IE6600 Computation and Visualization

Final Project

Inflation and its Impact on USA Economy

Sanay Shah

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Introduction:

Inflation aims to measure the overall impact of price changes for a diversified set of products and services and allows for a single value representation of the increase in the price level of goods and services in an economy over a period. As a currency loses value, prices rise, and it buys fewer goods and services. This loss of purchasing power impacts the general cost of living for the common public which ultimately leads to a deceleration in economic growth. sustained inflation occurs when a nation's money supply growth outpaces economic growth, too little inflation can also be a troubling indication that a country's economy is stagnant and not enough people have enough work.

Problem Statement:

Inflation has wreaked havoc on the global economy. The fate of the global economy is intrinsically connected to that of the United States, particularly in the previous two decades. Various events such as financial crises, pandemics, and government policies have caused inflation to fluctuate over the world. We're attempting to figure out which countries have the highest inflation and how the Federal Reserve adjusts interest rates to reduce inflationary pressures or boost spending to keep inflation under control in the US. In addition, how have various industries like private and government entities in various sectors performed over the previous two decades and contributed to the expansion of Gross Domestic Product of the US economy, as well as how has inflation differed in various areas such as energy, food, medical and transportation.

Data Description:

The dataset covers up to 196 countries over the period 1970-2021 (and includes six measures of inflation.
- Headline consumer price index (CPI) inflation
- Food CPI inflation
- Energy CPI inflation
- Core CPI inflation
- Producer price index inflation
- Gross domestic product deflator

The dataset also includes the events that occurred in last two decades and how Inflation and Fed rate varied in United States.

Also, the dataset includes estimates of GDP by industry, or value added—a measure of an industry's contribution to GDP in various sectors.

Methodology:

- Initially, we have done research on the various categories of the Consumer Price Index indifferent categories like Food, Energy, Headline, Federal Rates, Gross Domestic output We have used various parameters to calculate the Inflation like the Consumer Price Index indifferent categories like Food, Energy, Headline, Federal Rates, Gross Domestic output.
- The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by consumers for a market basket of consumer goods and services.
- In the world map visualization as shown below, Inflation Index across all the countries have been calculated over the years. Also created various parameters and indexes to figure out highest Inflation and deflation year wise in each category.
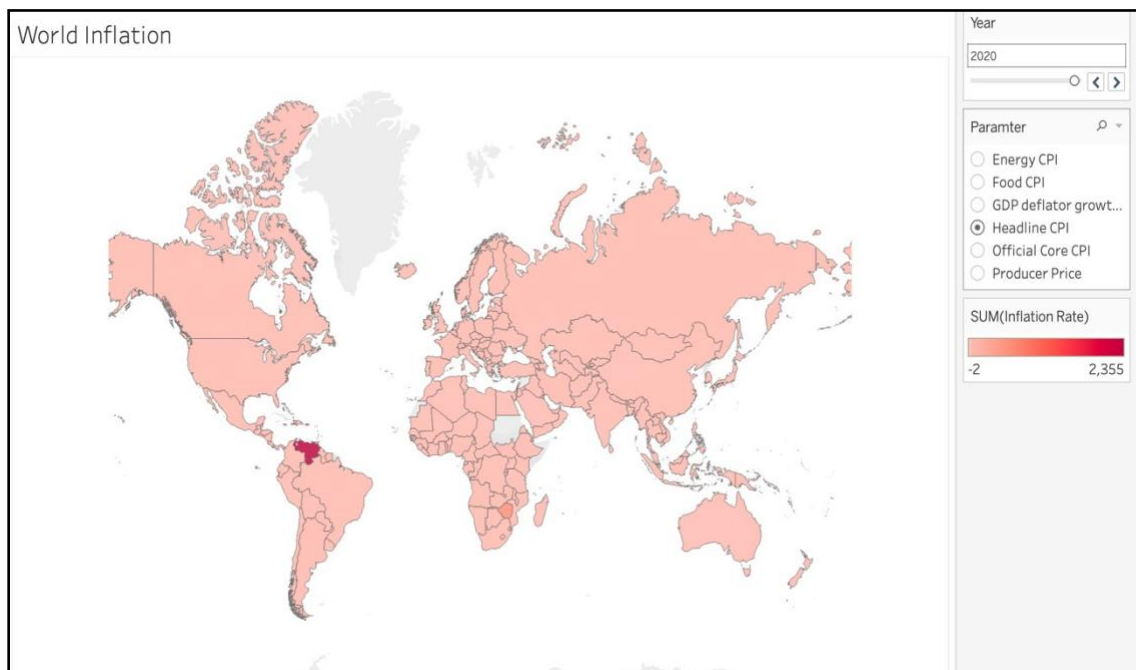
- The line charts create to study the relationship between the Inflation rate, Average Relative difference of industry types and years and for these visualization two data tables have been used where the major events have been mentioned to show the reason.

