Impact of Political instability on a country's International Trade- Empirical evidence from the EXIM data of India from 2010-2018

Introduction

Self-sufficiency or self-reliance is a "MYTH" if it means that a country depends only and only on itself for all its needs and is able to satisfy all the wants of its citizens without any external help. It is possible for a country to aim at self-reliance but as of 2021 there is no country that is self-reliant in the true sense of the word. This clearly hints at interdependence of continents, countries, state-governments, people, etc. We live in the 21st century which is highlighted by advancements in technology, globalization, improved healthcare and very importantly an extensive focus on research and development in any field imaginable.

Globalization a key word practically of high essence basically refers to a spirit of interconnectedness of people across the world-economically, culturally and politically with due credits to technology, information sharing, etc. The real implementation of Globalization was witnessed after the landmark 1991 Economic reforms. With globalization we also focus on international trade-Import and Export. But often trade which in simple layman's terms is only meant to have benefits for all parties concerned, especially international trade is something which results in international tensions- be it US-China trade war, etc. To understand the causes and reasons behind this it is important to understand the concept of Import and Export and how it has an effect on a country.

- **Import-** The concept of bringing in a good or a commodity of demand into a country from a foreign nation by an individual or a company for the purpose of selling it in the local market to the citizens with the sole purpose of earning profit.
- **Export-** The concept of sending a good or a commodity of demand into a foreign country which is the country other than good producing country by an individual or a company for the purpose of selling it in the local market of the foreign country to the citizens with the sole purpose of earning profit.

With the understanding of Import and Export it becomes critical to understand how and why data of a country's Import and Export matters. EXIM or Export and Import data basically relates to the movement of a resources-be it natural resources, man-made resources, etc across the international boundaries of nations.

Impact of Import-Export on a country's Macro-economic factors

Some of the key impacts of Export and Import of a nation are as follows:

- **Impact on Gross Domestic Product-** GDP or Gross Domestic Product can be understood in simple terms as the final value or monetary value of all the finished goods and services present within a country in a specific time span. Thus, GDP will include all goods including those for imports and exports. GDP is important to understand if a nation is actually growing and is becoming richer and better than where it stood a year or in comparison to any time span in the past. GDP is a monetary value and in order to calculate GDP it has the following components: - Consumer spending on goods and services, Investments in business capital goods, Government spendings, Export monetary value, Import monetary value. For GDP calculation Net Export minus Net Imports is used. In case the Net Exports are greater than Net Imports this is a positive and a good indicator for a nation which means a county has Trade Surplus and in case the Net Imports value is greater than the Net Exports this is a negative indicator for a nation and it is said that a country has Trade Deficit.

- **Impact on Exchange Rate-**There are a number of factors that are considered in calculating the exchange rate of a country's currency but one of the factors that place a key role is the data of a country's international imports and exports. Everything in economics has factors of Demand and Supply. Suppose country A produces grain and 10 country's import grain from country A. This means that the international currency of country A is in demand because of its exports. All the other countries want to have currency of country A but it is a known fact that the total quantity of currency is limited and this increases the exchange rate of country A currency. This entire concept is continuous in real world scenario with continuous trade among nations. This example has several underlying assumptions which are to be kept in mind while trying to understand the concept.

- **Impact of Inflation-**Inflation refers to the drop or decrease in the purchasing power of a country's currency, a simple way to understand inflation would be- in 2014, 1 kg of tomato cost was $1.5, but in 2016 the same 1 kg of tomato cost was $3.25. This means the $1.5 in 2016 had the power to exchange goods less than 1 kg tomato. Inflation has several types-demand-pull inflation, cost-push inflation, hyperinflation, etc. but we will not get into such details. Our purpose here is to understand impact of import and export

on inflation. Inflation as an economic factor depends on exchange rate-if exchange rate of a nation decreases, for the same amount more goods will be sent out of the country and this is a negative indicator for the country. Alongside this with more purchasing power or more money in the hands of the citizens of the nation to spend, they will demand more goods and potentially goods which need to be imported from the other nation as a result this will also only lead to outflow of wealth from the nation, yet another way in which inflation will damage a nation by means of import and export.

