

Investment Math 101: Calculating Your Own Performance

Tracking the performance of your investments is not as difficult as you might assume. Once you understand a few simple formulas, you can use a calculator or spreadsheet software to determine common metrics, such as annual rate of return or after-tax return.

Determining Rate of Return

Probably the most basic calculation for investors is return on investment. Total return includes capital appreciation and income components, and assumes all income distributions are reinvested. If you automatically reinvest distributions such as interest or dividends, but added no other new funds to the account, total return is calculated by taking the difference in an investment portfolio's ending and beginning balance, and dividing that difference by the beginning balance. In formula format, it would look like this:

$$\text{Total Return: (Calculator or Spreadsheet)} \\ \frac{(\text{Ending Balance [EB]} - \text{Beginning Balance [BB]})}{\text{Beginning Balance}}$$

For example, Joe started with an investment of \$10,000. After five years, his portfolio's value increased to \$12,000. He can determine his portfolio's total return as follows: $(\$12,000 - \$10,000) / \$10,000 = 0.20$, or 20%. Therefore, Joe can say his \$10,000 has increased by 20%.

To annualize this total return, you'll need to calculate the compound annual return.

For example, Jane also originally invested \$10,000. However, it took her portfolio only two years to grow to \$12,000. If you measure the performances of both Joe's and Jane's portfolios by using the formula above, both increased by 20%. To take the difference in time into consideration—i.e., to calculate the compound annualized rate of return—you would need a calculator that can raise to powers. Here's what the formula would look like:

$$\text{Compound Annualized Rate of Return:} \\ \text{Calculator: } [(EB / BB)^{(1 / \# \text{ of years})} - 1] \\ \text{Spreadsheet: } [(EB / BB)^{(1 / \# \text{ of years})}] - 1$$

Using this formula to calculate Joe's annual compound return, we take $\$12,000 / \$10,000 = 1.2$. Then, we raise 1.2 to the $1/5$ (or 0.20) power, giving us 1.03714. Subtract out 1, and we have 0.03714, or 3.714%, which is Joe's annualized return. Jane's portfolio, on the other hand, performed much better, earning 9.54% on average every year. Of course, two different investments should not be judged solely on performance results for short periods of time or for different time periods. The risk of the portfolio must also be considered.

The Rule of 72

If you need to estimate how your nest egg might grow, you might want to use the Rule of 72. The Rule of 72 can reveal how long it could take your money to double at a particular rate of return. To calculate this measurement, you would use the following formula:

$$72 / \text{Annual Rate of Return} = \text{Number of years it will take} \\ \text{for your money to double at a particular rate of return}$$

For example, Jane and Joe want to figure out how long it will take their \$10,000 investments to double to \$20,000. They would use their compound annual rates of return (as explained above) to estimate how many years it will take to double their money. Joe estimates it will take over 19 years ($72 / 3.71\% = 19.4$ years). However, Jane's portfolio could grow to \$20,000 in less than eight years ($72 / 9.54\% = 7.55$ years).

It is important to note that the Rule of 72 does not guarantee investment results or function as a predictor of how your investment will perform. It is simply an approximation of the impact a targeted rate of return would have. Investments are subject to fluctuating returns, and there can never be a guarantee that any investment will double in value.

Remember Taxes and Inflation

You should always take into consideration the effects of taxes and inflation when constructing an investment plan to meet your financial objectives. After all, even though Jane earned an average 9.54% on her investments every year, her "real" rate of return will be reduced by taxes and increases in the cost of living.

Depending on Jane's situation and income tax bracket, as much as 39.6% of her 9.54% compound annual return could be paid in federal taxes, leaving her with $[9.54\% \times (1 - 0.39.6)]$, or 5.76%.

Then, Jane must figure in the effects of inflation on her earnings. For example, assume inflation averaged 3% over the two years that Jane invested her \$10,000, and that she earned a 5.76% compound annual return after taxes, but before inflation. Now, Jane must adjust her after-tax return for the loss of purchasing power caused by inflation. To determine an inflation-adjusted rate of return, use the following formula:

$$\begin{aligned} &\text{Inflation-Adjusted Return:} \\ &\text{(Calculator or Spreadsheet:)} \\ &[(1 + \text{Rate of Return}) / (1 + \text{Inflation Rate}) - 1] \times 100 \end{aligned}$$

Jane's inflation-adjusted, after-tax rate of return is $[(1.0576) / (1.03) - 1] \times 100$, or 2.68%. Keep in mind that we've assumed the highest federal income tax bracket (which does not apply to every investor); however, the example does show the impact that taxes and inflation can have on your return.

No Substitute for Understanding

No matter what your level of investment experience or sophistication, you may benefit from developing a relationship with a financial advisor. Why? For starters, a qualified financial professional can help you understand your investments' performance, so you don't have to do these calculations yourself. And while it is still your responsibility to know what it all means, a trusted financial professional can make sure you grasp what the numbers are revealing.

From a "big picture" perspective, a financial pro is also trained to analyze your personal financial situation and prepare a program designed to help you address your financial goals and objectives.

Information and calculators are made available to you as self-help tools for your independent use and are not intended to provide investment advice. We cannot and do not guarantee their applicability or accuracy in regards to your individual circumstances. All examples are hypothetical and are for illustrative purposes. The hypothetical rates of return used do not reflect the deduction of fees and charges inherent to investing.

This article was prepared by Wealth Management Systems Inc. The opinions voiced in this material are for general information only and are not intended to provide specific advice or recommendations for any individual. We suggest that you discuss your specific situation with a qualified tax or legal advisor. Please consult me if you have any questions.

Because of the possibility of human or mechanical error by Wealth Management Systems Inc. or its sources, neither Wealth Management Systems Inc. nor its sources guarantees the accuracy, adequacy, completeness or availability of any information and is not responsible for any errors or omissions or for the results obtained from the use of such information. In no event shall Wealth Management Systems Inc. be liable for any indirect, special or consequential damages in connection with subscribers' or others' use of the content.