

Implementation of the Data Analytics Tool in the context of the Indian Economy

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Abstract -India is set to become the world's fifth-largest economy by 2024 also the fastest growing economy in the world and our current Prime Minister is trying to make our country self-reliant by introducing the "Vocal for Local" campaign. To achieve this milestone people should know about how our national economy flows over the past years and how it will be in the present situation. Our web application will help the user to know about the trends of few contexts of the economy of the nation like Employability rate, Taxation, GDP, Inflation in the economy, and a few more factors that will hold the economic growth of the country. This application uses an economic data set and analyzes the factors in a visualized manner in a complete dashboard.

Key Words: Economy, Data Analysis, Data Visualization

1. INTRODUCTION

Along with food, clothing, and shelter, the economy plays a key role in daily life. Everyone knows about how the economic growth of the nation goes up and down for our personal growth and development. It is necessary to know about the economic growth over time and also the factors which are dependent on that.

The use of this application can be done by the young entrepreneurs of this generation to learn about economic flow in the current market. Also, this application is used by various colleges and institutions to teach them about the economy because today's generation doesn't know about the economy. They only know how to get the salary from their job and this application will help to change their mentality towards the business which again is the next initiative towards national economic development.

Our web application is easy to use, no authentication is required to use the application. All the information is available in visualization form so it is easily understandable by the normal user also.

The overall purpose of this system is to provide easy access to Indian economic trends to a user using data analytics techniques. It provides graphical visualization information produced by several economic agencies. All of the information is maintained and updated by the statistical units of those agencies.

2. EMPLOYMENT

2.1 Based on Population

In this part we will see the general trend of unemployment in India from 1991 to Current. First we see the correlation of unemployment with respect to the population of working age.

2.1.1 Overall Population

The Pearson coefficient for correlation between population (of working age, 15-64) and unemployment is -0.39033803120875155 from the year 1991 to Current.

We can see that the coefficient is negative which means that the correlation is negative but the magnitude of the correlation is too little to conclude anything with affirmation.

For particular years-

- 2009 to 2014 (UPA Term) – Unemployment decreasing with Pearson coefficient factor being -0.883357686068193
- 2014 to 2019 (NDA Term 1) - Unemployment decreasing with Pearson coefficient factor being -0.7118533674591503
- 2019 to Current (NDA Term 2) – Unemployment increasing with Pearson coefficient factor being 0.9411527157423891

Plot of Overall Unemployment Percentage is as follows.



Fig -1: Overall Unemployment

2.1.2 Male Population

The Pearson coefficient for correlation between population (of working age, 15-64) and male unemployment is -0.5386666627079341 from the year 1991 to Current.

We can see that the coefficient is negative which means that the correlation is negative but the magnitude of the correlation is too little to conclude that unemployment is decreasing with affirmation.

For particular years

- 2009 to 2014 (UPA Term) – Unemployment decreasing with Pearson coefficient factor being -0.8328871401291689
- 2014 to 2019 (UPA Term 1) - Unemployment decreasing with Pearson coefficient factor being -0.4782438498399577
- 2019 to Current (NDA Term 2) – Unemployment has been increasing with Pearson coefficient factor being 0.9766665796899555

Plot of Male Unemployment Percentage is as follows

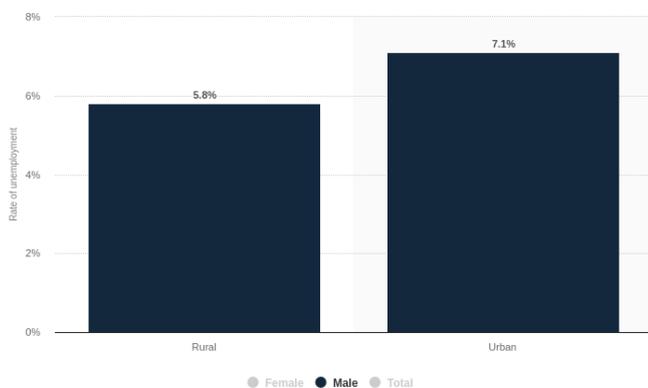


Fig 2: Male Unemployment

2.1.3 Female Population

The Pearson coefficient for correlation between population (of working age, 15-64) and female unemployment is 0.3338909522033719 from the year 1991 to Current.

