

Assignment -1

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Applied data Analytics**

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Report – 1

My domain in this assignment is focussed on **Economic Freedom of the World**.

It is the measurement of economic freedom, ranking countries and based on five areas based on size of the government , legal structure, security and security of property rights, access to sound money, freedom to trade internationally, regulation of credit, labour and business.

Introduction

The index published in Economic Freedom of the World by the Fraser Institute measures the degree to which the policies and institution of countries are supportive of economic freedom . The cornerstone of economic freedom are personal choice , voluntary exchange , freedom to enter markets and compete, security of the person and privately owned property. Forty-two data points are used to construct a summery index and a measure the degree of economic freedom in five broad areas.

Areas

- 1. Size of Government** – As government spending taxation, the size of the government – controlled enterprises increase , government decision -making is substituted for individual choice and economic freedom is reduced .
- 2. Legal System and Property Rights** – Protection of persons and their rightfully acquired property is a central element of both economic freedom and civil society. Indeed, it is the most important function of government .
- 3. Sound Money** – Inflation erodes the value of rightfully earned wages and savings. Sound Money Is thus essential to protect property rights. When inflation is not only high but also volatile, it becomes difficult for individuals to plan for the future and thus use economic freedom effectively.
- 4. Freedom to Trade Internationally** – Freedom to exchange in its broadest sense, buying , selling, making contracts, and so on – It is essential to economic Freedom, which is reduced when freedom to exchange does not include business and individuals in other nations.
- 5. Regulation** – Governments not only use a number of tools to limit the right to exchange internationally, they may also develop onerous regulation that limit the right to exchange , gain credit, hire or work for whom you wish, or freely operate your business.

In this assignment I have used 2 dataset which are interrelated to make my dashboards more precise and more pleasing .

1. Economic Freedom of the world – it's the main dataset
2. Countries Continent – Its used to include the continent attribute into the main data set to get the visualising more effective .

The links for the both the dataset are been given below .

- The problem domain – Economic Freedom of the World
- The source of the data – The data set is created by Fraser Institute
- Source link - <https://www.kaggle.com/gsutters/economic-freedom>,
<https://www.kaggle.com/statchaitya/countrycontinent>
- The intended use of the data - The index published in Economic Freedom of the World by the Fraser Institute measures the degree to which the policies and institution of countries are supportive of economic freedom.
- The attribute types of the data – The attributes are as follows:-
 1. Year – The data set ranges from the year 1970 to 2016.
 2. Countries – In this attribute it describes the countries which are included in the data set .
 3. Economic Freedom – This is the main focus of the dataset Its interrelated to all subcategories variables.
 4. Rank – It defines the rank of the particular country and shows where it stands in the economy of the world .
 5. Quartile – It is score given by computing the 5 main variables in aggregate value . The attribute are Size of the government , legal system and property rights, sound money, freedom to trade internationally, regulation.
 6. Government Consumption – It's the ratio where the economy is effected by the consumption of the Government .
 7. Transfers – It's a redistribution of income and wealth (payment) made without goods or services being received in return.
 8. Government Enterprises – Is a legal entity that is created by a government in order to partake in commercial activities on the government's behalf .
 9. Top margin tax rate – It is the tax incurred on each additional dollar of income . The marginal tax rate for an individual will increase as income rises .
 10. Size Government - It states the size of the governments economy in a particular country
 11. Impartial Courts – Judging whose actions and decision are free of bias or prejudice constitute a fair and impartial jury. All people regardless of race, religion, sex, national origin, or economic status, have the right to a trial by a fair and impartial jury.

12. Protection property rights – Are theoretical socially-enforced constructs in economic for determined how a resource or economic good is used and owned.
13. Military interference - It's calculated effect on economy of the country due to military interference .
14. Integrity legal system – The ratio which affect the countries economy due to legal system
15. Legal enforcement contracts – The contacts affects the economy of the country
16. Restriction sale real property – The effectiveness in economy due to the restriction in sale property .
17. Business costs crime – The cost of crimes against commercial and public sector targets.
18. Gender adjustment – Adjusting the economy in relation to the gender of the country .
19. Property rights – Economy effected due to property rights
20. Money growth – It states the growth of the money .
21. Standard 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.
22. 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.
23. Freedom own foreign currency – The value of economy changes with more amount of foreign currency exchange and this variable calculates the ration amount.
24. Sound money – Money not liable to sudden appreciation or depreciation in value: stable money money specifically.
25. Tariffs – A tax or duty to be paid on a particular class of imports exports
26. Regulatory trade barriers – The barriers effecting the trade which directly affect the economy of the country .
27. Black market – The illegal traffic or trade in officially controlled or scarce commodities
28. Control movement capital people – Is a residence based measures such as transaction taxes, other limits, or outright prohibitions that a nation's government can use to regulate flows from the capital markets into and out of the countries capital account .
29. Trade – It is a basic economic concept involving the buying and selling of goods and services, with compensation paid by a buyer to a seller, or the exchange of goods or services between parties.
30. Credit market regulation - Is a form of regulation or supervision, which subjects financial institution to certain requirements, restrictions and guidelines, aiming to maintain the integrity of the financial system.

31. Labour market regulation – It is a high profile, and often contentious , area of public policy
32. Business regulation – a law that controls the way that a business can operate, or all of these laws considered together.
33. Regulation – A rule or directive made and maintained by an authority.
34. Continents - this defines different region in world with a combined data of a set of different countries .

Objective : To discover some insights through an exploratory Data analysis And check where does the country stands economically in the world . World premier measurement of economic freedom , ranking countries based on five areas size of the government, legal structure and security of property rights, access to sound money, freedom to trade internationally, and regulation of credit, labour and business

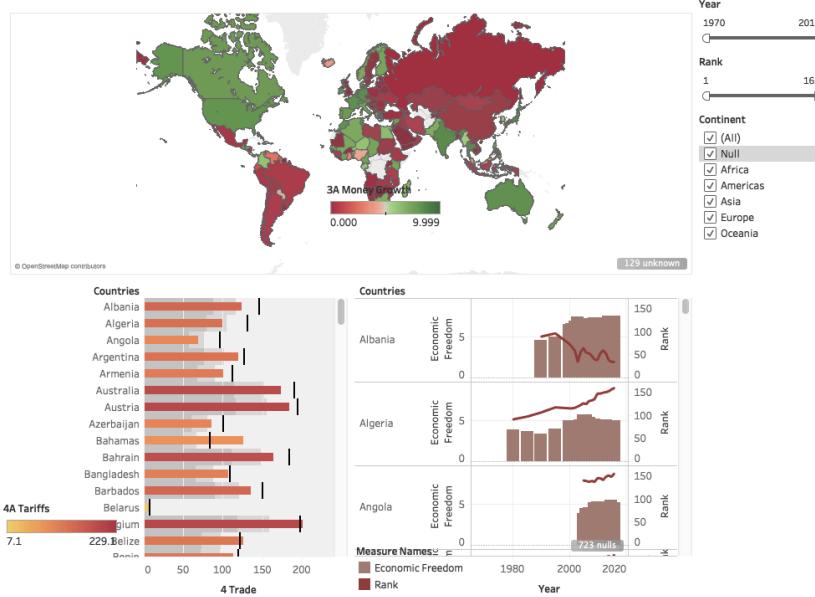
Importance : Economic Freedom is the basic right of every individual, where every person is free to use their income,property & resources and invest according to their will, without much intervention from the Governmental Policies. This is very important for overall prosperity of the society, democracy and the fundamental right to make economic decisions.

The question that can be answered :

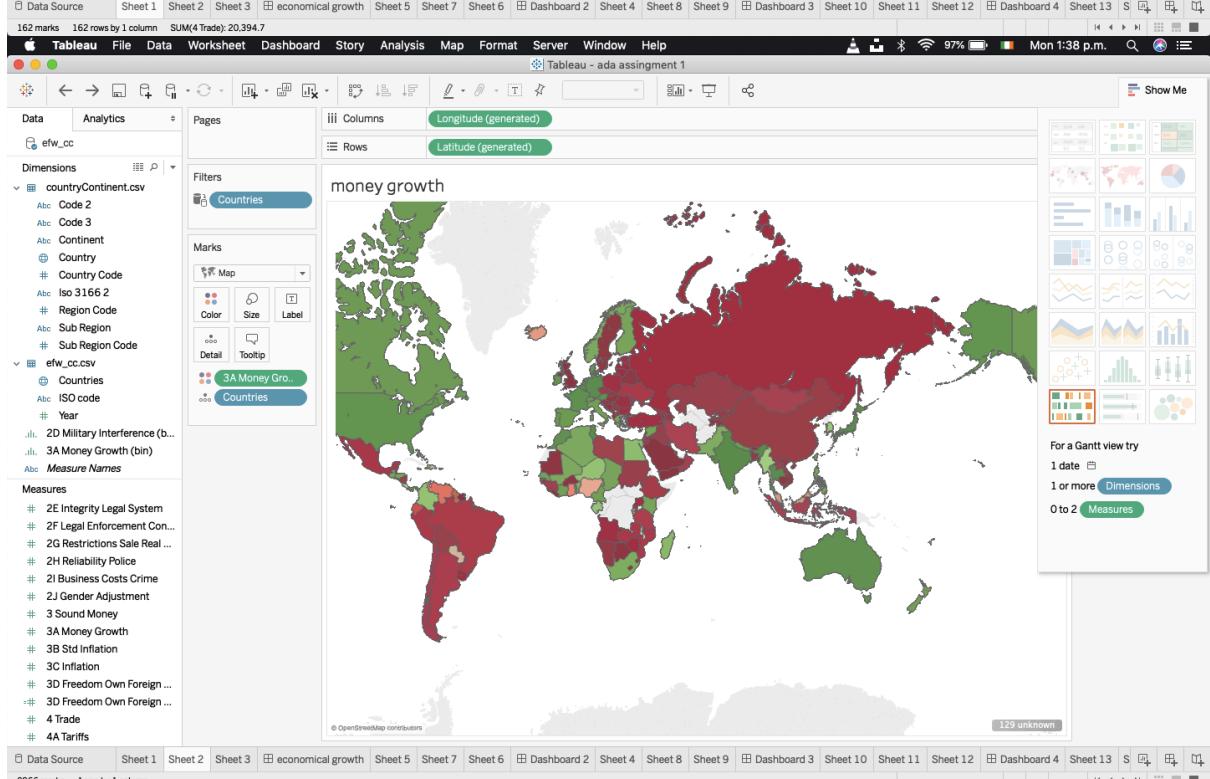
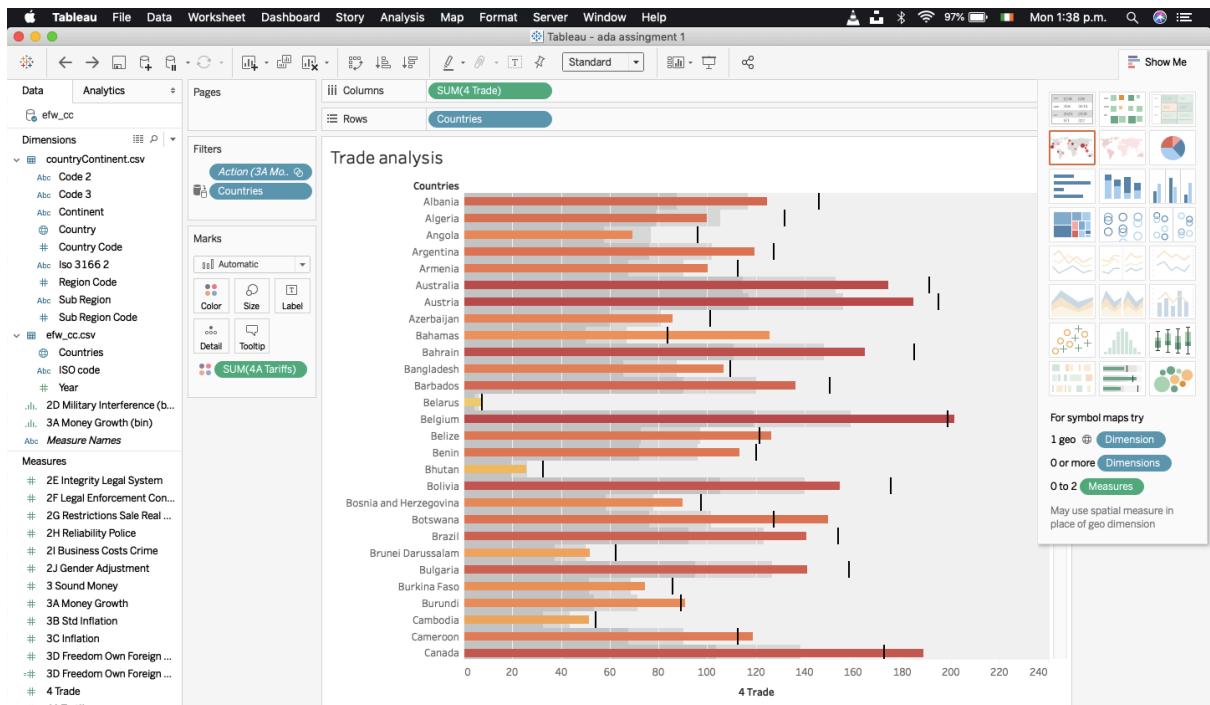
- Where is the particular companies economy stands .
- When did the the growth of a particular companies economy started rising or falling .
- What were the effects for the countries economy to fluctuate .
- Where are areas the countries need to be concerned about to raise their economy rank .
- How is different important factors inter- related to the Couse of the country's economy.

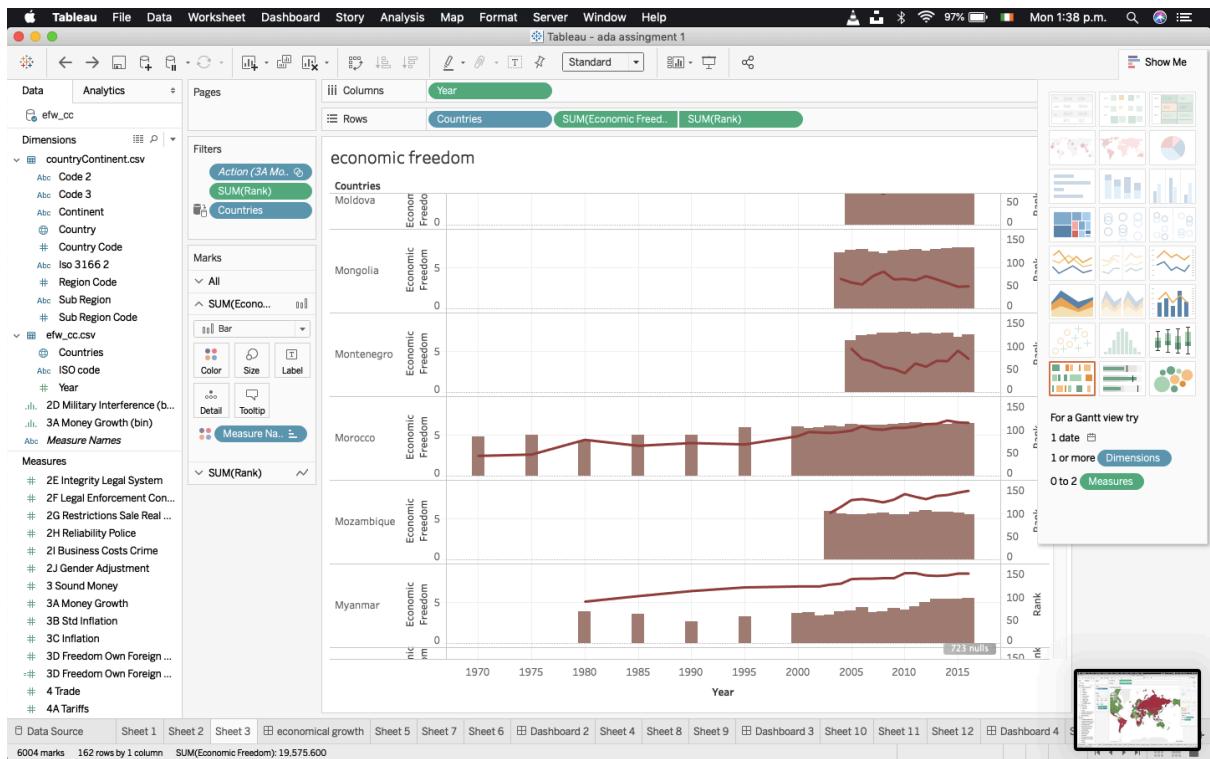
Dashboards :

EconomicalGrowth



Sheet 1 Sheet 2 Sheet 3 economical growth Sheet 5 Sheet 7 Sheet 6 Dashboard 2 Sheet 4 Sheet 8 Sheet 9 Dashboard 3 Sheet 10 Sheet 11 Sheet 12 Dashboard 4 Sheet 13 Sheet 14 Sheet 15



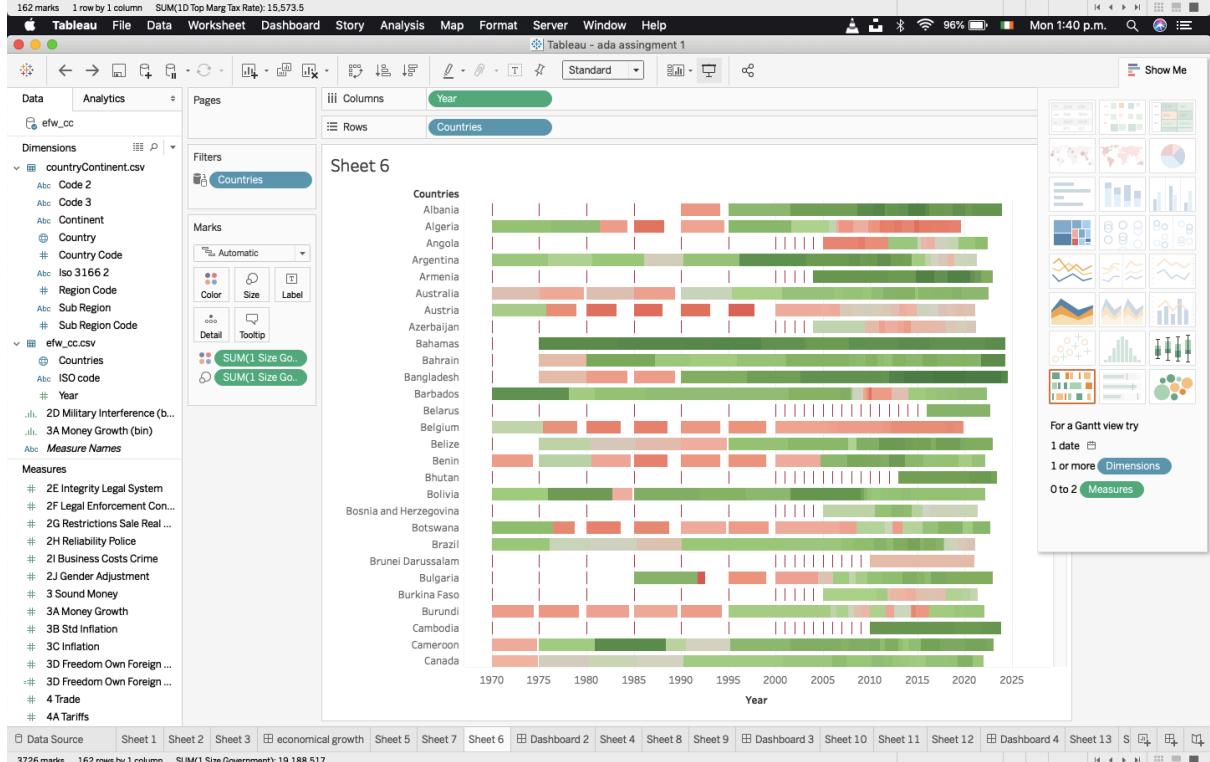
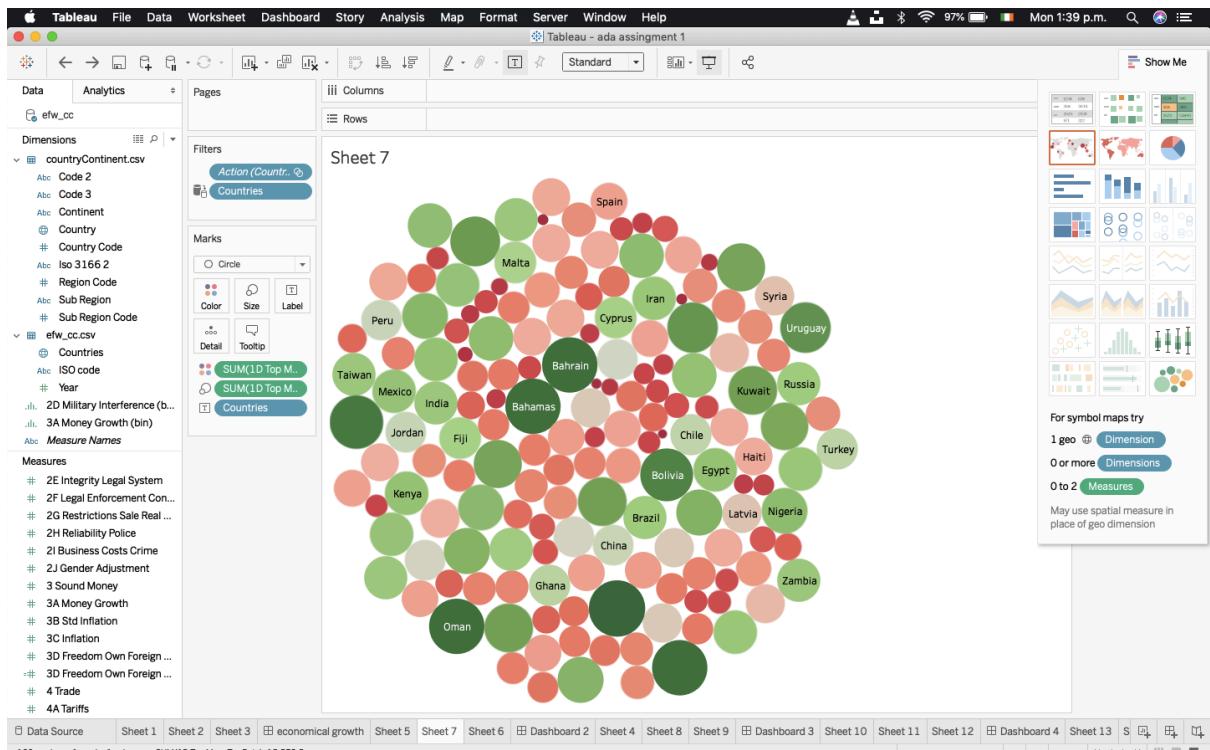


