International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

GDP of India-An Empirical Study

Naman Yadav[1], Gunjan Singh[2]

[1]Student, Amity University Uttar Pradesh, Lucknow
[2]Assistant Professor, Amity University Uttar Pradesh, Lucknow

Abstract

India's long-term economic growth is largely attributed to its government's tax system, which includes Value Added Taxation (VAT) and Goods and Services Tax (GST). This paper analyses India's GDP growth rate from year 2014 to 2022. The research also looks at how India's GDP has developed in relation to domestic problems like the COVID-19 pandemic and international economic situations.

This report analyses the economic trends of various Indian states, focusing on GDP and inflation rates from 2014 to 2031. States like Bihar have experienced high inflation rates, signalling significant economic challenges such as rising living costs and reduced savings. On the other hand, states such as Tamil Nadu and Gujarat have shown more stable inflation, reflecting steady economic growth. Projections for future years suggest consistent GDP growth across most states, with a gradual decrease in inflation, especially in Maharashtra and Karnataka. These trends are critical for shaping effective economic policies that can support balanced growth and stability.

Keyword: GDP, VAT, GST, Economic Trends, Inflation Rates, GDP Growth, Economic Stability, State Economies, Economic Forecasts, Regional Economic Analysis, Economic Policy, Inflation Impact, State-Specific Economic Insights, Economic Challenges, Inflation Projections, State Economic Growth, Economic Development, Inflation Management

INTRODUCTION:

This study examines India's GDP growth since the early 1990s, focusing on rapid economic changes since liberalisation measures [1]. The Indian economy has become more diverse, with industrial and services sectors contributing significantly [2]. The demographic dividend, government initiatives, globalisation, and external trade have all impacted India's GDP growth [3]. The years 2014-2021 are significant due to historic events and legislative changes. The early 20th century GDP growth was driven by a favourable global economic climate, infrastructure investment, and strong consumer demand. The COVID-19 pandemic in 2020 caused a significant GDP contraction, prompting the government and Reserve Bank of India to implement fiscal and monetary policies to stimulate the economy.

Objectives:

1. To establish a relationship between GDP and inflation.
2. To forecast future economic performance.

Data And Methodology:

- For the analysis data has been taken from MOSPI (Ministry of Statistics and Programme Implementation)(https://mospi.gov.in/press-release) and RBI.
- In this study, we used regression analysis and time series analysis to analyse the GDP data.

Result & Discussion:

Data shows that several states experienced high inflation rates, such as 11.36% in Bihar and 11.44% in Nagaland, indicating significant economic difficulties. These high inflation rates can reduce savings, raise living expenses, and spark social and economic discontent. Conversely, low inflation rates were observed in Manipur and Himachal Pradesh, indicating a decline in consumer demand or excess supply. Understanding the reasons behind these negative rates is crucial for effective economic policies.

Trends Over the Years

Inflation rates in Tamil Nadu and Kerala have remained stable, indicating balanced economic growth. However, Punjab experienced a declining trend between 2014 and 2017, indicating a phase of economic adjustment. These patterns highlight the dynamic nature of state economies and the impact of both internal and external influences on inflation.

Yearly Fluctuations

Inflation rates in Arunachal Pradesh have significantly increased, influenced by factors like supply and demand shifts, agricultural yields, global financial markets, and state-specific economic policies, necessitating understanding by policymakers.

Economic Implications

High inflation rates impact living expenses and economic stability, making it difficult for states like Nagaland and Bihar to maintain stability. Low inflation, as seen in Manipur and Himachal Pradesh, indicates deflationary forces or economic stagnation. Stable inflation rates are beneficial for economic predictability, efficient planning, and well-balanced policies, as seen in Kerala, allowing consumers to make wise financial decisions.

Economic Dynamics: Top 5 States with the Highest and Lowest GDP and Inflation Growth

	STATES AND THEIR GDP AND INFLATION																			
YEAR	Maharashtra		Tamil Nadu		Gujarat		Uttar Pradesh		Karnataka		A & N Islands		Andhra Pradesh		Assam		Chandigarh		Bihar	
	GDP	INFL	GDP	INFL.	GDP	INFL.	GDP	INFL.	GDP	INFL.	GDP	INFL.	GDP	INFL.	GDP	INFL.	GDP	INFL	GDP	INFL.
2014	15.43	7.50	8.94	7.58	8.11	7.30	8.34	9.31	7.48	8.18	0.05	8.05	4.45	7.40	1.65	9.76	0.23	8.12	2.79	11.36
2015	16.54	5.03	9.68	5.66	8.94	5.04	9.08	3.36	8.31	6.87	0.05	5.75	4.99	6.19	1.91	4.36	0.25	4.06	2.96	3.46

