

# Investment Analysis & Investment Tracker - A Statistical Prespective

## Contents

<b>Inflation</b>	<b>2</b>
CPI . . . . .	2
CPI Over Time . . . . .	2
Inflation Rate Calculation . . . . .	3
Monthly and yearly Inflation Rate . . . . .	4
<b>NIFTY 50</b>	<b>5</b>
Nifty 50 Index over Time . . . . .	5
Nifty 50 Monthly and Yearly growth rate . . . . .	6
<b>Investment Growth</b>	<b>7</b>
Investment Categories and Growth Comparison . . . . .	7
My Investment Growth indicators . . . . .	8
Invested Amount vs Current Value by Asset Class . . . . .	9
Invested and current Assest Value Distribution . . . . .	9
Fixed Deposit Distribution . . . . .	9

**“Money that doesn’t grow at least at the pace of inflation is silently losing its worth. Beating inflation is not luck—it is a skill. Sustaining it through time is the art of investing, and compounding is the power that turns patience into wealth.”**

## Inflation

### what is inflation?

Inflation is a macroeconomic phenomenon that represents the persistent and general increase in the price level of goods and services in an economy over time. It reduces the purchasing power of money, meaning that consumers need to spend more money to purchase the same quantity of goods and services compared to an earlier period.

**Inflation is commonly measured by using the Consumer Price Index (CPI).**

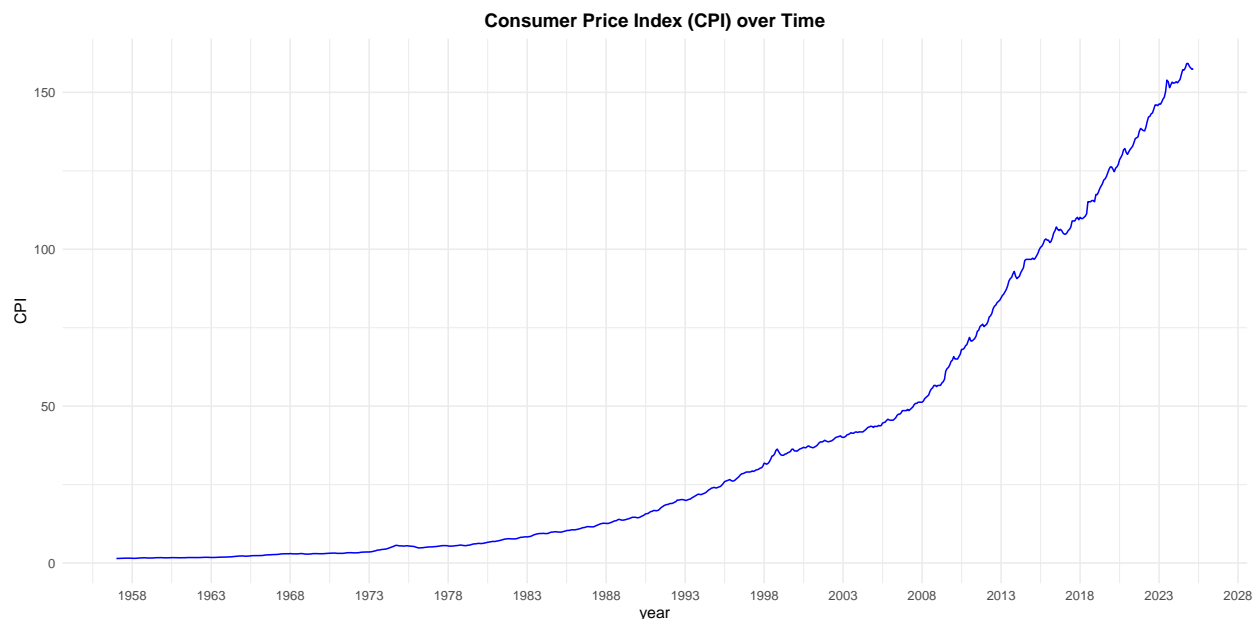
### CPI

The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food, and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them.

The CPI is used to measure inflation by tracking changes in the price level of a market basket of consumer goods and services over time. When the CPI rises, it indicates that the average price level of goods and services has increased, which is a sign of inflation. Conversely, when the CPI falls, it indicates deflation.

CPI values are often reported on a monthly basis, and the percentage change in CPI from one period to another is used to calculate the inflation rate.