Indian Political scenario from 2010-2018

India became a republic in the year 1947 after it gained freedom from the 200+ year rule of the British East India company and the British government. At that point in time there was only one major country-wide political party which took over as the ruling party-Indian National Congress. The year 1998 was significant as it was the first time NDA took over the lead to form government with BJP candidate Atal Bihari Vajpayee ji chosen as the Prime Minister candidate.

In 2004 Lok Sabha elections the NDA government tenure in office came to an end and again the UPA with INC a part of it came to power with Dr. Manmohan Singh taking the role of Prime Minister. The UPA government successfully managed to continue their term for the second time in the 2009 elections and finally in the 2014 elections the alliance faced a massive defeat. The two 5 year tenure was won on the promises of- rural jobs, better education, infrastructure development, reduced corruption, improved GDP, improved national security, better standard of living, etc.

 The 2014 election was a landslide win for the BJP and NDA together. In order for a political party to announce itself as being capable of forming a union government, they need to win at least 272 seats in the Lok Sabha either by themselves or through alliance. But for the first time, BJP by itself had won 282 seats in Lok Sabha and the NDA together had won 336 seats. This massive win shows that the country over the years 2010-2014 had gradually lost all faith in the UPA led government and was demanding a reform in the next elections. This demand for change in power can be described as political instability and can impact international treaties, international trade, etc.

Research Methodology

India is the world's 6th largest economy as of 2022 and this means that for more than the past decade India is one of the important and key market for businesses across the world. India with a population of 1.4 billion people has a significant say in product designing regarding- taste and preferences, etc. Thus, it will not be wrong on my part to say India has a say in global trade.

Objective of study

Indian politics has always been fascinating especially because India is one of the greatest International trade partners and also because India is strategically positioned between rival nations-China and Pakistan with history of wars in the 1900's and early 2000. Any change in political stability in India can be an opportunity for the other nations and thus globally India is always on keen watch of government agencies. India plays a major role in trade especially pharmaceuticals- API raw material, vaccines, etc. which has been proven with the 2019-ongoing Covid-19 pandemic, technology, textile, metal, etc.

The objective of this study is to analyze the change in the import and export data of India during the period of 2010-2018 wherein there are glimpses of political instability and change in power of the central government which indicates change in outlook towards international problems, new relationship development, etc. Such changes are critical because new government may or may not chose to continue the deals and international treaties which the previous government was keen on implementing.

For the purpose of study, we have a data of commodity trade both export and import of India with several International Country, Island Country and even State- Governmental deals for a period of 2010 to 2018. For the purpose of study, we will use special analysis tools like- python programming language and its special data analysis libraries- Numpy, Pandas, Matplotlib, Seaborn.

Python is a general-purpose interpreted, object- oriented, high-level programming language with dynamic semantics. Python is a 4th generation programming language and was created and released in the year 1991 by Guido van Rossum. The advantages of using python include it being simple and easy for interpretation by the programmer, having limited syntax to be learnt, extensible, portable, having built-in data structure, having automatic memory

management, allowing reusability of code which improves productivity and efficiency of developer and finally it having a large structural library for all almost all Internet applications like Internet, email, etc.

- **Numpy-** Numpy is the fundamental package for scientific computation in Python. Numpy stands for Numerical Python and was created in the year 2005 by Travis Oliphnat. In Numpy we deal with multidimensional array objects called "ndarray" which are a group of elements like list in python but the lists relatively are slower in their processing speed in comparison the array objects are found to have 50x faster processing speed and also are efficient in dealing with very large data. Numpy has special functions which broaden its potential of usage in vast fields like-linear algebra, Machine learning, Data visualization, Big data, etc.

- **Pandas-** Pandas stands for Panel-Data. Pandas is an open-source Python library providing high-performance data manipulation and analysis tools using its powerful data structures. In 2008, developer Wes McKinney started developing pandas when in need of high performance, flexible tool for analysis of data. Prior to Pandas, Python was majorly used for data munging and preparation. It had very little contribution towards data analysis. Pandas solved this problem. Using Pandas, we can accomplish five typical steps in the processing and analysis of data, regardless of the origin of data — load, prepare, manipulate, model, and analyze. Python with Pandas is used in a wide range of fields including academic and commercial domains including finance, economics, Statistics, analytics, etc.

