



## UNDERSTANDING YOUR RATES OF RETURN

Your Personalized Rates of Return (PROR) help you to assess the performance of the total investments in your plan over a selected period of time and allows you to compare performance with market indices. The method used to calculate your PROR is described below.

### Methodology:

The returns are calculated daily (or whenever cash flows occur), using a time-weighted formula called the Modified Dietz Method. This method is considered as the industry standard and gives a good indication of investment performance.

The formula for the Time-Weighted Rate of Return with a daily valuation is as follows:

$$R = \frac{MVE}{MVB^*} - 1$$

Where the **MVB\*** is the market value of the plan at the end of the previous period (the beginning of the current period) including any cash flows at the end of the previous period and any accrued income (applicable only to mutual funds) to the end of the previous period.

**MVE** is the market value of the plan at the end of the current period excluding any cash flows occurring in the period but including any income distributions (applicable only to mutual funds) in the current period.

### The Linking Formula is written as:

$$\text{Personal Rate of Return (PROR)} = \{[(1+R_1) \times (1+R_2) \times \dots (1+R_n)-1]\} \times 100$$

Where:

$R_1$  = First period calculation

$R_2$  = Second period calculation

$R_n$  = Last period calculation

The formula takes into account each cash flow by calculating R for variable periods as follows:

- From cash flow 1 to cash flow  $n$  (where  $n$  is a variable representing the next transaction), and
- From cash flow  $n$  to the end of the period

The return and linking PROR formulas calculate personal rates of return for any given reporting period up to 12 months. For periods longer than 12 months, returns are annualized using the following formula:

$$\text{ACCR} = (R_{\text{total}}^{365/n} - 1) \times 100$$

Where :

$$R_{\text{total}} = (1+R_1) \times (1+R_2) \times \dots (1+R_n)$$

$$n = \text{total days in period (total number of years times 365 days)}$$

The following is a sample calculation based upon activity over a 3 month period from January 1 to March 31, using the Modified Dietz Method:

### **SAMPLE CALCULATION**

**Step 1:** Transactions during the 3-month period:

January 1	Initial purchase	Investment A: 1,000 units @ 9.0000	\$ 9,000.00
		Investment B: 1,000 units @ 6.0000	\$ 6,000.00
	Balance		\$15,000.00
February 10	Purchase	Investment A: 500 units @ 9.5000	\$ 4,750.00
		Investment B: 500 units @ 7.0000	\$ 3,500.00
	Balance	Investment A: 1,500 units @9.5000	\$14,250.00
		Investment B: 1,500 units @7.0000	<u>\$10,500.00</u>
			\$24,750.00
March 15	Purchase	Investment A: 100 units @ 10.0000	\$ 1,000.00
	Redemption	Investment B: 200 units @ 7.2500	\$ 1,450.00
	Balance	Investment A: 1,600 units @10.0000	\$16,000.00
		Investment B: 1,300 units @ 7.2500	<u>\$ 9,425.00</u>
			\$25,425.00
March 31	No transactions	Investment A: Unit value: 10.1000	
		Investment B: Unit value: 7.3000	
	Balance	Investment A: 1,600 units @10.1000	\$16,160.00
		Investment B: 1,300 units @ 7.3000	<u>\$ 9,490.00</u>
			\$25,650.00

**Step 2:** Calculate returns for each cash flow period.

$$R = \frac{\text{Ending market value ( - purchases + redemptions + income distributions) - 1}{\text{Beginning market value}}$$

$$R_{\text{Feb 10}} = \frac{[\$14,250 + \$10,500] - [\$4,750 + \$3,500]}{[\$9,000 + \$6,000]} - 1$$

$$R_{\text{Feb 10}} = .100$$

$$R_{\text{Mar 15}} = \frac{[\$16,000 + \$9,425] - [\$1,000 - \$1,450]}{[\$14,250 + \$10,500]} - 1$$

$$R_{\text{Mar 15}} = .045$$

$$R_{\text{Mar 31}} = \frac{[\$16,160 + \$9,490] - 0}{[\$16,000 + \$9,425]} - 1$$

$$R_{\text{Mar 31}} = .009$$

**Step 3** Calculate 3 Month Personal Rate of Return as at March 31

$$PROR = \{[(1 + R_{\text{Feb 10}}) \times (1 + R_{\text{Mar 15}}) \times (1 + R_{\text{Mar 31}}) - 1]\} \times 100$$

$$PROR = \{[(1+.100) \times (1+.045) \times (1+.009) - 1]\} \times 100 = 16.0\%$$