EDA Africa Crisis

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Context

This dataset is a derivative of Reinhart et. al's Global Financial Stability dataset which can be found online at: https://www.hbs.edu/behavioral-finance-and-financial-stability/data/Pages/global.aspx

The dataset will be valuable to those who seek to understand the dynamics of financial stability within the African context.

Content

The dataset specifically focuses on the Banking, Debt, Financial, Inflation and Systemic Crises that occurred, from 1860 to 2014, in 13 African countries, including: Algeria, Angola, Central African Republic, Ivory Coast, Egypt, Kenya, Mauritius, Morocco, Nigeria, South Africa, Tunisia, Zambia and Zimbabwe.

Acknowledgements

Reinhart, C., Rogoff, K., Trebesch, C. and Reinhart, V. (2019) Global Crises Data by Country. [online] https://www.hbs.edu/behavioral-finance-and-financial-stability/data. Available at: https://www.hbs.edu/behavioral-finance-and-financial-stability/data/Pages/global.aspx [Accessed: 17 July 2019].

Inspiration

My inspiration stems from two questions: "Which factors are most associated with general Crises in Africa?" And; "How do the annual CPI Inflation rate change after the independence of each country?"

Analyzing Data

I started to analyze the data set through its columns and its type data.

Columns

- **case (integer)**: A number which denotes a specific country.
- **cc3 (string)**: A three letter country code.
- **country (string)**: The name of the country.
- **year (integer)**: The year of the observation.
- **systemic_crisis (binary category integer)**: "0" means that no systemic crisis occurred in the year and "1" means that a systemic crisis occurred in the year.
- **exch_usd (float)**: The exchange rate of the country vis-a-vis the USD.
- **domestic_debt_in_default (binary category integer)**: "0" means that no sovereign domestic debt default occurred in the year and "1" means that a sovereign domestic debt default occurred in the year.
- **sovereign_external_debt_default (binary category integer)**: "0" means that no sovereign external debt default occurred in the year and "1" means that a sovereign external debt default occurred in the year.
- **gdp_weighted_default (float)**: The total debt in default vis-a-vis the GDP.
- **inflation_annual_cpi (float)**: The annual CPI Inflation rate.
- **independence (binary category integer)**: "0" means "no independence" and "1" means "independence".
- **currency_crises (binary category integer)**: "0" means that no currency crisis occurred in the year and "1" means that a currency crisis occurred in the year.
- **inflation_crises (binary category integer)**: "0" means that no inflation crisis occurred in the year and "1" means that an inflation crisis occurred in the year.
- **banking_crisis (binary category string)**: "no_crisis" means that no banking crisis occurred in the year and "crisis" means that a banking crisis occurred in the year.

Univariate Analysis

Modification in the data set

As first step I rounded the columns ‘exch_usd’ and ‘inflation_annual_cpi’ to 5 decimal to not have long numbers, then I eliminated the columns ‘cc3’, ‘case’ and ‘gdp_weighted_default’ because they are not necessary, and I added a new column to change the value of the column ‘banking_crisis’ to **binary category string** for graph well.

Data shape

The data have 1059 observations and 12 columns.

