



## **Morningstar Tax Cost Ratio**

Morningstar Methodology Paper  
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# Introduction

The Morningstar Tax Cost Ratio measures how much a fund's annualized return is reduced by the taxes investors pay on distributions. Mutual funds regularly distribute stock dividends, bond dividends and capital gains to their shareholders. Investors then must pay taxes on those distributions during the year they were received.

Like an expense ratio, the tax cost ratio is a measure of how one factor can negatively impact performance. Also like an expense ratio, it is usually concentrated in the range of 0-5%. 0% indicates that the fund had no taxable distributions and 5% indicates that the fund was less tax efficient.

For example, if a fund had a 2% tax cost ratio for the three-year time period, it means that on average each year, investors in that fund lost 2% of their assets to taxes. If the fund had a three-year annualized pre-tax return of 10%, an investor in the fund took home about 8% on an after-tax basis. (Because the returns are compounded, the after-tax return is actually 7.8%.)

Some categories tend to be more tax efficient than others. Bond dividends are taxed at a higher rate than stock dividends, while municipal bond dividends are generally exempt from federal tax. The average tax cost ratio for muni-bond funds is 0.05%, but the average for the high-yield bond category is 3.29%. Other differences arise due to manager choices. Some funds follow a buy-and-hold strategy and rarely sell stocks to generate capital gains, while other funds turn over their holdings quickly and generate a lot of short-term capital gains. Sometimes, tax cost ratios are higher than 5%—one small-growth fund has a five-year tax cost ratio of 10.04%.

Investors in lower tax brackets will not experience the full tax costs implied by the tax cost ratio. Per the SEC's guidance, after-tax returns are calculated with the highest tax rates prevailing at the time of the distribution, as if the investor were in the highest tax bracket<sup>1</sup>. Because Morningstar uses after-tax returns to calculate the tax cost ratio, those assumptions also apply to the tax cost ratio. Therefore, the tax cost ratio is an estimate of what investors experienced.

Morningstar calculates this statistic for open-end mutual funds, exchange-traded funds, and variable annuity underlying funds based in the United States.

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<sup>1</sup> For more information about after-tax returns, please see the document entitled "Morningstar After-Tax Return Methodology."

## What This Means for Investors

The tax cost ratio helps investors estimate how much their fund's return is reduced by the impact of taxes. It provides different information than after-tax returns and can be used alone or as a supplement to other data.

The first key difference between the tax cost ratio and after-tax returns is that the tax cost ratio isolates the effects of taxes. Per the SEC's guidance, after-tax returns reflect both tax effects and sales loads.

At first glance, it looks like Fund B has been less tax-efficient than Fund A in the example below, because Fund B's after-tax return is much lower and the total return is similar for both funds. The tax cost ratio and the load-adjusted return reveal that the funds are equally tax efficient and the only difference is in the load structure.

Name	Morningstar Category	Total Return 3 Yr	After-Tax Return 3 Yr	Tax Cost Ratio 3 Yr	Load-Adj Return 3 Yr
Fund A	Mid-Cap Growth	10.22	10.22	0	10.22
Fund B	Mid-Cap Growth	10.21	8.62	0	8.62

This is especially relevant for municipal bond funds. Because municipal bond dividends are generally tax-exempt, investors are sometimes surprised when a municipal bond fund's after-tax return is much lower than the total return. In many of these cases, the difference can be attributed to loads. However, municipal bond funds can also distribute capital gains and these are taxable for shareholders.

The second key difference between the tax cost ratio and after-tax returns is that the tax cost ratio is independent of the level of return. It is expressed on an annualized basis, and it can be used to compare different funds, categories, managers, and time periods. It is more difficult to use after-tax returns to compare funds across these variables, because the level of return can vary across categories and across time. For example, if large-cap funds have been out of favor, a 5% after-tax return may be good, while a 5% after-tax return may not be that impressive for another category that has seen a lot of price appreciation.

Investors can compare a fund's tax cost ratios over time to see if the manager has become better at managing tax issues in more recent years. In the examples below, Fund C has paid out varying levels of taxable distributions over the years. In contrast, Fund D is a tax-managed fund and it has consistently limited its taxable distributions to shareholders.