### CPI Over Time



## Inflation Rate Calculation

The inflation rate is calculated using the formula:

$$\text{Inflation Rate (\%)} = \frac{\text{CPI}_t - \text{CPI}_{t-1}}{\text{CPI}_{t-1}} \times 100$$

Where:

- **CPI<sub>t</sub>** is the Consumer Price Index at the current time period.
- **CPI<sub>t-1</sub>** is the Consumer Price Index at the previous time period.

### Month on Month (MoM) Inflation Rate Calculation:

$$\text{MoM Inflation (\%)} = \frac{\text{CPI}_t - \text{CPI}_{t-1}}{\text{CPI}_{t-1}} \times 100$$

### Year on Year (YoY) Inflation Rate Calculation:

$$\text{YoY Inflation (\%)} = \frac{\text{CPI}_t - \text{CPI}_{t-12}}{\text{CPI}_{t-12}} \times 100$$

## Monthly and yearly Inflation Rate

Inflation growth rate															Inflation growth rate												
	Month														yearly growth value												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			Yearly												
1957	0%	0%	0%	2%	0.7%	1.9%	0%	0.9%	0.7%	-0.7%	0.7%	-0.7%	1957	0%													
1958	-1.5%	-1%	0%	1%	1.9%	2.6%	2.5%	0.9%	0.9%	1.5%	-0.6%	-2.6%	1958	3.7%													
1959	-1.6%	0.9%	-0.9%	0%	1.6%	1.8%	2.4%	0.9%	-0.8%	1.7%	0%	-1.7%	1959	5.5%													
1960	-1.5%	0%	-0.9%	0.9%	0.7%	0.9%	1.7%	0%	-0.8%	0%	-0.8%	0%	1960	4.3%													
1961	-0.9%	0%	0.9%	0%	0%	0.9%	1.7%	0.6%	0%	0%	0%	0%	1961	0.7%													
1962	-0.6%	0%	0%	0.6%	0.8%	0.8%	1.4%	0.8%	0%	0.8%	-0.8%	-1.4%	1962	3.4%													
1963	-0.8%	-0.8%	0.8%	0.8%	0.6%	1.6%	0.8%	0.8%	0.6%	0.8%	0%	1.5%	1963	2.3%													
1964	0%	1.3%	0.7%	0.7%	2%	2%	2.8%	1.2%	1.9%	2.7%	0%	0.5%	1964	7.7%													
1965	0.6%	-1.8%	-2%	0.7%	0.7%	1.3%	2.9%	1.3%	1.2%	0%	0.5%	0%	1965	17.8%													
1966	0%	0.6%	0%	0.6%	3.3%	2.3%	1.6%	1%	0.6%	0.6%	1.1%	1.5%	1966	4.8%													
1967	0%	0.5%	0.9%	1.1%	2%	2.4%	0.9%	1%	-0.5%	1.4%	-0.4%	-1%	1967	13.9%													
1968	2.8%	-1.4%	-1.8%	0.5%	-0.9%	0.9%	-0.5%	2.2%	0.6%	0.5%	-2.2%	-2.8%	1968	11.7%													
1969	-0.6%	-0.5%	0.5%	0.6%	1.1%	2.9%	0.6%	0%	0%	-0.6%	-0.5%	0%	1969	-5.5%													
1970	0%	0%	1.1%	1.1%	1.1%	1.2%	0.5%	0.6%	0.5%	0.6%	0%	-1.6%	1970	4.2%													
1971	-1%	0%	0%	0%	0%	1.6%	1.6%	2.1%	1%	0%	0.6%	-1%	1971	3.9%													
1972	-0.6%	-0.6%	0.6%	0.6%	0.4%	2.5%	2%	1%	0.5%	0.4%	0.5%	0%	1972	5.4%													