Data info

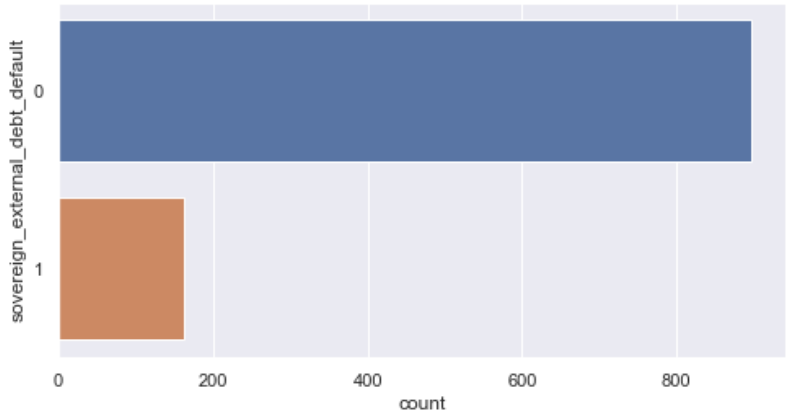
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1059 entries, 0 to 1058
Data columns (total 12 columns):
country                          1059 non-null object
year                             1059 non-null int64
systemic_crisis                  1059 non-null int64
exch_usd                         1059 non-null float64
domestic_debt_in_default         1059 non-null int64
sovereign_external_debt_default  1059 non-null int64
inflation_annual_cpi             1059 non-null float64
independence                     1059 non-null int64
currency_crises                  1059 non-null int64
inflation_crises                 1059 non-null int64
banking_crisis                   1059 non-null object
crisis_value                     1059 non-null int64
dtypes: float64(2), int64(8), object(2)
