INDIAN ECONOMY ANALYSIS

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UPD: 23-02-2024

I. INTRODUCTION

Understanding various parameters of a country's economy plays a pivotal role in shaping future decisions and policies. Key metrics such as Change in GDP [GDP Growth], Population Dynamics and other economic keys can help in shaping future decisions which drive development. This report focuses on gaining insights on the available data on several metrics/parameters of the Indian economy.

II. Data Processing and EDA

Profile reports were created using Pandas-Profiling module [Now renamed to ydt-profiling]. An HTML profile report was built using the aforementioned module and the results were used for EDA.

III. Profile Report [PR] insights

1. Overview

Overview | Alerts 22 | Reproduction

Dataset statistics

Number of variables	12
Number of observations	61
Missing cells	0
Missing cells (%)	0.0%
Duplicate rows	0
Duplicate rows (%)	0.0%
Total size in memory	5.8 KiB
Average record size in memory	98.1 B

Variable types

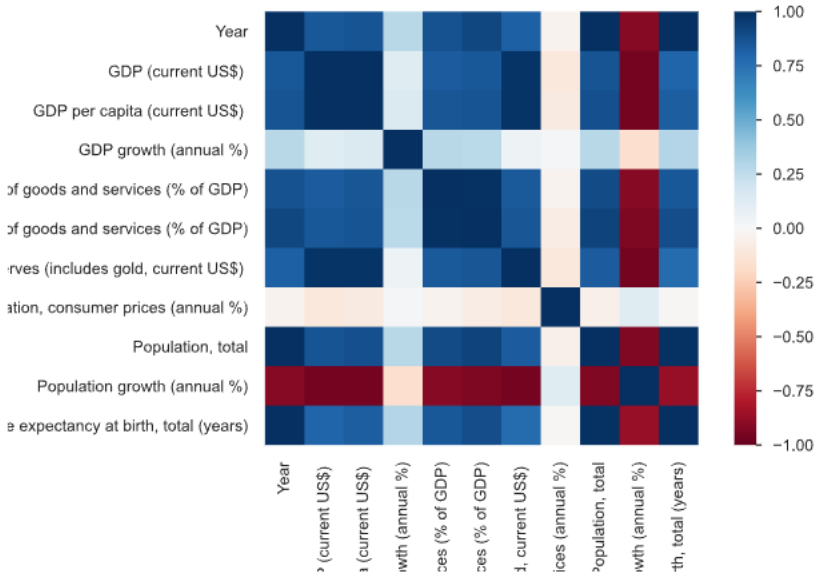
Numeric	11
Categorical	1

2. Alerts

Alerts

`Country Name` has constant value "India"	Constant
`Year` is highly correlated with `GDP (current US$)` and 7 other fields	High correlation
`GDP (current US$)` is highly correlated with `Year` and 7 other fields	High correlation
`GDP per capita (current US$)` is highly correlated with `Year` and 7 other fields	High correlation
`GDP growth (annual %)` is highly correlated with `Country Name`	High correlation
`Imports of goods and services (% of GDP)` is highly correlated with `Year` and 7 other fields	High correlation
`Exports of goods and services (% of GDP)` is highly correlated with `Year` and 7 other fields	High correlation
`Total reserves (includes gold, current US$)` is highly correlated with `Year` and 7 other fields	High correlation
`Inflation, consumer prices (annual %)` is highly correlated with `Life expectancy at birth, total (years)`	High correlation
`Population, total` is highly correlated with `Year` and 7 other fields	High correlation
`Population growth (annual %)` is highly correlated with `Year` and 7 other fields	High correlation
`Life expectancy at birth, total (years)` is highly correlated with `Year` and 8 other fields	High correlation
`Country Name` is highly correlated with `Year` and 10 other fields	High correlation
`Year` is uniformly distributed	Uniform
`Year` has unique values	Unique
`GDP (current US$)` has unique values	Unique
`Imports of goods and services (% of GDP)` has unique values	Unique
`Total reserves (includes gold, current US$)` has unique values	Unique
`Inflation, consumer prices (annual %)` has unique values	Unique
`Population, total` has unique values	Unique
`Life expectancy at birth, total (years)` has unique values	Unique
`GDP growth (annual %)` has 1 (1.6%) zeros	Zeros