1973	0%	1.4%	1.4%	2.3%	3.1%	2.2%	4.3%	1.7%	0.4%	2.4%	2%	0.4%	1973	8.3%													
1974	1.5%	1.1%	3%	2.9%	3.9%	2.4%	3.4%	3.2%	4%	0.3%	-1.2%	-1.5%	1974	25.7%													
1975	0%	-0.3%	-1.2%	0.6%	1.2%	0.3%	-1.2%	-0.9%	-0.6%	-0.9%	-0.3%	-2.9%	1975	23.5%													
1976	-2.5%	-2.7%	-1.4%	1.1%	0.4%	0.3%	2.1%	0.4%	1.3%	0.6%	0.6%	0%	1976	-8.6%													
1977	0.4%	1%	0.6%	0.3%	1.6%	0.6%	1.6%	0.6%	1.3%	-0.3%	0%	0%	1977	3%													
1978	-1.5%	-1.5%	0.3%	0.3%	0.3%	1.2%	0.9%	0.3%	1.5%	1.2%	0%	-1.5%	1978	5.9%													
1979	-0.8%	-0.9%	0.9%	1.5%	0.6%	1.8%	2.3%	2%	0.8%	0.5%	0.8%	1.6%	1979	2.2%													
1980	-0.8%	-0.6%	1.1%	0.5%	1.9%	1%	2.1%	0.8%	1.3%	1%	1.2%	-0.7%	1980	11.7%													
1981	0%	1.7%	0.5%	1.6%	1.4%	1.4%	1.8%	1.5%	0.4%	0.9%	0.4%	-0.4%	1981	10.7%													
1982	-0.2%	-0.2%	-0.2%	0.4%	0.7%	1.7%	1.7%	2.1%	0.2%	0.4%	1%	0.2%	1982	11.7%													
1983	-0.4%	1%	0.4%	1.2%	2.6%	2.3%	1.5%	1.5%	0.9%	0.7%	0.5%	-0.3%	1983	7.8%													
1984	0.7%	-0.4%	-0.5%	0.2%	0.5%	2.1%	1.9%	0.2%	0.5%	0.5%	0.5%	-1.2%	1984	13.8%													
1985	0%	-0.5%	0.2%	1.4%	1%	1%	1.5%	0.5%	0.1%	1%	0.8%	0%	1985	4.4%													
1986	-0.2%	0.7%	0.8%	0.8%	1.2%	1.1%	1.5%	0.6%	0.6%	1.3%	1%	-0.6%	1986	6%													
1987	0%	-0.3%	0%	0.7%	1.7%	1.7%	1.2%	1.7%	1.2%	0.7%	0.7%	-0.4%	1987	9.4%													
1988	0.1%	-0.5%	0.5%	1.3%	1%	1.4%	1.7%	0.6%	0.8%	2.1%	0.6%	-1.2%	1988	9.4%													
1989	-0.6%	0%	0.6%	0.6%	1.2%	0.6%	1.2%	1.2%	1.1%	0%	0%	-0.6%	1989	8%													
1990	-0.6%	0.6%	1.1%	1.7%	1.1%	1.6%	2.2%	0.5%	0.5%	2.1%	1.5%	0.5%	1990	5.5%													
1991	1.5%	0%	-0.5%	0.5%	1%	2.5%	2.4%	1.4%	1.8%	0.9%	0.9%	0%	1991	16.1%													
1992	1.3%	0.4%	0%	0.9%	1.3%	0.9%	2.5%	0%	0.4%	0.4%	0%	-0.4%	1992	12.9%													
1993	-0.8%	0%	0.8%	0.8%	0.4%	1.6%	1.2%	1.2%	1.2%	1.1%	-0.4%	-0.4%	1993	5.7%													
1994	-0.4%	0.8%	0.8%	0.7%	1.1%	1.8%	1.4%	1.1%	1.4%	0.3%	0.7%	-0.7%	1994	9.1%													
1995	0%	0.7%	0.7%	0.7%	1.7%	2%	2.3%	0.6%	0.6%	0.6%	0.6%	-1.2%	1995	9.9%													
1996	-0.6%	0.3%	0.9%	1.6%	1.2%	1.5%	1.8%	1.2%	0.3%	0.6%	0.9%	0.3%	1996	9%													
1997	0%	0%	0.3%	0.9%	-0.6%	0.9%	0.8%	0.3%	0.6%	1.1%	0.3%	1.6%	1997	11.1%													
1998	3.2%	-0.5%	-0.5%	0.8%	1.6%	2.6%	3%	0.5%	1.7%	3.1%	1.2%	-2.1%	1998	9.7%													