memory usage: 99.4+ KB
```

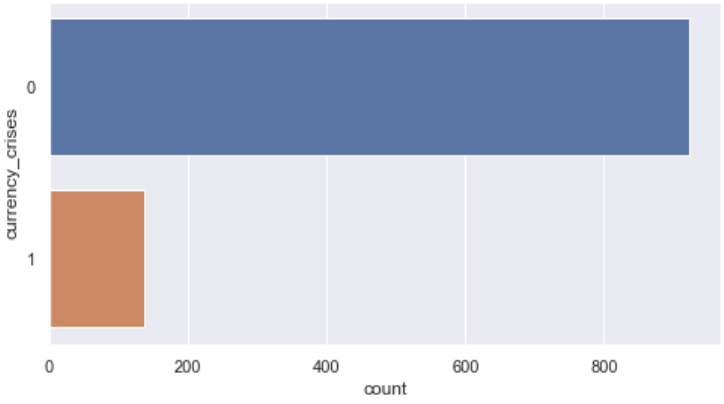
Describe Data (inflation and exch usd)

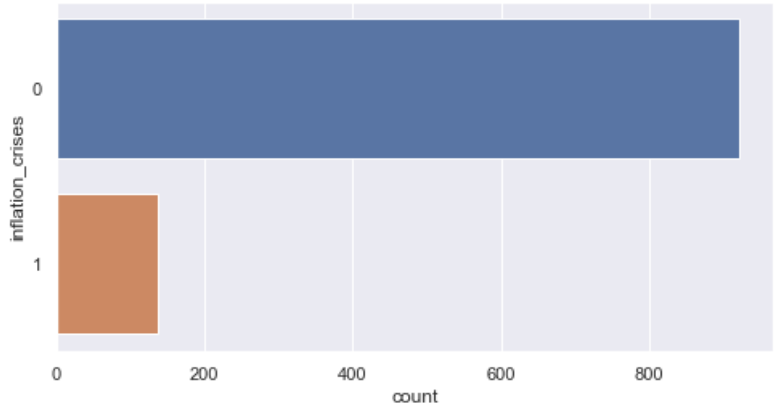
	count	mean	std	min	25%	50%	75%	max
inflation_annual_cpi	1059.0	20848.892444	675727.429176	-28.50214	2.08616	5.76233	11.64405	2.198970e+07
exch_usd	1059.0	43.140831	111.475380	0.00000	0.19535	0.86840	8.46275	7.443061e+02

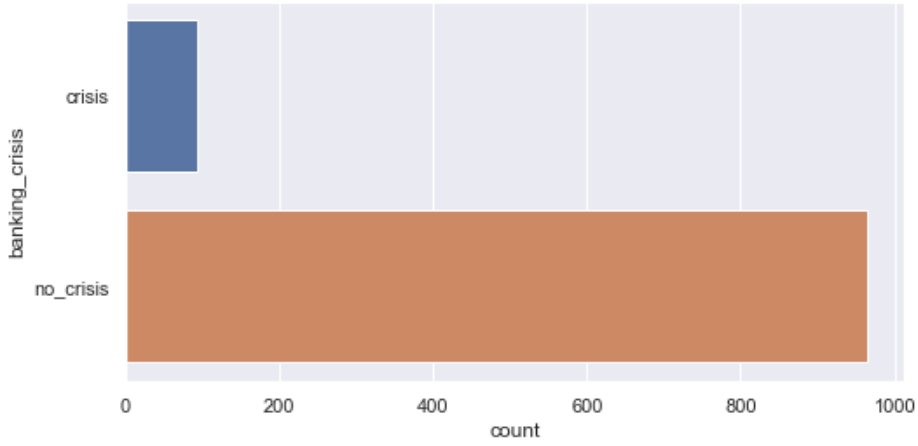
Count Graphs

In this step I did a general count for each type of crisis to analyze the frequency of the crisis that occurred, from 1960 to 2014. In the graphs we can see that there were more sovereign external debt default crisis and that also say us there were many inflation crisis and currency crisis. The last graph shows if there was a general crisis of the countries.



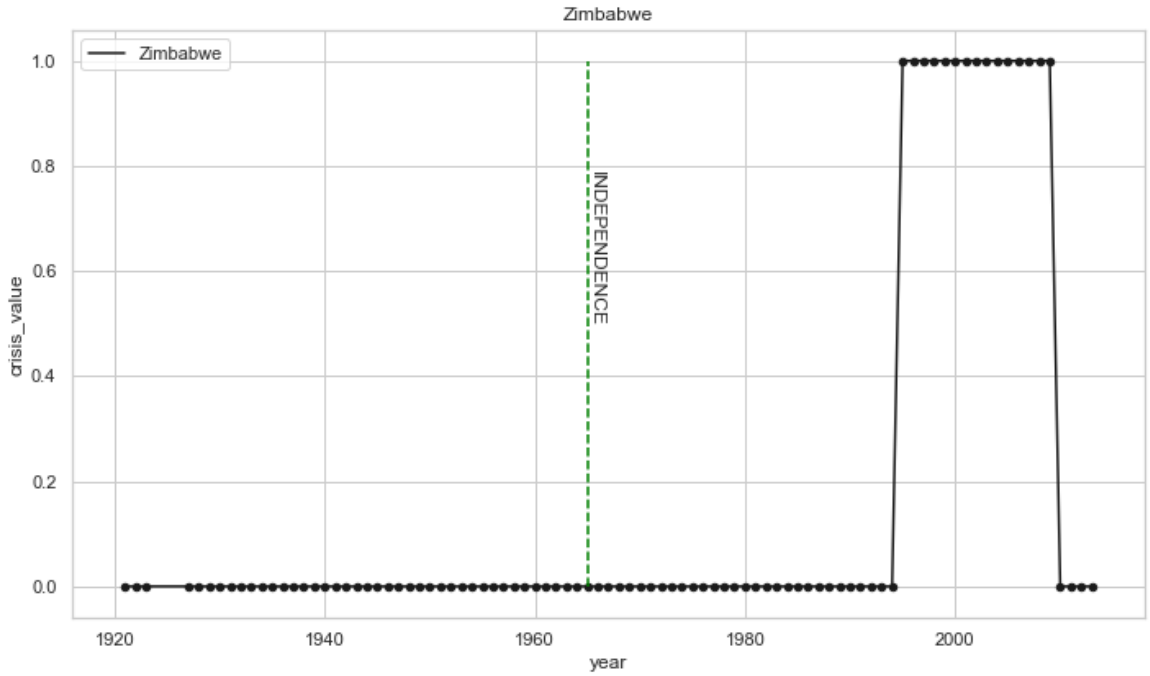