Name	Morningstar Category	Tax Cost Ratio 1 Yr	Tax Cost Ratio 3 Yr	Tax Cost Ratio 5 Yr	Tax Cost Ratio 10 Yr
Fund C	Large Growth	1.54	0.91	3.11	4.38
Fund D	Large Growth	0.19	0.24	0.23	0.22

Investors can also use the tax cost ratio to compare funds from different categories. If you only look at after-tax return, Fund E and Fund F below look equally attractive. But, the tax cost ratio shows that Fund F had significantly more tax costs. High-yield bonds tend to distribute more taxable income to shareholders, and they also tend to be more risky than intermediate-term bonds. In this case, the high-yield bond fund had a higher total return (and probably higher risk), but those gains are erased when you compare the two funds on an after-tax basis.

Name	Morningstar Category	After Tax Return 3 Yr	Tax Cost Ratio 3 Yr	Total Return 3 Yr	Load-Adj Return 3 Yr
Fund E	Intermediate-Term Bond	8.31	1.38	9.83	9.83
Fund F	High Yield Bond	8.30	3.28	11.97	11.97

The tax cost ratio highlights an important cost for investors. Sometimes investors only look at the expense ratio when they evaluate how costly a fund will be. The tax cost ratio impacts an investor's take-home performance just the same way as the expense ratio. In the examples below, the two funds have the same expense ratio, but the tax costs for investors have been much greater on the second fund. Investors should not ignore tax costs when evaluating a new fund purchase.

Name	Morningstar Category	Expense Ratio	Tax Cost Ratio 3 Yr
Fund G	Large Value	0.56	0.94
Fund H	Large Value	0.56	2.12

# Methodology

Morningstar calculates the tax cost ratio in-house on a monthly basis, using load-adjusted and tax-adjusted returns for different time periods. The tax cost ratio,  $T_i$ , is

$$T_i = 1 - \frac{(1 + ATR_i)}{(1 + L_i)}$$

where

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$ATR_i$  = annualized after-tax return for the time period i (This is also load-adjusted.)

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$L_i$  = annualized load-adjusted pre-tax return for the time period i

Morningstar uses the tax-adjusted return that is called “pre-liquidation after-tax return,” which is also known as “return after taxes on distributions.” This version of after-tax return measures the taxable effects of distributions only. In contrast, the post-liquidation after-tax return assumes that the investor sells the fund at the end of the time period and realizes additional taxes for their personal capital gains.

The after-tax return is adjusted for both taxes and sales charges. Therefore, Morningstar uses a load-adjusted return in the denominator of the tax cost ratio calculation in order to measure the effects of taxes alone.

The tax cost ratio is a positive expression of the negative rate of return that is due to taxes. By rewriting the equation above, it is apparent that the after-tax return is the same as compounding the pre-tax load-adjusted return and the tax cost ratio negative return.

$$\begin{aligned} (1 + ATR_i) &= (1 + L_i) (1 - T) \\ (1 + \text{after-tax ret}) &= (1 + \text{pre-tax load-adj ret}) (1 - \text{tax cost ratio}) \end{aligned}$$

In the example from the introduction, the product of the 10% pre-tax return and the 2% (negative) tax cost ratio is the same as the after-tax return of 7.8%.

$$1.078 = (1 + 0.10)(1 - 0.02)$$

The tax cost ratio can also be calculated as the ratio of the dollars paid in taxes to the investor’s ending assets in the fund. For example, an initial investment of \$100 would have grown to \$115 with a load-adjusted return of 15% and would have grown to \$112 with a tax- and load-adjusted return of 12%. The tax cost ratio is (dollars paid in taxes)/(ending value) = \$3/\$115 = 2.61%. This is equivalent to the original formula  $1 - (1.12/1.15) = 2.61\%$ .

# Conclusion

The tax cost ratio is a measure of how taxes reduce an investor's return. It isolates the effects of taxes alone, and therefore can be used differently than after-tax returns, which reflect both tax effects and sales charges. Investors can use the tax cost ratio to evaluate if the portfolio manager is limiting taxable distributions to shareholders. It is a flexible tool that can help investors easily compare different time periods, different funds, and different categories. Investors pay taxes when they receive a taxable distribution and these costs are just as relevant as the expense ratio in reducing an investor's take-home return.