- Matplot and Seaborn are special libraries that help with data visualization so that it becomes easy and simple to represent data and for its interpretation.

Data Analysis and Interpretation

Overview

The underlying question attempted to find a solution to by the course of this research is-does political instability be in change in government at union level impact a country's international trade- import and export policies. The main reason behind choosing India for the purpose of study is personal experience to the want for change in political power in the Central government, living, listening, understanding the reasons for the same as well as the landmark win for the NDA in the 2014 elections which makes it even more worthy for consideration as a case study. Due to change in government made official in March,2014 and the time span for actual process of transfer of power and setting up of cabinet, etc. we have considered the year 2014 as a centre point which is not studied and only serves as the time span that separates 4-year rule of UPA and NDA term. We will study UPA term from 2010-2013 and NDA term from 2015-2018, which makes it 4-year comparison.

Data and Hypothesis

For the purpose of the study, we have 2 separate dataset each for Import data between year 2010-2018 and the other for Export data for years 2010-2018. The data for export consists of HS Code of commodities being exported, Commodity name, the value of commodity being exported in million US ($), the year of transaction and finally the Country or trade partner who is importing the goods being exported by India. There are a total of 1,37,023 entries or records of export data between years 2010 and 2018. On the other hand, the data for import consists of HS Code of commodities being imported, Commodity name, the value of commodity being imported in million US ($), the year of transaction and finally the Country or trade partner who is exporting the goods being imported by India. There are a total of 76,124 entries or records of export data between years 2010 and 2018. In order to conduct the test, it is important to create a proposition which will be tested in the process or the so- called hypothesis.

Null Hypothesis or H0:	Political instability and change in government do not have an impact on a country's international trade-import and export
Alternative Hypothesis or H1:	Political instability and change in government do have an impact on a country's international trade-import and export

Hypothesis testing and Interpretation

For the purpose of testing the hypothesis we will use a Jupyter Notebook and import Numpy, Pandas, Matplotlib and Seaborn.

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings("ignore")
```

Analysis of India's Export dataset for 2010-2018

- Using .info() to get additional information regarding dataset-No. of rows and columns, datatype, etc. There is total 5 columns and 137023 rows with different types.

```
exp.info()
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 137023 entries, 0 to 137022
Data columns (total 5 columns):
 #   Column     Non-Null Count   Dtype
---  ------     --------------   -----
 0   HSCode     137023 non-null  int64
 1   Commodity  137023 non-null  object
 2   Value      122985 non-null  float64
 3   Country    137023 non-null  object
 4   Year       137023 non-null  int64
dtypes: float64(1), int64(2), object(2)
memory usage: 5.2+ MB
```

- The data set is not arranged in ascending order from 2010-2018 so we will use Pandas function- .sort_values () on dataset to arrange it according to the year.

```python
exp.sort_values(["Year"],inplace=True)#the inplace=True saves this sorting
```

```python
exp.head()
```

	HSCode	Commodity	Value	Country	Year
137022	99	MISCELLANEOUS GOODS.	0.07	ZIMBABWE	2010
127311	5	PRODUCTS OF ANIMAL ORIGIN, NOT ELSEWHERE SPECI...	0.01	GREECE	2010
127310	4	DAIRY PRODUCE; BIRDS' EGGS; NATURAL HONEY; EDI...	0.00	GREECE	2010
127309	3	FISH AND CRUSTACEANS, MOLLUSCS AND OTHER AQUAT...	17.95	GREECE	2010
127308	99	MISCELLANEOUS GOODS.	0.00	GIBRALTAR	2010

- Using Description function to get details about dataset-mean, standard deviation, max value, min value, quartiles, etc.