3. Corelations

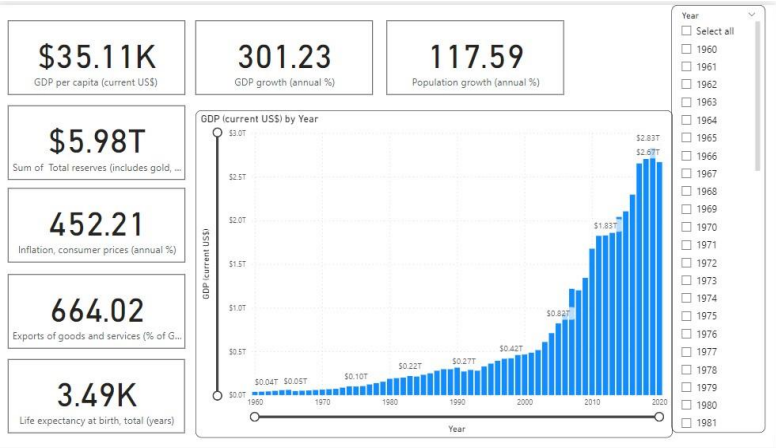


Reproduction

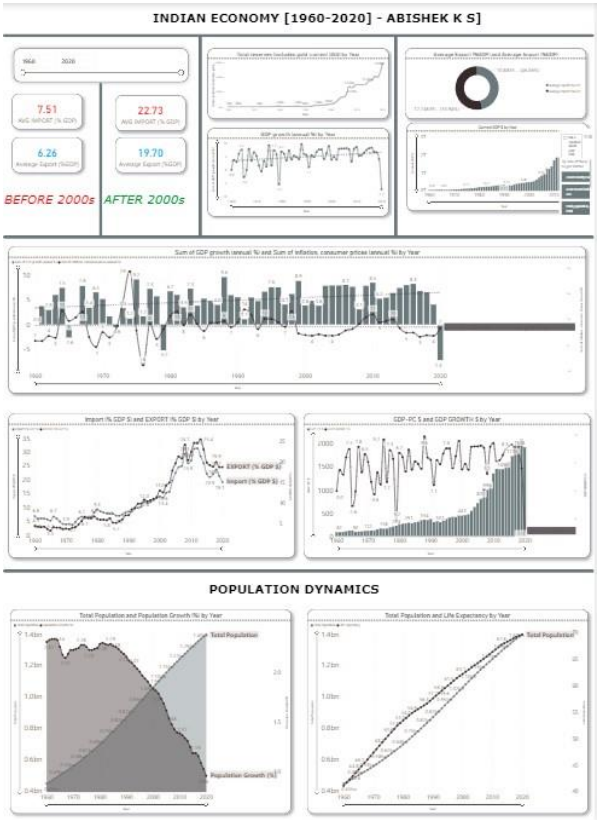
Analysis started	2022-11-06 10:03:59.670683
Analysis finished	2022-11-06 10:04:14.789174
Duration	15.12 seconds
Software version	pandas-profiling v3.4.0
Download configuration	config.json

III. ANALYSIS AND INSIGHTS

PowerBi was used to create an elegant and dynamic dashboard. The dashboard was changed on 23-02-2024 to a different theme and an entirely new set of visuals were added, resulting in the change as elucidated below.