We can see that the coefficient is positive which means that the correlation is positive but the magnitude of the correlation is too little to conclude that unemployment is increasing with population.

For particular years

- 2009 to 2014 (UPA Term) – Unemployment decreasing with Pearson coefficient factor being -0.6695944187581783 .
- 2014 to 2019 (UPA Term 1) - Unemployment decreasing with Pearson coefficient factor being -0.9885937949927284 .
- 2019 to Current (NDA Term 2) – Unemployment has been increasing with Pearson coefficient factor being 0.5273043026065888 .

Plot of the Female Unemployment Percentage is as follows

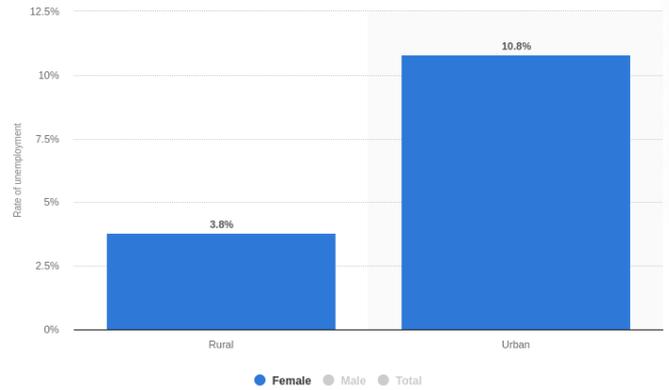


Fig -3: Female Unemployment

2.2 Based on Industry

In this part we will see the general trend of employment in India from 1991 to Current for different types of industries.

2.2.1 Employment in Industries

We see that the overall employment in industries has increased with respect to the working population from 1991 to Current.

The Pearson coefficient is 0.9650492484455186. For particular years

- 2009 to 2014 (UPA Term1) – Employment increasing with Pearson coefficient factor being 0.9730914301293814 .
- 2014 to 2019 (UPA Term 2) - Employment increasing with Pearson coefficient factor being 0.889162692141398
- 2019 to Current (NDA Term 2) – Employment has been decreasing with Pearson coefficient factor being -0.8366886077104094 .

Plot of the Overall Employment percentage in Industries is as follows

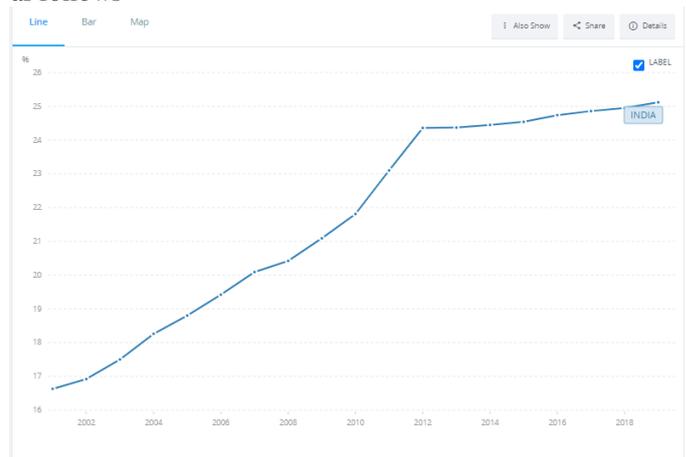


Fig 4: Employment in Industries

2.2.2 Wage and Salaried Workers

We see that the Overall employment for wage and salaried workers has increased with respect to the working population from 1991 to Current.

