



# IS AI RESHAPING INDIA? - A STUDY ON GDP OF INDIA AND US

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## Abstract:

“IS AI RESHAPING INDIA? A STUDY ON GDP OF INDIA AND USA-”to study the GDP at the current US dollar, GDP growth, GDP per capita, and the inflation rate of India and USA from 2000 to 2023 by employing descriptive statistical tools (mean, standard deviation, regression, etc.) **GDP value** India stood at second position and the USA occupied first place. **GDP per capita**, India stood at second position against the USA. The **GDP growth rate** and average growth rate of GDP of India stood at first place when compared to the USA. The **inflation** of India stands at second position from low to high when compared to the USA. It is hardly required to retain an adjustable balance between inflation and GDP with AI supported accelerated fiscal and monetary policy to achieve targeted GDP in the future by boosting of AI powered manufacturing, Healthcare, Agriculture, Telecom, E-Commerce and other allied industries of GDP constituents, The main conclusions of this study highlight AI's potential to significantly boost productivity, expand employment possibilities, and drive GDP in rapidly to occupy the India as a second largest economy after America. At present (2023) India stands at 5th largest economy in the world (GDP in US Trillion Dollars as follows USA 27.7 China, 17.79, Germany 4.56, Japan 4.2 and India 3.57 as per world bank data 2023)

**Key words used:** GDP, GDP Growth Rate, GDP Per capita, Inflation, Mean, Standard Deviation, Regression

## I. INTRODUCTION

### A. What is GDP and Its Growth rate

Gross domestic product is the ultimate value of the goods and services produced within the geographic limits of a country in a year. GDP growth rate is an indicator of the economic performance of a country and is a product of  $P1-P0/P0*100$ .

P1 = Current Value of GDP

P0 = Previous Value of GDP

### B. Inflation (CPI)

Inflation is measured in terms of consumer price index

## II. NEED AND IMPORTANCE OF THE STUDY

It is necessary to study the trends of GDP of India and USA as they are the most important emerging economies in the world. It is pressing need to know the present status of GDP and Inflation along with GDP projections up to 2050 and what kind of fiscal and monetary policy which is enable with artificial intelligence will lead to achieving the targeted place

## III. OBJECTIVES OF THE STUDY

The objectives of the study are:

- To analyse the GDP of India and USA in US billion and trillion dollars
- To study the GDP growth of India and USA
- To examine the GDP per capita in US dollars of India and USA
- To examine the inflation trends of India and USA
- To examine the GDP growth rates between India and USA
- To identify the Sectors which need AI enabled to boost the GDP

#### IV. HYPOTHESES

It is proposed to test the following hypotheses in the study:

**H01:** There is no significant difference is found in the GDP values of India and USA

**H02:** There is no significant difference in the GDP growth rates of India and USA

**H03:** There is no significant difference in the GDP per capita of India and USA.

**H04:** There is no significant difference in the average inflation rate between the India and USA .

**H05:** There is no significant difference in standard deviation in inflation between India and USA

**H06:** There is no significant change in the GDP projections up to 2050 between India and USA

#### V. RESEARCH METHODOLOGY

##### a) Data source

The required secondary data has been obtained from the World Bank website. The analysis is made with the help of such descriptive statistics as mean, standard deviation, skewness, etc.

##### b) Methodology

**A. Mean/Average** The central tendency is the average value of the series. This is the most commonly stated feature of a series. The formula to compute the mean is given in equation

$$\bar{X} = \frac{\sum X}{N}$$

##### B. Correlation:

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2} \sqrt{\sum(y-\bar{y})^2}}$$

Where,  $\bar{x}$  - mean of X variable  
 $\bar{y}$  - mean of Y variable

##### C. Regression- Least Square Method

$Y = mx + b$

$$m = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \quad b = \frac{\sum y - m(\sum x)}{n}$$

##### D. Standard Deviation

$$s = \sqrt{\frac{\sum(X - \bar{x})^2}{n - 1}}$$

#### VI. LIMITATIONS

1. The analyses are based on secondary data; any limitations pertaining to them would significantly affect the accuracy of the results.

