Analysis of the relationship between the country's economy and the change in its climate

1. Introduction

Main Question:
Is there a direct correlation between a Country's economy and its economy?

Description:
A Nation's push to boost its economy may have some negative impacts on its climate. This project intends to study the impacts of GDP (Gross Domestic Product) on the surface temperature of the country. This project will consider two factors i.e. GDP & Rise in surface temperature of 5 different countries across 60 years of time and document any direct correlations between the both factors. This project integrates data from Kaggle datasets "World GDP by Country" and "Climate change indicators" and tries to identify any underlying patterns in the data.

2. Data Used:

2.1 Data Sources:

Source-1: World GDP by country (KAGGLE)
URL: World GDP data
Licence: CC-BY 4.0 Public Domain
Description:
This dataset contains the GDP of every country from 1960 to 2022.
The GDP figures are measured in current U.S. dollars and represent the sum of gross value added by all resident producers in each country's economy.

Fields of the World GDP by Country:
Country: Name of the Country, **Country Code**: A code for referring to each country or group of countries, **1960-2022**: The GDP value of the country or group of countries in the particular year.

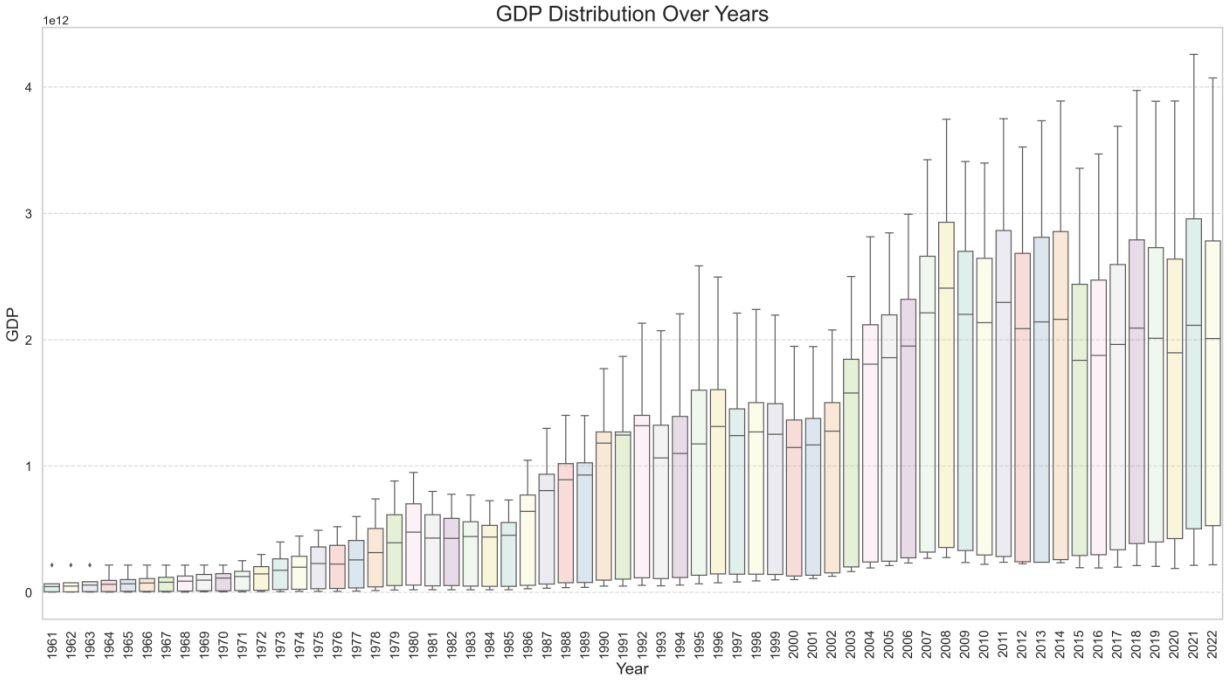
Source-2: Climate-change-indicators (KAGGLE)
URL:Climate Change indicators
License: CC0: Public Domain
Description:
This dataset contains temperature change of each country with respect to baseline climatology from the years 1961 -20222. The source for this dataset is the Food and Agriculture Organisation of the United Nations (FAO).

