

Understanding Average Annual Return and Compounded Annual Growth Rate (CAGR)

The average annual return and the compounded annual growth rate are measurements used to evaluate the performance of investments like stocks, bonds, mutual funds and ETFs (exchange traded funds). Understanding how these products are measured will help you choose suitable investments by ensuring you use the appropriate evaluation method.

Average Annual Return

The average annual return for a set of investment years is calculated by summing the results of each year and dividing by the total number of years. Below is an example based on the returns of Vanguard's Total Stock Market ETF (VTI) from 2004-2013.

The average annual return calculation would be....

12.73% + 6.15% + 15.70 + 5.36% + -36.81% + 28.73% + 17.28% + 1.00% + 16.45% + 33.48% Divided by 10 years = 10.01%

Compounded Annual Growth Rate

The compounded annual growth rate (CAGR) measures performance over a series of years and represents what you actually get from your investments at the end of the investing period. It accounts for compounding and volatility (unlike the simpler average annual return calculation). This is best explained with an example.

If you invest \$100,000 dollars over two years and the returns are 10% and -10% the average annual return is 0% (10% + -10% / 2 = 0%). However, this doesn't represent what you actually get at the end of the two year investing period.

At the end of the first period you will have \$110,000 dollars but after a 10% decline at the end of the second year, which is \$11,000, you will have a loss ending on 99,000.

The average annual return statistic would have you believe that you ended the two period on \$100,000 (because of the 0% average annual return) but this isn't the case. The compounded annual growth rate formula would have picked this up and given you an annual return of -0.5%. So if you returned -0.5% in the first year and -0.5% in the second year you would have \$99,000. Which is exactly what you got at the end of the period.

The formula for CAGR is outlined below. It is a little complicated so you can use an online calculator at websites such as Investopedia.com.

$$\text{CAGR} = (B/A)^{1/n} - 1$$

A = Original investment amount, B = Value of your investment at the end of the period, n = number of periods (e.g. years).

Implications for Investors

In the example above we only used a two year period however the difference between the average annual return and the CAGR tends to grow larger over longer time periods and periods of volatility. Using the example of the Vanguard Total Stock Market ETF quoted earlier the average annual return is 10.01% but the CAGR is 8.13%. Put simply, average annual return ignores compounding, which is critical factor in an investor's returns. **So what should an investor do?**

- Where possible calculate the CAGR before selecting any investment product.
- Expect your return to be a little less than any quoted average annual return statistic.
- When evaluating investments do your best to evaluate like with like.