The Pearson coefficient is 0.7732885889506631. For particular years

- 2009 to 2014 (UPA Term1) – Employment increasing with Pearson coefficient factor being 0.9808729414448635.
- 2014 to 2019 (UPA Term 2) - Employment increasing with Pearson coefficient factor being 0.9309755309877512.
- 2019 to Current (NDA Term 2) – Employment has been increasing with Pearson coefficient factor being 0.9755166180580906.

Plot of the Overall Employment percentage for Wage and Salaried workers is as follows.

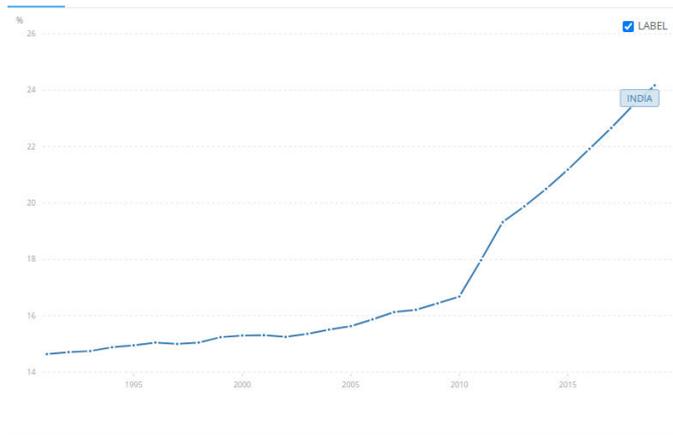


Fig -5: Wage and Salaried Workers

2.2.3 Vulnerable Workers

We see that the Overall Vulnerable Employment has decreased with respect to the population from 1991 to Current.

The Pearson coefficient is - 0.7213439890808735. For particular years

- 2004 to 2009 (UPA Term1) – Employment decreasing with Pearson coefficient factor being -0.9791994147908917 .
- 2009 to 2014 (UPA Term 2) - Employment decreasing with Pearson coefficient factor being -0.9265044777230029 .
- 2014 to 2017 (NDA Term 2) – Employment decreasing with Pearson coefficient factor being -0.9761536812271961 .

Decreasing employment in Vulnerable sector is a good sign for the economy because it shows that more people are moving from vulnerable jobs to stable jobs.

Plot of Overall Vulnerable Employment percentage is as follows.

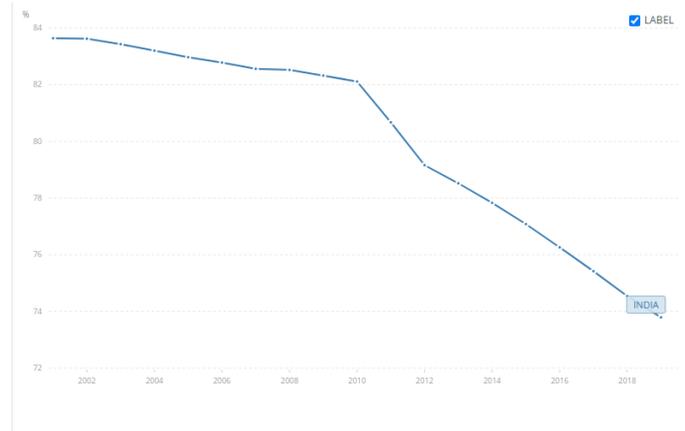


Fig -6: Vulnerable Workers

2.3 Employment to Population Ratio

Employment to population ratio is the proportion of a country’s population that is employed.

Employment is defined as persons of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period (i.e. who worked in a job for at least one hour) or not at work due to temporary absence from a job, or to working-time arrangements. Ages 15 and older are generally considered the working-age population.