2. Projection of GDP using Regression analysis is subject to changes in the economic, political, fiscal, and monetary policies of that country

#### VII. PERIOD AND SCOPE OF THE STUDY

The study covers a time frame of 2000–2023, taking around 24 years. The study is restricted to India and USA

#### VIII. DATA ANALYSIS

It analyses the GDP of India and USA, in US billion and trillion dollars, this section discusses the detailed GDP values in current market prices in US dollars, GDP per capita in US dollars, GDP growth rates, and inflation rates in a detailed manner. These macro-economic indicators are described using descriptive statistics like mean, standard deviation and regression

**Table-I**  
**gdp of india and usa intrillion dollar at current prices**

YEAR	INDIA	USA
	GDP IN US \$	GDP IN US \$
2000	0.47	10.25
2001	0.49	10.58
2002	0.51	10.93
2003	0.61	11.46
2004	0.71	12.22
2005	0.82	13.04
2006	0.94	13.82
2007	1.22	14.47
2008	1.20	14.77
2009	1.34	14.48
2010	1.68	15.05
2011	1.82	15.60
2012	1.83	16.25
2013	1.86	16.84
2014	2.04	17.55
2015	2.10	18.21
2016	2.29	18.70
2017	2.65	19.48
2018	2.70	20.53
2019	2.84	21.38
2020	2.67	21.06
2021	3.15	23.32
2022	3.39	25.46
2023	3.57	27.71
Average GDP	<b>1.71</b>	<b>16.32</b>
Max GDP	<b>3.57</b>	<b>27.71</b>
Min GDP	<b>0.47</b>	<b>10.25</b>
Median	<b>1.82</b>	<b>15.60</b>
Skewness	<b>0.19</b>	<b>0.43</b>
Standard Dev	<b>0.89</b>	<b>4.10</b>
<b>Linear Estimation</b>		
<b>2030</b>	<b>4.2</b>	<b>27.88</b>
<b>2040</b>	<b>5.6</b>	<b>33.97</b>
<b>2050</b>	<b>6.9</b>	<b>40</b>

**Source: World Bank Published Data and compiled using MS Excel**

Above table-I represents the GDP values in terms of US Trillion dollars, USA reported in steady growth in GDP very beginning it is 10.25 Trillion dollar in the year 2000-01 gradually increasing GDP over 24 years it was reached at around 27.71 Trillion Dollar whereas India 0.47 trillion dollar at the beginning 2000 year and Indian economy is entered into 1.2 trillion dollar GDP in the year 2007, India GDP is attained 3.57 Trillion Dollar at 2023,during study period Average GDP in US trillions over 24 years is reported in the above table high to low is USA 16.32, The maximum GDP posted during the study period India (2023) 3.57 US trillion dollars, USA 27.71(2023), as per the linear estimation of up to 2050 India become 7 trillion economy whereas USA 40 trillion economy, it shows India need growth of 6 times more than USA

**Table-II**  
**gdp growth rates of india and usa - annual percentage growth rate**

YEAR	INDIA	USA
	GDP GROWTH RATE	GDP GROWTH RATE
2000	3.8	4.1
2001	4.8	1
2002	3.8	1.7
2003	7.9	2.8
2004	7.9	3.9
2005	7.9	3.5
2006	8.1	2.8
2007	7.7	2
2008	3.1	0.1
2009	7.9	-2.6
2010	8.5	2.7
2011	5.2	1.5
2012	5.5	2.3
2013	6.4	1.8
2014	7.4	2.3
2015	8	2.7
2016	8.3	1.7
2017	6.8	2.2
2018	6.5	2.9
2019	3.9	2.3
2020	-5.8	-2.8
2021	9.1	5.9
2022	7	2.1
2023	8.2	2.9
Average GDP GROWTH RATE	<b>6.07</b>	<b>2.04</b>
Max GDP GROWTH RATE	<b>9.1</b>	<b>5.9</b>
Min GDP GROWTH RATE	<b>-5.8</b>	<b>-2.8</b>
Median	<b>7</b>	<b>2.3</b>
Skewness	<b>-2.67</b>	<b>-1.07</b>
Standard Dev	<b>3.06</b>	<b>1.84</b>