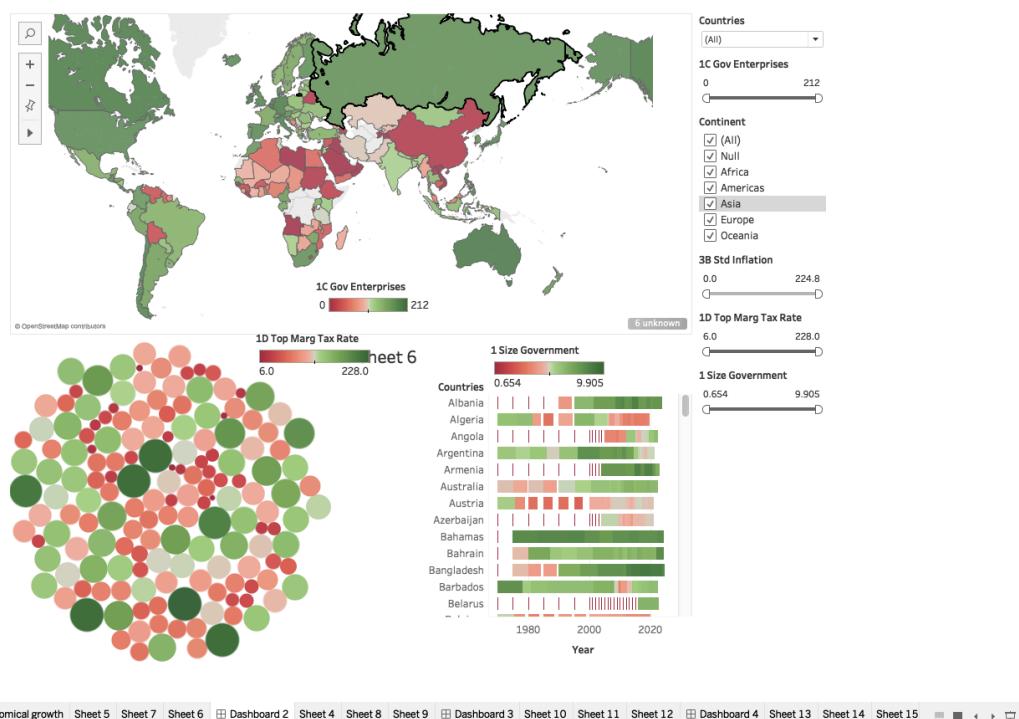
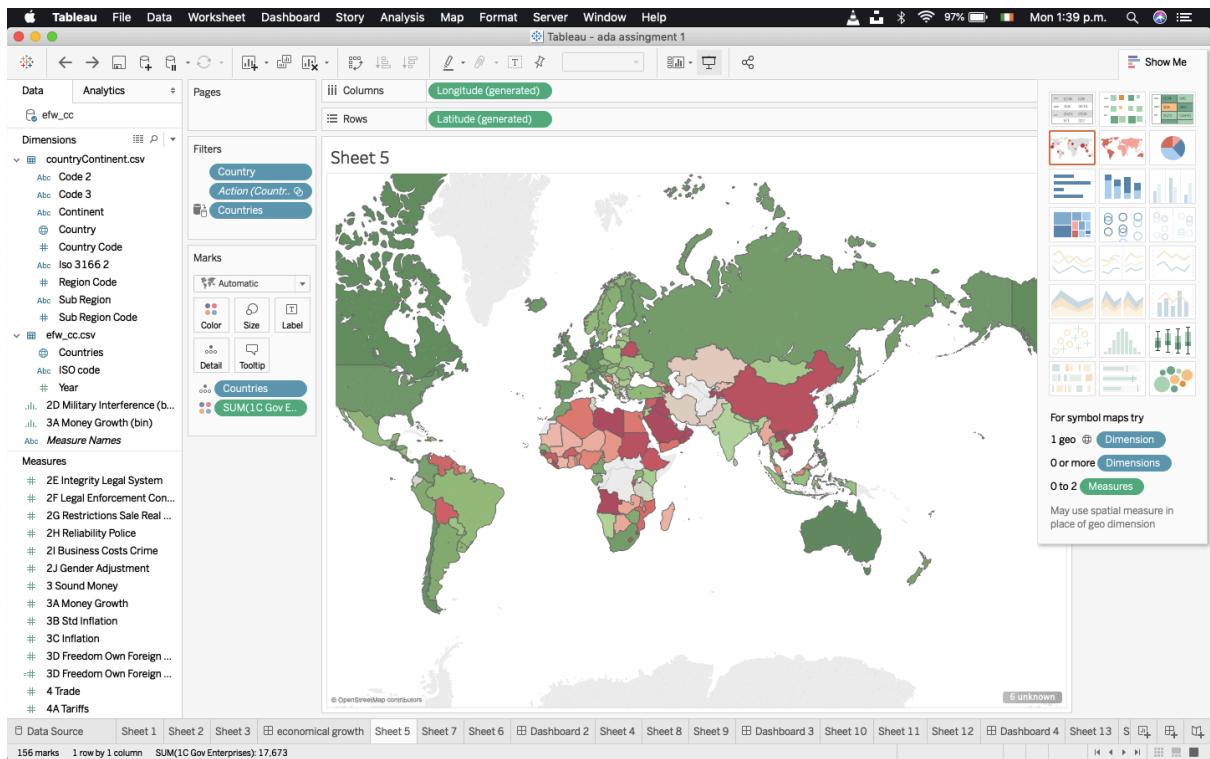
Dashboard : 1

In the given dashboard we can see the 3 different graphs. One of the graph indicates the economic freedom with respect to the rank of each country . In another its indicates the money growth in respect to the particular country and in the third one we could see the trade vs tariff graph in respect to different country .

Through this data set we can easily calculate the effect of economic growth in respect to trade, tariff , money growth . And we can even check the status of different country in respect to the credentials available .

We can also check the aggregate value for the trade vs tariff and its effect towards the economic growth of the country.



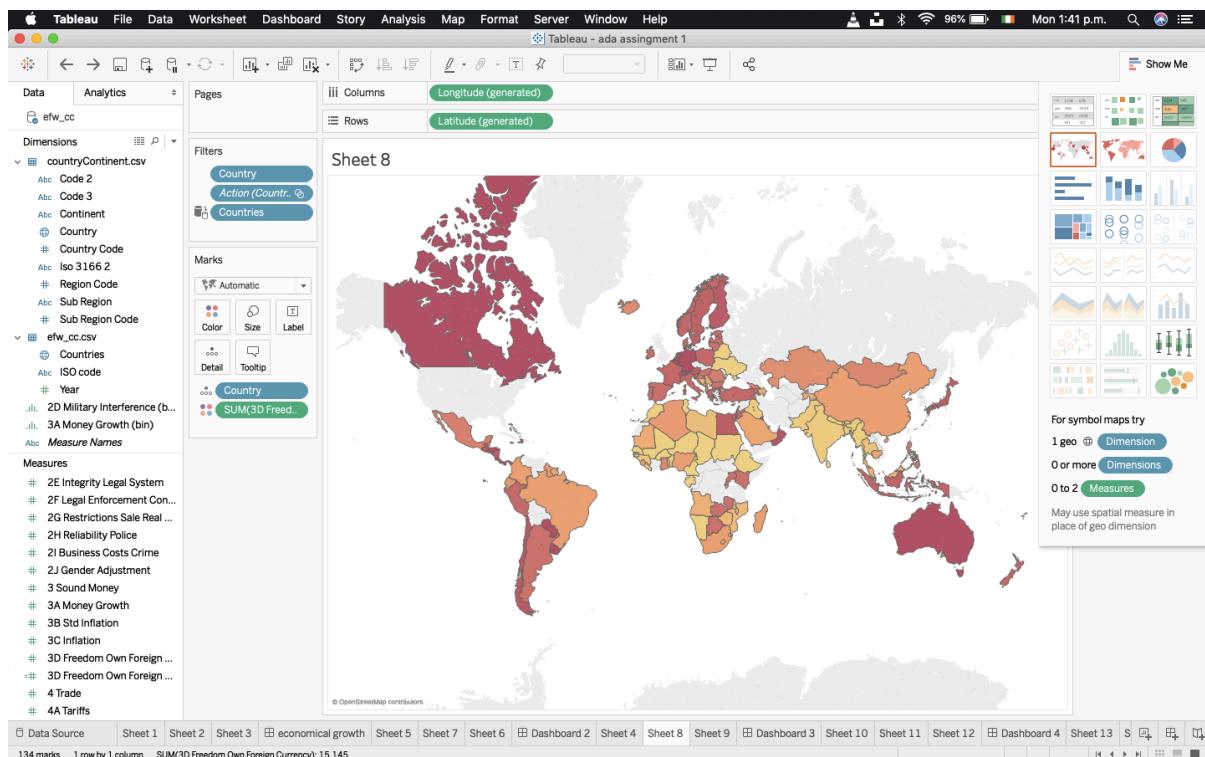
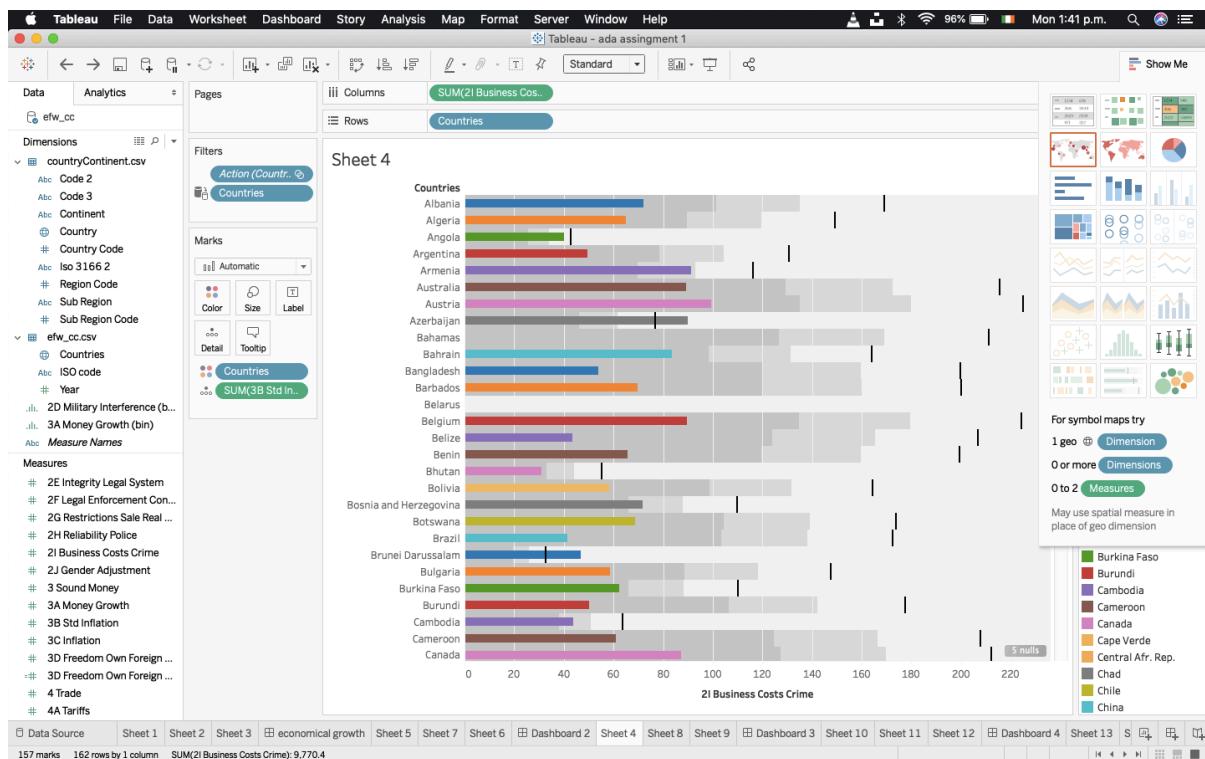


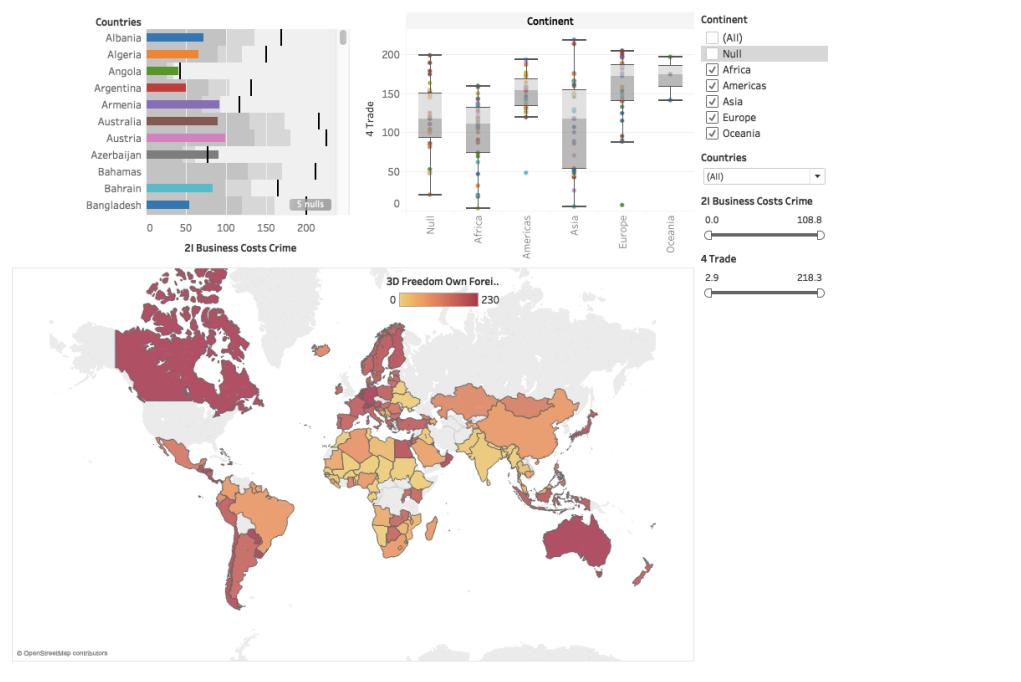
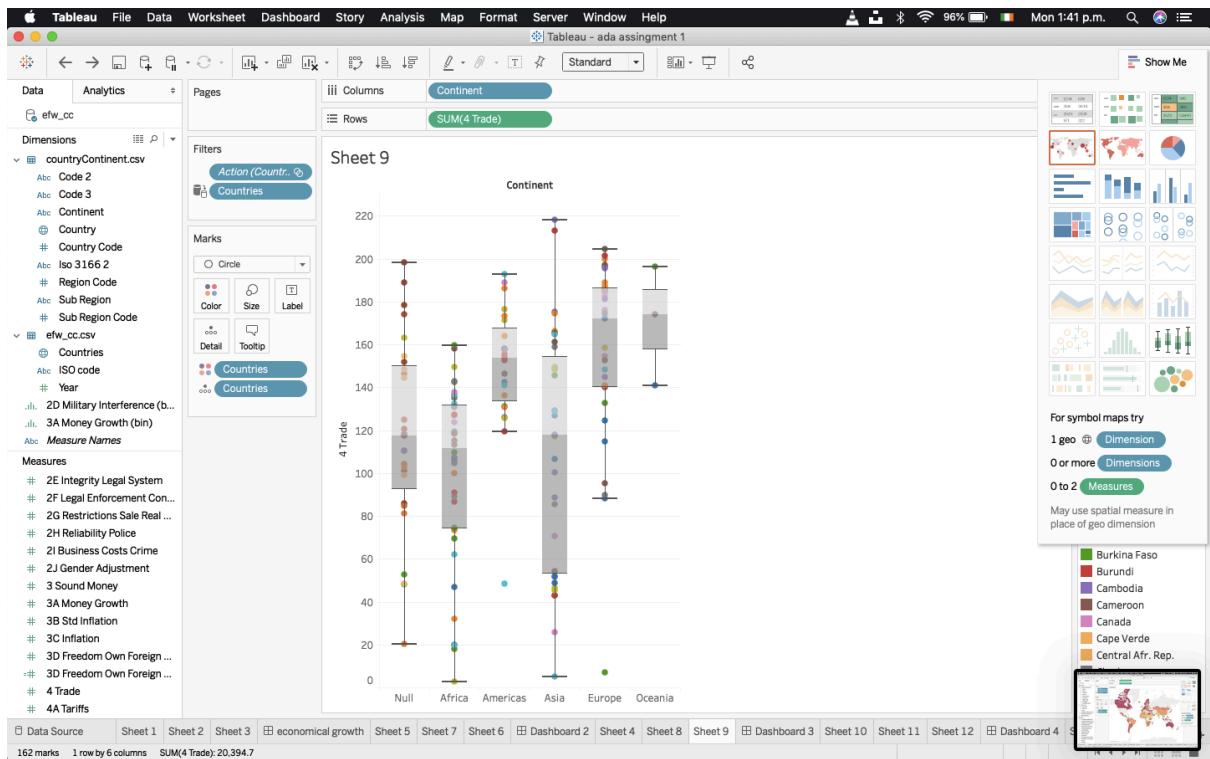
Dashboard : 2

In this dashboard we can clearly check the status of economic growth in respect to top margin tax rate ,standard inflation and size of the government .

This may help to check status of different government and its impact towards the economy .

It's mainly focuses of various impact in economy in relation to the inflation and government impacts. The audience here is government authorities.

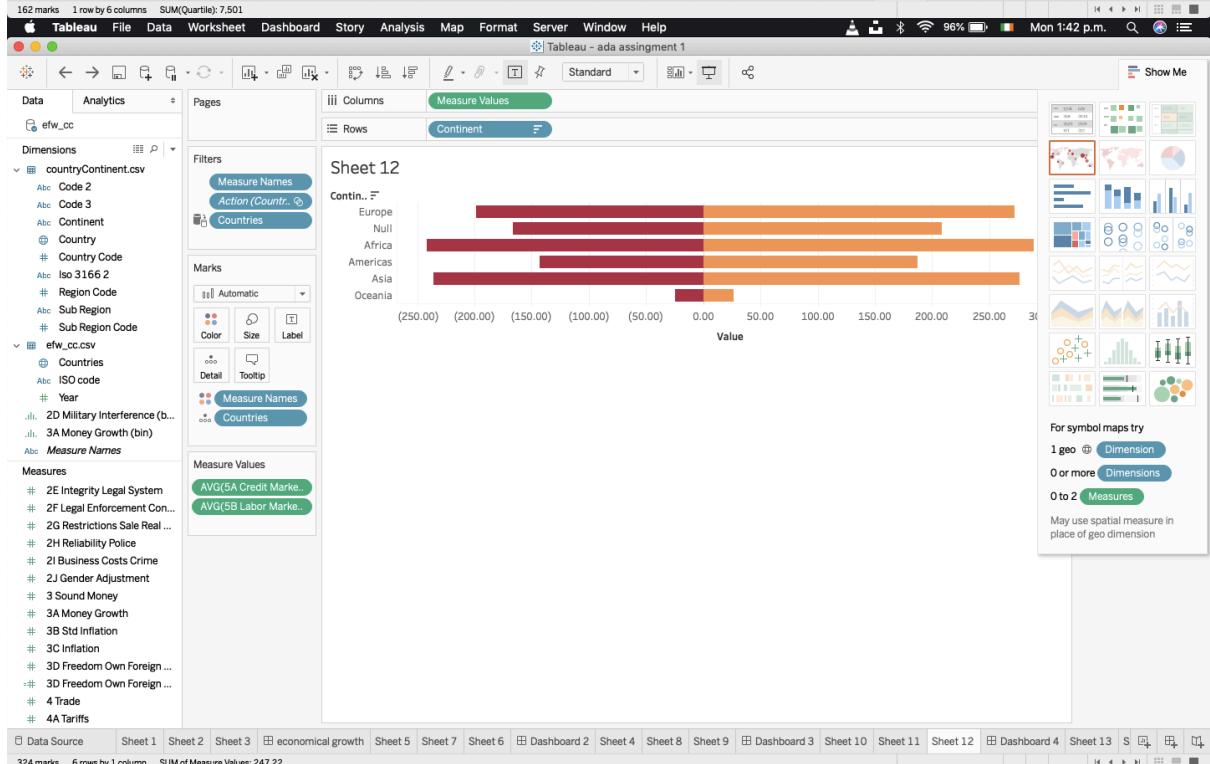
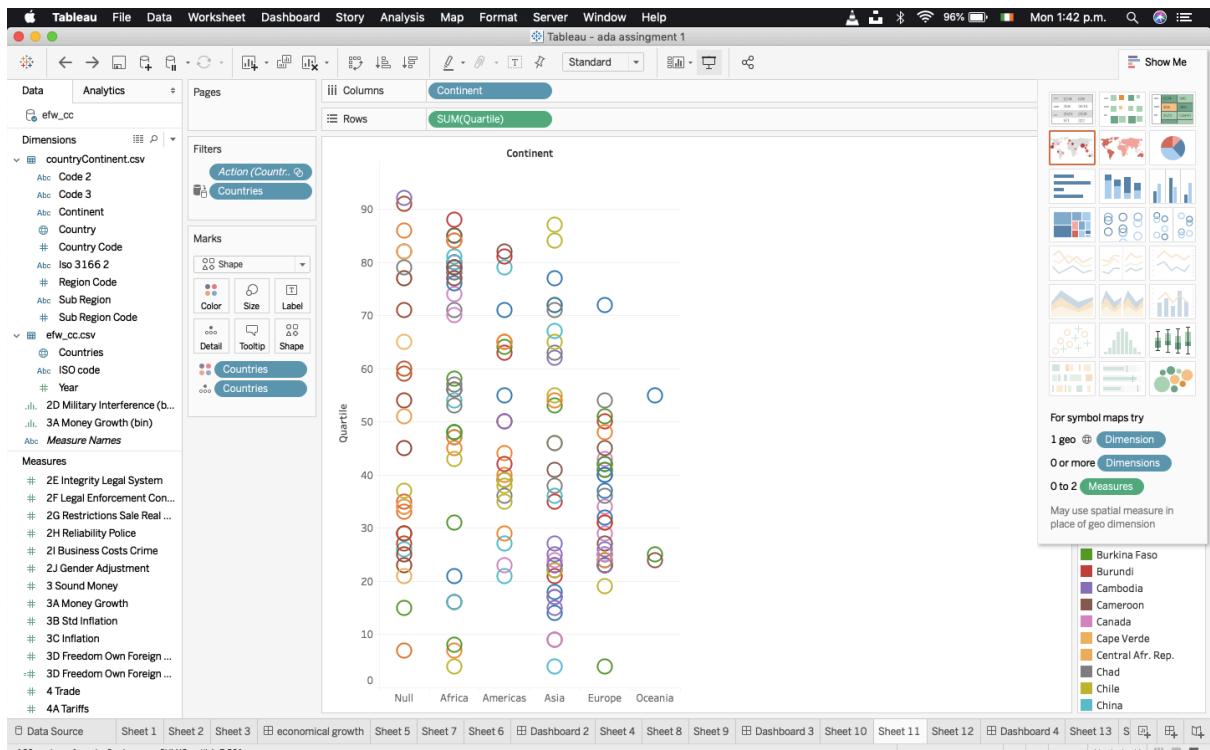