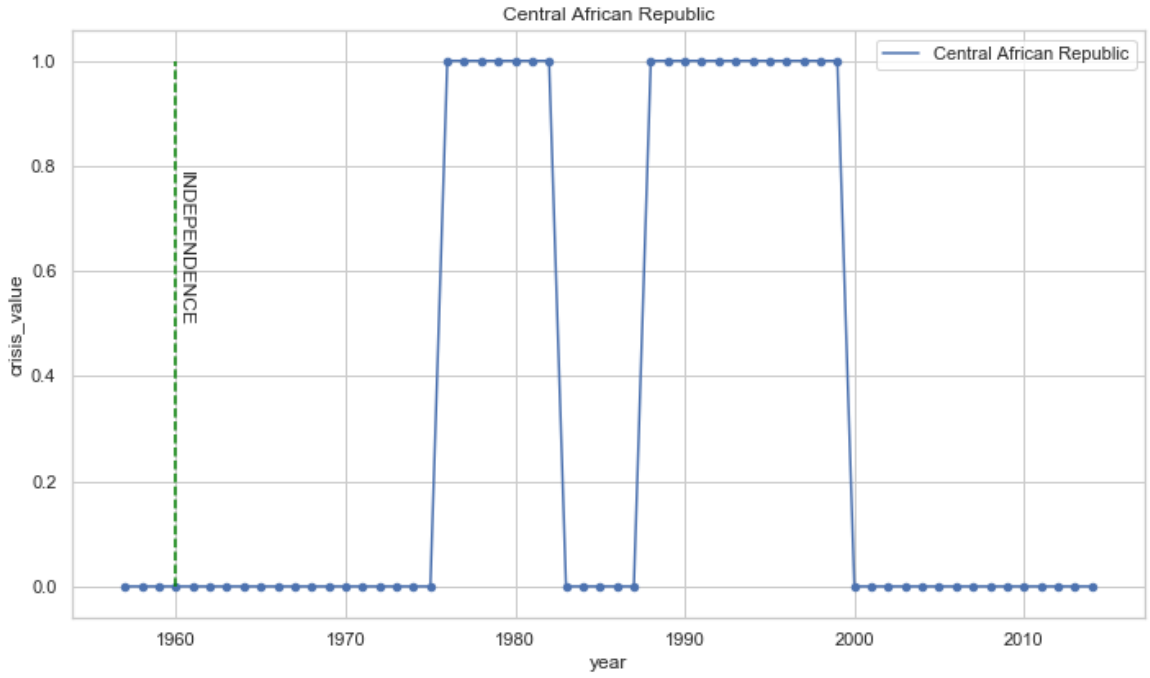


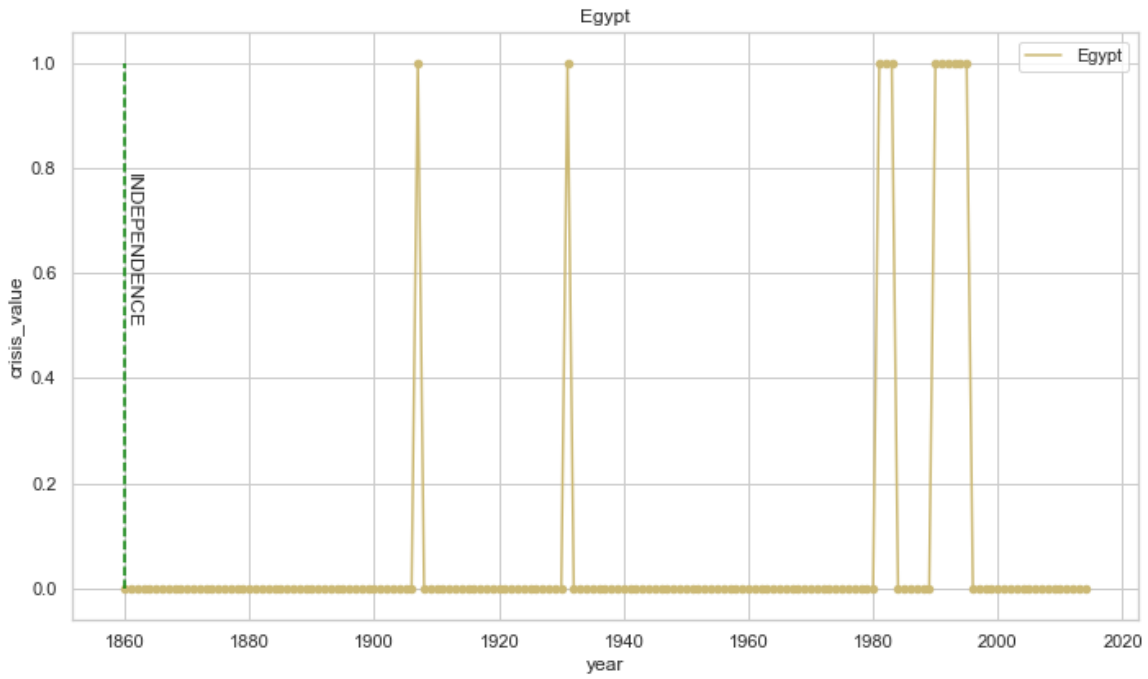

banking_crisis
crisis
no_crisis
0
200
400
600
800
1000
count

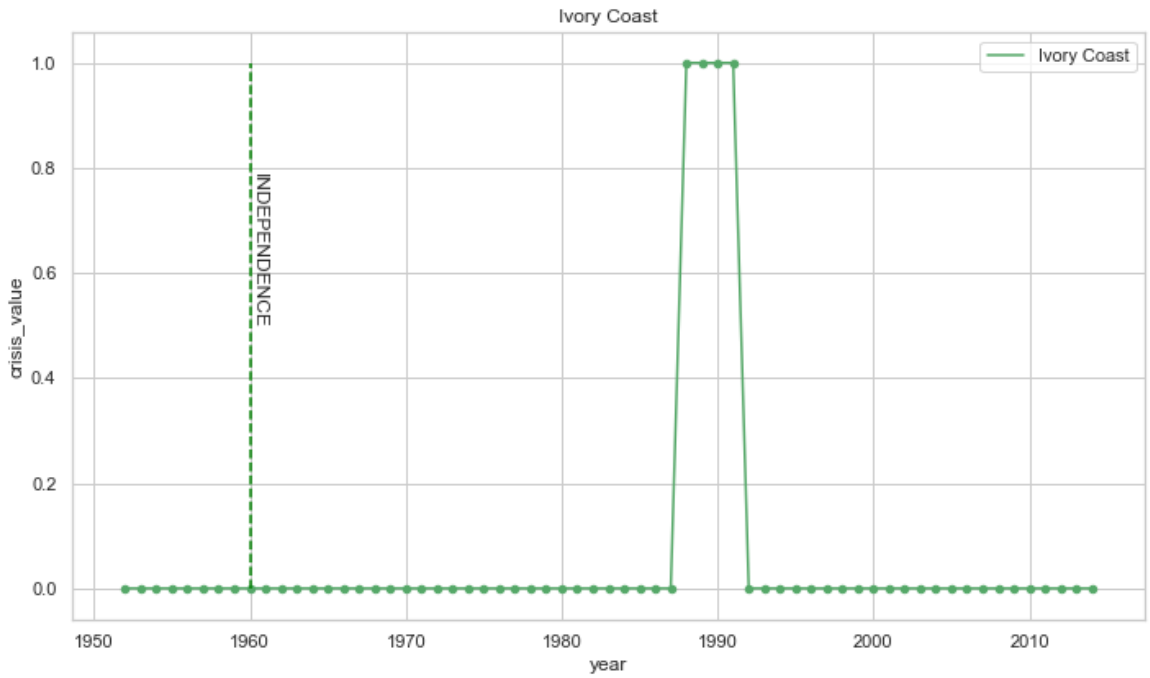
Multivariate Analysis

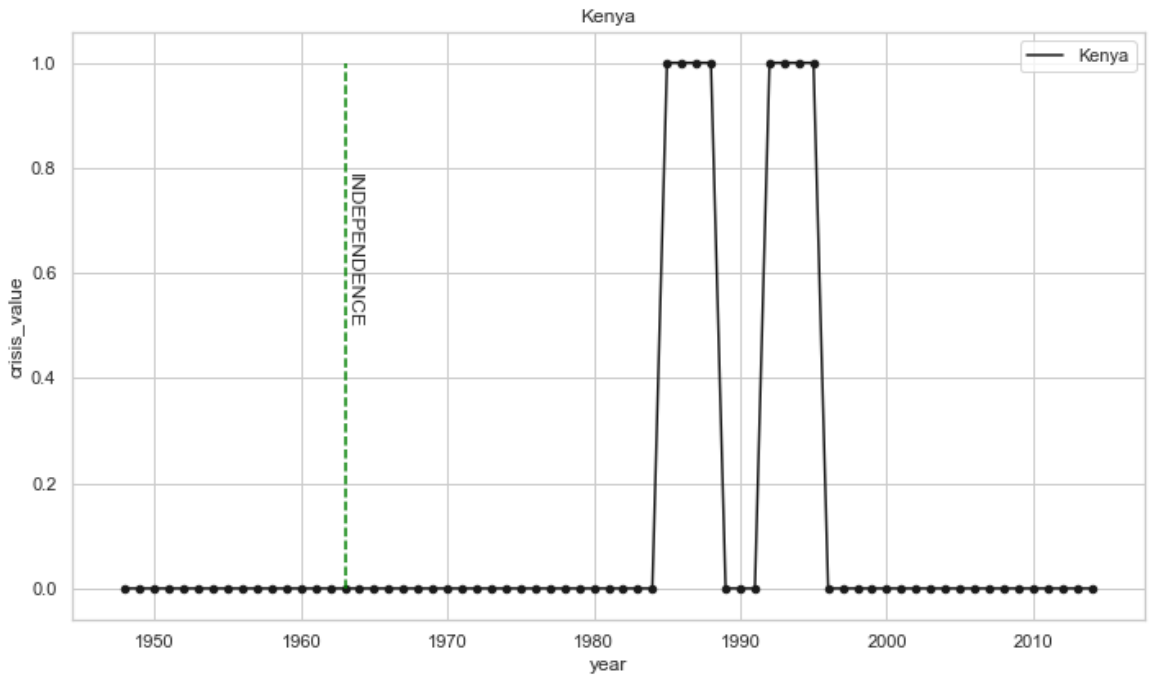
In this part I analyzed the data of an interesting way, how many general crises were in each year in each country after the independence of the country? This analysis is going to say us if the independence of the country influences that there is more general crisis.

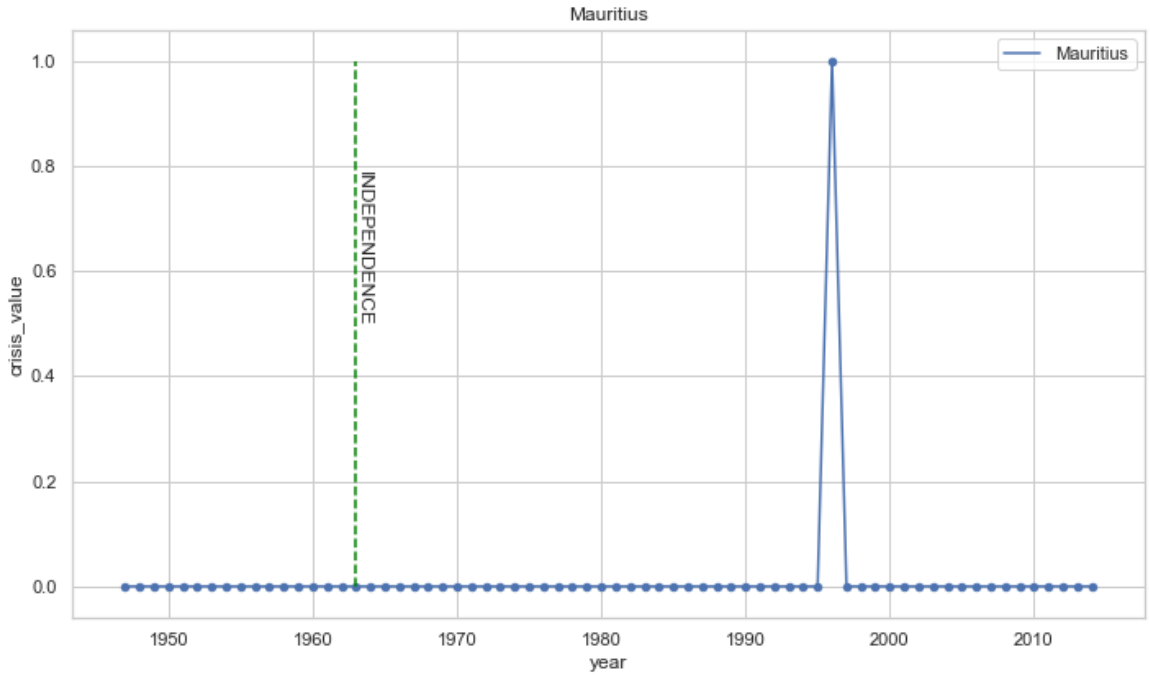


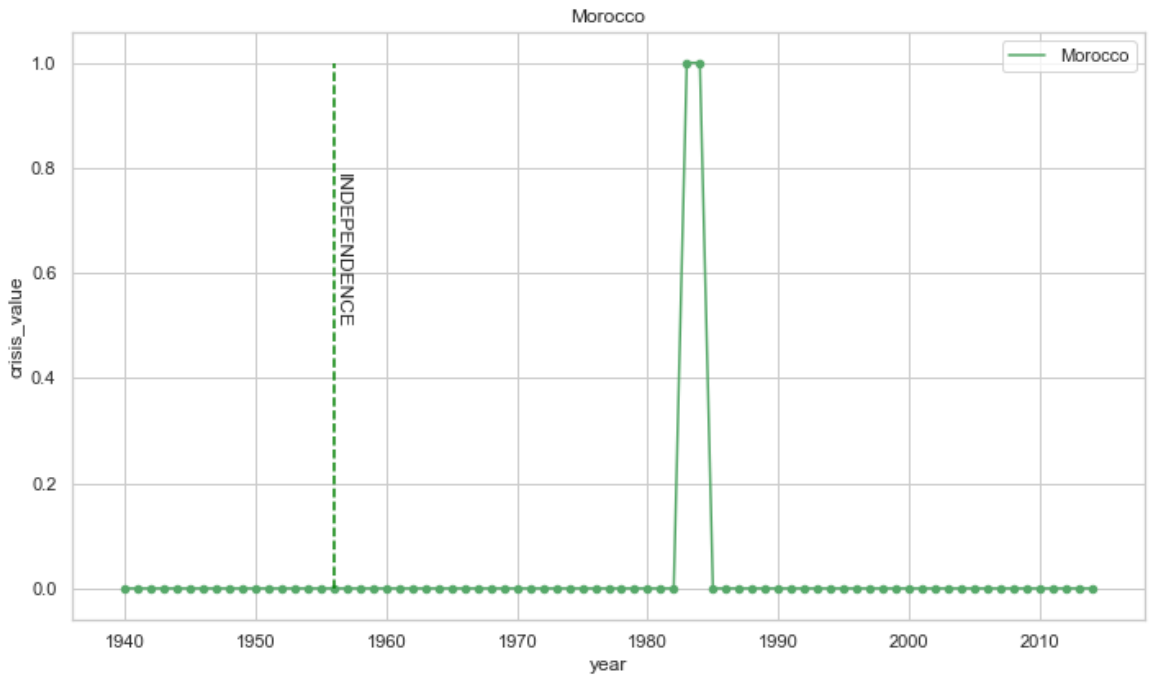


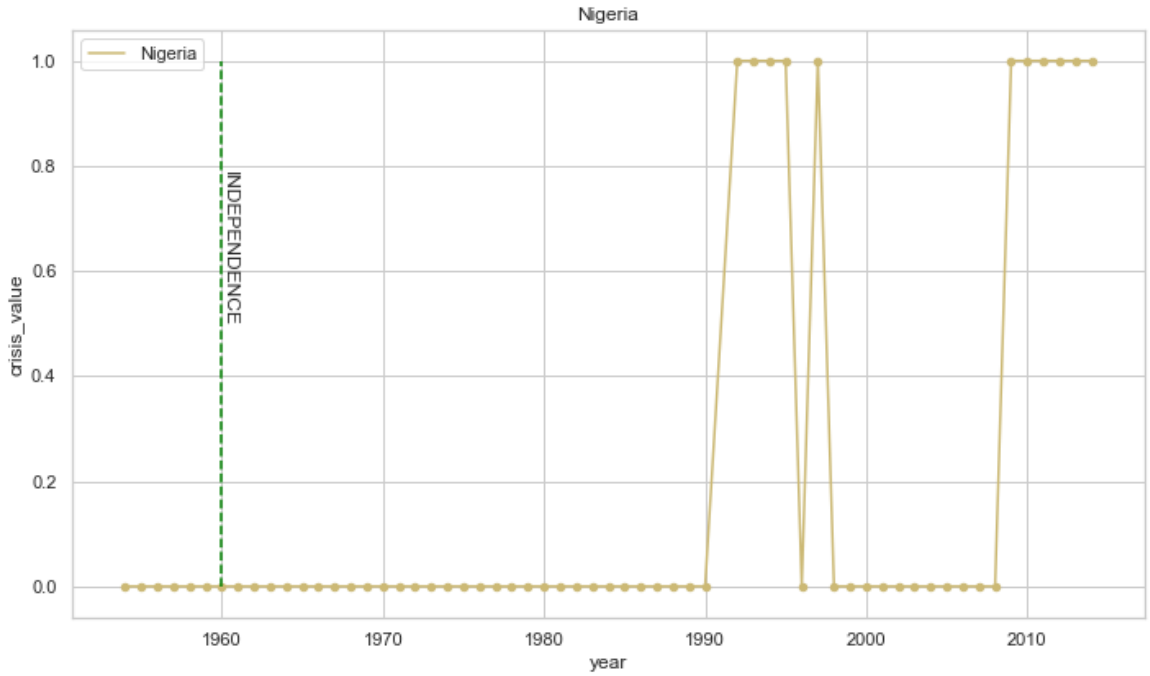

Egypt
Egypt
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1860
1880
1900
1920
1940
1960
1980
2000
2020

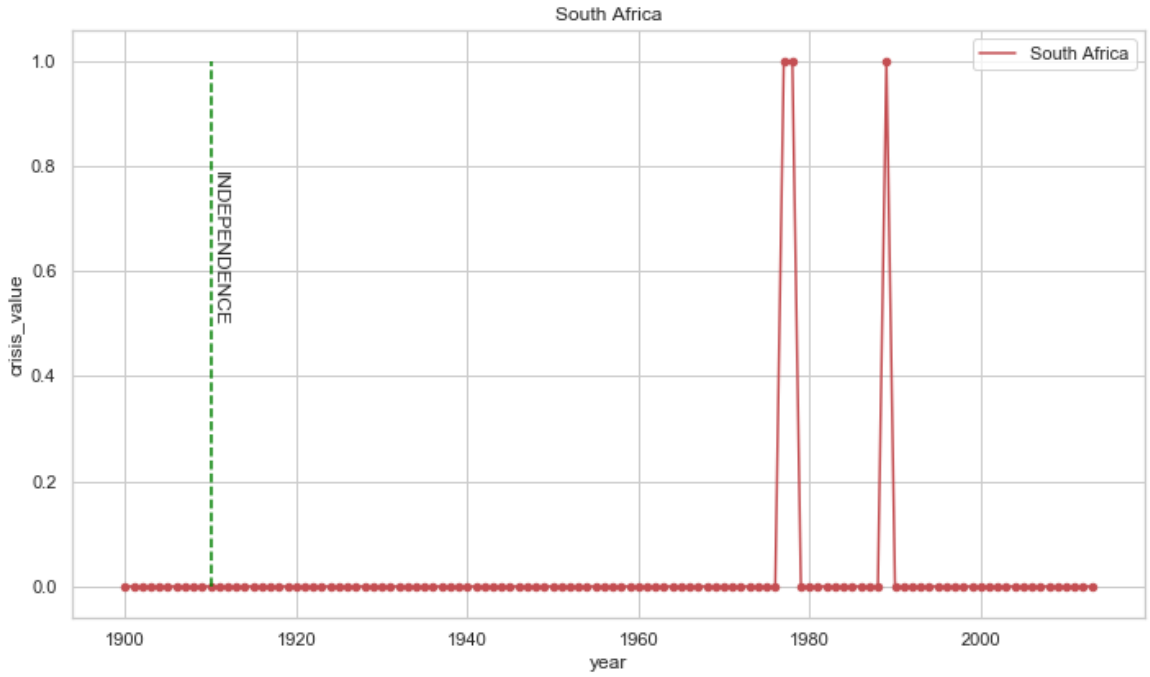

Ivory Coast
Ivory Coast
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1950
