New Zealand Portfolio Investment Entity (PIE) Performance Calculation Methodology

Morningstar Methodology Paper

July 2008

Contents

 © Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Introduction

This Methodology Paper details the Before-Tax and after-tax PIE return methodology, the treatment of a PIE funds non-PIE performance history, the assumptions necessary for calculations, and the Tax Cost Ratio calculation.

The New Zealand Government made significant changes to the taxation of managed funds in early 2007. One of these changes was the creation of a new legal type, a Portfolio Investment Entity (PIE).

PIE's differ from traditional managed funds in a few important ways. The most significant of these is that they now pass all taxation through to the end investor. However fund management companies are required to calculate each unit-holder's tax liability and forward the payment to (or collect the rebate from) the Inland Revenue Department (IRD) on behalf of unit-holders.

A unit-holder's tax liability is calculated using their taxable income, tax credits and marginal tax rate. Investors can have one of three different marginal tax rates depending on external circumstances; 19.5%, 33% (reducing to 30% in April 2008), and 0% (for charities and PIE's which invest in other PIE's). As a result, the industry has adopted the Before-Tax return as the standard for presenting PIE performance.

From 1 October 2007, PIE funds started reporting untaxed tax unit prices and distributions. The industry standard is to supply research houses with unit prices and tax components on a daily basis. Using this information, Morningstar can calculate Before-Tax and after- tax performance for PIE funds.

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 as well as a funds 'tax-effectiveness'. The tax effectiveness of a fund can be measured by the Tax Cost Ratio.

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

© Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Inputs

The minimum requirements for calculating standard investment fund performance are:

- Ex-Price
- Distributions

In addition to the list above, the minimum requirements for calculating Before-Tax performance for a PIE are:

- Foreign Tax Credits (FTC)
- Dividend Withholding Payments (DWP)
- Residential Withholding Taxation (RWT)
- Imputation Credits (IC)
- Future income tax benefit released (FITB), currently recorded as 'Other'

While the distinction between the different tax credits above is of some importance to an institutional investor, for the purposes of our calculation, we can simply aggregate the individual daily amounts into a single value which we will call the Sum of All Tax Credits (TC).

Tax credit data (FTC, DWP, RWT, and IC) is received daily in per unit values. FITB may be collected each day, but is most likely collected at the end of each month and applied retrospectively. It may be provided as a total for the fund, in which case it needs to be converted to a per unit value. This will require an additional input, Total Units in the Fund.

An abridged example of a completed IMD collection form is presented in Appendix A.

© Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Assumptions

- Investors are assumed to be New Zealand tax residents exposed to the complete set of local taxation rules.
- Investors are assumed to have purchased a single unit (notional units) of the fund at the funds inception.
- Units are infinitely divisible.
- All tax credits/concessions can be fully utilised immediately and are re-invested at the ex-distribution exit price (Ex-Price) at the end of each day.

© Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Total Return

Morningstar measures a funds performance between two points in time by calculating the rate of growth in the notional Net Asset Value (NAV).

$$TR = (NAVC / NAVP) - 1$$

Where:

TR	=	Total return
NAVC	=	the number net asset value at the end of the current period
NAVP	=	the number net asset value at the end of the previous period

The NAV for a fund at any point in time is calculated using the relevant ex-distribution exit unit prices (ex-price) and the number of notional units.

$$NAV = EP * UC$$

Where:

EP	=	the ex-price
UC	=	the number of notional units at the end of the current period

The number of notional units is affected by the reinvestment of all distributions.

$$UC = UP * (1 + [D / EP])$$

Where:

UC	=	the number of notional units at the end of the current period
UP	=	the number of notional units at the end of the previous period
D	=	the distribution
EP	=	the ex-price

Capital Return

Morningstar measures a funds capital return between two points by calculating the rate of growth in the ex-distribution exit prices.

$$CR = EPC / EPP - 1$$

Where:

CR	=	Capital growth

 © Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

EPC	=	the ex-price at the end of the current period
EPP	=	the ex-price at the end of the previous period

Income Return

Morningstar measures a funds income return by subtracting the capital return from the total return.

$$IR = TR - CR$$

Where:

IR	=	Income return

Unlike the total return and the capital return, the income return cannot be geometrically linked. That is, it is not possible to compound monthly income returns to calculate an annual income return.

© Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Before-Tax PIE Total Return

The Before-Tax total return series will be represent the returns of a fund before all taxes and with all distributions reinvested. This extends upon the basic performance calculation method and requires the accrual of tax credits (which represent tax that has already been paid) and future income tax benefits (arising for the use of the tax asset created by formation losses.)

Before-Tax PIE Total Return Calculation

The calculation of the daily tax-credit unit-adjustment is central to the Before-Tax return series. The daily tax-credit unit-adjustment describes a process similar to that of an ordinary cash distribution. The result of this unit-adjustment, as with any ordinary cash distribution, is a change in the number of notional units. The change in the number of notional units is a function of the sum of all taxation credits and concessions and the ex-price.

The simple formula for the daily tax-credit unit-adjustment is:

$$UC = UP * (1 + [TC / EP])$$

Where:

UC	=	the number of notional units at the end of the current day
UP	=	the number of notional units at the end of the previous day
TC	=	the sum of all tax credits
EP	=	the ex-price

As this tax-credit unit-adjustment occurs every day, there will be times when it coincides with an ordinary cash distribution. In this case, the formula for the daily tax-credit unit-adjustment would be:

$$UC = UP * (1 + [(TC + D) / EP])$$

Or,

$$UC = UP * (1 + [TC / EP] + [D / EP])$$

Where:

D	=	the ordinary cash distribution

 © Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Before-Tax PIE Total Return Example

The following practical example will use the data from 30 January 2008 and 31 January 2008 in Appendix A to illustrate the method of calculating a Before-Tax total return for a PIE. For simplicity we will assume the number of units on 30 January 2008 is equal to one.

Ex-price 30 January 2008	=	1.0609112
Ex-price 31 January 2008*	=	1.0620123
Sum of all tax credits	=	0.0001464 (FTC)+ 0.00 (DWP)+ 0.0 (RWT)+ 0.0001464 (IC) = 0.0002928
Initial notional units	=	1.0000000

Firstly, we need to calculate the initial NAV, which is the NAV for the previous day.

NAVP = 1.0609112 * 1.0000000 = 1.0609112

Secondly we need to calculate the NAV for the current day, but in order to do that we need to calculate the number of units at the end of the current day.

UC = 1.0000000 * (1 + [0.0002928 / 1.0620123])
UC = 1.0000000 * (1.0002757)
UC = 1.0002757

Therefore,

NAVC = 1.0620123 * 1.0002757
NAVC = 1.0623051

And,

TR = (1.0623051 / 1.069112) – 1
TR = 1.0013139 – 1
TR = 0.0013139, or 0.13139%

The primary purpose of this example is to illustrate the daily adjustment to the number of notional units. At this stage Morningstar does not calculate and publish daily returns for New Zealand managed funds. However, we will be making a daily adjustment to the number of notional units, which will allow for daily compounding of all tax credits.

Before-Tax Pre-inception PIE Performance History

Funds that converted to PIE on 1 October 2007 will have a relevant return history that needs to be captured in longer dated historical returns going forward. In order to maintain symmetry between the return series before and after PIE conversion Morningstar will be adjusting the previous after-tax returns to reflect an estimate of the tax paid.

 © Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Morningstar has opted for a simple method of adjustment for the historical returns. Each month in the pre-PIE after-tax monthly return series will be 'grossed up' using the following formula.

MGR = MNR / (1 – TXR)

Where:

MGR	=	Monthly gross total return (estimated monthly Before-Tax return)
MNR	=	Monthly net total return (actual monthly after-tax return)
TXR	=	The relevant tax rate (i.e. Unit Trusts and Super Funds 33%, GIF's 19.5% and Passive Funds 0%)

© Morningstar Australasia Pty Ltd 2007. ABN: 95 090 665 544, AFSL: 240892

Appendix A

INVESTMENT MANAGEMENT DATA FORM
Form MSTAR001NZ: Unit Prices - Unit-Linked Products or Mandates
(For After and Before Tax and Fees Unit Prices)

