Power of Compounding in Mutual Funds

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Abstract: *Compounding can make things appear to be larger than they really are. This effect can arise when returns resulting from an event are compounded over a long holding-period. With compound interest, the interest that you earn increases with the increase in your investment (monthly/quarterly/semi-annual/or annual investment plus the interest that you are earning on this investment). This calculator will help you calculate the worth of your investment after a set number of monthly investments or even a single, initial investment, based on the interest accrued on the invested amount. This paper aims to know the Power of Compounding in Mutual Funds.*

Keywords: Compounding, effect, interest, calculator, investment.

1. Introduction

"Reinvestment of earnings at the same rate of return to grow the principal amount every year is compounding. Compounding is a compelling concept. It is because the interest of your invested money is also earning interest. This is known as compound interest. The value of the investment keeps growing at a geometric rate (always increasing) rather than at an arithmetic rate (straight-line). Reinvestment of earnings at the same compound interest rate of return would help in continually growing the principal amount year-on-year.""

"When the principal includes the accumulated interest of the previous periods and interest is calculated on this then they say its compound interest. This powerful tool (compound interest) can be used by investors to plan their financial goals. In the long term, this technique will benefit the investor. Longer, the investment horizon higher are the returns. The right advice is to start saving regularly and invest wisely. An early start would give the investor a higher compounding effect, and building wealth becomes easy. The possibilities of the compound interest are endless. With time, compound interest only further enhances the earnings, and the investment grows manifold."

Compound interest can be calculated by:

- Daily compounding
- Monthly compounding
- Quarterly compounding
- Half-yearly compounding
- Yearly compounding

"Compounding is done on loans, deposits and investments. Frequency of compounding is basically the number of times the interest is calculated in a year. The higher the frequency of compounding, the greater the amount of compound interest. The frequency of compounding depends on the instrument. A credit card loan is usually compounded monthly and a savings bank account is compounded daily. The frequency of compounding varies based on the scheme offered by the bank or financial institutions."

"One doesn't have to be a financial analyst to understand the concept of compounding. To make the maximum advantage of the compound interest, invest a small amount regularly for long periods of time. Use the compound interest calculator to see how the magic unfolds with time. Compounding is a technique that makes money work harder. An average investor depends on this tool to plan for their financial goals. Most long term financial goals become easier and achievable because of the power of compounding."

"For example, INR 100 is invested, and the compound interest rate is 6% p.a. The principal amount is INR 100, and the interest earned at the end of 1 year is INR 6 (6% of INR 100). Instead of withdrawing the interest amount, it is reinvested, then the principal amount for the second year becomes INR 106 (INR 100 + INR 6). The interest earned for the second year is INR 6.36, this is 0.36 more than the previous year. Even though the amounts look very small, it makes a huge difference in the long term. The magic of compounding works only over long periods of time."

Power of Compounding Calculator

"Compounding is when the returns earned from an investment are reinvested to generate additional earnings over time. In short, compounding is Interest on Interest, hence magnifying the returns over time. The power of compounding uses this concept to estimate the value of an investment."

"Power of Compounding calculator is a tool that will help in calculating the worth of an investment. It calculates the value of an investment after 'n' number of years at a specified interest rate. The power of compounding calculator uses compound interest formula as a basis. The entire concept of compound interest revolves around making high returns by adding the interest earned to the principal amount at the compound interest rate. The compound interest formula used in the power of compounding calculator is:"

"$P [((1 + i)^n) - 1]$,
where,
P = principal
i = annual interest
n = number of periods."

"The calculator helps in understanding how much an individual will earn if they invest a fixed amount for a fixed period at a given annual rate of interest. By using this calculator, one can calculate the potential returns from an investment. They can find out how much their savings will grow if invested."

"The calculator has the following components:"

- Principal Amount: It is the amount one intends to invest.
- Investment Period: It is the number of years one wants to invest.
- Rate of Return: It is the interest one expects to earn from the investment.
- Benefits of using a Power of Compounding Calculator

"The power of compounding calculator is a handy tool. It has the following benefits:"

Easy to use
"The calculator is very easy to use. All one has to do is enter the three values. The investment amount, investment period (in years), and expected return (in %). The calculator returns the values of total investment, wealth gained, and maturity value along with a graph."

Makes calculation easy and time-saving
"Calculating compound interest on an investment and determining the final value manually is a time taking process. The power of compounding calculator gives back accurate results in a matter of seconds. Hence saves time for the investor."

Future planning
"The power of compounding calculator helps plan the future financially. Investors can use the calculator to find out how much an investment will reap before investing in it. This way, they can compare all the plans and pick the most profitable option."

Free to use
"The calculator is online and can be used multiple times for free. Helping investors to plan their future cost-effectively."