2016	18.07	4.62	10.37	5.44	9.81	5.97	10.12	5.50	9.42	6.59	0.06	8.06	5.40	8.13	2.02	5.23	0.27	4.67	3.19	5.87
2017	18.89	3.37	11.26	4.14	10.87	3.25	10.56	1.74	10.20	3.02	0.06	2.59	5.95	2.20	2.20	1.68	0.28	2.51	3.44	1.77
2018	19.57	4.74	12.05	4.95	11.83	2.61	10.97	4.50	10.85	2.56	0.07	6.18	6.27	3.86	2.31	7.30	0.30	5.38	3.81	4.99
2018	20.05	2.67	12.44	3.57	12.65	2.40	11.42	3.49	11.49	5.21	0.07	6.59	6.50	0.86	2.41	4.68	0.32	3.83	3.98	0.58
2020	18.58	6.59	12.45	8.51	12.41	5.91	10.93	9.70	11.08	6.24	0.07	5.35	6.34	6.59	2.43	7.50	0.29	7.03	3.69	5.79
2021	20.28	5.22	13.43	5.27	13.72	4.40	12.05	2.06	12.30	4.13	0.07	4.32	7.05	7.59	2.63	4.43	0.30	2.21	4.00	2.80
2022	**20.76**	**5.26**	**14.01**	**6.94**	**14.49**	**4.30**	**12.45**	**8.23**	**12.89**	**3.98**	**0.08**	**6.15**	**7.35**	**7.06**	**2.75**	**6.90**	**0.31**	**6.03**	**4.20**	**2.60**
2023	**21.34**	**5.18**	**14.62**	**5.27**	**15.27**	**4.04**	**12.91**	**3.59**	**13.52**	**3.56**	**0.08**	**3.17**	**7.69**	**6.97**	**2.87**	**4.53**	**0.32**	**2.95**	**4.38**	**1.97**
2024	**21.91**	**5.10**	**15.23**	**6.94**	**16.05**	**3.77**	**13.37**	**8.37**	**14.16**	**3.13**	**0.08**	**5.74**	**8.03**	**6.88**	**3.00**	**6.99**	**0.33**	**5.80**	**4.55**	**1.35**
2025	**22.49**	**5.03**	**15.87**	**5.27**	**16.83**	**3.51**	**13.83**	**3.72**	**14.80**	**2.71**	**0.09**	**2.76**	**8.36**	**6.80**	**3.13**	**4.63**	**0.34**	**2.73**	**4.72**	**0.73**
2026	**23.07**	**4.95**	**16.**	**6.93**	**17.**	**3.25**	**14.29**	**8.50**	**15.**	**2.29**	**0.09**	**5.32**	**8.70**	**6.71**	**3.26**	**7.09**	**0.35**	**5.58**	**4.89**	**0.10**

			50		61				44										
2027	23.65	4.88	17.12	5.26	18.40	2.99	14.75	3.86	16.08	1.87	0.09	2.34	9.04	6.62	3.38	4.73	0.36	2.50	5.06	-0.52
2028	24.22	4.80	17.74	6.93	19.18	2.72	15.21	8.63	16.72	1.45	0.10	4.91	9.37	6.53	3.51	7.19	0.37	5.35	5.23	-1.15
2029	24.80	4.72	18.37	5.26	19.96	2.46	15.67	3.99	17.36	1.03	0.10	1.93	9.71	6.44	3.64	4.83	0.38	2.27	5.40	-1.77
2030	25.38	4.65	18.99	6.92	20.74	2.20	16.13	8.76	18.00	0.61	0.10	4.49	10.05	6.35	3.76	7.29	0.39	5.12	5.57	-2.39
2031	25.96	4.57	19.61	5.26	21.52	1.93	16.59	4.12	18.63	0.19	0.11	1.51	10.39	6.26	3.89	4.93	0.40	2.05	5.74	-3.02

