

How to Calculate Your Personal Rate of Return

Your *personal rate of return* shown on your PEPP statement, is based on your account transactions during the last six and 12 month period. Your personal rate of return is determined by calculating the change in your fund's unit value, any transfers and contributions; this calculation can be referred to as the *Modified Dietz Method*.

The personal rate of return is calculated for each plan member, so your return may vary from other Plan members. Your personal rate of return may also differ from the fund rate of return posted on the PEBA website.

For a detailed description on how to calculate your personal rate of return, [click here](#).

How to Calculate Your Personal Rate of Return

To determine your personal rate of return, follow these steps:

1. Determine the *earnings* in the month.
(Earnings = Closing Balance – Opening Balance – Transactions);
2. Calculate the *time-monies invested* (number of days invested) for each transaction: determine the total number of days in the month that the transaction was invested. For example, a deposit on January 15th would be invested for 17 days (31 – 14). Take the result and divide it by the total number of days in the month (17÷31 = 0.5484);
3. Multiply the time-monies invested by each transaction. For example, if you contributed \$100 on January 15th, the result would be \$54.84 [\$100 x (17÷31)];
4. Add the results in Step 3 for all transactions in that month, including the opening balance for the month;
5. Divide the monthly earnings by the sum of the time-monies invested earnings (Step 4). This will give you the rate of return for the month;
6. Repeat Step 1 to 5 for each month thereafter.
7. To determine your *one-year personal rate of return*:
 - a. Add one to each month's rate of return (from Step 6). Then, multiply 12 rates together;
 - b. When you complete that series of multiplications, subtract one from the result.
Multiply that number by 100. This will give you the one-year personal rate of return.
8. To determine your *annualized return rate* of return for any time period, you would calculate it using the modified dietz formula the same way you would for 12 months. The only difference is that you would calculate it over 24, 36, 38, 48 months, etc. Then you apply the following formula to get the annualized rate of return:

$$(1 + \text{Modified Dietz})^{12/\text{number of months}} - 1$$

So to calculate a 4 year (48 month) annualized return, your calculation would be:

$$(1 + \text{Modified Dietz})^{12/48} - 1$$

For an example of how to calculate your personal rate of return, [click here](#).

Example:

John Smith had \$10,000 invested in PEPP at the beginning of the year. He contributes \$300 on the 15th of every month. John's balance on January 31st was \$10,431.12. To arrive at each of John's one-month personal rates of return, follow these steps:

Step 1: Calculate John's earnings for each month. For January, John's earnings would be:
 $\$10,431.12 - \$10,000 - \$300 = \mathbf{\$131.12}$

Step 2: Calculate the value of John's time-monies invested during the month.

John's first contribution was on January 15th. Therefore, John's time-monies invested for January is $(31 - 14) \div 31 = \mathbf{0.5484}$.

Step 3: Multiply the time-monies invested by the transaction: $0.5484 \times \$300 = \mathbf{\$164.40}$.

Step 4: Add the opening balance at the beginning of the month to Step 3.
 $(\$10,000 + \$164.40 = \mathbf{\$10,164.40})$

Step 5: To find out John's monthly personal rate of return for January, divide Step 1 by Step 4.
 $(\$131.12 \div \$10,164.40 = \mathbf{1.29\%})$

Step 6: Start the next month's calculation with January's closing balance of \$10,431.12 and follow Step 1 through Step 5 for each month thereafter.

Step 7: To calculate John's one-year personal rate of return:

Add one to each month's return. Then multiply those 12 results together. When you complete that series of multiplications, subtract one from the result and multiply by 100 to get John's one-year rate of return.

John's monthly returns were:

<u>Month</u>	<u>Return</u>	<u>Month</u>	<u>Return</u>
January	1.29%	July	2.69%
February	-1.11%	August	1.94%
March	0.13%	September	-2.84%
April	-4.63%	October	-2.22%
May	0.10%	November	1.43%
June	-0.05%	December	-9.53%

Therefore, **John's one-year personal rate of return** is: $[(1 + 1.29\%) * (1 - 1.11\%) * (1 + 0.13\%) * (1 - 4.63\%) * (1 + 0.10\%) * (1 - 0.05\%) * (1 + 2.69\%) * (1 + 1.94\%) * (1 - 2.84\%) * (1 - 2.22\%) * (1 + 1.43\%) * (1 - 9.53\%)] - 1] * 100 = \mathbf{-12.66\%}$