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Analysis & Visualization of GDP/GDSP of Indian States

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Abstract - The analysis is significant to analyze the progress of a country in various sectors of the country. The analysis and visualization of GDP enables policymakers and central banks to judge whether the economy is contracting or expanding and promptly take necessary action. It also allows policymakers, economists, and businesses to analyze the impact of variables such as monetary and fiscal policy, economic shocks, and tax and spending plans.

Key Words: GDP, Economy, analysis, Visualization

1.INTRODUCTION

The empirical data was taken from already available data sets from Kaggle and planning commission (Niti-Aayog) and a linear regression model was used to analyze the data and make analysis and conclusions according to that. Graphs were plotted from this data and political as well as economic side of the data was depicted in this project.

GDP is important because it gives information about the size of the economy and how an economy is performing. The growth rate of real GDP is often used as an indicator of the general health of the economy. Everyone—investors, politicians, and citizens—is impacted by the strength of global and local economies, and GDP is a critical measurement of an economy's size, performance, and general health. Hence, the analysis of the GDP and GDSP of Indian states and its visualization benefit investors in gaining knowledge about their investment area or potential investment places but also acts as an insight for the public on how better they can make their country. [1].

2. STUDY AREA

Indian Geography

The India is divided into 28 States (further subdivided into districts) and 8 union territories including the National capital territory (i.e., Delhi). India's borders run a total length of 15,200 km (9,400 mi).

Its borders with Pakistan and Bangladesh were delineated according to the Radcliffe Line, which was created in 1947 during Partition of India. Its western border with Pakistan extends up to 3,323 km (2,065 mi), dividing the Punjab region and running along the boundaries of the Thar Desert and the Rann of Kutch. This border runs along the Indian states of Jammu and Kashmir, Rajasthan, Gujarat, and Punjab.[8] Both nations delineated a Line of Control (LoC) to serve as the informal boundary between the Indian and Pakistan-administered areas of Jammu and Kashmir. India claims the whole state of Jammu and Kashmir, which includes Pakistan-administered Kashmir and China-administered Aksai Chin, which, according to India are illegally occupied areas.

Indian Economy

The long-term growth perspective of the Indian economy remains positive due to its young population and corresponding low dependency ratio, healthy savings, and investment rates, increasing globalization in India and integration into the global economy. The economy slowed in 2017, due to shocks of "demonetization" in 2016 and the introduction of the Goods and Services Tax in 2017. Nearly 60% of India's GDP is driven by domestic private consumption. The country remains the world's sixth-largest consumer market. Apart from private consumption, India's GDP is also fueled by government spending, investment, and exports. In 2019, India was the world's ninth-largest importer and the twelfth-largest exporter. India has been a member of the World Trade Organization since 1 January 1995. It ranks 63rd on the Ease of doing business index and 68th on the Global Competitiveness Report.With 500 million workers, the Indian labour force was the world's second-largest as of 2019. India has one of the world's highest number of billionaires and extreme income inequality. Since India has a vast informal economy, barely 2% of Indians pay income taxes.[2].

[3] India has emerged as the fastest growing major economy in the world and is expected to be one of the top three economic powers in the world over the next 10-15 years, backed by its robust democracy and strong partnerships.

Market size

India's gross domestic product (GDP) at current prices stood at Rs. 51.23 lakh crore (US$ 694.93 billion) in the first quarter of FY22, as per the provisional estimates of gross domestic product for the first quarter of 2021-22.

India is the fourth-largest unicorn base in the world with over 21 unicorns collectively valued at US$ 73.2 billion, as per the Hurun Global Unicorn List. By 2025, India is expected to have ~100 unicorns by 2025 and will create ~1.1 million direct jobs according to the Nasscom-Zinnov report 'Indian Tech Start-up'. [3]

GDP

The gross domestic product (GDP) measures of national income and output for a given country's economy. Gross domestic product (GDP) is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time.[4]

GDP measures the monetary value of final goods and services—that is, those that are bought by the final user—

produced in a country in a given period of time (say a quarter or a year). It counts all of the output generated within the borders of a country. GDP is composed of goods and services produced for sale in the market and also includes some nonmarket production, such as defense or education services provided by the government.