Fields of the climate change indicators dataset:
ObjectId: Index, **Country**: Name of the country, **ISO2 & ISO3**: standardized country codes, **Indicator**: Temperature change with respect to a baseline climatology, corresponding to the period 1961-1980, **Unit**: Unit of measure of the temperature (Celsius), **Source**: The source of obtaining data (FAO), **CTS_Code**: Clear-to-send, is a control signal for modem-modem connections, **CTS_Name**: Extended county codes system for extension beyond ISO**, CTS_Full_Descriptor**: Environment, Climate Change, Climate Indicators, Surface Temperature Change, **F1961-F2022**: The temperature change in Celsius for each country in that year.

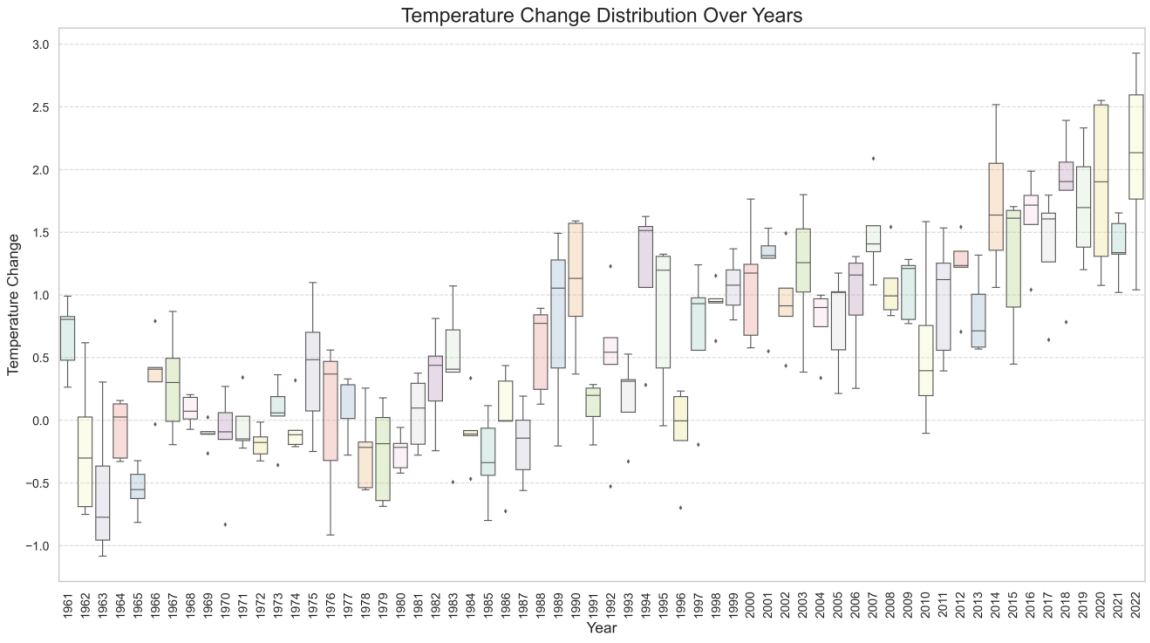
2.2 Data Structure:

Understanding the structure of the datasets plays a key role as the data we intend to use comes from different sources and their ranges could differ a lot and hence could lead to improper analysis. A box plot is one way of visualizing the ranges of the data fields in our datasets.

