David Kindness is an accounting, tax, and finance expert. He has helped individuals and companies worth tens of millions achieve greater financial success.
Bạn đang xem: Arithmetic mean là gì
What Is the Difference Between the Arithmetic Mean and the Geometric Mean?
There are many ways to measure financial portfolio performance and determine if an investment strategy is successful. Investment professionals often use the geometric average**,**more commonly called the geometric mean.
For volatile numbers, the geometric average provides a farmore accurate measurement of the true return by taking into account year-over-year compounding.
The geometric mean differs from the arithmetic average, or arithmetic mean,in how it is calculated because it takes into account the compounding that occurs from period to period. Because of this, investors usually consider the geometric mean a more accurate measure of returns than the arithmetic mean.

The Formula for Arithmetic Average
A=1n∑i=1nai=a1+a2+…+annwhere:a1,a2,…,an=Portfolioreturnsforperiodnn=Numberofperiodsbegin{aligned} &A = frac{1}{n} sum_{i =1}^n a_i = frac{a_1 + a_2 + dotso + a_n}{n} \ &textbf{where:} \ &a_1, a_2, dotso, a_n=text{Portfolio returns for period } n \ &n=text{Number of periods} \
end{aligned}A=n1i=1∑nai=na1+a2+…+anwhere:a1,a2,…,an=Portfolioreturnsforperiodnn=Numberofperiods

How to Calculate the Arithmetic Average
An arithmetic average is the sum of a series of numbers divided by the count of that series of numbers.
If you were asked to find the class (arithmetic) average of test scores, you would simply add up all the test scores of the students and then divide that sum by the number of students. For example, if five students took an exam and their scores were 60%, 70%, 80%, 90%, and 100%, the arithmetic class average would be 80%.
Xem thêm: Cách Trị Rụng Tóc Bằng Nha Đam Trị Rụng Tóc, Dùng Nha Đam Trị Rụng Tóc
60%+70%+80%+90%+100%5=80%begin{aligned} &frac {60% + 70% + 80% + 90% + 100% }{ 5 } = 80% \ end{aligned}560%+70%+80%+90%+100%=80%
The reason weuse an arithmetic average for test scores is that each score is an independent event. If one student happens to perform poorly on the exam, the next student”s chances of performing poorly (or well) on the exam is not affected.
In the world of finance, thearithmetic mean is not usually an appropriate method for calculating an average. Consider investment returns, for example. Suppose you have invested your savings in the financial marketsfor five years. If your portfolio returns each year were 90%, 10%, 20%, 30%, and -90%, what would your average return be during this period?
With the arithmetic average, the average return would be12%, which appears at first glance to beimpressive—but it”s not entirely accurate. That”s because when it comes to annual investment returns, the numbers are not independent of each other. If you lose a substantial amount of money in a particular year, you have that much less capital to invest andgenerate returns inthe following years.
We need to calculate the geometric average of your investment returns to arrive atan accurate measurement of what your actual average annual return over the five-year period would be.

The Formula for Geometric Average

(∏i=1nxi)1n=x1x2…xnnwhere:x1,x2,⋯=Portfolioreturnsforeachperiodn=Numberofperiodsbegin{aligned} &left(prod_{i = 1}^n x_i right)^{frac{1}{n}} = sqrt

How to Calculate the Geometric Average
The geometric mean for a series of numbers is calculated by taking the product of these numbers and raising it to the inverse of the length of the series.
To do this, weadd one to each number (to avoid any problems with negative percentages). Then, multiply all the numbers together and raise their product to the power of one divided by the count of the numbers in the series. Then, we subtract one from the result.
Xem thêm: Đạo Phật Xuất Hiện Ở Việt Nam Khi Nào, Lịch Sử Phật Giáo Việt Nam
1n−1where:R=Returnn=Countofthenumbersintheseriesbegin{aligned} &^{frac {1}{n} } – 1 \ &textbf{where:} \ &text{R} = text{Return} \ &n = text{Count of the numbers in the series} \ end{aligned}n1−1where:R=Returnn=Countofthenumbersintheseries
The formula appears complex,but on paper, it”snot so difficult. Returning to our example, we calculate the geometric average: Our returns were 90%, 10%, 20%, 30%, and -90%, so we plug them into the formula as:
(1.9×1.1×1.2×1.3×0.1)15−1begin{aligned} &(1.9 times 1.1 times 1.2 times 1.3 times 0.1)^{frac{1}{5}} -1 \ end{aligned}(1.9×1.1×1.2×1.3×0.1)51−1
The result givesa geometric average annual return of -20.08%. The result using the geometric average isa lot worse than the 12% arithmetic average we calculated earlier, and unfortunately,it is also the number that represents reality in this case.
Chuyên mục: Kiến Thức

XEM THÊM: https://cauthu.top/
Bài viết Arithmetic Mean Là Gì ? Ứng Dụng Và Han Chế Arithmetic Mean đã xuất hiện đầu tiên vào ngày CAUTHU.TOP.

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