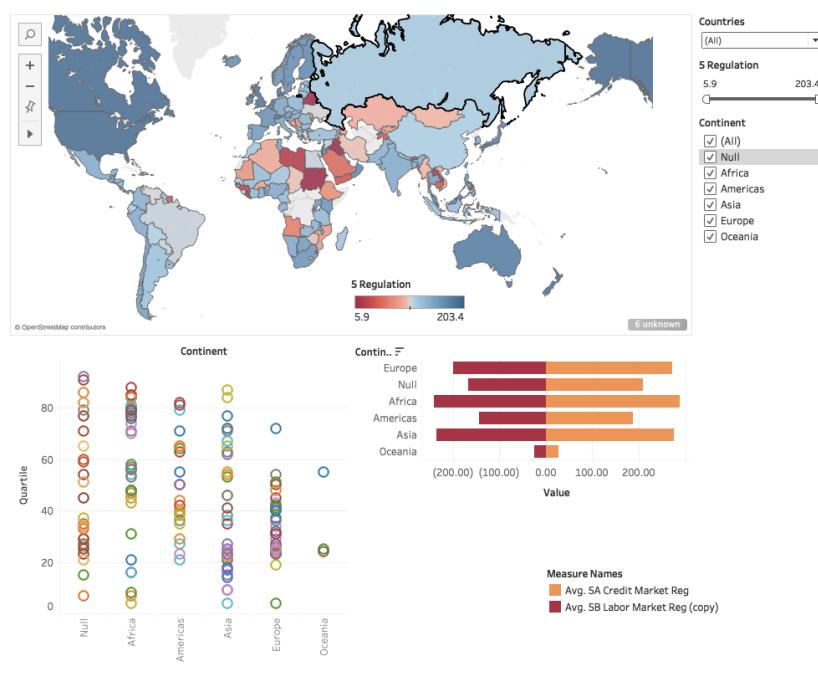
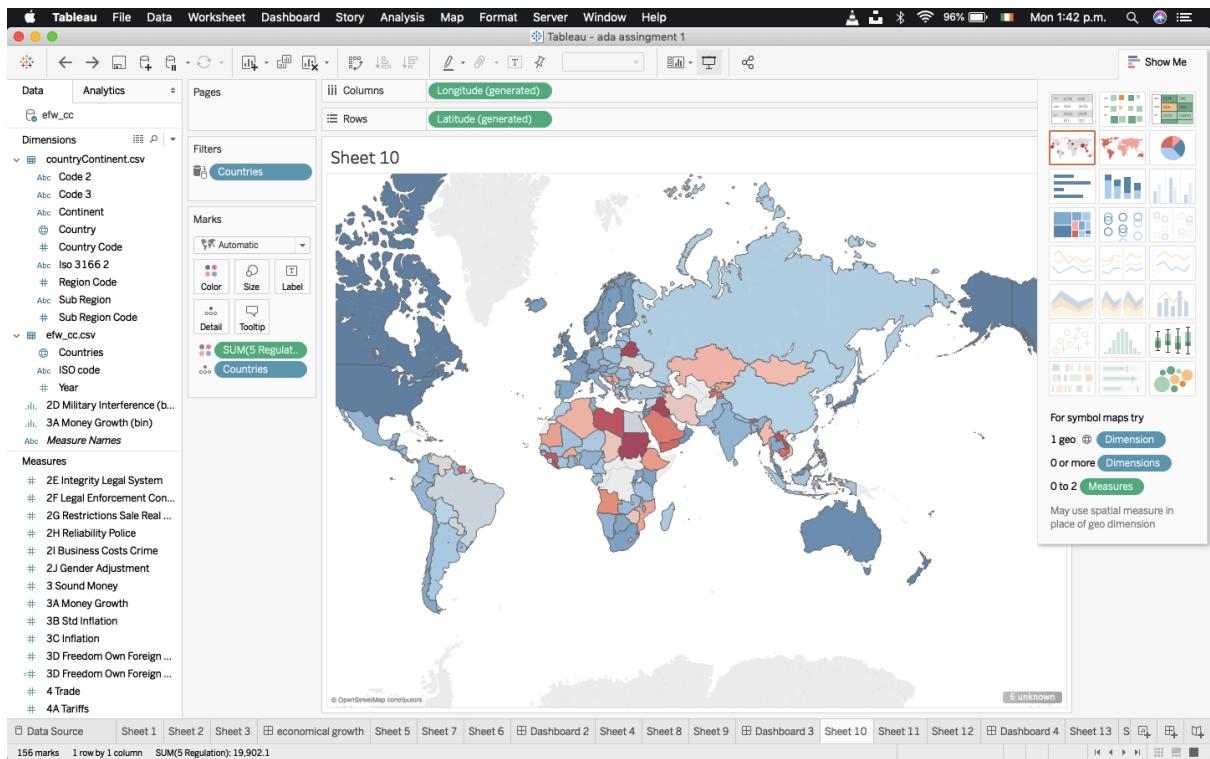


Dashboard : 3

In this dashboard we are focusing on negative impacts which effects the economic growth. The main attributes are business cost crime , trade , currency exchange .

It shows how bad it effects the country economy while we have a foreign exchange , trade and business cost crime . We can also navigated different continent and as per the graph, Asia is having the highest number of trade and Belgium is having the highest number of business cost crime.



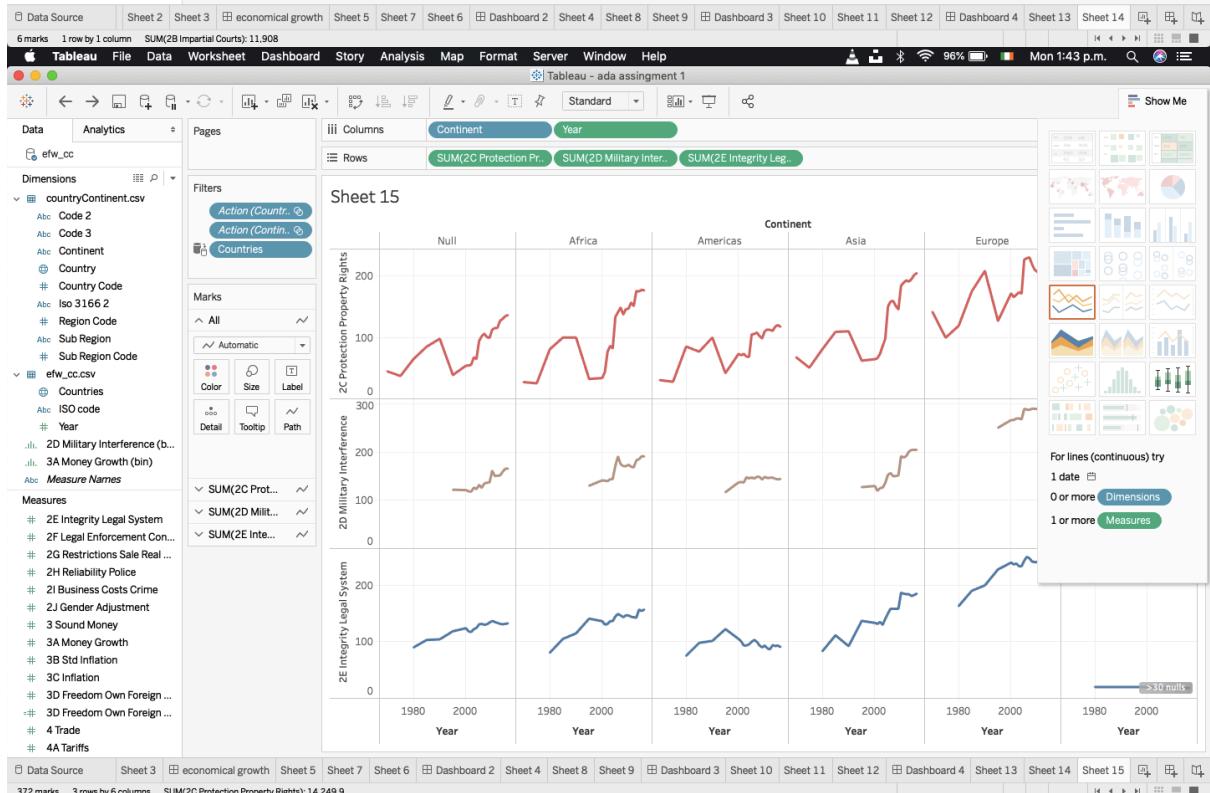
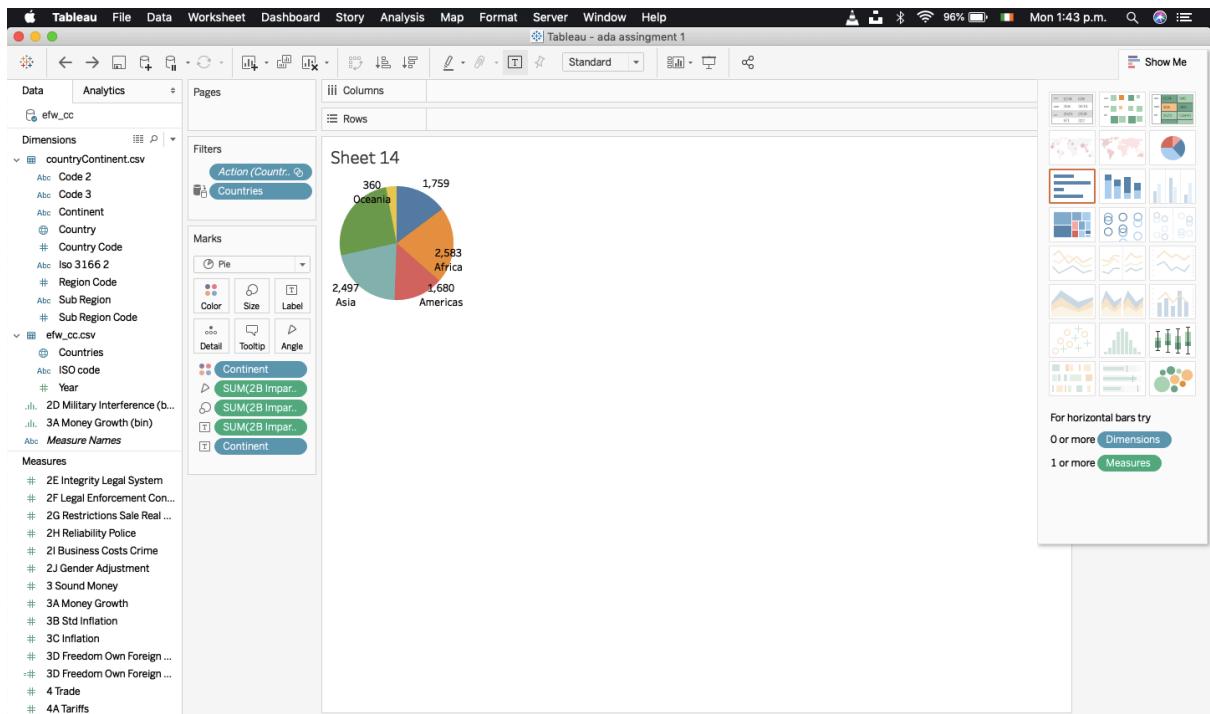


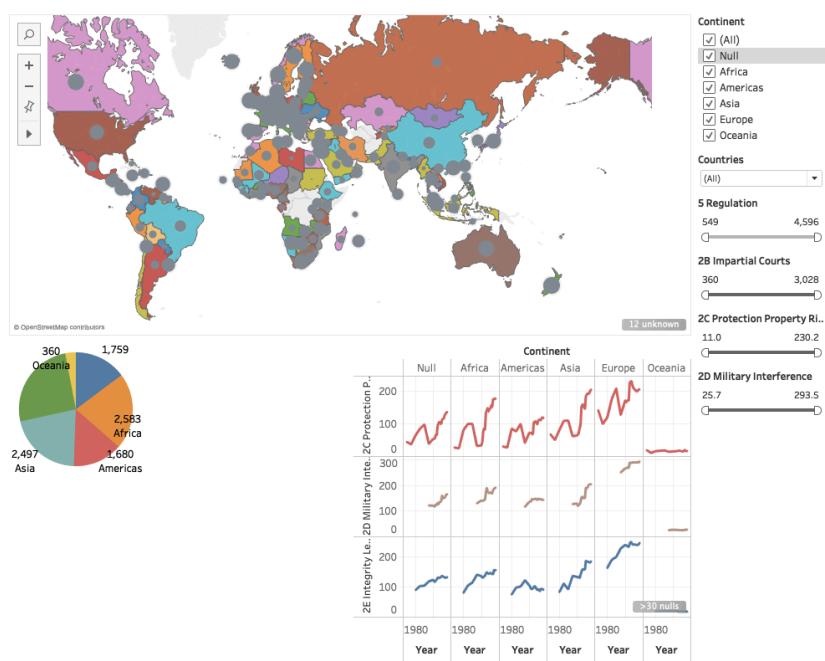
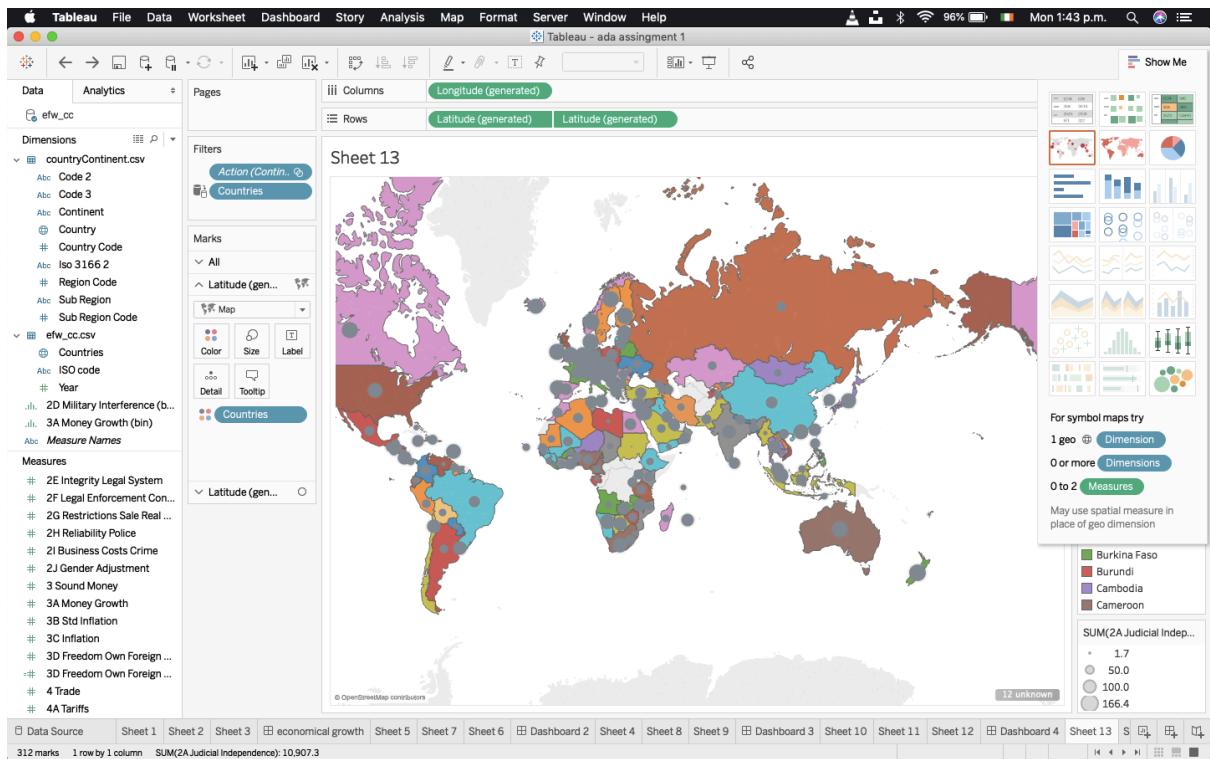
Dashboard : 4

In this dash board we can check regulations density in the whole world . Quartiles are been calculated in regards to the continents .

It gives the comparison for credit market regulation and labour market regulation . In this the dashboard is focuses on the main regulation effects to the country and they are been arranged and filtered separately in different graphs .