```
exp.describe()
```

	HSCode	Value	Year
count	137023.000000	137023.000000	137023.000000
mean	51.330302	19.395088	2014.056304
std	28.018026	217.711880	2.580160
min	1.000000	0.000000	2010.000000
25%	28.000000	0.040000	2012.000000
50%	52.000000	0.360000	2014.000000
75%	74.000000	2.850000	2016.000000
max	99.000000	19805.170000	2018.000000

- Here the most important column is the Value column which represents the amount of trade in US ($) and the mean trade is $19.39 million and the median when calculated comes to $0.36 million. This shows that there exists a Positive skewness in the Value data as Mean > Median and there are outliers. The highest value od trade is $19805.17 million and the lowest value of trade is even less than half a million USD.

- There are 98 unique commodities that are being exported by India this is calculated using .nunique() function of Pandas.

- There 248 unique trade partners of India who imported goods from India between 2010-2018, they include a combination of countries, state- governments, international organizations, etc.

- The top 5 segmented exported goods with their tally of transactions over the period of 2010-2018 are as follows:

|	
ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVISION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS.	1963
NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF.	1945
OPTICAL, PHOTOGRAPHIC CINEMATOGRAPHIC MEASURING, CHECKING PRECISION, MEDICAL OR SURGICAL INST. AND APPARATUS PARTS AND ACCESSORIES THEREOF	1917
PHARMACEUTICAL PRODUCTS	1916
ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, NOT KNITTED OR CROCHETED.	1907

- The total export amount per year is as follows:

| Year	Amount
2010	250380.78
2011	306484.68
2012	300960.68
