HOW IS YOUR PERSONAL RATE OF RETURN CALCULATED?

Your personal return is calculated using the money-weighted rate of return (MWRR) method.

To determine the annualized rate of return on your investments, you need to:

A.

Know the dollar amounts and dates of any deposits or withdrawals made throughout the year;

B.

Calculate the annualized rate of return using the MWRR method.

Here's an example:

You invested $100,000 in Desjardins Funds on December 31, 2010.

DECEMBER 31, 2010

$100,000

Over the next few years, you made a few purchases of units in Desjardins Funds, investing $10,000 each time. In 2015, you withdrew $10,000.

2012, 2013 AND 2014

$10,000 DEPOSITS

2015

$10,000 WITHDRAWAL

During these years, the value of your investments went up and down with the stock market, and at the end of 2015, the market value of your Desjardins Funds stood at $164,000.

DECEMBER 31, 2015

$164,000

CALCULATING YOUR PERSONAL RATE OF RETURN

On December 31, 2015, the market value of your Desjardins Funds was $164,000.

Because you invested $120,000 between December 2010 and December 2015, it appears your money grew by $44,000, or 7.33% annually.

This simple calculation, which is for illustration purposes only, might produces a rate of return of 7.33%.

INVESTMENT AMOUNT:
$120,000 = ($100,000 + (3 x $10,000) - $10,000)

CAPITAL GROWTH:
$44,000

NUMBER OF YEARS:
5

([$44,000 / $120,000]/5) * 100 = 7.33%

However, your annual rate of return isn't actually 7.33%. That number doesn't take into account the deposits and withdrawals you made and the timing of them.

To calculate your personal annualized return, you need to know **the exact dates and amounts** of all the monetary movements.

Personal return calculation formula

$$BMV + \left[\frac{M_1}{(1+R)^{(Wi)1}} + \frac{M_2}{(1+R)^{(Wi)2}} + \frac{M_3}{(1+R)^{(Wi)3}} \cdots + \cdots \right] - \frac{EMV}{(1+R)^{(Wi)n}} = 0$$

R =	personal annualized return	TBD
BMV =	market value of the account at the beginning of the period	$100,000
EMV =	market value of the account at the end of the period	$164,000
M =	monetary movements (deposits or withdrawals)	$10,000
n =	timing of monetary movements	Various dates
WI =	Di /D	
where		
Di =	number of days elapsed between the beginning of the period (December 31, 2010) and the date of the monetary movements	
D =	number of days in the year	365 days in this example

We will explain, step by step, how to calculate your personal return.

Step A

- You need to know the exact dates and dollar amounts of all your monetary movements.

- You need to know the market value at the beginning and end of the calculation period.

SUMMARY OF MONETARY MOVEMENTS				NUMBER OF DAYS ELAPSED SINCE THE BEGINNING OF THE PERIOD (DECEMBER 31, 2010)
Initial	December 31, 2010	Beginning market value	$100,000	0
1st	January 15, 2012	Deposit	$10,000	380
2nd	February 24, 2013	Deposit	$10,000	785
3th	March 18, 2014	Deposit	$10,000	1,172
4th	January 25, 2015	Withdrawal	$10,000	1,485
5th	December 31, 2015	Ending market value	$164,000	1,825

▢ Step B

- Calculate the annualized rate of return using the money-weighted rate of return method. To do this, you'll need to find the rate of return that produces a result of zero in the formula below after adding up the present values of all the monetary movements.[3]

It's a complicated calculation that requires a computer program or application. That's why we do it for you.

Your return (R) is 6.71842%.

Here's how we arrived at that number:

$$\text{BEGINNING MARKET VALUE} + \left[\frac{\text{DEPOSIT/WITHDRAWAL 1}}{(1+\text{RETURN})^{\text{DATE 1}}} + \frac{\text{DEPOSIT/WITHDRAWAL 2}}{(1+\text{RETURN})^{\text{DATE 2}}} \cdots + \cdots \right] - \frac{\text{ENDING MARKET VALUE}}{(1+\text{RETURN})^{\text{DATE n}}} = 0$$

$$-100{,}000 + \left[\frac{-10{,}000}{(1+R)^{380/365}} + \frac{-10{,}000}{(1+R)^{785/365}} + \frac{-10{,}000}{(1+R)^{1172/365}} + \frac{10{,}000}{(1+R)^{1485/365}} \right] + \frac{164{,}000}{(1+R)^{1825/365}} = 0$$

$$-100{,}000 + \left[\frac{-10{,}000}{(1.0671842)^{1.0411}} + \frac{-10{,}000}{(1.0671842)^{2.1507}} + \frac{-10{,}000}{(1.0671842)^{3.2110}} + \frac{10{,}000}{(1.0671842)^{4.0685}} \right] + \frac{164\,000}{(1{,}0671842)^{5}} = 0$$

$$-100{,}000 + \left[\frac{-10{,}000}{(1.0700)} + \frac{-10{,}000}{(1.1501)} + \frac{-10{,}000}{(1.2322)} + \frac{10{,}000}{(1.3028)} \right] + \frac{164{,}000}{(1.3842)} = 0$$

$$-100{,}000 + \left[-9{,}346 + -8{,}695 + -8{,}115 + 7{,}676 \right] + 118{,}480 = 0$$

$$-118{,}480 + 118{,}480 = 0$$

The personal annualized rate of return that gives a result of 0 for the **period is 6.71842%**.

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[3] For the purposes of this example, the beginning market value and deposits are negative values, and withdrawals and the ending market value are positive values. This may sound counterintuitive, but think of it this way: when you contribute to your investment, you're taking money out of your pocket; and when you withdraw money from your investment, you're putting it back in your pocket.