



# After-Tax Performance Calculation Methodology

Morningstar Methodology Paper  
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# Introduction

Morningstar calculates investment performance measures, returns, after tax returns, standard deviations, modern portfolio statistics and Sharpe indices for unlisted managed investments and market indices.

We also calculate performance measure averages for like groupings of managed investments (such as the Morningstar category indices). These calculated figures are designed to assist users to make:

- ▶ fair comparisons between individual managed investments which may be considered to be peers;
- ▶ assessments relative to other types of investments.

This After-Tax Performance Calculation Methodology provides a summary and explanation of the methodology used by Morningstar in Australia for calculating pre-liquidation after-tax returns for investment trusts.

The fundamental fund comparisons that take place are based on the after-tax performance calculation of a fund universe that has varying attributes. The impact of taxation on the performance of an investment trust may be significant and in many cases pivotal to achieving an investor's ultimate goal. We aim to assist investors in making informed investment decisions by enabling comparisons between funds' after-tax returns and thus 'tax-effectiveness', despite having fund details that are heterogeneous in nature. The tax effectiveness of a fund can be measured by the Tax Cost Ratio.

# Methodology

This Methodology Paper details the pre-liquidation after-tax return methodology, assumptions necessary for calculation, and the Tax Cost Ratio calculation.

Please refer to the Morningstar Performance Calculation Methodology - Returns Paper in conjunction with this Methodology Paper.

## Assumptions

- ▶ Investors are assumed to be Australian residents exposed to the complete set of local taxation rules.
- ▶ All taxation credits/concessions can be fully-utilised immediately.
- ▶ The highest tax bracket will apply when calculating an after-tax CPU. This has been set at 48.5% for all after-tax return calculations before 1 July 2006 and 46.5% will apply for after-tax returns calculated thereafter.
- ▶ The after-tax distribution is re-invested at the ex-distribution exit price (Ex-Price), on the distribution end date. This will assimilate consistency between the before-tax performance and pre-liquidation after-tax performance methodology.
- ▶ The inception date for an after-tax return will not always coincide with the inception date of the fund. After-tax returns will only be calculated for periods where tax data has been provided by the manager, and will not pre-date 1 October 1999.
- ▶ After-tax returns will only be calculated for periods of one year and over.
- ▶ After-tax returns will be calculated only for unitholded investment trust funds, that is, only for those with the legal structure Investment Trusts.

## Pre-Liquidation After-Tax Returns

The pre-liquidation after-tax return series will essentially follow the normal Morningstar performance series. The Total, Capital and Income Returns will be derived in similar ways. The major difference with the pre-liquidation after-tax return series is that we assume that the taxed distribution amount (as opposed to the gross distribution) is reinvested in the fund.

## Calculation

The calculation of the after-tax distribution is central to the after-tax returns performance series. Each individual component of the distribution will have the appropriate taxation rate applied to leave a taxed distribution component.

We have provided an example of a completed IMD02P005 form over which outlines the treatment of each component of a distribution for the purpose of deriving an after-tax distribution figure.

- ▶ The 'taxed' components are those where the highest marginal tax rate will apply (48.5% to 30 June 2006, 46.5% from 1 July 2006).
- ▶ The 'tax-free' components are those that will not have any taxation rate applied.
- ▶ The 'tax-free-return of capital' components are those that also do not have a tax rate applied to them in calculation of pre-liquidation after-tax returns, but have tax implications in the post-liquidation after-tax returns.