2013	314930.77
2014	310917.90
2015	262844.90
2016	276405.51
2017	304038.85
2018	330609.08
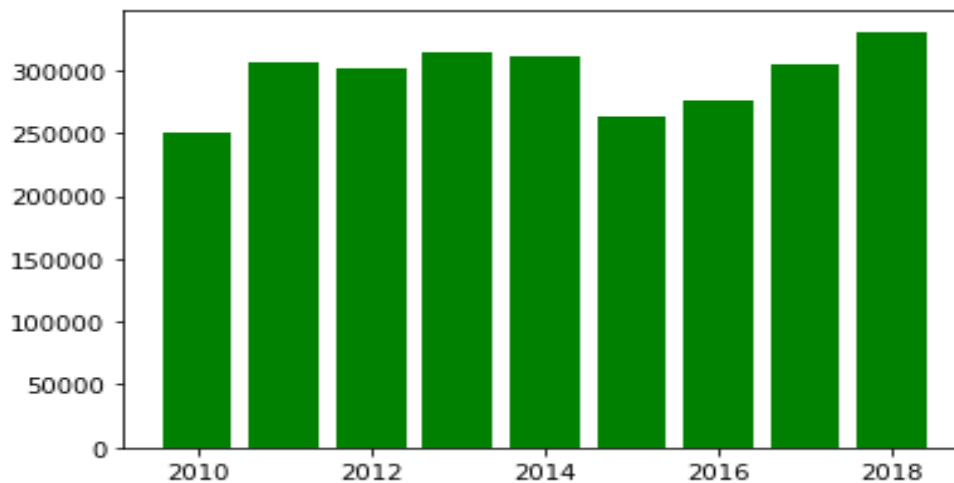
- It can be observed that from 2010-2013 the total exports increased and remained almost constant and the sum total of exports account for $1172756.91 million on the other hand for the period of 2015-2018 there has been a constant growth in exports which means there was an inflow of international currency into currency and the sum of total exports for period of 2015-2018 is $1173898.34 million. It is clear to say that with change in government in 2014 there was a sudden decline in exports in the year 2015 but with time and changing international policies of the new government there was a good boost for international trade and exports increased bringing international currency into the country as observable through the bar graph above.

- For the entire period between 20110 and 2018 the highest importer in terms of value of trade has been USA and the top 5 Indian goods importing countries are as follows:
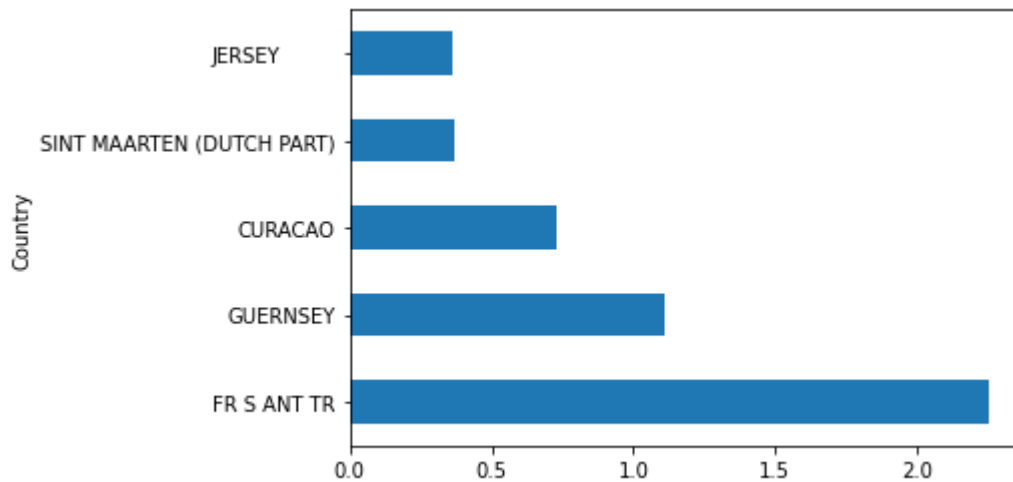
Country	Value in million USD
USA	360611.73
UAE	289374.88
China P RP	121814.64
Hong Kong	115704.51
Singapore	101683.33
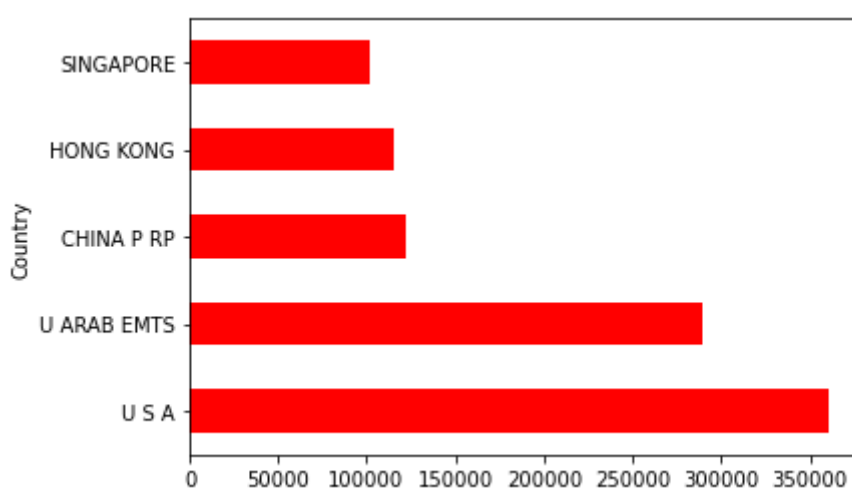
Countries that account for top 5 Indian Exports
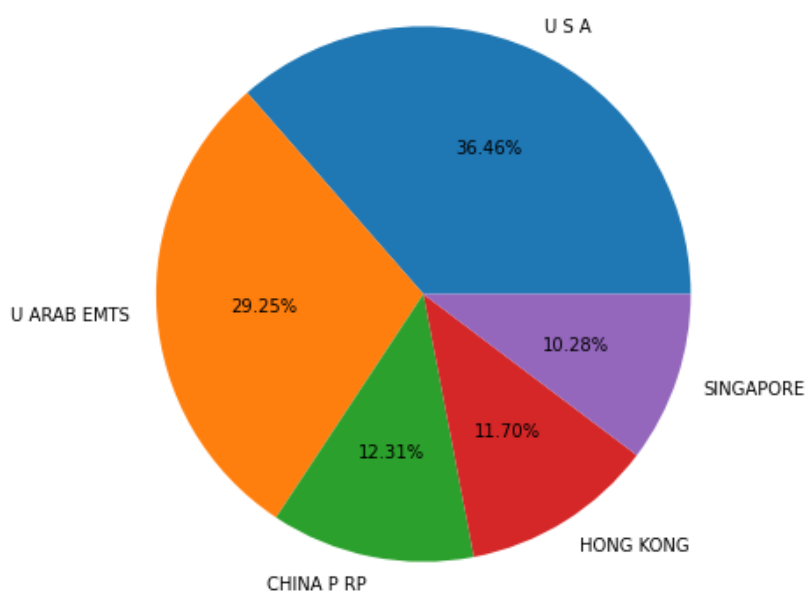
- On the other extreme the 5 countries or trade partners with whom India interacted the least in exports include- Jersey, Sint Maarten, Curacao, Guernsey and Fr S Ant Tr, with transactions less $2.5 million.

Analysis of India's Imports for 2010-2018

- Using Pandas- .sort_values() function to adjust data in ascending order based on Year, so that data available for study is in order from 2010-2018.