Dashboard : 5



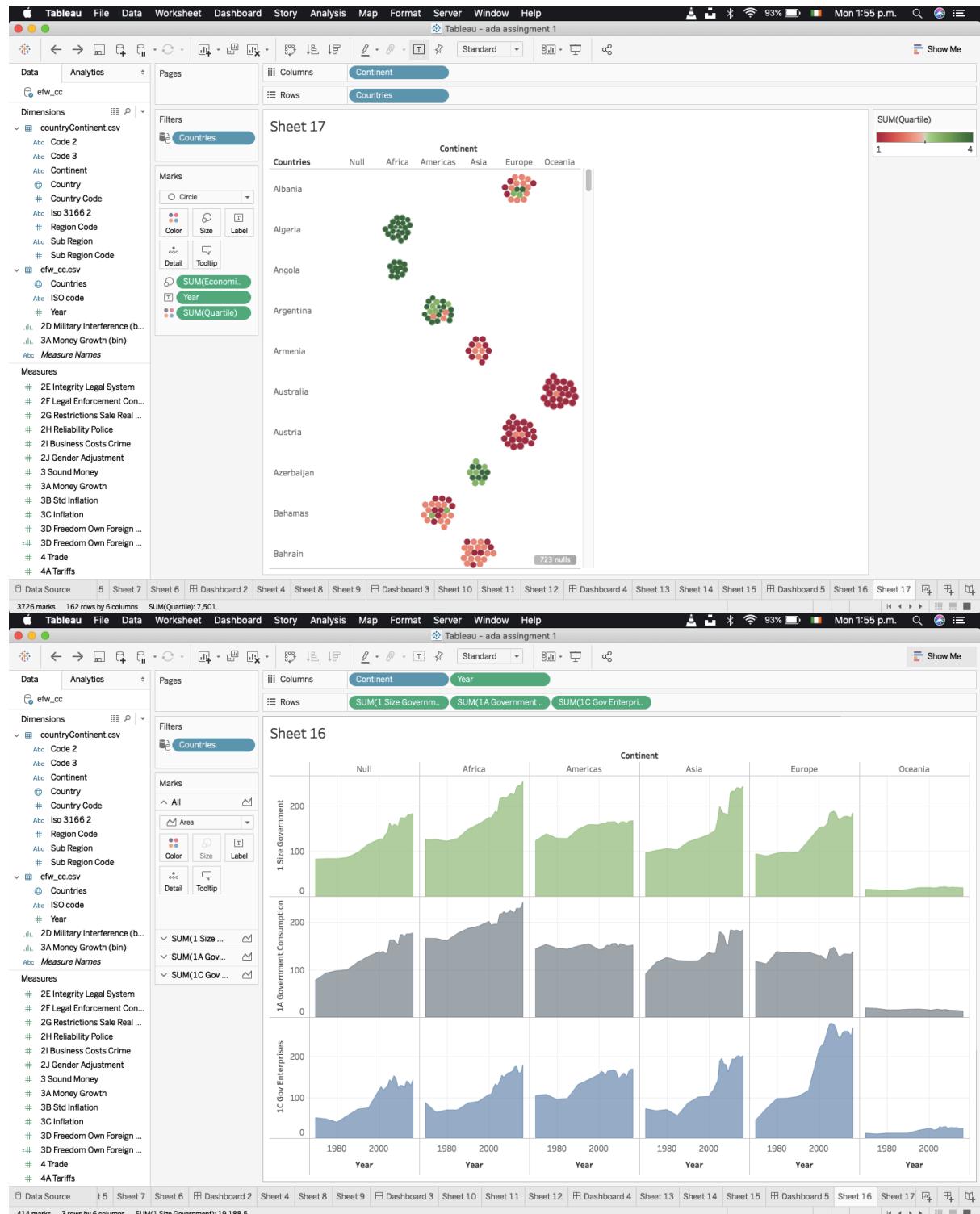


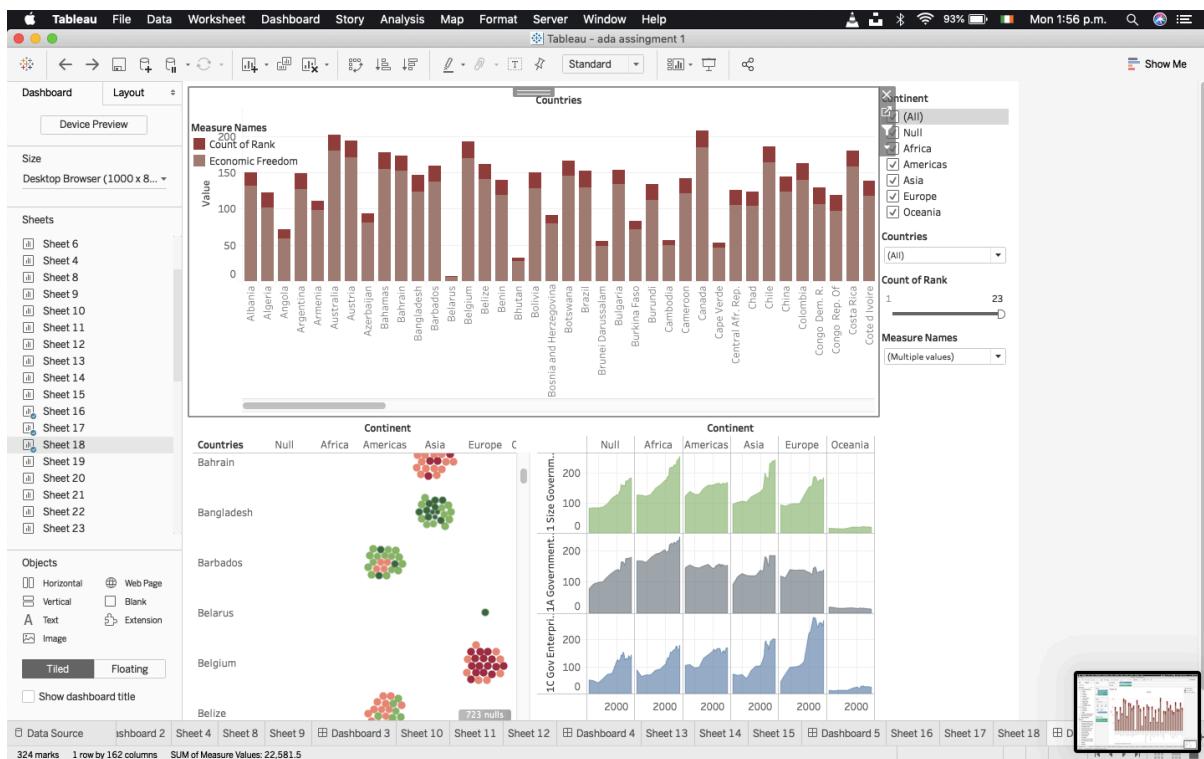
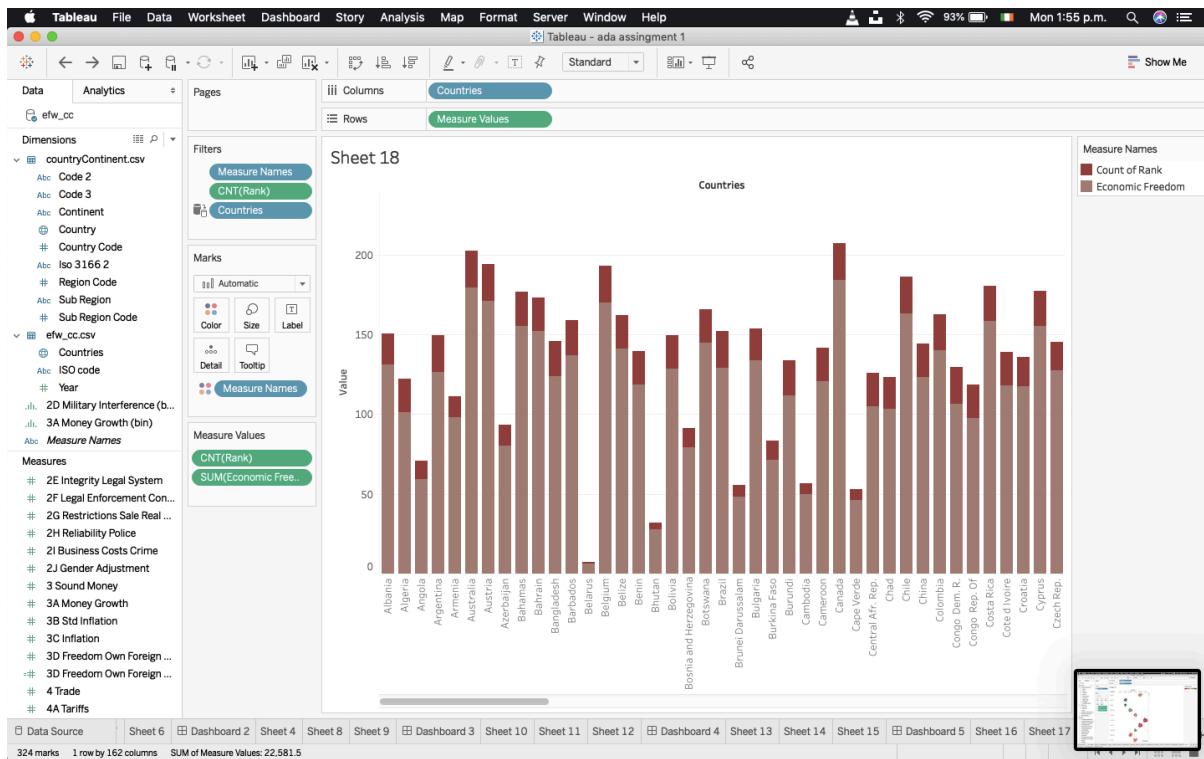
Dashboards : 6

In this dashboard we check different negative effect towards the economy of different countries. It focuses on protection property right , military interference, integrity legal

system . In this user can check in 3 different graphs and compare their status with other countries . While going through the graph it can be seen that Asia is having more number of negative impact from the very early stage .

The main audience for this data are the politicians , military army , property dealers .



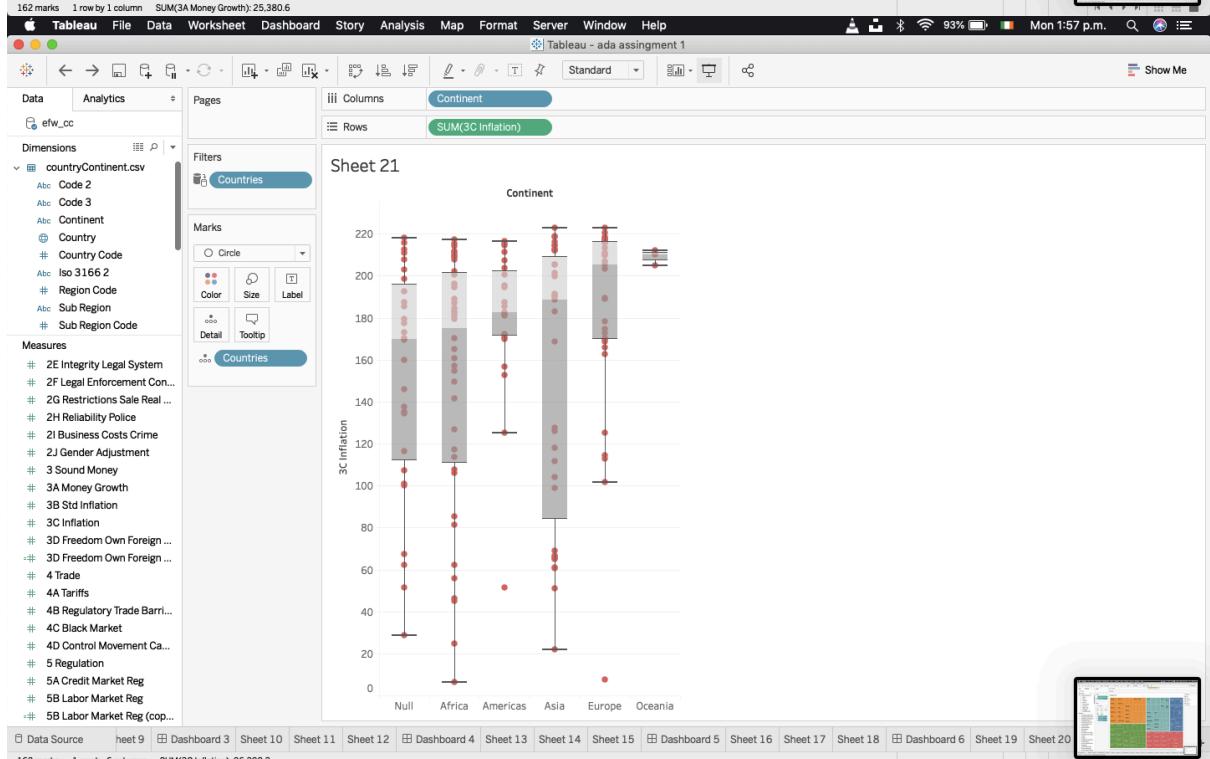
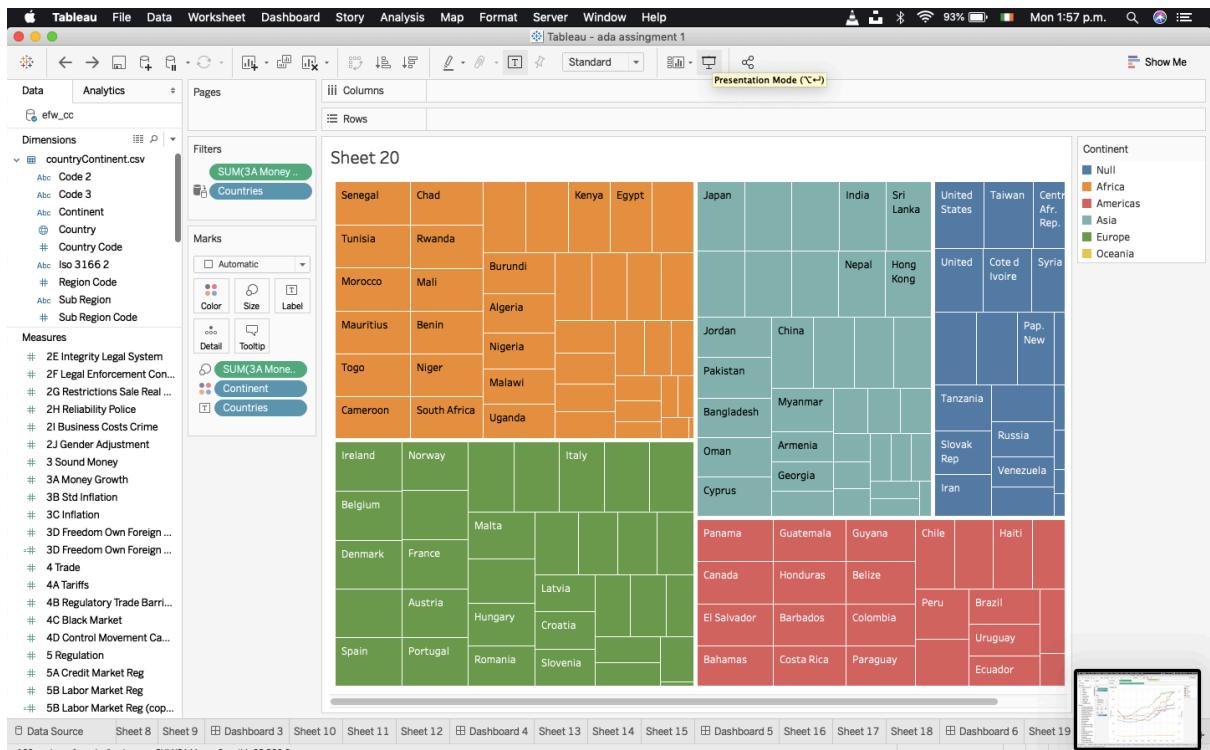


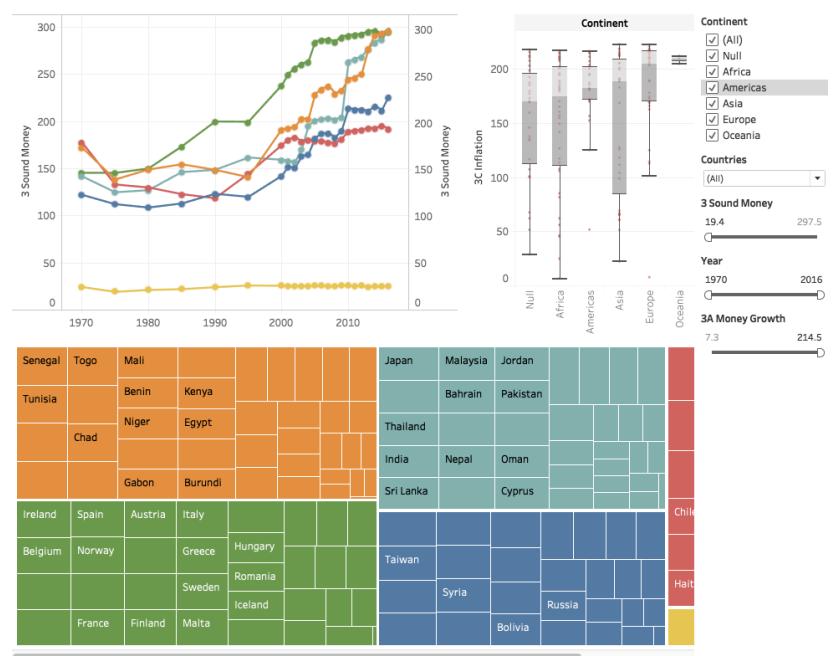
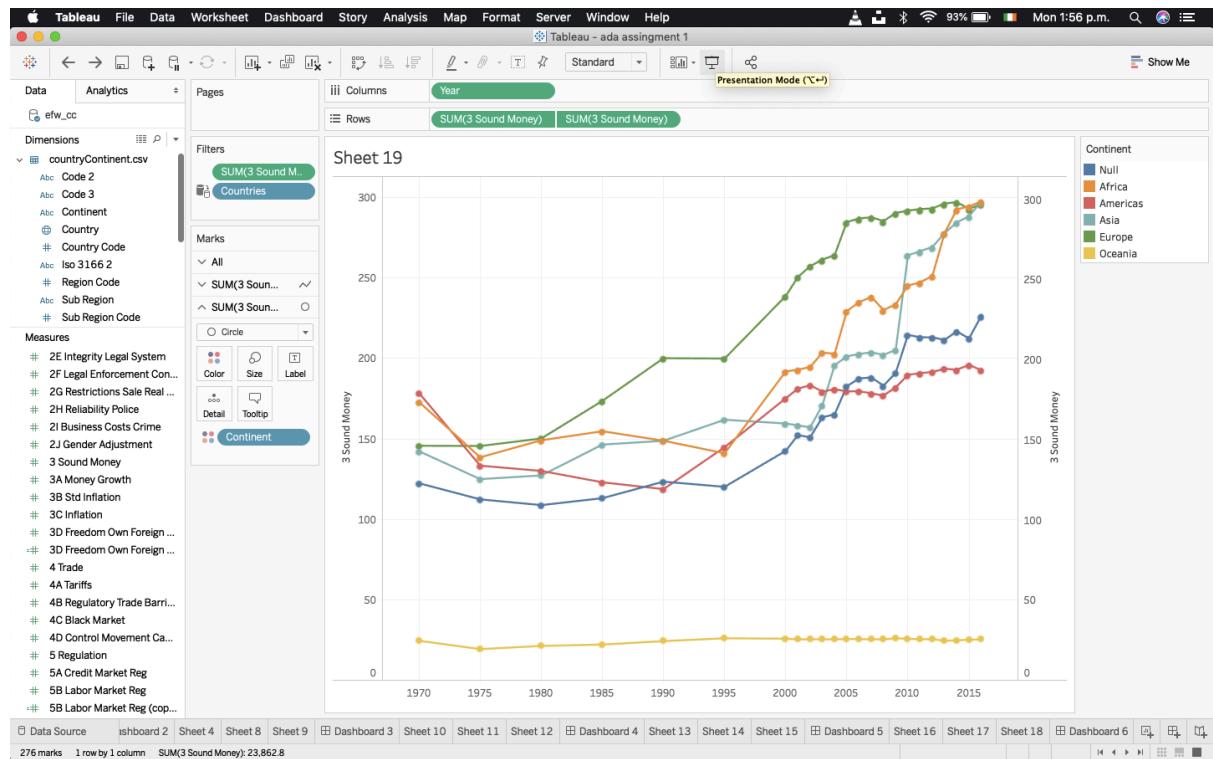
Dashboard : 7

In this dashboard we are comparing the economic freedom with respect to economic freedom for particular countries in respect to the rank , government interference which effects the economic freedom .

In this data we can compare the countries status according to the rank and check in which countries has the government interference more to the other countries .

The audience here is again the government itself and UNESCOs to calculate and analyse between different countries .





Dashboard : 8

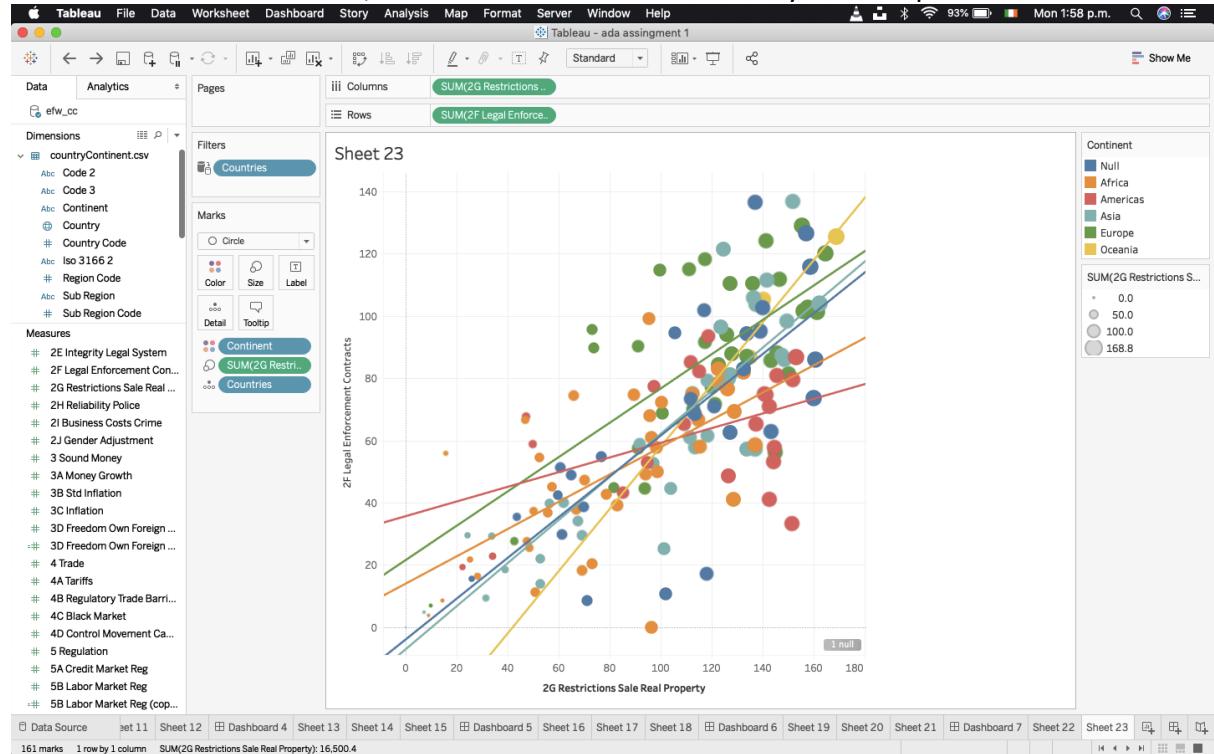
In this dashboard the main focus is on the money growth effect in economic freedom and growth.

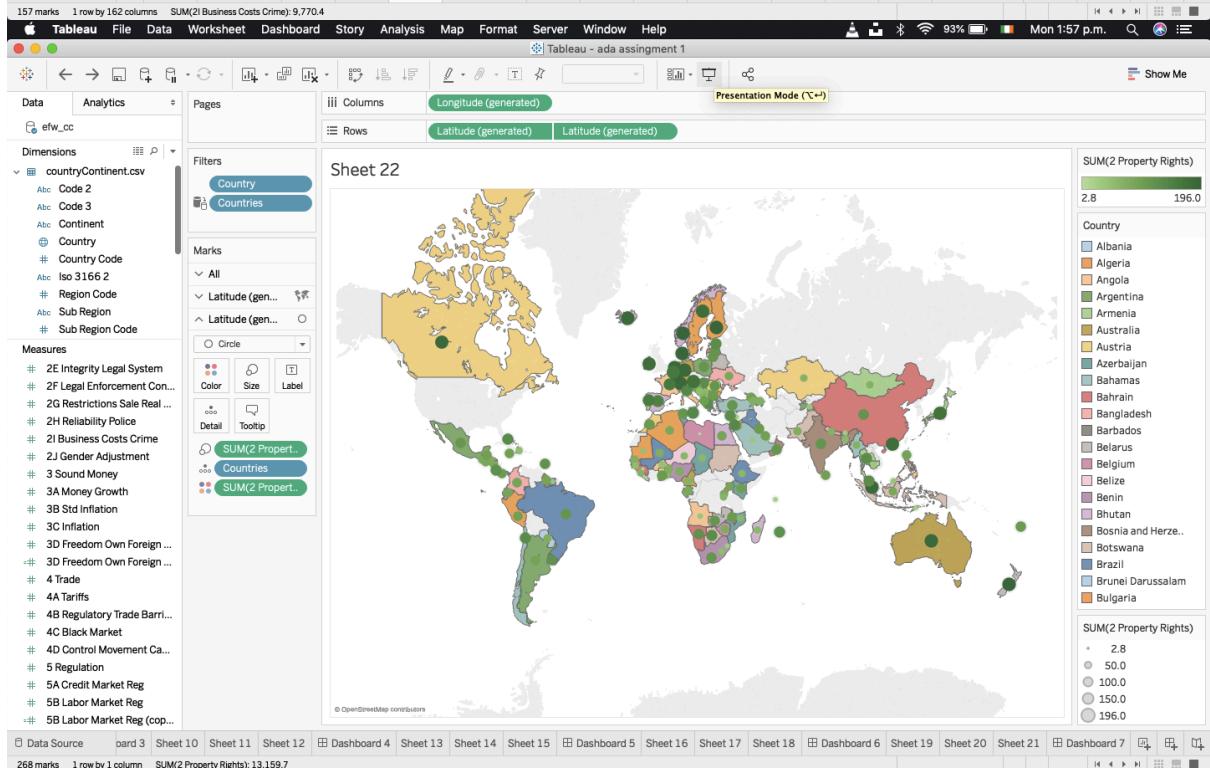
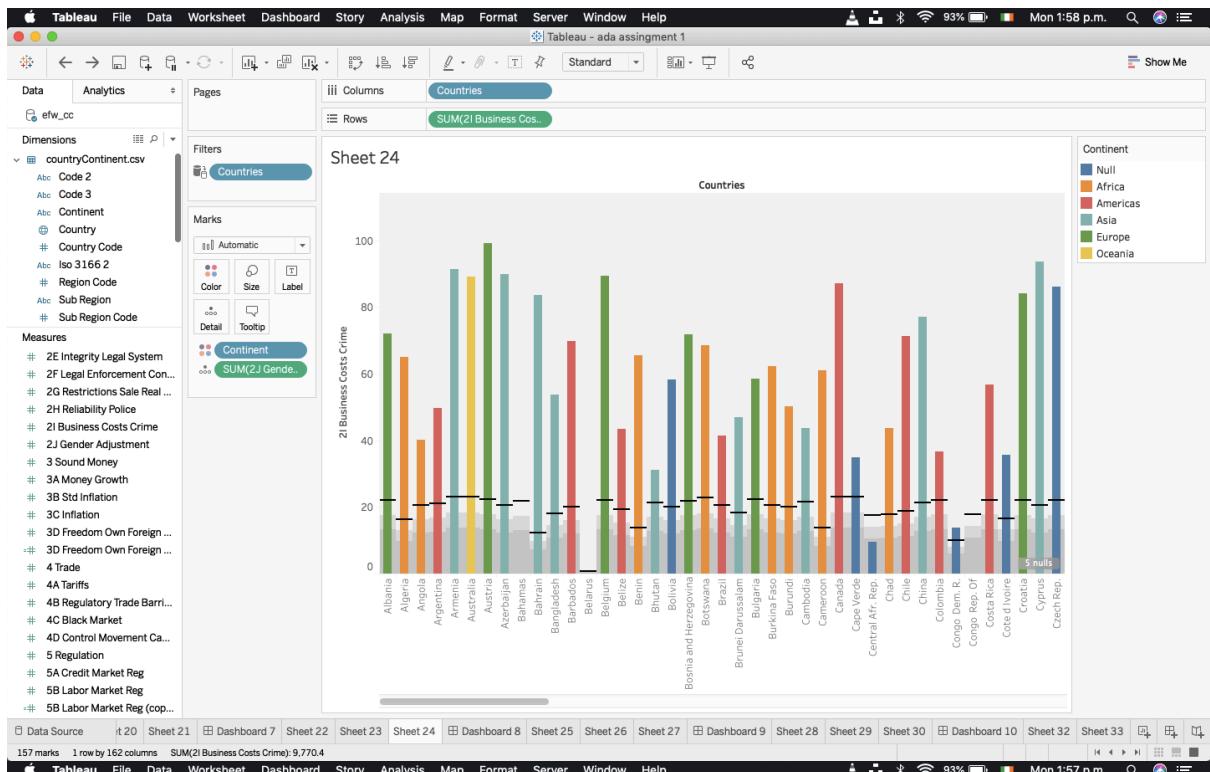
The attributes used here are money growth, inflations, sound money .