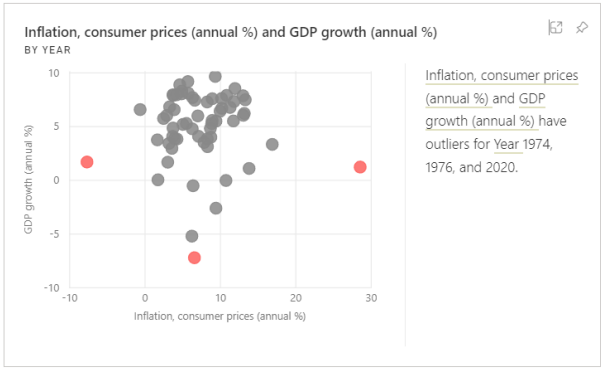


BEFORE

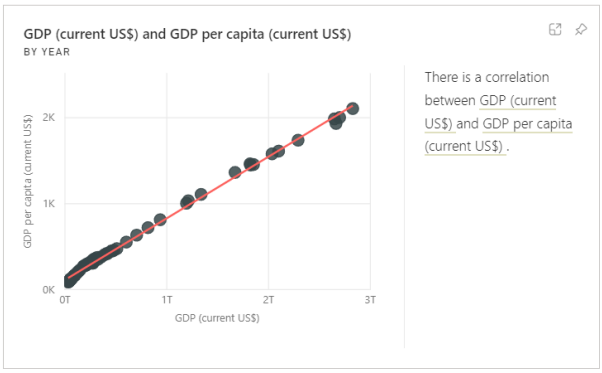


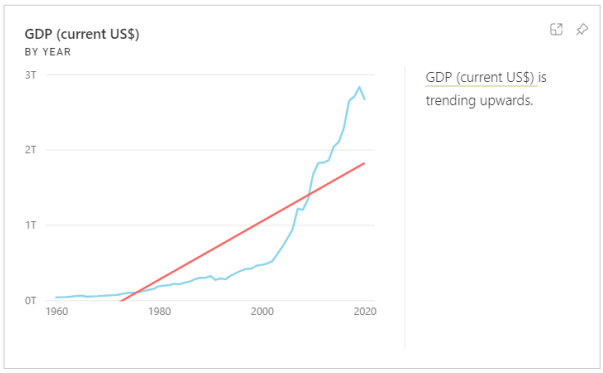
AFTER

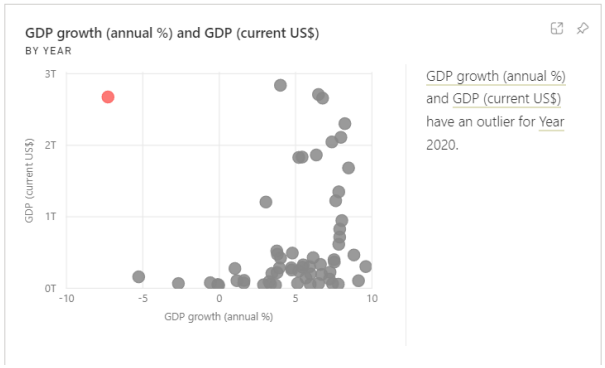
IV. INSIGHTS

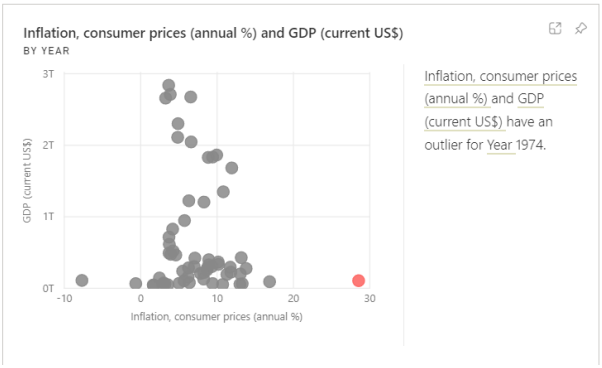

Inflation, consumer prices (annual %) and GDP growth (annual %)
BY YEAR
GDP growth (annual %)
Inflation, consumer prices (annual %)
Inflation, consumer prices (annual %) and GDP growth (annual %) have outliers for Year 1974, 1976, and 2020.


Inflation, consumer prices (annual %)
BY YEAR
Inflation, consumer prices (annual %) has outliers.