Time Series of Gross output Industry wise
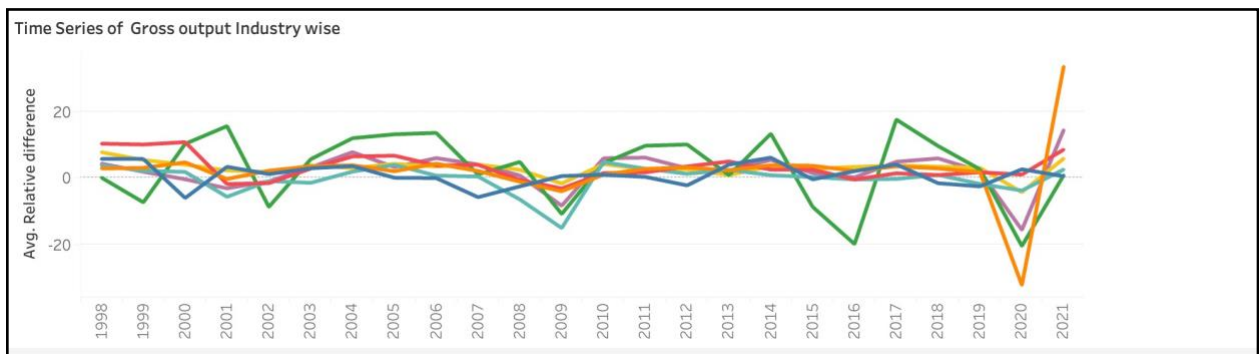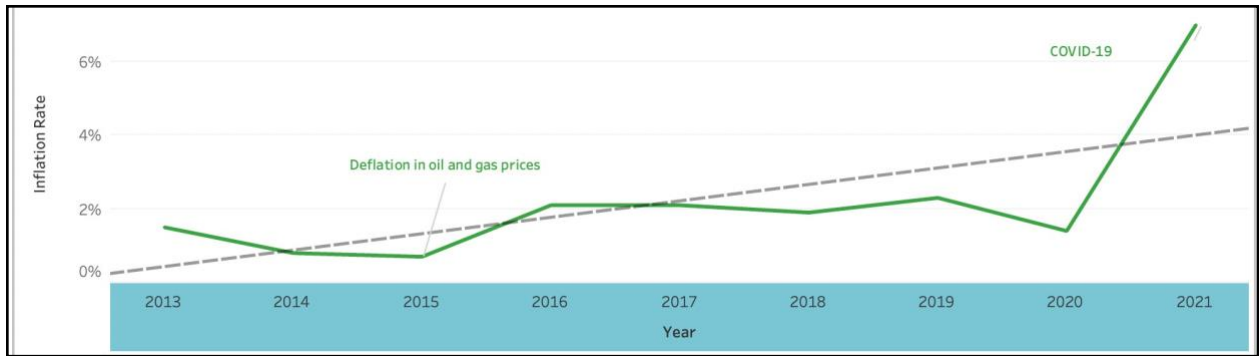
- For the tree map, the average of the relative difference of