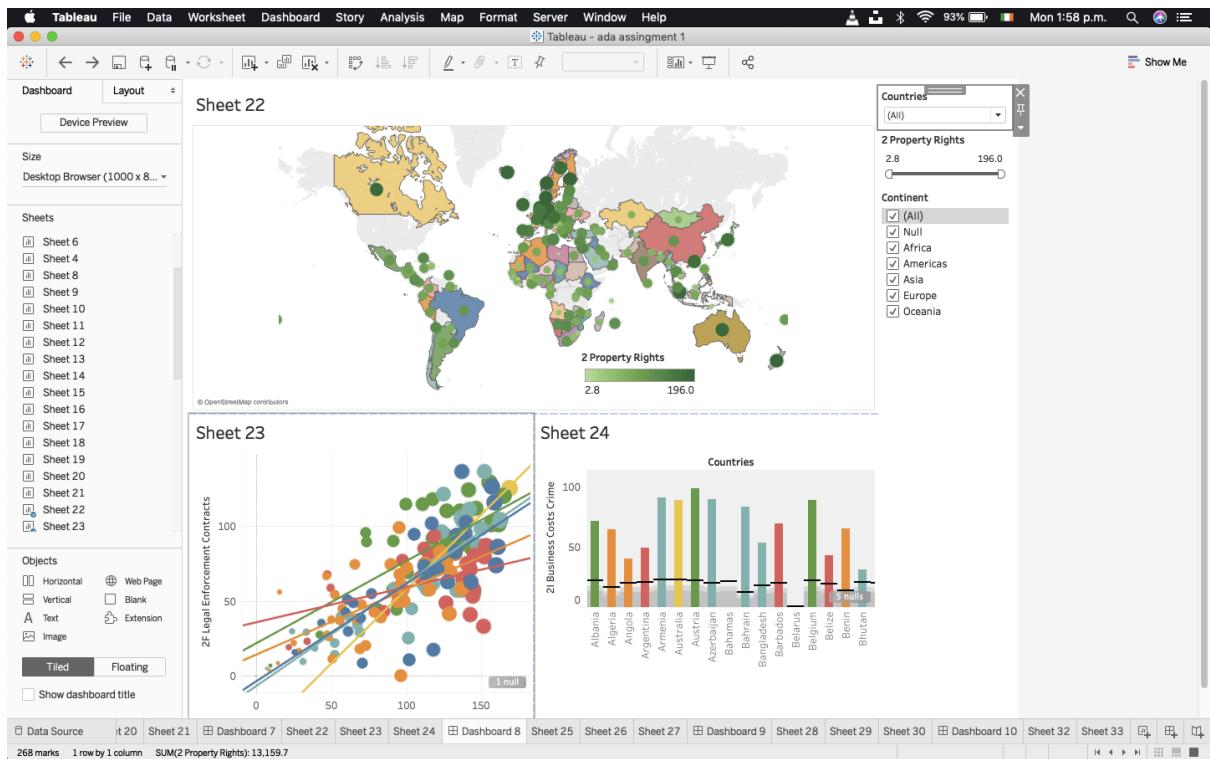
With the help of this we can check which country or which continent is having more economy and can get the challenges easily .

The main insight in this dataset is that sound money impacts directly towards the economic freedom of the particular country .

The audiences are Bankers , finance ministers and data analysts in respected fields.







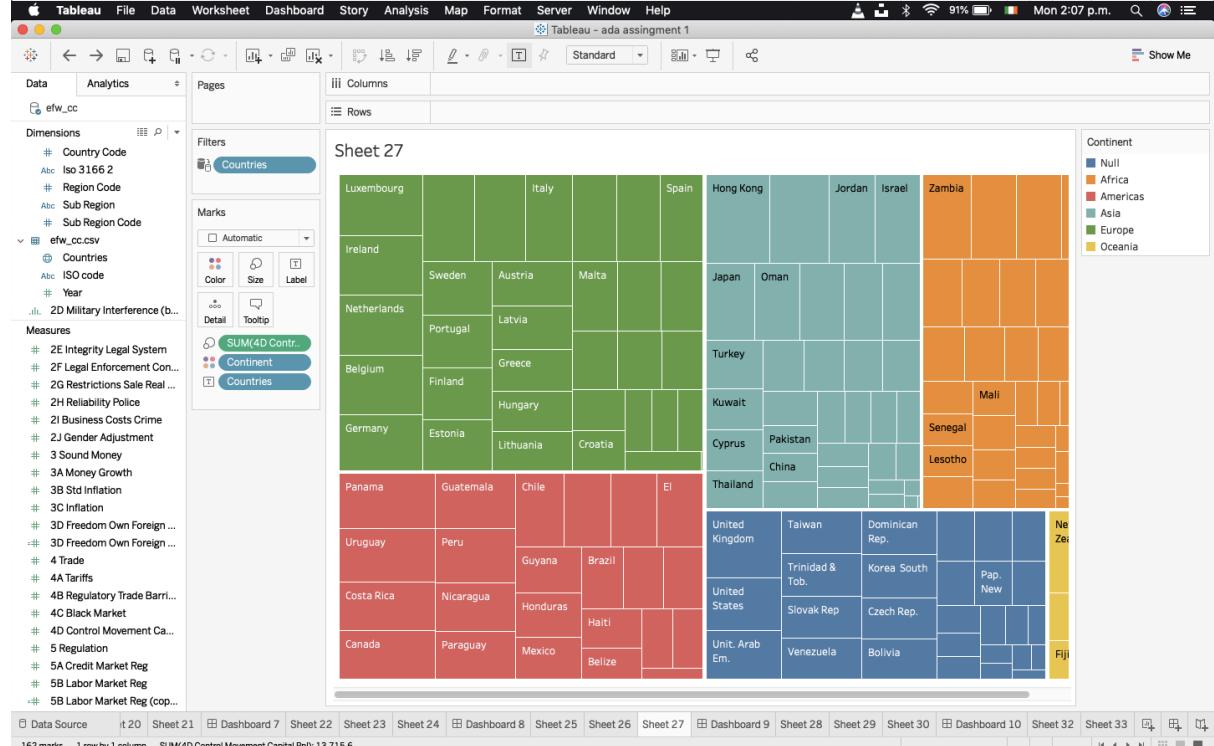
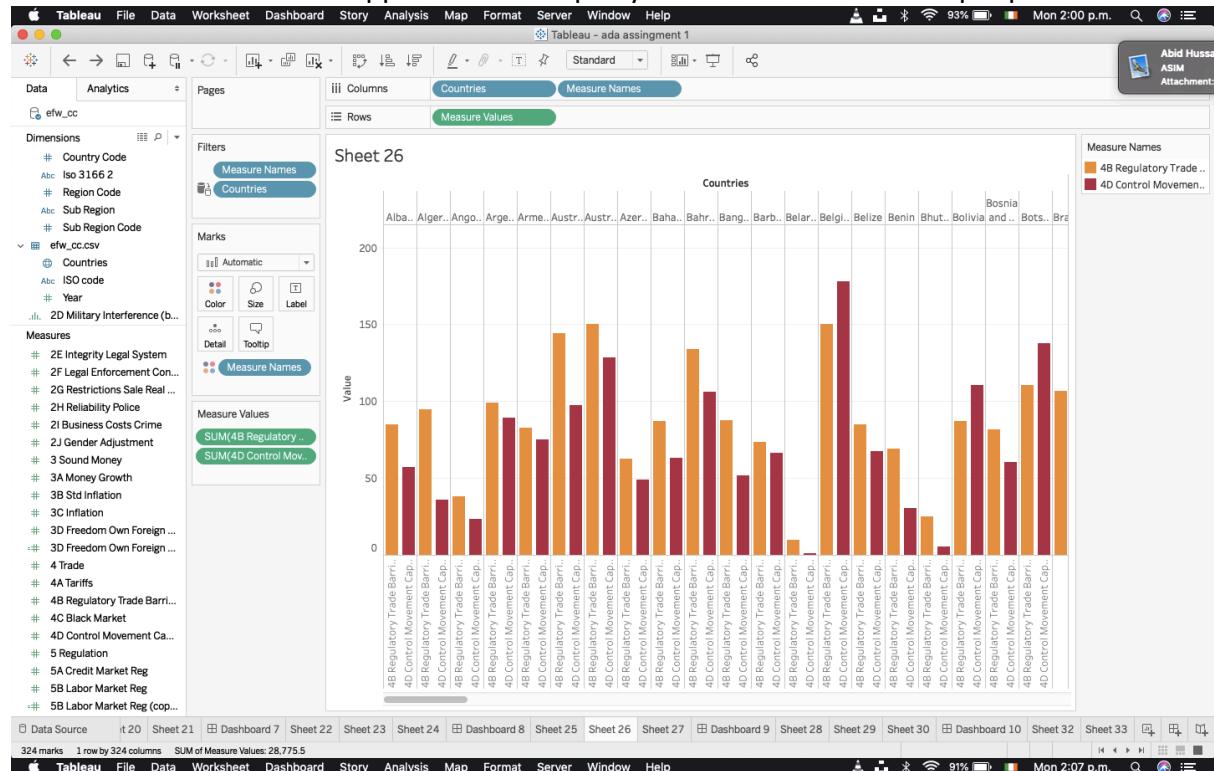
Dashboard : 9

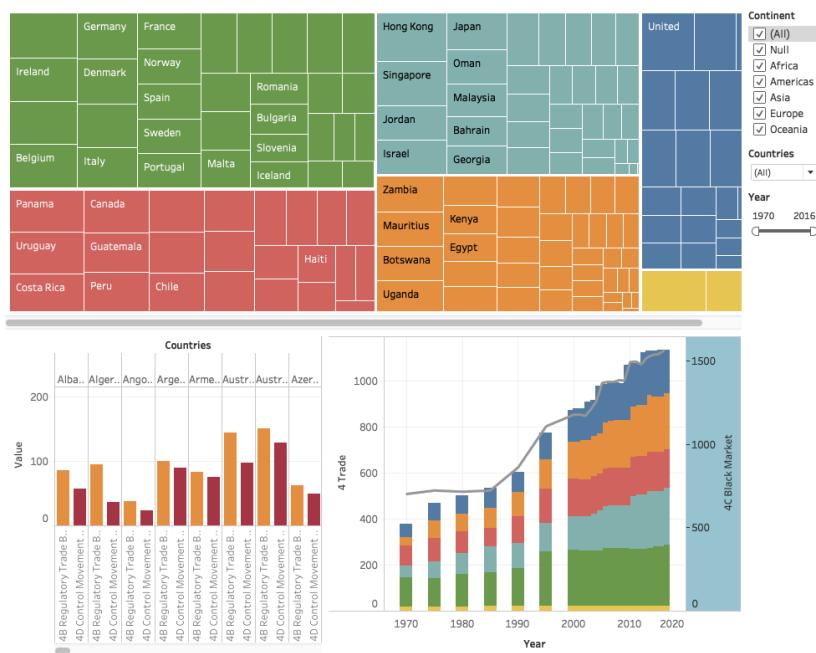
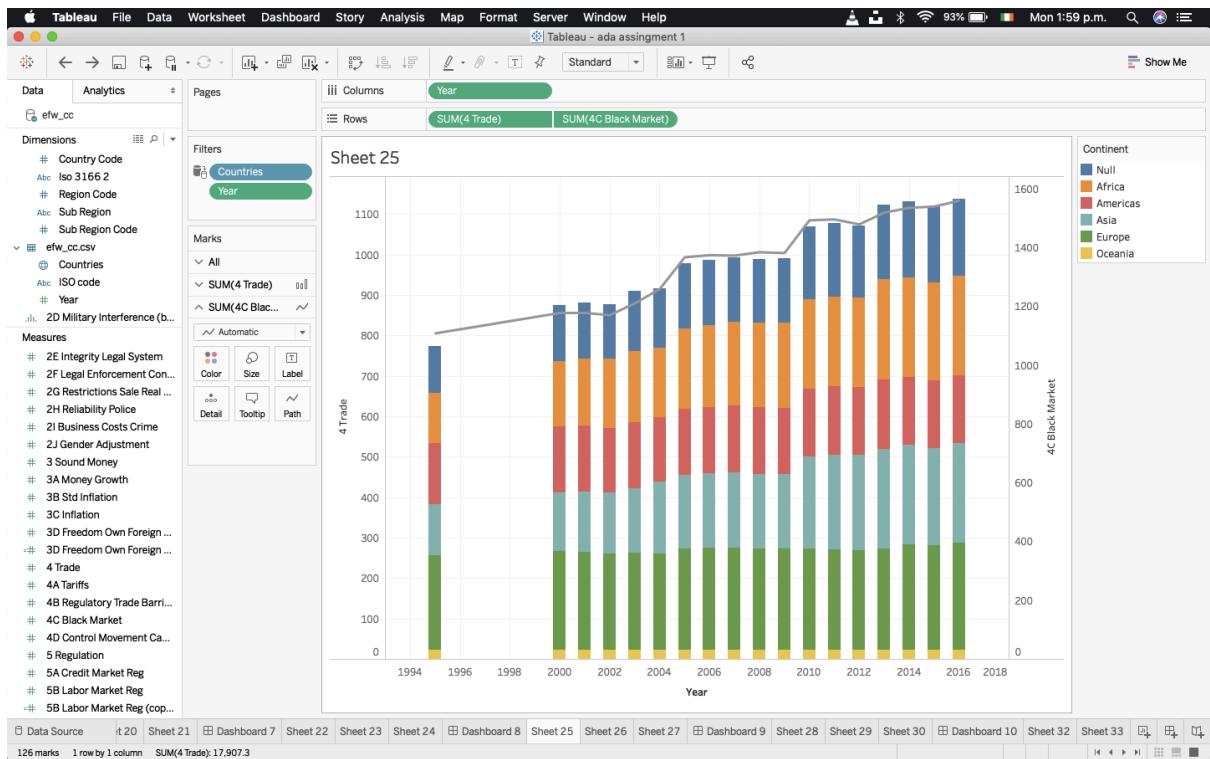
In this dashboard the main focus is on attributes which effects the economic growth negatively . The attributes used here are property rights , restriction in sale of real properties, legal enforcements.

In this all the attributes are co related to each other which effects the economic freedom of the country directly .

This is been visualised in different formats which is very much convincing and brings users attention and provides précised values for the respected values .

The main audience in this approach are Property brokers and real estate peoples .

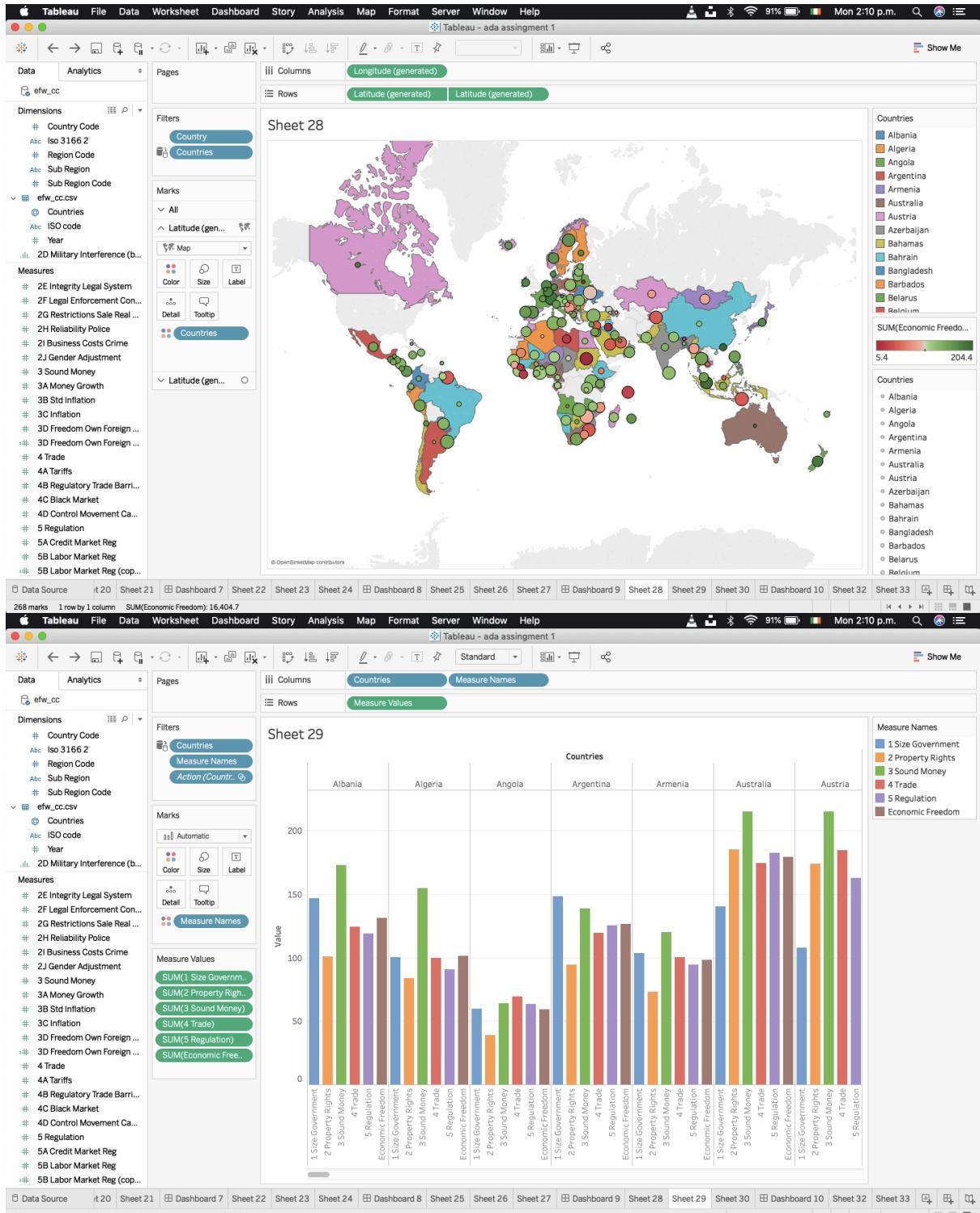


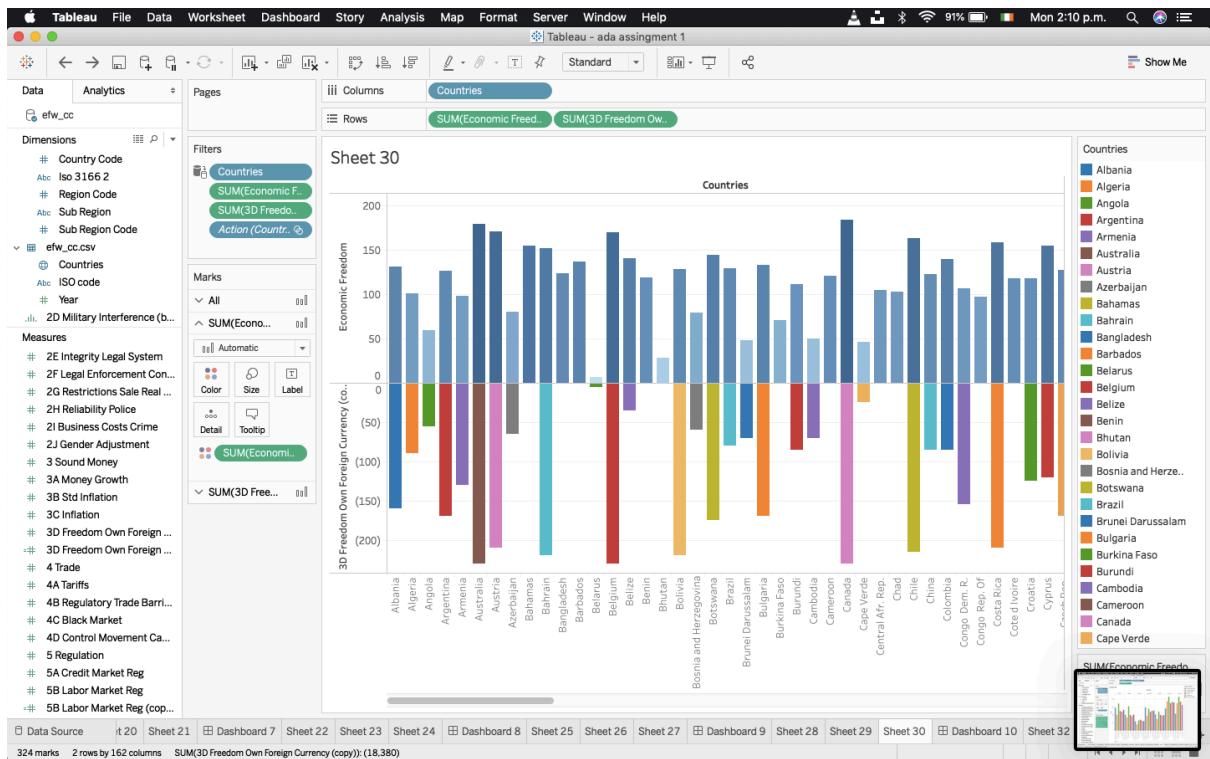


Dashboard : 10

In this dash board the main aim is to show some more negative impact towards the freedom and growth of the economy In the world. The attributes used here are trade, black market, regulatory trade barriers. In this the main focuses on impacts caused by particular country which leads to the variation of economical freedom . Due to increase of these

impacts it's been proved in the analytics that there were variation in the economical ranking of the country as well as the score .