Box plot the GDP data source (source-1):



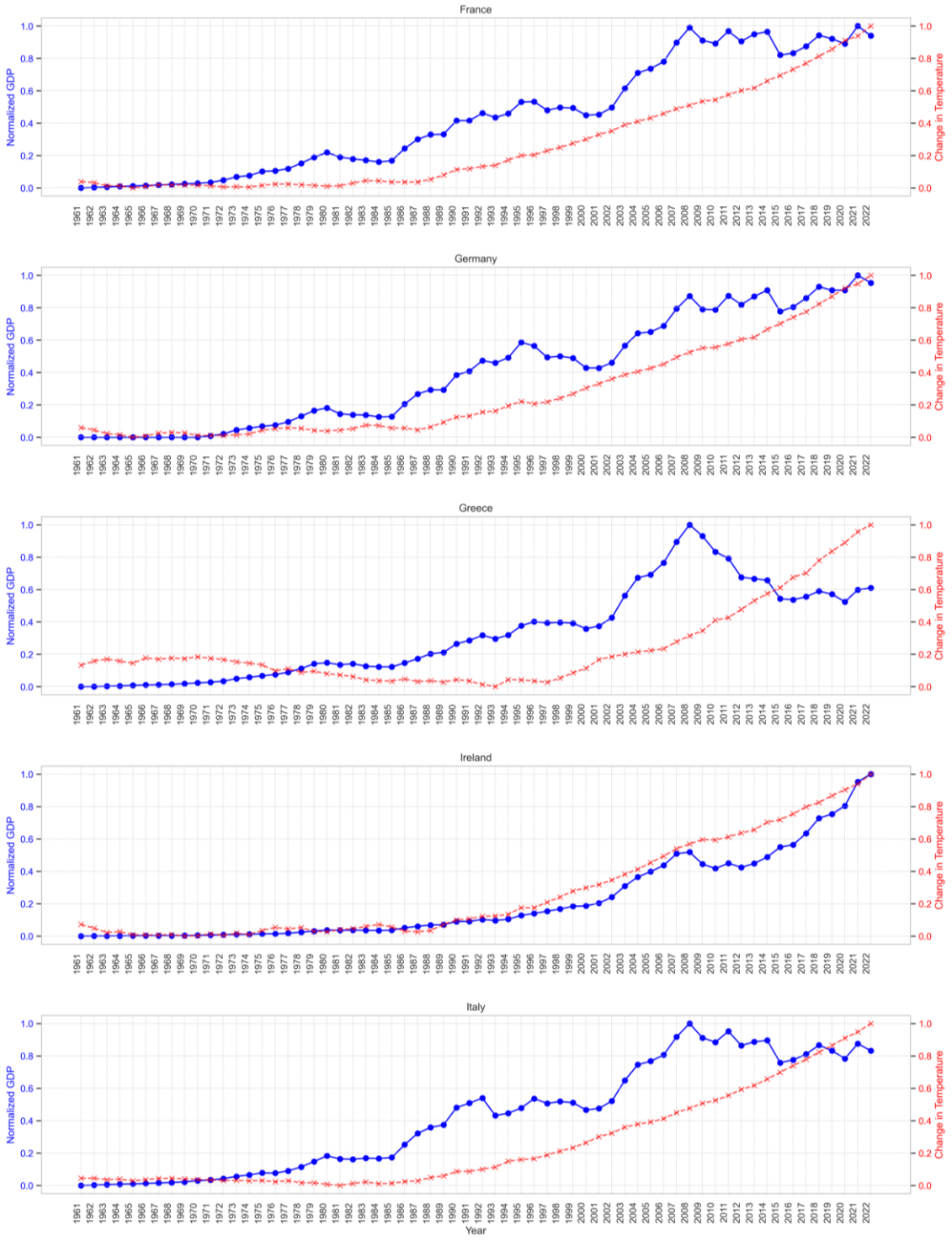
Box plot of Climate change indicators (source-2):



We can observe from the above two plots that the two datasets have very differing ranges in the data fields and hence it is essential to standardize the data.

3. Analysis:

By plotting a line plot of the standardized data from the two datasets i.e. GDP data and the Temperature change data, we can study the trends in the data and observe any possible correlations.



4. Conclusions:

At first glance it seems that the GDP of the country and the change in its surface temperature are in direct correlation, but that is very weak conclusion as the “change in surface temperature” is a gradually ever-rising graph and it may or may not have any connection with the GDP of the nation. Hence it is hard to make a conclusion based on the above results.