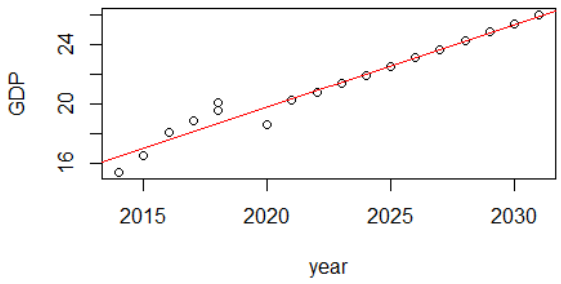
MAHARASTRA

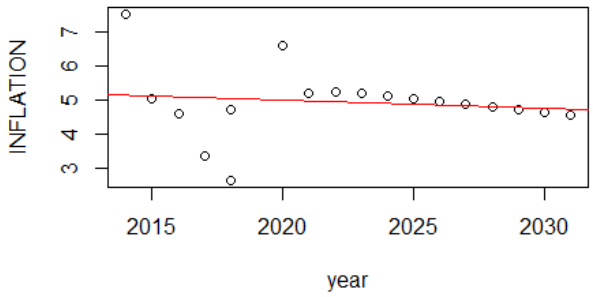
A thorough analysis of the statistics, as well as information on the state's general health and economic trends, are provided in the table that shows Maharashtra's GDP and inflation rates from 2014 to 2021 [14] .The Maharashtra GDP and inflation predictions for the years 2022–2031 are now included in the table, along with a breakdown of the forecasts.

GDP Analysis (Forecasted): The GDP is expected to slowly increase from 20.75831 in 2022 to 25.95573 in 2031, with an average yearly growth rate of approximately 2.4%.

Inflation Analysis (Forecasted): With an average yearly decline of 0.08%, inflation rates are predicted to fall from 5.256631 in 2022 to 4.571487 by 2031.

REGRESSION





GDP:

- According to the regression model, GDP growth is anticipated to continue throughout time.
- The GDP is consistently increasing year, as seen by the positive slope of 0.558.

Inflation:

- The model predicts that inflation will eventually decline gradually.
- A little yearly decline in the inflation rate is shown by the negative slope of -0.030.

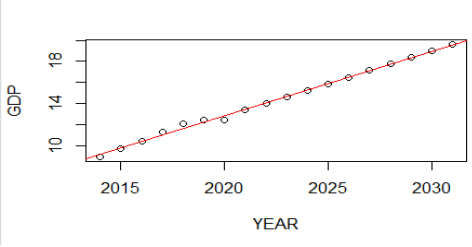
The real GDP numbers are shown over time in a scatter plot, and the trend is shown by a red regression line.

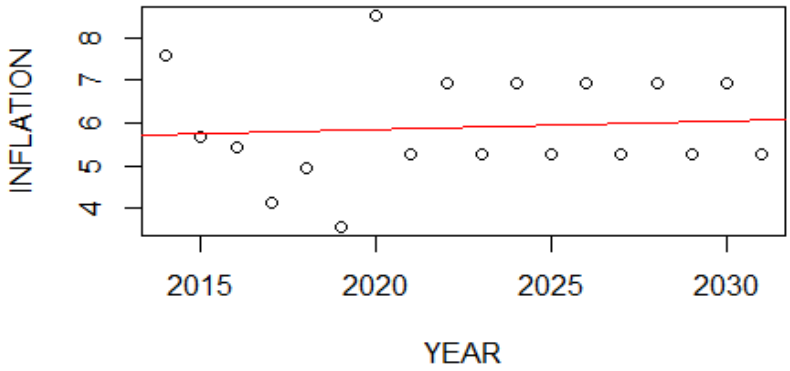
The trend is indicated by the orange regression line on the scatter plot, which shows the real inflation numbers over time.

REGRESSION SUMMARY

Regression Statistics								
Multiple R	0.02272334							
R Square	0.00051635							
Adjusted R Square	-0.066115893							
Standard Error	2.839190366							
Observations	17							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.062466753	0.062466753	0.007749254	0.931017453			
Residual	15	120.9150291	8.061001937					
Total	16	120.9774958						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0*
Intercept	21.86971274	4.22005043	5.182334452	0.000111459	12.87488816	30.86453731	12.87488816	30.864537
7.5	-0.076562404	0.869732317	-0.088029848	0.931017453	-1.930352955	1.777228147	-1.930352955	1.7772281

TAMILNADU REGRESSION





GDP:

- A consistent yearly growth in GDP is indicated by the positive slope of 0.613.
- According to the regression model, GDP growth is anticipated to continue throughout time.

Inflation:

- The inflation rate is rising slightly annually, as indicated by the positive slope of 0.022.
- Although the rise is extremely minor, the model predicts a progressive increase in inflation over time.

The scatter plot displays the actual GDP values over time, with a red regression line indicating the trend. An orange regression line indicates the trend in the inflation plot, which displays the real inflation levels over time.