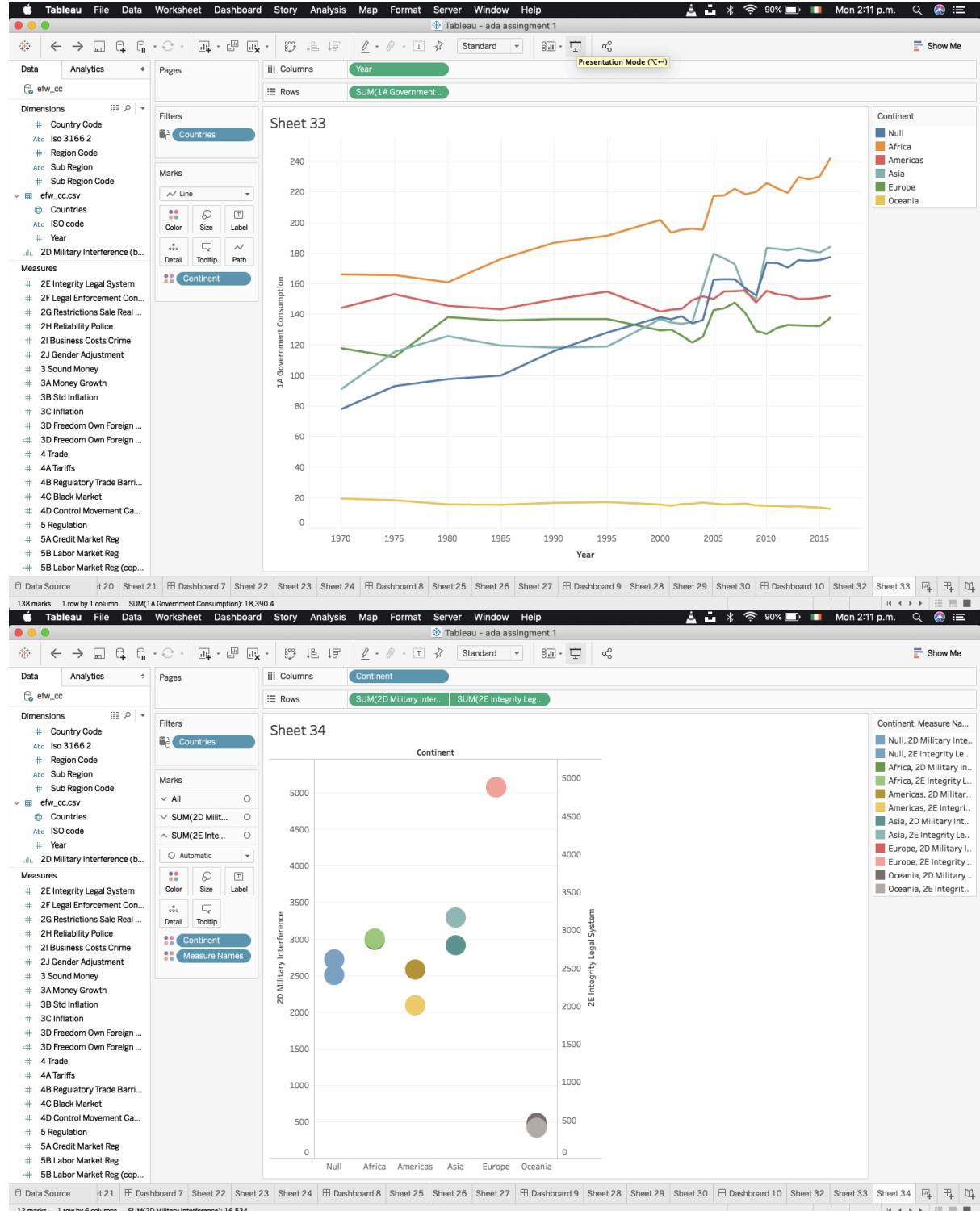


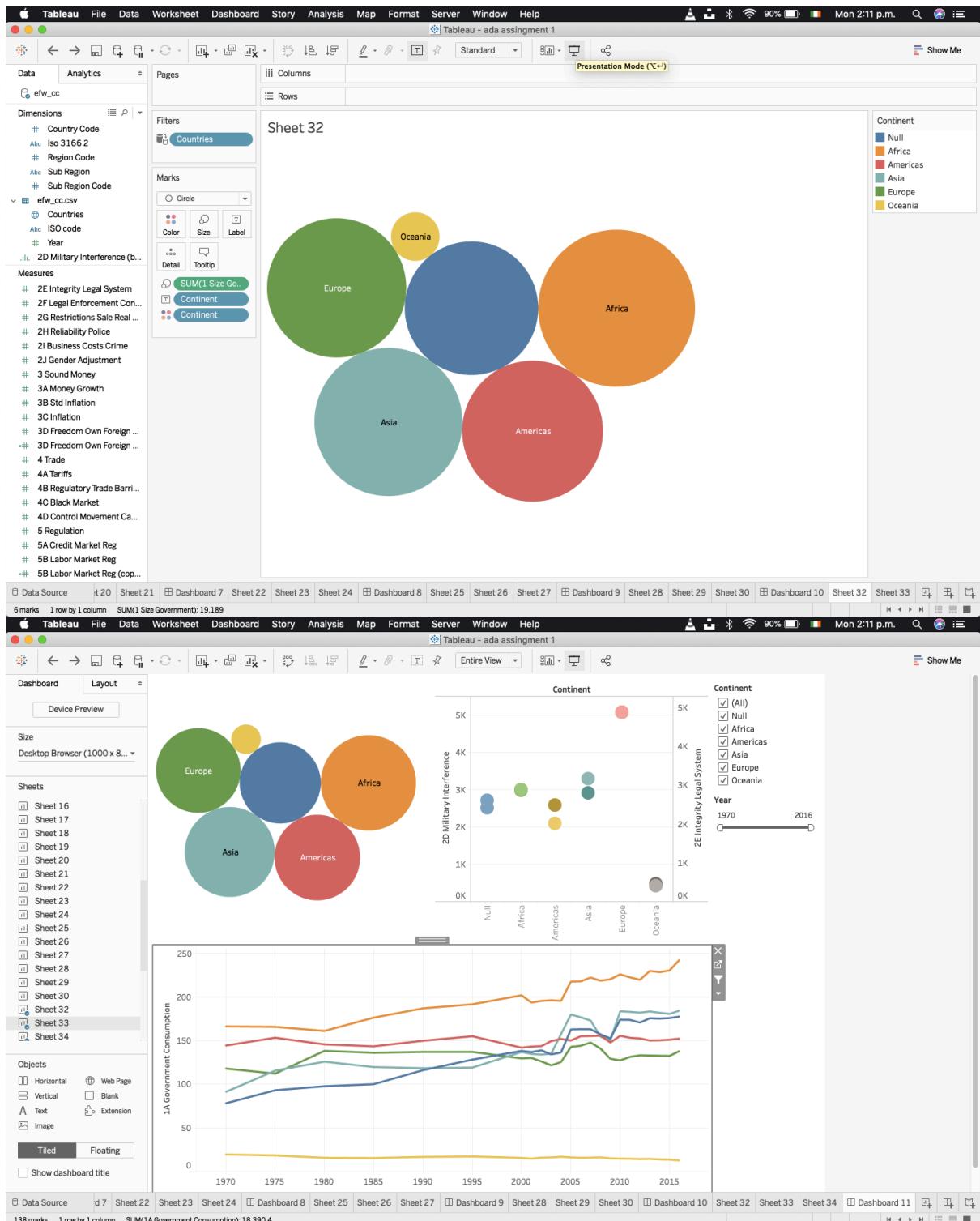


Dashboard : 11

In this dashboard We are comparing Foreign exchange and the economic freedom of the country , how far is the foreign exchange impacted to the current economic of the country. It also shows the BRIC's comparisons between selected countries and its impact to the economic freedom .

The main audience for this Dashboard are in the currency exchange markets.

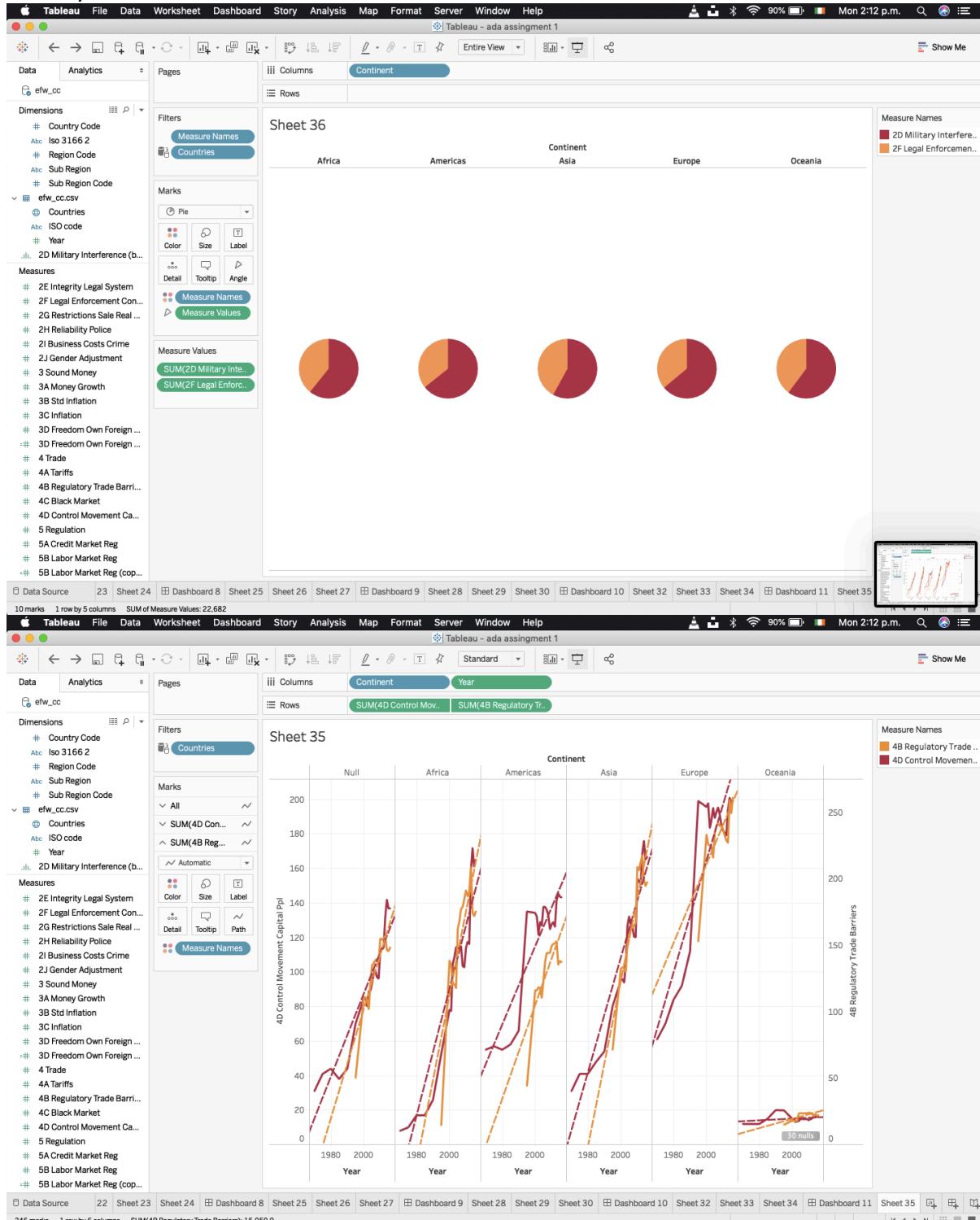


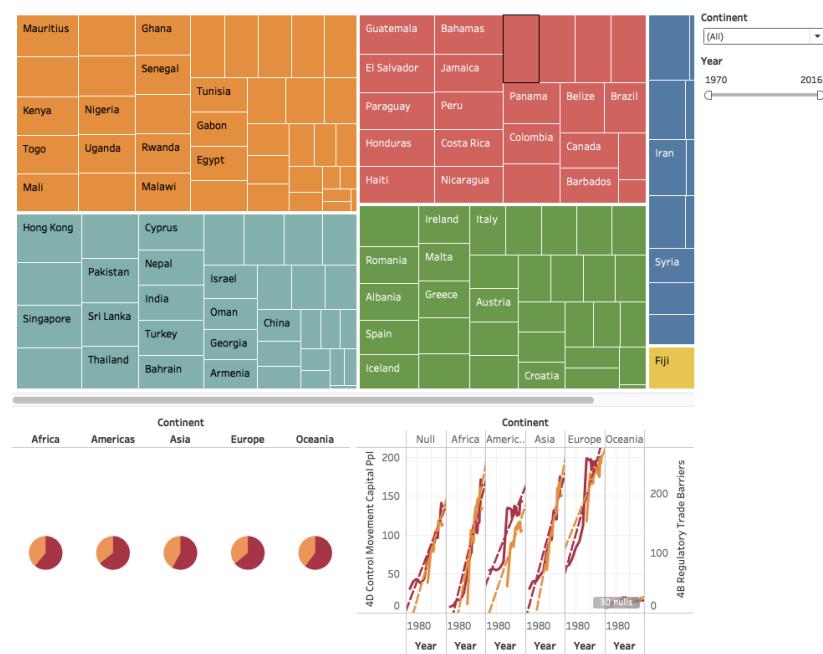
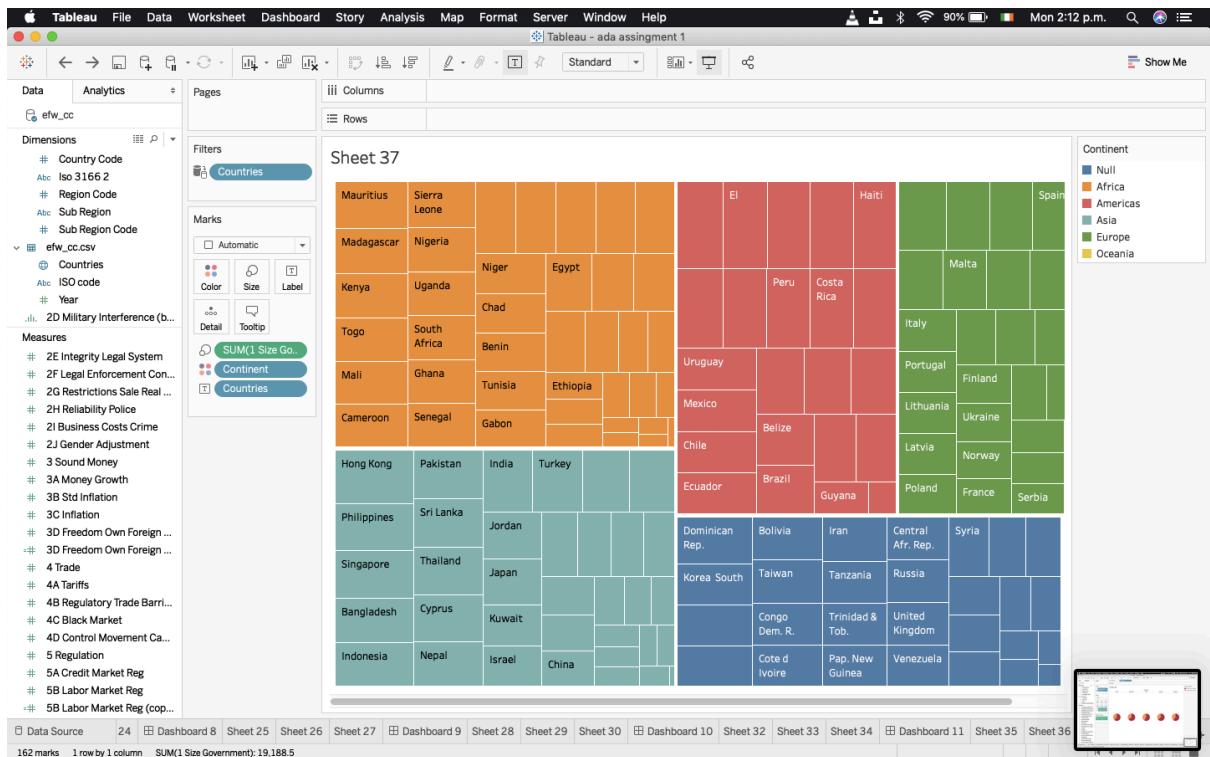


Dashboard : 12

This dashboard mainly focuses on economic Freedom effects in continental basis in respect to the government and military effects. In which we can see that Africa and Asia are in the top in this dashboard in the same time we can check the constant increase in government consumption in every continent except Oceania. It also shows that the military interference

and government consumption does effects the economic freedom for the particular country .