GDP, as currently defined, is not a comprehensive measure of welfare or even economic well-being, the GDP concept—along with the pieces of GDP available through

the national accounts—is useful in and of itself and should provide a great deal of information that is closely related to welfare. The exclusion of non-market activities that bear on economic well-being merits more attention, particularly given the potential for changes in the importance of such activities over time to change the degree to which changes in GDP capture changes in well-being.[6]

GDSP

GSDP is the sum total of value added by different economic sectors (Agriculture, Industry & Services) produced within the boundaries of the state calculated without duplication during a year. It is one of the measures of economic growth for a state's economy.

These are lists of Indian states and union territories by their nominal gross state domestic product (GSDP). GSDP is the sum of all value added by industries within each state or union territory and serves as a counterpart to the national gross domestic product (GDP).[5]

The growth of gross state domestic product is an important parameter to measure the state of economic health of states and as a whole of the country. It helps to describe the status of public welfare of the states and overall picture of the economy. But there is uneven growth of state domestic product (SDP) of Indian states which is a constraint on the overall growth of India's gross domestic product (GDP). The growth of most of the Indian states is found to be featured with instability and volatility.[7]

3. DATA AND METHODOLGY

Data flow diagram/flowchart

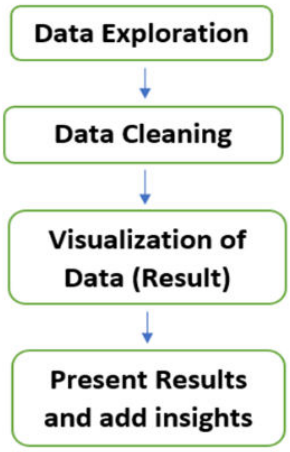

Fig-1.1

Algorithm

Import the required data sets. Import the necessary libraries. Read the prominent data sets for visual clarity. Clean the data sets if they have null values. Dropped the columns whose rows had null values. Dropped the Union territories which are not needed for analysis. And started plotting according to the data available using matplotlib etc.

4. TASKS PERFORMED

Average % growth vs States

Here in the figure below (Fig1.2) the gross4_mean of each state is plotted in a horizontal bar graph and also the All India GDP is also plotted in the same graph together with the states, as it can be seen with a blue line. The horizontal bar graph depicts Average percent growth in the x axis and States in the y axis. The states with null values and union territories were removed in the gross4_mean data-frame.

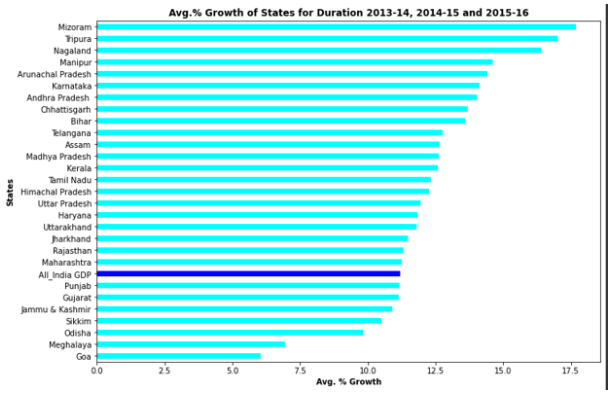

Fig-1.2

Home state vs National Average (Avg% Growth of Home state vs National Avg. for Duration 2013-14, 2014-15 and 2015-16)

My home state's gross4_mean Andhra Pradesh is compared with the gross4_mean of All India GDP in a plot Average % Growth vs Home-state & National Average. This plot shows that the average percent growth of the state of Andhra Pradesh fares higher than the national average for average percent growth. Which indicates that the economic well-being of Andhra Pradesh is doing fairly well and if the GDSP rate is high, it indicates that education, economic and industrial growth of the said state is high and doing well.