**Source: World Bank Published data and compiled using MS Excel**

From the above table II reported that a series of GDP growth rates of USA and India over a span of 23 years from 2000 to 2023 the average growth rates of USA and INDIA are reported as India 6.07 and USA 2.04. It is good to sing that India had reported the highest average growth rate of 9.1 compared to the USA, India occupies 1st place with 6.1 growth rates this is the way to achieve the strongest economy in the future to come. During the study period of 24 years, the max growth rate was reported at 9.1 by India in the year 2021, followed USA 5.9(2021)

**Table-III**  
gdp per capital at current us dollar of india and usa

YEAR	INDIA	USA
	GDP PER CAPITA IN US \$	GDP PER CAPITA IN US \$
2000	442	36330
2001	450	37133
2002	469	37998
2003	544	39490
2004	624	41724
2005	710	44123
2006	802	46302
2007	1022	48050
2008	993	48570
2009	1097	47195
2010	1350	48651
2011	1449	50066
2012	1431	51784
2013	1438	53291
2014	1560	55124
2015	1590	56763
2016	1714	57867
2017	1958	59908
2018	1974	62823
2019	2050	65120
2020	1913	63528
2021	2238	70220
2022	2388	76399
2023	2530	82769
Average PER CAPITA	<b>1313</b>	<b>52107</b>
Max PER CAPITA	<b>2530</b>	<b>82769</b>
Min PER CAPITA	<b>442</b>	<b>36330</b>
Median	<b>1431</b>	<b>50066</b>
Skewness	<b>0</b>	<b>0</b>
Standard Dev	<b>599</b>	<b>10560</b>

**Table-IV**  
gdp per capita estimation of india and usa

YEAR	INDIA	USA
	GDP PER CAPITA IN US \$	GDP PER CAPITA IN US \$
Linear Estimation		
2030	2014	81705
2040	3909	97283
2050	4803	112862

Source: World Bank published data in the website and compiled using MS Excel

From the above Table-III is depicted GDP per capita in US Dollar. During the period from 2000 to 2023 it is observed that the highest average per capita reported by USA over 24 years term is 52107 US Dollar and followed by India 1313 US Dollar. Max per capita is reported by USA in terms of US Dollars 82769(2023), India 2530 (2023). Min per capita is reported by USA in terms of US Dollars 36330 (2000),

followed by India 442 (2000). GDP per capita is estimated using regression least square method is reported in the above table IV as follows India up to 2050 in US Dollar USA is to be reported as 112862, followed by India 4803 US Dollars

**Table-V**

<b>Inflation rates of India and USA-(Consumer Price Index CPI)</b>	<b>INDIA</b>	<b>USA</b>
<b>YEAR</b>	<b>CPI INFLATION</b>	<b>CPI INFLATION</b>
2000	4.00	3.40
2001	3.80	2.80
2002	4.30	1.60
2003	3.80	2.30
2004	3.80	2.70
2005	4.20	3.40
2006	5.80	3.20
2007	6.40	2.90
2008	8.30	3.80
2009	10.90	-0.40
2010	12.00	1.60
2011	8.90	3.20
2012	9.50	2.10
2013	10.00	1.50
2014	6.70	1.60
2015	4.90	0.10
2016	4.90	1.30
2017	3.30	2.10
2018	3.90	2.40
2019	3.70	1.80
2020	6.60	1.20
2021	5.10	4.70

2022	6.70	8.00
2023	5.6	4.1
Average CPI INFLATION	<b>6.15</b>	<b>2.49</b>
MaxCPI INFLATION	<b>12.00</b>	<b>8.00</b>
Min CPI INFLATION	<b>3.30</b>	<b>-0.40</b>
Median	<b>5.10</b>	<b>2.30</b>
Skewness	<b>0.90</b>	<b>1.47</b>
Standard Deviation	<b>2.54</b>	<b>1.63</b>