1999	-2.1%	-1.2%	-0.2%	0.2%	1%	0.2%	1%	0.5%	0.7%	1.9%	0.2%	-1.6%	1999	9.4%													
2000	0%	-0.2%	0.9%	0.9%	0.5%	0.5%	0.7%	-0.4%	0.2%	1.1%	0.2%	-0.9%	2000	8.6%													
2001	-0.2%	-0.4%	0.5%	0.7%	0.7%	1.3%	1.3%	0.6%	-0.2%	0.6%	0.9%	-0.6%	2001	3.2%													
2002	-0.4%	-0.2%	0.4%	0.2%	0.6%	0.8%	1.1%	0.6%	0.2%	0.4%	0.4%	-1%	2002	4.9%													
2003	-0.2%	0.2%	0.6%	1.2%	0.2%	0.6%	0.8%	-0.4%	0%	0.8%	0.2%	-0.4%	2003	3.4%													
2004	0.4%	0%	0%	0%	0.8%	0.8%	1%	1%	0.2%	0.6%	-0.2%	-0.8%	2004	4.3%													
2005	1%	-0.2%	0%	0.8%	-0.4%	0.4%	1.7%	0.4%	0.4%	1.1%	0.9%	-0.5%	2005	4.4%													
2006	-0.2%	0%	0%	0.8%	0.8%	1.7%	0.8%	0%	0.8%	1.6%	0%	0%	2006	4.4%													
2007	0%	0.8%	-0.8%	0.8%	0.8%	0.8%	1.5%	0.8%	0%	0.8%	0%	0%	2007	6.7%													
2008	0%	0.7%	1.5%	0.7%	0.7%	0.7%	2.1%	1.4%	0.7%	1.4%	0%	-0.7%	2008	5.5%													
2009	0.7%	0%	0%	1.4%	0.7%	1.3%	3.6%	1.3%	0.6%	1.2%	1.8%	0.6%	2009	10.4%													
2010	1.8%	-1.2%	0%	0%	1.2%	1.2%	2.3%	0%	0.6%	1.1%	0.6%	1.6%	2010	16.2%													
2011	1.6%	-1.6%	0%	0.5%	0.5%	1.1%	2.1%	0.5%	1.5%	0.5%	0.5%	-1%	2011	9.3%													
2012	0.5%	0.5%	1%	2%	0.5%	1%	1.9%	0.9%	0.5%	0.9%	0.5%	0.5%	2012	5.3%													
2013	0.9%	0.9%	0.4%	0.9%	0.9%	1.3%	1.7%	0.9%	0.4%	1.3%	0.8%	-1.6%	2013	11.6%													
2014	-0.8%	0.4%	0.4%	1.3%	0.8%	0.8%	2.4%	0.4%	0%	0%	0%	0%	2014	7.2%													
2015	0.4%	-0.4%	0.4%	0.8%	0.8%	1.2%	0.8%	0.4%	0.8%	1.1%	0.4%	-0.4%	2015	7.2%													
2016	0%	-0.7%	0.4%	1.1%	1.5%	0.7%	1.1%	-0.7%	-0.4%	0.4%	-0.4%	-0.7%	2016	5.9%													
2017	-0.4%	0%	0.4%	0.7%	0.4%	0.7%	1.8%	0%	0%	0.7%	0.3%	-0.7%	2017	1.9%													
2018	0.7%	-0.3%	0%	0.3%	0.3%	0.7%	3.4%	0%	0%	0.3%	0%	-0.3%	2018	5.1%													
2019	2%	0%	0.7%	1%	0.6%	0.6%	0.9%	0.3%	0.6%	0.9%	0.9%	0.6%	2019	6.6%													
2020	0%	-0.6%	-0.6%	0.9%	0.3%	0.6%	1.2%	0.6%	0.6%	1.2%	0.3%	-0.9%	2020	7.5%													
2021	-0.5%	0.7%	0.5%	0.4%	0.4%	0.9%	0.9%	0.2%	0.2%	1.3%	0.6%	-0.2%	2021	3.2%													
2022	-0.2%	-0.1%	0.8%	1.3%	1%	0.2%	0.5%	0.2%	0.8%	0.9%	0%	-0.2%	2022	5.8%													
2023	0.4%	-0.1%	0.5%	0.7%	0.4%	1.3%	2.4%	-0.4%	-1.2%	0.7%	0.5%	-0.2%	2023	6.2%													
2024	0.1%	0.2%	-0.2%	0.4%	0.4%	1.1%	0.9%	-0.1%	0.5%	0.8%	0%	-0.6%	2024	4.6%													
2025	-0.3%	-0.3%	0.1%										2025	3.1%													