1960
1970
1980
1990
2000
2010

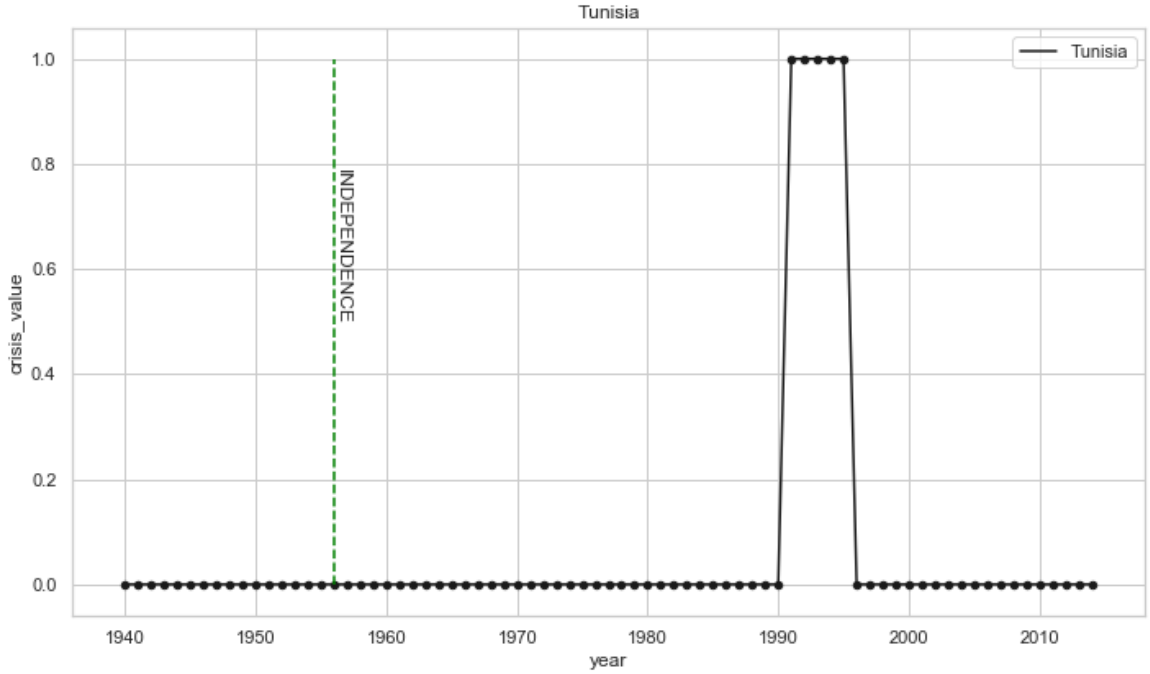

Kenya
Kenya
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1950
1960
1970
1980
1990
2000
2010

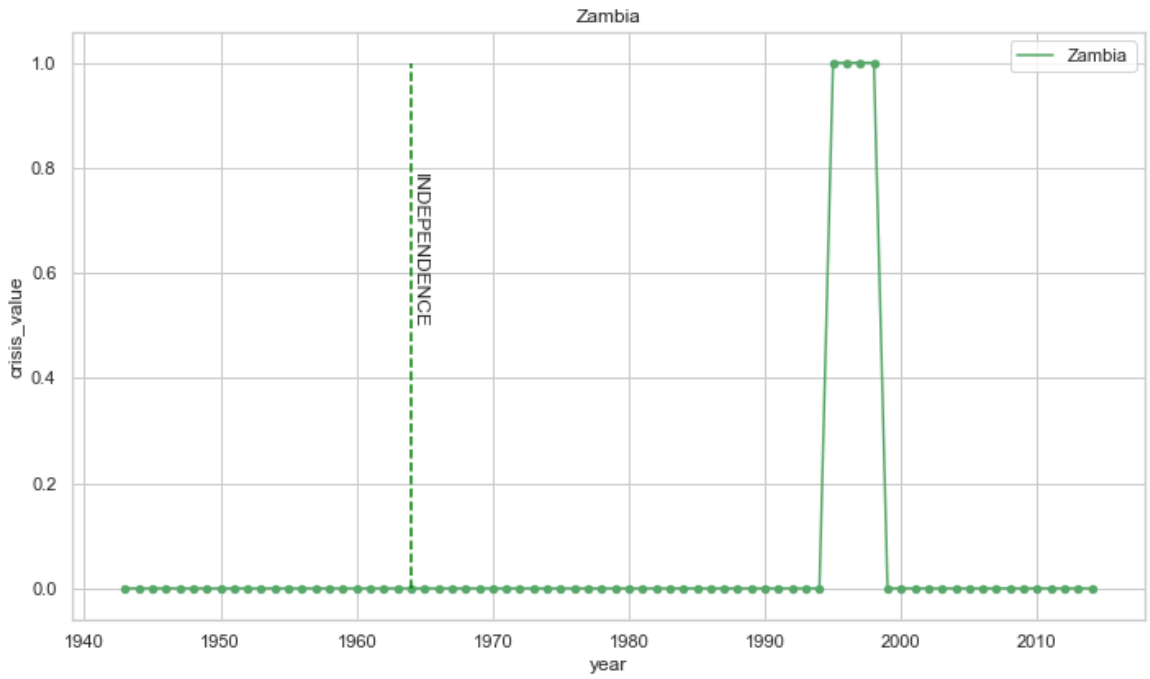

Mauritius
Mauritius
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1950
1960
1970
1980
1990
2000
2010

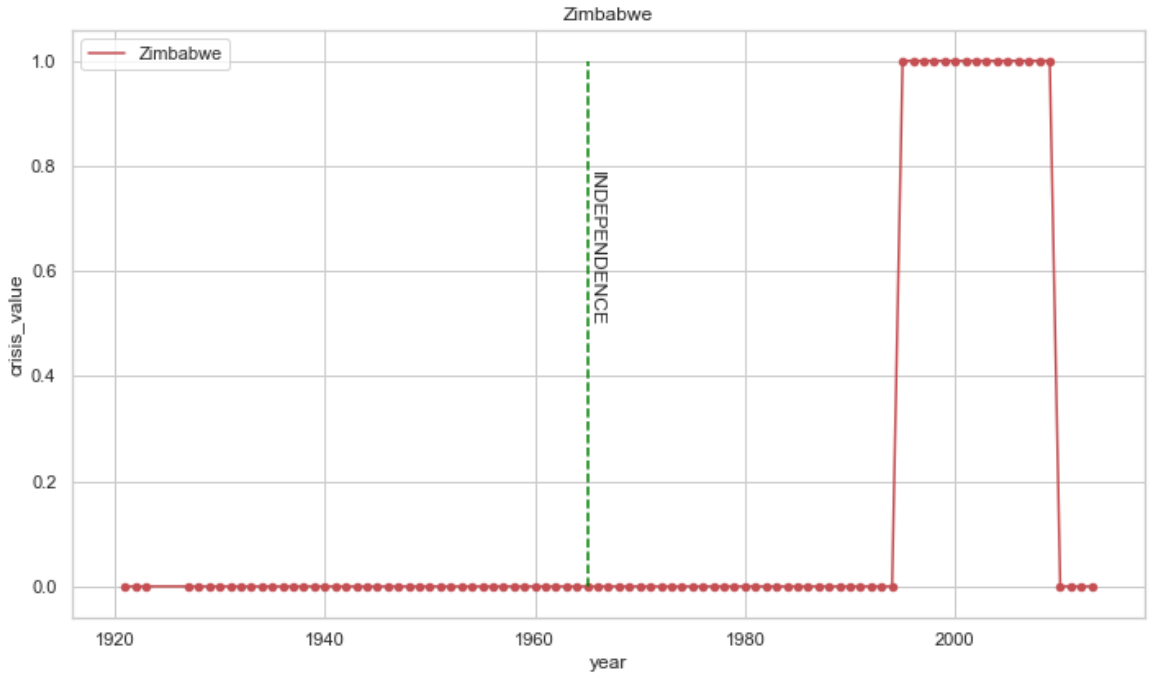

Morocco
Morocco
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1940
1950
1960
1970
1980
1990
2000
2010

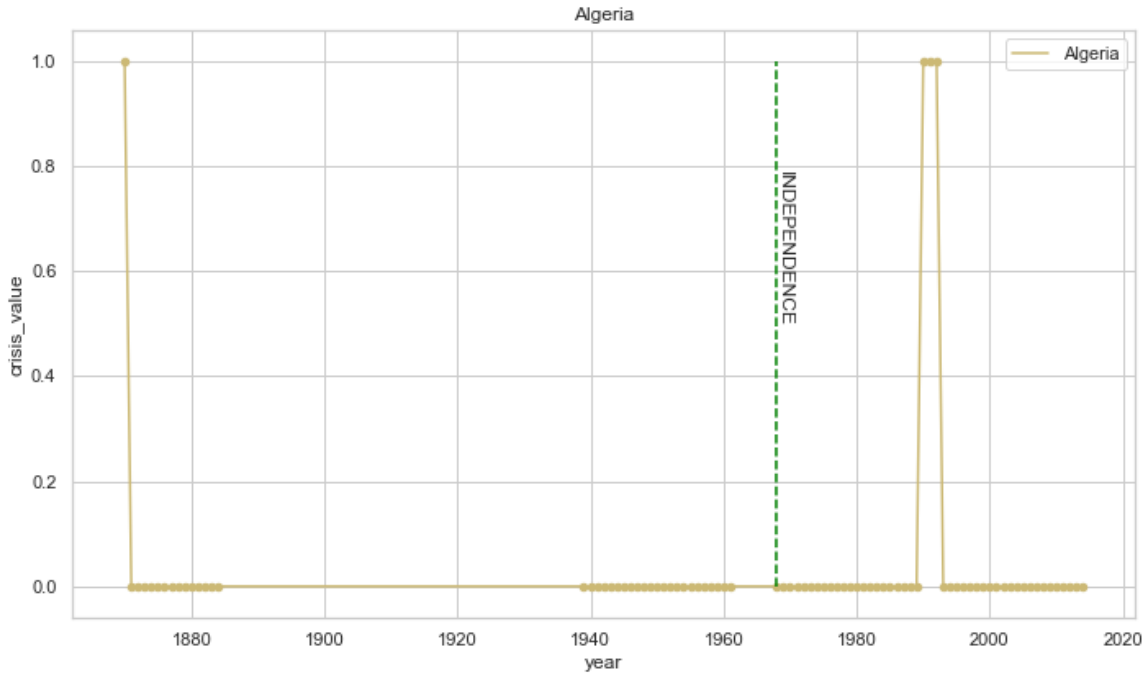

Nigeria
Nigeria
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1960
1970
1980
1990
2000
2010

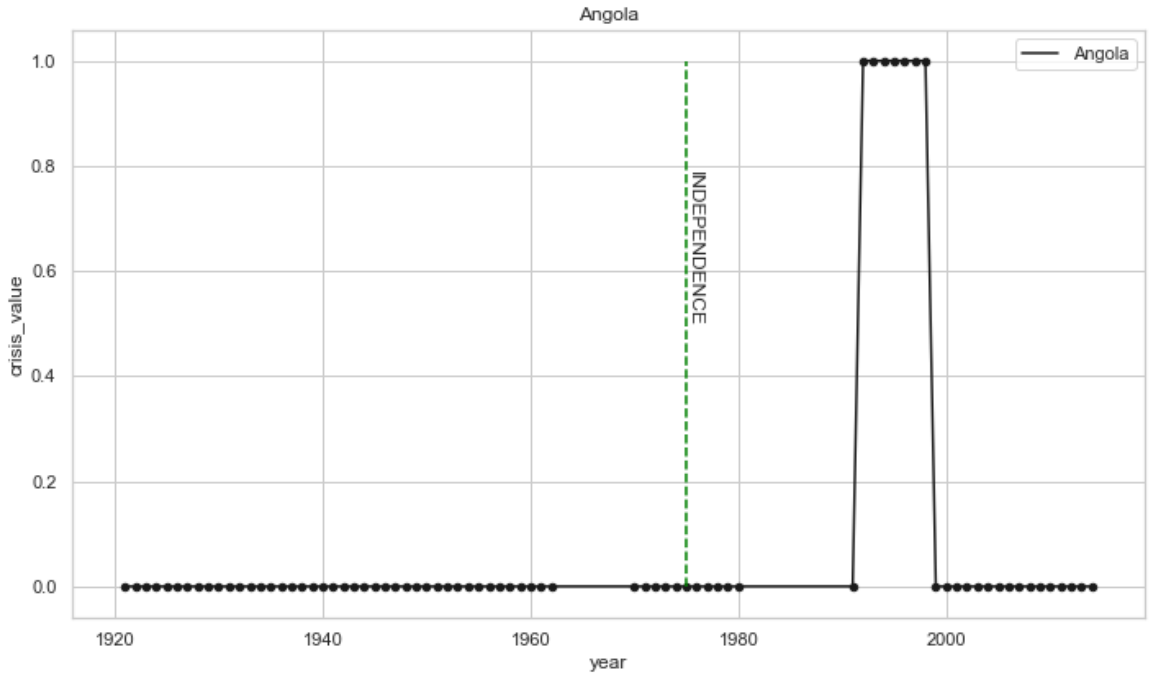

South Africa
South Africa
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1900
1920
1940
1960
1980
2000


Tunisia
Tunisia
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1940