Compare multiple scenarios
"An investor can use the calculator to run multiple scenarios by tweaking the interest rate, investment amount, and the time of investment. He/she can compare the results from all the scenarios and find out the best plan to invest."
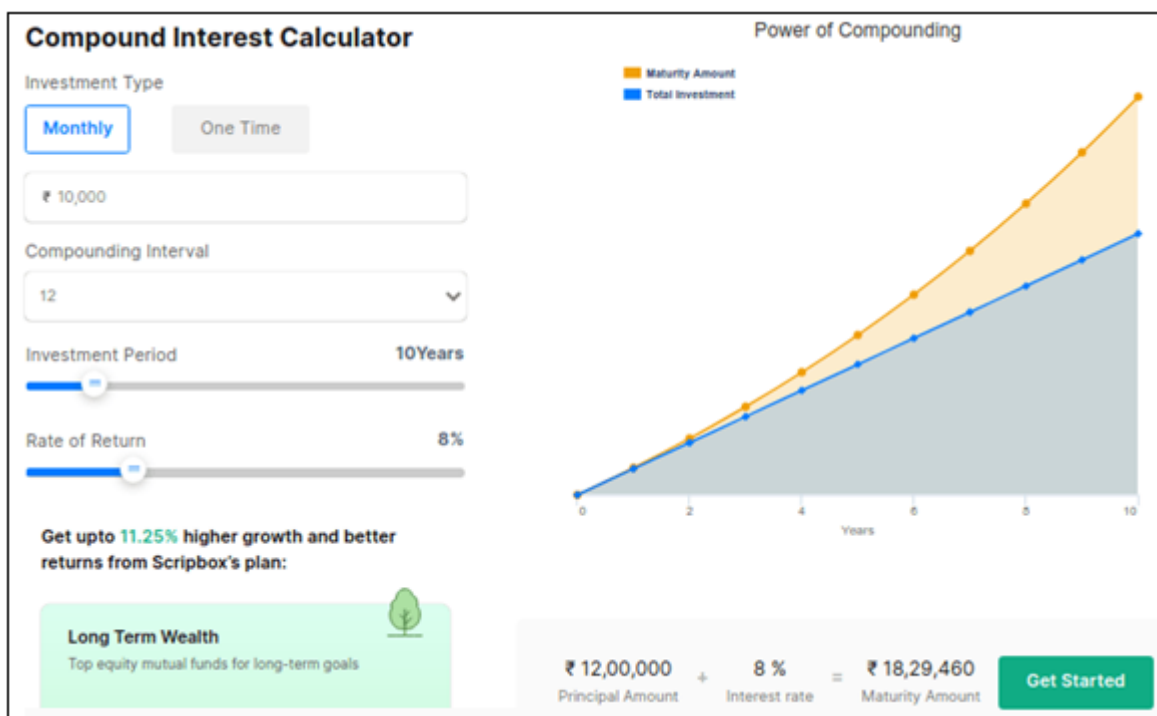
Use the Power of Compounding Calculator
"The power of compounding calculator is effortless to use. It has a principal amount, investment period, and rate of return fields. These fields have to be entered by the investor to check how much they will earn. The compound interest calculator gives the total investment, wealth gained, and maturity value both in number and in graphical format. In short, the power of compounding calculator shows the maturity value of a lump sum investment at the end of a specified period at a specific rate of return."

"Here's an example of an investment of INR 1,00,000 for ten years with an expected return rate of 12%. The inputs to be entered are:"

- Principal Amount: In the principal amount field, enter INR 100,000.
- Investment Period: In the investment period field, enter 10 years.
- Rate of Return: In the rate of return field, enter 12%.
- The calculator then returns the following values along with a graphical representation:
- Total Investment: INR 100,000
- Wealth Gained: INR 210,585
- Maturity Value: INR 310,585

"The investor can also see which funds will help him/her earn the return they are expecting in a specific period by clicking Get Started. It will show various investment portfolio suggestions based on investor requirements."

Graph 1: Compound Interest Calculator

Compound Interest

The compound interest offers interest on the previously earned interest, unlike simple interest, which earns interest only on the principal amount. Simply put, compound interest means Interest on Interest. The entire concept of compound interest revolves around making high returns by adding the interest earned to the principal amount at the compound interest rate.

As an investor, never withdraw these earnings. It is crucial to have the earning generated to be reinvested to earn higher returns. The reinvestment is done at the same compound interest rate of return. Withdrawing the profits wouldn't help in investment growth.

The compound interest formula used in the compound interest calculator is:
$A = P(1+r/n)^{(nt)}$
A = the future value of the investment
P = the principal investment amount
r = the compound interest rate
n = the number of times that interest is compounded per period
t = the number of periods the money is invested for

For example, Ishika Mittal invests INR 5,00,000 for ten years at a rate of 10% p.a. At the end of 10 years, she would have INR 12,96,871 when the investment is compounded. In case of a simple interest return, she would earn only INR 10,00,000 at the end of 10 years.