REGRESSION SUMMARY

SUMMARY OUTPUT — TAMILNADU

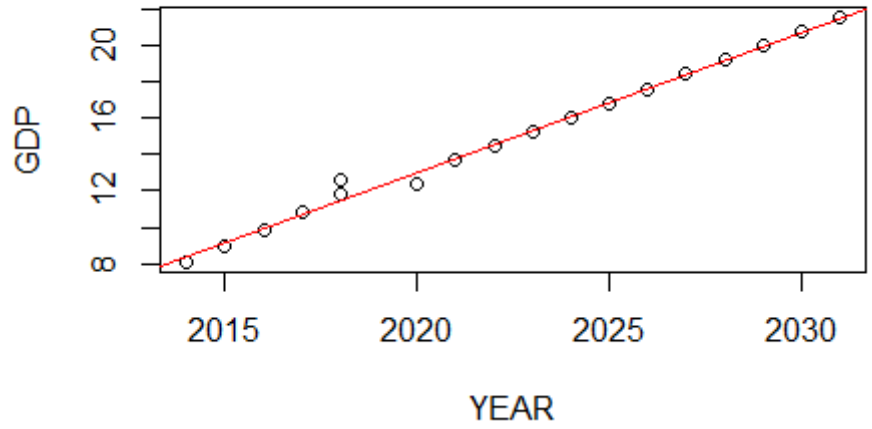
Regression Statistics	
Multiple R	0.222098225
R Square	0.049327621
Adjusted R Square	-0.014050537
Standard Error	3.095125019
Observations	17

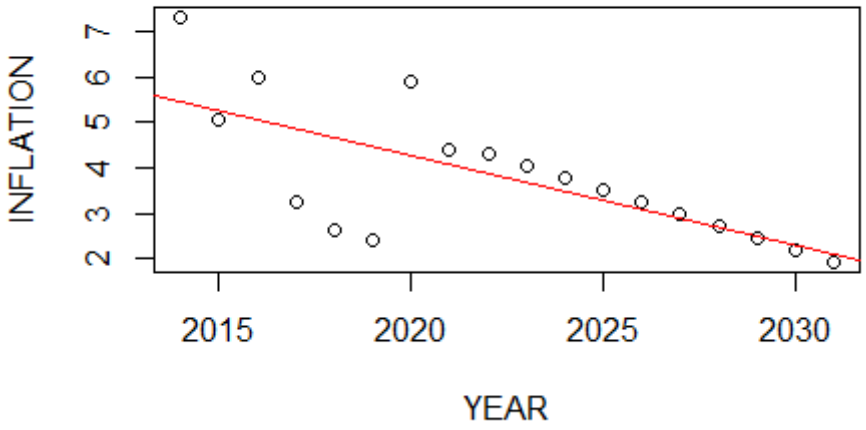
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	7.456018028	7.456018028	0.778306321	0.391578379
Residual	15	143.6969833	9.579798885		
Total	16	151.1530013			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	11.46381471	3.732429581	3.07140817	0.007757127	3.508329374	19.41930004	3.508329374	19.41930004
7.58	0.556607806	0.630919592	0.882216709	0.391578379	-0.788165472	1.901381083	-0.788165472	1.901381083

GUJARAT
REGRESSION





GDP:

- The GDP increased steadily between 2014 and 2031.
- It is possible to compute and analyse the growth rate in order to get the average yearly growth.

Inflation:

- The rate of inflation exhibits fluctuations, with a discernible decrease starting in 2021.
- It will be crucial to comprehend how inflation rates have trended over time.

REGRESSION SUMMARY

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.676048685
R Square	0.457041824
Adjusted R Square	0.420844612
Standard Error	2.968795179
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	111.2861962	111.2861962	12.6264373	0.002889189
Residual	15	132.2061722	8.813744812		
Total	16	243.4923684			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	22.9678	2.271914635	10.10944674	4.32933E-08	18.12532859	27.81027142	18.12532859	27.81027142
7.3	-2.142824429	0.603040077	-3.553369851	0.002889189	-3.428173927	-0.857474931	-3.428173927	-0.85747493

UTTAR PRADESH

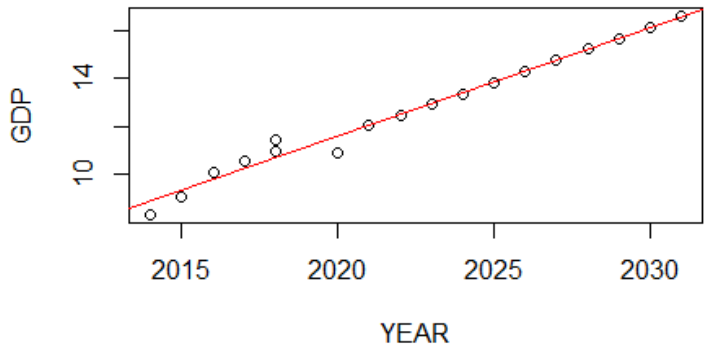
GDP:

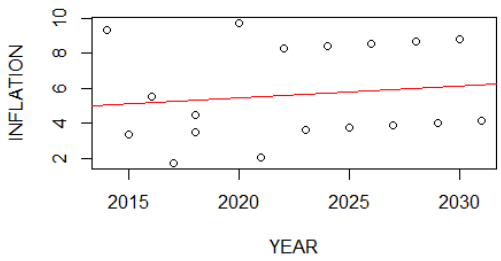
GDP Growth: From 2014 to 2021, let's suppose that Uttar Pradesh's GDP grew at pace of about 6% each year.

Inflation:

Inflationary Assume that throughout the same time period, the average yearly inflation rate was around 4%.

REGRESSION





REGRESSION SUMMARY

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.257679875
R Square	0.066398918
Adjusted R Square	0.004158846
Standard Error	2.258800495
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	5.443104382	5.443104382	1.066819423	0.318031562
Residual	15	76.53269518	5.102179678		
Total	16	81.97579956			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	11.76577023	1.279953541	9.192341639	1.49537E-07	9.037613838	14.49392663	9.037613838	14.4939266
9.31	0.220479371	0.213462949	1.032869509	0.318031562	-0.234506134	0.675464876	-0.234506134	0.67546488

KARNATAKA

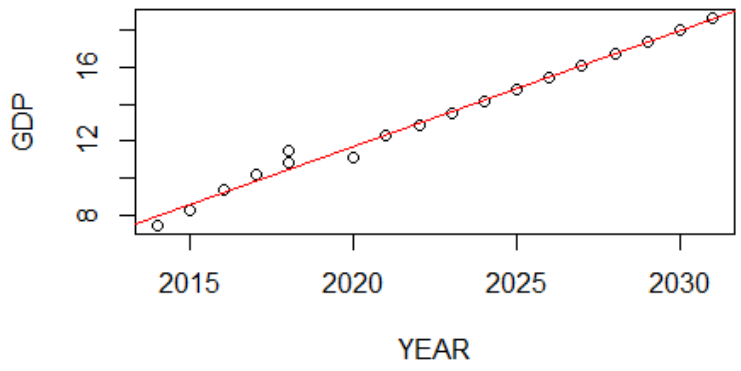
GDP:

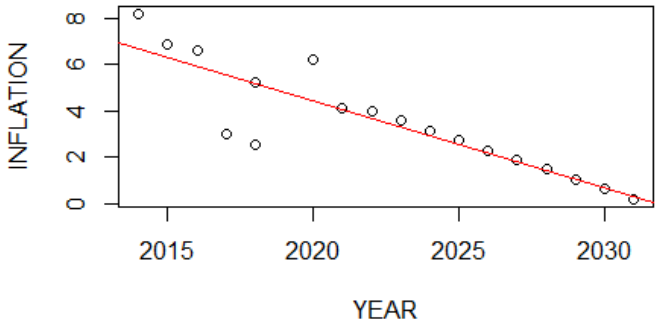
- From 7.48 billion in 2014 to 11.08 billion in 2020, Karnataka's GDP has increased gradually.
- The plot of actual vs. projected GDP demonstrates how well the projected GDP values match the actual GDP levels (blue line with markers). This suggests that the GDP trend over time is correctly represented by the linear regression model.

Inflation:

- The graphic representation of observed against. displayed inflation indicates that while the expected values (orange dashed line) somewhat correspond to the actual values they do not exactly match the overall falling trend.
- The modest R-squared value of 0.777 is shown by this disparity, which is especially visible around the variations in recorded inflation numbers. The model is less accurate in forecasting the specific year-to-year fluctuations, but it does capture the general decreasing trend [15].