1950
1960
1970
1980
1990
2000
2010


Zambia
Zambia
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1940
1950
1960
1970
1980
1990
2000
2010

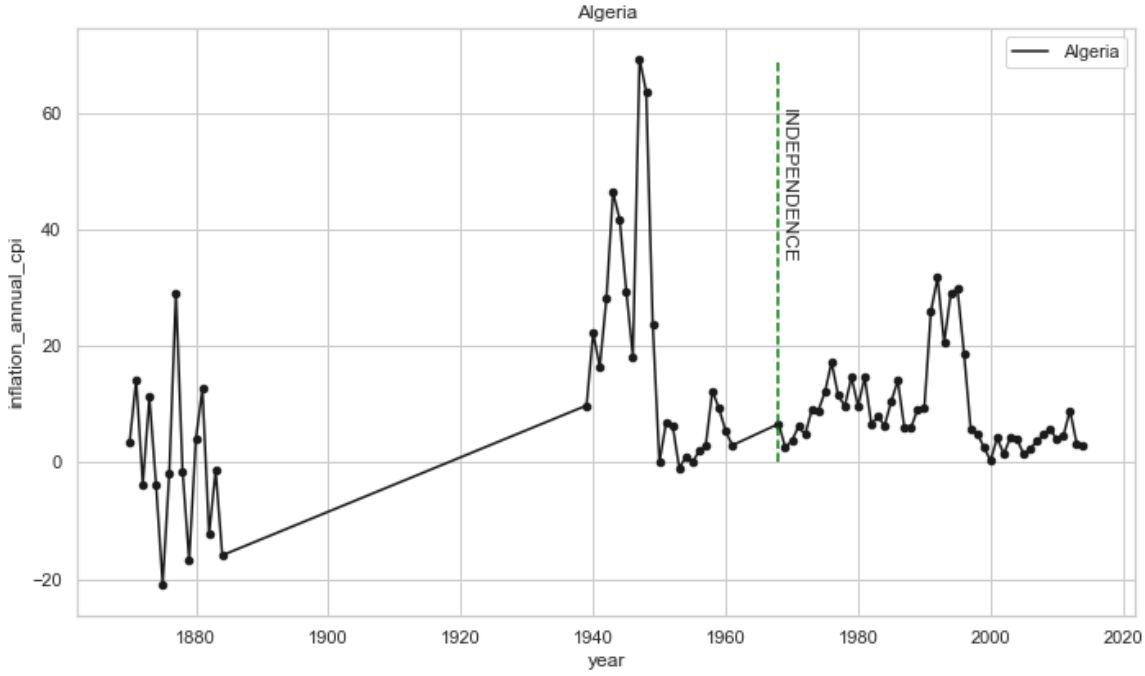

Zimbabwe
Zimbabwe
INDEPENDENCE
crisis_value
year
1.0
0.8
0.6
0.4
0.2
0.0
1920
1940
1960
1980
2000



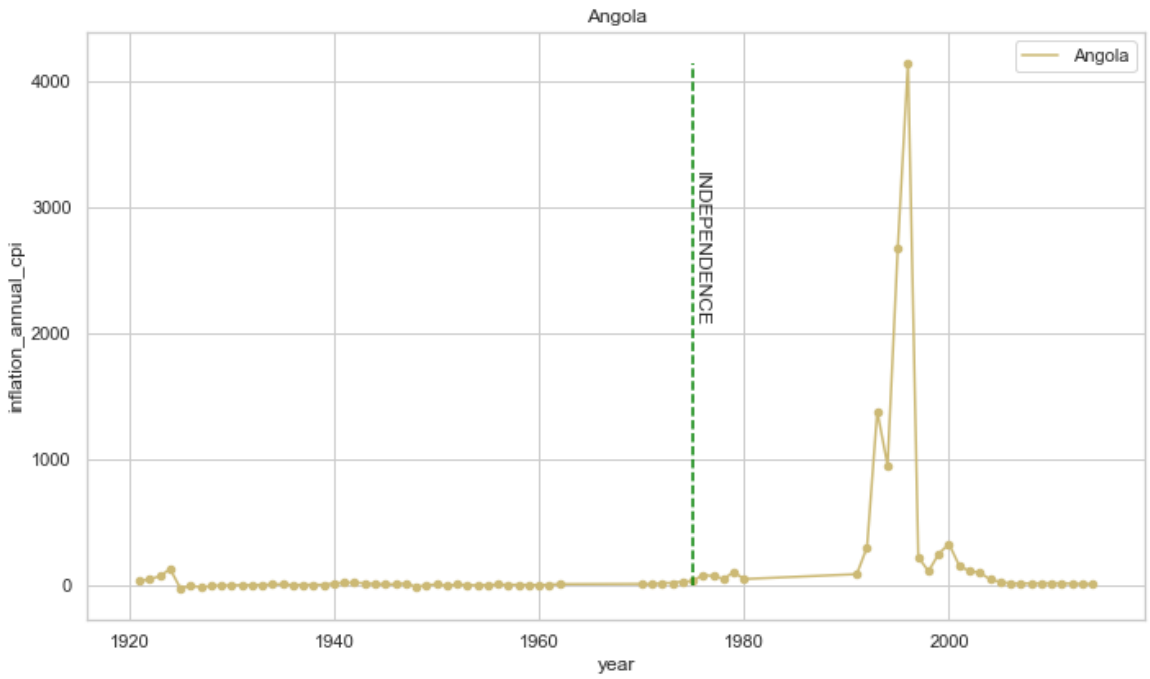


We can observe that indeed after the independence of the country general crises began to be generated.

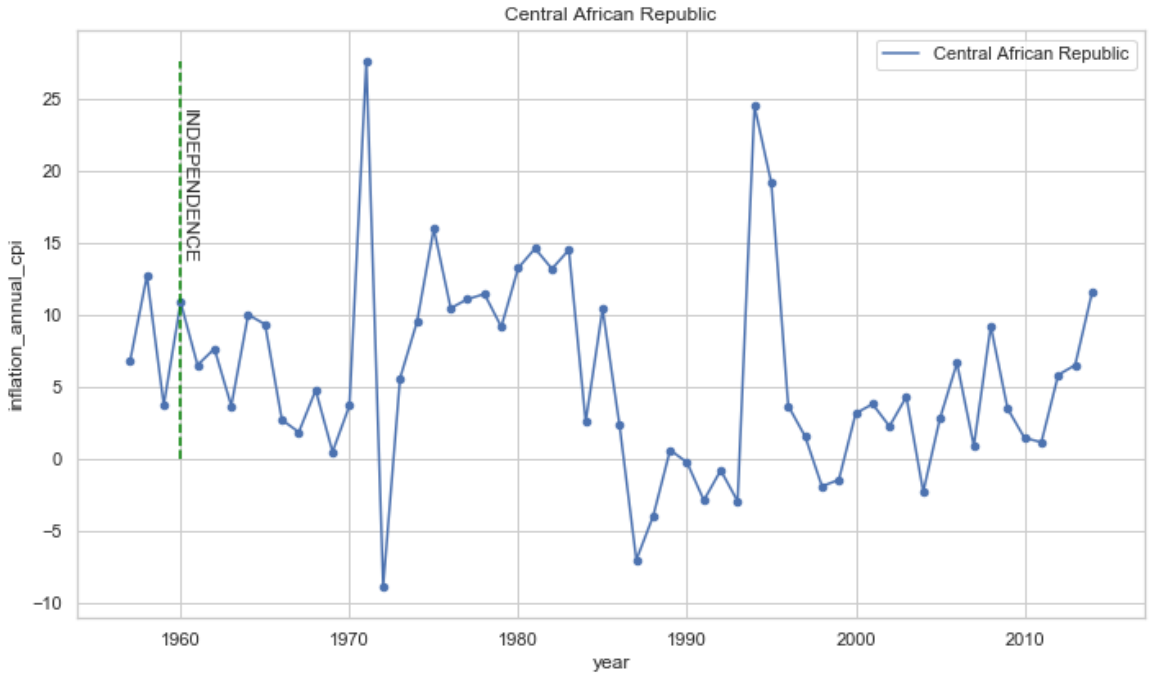
Then I analyzed the annual CPI inflation rate after the independence of the country, this can show us if the independence of the country affects their inflation and also observe in what year there was an inflation crisis and if it happened after independence.

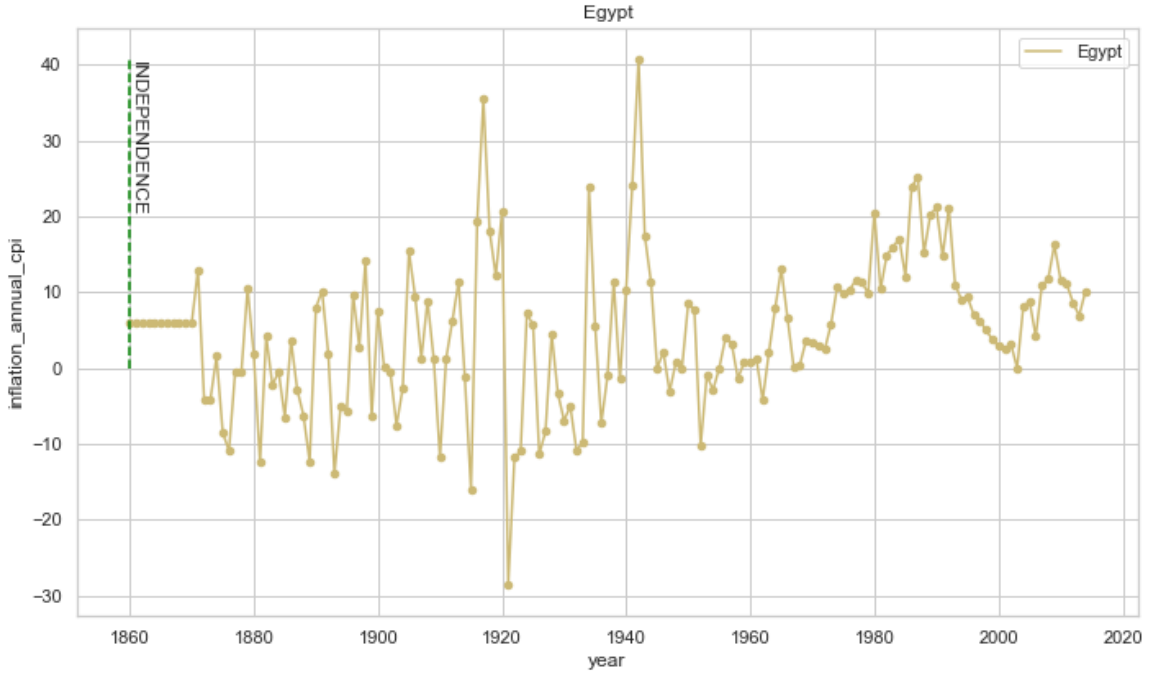


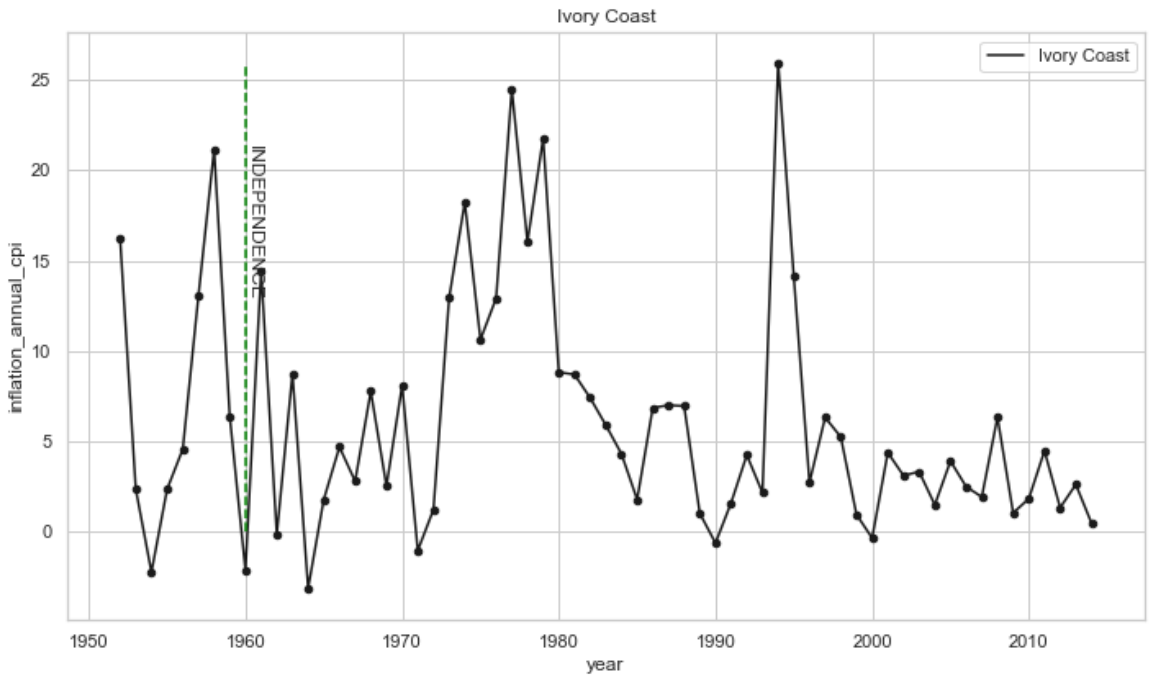