We have the total population between the working age. From that we have calculated the employed population and the unemployed population.

$$\text{Employed population} = \text{Employment to population ratio} * \text{total population}$$

$$\text{Unemployed population} = \text{Total population} - \text{Employed population}$$

Plot of population is as follows

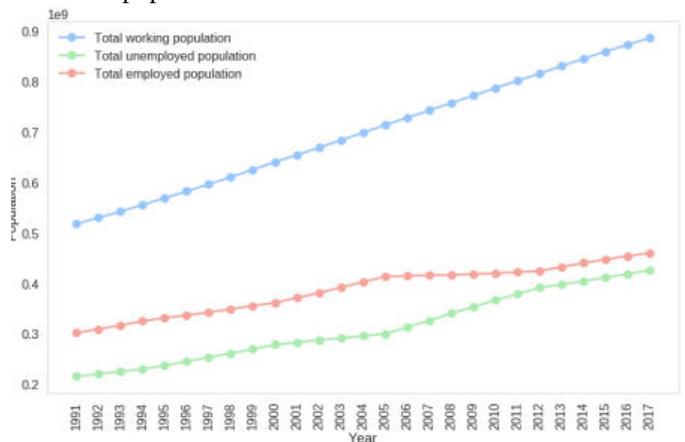


Fig -7: Employed vs Unemployed

3. TAX

3.1 Corporate Tax

This tax is paid by the companies registered under company law in India on the net profit that it makes from businesses. It is taxed at a specific rate as prescribed by the income tax act subject to the changes in the rates every year by the IT department.

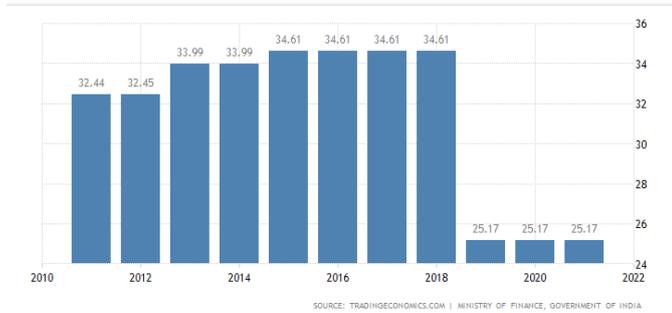


Fig -8: Corporate Tax

3.2. Personal Tax

An income tax is a tax imposed on individuals or entities (taxpayers) that varies with respective income or profits (taxable income). Income tax generally is computed as the product of a tax rate times taxable income. Taxation rates may vary by type or characteristics of the taxpayer.

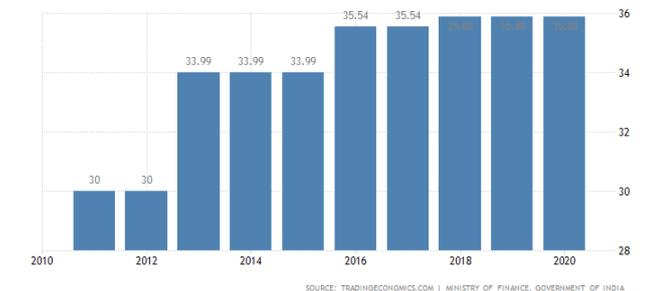


Fig -9: Personal Tax

3.3. Types of Tax

3.3.1 Direct Tax

Direct tax is a type of tax where the incidence and impact of taxation fall on the same entity. Description: In the case of direct tax, the burden can't be shifted by the taxpayer to someone else. These are largely taxes on income or wealth.

3.3.2 Indirect Tax

An indirect tax (such as sales tax, per unit tax, value added tax (VAT), or goods and services tax (GST)) is a tax collected by an intermediary (such as a retail store) from the person who bears the ultimate economic burden of the tax (such as the consumer).

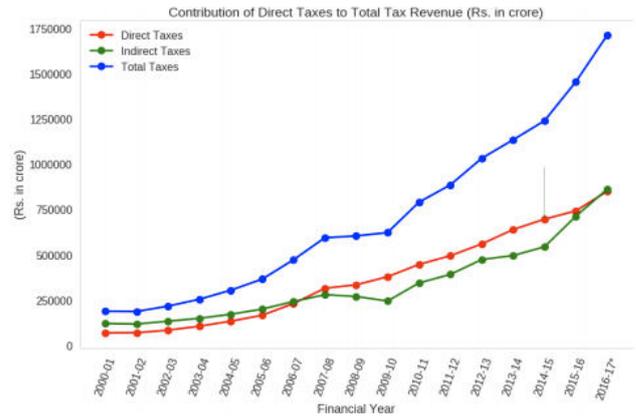


Fig -10: Direct, Indirect and Total Tax

4. Digital Payments

Here, we will analyze the Digital Payment system in India. These modes of payments come under Digital Payments -