The same can be calculated using online compound interest calculators, which make the calculation seem effortless. Compound Interest is the foundational concept for both building wealth and quick repayment of debt. The compound interest calculator will help in getting an estimation of how much an investment will yield. The scope of compound interest is enormous. Using the compound interest calculator, observe the returns for an investment made at a 6% compound interest rate. The value of the investment doubles in 12 years, and the same will grow fourfold in 24 years. Initially, the returns might seem low, but with time, the returns are enormous.

Calculate the compound interest

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A simple example, INR 100 is invested, and the compound interest rate is 6% p.a. The principal amount is INR 100, and the interest earned at the end of 1 year is INR 6 (6% of INR 100). Instead of withdrawing the interest amount, it is reinvested, then the principal amount for the second year becomes INR 106 (INR 100 + INR 6). The interest earned for the second year is INR 6.36, this is 0.36 more than the previous year.

Power of Compounding works in Investments

When an investor invests a certain amount, the interest earned on this amount is added to the principal. Then new interest is earned on the new principal amount. In simple terms, compound interest makes interest on interest.

Considering the above example, where Ishika Mittal invests a lump sum of INR 5,00,000 for a period of 10 years at a 10% rate of return. Below is the tabulated data of interest earned during the investment tenure of Ms. Ishika. In Scenario 1, the interest earned is reinvested while in Scenario 2, interest is withdrawn every year.

Scenario 1		Scenario 2		
Year	Principal Amount	Year	Principal Amount	Interest
1	Rs 500,000	1	Rs 500,000	Rs 50,000
2	Rs 550,000	2	Rs 500,000	Rs 50,000
3	Rs 605,000	3	Rs 500,000	Rs 50,000
4	Rs 665,500	4	Rs 500,000	Rs 50,000
5	Rs 732,050	5	Rs 500,000	Rs 50,000
6	Rs 805,255	6	Rs 500,000	Rs 50,000
7	Rs 885,781	7	Rs 500,000	Rs 50,000
8	Rs 974,359	8	Rs 500,000	Rs 50,000
9	Rs 1,071,794	9	Rs 500,000	Rs 50,000
10	Rs 1,178,974	10	Rs 500,000	Rs 50,000

"In Scenario 1, the total interest earned is INR 7,96,871, and the total value of the investment at the end of 10 years is INR 1,296,871. In Scenario 2, the total interest earned is INR 5,00,000, and the total value of the investment at the end of 10 years is INR 1,000,000."

"Here the maturity amount in scenario 1 is higher because the interest is being reinvested, and every year interest is calculated on the new principal amount. In other words interest is calculated using compound interest. This little reinvestment of the interest is helping Ishika to earn nearly INR 2.96 lakhs more when compared to taking out the interest earned every year. This example shows the power of compound interest."

"The longer the investment duration, the higher are the returns. The sooner one starts investing, the more money starts working overtime, and the sooner it'll help in achieving financial freedom."

"Therefore, as a wise investor, it is essential to leverage the power of compound interest and start investing early and regularly. Being patient during the investment duration is as essential as investing regularly. The power of compounding lies in the fact that it fundamentally increases the principal amount every year. This increase in principal amount is attributed to the interest amount being reinvested. Compound interest has the potential to earn higher returns and has a definite edge over simple interest."

Key Rules of Investment that enable Power of Compounding

"**Start Young:** Starting investments early will help in making the most of the power of compounding. Early investing will help in building wealth to achieve long term goals. It enables funds to grow over time."

"**Make disciplined investments:** Financial discipline is essential. Define goals and work towards achieving them by investing regularly. Small investor or a big investor, it doesn't matter, investing periodically and staying invested for long will help in reaping maximum benefits. "

"**Be Patient:** Investing for the long term is the key. Don't be in a hurry to earn a quick return. Long term investments reap higher returns due to the power of compounding. Always give a reasonable amount of time for investments to grow significantly."

"**Watch your spending:** Saving is easier said than done. However, watchful spending will help in saving at least a small amount. Investing doesn't necessarily have to be only in large sums. Start with small amounts, and as the income increases, make sure to increase savings proportionately. It will help in achieving financial goals comfortably."

"**Consider interest rates:** While choosing any investment return is very important. Similarly, a higher annual compound interest rate implies higher returns."

"**Compounding Intervals:** The frequency of compounding and wealth accumulation are directly related. The higher the frequency of compounding, more the accumulation of wealth. Let's look at the growth of INR 10,000 at 10% compound interest compounded at different frequencies."

Time	Annual	Quarterly	Monthly
1	Rs 11,000.00	Rs 11,038.13	Rs 11,047.13
5	Rs 16,105.10	Rs 16,386.16	Rs 16,453.09
10	Rs 25,937.42	Rs 26,850.64	Rs 27,070.41

It is very clear from the above example that the higher the compounding interval, the higher is the wealth accumulated. Also, longer the investment tenure higher is the wealth accumulated."