This country shows that there was more inflation crisis before of its independence than after of its independence, but not all country has this characteristic.



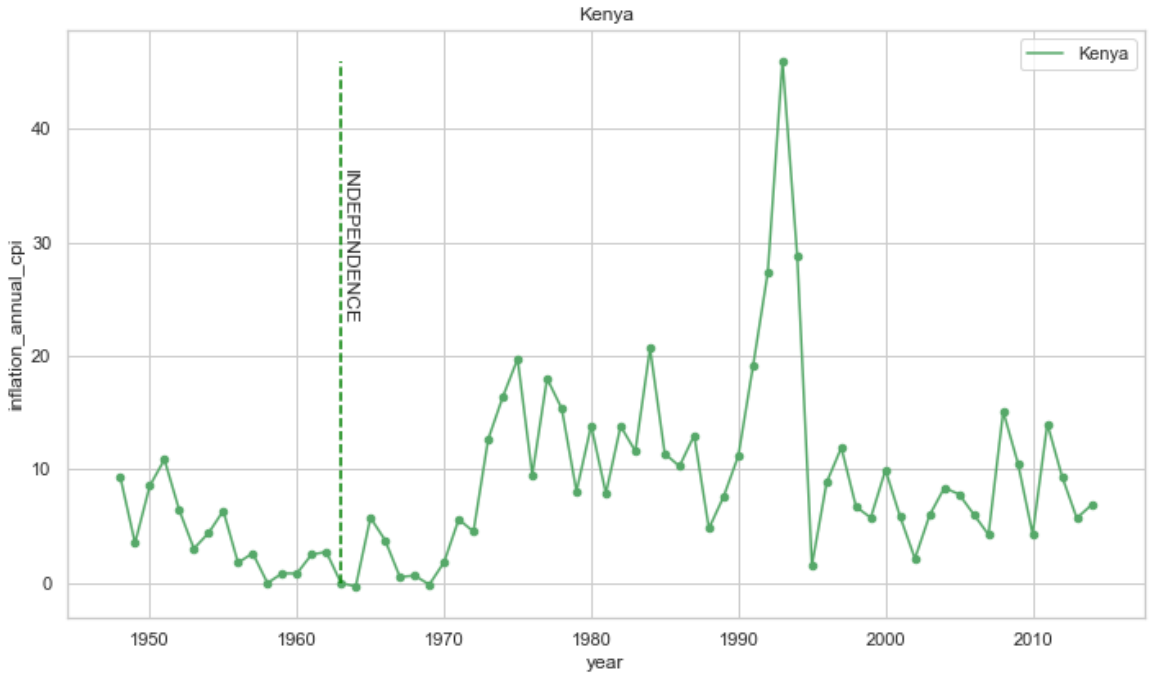
Let’s see Angola, It´s had crisis inflation after of its independece.

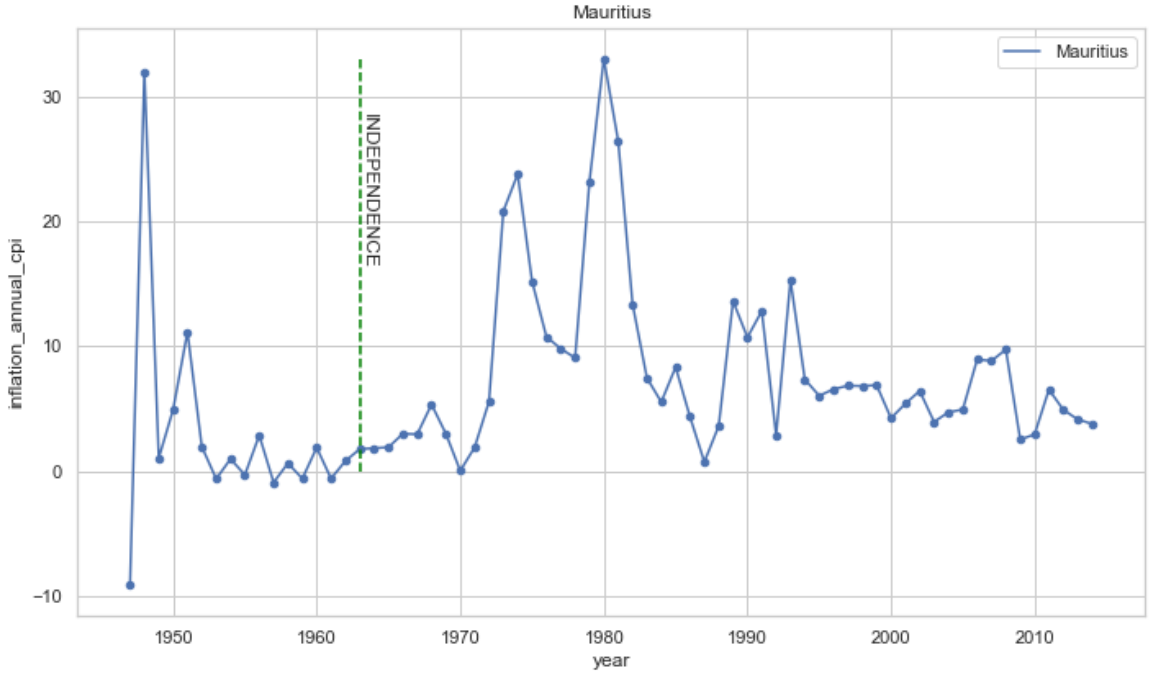

Central African Republic
Central African Republic
INDEPENDENCE
inflation_annual_cpi
year
25
20
15
10
5
0
−5
−10
1960
1970
1980
1990
2000
2010

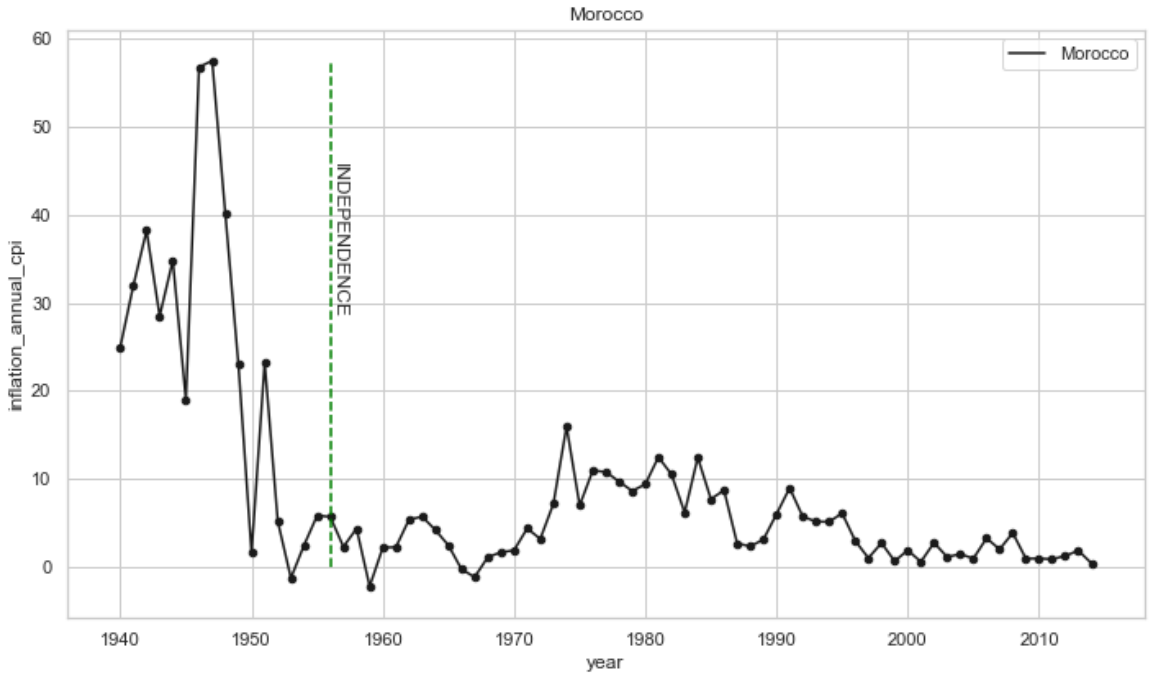

Egypt
Egypt
INDEPENDENCE
inflation_annual_cpi
year
40
30
20
10
0
−10
−20
−30
1860
1880
1900
1920
1940
1960
1980
2000
2020

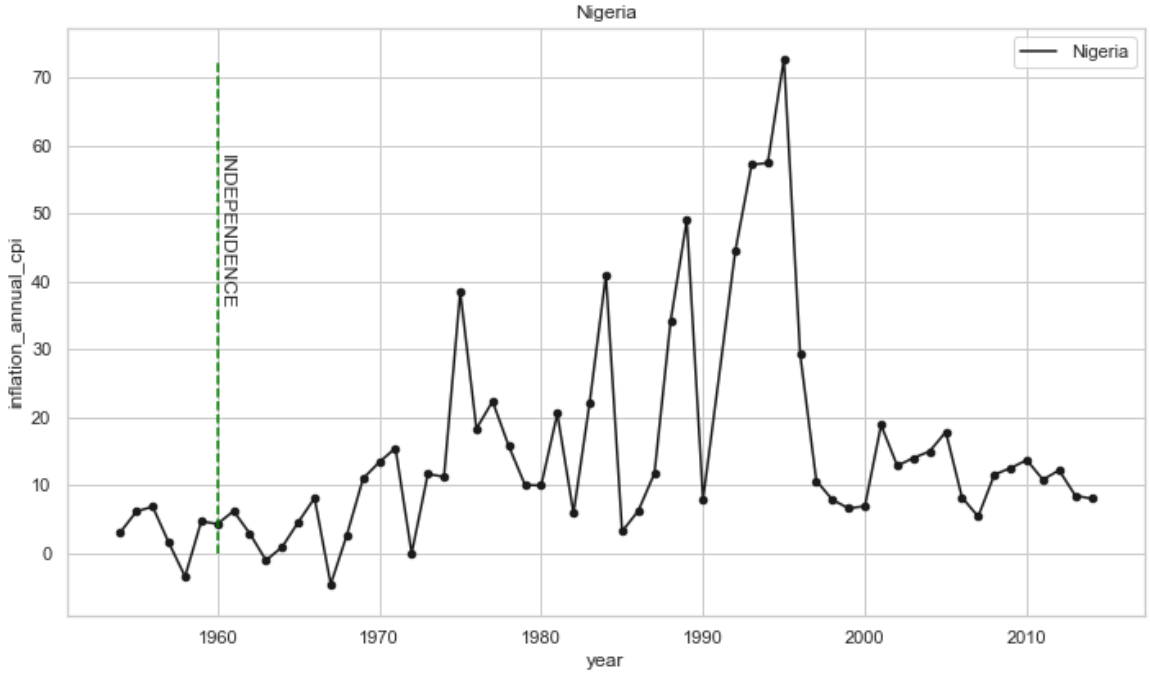


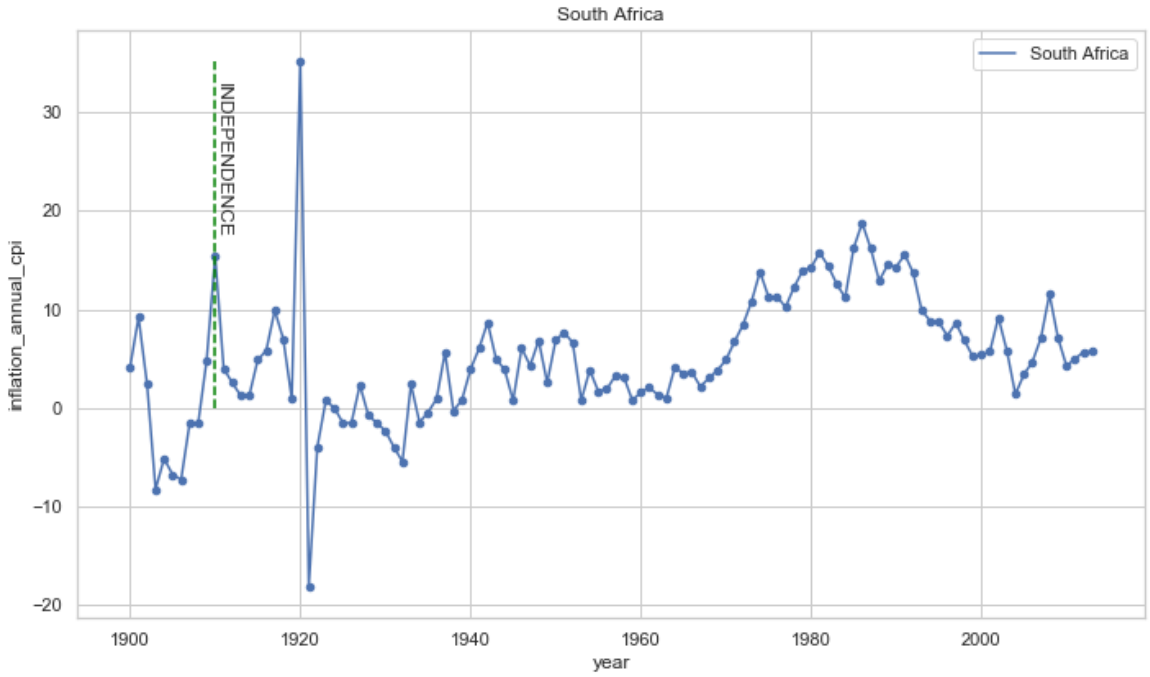
This case is very interesting, because Ivory Coast had crisis inflation before of the its independence and the it had a stable inflation, but the it had as 6 crisis inflation