Table 1: Example IMD Form

| <b>INVESTMENT MANAGEMENT DATA FORM</b>                                                         |                           |                           |                    |                                                     |  |
|------------------------------------------------------------------------------------------------|---------------------------|---------------------------|--------------------|-----------------------------------------------------|--|
| <b>Form IMD02P005: Tax Components of Distributions - Unit Trusts, Common Funds or Mandates</b> |                           |                           |                    |                                                     |  |
| Manager:                                                                                       |                           | Date:                     |                    | Frequency: Each Distribution and Financial Year End |  |
| Prepared by:                                                                                   |                           | Fax:                      |                    | Phone:                                              |  |
| <b>NOTE: ALL AMOUNTS IN CENTS/UNIT</b>                                                         |                           |                           | <b>Version 1.0</b> |                                                     |  |
| <b>Product Names</b>                                                                           | ABC Australian Share Fund | ABC Australian Share Fund |                    |                                                     |  |
| <b>APIR PIC (or 'M' for Mandate)</b>                                                           |                           |                           |                    |                                                     |  |
| Accrual Period: Start Date                                                                     | 1/7/2004                  | 1/1/2005                  |                    |                                                     |  |
| Accrual Period: End Date                                                                       | 31/12/2004                | 30/6/2005                 |                    |                                                     |  |
| Allocation Basis (1 = cpu or 2 = cpu/day)                                                      | 1                         | 1                         |                    |                                                     |  |
| <b>Australian Assessable (inc Tax Credits):</b>                                                |                           |                           |                    |                                                     |  |
| - Class A (36%) Franked Dividends + Imp Credit                                                 |                           |                           |                    |                                                     |  |
| - Class B (33%) Franked Dividends + Imp Credit                                                 |                           |                           |                    |                                                     |  |
| - Class C (30%) Franked Dividends + Imp Credit                                                 | 39.7315                   | 28.7125                   |                    |                                                     |  |
| - Total Franked Dividends + Imputation Credits                                                 | 39.7315                   | 28.7125                   |                    |                                                     |  |
| - Unfranked Dividends                                                                          | 9.7587                    | 9.0739                    |                    |                                                     |  |
| - Interest Income                                                                              |                           |                           |                    |                                                     |  |
| - Other Australian Income                                                                      | 0.2114                    |                           |                    |                                                     |  |
| - Realised Capital Gains                                                                       |                           |                           |                    |                                                     |  |
| <b>Foreign Assessable (Incl Tax Credits):</b>                                                  |                           |                           |                    |                                                     |  |
| - Dividends Incl Tax Credits                                                                   |                           |                           |                    |                                                     |  |
| - Interest Incl Tax Credits                                                                    |                           |                           |                    |                                                     |  |
| - Passive Foreign Income Incl Tax Credits                                                      |                           |                           |                    |                                                     |  |
| - Other Foreign Income Incl Tax Credits                                                        |                           |                           |                    |                                                     |  |
| - Realised Capital Gains Incl Tax Credits                                                      |                           | 36.6721                   |                    |                                                     |  |
| <b>Tax Free Income:</b>                                                                        |                           |                           |                    |                                                     |  |
| - Building Depreciation Allowance                                                              |                           |                           |                    |                                                     |  |
| - Realised Capital Gains                                                                       |                           | 36.6721                   |                    |                                                     |  |
| - Other Non-Assessable                                                                         |                           |                           |                    |                                                     |  |
| <b>Tax Deferred Income:</b>                                                                    |                           |                           |                    |                                                     |  |
| - Depreciation                                                                                 |                           |                           |                    |                                                     |  |
| - Other Tax Deferred                                                                           |                           | 1.1764                    |                    |                                                     |  |
| <b>Other Not Specified Above</b>                                                               |                           |                           |                    |                                                     |  |
| <b>GROSS TAX DISTRIBUTION</b>                                                                  | 49.7016                   | 112.3070                  |                    |                                                     |  |
| <b>LESS: Imputation Credits Class A</b>                                                        |                           |                           |                    |                                                     |  |
| <b>LESS: Imputation Credits Class B</b>                                                        |                           |                           |                    |                                                     |  |
| <b>LESS: Imputation Credits Class C</b>                                                        | 12.3116                   | 8.9770                    |                    |                                                     |  |
| <b>LESS: Total Imputation Credits</b>                                                          | 12.3116                   | 8.9770                    |                    |                                                     |  |
| <b>LESS: Foreign Tax Credits (claimable in Aust)</b>                                           |                           |                           |                    |                                                     |  |
| <b>LESS: Other Foreign Tax Paid</b>                                                            |                           |                           |                    |                                                     |  |
| <b>TAX DISTRIBUTION NET OF CREDITS</b>                                                         | 37.3900                   | 103.3300                  |                    |                                                     |  |

The after-tax distribution amount is derived as follows.

$$[1] \quad \text{After-tax Distribution Amount} = \{ \sum (\text{TC}) * (1-\text{TR}) \} + \text{TF} + \text{TFRC}$$

Where:

|      |   |                                       |
|------|---|---------------------------------------|
| TC   | = | Taxable components                    |
| TR   | = | Tax rate (at the time)                |
| TF   | = | Tax-free components                   |
| TFRC | = | Tax-free return of capital components |

Therefore, if we use the data from the sample IMD form above as the example – the after-tax distribution amount for 30/06/2005:

$$\begin{aligned}
 &= \{(28.7125 + 9.0739 + 36.6721) * (1 - 0.485)\} + 36.6721 + 1.1764 \\
 &= \{74.4585 * (1 - 0.485)\} + 36.6721 + 1.1764 \\
 &= 38.3461 + 36.6721 + 1.1764 \\
 &= 76.1946
 \end{aligned}$$

We assume that this after-tax distribution figure will then be reinvested at the ex-price.

### Comparing Returns

Compound percent per annum returns may be calculated from “point-to-point” over one- to 10-year time periods ('n') ending at each month-end. Returns are calculated using the Morningstar Total Value Index series as follows:

$$[2] \quad \text{Annualised Total After-tax Return} = \{ F/I \}^{1/n} - 1 \} * 100 \text{ (\% per annum)}$$

Where:

|   |   |                                                                                                    |
|---|---|----------------------------------------------------------------------------------------------------|
| F | = | The (final) total value after-tax index figure for the month at the end of the time period         |
| I | = | The (initial) Total value after-tax index figure for the month at the beginning of the time period |

The same formula is used for calculating after-tax growth returns, except that in this case 'F' is replaced by 'F<sub>c</sub>', the final figure for the After-tax Capital Value Index, and 'I' is replaced by 'I<sub>c</sub>', the initial value for the After-Tax Capital Value Index. That is:

$$[3] \quad \text{Annualised Total After-Tax Return} = \{ F_c/I_c \}^{1/n} - 1 \} * 100 \text{ (\% per annum)}$$

All calculations are nominally from end of month to end of month. Where a soft close exit price is not available from the manager on the last business day of the month, and a return cannot be calculated, 'Nav' appears in Morningstar performance tables.