Previously, we saw how much percentage the amount should grow to satisfy the inflation growth rate. There are different indicators that provide higher growth in the economic market. One of the most famous indicators is the NIFTY 50. Here, we see what is **NIFTY 50**.

## NIFTY 50

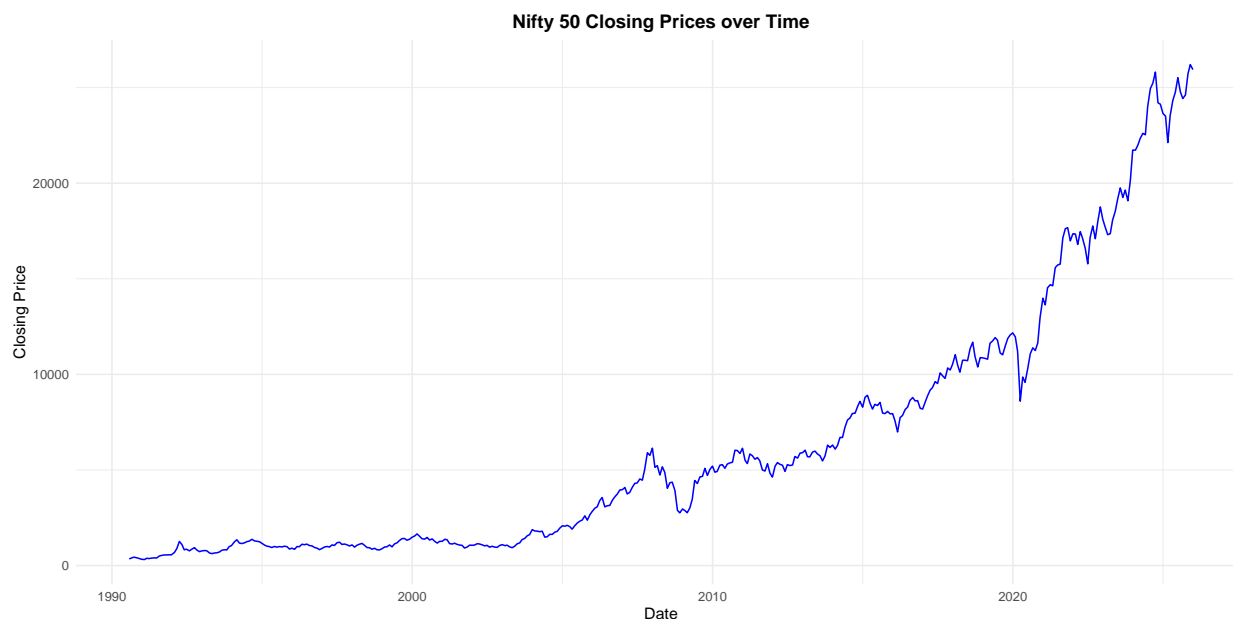
NIFTY 50 is the benchmark index of the **National Stock Exchange (NSE)** of India. It represents the weighted average of the 50 largest and most liquid Indian companies listed on the NSE. The NIFTY 50 index is widely used as a barometer of the overall performance of the Indian stock market and serves as a benchmark for various mutual funds and investment portfolios.

NIFTY 50 reflects market trends and investor sentiment in the Indian equity market. It is calculated using the free-float market capitalization method, which considers only the market value of shares that are available for trading in the market.

The index covers various sectors of the economy, including banking, information technology, energy, pharmaceuticals, and consumer goods, among others.

The NIFTY 50 index is reviewed semi-annually to ensure that it accurately represents the performance of the Indian stock market.

### Nifty 50 Index over Time



Calculation of monthly and yearly growth rate of Nifty 50 index is shows the percentage change in the index value over a specific period.