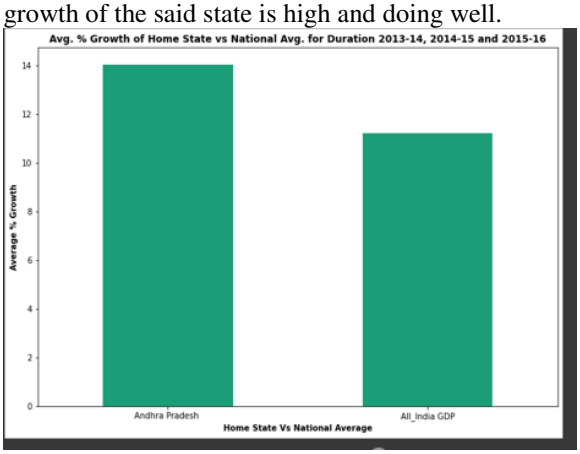

Fig-1.3

Years vs GDSP (Before partition of Andhra and Telangana)

Here we can see a plot which shows a bar graph comparing years and GDSP of the state known as Andhra Pradesh before their division/partition. The main reason for partition was the difference in economic growth of the regions of Andhra and Telangana. Even though the IT hub of Andhra was in Hyderabad city which was in the Telangana's region, still it did not show much progress. Therefore, the division of the two regions were called for more representation and better development of Telangana state, while Andhra already has Vishakhapatnam as the port area. There were some regional and national politics involved for power, although the main public especially the middle class wasn't interested in the division of the states as they thought it would not benefit any state.

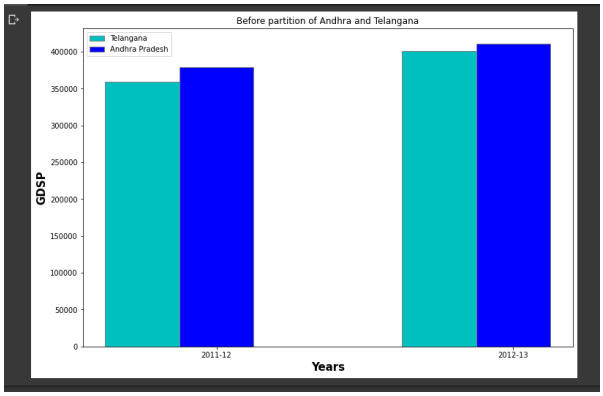

Fig-1.4

Years vs GDSP (After Partition of Andhra and Telangana)

Now in this plot, we see the results of division of the state of Andhra into Andhra and Telangana. The division did not affect Telangana in any major way, even after having Hyderabad for their own after partition. Andhra without their previous capital Hyderabad, still outperformed Telangana in GDSP. This showed that the division was unnecessary and could have been avoided. The agricultural production of Andhra far exceeds that of Telangana, and even after having a metropolitan city, the results showed that Telangana did not exceed Andhra's GDSP.