Similarly, time periods for which a return is not applicable are indicated with dashes ('----') or 'NAp'. Special characters or no data are provided for these situations in the Morningstar Licensed Data records.

Table 2: Example of the calculation of pre-liquidation after-tax returns

| 1. Fact                                                  | Value       | Units   |        |
|----------------------------------------------------------|-------------|---------|--------|
| Price 30 June 2004                                       |             |         |        |
| End of month cum-distribution price (no dist. were made) | \$15.2565   |         |        |
| Distributions (taxed adjusted)                           |             |         |        |
| 30/12/04 - cents per unit                                | 25.5963     |         |        |
| 31/12/04 - Ex-Price                                      | \$18.1200   |         |        |
| 30/06/05 - cents per unit                                | 76.1946     |         |        |
| 30/06/05 - Ex-Price                                      | \$17.6967   |         |        |
| 2. Total after-tax return calculation 1yr to 30/06/05    | Value       | Units   | Return |
| No. of units                                             | \$10,000    | 655.46  |        |
| 31/12/04 distribution (655.46*0.255963)                  | \$167.77    |         |        |
| Reinvest \$167.77 @ \$18.12                              |             | 9.2588  |        |
| Growth of initial investment (664.71*18.12)              | \$12,044.55 | 664.71  |        |
| 30/06/05 distribution (664.71*0.761946)                  | \$506.47    |         |        |
| Reinvest \$506.47 @ \$17.6967                            |             | 28.6195 |        |
| Growth of initial investment (693.33*17.6967)            | \$12,269.65 | 693.33  |        |
| 1yr Total Return @ 30/06/05 (12269.65/10000)             |             |         | 22.70% |
| 1yr Growth Return                                        |             |         |        |
| 30/06/04 exit price                                      | \$15.2565   |         |        |
| 30/06/05 ex-price                                        | \$17.6967   |         |        |
| (17.6967/15.2565)-1                                      |             |         | 15.99% |
| 1yr Income Return (22.7%-15.99%)                         |             |         | 6.71%  |

### Tax Cost Ratio

The Morningstar Tax Cost Ratio is a measure of the extent to which a fund's returns in the hands of the end investor are reduced by the taxes they have paid on their distributions. The Tax Cost Ratio is akin to an expense ratio, where the investor's in-the-pocket performance return is reduced similarly by the fees charged by the fund manager.

The Tax Cost Ratio will allow investors to compare the tax effectiveness of funds. A lower Tax Cost Ratio indicates better tax-effectiveness for a fund. For example, if two funds have the same before-tax return, but one has a lower Tax Cost Ratio, the latter will have provided a better after-tax return.

The calculation for the Tax Cost Ratio will compare the standard performance series to the pre-liquidation performance series, as follows:

$$[4] \quad \text{Tax Cost Ratio} = 1 - \left[ \frac{(1 + ATR)}{(1 + BTR)} \right]$$

Where:

|     |   |                                                      |
|-----|---|------------------------------------------------------|
| ATR | = | The pre-liquidation after-tax returns                |
| BTR | = | The before-tax returns (standard performance series) |

For example, see Table 3 and a worked example of ABC Australian Share Fund’s Tax Cost Ratio over multiple time periods.

Table 3: Hypothetical before- and after-tax returns for ABC Australian Share Fund

|                         | <b>1 Year %</b> | <b>3 Year % pa</b> |
|-------------------------|-----------------|--------------------|
| Total Before-tax Return | 25.31           | 10.50              |
| Total After-tax Return  | 22.70           | 8.10               |
| Tax Cost Ratio          | 2.08            | 2.17               |

Therefore the three-year Tax Cost Ratio for the ABC Australian Share Fund is calculated as follows:

$$\text{Tax Cost Ratio} = 1 - \left[ \frac{(1 + 0.081)}{(1 + 0.105)} \right]$$

$$\text{Tax Cost Ratio} = 1 - 0.9783$$

$$\text{Tax Cost Ratio} = 2.17\%$$

The fund had a three-year annualised before-tax return of 10.50%, and an investor in the fund took home 8.10% on an after-tax basis. Inherently, investors in that fund lost about 2.4% pa of their assets to taxes, resulting in the fund having a 2.17% Tax Cost Ratio for the three-year time period. As seen above the, ABC Australian Share Fund improved its tax-effectiveness over time from a 2.17% Tax Cost Ratio for the three-year period which was reduced to 2.08% for the most recent one- year period.

The Tax Cost Ratio isolates the effects of taxes alone. Investors can use the Tax Cost Ratio to evaluate if the portfolio manager is limiting taxable distributions to unit holders. The Tax Cost Ratio is a flexible tool that can help investors easily compare returns over 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 an expense ratio in potentially reducing an investor’s in-the-pocket return.