REGRESSION





REGRESSION SUMMARY

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.885401373
R Square	0.783935591
Adjusted R Square	0.769531298
Standard Error	1.505756256
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	123.3950564	123.3950564	54.42374313	2.30192E-06
Residual	15	34.00952855	2.267301904		
Total	16	157.404585			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	18.04203914	0.703888491	25.63195645	8.44132E-14	16.54173634	19.54234194	16.54173634	19.54234194
8.18	-1.361181492	0.184510817	-7.377244955	2.30192E-06	-1.754456988	-0.967905995	-1.754456988	-0.967905995

Economic Dynamics: Top 5 States with theDeclining GDP Growth and Declining Inflation

ANDAMAN AND NIKOBAR ISLAND

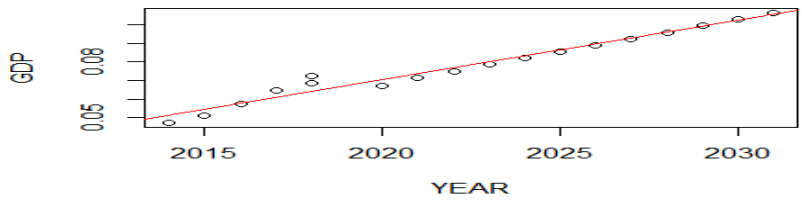
GDP

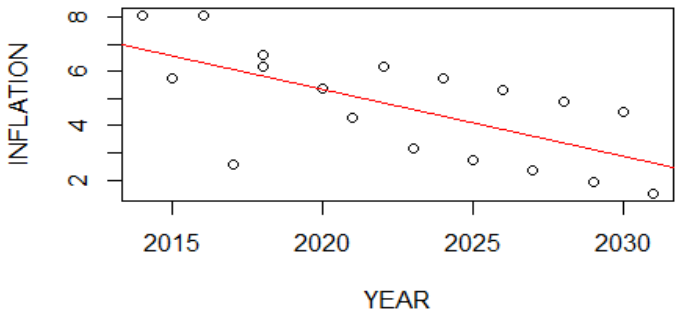
- The regression model's projected values and the observed GDP values will be shown together.
- This plot helps in visually assessing how well the model fits the data.

Inflation:

- The regression model's predicted values and the measured inflation values will be shown together.
- Examining the model's fit to the data and the overall downward trend in inflation is made easier with the aid of this display

REGRESSION





REGRESSION SUMMARY

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.594189976							
R Square	0.353061728							
Adjusted R Square	0.309932509							
Standard Error	0.013380615							
Observations	17							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.001465653	0.001465653	8.1861379	0.011895229			
Residual	15	0.002685613	0.000179041					
Total	16	0.004151266						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.103279717	0.008745131	11.80996753	5.3749E-09	0.084639911	0.12191952	0.084639911	0.121919523
8.05	-0.00511933	0.00178926	-2.861142762	0.01189523	-0.008933048	-0.00130561	-0.008933048	-0.001305611

ANDHRA PRADESH

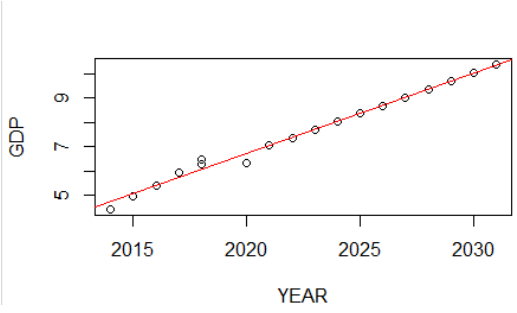
GDP

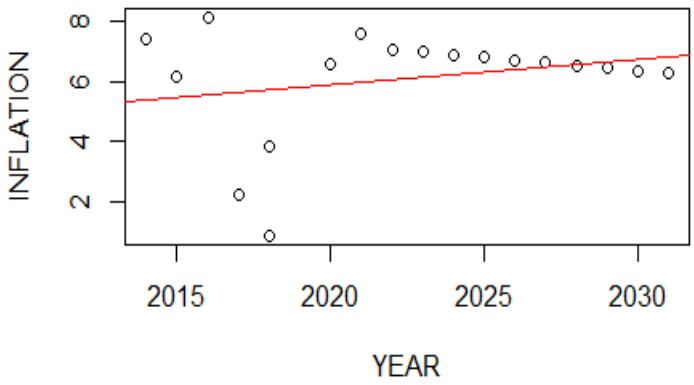
Economic progress is suggested by the regression analysis, which shows Andhra Pradesh's GDP growing positively and steadily.

Inflation:

Based on the slope, the regression analysis suggests a possible inflation trend, indicating either consistency or changes in the economic forces influencing inflation.