Manager:			Email: data.nz@morningstar.com			Frequency: Each Unit Valuation (Maximum Daily)								
Prepared by:			See second worksheet for example			Fax:								
Date of Preparation:			Mandatory fields			Phone:								
Version 1.1			Optional fields											

APIR PIC TICKER	Product Name	Unit Price Information						Fund Type	Taxation Component Breakdown					
		Effective Date for Hard Close or Soft Close Price			Cum-Distrib ENTRY NZ$	Base NZ$	Cum-Distrib EXIT NZ$	PIE? Y/N	Taxable Income	Foreign Taxation Credits	Dividend Withholding Payments	Resident Withholding Taxation	Imputation Credits	Non-Taxable Income
		From	To											
98765	Fund XYZ		31-Dec-07				1.0589000	Y						
98765	Fund XYZ		1-Jan-08				1.0581608	Y	-0.000739217	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		2-Jan-08				1.0576302	Y	-0.000530632	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		3-Jan-08				1.0582959	Y	0.000665772	0.0000000	0.0000237	0.0000000	0.00002366	
98765	Fund XYZ		4-Jan-08				1.0586048	Y	0.000308861	0.0000000	0.0000431	0.0000000	0.00004306	
98765	Fund XYZ		5-Jan-08				1.0578274	Y	-0.000777378	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		6-Jan-08				1.0589421	Y	0.001114737	0.0001737	0.0000000	0.0000000	0.00017371	
98765	Fund XYZ		7-Jan-08				1.0588213	Y	-0.000120821	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		8-Jan-08				1.0588137	Y	-0.000007601	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		9-Jan-08				1.0588380	Y	0.000024291	0.0000000	0.0000000	0.0000025	0.00000247	
98765	Fund XYZ		10-Jan-08				1.0597284	Y	0.000890401	0.0000000	0.0000000	0.0001523	0.00015226	
98765	Fund XYZ		11-Jan-08				1.0589108	Y	-0.000817599	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		12-Jan-08				1.0599186	Y	0.001007759	0.0000000	0.0000000	0.0002514	0.00025144	
98765	Fund XYZ		13-Jan-08				1.0595103	Y	-0.000408301	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		14-Jan-08				1.0592839	Y	-0.000226388	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		15-Jan-08				1.0588062	Y	-0.000477707	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		16-Jan-08				1.0577824	Y	-0.001023802	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		17-Jan-08				1.0569441	Y	-0.000838320	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		18-Jan-08				1.0565551	Y	-0.000388919	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		19-Jan-08				1.0557488	Y	-0.000806346	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		20-Jan-08				1.0560639	Y	0.000315116	0.0000578	0.0000000	0.0000000	0.00005776	
98765	Fund XYZ		21-Jan-08				1.0553906	Y	-0.000673304	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		22-Jan-08				1.0543893	Y	-0.001001289	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		23-Jan-08				1.0548858	Y	0.000496533	0.0000646	0.0000000	0.0000000	0.00006460	
98765	Fund XYZ		24-Jan-08				1.0553414	Y	0.000455509	0.0000433	0.0000000	0.0000000	0.00004331	
98765	Fund XYZ		25-Jan-08				1.0567344	Y	0.001393005	0.0000209	0.0000000	0.0000000	0.00002092	
98765	Fund XYZ		26-Jan-08				1.0581335	Y	0.001399120	0.0001379	0.0000000	0.0000000	0.00013787	
98765	Fund XYZ		27-Jan-08				1.0592579	Y	0.001124424	0.0000241	0.0000000	0.0000000	0.00002409	
98765	Fund XYZ		28-Jan-08				1.0585189	Y	-0.000738999	0.0000000	0.0000000	0.0000000	0.00000000	
98765	Fund XYZ		29-Jan-08				1.0599352	Y	0.001416287	0.0000826	0.0000000	0.0000000	0.00008265	
98765	Fund XYZ		30-Jan-08				1.0609112	Y	0.000975970	0.0000081	0.0000000	0.0000000	0.00000812	
98765	Fund XYZ		31-Jan-08				1.0620123	Y	0.001101153	0.0001464	0.0000000	0.0000000	0.00014644	