1. Prepaid Payment Instruments - Prepaid payment instruments are methods that facilitate purchase of goods and services against the value stored on such instruments. The value stored on such instruments represents the value paid for by the holder, by cash, by debit to a bank account, or by credit card.
2. m-Wallet - The mobile wallet, which is also called mWallet, digital wallet, or eWallet, refers to a mobile technology that is used similarly to a real wallet. The Mobile Wallet provides a convenient solution for any business looking to allow customers to purchase their products online with greater ease, therefore driving sales.
3. PPI Cards - PPI stands for 'Payment Protection Insurance'. It's designed to cover credit card repayments for a year in the event of an accident, sickness or unemployment, or sometimes just accident and sickness. Yet it's been widely mis-sold, and you could even have it without knowing.
4. Paper Voucher - A paper or gift voucher is a card or piece of paper that you buy at a shop and give to someone, which entitles the person to exchange it for goods worth the same amount.
5. Mobile Banking - Mobile banking refers to the use of a smartphone or other cellular device to perform online banking tasks while away from your home computer, such as monitoring account balances, transferring funds between accounts, bill payment and locating an ATM.

The following graph shows the usage of different types of online transaction modes.

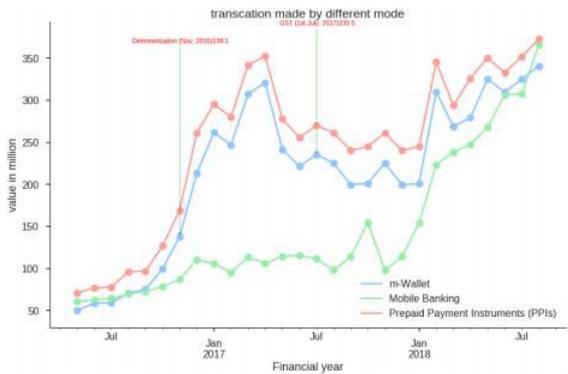


Fig -11: Digital Payment Methods

Below pie chart shows the usage of several UPI transactions mobile application

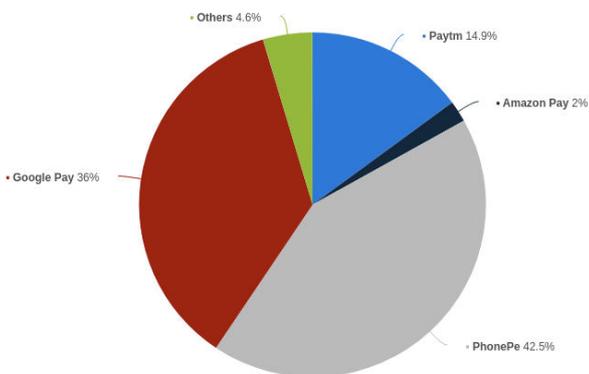


Fig -12: UPI Payment Application

5. GDP

Gross domestic product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period. Though GDP is usually calculated on an annual basis, it can be calculated on a quarterly basis as well (in the United States, for example, the government releases an annualized GDP estimate for each quarter and also for an entire year). GDP includes all private and public consumption, government outlays, investments, private inventories, paid-in construction costs and the foreign balance of trade (exports are added, imports are subtracted). Put simply, GDP is a broad measurement of a nation's overall economic activity.

It may be contrasted with gross national product (GNP), which measures the overall production of an economy's citizens, including those living abroad, while domestic production by foreigners is excluded. In this part we will see the trend of GDP growth through the years.