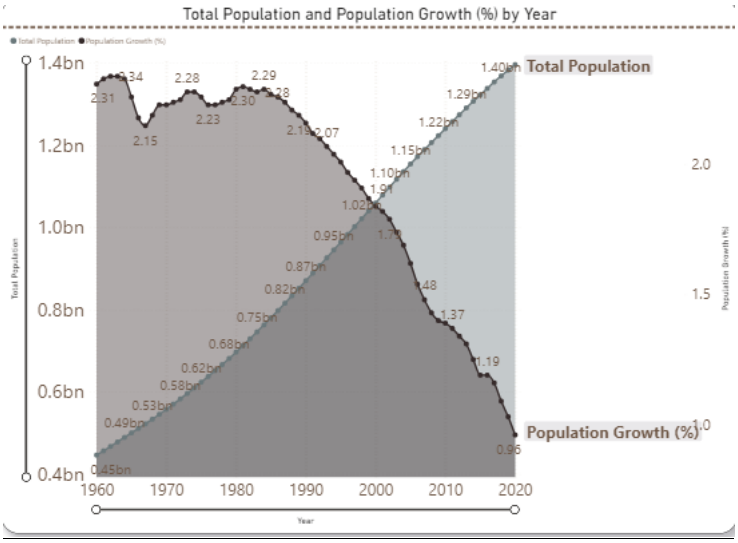

GDP (current US$) and GDP per capita (current US$)
BY YEAR
GDP per capita (current US$)
GDP (current US$)
There is a correlation between GDP (current US$) and GDP per capita (current US$) .


GDP (current US$)
BY YEAR
GDP (current US$) is trending upwards.


GDP growth (annual %) and GDP (current US$)
BY YEAR
GDP (current US$)
GDP growth (annual %)
GDP growth (annual %) and GDP (current US$) have an outlier for Year 2020.


Inflation, consumer prices (annual %) and GDP (current US$)
BY YEAR
GDP (current US$)
Inflation, consumer prices (annual %)
Inflation, consumer prices (annual %) and GDP (current US$) have an outlier for Year 1974.

1. Understanding Population Dynamics



I. The Population Growth rate is on a constant decline since the 1980s.

II. There seems to be an unsual reduction in population growth rate from 1964 to 1967, which can be attributed to various factors like Post-sterlization effects, Natural Disasters [Bihar Famines], effect of Family Planning Programmes, etc.

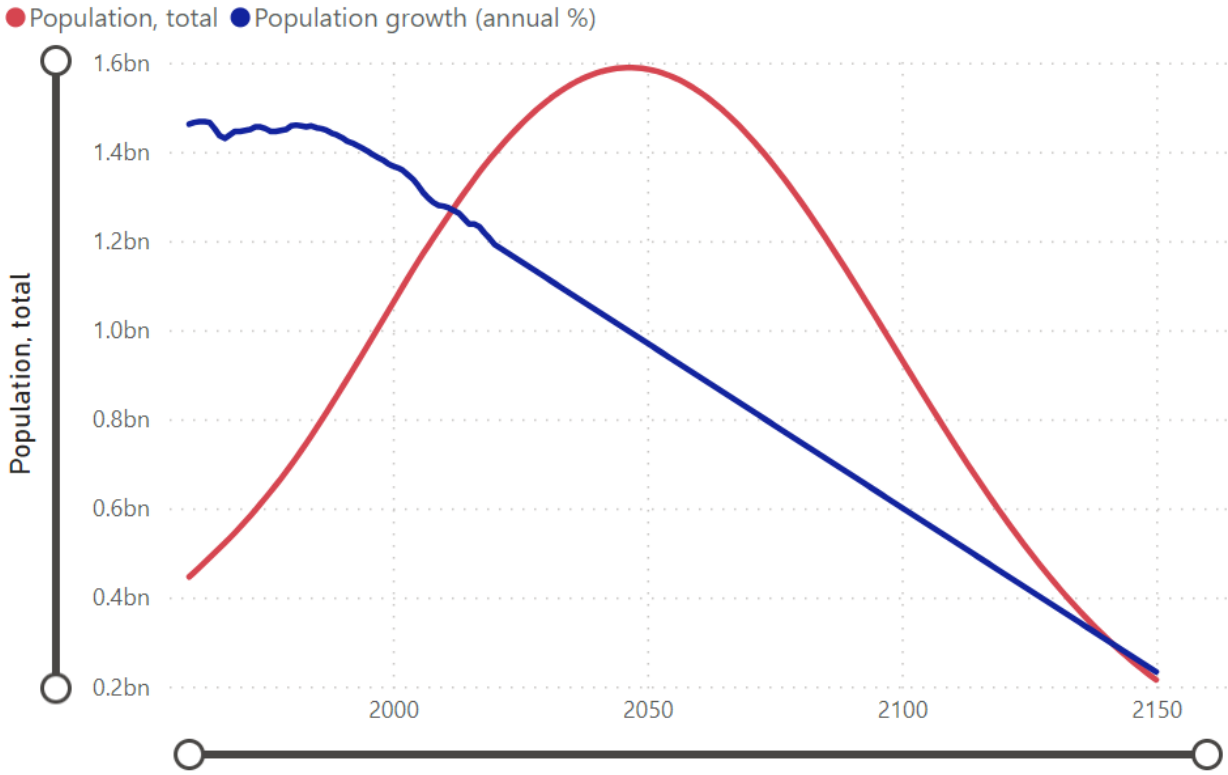
III. The Population Growth rate has been constantly declining at a rate of **-0.0369,** Which means it would take **27 more years for the population to start declining** [2047], assuming same mortality and emigration rates.