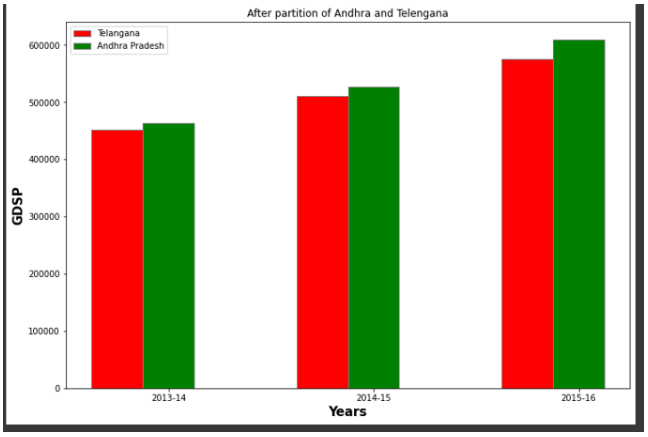

Fig-1.5

Pie chart Avg% growth of GDSP AP, Telangana All India GDP

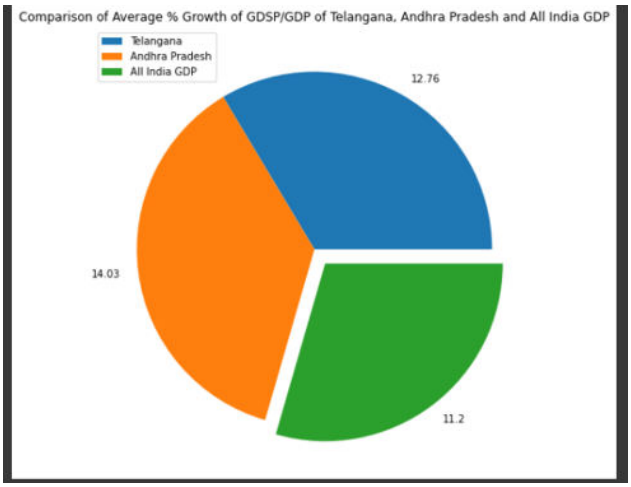

Fig-1.6

GDSP vs years (comparison of the highest GDP contributors with the All India GDP of the selected years)

Here we plotted UP & Karnataka (the two highest contributing states to GDP while comparing them with the national GDP if the years). This insight displays that the 2 states are stagnated throughout the years and have not gone even higher than what they contribute originally. This sheds light on the weak development in the agricultural and technical sector of the two states.

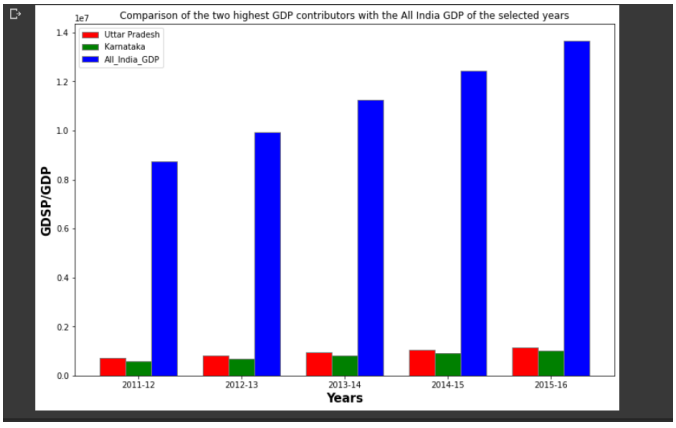

Fig-1.7

All India GDP vs Years (Before formation of BJP & After formation of BJP party at Centre in majority)

This plot displays the All India GDP over the years (2011-12 to 2016-17). In these years, there was a period of time which can be divided into before majority of BJP (Bharatiya Janata Party in the govt and after their majority. We can clearly see in the plot that India's GDP fared higher in the years after BJP took over than before their win in elections in 2014. It was a historic win, ending the dominance of INC (Indian National Congress) party in the general elections.

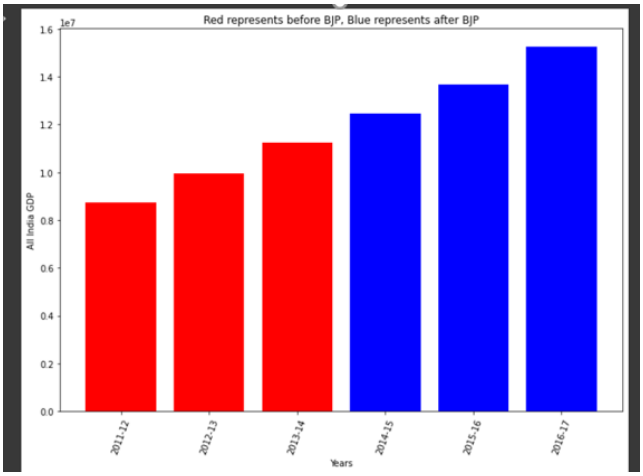

Fig-1.8

Total GDP vs states (Total GDP of top 5 states 2015-2016)

Fig-1.9 displays the top five highest GDP contributing states from each region of India. It is a plot which has a bar graph with x-axis as 'States' and y-axis as 'Total GDP (in crore).