Gross output have been calculated for different industry sectors and the created a set for top n bottom of the industry type.
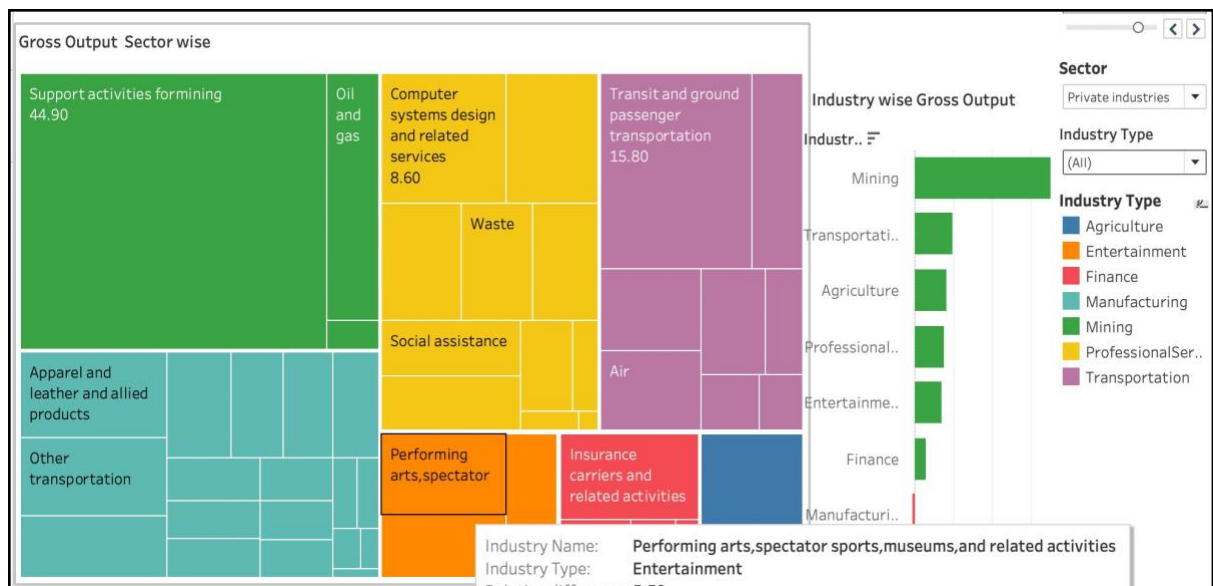
Design Process:

- Initially, we have created the initial sketch of dashboard before final dashboard on multiple parameters with Inflation Rate like Bar Charts, World map and Line chart.
- **Dashboard 1:** Design consists of world map indicating the **Inflation Rate** and with filter options of different parameters and year.

  The Dashboard has been designed to show the Highest and Lowest Inflation for the chosen inflation parameter and year.

  Filter Usage: There is a Slider filter attached for years to select the years from 1970-2021.

  Single value list button assigned to the user to select the type of parameter.

Dashboard Visualizations:
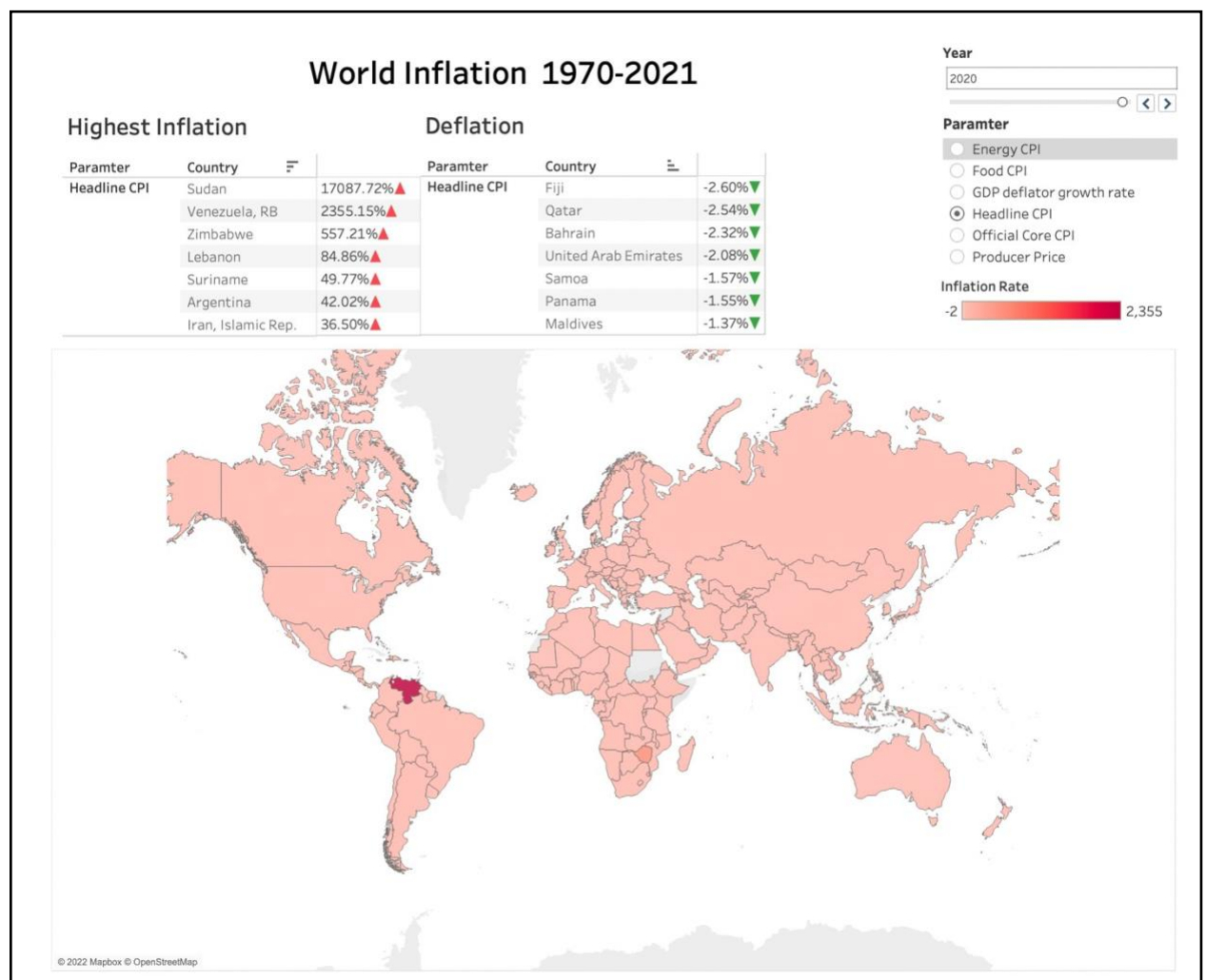
- **Dashboard 2:** Created Heat Map to show the sum of **CPI** for different categories like Apparel, Education, Housing, Medical Care etc., in the USA. In the second visualization change in Fed Funds Rate and GDP Growth have been observed over the years.The Saturation color used to show the **CPI** rate across the years and applied filters on years select the years according to user choice.