```
imp.sort_values(["Year"],inplace=True)
```

Using .head() to view the first 5 rows of the dataset

```
imp.head()
```

	HSCode	Commodity	Value	Country	Year
76123	99	MISCELLANEOUS GOODS.	NaN	ZIMBABWE	2010
70645	47	PULP OF WOOD OR OF OTHER FIBROUS CELLULOSIC MA...	0.44	HONG KONG	2010
70646	48	PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, ...	36.41	HONG KONG	2010
70647	49	PRINTED BOOKDS, NEWSPAPERS, PICTURES AND OTHER...	93.80	HONG KONG	2010
70648	50	SILK	2.14	HONG KONG	2010

- The .info() function will provide us information regarding the number of rows and columns, name of each column, datatype of each column, etc. In Import dataset there are a total of 5 columns and 76124 rows.

```
imp.info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 76124 entries, 76123 to 0
Data columns (total 5 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   HSCode     76124 non-null  int64
 1   Commodity  76124 non-null  object
 2   Value      64536 non-null  float64
 3   Country    76124 non-null  object
 4   Year       76124 non-null  int64
dtypes: float64(1), int64(2), object(2)
memory usage: 3.5+ MB
```

- Using Description function to get details about dataset-mean, standard deviation, max value, min value, quartiles, etc. The describe function is providing us with critical details regarding the distribution of data- the mean of Value which is the monetary value of Imports made between 2010-2018 is $52.92 million whereas the median which is calculated separately using .median() function is $0.37 million. This means the Mean > Median therefore, there is a Positive Skewness in the data. The maximum or the highest import transaction was $32781.57 million and the lowest amount of import was less than a million USD.

```
imp.describe()
```

	HSCode	Value	Year
count	76124.000000	76124.000000	76124.000000
mean	53.905023	52.924761	2014.018299
std	27.546852	613.921948	2.579385
min	1.000000	0.000000	2010.000000
25%	30.000000	0.040000	2012.000000
50%	54.000000	0.370000	2014.000000
75%	78.000000	2.880000	2016.000000
max	99.000000	32781.570000	2018.000000

●