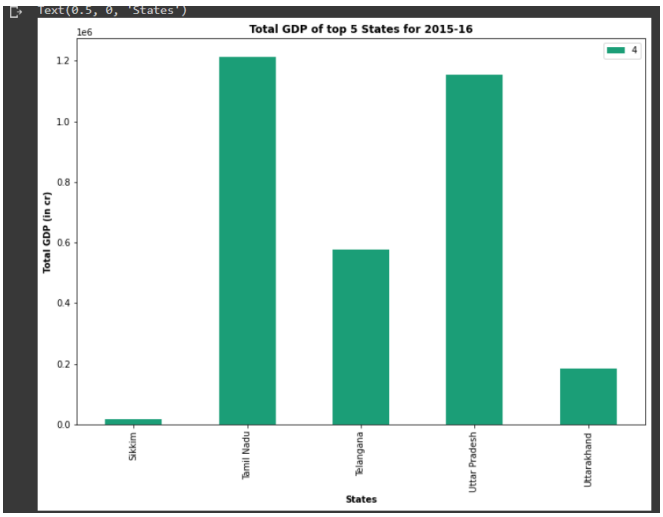

Fig-1.9

5. CONCLUSIONS

Gross Domestic Product, the total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. GDP is important because it gives information about the size of the economy and how an economy is performing. The growth rate of real GDP is often used as an indicator of the general health of the economy. In broad terms, an increase in real GDP is interpreted as a sign that the economy is doing well. Exploration suggests that while GDP, as currently defined, is not a comprehensive measure of welfare or even economic well-being, the GDP concept—along with the pieces of GDP available through the national accounts—is useful in and of itself and should provide a great deal of information that is closely related to welfare. Our finding that changes in real GDP do a reasonable job in capturing changes in economic wellbeing has one important exception. We argue that the exclusion of non-market activities that bear on economic well-being merits more attention, particularly given the potential for changes in the importance of such activities over time to change the degree to which changes in GDP capture changes in well-being.[3][4]

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REFERENCES

1. McCulloch, W.S.; Pitts, W. A logical calculus of the ideas immanent in nervous activity. Bull. Math. Biophys.1943,5, 115–133.2.
2. Rosenblatt, F. The perceptron: A probabilistic model for information storage and organization in the brain. Psychol. Rev. 1958,65, 386Thiago Gomes Heck, Pauline Brendler Goettems Fiorin, Matias Nunes Frizzo and Mirna Stela Ludwig (December 20th 2017). Fine Particulate Matter (PM2.5) Air Pollution and Type 2 Diabetes Mellitus (T2DM): When Experimental Data Explains Epidemiological Facts, Diabetes and Its Complications, Ahmed R.
3. K. Hema Vidya, V Rama Devi Procedia Economics and Finance. A Study on Predictors of GDP: Early Signals. Findings of the study. 381.
4. K. Hema Vidya, V Rama Devi Procedia Economics and Finance. A Study on Predictors of GDP: Early Signals. Conclusions. 381-382.
5. Mahmud Muhammad Al, Yoshihiro Kameyama. EDUCATION AND ECONOMIC GROWTH IN SOUTH ASIA. International Journal of Development and Economic Sustainability. Literature Review. 53.
6. Huang Jessie. GDP and Underground Economy (UE). A Literature Review on the Mistaken Significance of Underground Economies. Conclusion. 6.
7. Louise Sheiner, Karen Dynan. Hutchins Center Working Paper #43. GDP as a Measure of Economic Well-being. Intro. 2-3.
8. Sebastian Raschka, Joshua Patterson and Corey Nolet. Machine learning in python: Technology trends in Artificial Intelligence. Machine Learning in Python. 2-3.