Source: World Bank published data in the website and compiled using MS Excel

During the study period, over 24 years since 2000 to 2023 India and USA reported inflation rates in Table V above are taken from World Bank published data. Inflation always triggers the GDP of a country; as inflation grows, the growth rate obviously tends to fall as a result of tightening monetary policy to control inflation. It is a natural phenomenon between GDP and inflation, even though in certain circumstances maybe they are positively related. The above table shows average inflation over the 23 years of span the India and USA reported: India stood at 6.15 and USA at 2.49. The highest inflation rate has been reported by India during study period is 12 percent in the year 2010, and the USA is 8 percent during 2022. The lowest inflation rate during the study period is reported by India at 3.30 in 2017, and the USA -0.4 during the 2009. Standard deviation in inflation rates are shown in the above table V, as higher the standard deviation is higher the risk of variance associated with inflation rates, and lower the standard deviation is lower the risk of variance associated with inflation rates. Standard deviation of India is reported 2.54 is higher than USA it is 1.63 reported

## IX. FINDINGS

### H01:

It is found that the null hypothesis 01 is rejected as there is a significant difference is found in the GDP values during the study period of 24 years between India and USA. It might depend on the fiscal and monetary policy of that country as well as the GDP contributors of household consumption, private investment, government expenditure, and net exports of that country, which may vary, resulting in a huge difference in respect of all the

### H02:

Rejected the null hypothesis: in respect of growth rates, there is a significant difference in the average growth rates of India and USA due to economic and political policies as well as the economic cycles of those, which may lead to a difference in the growth rates of GDP over the USA group and India

### H03:

The null hypothesis is rejected with respect to India and USA as there is a significant difference is found between the India and USA with respect to per capita GDP in the US dollar.

### H04:

The null hypothesis is rejected, as there is a significant difference is found between India and USA in respect of average inflation rate

### H05:

The null hypothesis is rejected, as there is a significant difference is found between India and USA in respect of standard deviation in inflation rate

### H06:

It was found that there is a significant change in the GDP projections up to 2050 between the India and USA. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted, as huge differences are found between India and USA

## X. Conclusion

As GDP increases, it is perceived to be good for the economy, and as it decreases, it is bad to the economy, GDP value is also depending on the fiscal and monetary policies of a country. It is concluded that the GDP value (2023) in US dollar at current prices, India reported lower when compare to USA, USA occupied first place in all the macro parameters except the growth rate, whereas average GDP value over 24 years in US dollar at current prices, India stood at again second position when compare to USA. It is concluded that the GDP per capita of India stood at second position when compare to USA, whereas average per capita of India also stood at second in position, the reason behind this is population, it is hardly need to control population in order to enhance per capita.

It is concluded that GDP growth of India (2023) stood at 1<sup>st</sup> place when compare to USA, average GDP growth rate over 24 years India stood at 1<sup>st</sup> in place followed by USA, the speed of growth rate is very high with respect to India when compare to USA. It is concluded that, inflation (2023) of India is stood at second position from low to high when compare to USA, whereas average inflation rate around 24 years from low to high India stood at again second place compare to USA, **The IMF** estimated the global average inflation rate for the year 2024 to be 5.9, and 2025 4.5 per cent. It is mandatory to maintain a balance between GDP and inflation, and fueling to various sectors by initiating strong fiscal and monetary policy enabled with artificial intelligence a head to achieve targeted GDP volume in the future to take India first or second largest economy in the world.

India is far better in the growth rate reported 6.9 per cent when compare to the IMF estimated GDP growth rate of 3.2 per cent 2025, India stood at 10 trillion US dollars to be attained in 2030. It is possible only when implementing artificial intelligence rapidly wherever necessary to increase the share of GDP contributors like C+I+G+ Net Exports, as well as the standard fiscal and monetary policy of the government, are led to achieve the estimated target of 10 trillion US dollars in the economy. It is necessary to achieve a higher real growth rate every year by year; it's only the way to achieve the IMF and other agencies expected growth, fiscal policy measures to support vulnerable groups, especially it is need to improve exports rather than imports, the industries which are boosting exports like textile, spice, petroleum products, tea, jewelry, dairy products, emerging industries like pharmaceutical, automobile, renewable energy, In tackling front-loaded monetary policy tightening to address elevated inflation also a big challenge in front to take India a largest economy in the world

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