparent that the manager lost 41 bps of value on a pre-tax basis, while adding 34 bps of value in tax management.

Giving equal weight to each category, we found mutual fund managers' pre-tax alpha averaged 4 bps and their tax alpha averaged -67 bps. Combining these results shows active managers experienced an annual total alpha of -63 bps, compared to the index, each year, over the last ten years. Similar to findings using the tax efficiency ratio, growth managers provided less tax alpha than value managers, at -63 bps versus -55 bps.

Exhibit 4 summarizes tax alpha by category. Clearly active managers as a group were not able to add value managing for taxes relative to their respective benchmark, but some categories such as small value were reasonably tax efficient while others like large cap managers were tax inefficient.

## EXHIBIT 4

### 10 Year Returns (%)

06/30/95 - 06/30/05

### Active Manager

Manager Category	Pre-Tax Alpha	+ Tax Alpha	= Total Alpha
Large Blend	-1.47	-1.22	-2.69
Large Value	-1.98	-1.01	-2.99
Large Growth	0.22	-0.99	-0.77
Mid Blend	-1.29	-0.72	-2.01
Mid Value	-1.38	-0.58	-1.96
Mid Growth	-0.47	-0.26	-0.73
Small Blend	1.90	-0.74	1.16
Small Value	0.08	-0.07	0.01
Small Growth	3.88	-0.65	3.23
Foreign Large	0.46	-1.02	-0.56
Emerging Markets	0.44	-0.10	0.34
<b>Average (%)</b>	<b>0.04</b>	<b>-0.67</b>	<b>-0.63</b>

## EVIDENCE SHOWS IT IS POSSIBLE TO CREATE TAX ALPHA

*A bird doesn't sing because it has an answer, it sings because it has a song.* Writing about action. Maya Angelou, 1928 African-American poet, writer and performer.

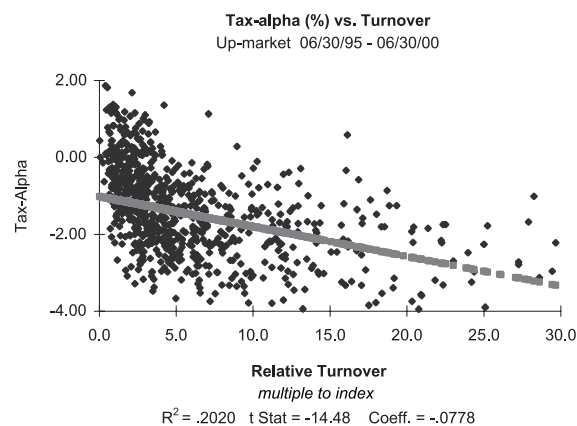
We now look at the tax component of total return. There are three factors that impact tax alpha; realization of capital gains and losses, distribution of dividends, and the rate at which they are taxed. Of these three, dividends and tax rates are hard to control. Taxes associated with dividends can be reduced somewhat by favoring lower dividend paying stocks, but only to the extent that dividend paying stocks are needed for diversification. Federal and state tax rates, set by elected officials, are even harder to control. In contrast, active managers do have significant control in deciding when to realize capital gains and losses.

Capital gain and loss realization is a function of turnover and the strength of market returns. Turnover in a positive market typically produces gains; turnover in a negative market can generate losses. Extending this relationship to tax alpha we used relative turnover or turnover that exceeds benchmark turnover, and regress it against tax alpha during varying time periods.<sup>7</sup> The results on the next page show that turnover has a significant inverse relationship with tax alpha.

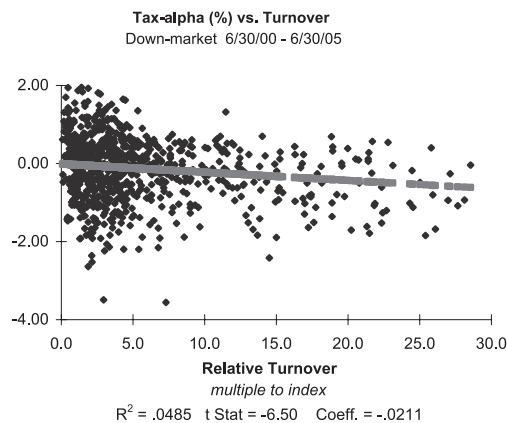
The regression shows that portfolio turnover explained over 20% of the variation in active managers' tax alpha. This is noteworthy because it shows that on average, the more often a manager makes a buy and sell decision, the lower his return will be, due to the tax component of total return. In this case a manager does a lot by doing nothing. The significance of this relationship was heavily weighted in years with positive returns; for example, the years 1995 through early 2000 account for almost all of the correlation. From 2000 to 2005, turnover had minimal significance in explaining tax alpha because of the substantial losses realized early in the period. Exhibits 5 and 6 demonstrate these relationships.