```
y=imp["Value"].median()
y

0.37
```

- There are a total of 98 commodity segments within which all imports made in India for the time span of 2010-2018 is categorized.

- The top 5 category of items imported into India for the span of 2010-2018 are:

| Items Imported	Frequency
ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS T HEREOF; SOUND RECORDERS AND REPRODUCERS, TELEVI SION IMAGE AND SOUND RECORDERS AND REPRODUCERS, AND PARTS.	1778
NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHA NICAL APPLIANCES; PARTS THEREOF.	1711
MISCELLANEOUS GOODS.	1533
PLASTIC AND ARTICLES THEREOF.	1525
IRON AND STEEL	1503

- There are a total of 242 trade partners from where India imported items in the period of 2010-2018.
- Over the period of 2010-2018 the maximum number of trade transactions of Import were carried out by India with Belgium with a total of 953 transactions.
- The total import amount per year is as follows:

| Year	Amount
2010	370147.79
2011	489803.17
2012	491299.13
2013	450688.05
2014	448485.06
2015	413062.19
2016	384811.31
2017	466009.88
2018	514537.90
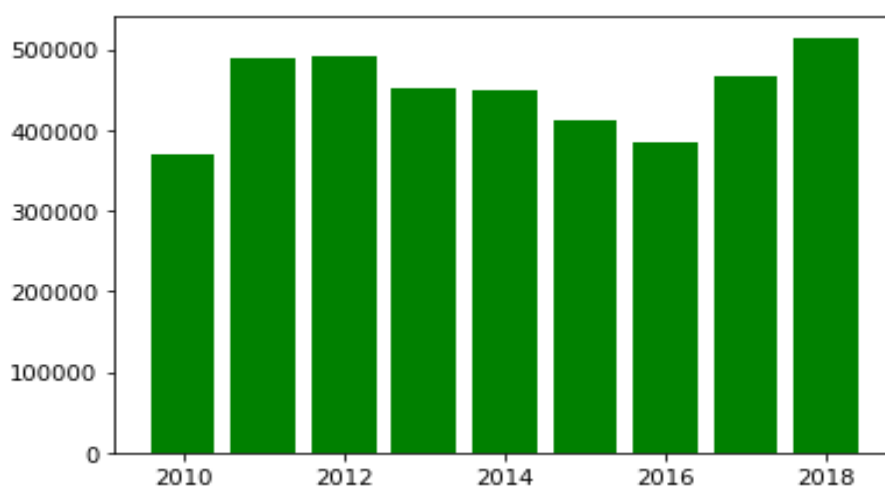
- For the years of 2010-2013 there was a total imports accounting to monetary value of $1801938.14 million on the other hand, the imports for the period of 2015-2018 accounted for a sum of $1778421.28 million. The potential reasons for the decrease in the import values include change in government at the Center in India post the 2014 elections. The potential reasons for the decrease in the imports include government policies like- Make in India- which essentially is meant to promote production of goods within the nation, Demonetization in 2016 which was meant to reduce money laundering, corruption, etc. which are some ways which will reduce the purchasing power of individuals in the nation as the black money is reduced, introduction of GST or the Goods and Services Tax which basically is a separate tax slab for different variety of goods, where necessity goods have a low tax rate while the goods of luxury are categorized under high tax rate. This too impacts the demand for goods in the nation, thus having an impact on demand for imported goods.
- The country from which India imported its goods to the maximum is- People's Republic of China with a total import of $532179.36 million.
- The top five country's from which India imported goods in respect to value include-