IV. Assuming a ***Constant decline rate of -0.0369***, the following table for population can be derived :

2021	1409792443	0.9231
2022	1422806237	0.8862
2023	1435415146	0.8493
2024	1447606127	0.8124
2025	1459366479	0.7755
2026	1470683866	0.7386
2027	1481546337	0.7017
2028	1491942348	0.6648
2029	1501860781	0.6279
2030	1511290965	0.591

2031	1520222694	0.5541	**2073**	1395652333	-0.9957
2032	1528646248	0.5172	**2074**	1381755823	-1.0326
2033	1536552407	0.4803	**2075**	1367487812	-1.0695
2034	1543932468	0.4434	**2076**	1352862530	-1.1064
2035	1550778264	0.4065	**2077**	1337894459	-1.1433
2036	1557082178	0.3696	**2078**	1322598311	-1.1802
2037	1562837154	0.3327	**2079**	1306989006	-1.2171
2038	1568036713	0.2958	**2080**	1291081643	-1.254
2039	1572674966	0.2589	**2081**	1274891479	-1.2909
2040	1576746621	0.222	**2082**	1258433905	-1.3278
2041	1580246999	0.1851	**2083**	1241724420	-1.3647
2042	1583172036	0.1482	**2084**	1224778607	-1.4016
2043	1585518297	0.1113	**2085**	1207612110	-1.4385
2044	1587282979	0.0744	**2086**	1190240609	-1.4754
2045	1588463917	0.0375	**2087**	1172679799	-1.5123
2046	1589059591	0.0006	**2088**	1154945363	-1.5492
2047	1589069125	-0.0363	**2089**	1137052949	-1.5861
2048	1588492293	-0.0732	**2090**	1119018152	-1.623
2049	1587329517	-0.1101	**2091**	1100856488	-1.6599
2050	1585581867	-0.147	**2092**	1082583371	-1.6968
2051	1583251062	-0.1839	**2093**	1064214096	-1.7337
2052	1580339463	-0.2208	**2094**	1045763817	-1.7706
2053	1576850074	-0.2577	**2095**	1027247522	-1.8075
2054	1572786531	-0.2946	**2096**	1008680023	-1.8444
2055	1568153102	-0.3315	**2097**	990075929.1	-1.8813
2056	1562954674	-0.3684	**2098**	971449630.7	-1.9182
2057	1557196749	-0.4053	**2099**	952815283.8	-1.9551
2058	1550885431	-0.4422	**2100**	934186792.2	-1.992
2059	1544027415	-0.4791			
2060	1536629980	-0.516			
2061	1528700969	-0.5529			
2062	1520248782	-0.5898			
2063	1511282354	-0.6267			
2064	1501811148	-0.6636			
2065	1491845129	-0.7005			
2066	1481394754	-0.7374			
2067	1470470949	-0.7743			
2068	1459085093	-0.8112			
2069	1447248994	-0.8481			
2070	1434974876	-0.885			
2071	1422275348	-0.9219			
2072	1409163391	-0.9588			

V.



Assuming constant decline rates, the popluation of India will peak in the year 2047, and then start to gradually decline. But, such situations may be very unlikely to occur, as the government may be very swift in promoting policies to increase population growth.

Hence a Sigmoid Curve would be a reasonable population estimate.