Dashboard Visualizations:
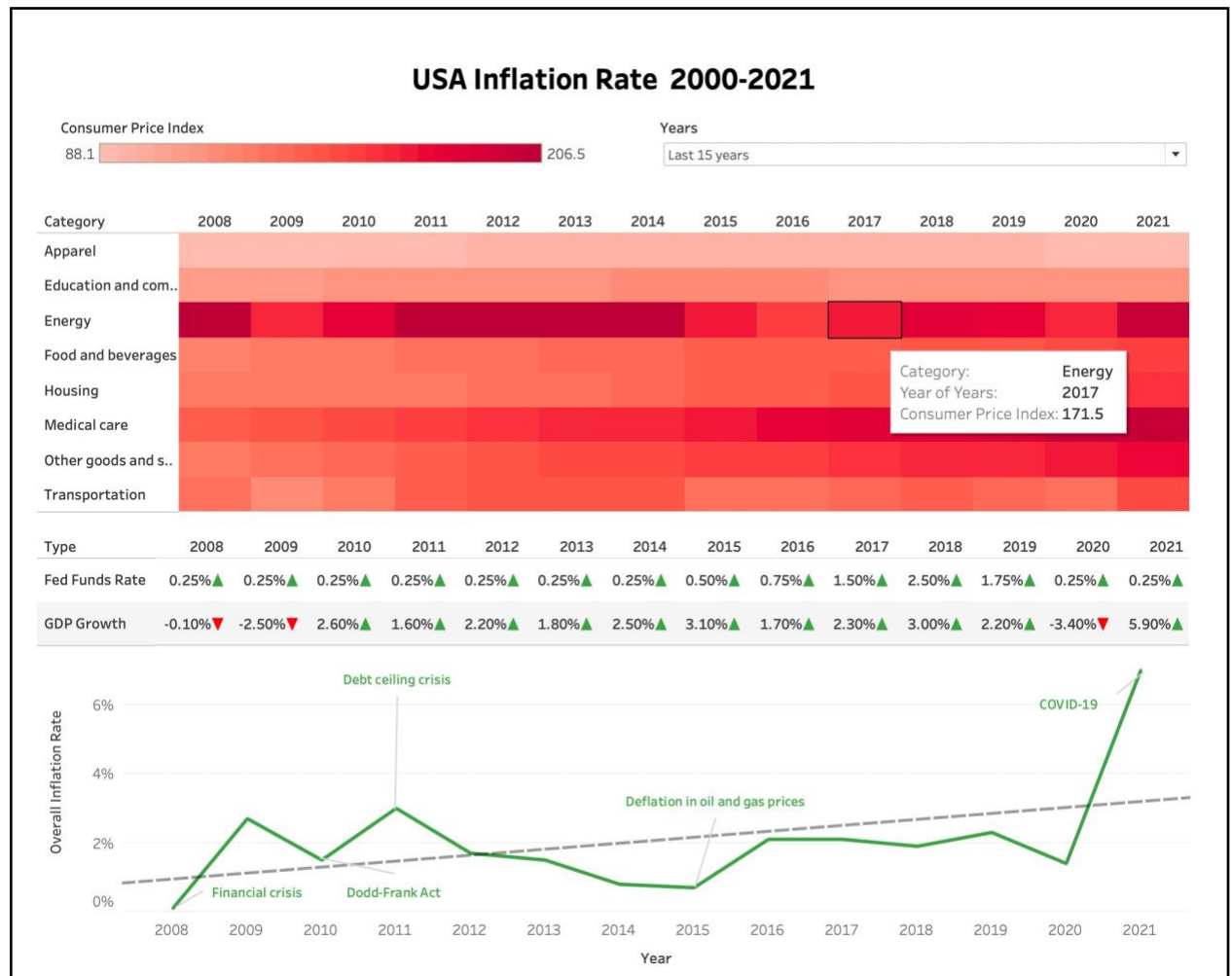
- **Dashboard 3:** Tree map has been created to show the average of the **Gross Output** for the selected year and colors applied on the industry types. We have chosen variables like industry type, sector, and year as filter to make the dashboard clearer and more understandable to get insights. In the Line chart we are comparing the relative difference of various industry types over years.
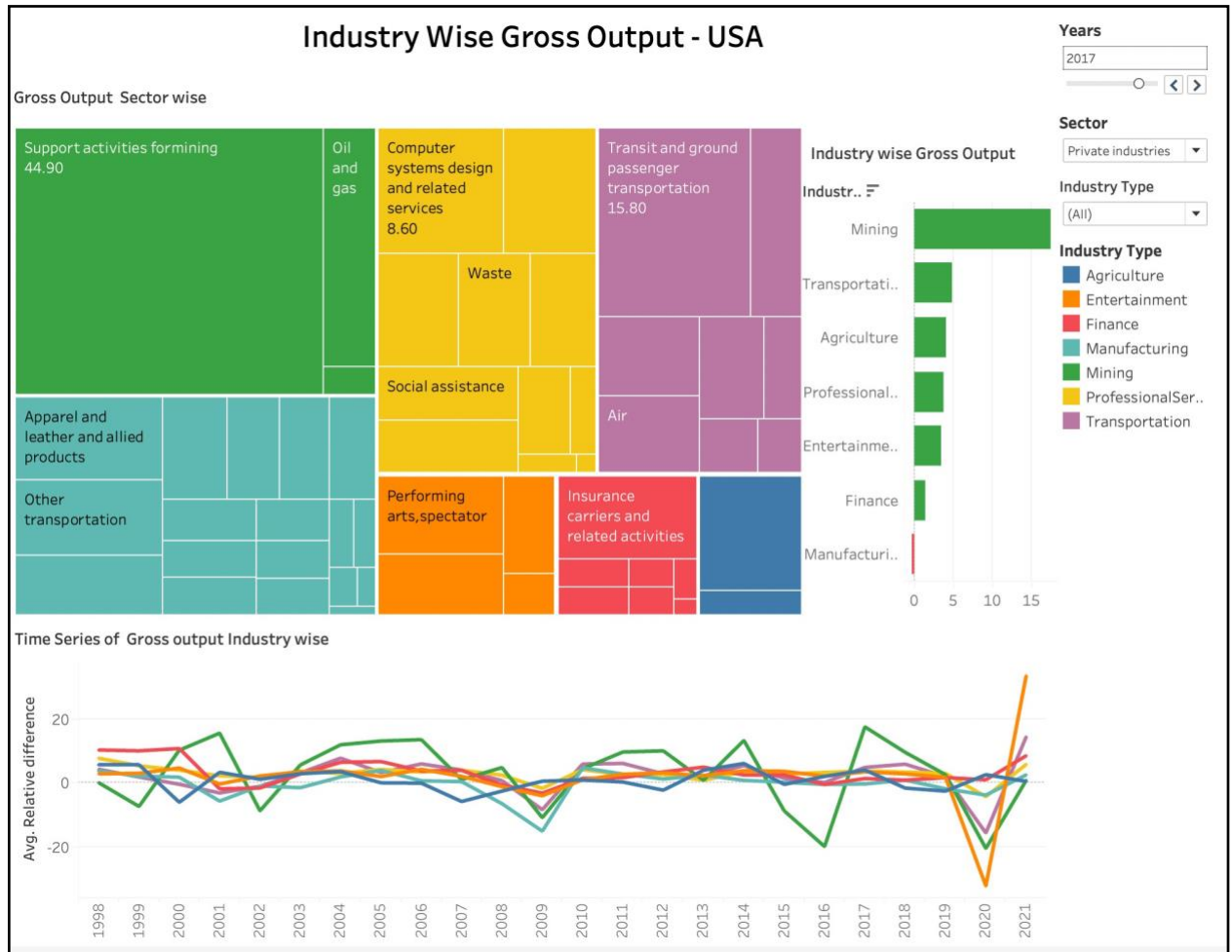
Key Insights:

Inflation is highest for underdeveloped and few developing countries. The top countries with highest Inflation are as follows Venezuela, Sudan, Libya and Zimbabwe in most of the categories. The major factor of Inflation which is influencing the prices of the commodities is Headline Consumer Price Inflation. The decade of 1970-1980 is called decade of Inflation, the easy-money policies of the American central bank designed to generate full employment by the early 1970s resulted in high inflation in United States

The Inflation in United States in last two decades has been on an average 2.5%. Inflation increased post 2008 due to major financial crisis in United States which also increased Inflation across the globe for next couple of years. While the country was recovering again it was hit by the debt ceiling crisis and was hit by Pandemic in 2020 due to which inflation spiked to 7% which was highest in last 50 years. The Energy and Medical Care contributed highest to Inflation

Furthermore, the contribution to Gross Domestic Product was majorly by Private Sector as compared to Government Sector. Pre- pandemic the highest contribution was from manufacturing sector, followed by Professional Services and Finance Industry During the pandemic the Entertainment and transportation sector boomed as people were at home and majorly essential services were on during lockdown and business were hugely impacted.

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- https://www.thebalance.com/us-economy-4073968