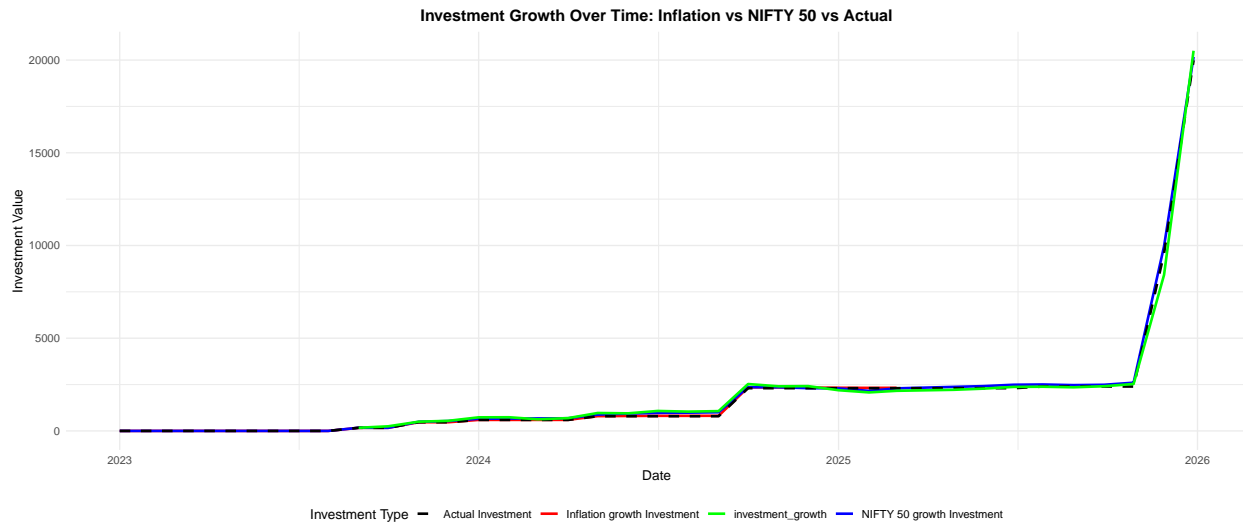
Nifty 50 Monthly and Yearly growth rate

Nifty 50 Monthly Return													Nifty 50 Yearly Return	
	Month												yearly growth value	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	yearly	yearly
1991	-5%	28.9%	-3.6%	6.2%	3.6%	-2.8%	27.2%	6.7%	4.1%	6.1%	1.6%	-0.8%	1991	0%
1992	22.6%	29.8%	41.9%	-12.4%	-25.3%	3.6%	-10.3%	10.8%	10.3%	-13.7%	-10.3%	4.8%	1992	117.9%
1993	3.1%	-1.4%	-14.7%	-5.8%	5.4%	1.7%	5.9%	13.1%	3.4%	-1.2%	21%	5.4%	1993	14.7%
1994	19.6%	8.3%	-12.8%	-2.3%	3.2%	5.2%	2.3%	7.4%	-6%	-1.8%	-1.7%	-5.1%	1994	58.7%
1995	-9.4%	-5.3%	-2.4%	-4.9%	5.9%	-3.6%	3.4%	-2.3%	4.1%	-2.3%	-12.8%	5.4%	1995	-14.1%
1996	-6.6%	17%	-0.7%	13.1%	-2.2%	2.9%	-7.1%	-1.3%	-8.3%	-3.7%	-8.7%	8.3%	1996	-20.8%
1997	8.2%	2.7%	-3%	11.5%	-2.7%	13.5%	2.4%	-9.5%	1.7%	-3.4%	-5.6%	5.4%	1997	14.6%
1998	-10.7%	10.1%	5.3%	3.8%	-8.3%	-11.4%	-1.1%	-8.4%	6.1%	-8.9%	-0.8%	8.1%	1998	-8.9%
1999	9.3%	1.6%	9.9%	-9.3%	15.8%	4.9%	10.3%	7.8%	0.1%	-6.2%	3.8%	7.6%	1999	0.3%
2000	4.4%	7%	-7.6%	-8%	-1.9%	6.6%	-9.4%	4.6%	-8.8%	-7.8%	8.1%	-0.4%	2000	60%
2001	8.6%	-1.5%	-15%	-2%	3.8%	-5.1%	-3.2%	-1.8%	-13.3%	6.4%	9.8%	-0.8%	2001	-11.3%
2002	1.8%	6.2%	-1.1%	-4%	-5.1%	2.8%	-9.3%	5.4%	-4.7%	-1.2%	10.4%	4.1%	2002	-21.8%
2003	-4.7%	2.1%	-8%	-4.5%	7.8%	12.6%	4.6%	14.4%	4.5%	9.8%	3.8%	16.4%	2003	-3.1%
2004	-3.7%	-0.5%	-1.6%	1.4%	-17.4%	1.5%	8.4%	0%	7%	2.4%	9.6%	6.2%	2004	73.7%
2005	-1.1%	2.2%	-3.2%	-6.8%	9.7%	6.4%	4.1%	3.1%	9.1%	-8.9%	11.9%	6.9%	2005	13.7%
2006	5.8%	2.5%	10.7%	4.6%	-13.7%	1.9%	0.5%	8.6%	5.1%	4.3%	5.6%	0.3%	2006	45.9%