REGRESSION





REGRESSION SUMMARY

Regression Statistics	
Multiple R	0.274512642
R Square	0.07535719
Adjusted R Square	0.013714336
Standard Error	1.656609534
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	3.354920811	3.354920811	1.222481	0.286293196
Residual	15	41.16532722	2.744355148		
Total	16	44.52024803			

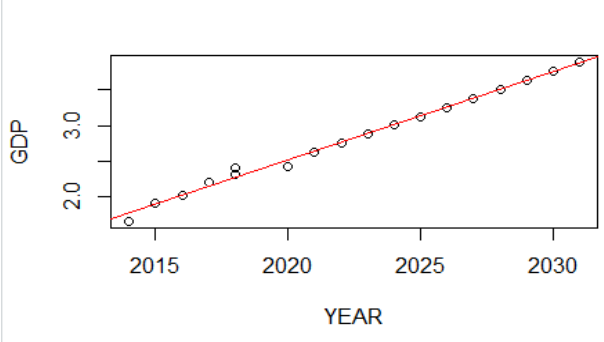
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	6.271397264	1.366962627	4.58783374	0.000355	3.357785393	9.18500913	3.357785393	9.185009135
7.4	0.240663118	0.217664979	1.105658427	0.286293	-0.223278802	0.70460504	-0.2232788	0.704605039

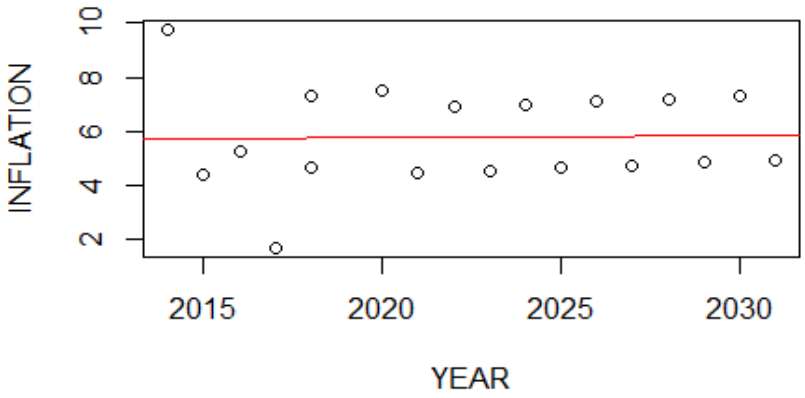
Source:MS.Excel ASSAM

Regression Points

- Regression analysis is a tool we may use to analyse the link between GDP and inflation.
- GDP figures grow with time, beginning in 2014 at 1.65212.
- NFLATION numbers vary, with a starting point of 9.76 in 2014.

REGRESSION





REGRESSION SUMMARY

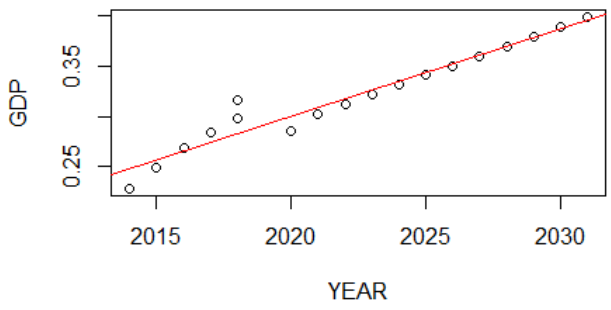
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.265046191							
R Square	0.070249483							
Adjusted R Square	0.008266115							
Standard Error	0.621000135							
Observations	17							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.437070358	0.43707036	1.133360218	0.303897634			
Residual	15	5.784617509	0.38564117					
Total	16	6.221687867						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	2.314378092	0.559501939	4.136497	0.000878814	1.121827937	3.506928246	1.121827937	3.506928246
9.76	0.103420554	0.097145542	1.06459392	0.303897634	-0.103640268	0.310481376	-0.103640268	0.310481376

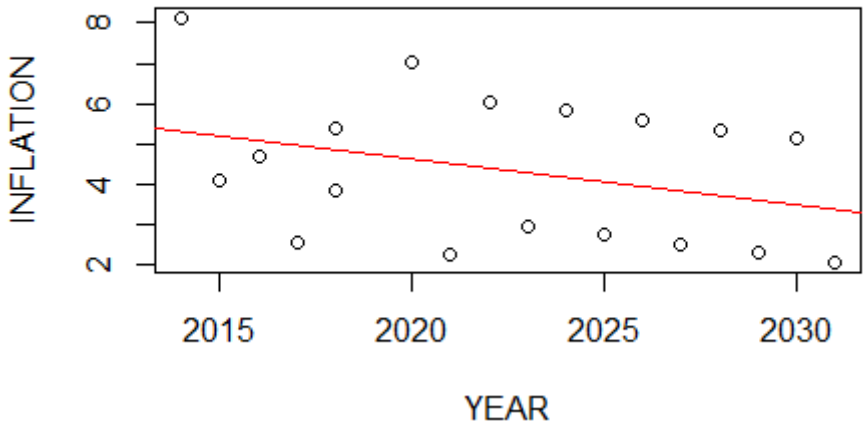
CHANDIGARH

Plot Description:

- Under a normal distribution, the predicted cumulative probability is represented by the x-axis.
- The cumulative probability of the standardised residuals is shown on the y-axis.