"Top-up Investments: Below is the same example of Ishika investing INR 5,00,000 for ten years at a 10% rate of return. She also tops up his investment every year by 10%. The table shows how this top-up would help in compounding return."

Year	Opening Balance	Investment	10% Interest	Closing Amount
1	Rs 0	Rs 500,000	Rs 50,000.0	Rs 550,000.0
2	Rs 550,000.0	Rs 600,000.0	Rs 60,000.0	Rs 660,000.0
3	Rs 660,000.0	Rs 720,000.0	Rs 72,000.0	Rs 792,000.0
4	Rs 792,000.0	Rs 864,000.0	Rs 86,400.0	Rs 950,400.0
5	Rs 950,400.0	Rs 1,036,800.0	Rs 103,680.0	Rs 1,140,480.0
6	Rs 1,140,480.0	Rs 1,244,160.0	Rs 124,416.0	Rs 1,368,576.0
7	Rs 1,368,576.0	Rs 1,492,992.0	Rs 149,299.2	Rs 1,642,291.2
8	Rs 1,642,291.2	Rs 1,791,590.4	Rs 179,159.0	Rs 1,970,749.4
9	Rs 1,970,749.4	Rs 2,149,908.5	Rs 214,990.8	Rs 2,364,899.3
10	Rs 2,364,899.3	Rs 2,579,890.2	Rs 257,989.0	Rs 2,837,879.2

- The total investment made by Ishika is INR 25.79 lakhs
- Total interest earned is INR 12.97 lakhs
- Overall Earnings at the end of 10 years is INR 38.77 lakhs

Benefits from compound interest are highly effective by topping up investments at regular intervals.

Therefore, to earn higher returns, always consider topping up investments at least annually, and stay invested for longer durations. This disciplined habit will not only help in regular savings but is also highly rewarding by earning higher returns. The advice for all investors is that start investing early in life to enjoy maximum benefits by staying invested for longer durations. Watchful spending and increasing investment corpus every year will also help in building wealth faster.

Power of Compounding in Mutual Funds
When an investment earns interest on interest, it is called compounding, which best works in the long term. Staying invested for longer tenures will help investors earn higher. Let's take an example of two friends Ishika and Tanisha. Ishika started investing INR 2,000 per month in equity mutual funds at the age of 21, and Tanisha started investing INR 10,000 per month in equity mutual funds at the age of 35. Both of them kept investing until the age of 50. If both of them earn an interest of 12% per annum, who would be richer? Ishika of course.

At the age of 50, Ishika's investment value is INR 61.81 lakhs, whereas Tanisha's investment value would've been INR 49.96 lakhs. Ishika would still be richer if he and Vijay invested quarterly or one-time."

Let's assume Ishika invests INR 2,000 every quarter from the age of 21 and keeps investing until he turns 50. And Tanisha invests INR 10,000 every quarter from the age of 35 and keeps investing until he turns 50. The maturity value for Ishika and Tanisha will be INR 19.89 lakhs and INR 16.31 lakhs, respectively, if their return is 12% per annum."

If Ishika made a lump sum investment at the age of 21 of INR 25,000 and Tanisha made a lump sum investment of INR 1,00,000 at the age of 35, both at a return of 12%. Their maturity value when they turn 50 will be INR 6.68 lakhs (Ishika) and INR 5.47 lakhs (Tanisha)."

	Ishika			Tanisha		
Frequency of Investment	Tenure of Investment	Investment	Maturity Value	Tenure of Investment	Investment	Maturity Value
Monthly	29 Years	Rs 2000	Rs 61.81 Lakhs	15 Years	Rs 10,000	Rs 49.96 Lakhs
Quarterly	29 Years	Rs 2000	Rs 19.89 Lakhs	15 Years	Rs 10,000	Rs 16.31 Lakhs
One Time	29 Years	Rs 25,000	Rs 6.68 Lakhs	15 Years	Rs 100,000	Rs 5.47 Lakhs

Even though Ishika's investment was less than Tanisha, the duration of his investment is longer and compounding best works in long investment tenures. Hence, Ishika's maturity value is higher than that of Tanisha's.

The longer one stays invested, the more will be the money they make. To take advantage of the benefit of compounding, one has to remain invested for long tenures, which can be done by investing early.

2. Conclusion

Compounding helps investors earn interest on interest. The following are the advantages of compound interest. Compound interest makes investor's money grow faster as it helps earn interest on interest. Longer, the investment duration more will be the potential to earn higher returns. Make regular contributions to the existing investment to add potential to compounding. The higher the number of compounding periods, the higher will be the returns. Compounding every month can earn more than compounding annually.

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