2007	2.9%	-8.3%	2%	7%	5.1%	0.5%	4.9%	-1.4%	12.5%	17.5%	-2.3%	6.5%	2007	36%
2008	-16.3%	1.7%	-9.4%	9.1%	-5.7%	-17%	7.2%	0.6%	-10.1%	-26.4%	-4.5%	7.4%	2008	25.8%
2009	-2.9%	-3.9%	9.3%	15%	28.1%	-3.5%	8%	0.6%	9%	-7.3%	6.8%	3.3%	2009	-44%
2010	-6.1%	0.8%	6.6%	0.6%	-3.6%	4.4%	1%	0.6%	11.6%	-0.2%	-2.6%	4.6%	2010	69.8%
2011	-10.2%	-3.1%	9.4%	-1.4%	-3.3%	1.6%	-2.9%	-8.8%	-1.2%	7.8%	-9.3%	-4.3%	2011	12.8%
2012	12.4%	3.6%	-1.7%	-0.9%	-6.2%	7.2%	-0.9%	0.6%	8.5%	-1.5%	4.6%	0.4%	2012	-5.6%
2013	2.2%	-5.7%	-0.2%	4.4%	0.9%	-2.4%	-1.7%	-4.7%	4.8%	9.8%	-2%	2.1%	2013	16.1%
2014	-3.4%	3.1%	6.8%	-0.1%	8%	5.3%	1.4%	3%	0.1%	4.5%	3.2%	-3.6%	2014	0.9%
2015	6.4%	1.1%	-4.8%	-3.6%	3.1%	-0.8%	2%	-6.6%	-0.3%	1.5%	-1.6%	0.1%	2015	44.7%
2016	-4.8%	-7.6%	10.8%	1.4%	4%	1.6%	4.2%	1.7%	-2%	0.2%	-4.7%	-0.5%	2016	-14.1%
2017	4.6%	3.7%	3.3%	1.4%	3.4%	-1%	5.8%	-1.6%	-1.3%	5.6%	-1.1%	3%	2017	13.2%
2018	4.7%	-4.9%	-3.6%	6.2%	0%	-0.2%	6%	2.9%	-6.4%	-5%	4.7%	-0.1%	2018	28.8%
2019	-0.3%	-0.4%	7.7%	1.1%	1.5%	-1.1%	-5.7%	-0.9%	4.1%	3.5%	1.5%	0.9%	2019	-1.8%
2020	-1.7%	-6.4%	-23.2%	14.7%	-2.8%	7.5%	7.5%	2.8%	-1.2%	3.5%	11.4%	7.8%	2020	10.4%
2021	-2.5%	6.6%	1.1%	-0.4%	6.5%	0.9%	0.3%	8.7%	2.8%	0.3%	-3.9%	2.2%	2021	14%
2022	-0.1%	-3.1%	4%	-2.1%	-3%	-4.8%	8.7%	3.5%	-3.7%	5.4%	4.1%	-3.5%	2022	27.2%
2023	-2.4%	-2%	0.3%	4.1%	2.6%	3.5%	2.9%	-2.5%	2%	-2.8%	5.5%	7.9%	2023	1.9%
2024	0%	1.2%	1.6%	1.2%	-0.3%	6.6%	3.9%	1.1%	2.3%	-6.2%	-0.3%	-2%	2024	23%
2025	-0.8%	-5.9%	6.3%	3.5%	1.7%	3.1%	-2.9%	-1.4%	0.8%	4.5%	1.9%	-1%	2025	8.2%