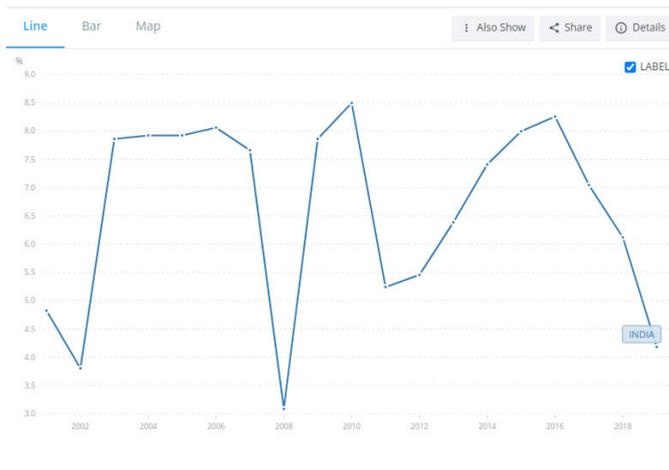


Fig -13: GDP

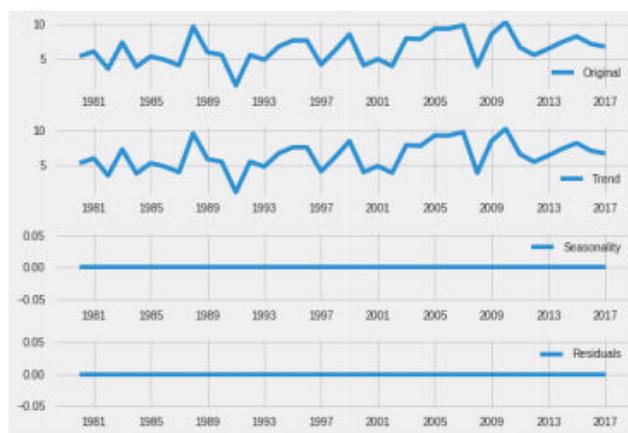


Fig -14: Trends in GDP

6. INFLATION

Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over a period of time. Often expressed as a percentage, inflation indicates a decrease in the purchasing power of a nation's currency. As prices rise, they start to impact the general cost of living for the common public and the appropriate monetary authority of the country, like the central bank, then take the necessary measures to keep inflation within permissible limits and keep the economy running smoothly. Inflation is measured in a variety of ways depending upon the types of goods and services considered, and is the opposite of deflation which indicates a general decline occurring in prices for goods and services when the inflation rate falls below 0 percent.

Plot of inflation as percentage through the years

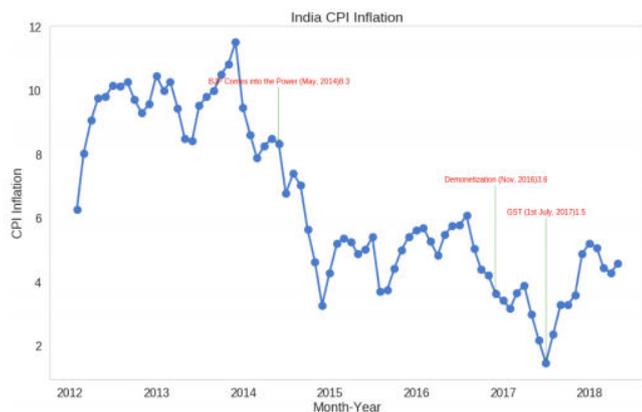


Fig -15: Inflation

[7] <https://www.thebalance.com/what-is-inflation-how-it-s-measured-andmanaged-3306170>

7. CONCLUSION

This application provides the following important information:

1. The employment curve in India.
2. Data about the tax collection in India.
3. The effect of demonetization and GST on the Indian economy.
4. Increase in the usage of digital payment modes.
5. Inflation and GDP in India.

However, from this application we can conclude that using these results we can say for certain that which government has done a better job in elevating the economy of our country. But it can be used to initiate a healthy debate regarding politics

8. REFERENCES

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