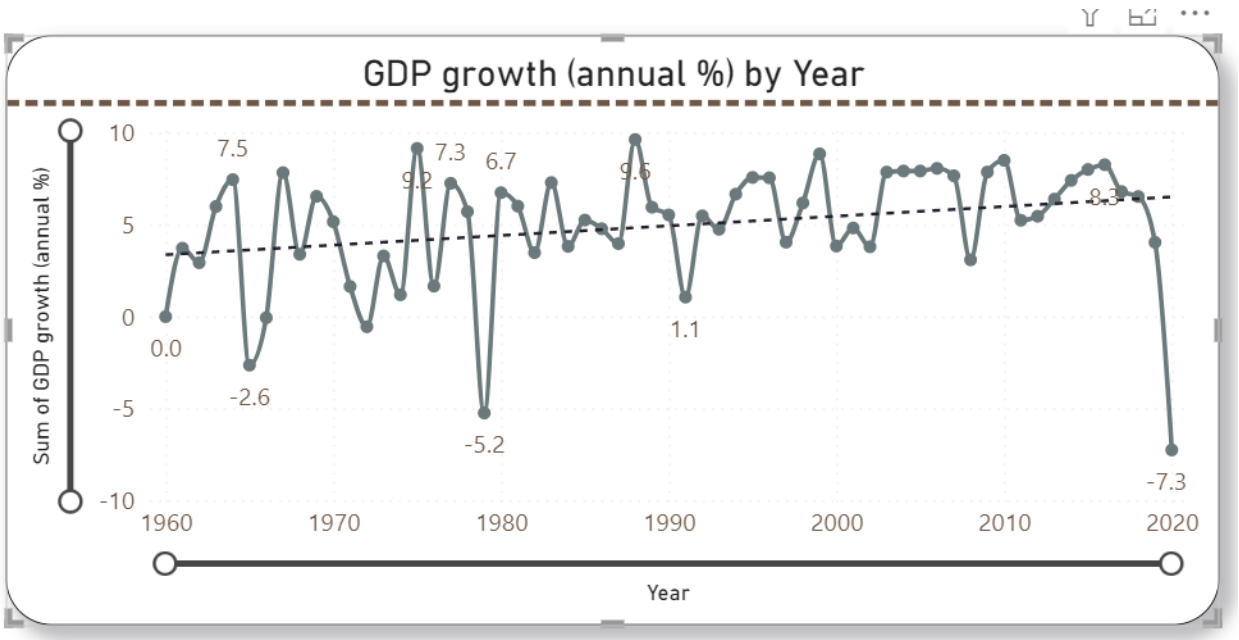
2.IMPORT & EXPORT OVER THE YEARS

I. The average Import ratio [vs GDP] stood at an average of 12.75% while the average Export Ratio [vs GDP] stood at an average of 10.89% over the years.

II. The share of Imports as a part of GDP has **tripled on an average**. The average rates of Import before 2000 were **7.51%,** whilst after 2000 it stood at an average of **22.73%,** showing an increase of 3.02%.

III. Similarly, the export ratio has also **tripled from 6.26 to 19.70** [before and after 2000s respectively]

3 .GDP & GDP GROWTH RATE TRENDS



I. A Quick observation shows that the GDP growth rates have sharply fallen during the times of Economic Crisis, usually triggered by External Factors like War & Pandemics.

II. A fall of GDP growth rate to -2.6 in 1965 was a direct consequence of Indo-Pak War.

III. It can be seen that the Indo-Pak war had a greated effect on GDP growth than the Indo-China war in 1962, which did result in a shorted dip of Prices. The GDP growth rate was still in negatives in 1966.

IV. Another sharp decrease since 1971 is a direct consequence of India-Pak war.

V. The sharp decline in 1979 was due to both internal and external factors. With severe drought gripping most of the country and crude oil prices almost doubling due to supply disruptions because of the Iranian revolution against the state's monarch. After two remarkable years of good rainfall, the drought in the kharif season in the grain producing states of the country led to decline in agricultural production by 10%. The sharp rise in petroleum prices also led to flare up of inflationary pressure with wholesale price inflation soaring 20%.

