

Finance Essentials: Compound Interest Class

Compound interest is not a new financial concept. The oldest record of this type of interest was found in a clay tablet dating back to around 2000-1700 B.C. from Babylon[i]. Even with its ancient history, compound interest can still be an ambiguous financial topic.

In the simplest terms, compound interest is interest on interest. One way to illustrate this concept is to use an old fable. In this fable, the inventor of chess wants to sell the game to the emperor of India. The inventor offers to sell the game if the emperor gives him a grain of rice for one square and then doubles it every square (1+2+4+8+16...). The emperor thinks this is a great deal until they start dishing out the rice. Because the number of rice doubles for every square, it grows incredibly fast. By the time they get to the 64th square, the number of rice totals 18,446,744,073,709,551,615[iii] or about 18 quintillion. Which is probably a bit more rice than anyone could ever eat.

So, what does an inordinate amount of rice have to do with compound interest? It illustrates the concept of earning interest on interest.

How Does Compound Interest Work

Compound interest works by using the principal or initial investment plus the interest earned in the past to calculate the following amount of interest. Compound interest differs from simple interest because compound interest takes into account previously gained interest. In contrast, simple interest is calculated based on the initial investment only.

Not that anyone wants to see the math for it, but the formula is:

$$\text{Compound interest} = [P (1+i)^n]-P \quad [\text{iv}]$$

Where:

P = Principle Amount

i = Interest

n = number of times compounded

Why Does Compound Interest Grow So Fast?

Compound interest grows so fast because it has a sort of snowball effect. Each period, the investment interest is calculated on increases. Therefore, the interest grows, which causes the investment to grow, which causes the interest to grow, and so on.

The interest rate does not change, but because of compounding, the investment amount varies. Just like 10% of 1,000 is more than 10% of 100, even though the percentage did not change.

Another factor in the speed of compound interest is the compounding schedule. The compounding schedule refers to the frequency of compounding or the frequency that the account adds newly earned interest to the beginning amount. The more frequently this occurs, the faster the compound interest investment grows.

Investments That Use Compound Interest

Some accounts and investments that could use compound interest are:

- **401(k) accounts**
- **Investment accounts**
- **CD (Certificates of Deposit)**

Compound Interest is typically most advantageous for younger investors. This advantage is because the more time investment has to accrue interest and compound, the more return the investment will yield.

What are the Drawbacks of Compound Interest

Compound interest could be a great way to build an investment quickly, but it can sometimes work against you. Compounding can cause interest payments to multiply when it comes to borrowing. For example, if you carried a loan with a high compound interest rate that compounded frequently, your interest payments would quickly grow larger and larger. As with many bad things, it can get out of hand fast.

In conclusion, compound interest is earning interest on interest and can cause investment returns to increase at a faster rate. This type of interest is utilized in many investments but could be potentially costly if you are a borrower.

The financial world can be full of confusing and complicated topics that may cause miscommunications between you and your clients. We hope this article will help bridge the understanding gaps between your clients and you and facilitate direct and productive client-advisor relationships.

Sources

- [i] <https://www.cambridge.org/core/journals/british-actuarial-journal/article/emergence-of-compound-interest/799CB1D40CDD46F3010767BFC60F24DB>
- [ii] <https://www.npr.org/sections/kruhwich/2012/09/15/160879929/that-old-rice-grains-on-the-chessboard-con-with-a-new-twist>
- [iii] <https://mathworld.wolfram.com/WheatandChessboardProblem.html>
- [iv] <https://www.investopedia.com/terms/c/compoundinterest.asp>