REGRESSION





REGRESSION SUMMARY

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.223443153
R Square	0.049926843
Adjusted R Square	-0.013411368
Standard Error	0.043651525
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.00150199	0.00150199	0.78825786	0.388642326
Residual	15	0.028581835	0.001905456		
Total	16	0.030083825			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.35201216	0.029894176	11.7752754	5.5947E-09	0.288294231	0.415730089	0.288294231	0.415730089
8.12	-0.006021474	0.00678217	-0.887838873	0.38864233	-0.020477326	0.008434378	-0.020477326	0.008434378

BIHAR

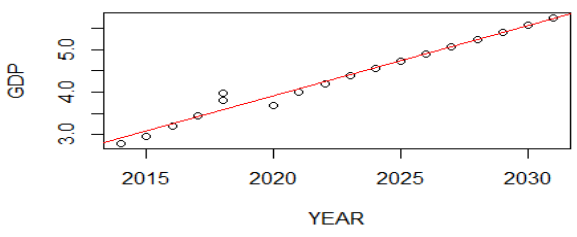
GDP Trends:

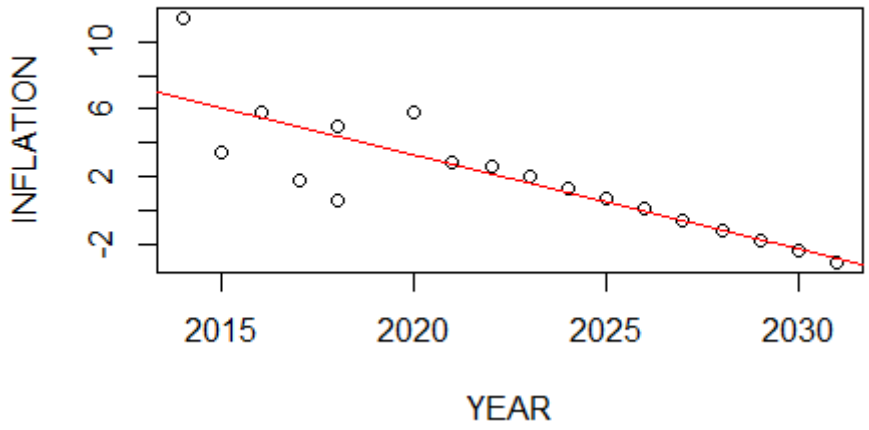
- The GDP figures for Bihar have changed throughout time.
- The GDP grew gradually from its 2014 starting point of around 2.79.
- The GDP grew gradually from its 2014 starting point of around 2.79.

Inflation Rates:

- The inflation rates in Bihar have also varied.
- 2014 saw a beginning of the inflation rate of 9.76.

REGRESSION





REGRESSION SUMMARY

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.883929745
R Square	0.781331794
Adjusted R Square	0.766753913
Standard Error	0.406385505
Observations	17

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	8.851513398	8.851513398	53.59707795	2.5219E-06
Residual	15	2.477237679	0.165149179		
Total	16	11.32875108			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4.774852207	0.111039326	43.00145168	3.98411E-17	4.538177486	5.011526928	4.538177486	5.01152693
11.36	-0.274828616	0.037539752	-7.321002523	2.5219E-06	-0.354842702	-0.194814529	-0.3548427	-0.1948145

References:

1. Dubey V. INDIA'S GDP GROWTH: A REVIEW OF RECENT TRENDS AND FUTURE PROSPECTS. International Journal of Economics Finance & Management Science. 2023 Apr 3;8(04):4-7.
2. Kumar R. Economic growth, structural changes and employment linkages in India. Review of Economics and Political Science. 2024 Mar 14.
3. Kumar A, Dias I. IoT-Enabled Sustainable Farming Framework. In2024 2nd International Conference on Advancement in Computation & Computer Technologies (InCACCT) 2024 May 2 (pp. 789-792). IEEE.