Country	Value in million USD
People's Republic of China	532179.36
UAE	256296.07
Saudi Arabia	241583.48
USA	219278.51
Switzerland	206744.20
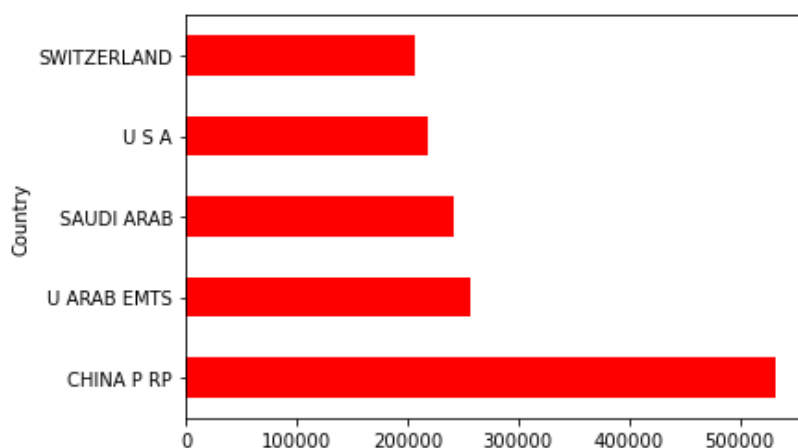
Countries that account for top 5 Indian Imports
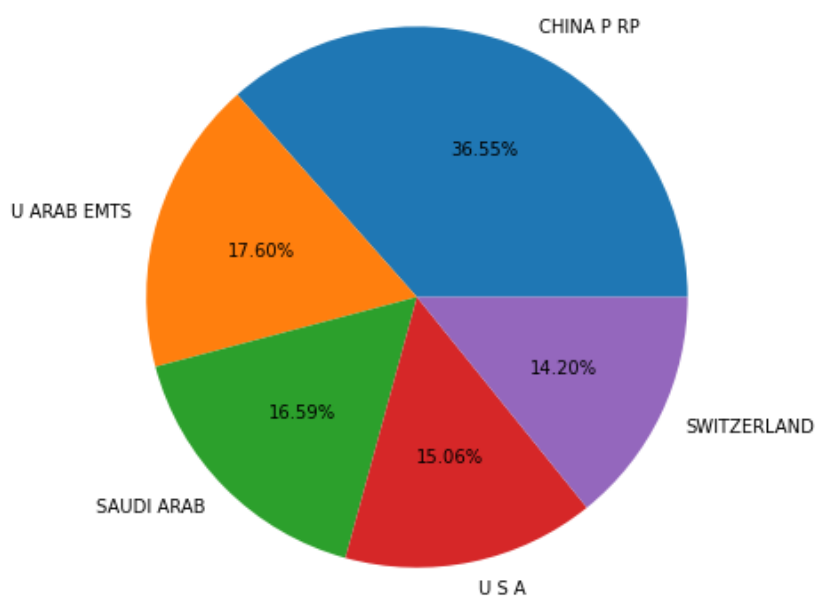
- The country's from which India imports the lowest during the period of 2010-2018 include- FR S Ant Tr, Guernsey, Curacao, Sint Maarten and Jersey. The share of India's imports from them are less than $2.5 million.
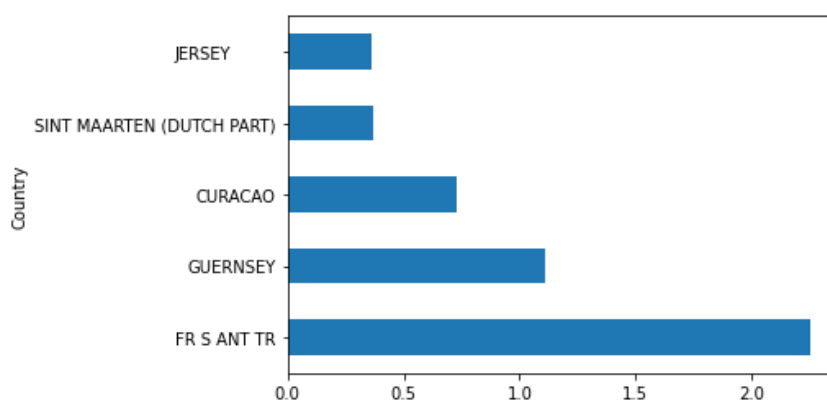
Conclusion

As we understand the term political instability as- either a potential of a change in government of a place or as the potential of violence, protest, etc. anything that has the potential to disrupt the normal functioning of the economy. The elections in India are possibly one of the biggest every Democratic Electoral celebration in the entire world with approximately 912 million are able to vote and are registered with the Election Commission of India which is the body that regulates the entire process.

On analyzing the entire data for Imports and Exports to and from India, we understand that election and the year before elections is a very crucial period which actually is characterized by polling rally's, candidature selection, etc. Based on all analysis of public opinion organizations across the world analyze the direction in which the wind is blowing and what are the potential threats and opportunities which a party can take an advantage of in due time.

The 2014 election in India is a landmark move for the NDA alliance and a major setback for the UPA alliance. On the analysis of the UPA tenure import-export data and the NDA tenure import-export data we find that we have sufficient pointers to conclude that Alternative hypothesis is held True and accurate and thus, Acceptable. The NDA tenure data was characterized by growth in exports and decline in imports which is a positive indicator for an economy. The next year of analysis is 2019 and although we are in 2022 based on known facts, we cannot really blindly predict what may have happened in regards to 2019 import-export data as 2019 was also an election year. Though the pace at which NDA government moved from 2015-2018 we can predict it should be able to continue towards Trade Surplus targets if any uncertainty does not occur.