## Investment Growth

To understand how investments grow over time, we can analyze the growth of an investment considering different growth rates, such as inflation and NIFTY 50 returns.

Here, we will look at how an investment grows over time when subjected to inflation rates and NIFTY 50 returns. and my personal investment Portfolio growth.



## Investment Categories and Growth Comparison

I invested in different categories like stocks, mutual funds, bonds, gold and fixed deposits.

Even in a fixed deposit, I created three different fixed deposits for my plans:

1. **Investment Fixed Deposit:** For general investment purposes.
2. **Emergency Fixed Deposit:** For emergency funds.
3. **Opportunity Fixed Deposit:** For taking advantage of sudden investment opportunities.

Bonds doesn't provide high returns like stocks or mutual funds, but they are relatively safer and provide a steady income stream to invest more in the future.

## My Investment Growth indicators

### Overall Investment Growth Comparison

## [1] "Total Invested Amount is 19986.02, Current Value of my investment is 20501.93"

## [1] "XIRR on my overall investment is 12.79%, Overall return on my investment is 2.58%"

### Stock

## [1] "Total Stock Invested Amount is 5841.02, Current Value of my Stock is 6404.3"

## [1] "XIRR on my stock investment is 15.31%, Overall return on my stock investment is 9.64%"

### Mutual Fund

## [1] "Total Mutual Fund Invested Amount is 7350, Current Value of my Mutual Fund is 7340"

## [1] "XIRR on my mutual fund investment is -8.65%, Overall return on my mutual fund investment is -0.12%"

### Fixed Deposit

## [1] "Total Fixed Deposit Invested Amount is 6000, Current Value of my Fixed Deposit is 6020"

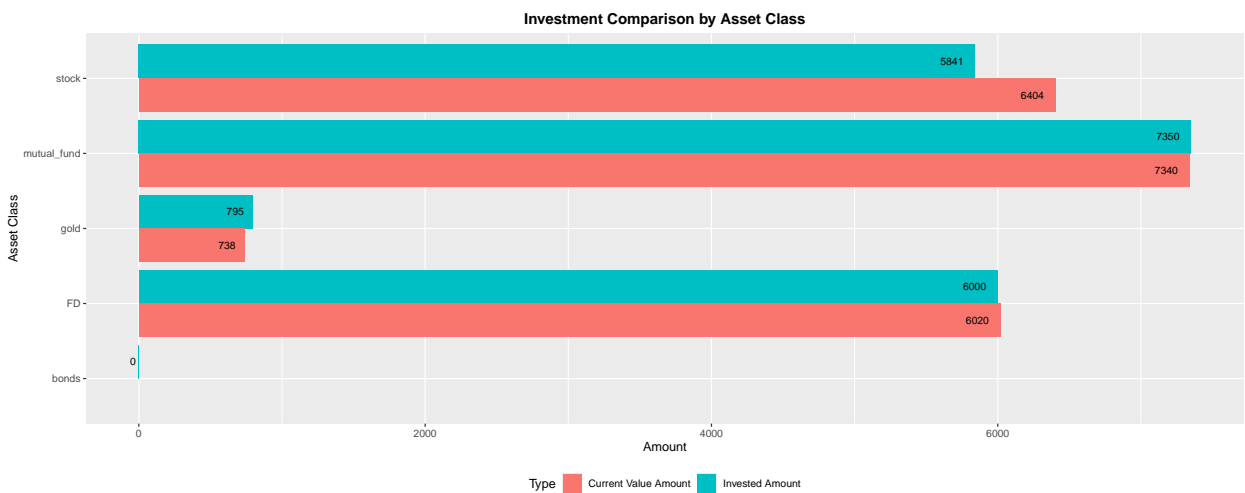
## [1] "XIRR on my FD investment is 8.43%, Overall return on my FD investment is 0.33%"

### Gold

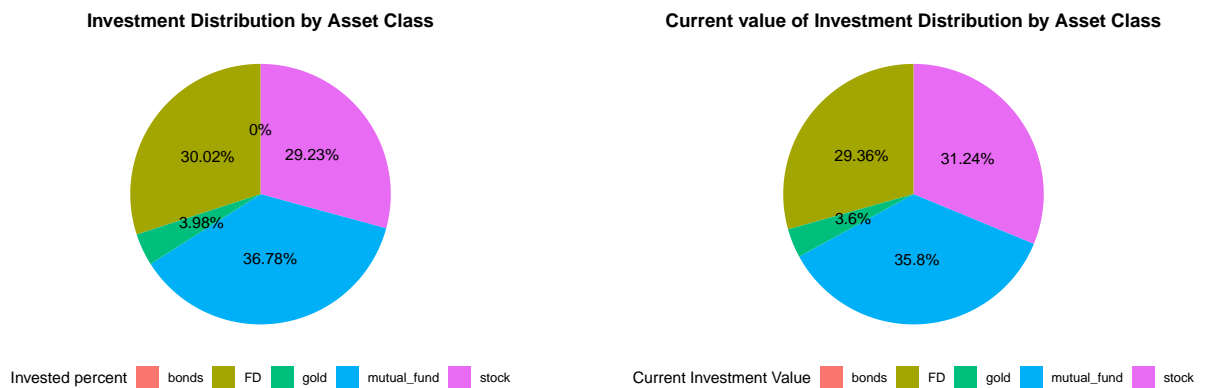
## [1] "Total Gold Invested Amount is 795, Current Value of my Gold is 737.63"

## [1] "XIRR on my gold investment is -78.41%, Overall return on my gold investment is -7.22%"

Invested Amount vs Current Value by Asset Class



Invested and current Assest Value Distribution



Fixed Deposit Distribution