Unlike other factors, turnover's inverse relationship to return was pervasive; significant even within most of the nine mutual fund categories. At the category level, turnover explained up to 45% of tax alpha variation, depending on the category. For example, over the 10-year period the average mid-cap mutual fund created

## EXHIBIT 5



## EXHIBIT 6



about 3 times as much turnover as the related benchmark. This turnover reduced after-tax return by about 90 basis points on average. Large cap funds were even more active, creating 9 times as much turnover as the related benchmark but since the trend line was not as steep reduced return 94 basis points on average. Small cap managers created two times the benchmark turnover, but the relationship was only marginally significant.

These observations support Susko [2003], who emphasized that most active managers do not vigorously manage turnover in their portfolios to minimize the adverse effect of taxes. He uses a model to estimate that these managers need to return almost 1.3 times the related benchmark return on a pre-tax basis to match the benchmark's after-tax return.

The inverse relationship between tax alpha and turnover has exceptions. Loss harvesting is a practice where turnover is focused specifically on those positions in the portfolio held at a loss. In this case, where turnover results in the realization of net losses, turnover can actually create a tax-benefit. For example, a standard Russell 1000 index portfolio is reconstituted every June 30 and may create portfolio turnover of 10%. A similar Russell 1000 portfolio that is loss harvested in addition to the annual reconstitution may have a turnover of 25% or greater, yet still provide a higher tax alpha while maintaining a similar pre-tax return. In this case the relationship between tax alpha and turnover is positive due to net realization of losses rather than net realization of gains. Here it is the nature of the turnover that is the overriding factor effecting tax alpha.

Based on our findings and our experience with tax-management, turnover can be managed to create a beneficial effect on tax alpha; be it through loss harvesting practices, or, to a lesser extent, favoring turnover in years when the market is down, rather than up, or by simply reducing turnover in general.

## CONCLUSION

We have provided evidence that there is value in tax management. The impact of tax management can be significant and varies with the size and style of managers. In developing this conclusion we first compiled pre-tax and after-tax data for active managers and compared the results to related pre-tax and after-tax indexes returns. We then isolated the tax component of active managers' return using two metrics: the tax efficiency ratio and tax alpha. As a final measure, we analyzed the effect of portfolio turnover on after-tax performance.

We found that, on average, active small-cap and emerging market managers outperformed their respective benchmarks on an after-tax basis; while mid and large-cap active managers underperformed. We also found, despite differences in pre-tax category performance basis, the average manager in each mutual fund category underperformed the related benchmark on a tax management basis. We then identified turnover as a tax management factor that, if properly controlled, leads to higher after-tax return. Further we determine that, with the exception of managers who deliberately harvest losses, lower turnover is significantly correlated

with higher tax alpha, leading to higher after-tax investment return.

The findings suggest there may be opportunity to increase return through tax management. We believe the turnover relationship we identify is controllable and repeatable, even if fully exploited. We do not believe the relationship is a time period phenomenon since active managers as a group have historically had higher turnover and have not demonstrated a significant effort to change turnover practices. In the continual quest to outperform, managers may best serve shareholders by focusing on after-tax alpha rather than pre-tax alpha, and specifically by controlling turnover.

## ENDNOTES

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<sup>1</sup>2006 Investment Company Institute Fact Book

<sup>2</sup>Variables are defined as: Pre-tax index return ( $r$ ); the rate at which gains are realized ( $g$ ); capital gain tax rates ( $t_g$ ); the initial market value ( $V_p$ ); cost basis of the initial investment ( $C_p$ ); dividend yield on the index ( $d$ ); the highest tax rate associated with dividends ( $t_d$ ).

<sup>3</sup>Based on the June 30, 2000 through June 30, 2005 time period. Four ETF's that closely aligned to the Russell Index categories were compared to after-tax returns produced by the after-tax index model. ETF's used for the comparison were IWB for the Russell 1000 Large Cap Blend Index, IWD for the Russell 1000 Large Cap Value Index, IWF for the Russell 1000 Large Cap Growth Index, and IWM for the Russell 2000 Small Cap Index. ETF's and mutual funds with at least 5 year return histories were not available for comparison to the other Russell categories used in this article.

<sup>4</sup>Survivorship bias creates a discrepancy in the data. This occurs when mutual fund returns as a group are overstated because the unsuccessful funds were merged or went out of business, thus some under performing returns do not show up in the data.

<sup>5</sup>Some of the tax inefficiency of mutual funds may be attributed to their cash flows. Managers cannot control turnover when fund shareholders are liquidating or purchasing shares giving them less ability to control for taxes. This goes both ways. Sometimes helps, sometimes hurts.

<sup>6</sup>We made this estimate using Quisenberry's version of the after-tax return model and assumed cost basis was equal to market value at the initiation of the estimate starting in

year 1972. The current loss carry-forward estimate assumes both value and growth funds held a loss carry-forward of zero at the end of 1995.

<sup>7</sup>Morningstar defines turnover as a measure of the fund's trading activity that is computed by taking the lesser of purchases or sales (excluding all securities with maturities of less than one year) and dividing by average monthly net assets. Morningstar does not calculate turnover ratios. The figure is pulled directly from the financial highlights of the fund's annual report.

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