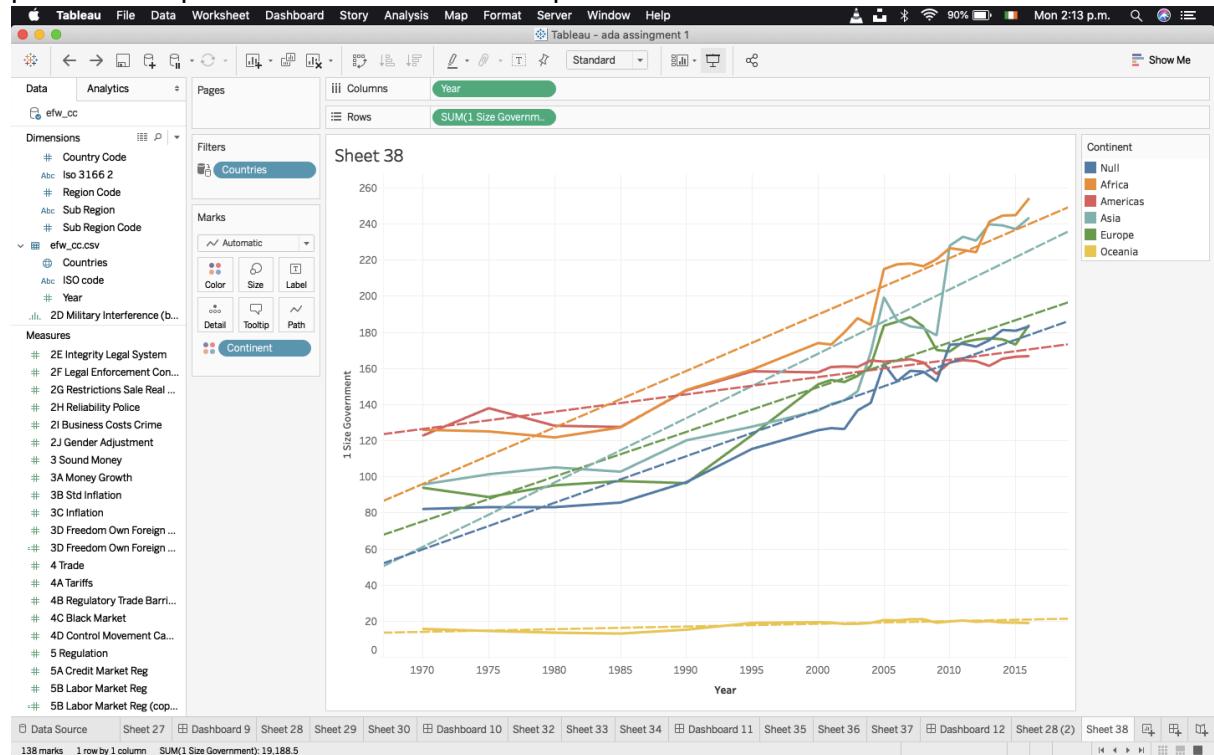


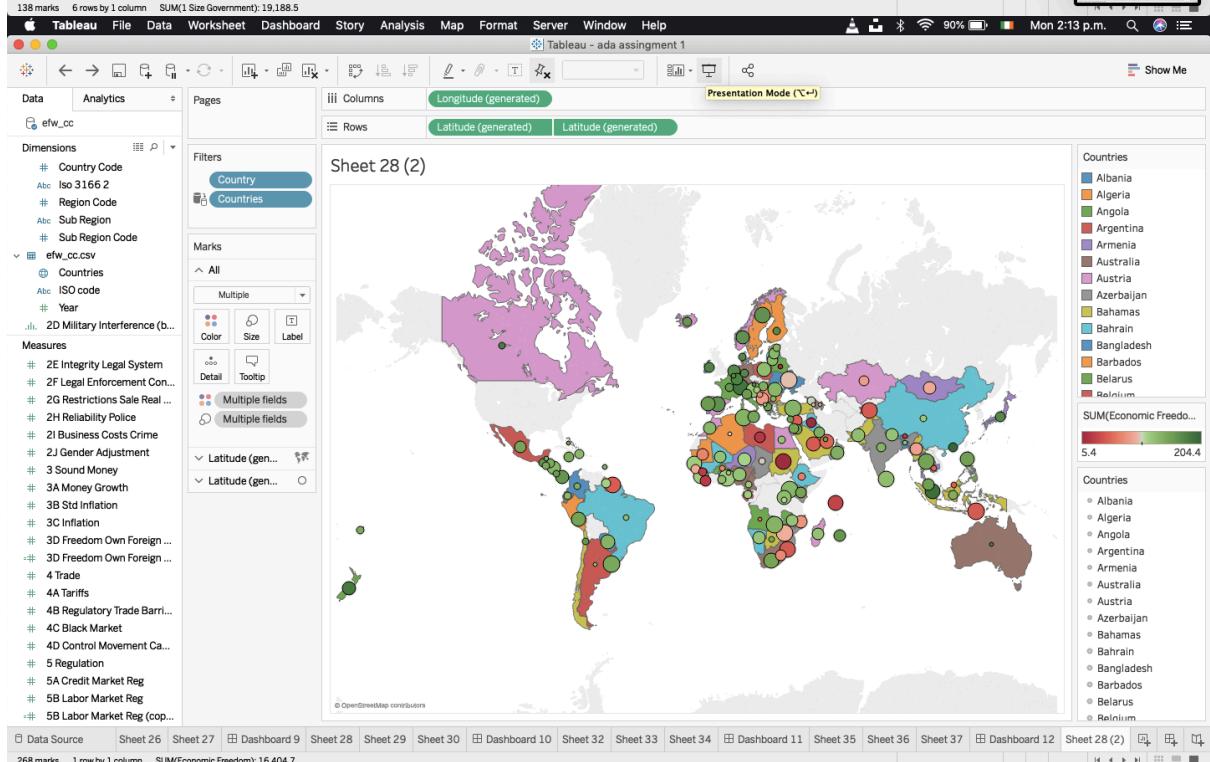
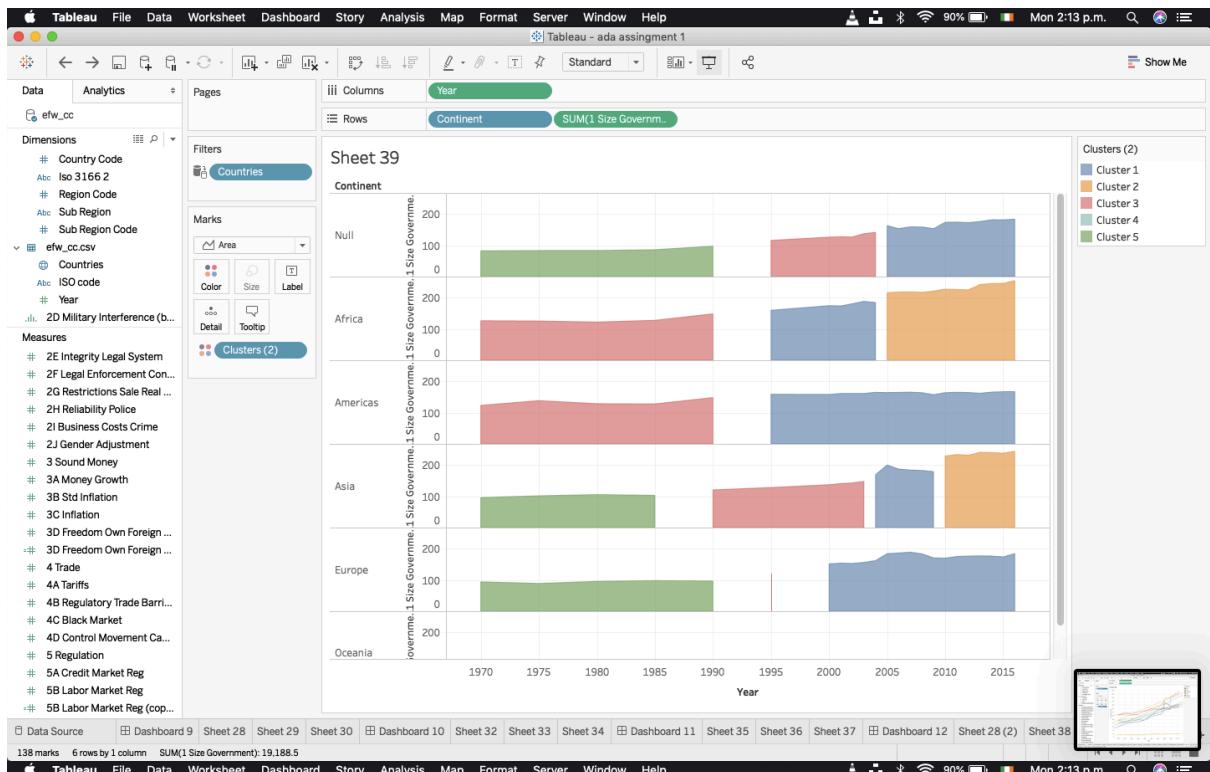
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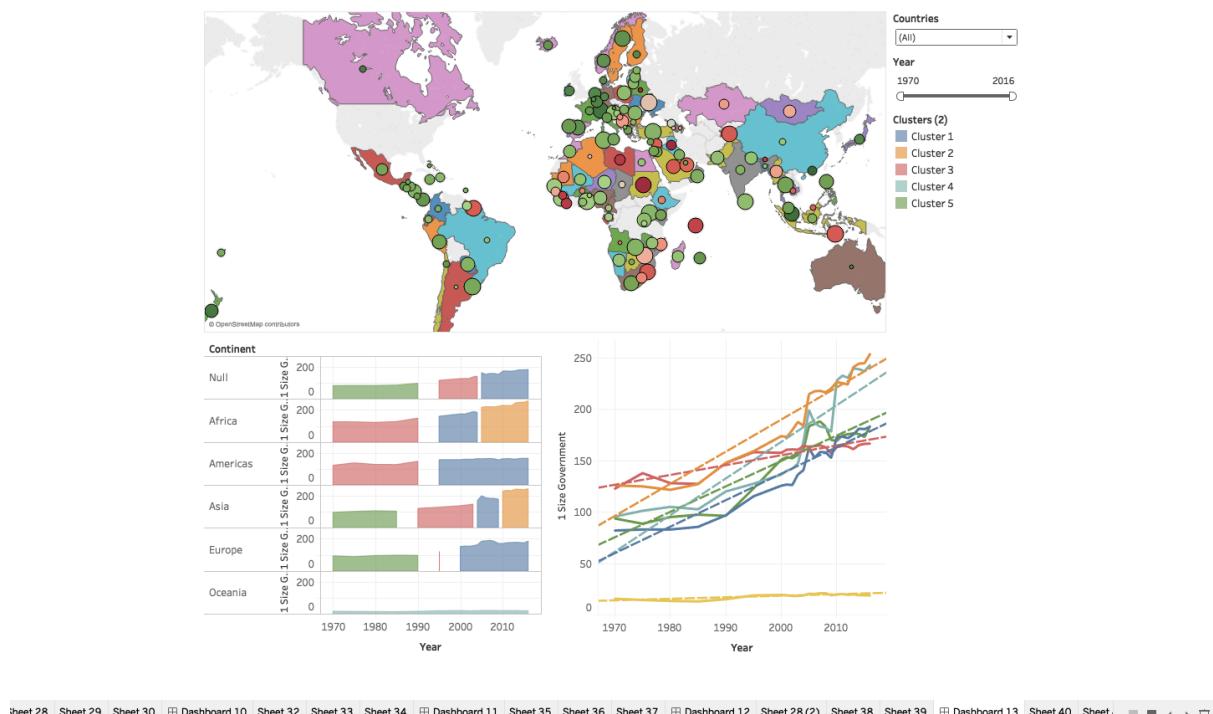
Dashboard : 13

In this dashboard we are making some prescriptive analysis for economic freedom of the world . It's been calculated from the year 1980 to 2000 for each continent . It also compare the government size of each country and also shows the size of the government with a different colour. It also compares the military interference with the legal enforcement and

provides the precise ration in the form of pie chart .

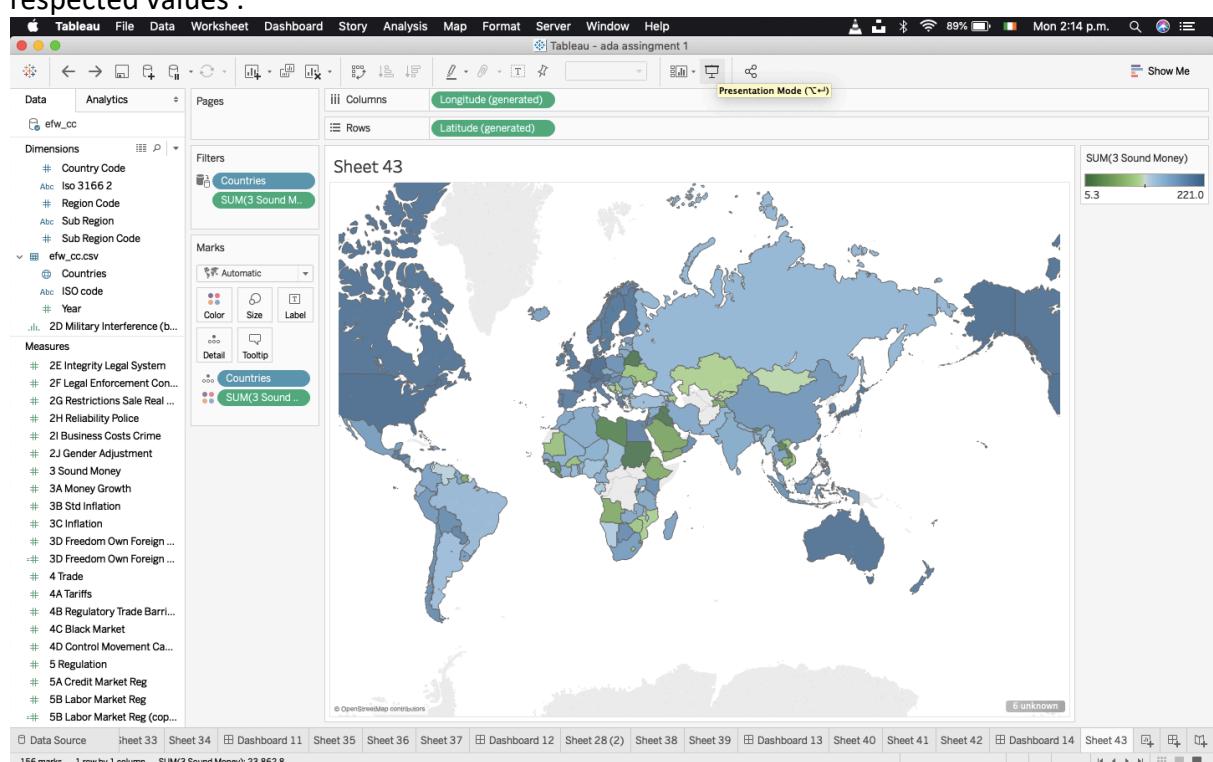


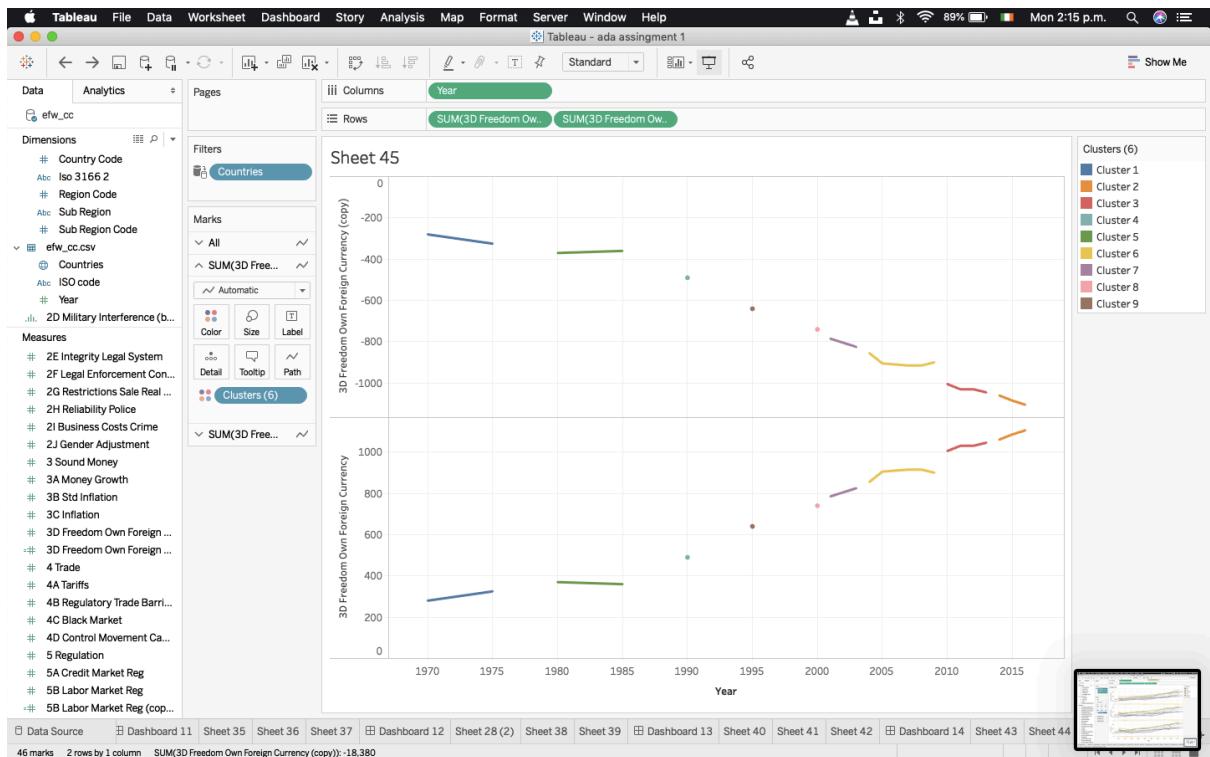
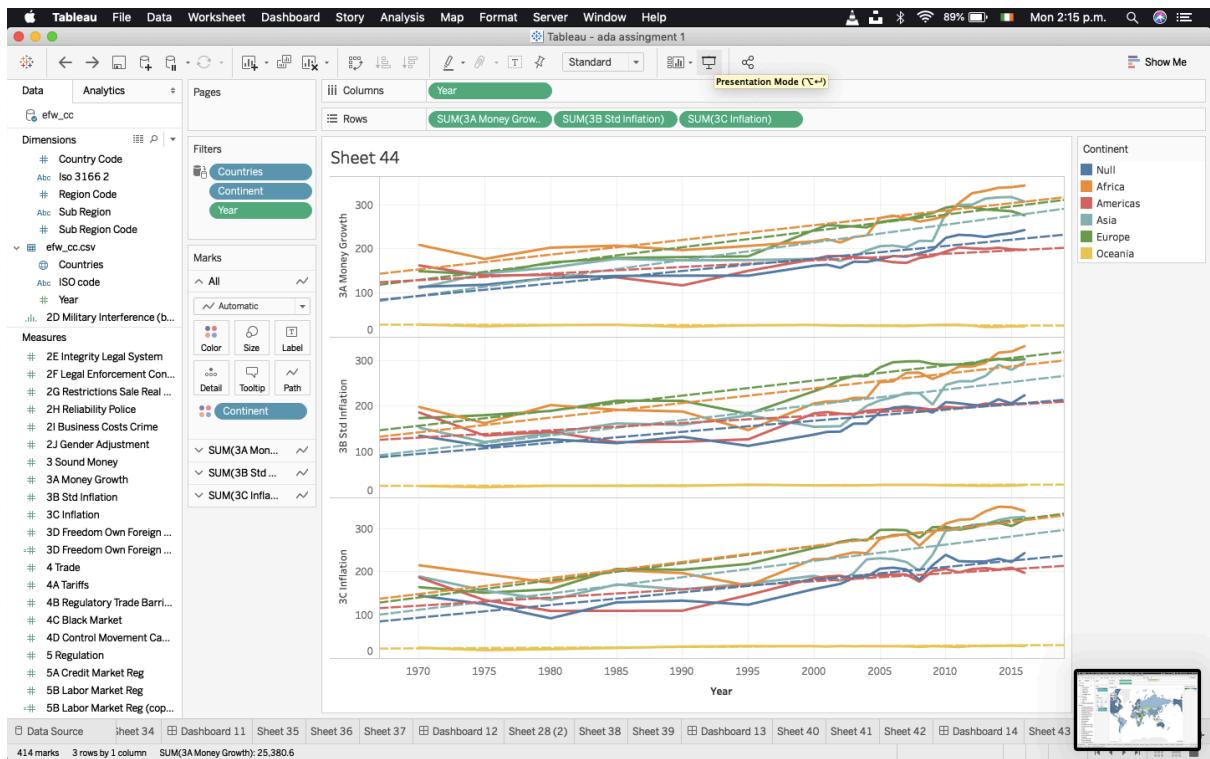


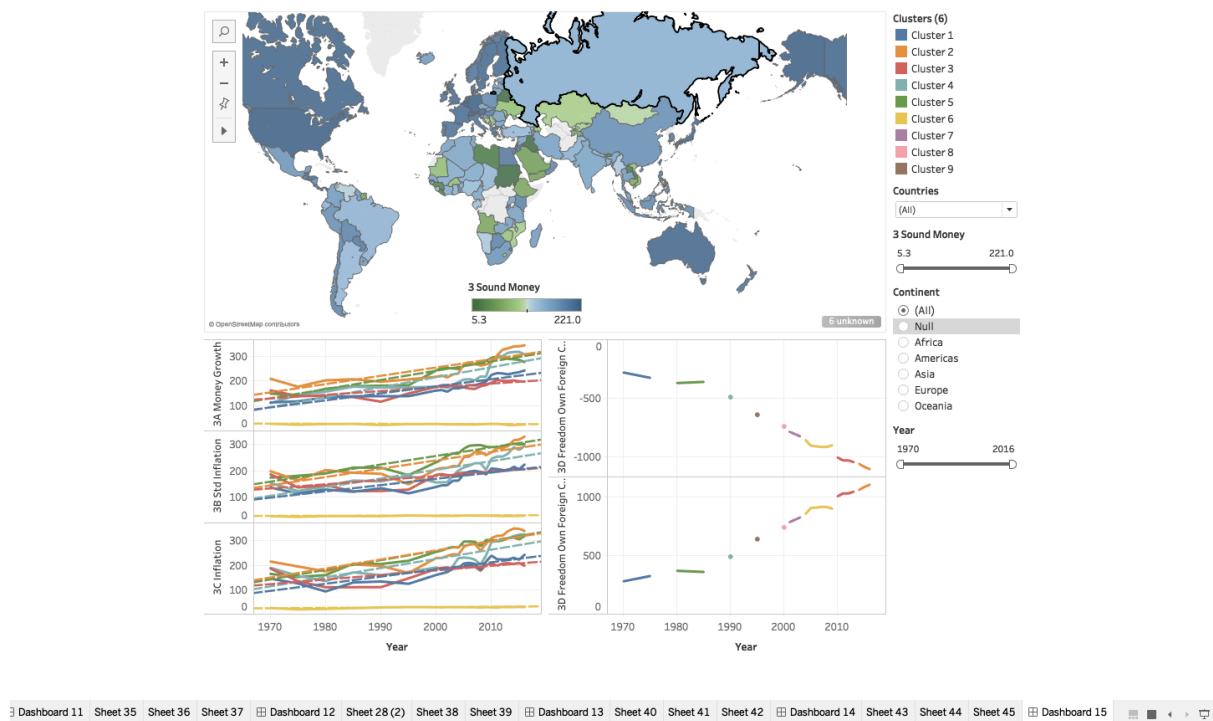


Dashboard : 14

In this Dashboard we are using 2 different prescriptive analysis to plot the graph, One is by producing clusters and another is by producing trend line . This trend line and the clusters are analysis in behalf of different continent where we were able to produce 5 clusters and the trending lines are shown in respect to the size of the government in each continent . So here we can calculate the economic freedom and its correlation effect to the trends of the respected values .







Dashboard : 15

In this dashboard we are focusing on 3 different interrelated attribute and shows there impacts on each country in respect to the economics of the country . This comparison is respect to the sound money , inflations and the freedom of foreign currency , where the density of the sound money is been shown in the world map with different heat level . The inflation trends in accordance to different continent are been also visualised . There are 9 different clusters formed which is been produce in relation to foreign currency exchange through the world . If we use the filter we can come to know the correlation of different approaches in this dashboard . And also all these attributes are interrelated to each other .