VI. The most notable fall was during Covid-19, where **GDP growth stood at -7.25**

4. LIFE EXPECTANCY

The average Life expectnacy shown a decent increase since 1960s. The decadal Life Expectancy change is given as follows:

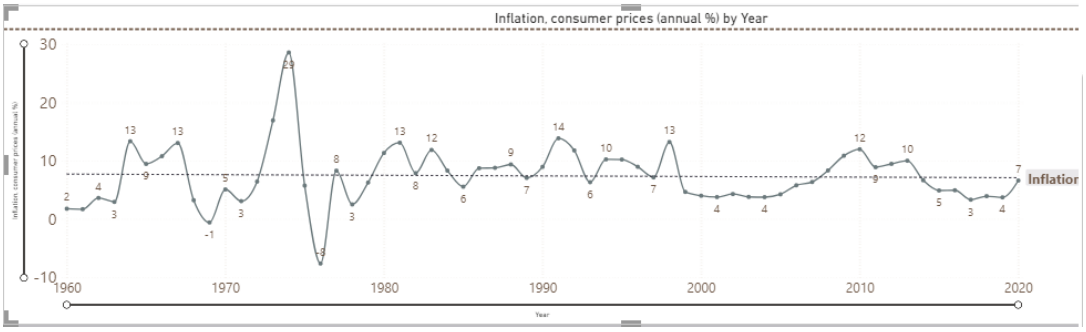
Year	CLE
1960-1970	5.62
1970-1980	5.58
1980-1990	3.71
1990-2000	3.73
2000-2010	3.29
2010-2020	2.63

Overall, the life expectancy has increased by **24 years** since 1960s

5. FORMULATING SCENARIOS

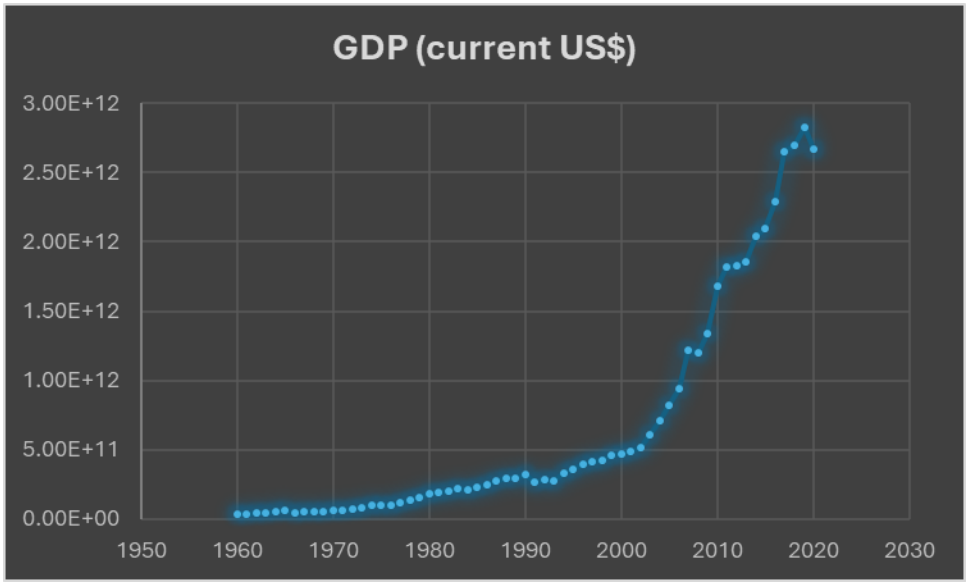
In the previous section, we had discussed the population dynamics. Since population of a country can be subject to frequent population shocks along with various parameters [Like Birth & Death Rates, Immigration and Emigration] driving the total population with unpredictable variability, it is important to simulate a wide variety of scenarios to sit down with the best estimate.

6.INFLATION



The average Inflation rate stands at **7.41%** across the years. In this, the average Yearly inflation stands **at 6.41% for 2000-2010** and **6.256% for 2011-2020.**

7.GDP [$]



GDP has been steadily increasing over the years. Even during times of Recession in 2008, only a small dip was seen. Covid-19 had a devastating impact on GDP in 2020, much greater than the 2008 reccession as the dip in GDP($) was far more downwards than that in 2008.

SUMMARY:

Thus, the Indian Economy and related parameters were analyzed for the years between 1960 and 2020.