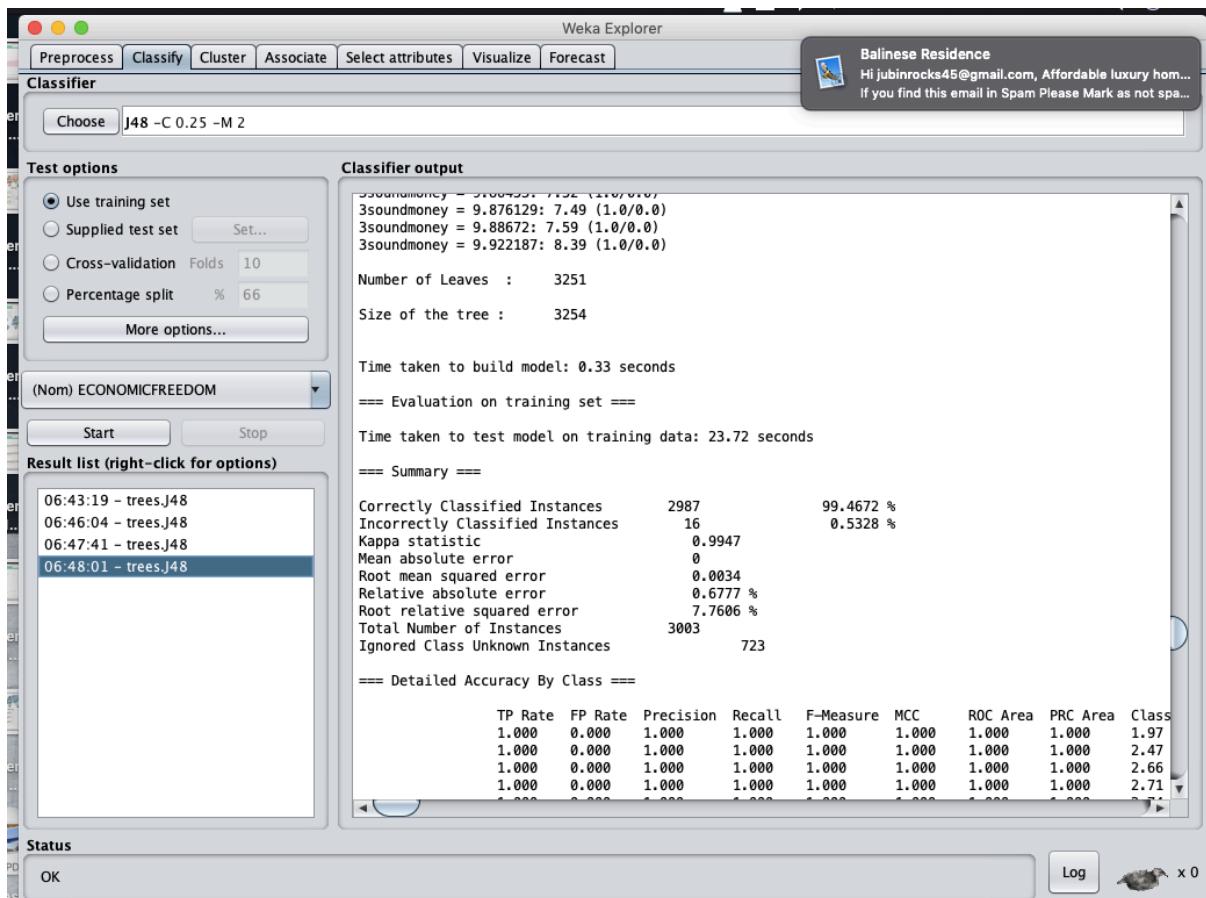
Report 2

This analysis is done in weka as my dataset doesn't allow me to do predictive analysis in tableau .

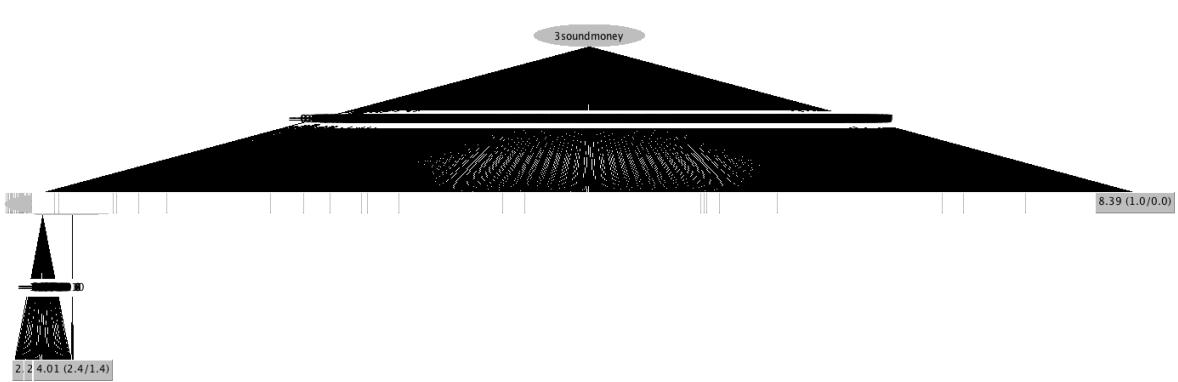
Following are my finding in different approaches and analyse it

Classification : It is a data mining technique used to predict group membership for data instances . There are different kinds of classification method and I am just pointing out some of them which would be useful for analysing .

Decision Tree : It classify instances by sorting them based on feature and values. Each node in a decision tree represents a feature in an instances to be classified, and each branch represent the value that the node can assume .



Ap



Apriori algorithm – Is an influent algorithm for mining frequent itemsets for Boolean association rules.

The screenshot shows the Weka Explorer interface with the 'Associate' tab selected. The 'Choose' button is set to 'Apriori -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1'. The 'Start' and 'Stop' buttons are visible. The 'Result list (right-click)' pane displays the output of the Apriori algorithm. The output starts with the message '==== Associator model (full training set) ====' followed by the 'Apriori' parameters: Minimum support: 0.1 (373 instances), Minimum metric <confidence>: 0.9, and Number of cycles performed: 18. It then lists the generated sets of large itemsets (L1 to L4) and the best rules found. The 'Status' pane at the bottom shows 'OK'.

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==== Associator model (full training set) ====
Apriori
=====
Minimum support: 0.1 (373 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 18

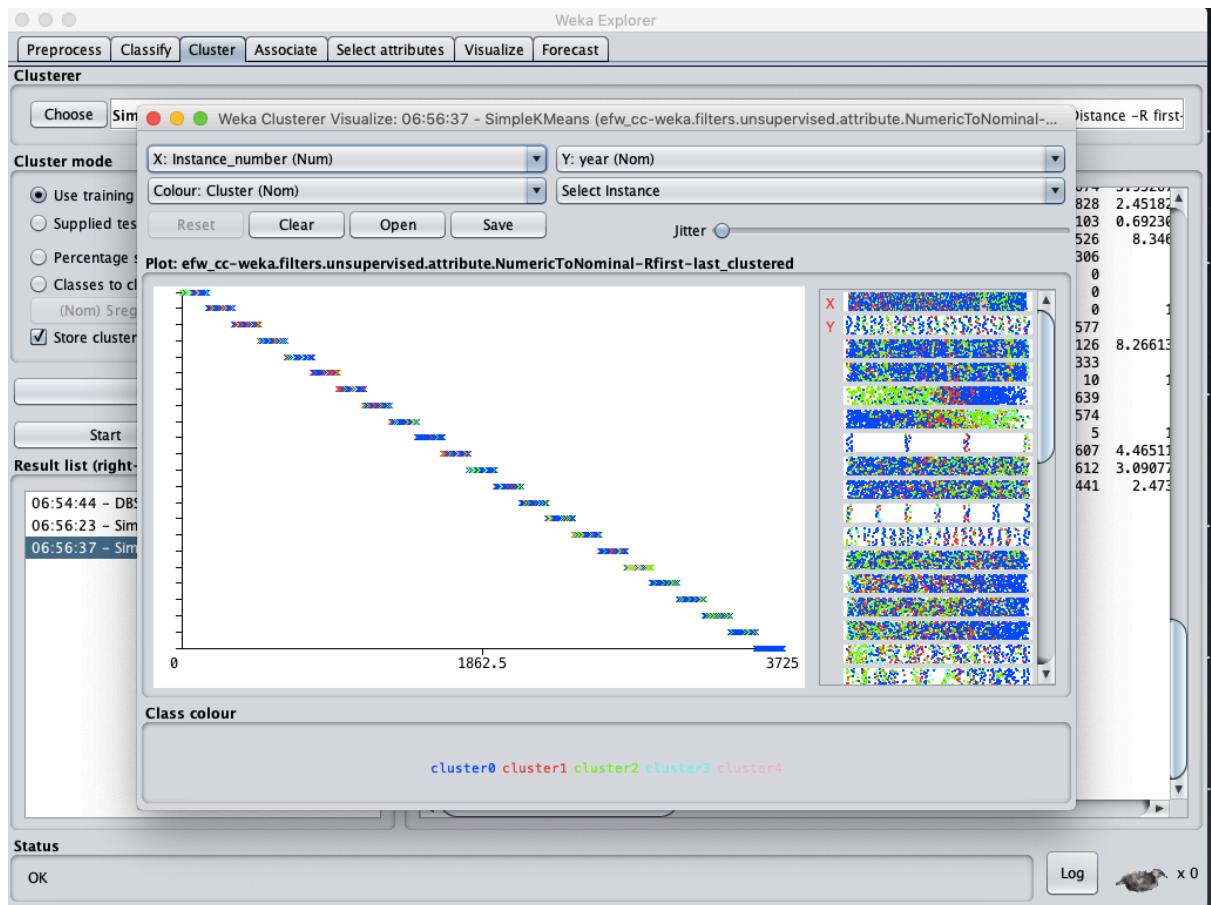
Generated sets of large itemsets:
Size of set of large itemsets L(1): 18
Size of set of large itemsets L(2): 23
Size of set of large itemsets L(3): 9
Size of set of large itemsets L(4): 1

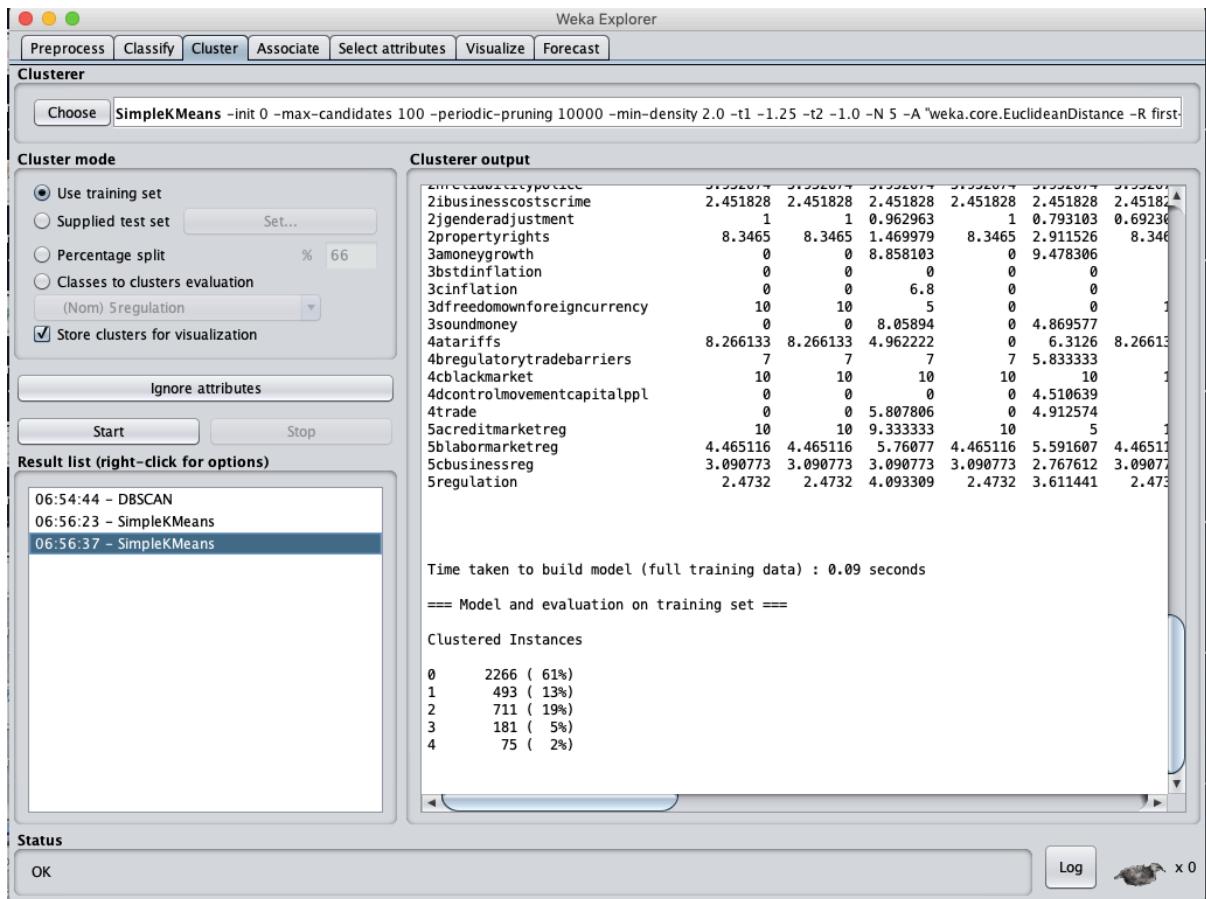
Best rules found:
1. 2dmilitaryinterference=10 3dfreedomownforeigncurrency=10 418 ==> 4cblackmarket=10 418   <conf:(1)> lift:(1.54) 1
2. quartile=1 2jgenderadjustment=1 3dfreedomownforeigncurrency=10 544 ==> 4cblackmarket=10 540   <conf:(0.99)> lift:
3. 2dmilitaryinterference=10 2jgenderadjustment=1 403 ==> 4cblackmarket=10 400   <conf:(0.99)> lift:(1.52) lev:(0.6
4. 1cgovernterprises=10 3dfreedomownforeigncurrency=10 401 ==> 4cblackmarket=10 398   <conf:(0.99)> lift:(1.52) lev:
5. 2dmilitaryinterference=10 484 ==> 4cblackmarket=10 479   <conf:(0.99)> lift:(1.52) lev:(0.04) [163] conv:(28.12)
6. 2dmilitaryinterference=8.333333 434 ==> 4cblackmarket=10 428   <conf:(0.99)> lift:(1.51) lev:(0.04) [145] conv:
7. quartile=1 3dfreedomownforeigncurrency=10 715 ==> 4cblackmarket=10 705   <conf:(0.99)> lift:(1.51) lev:(0.06) [2
8. 2jgenderadjustment=1 3dfreedomownforeigncurrency=10 822 ==> 4cblackmarket=10 802   <conf:(0.98)> lift:(1.5) lev:
9. quartile=1 2jgenderadjustments=1 574 ==> 4cblackmarket=10 560   <conf:(0.98)> lift:(1.5) lev:(0.05) [186] conv:(1
10. quartile=1 756 ==> 4cblackmarket=10 732   <conf:(0.97)> lift:(1.49) lev:(0.06) [239] conv:(10.54)

```

It shows the best 10 rule which are associated with each other and can be corelated . This algorithm helps to identify interesting relation between different variables in a large dataset . So in the above figure shows the relation between different variables and how they are related to each other .

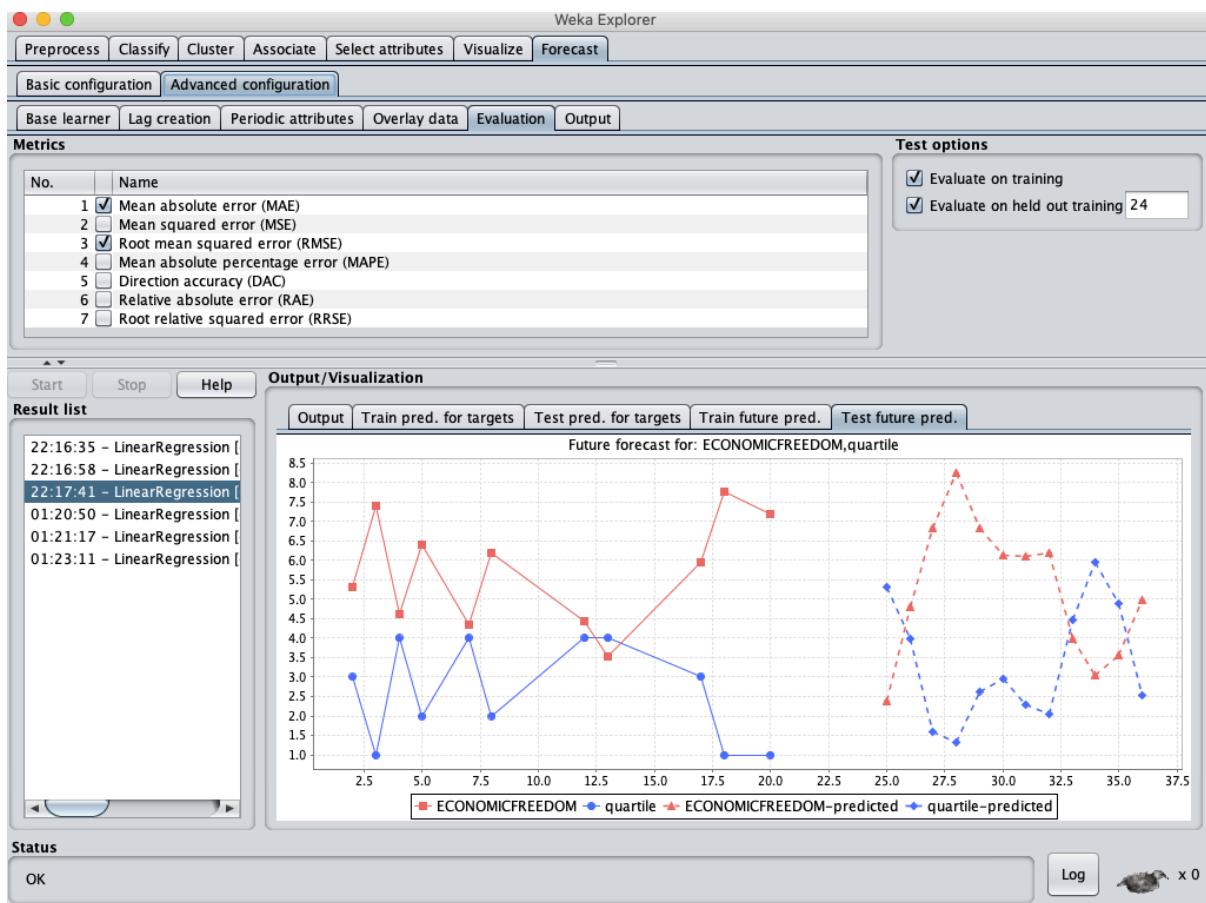
K Means clustering – It is a method used to identify different number of cluster in data mining . K means cluster aims to partition n observations into K clusters in which each observation belongs to the cluster with the nearest mean .

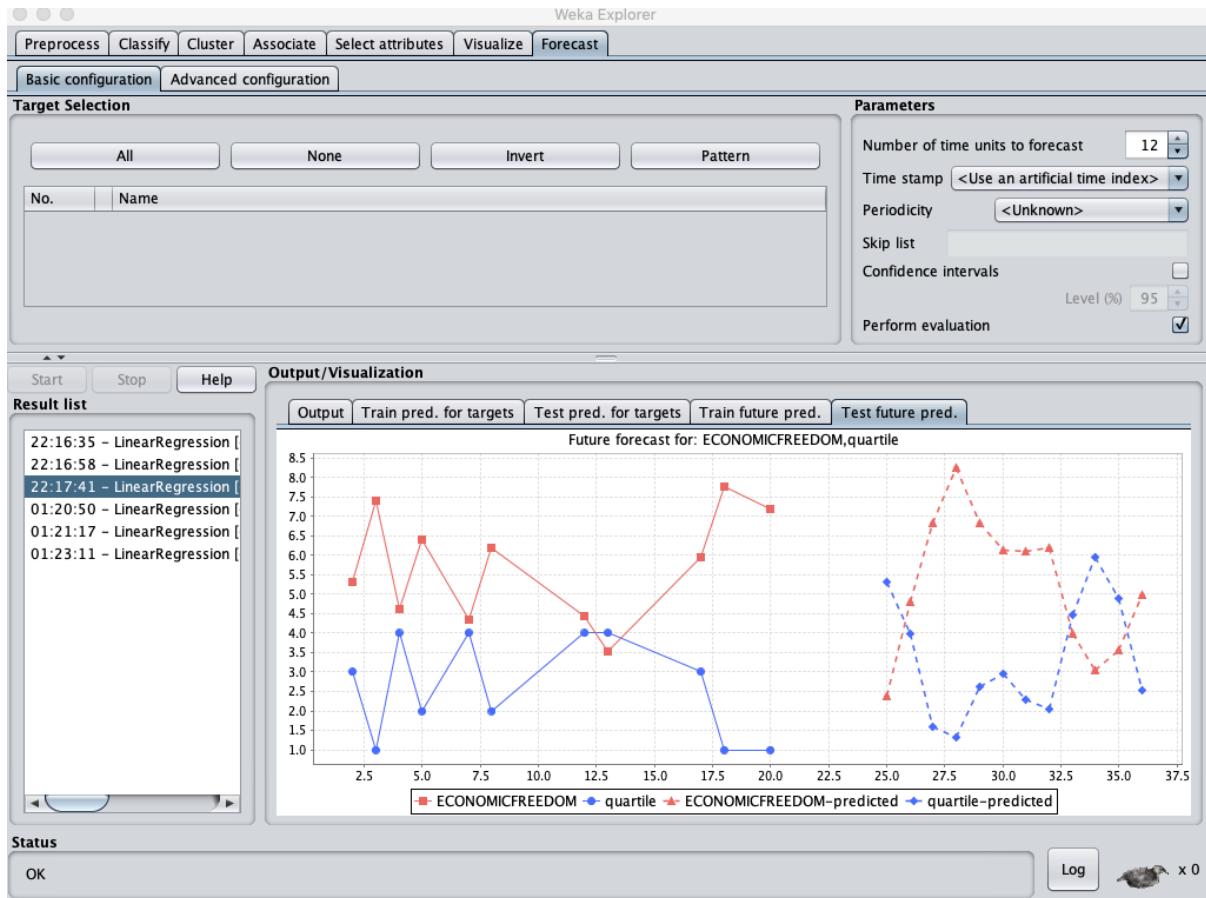




Forecasting Using Weka :

Time series analysis is the process of using statistical techniques to model and explain a time-dependent series of data points. Time series forecasting is the process of using a model to generate predictions (forecasts) for future events based on known past events. Time series data has a natural temporal ordering - this differs from typical data mining/machine learning applications where each data point is an independent example of the concept to be learned, and the ordering of data points within a data set does not matter. Examples of time series applications include: capacity planning, inventory replenishment, sales forecasting and future staffing levels.





In this predictive analysis we are using 2 variable Economicfreedom and Quartile . Where we can clearly see the predicted and the actual line and where bot the variable are been correlated with each other . If the economic freedom is more the quartile would be less. The future prediction here is been shown for the next 2 years which is been configured in the advance option and the instances for time unit forecast is been mentioned as 12 .