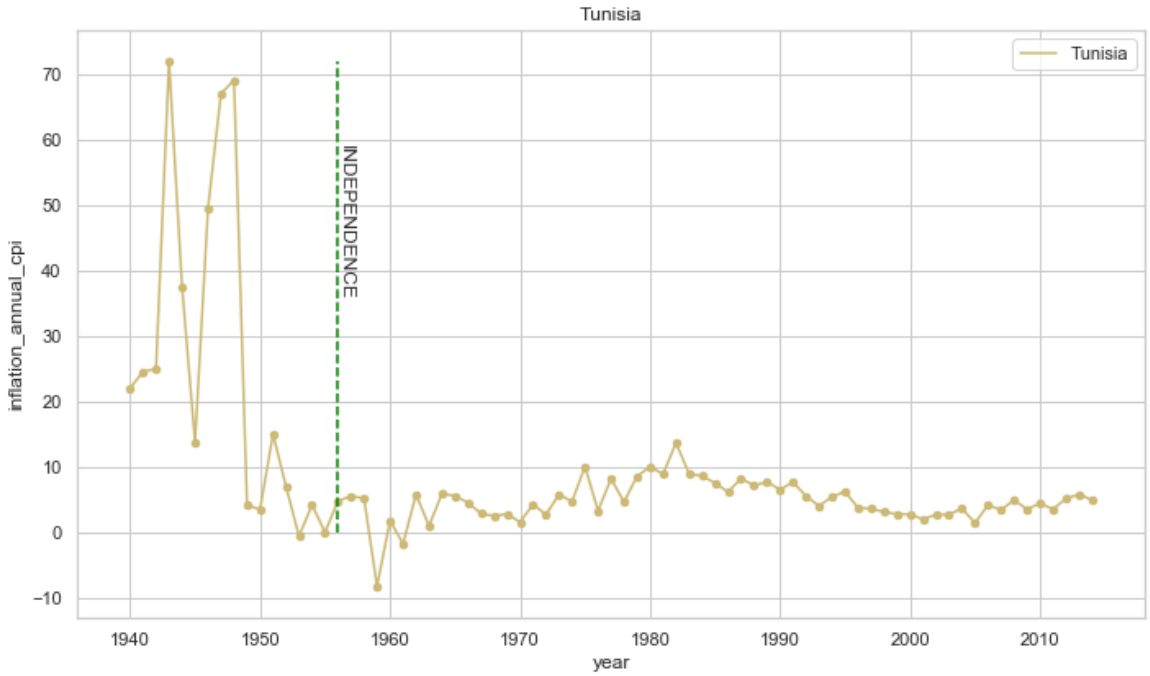

Kenya
Kenya
INDEPENDENCE
inflation_annual_cpi
year
0
10
20
30
40
1950
1960
1970
1980
1990
2000
2010


Mauritius
Mauritius
INDEPENDENCE
inflation_annual_cpi
year
−10
0
10
20
30
1950
1960
1970
1980
1990
2000
2010


Morocco
Morocco
INDEPENDENCE
inflation_annual_cpi
year
60
50
40
30
20
10
0
1940
1950
1960
1970
1980
1990
2000
2010

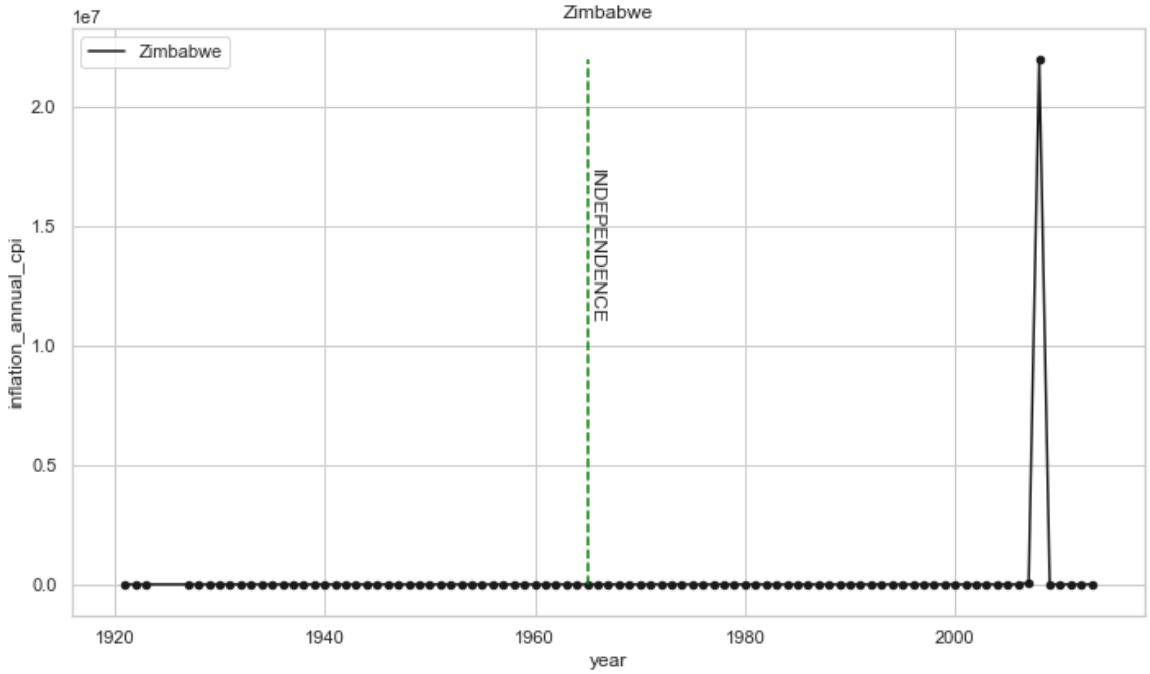

Nigeria
Nigeria
INDEPENDENCE
inflation_annual_cpi
year
70
60
50
40
30
20
10
0
1960
1970
1980
1990
2000
2010



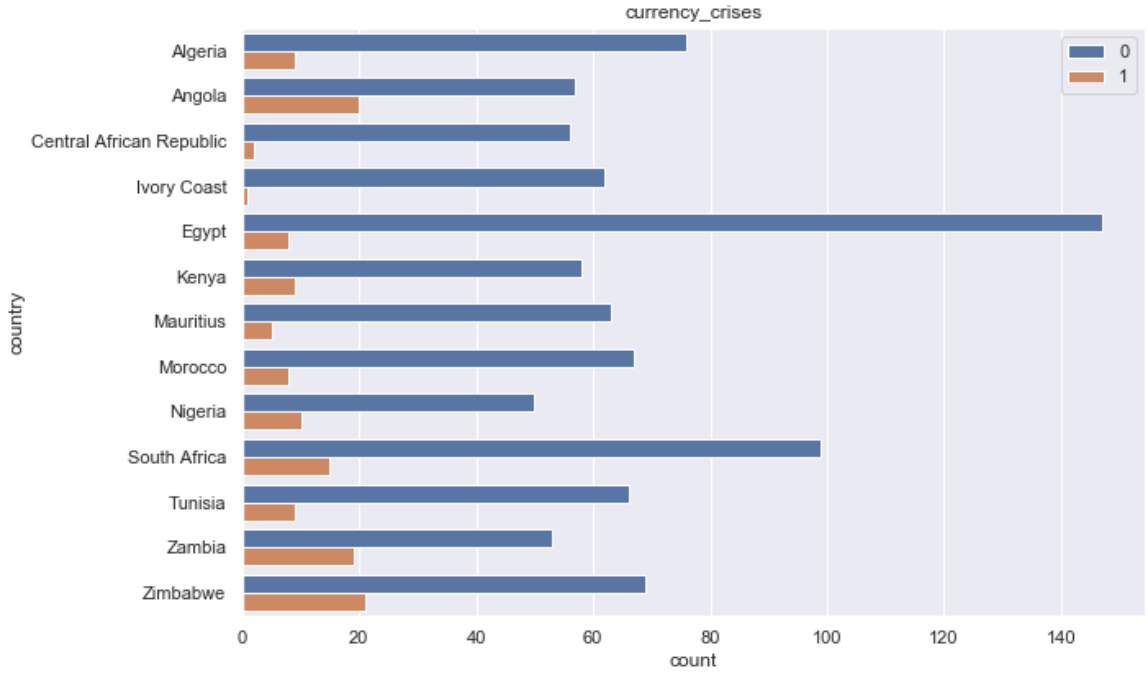


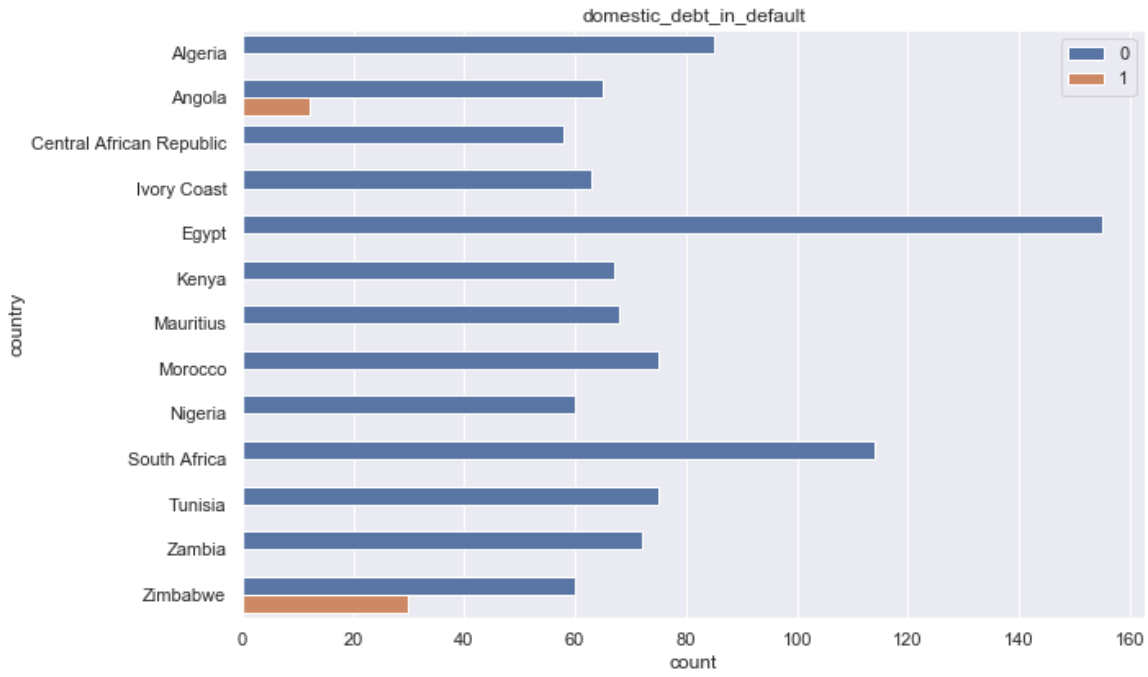
This graph shows that Tunisia had crisis inflation before of its independence, bot then it had a stable inflation.

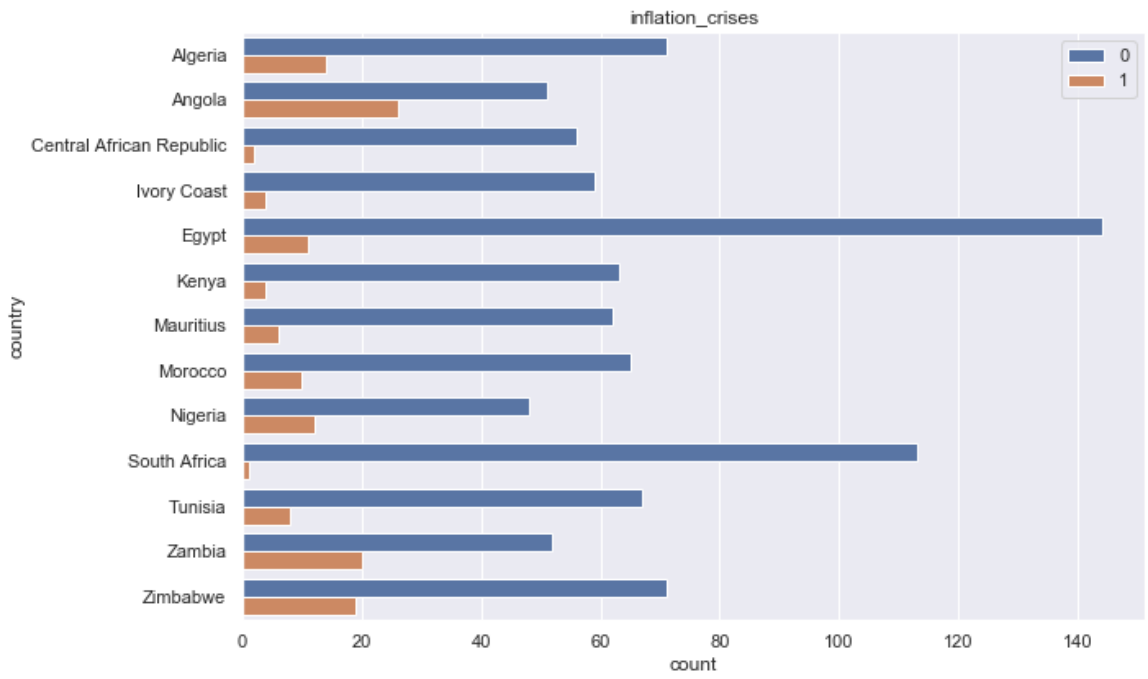
Zambia
Zambia
INDEPENDENCE
inflation_annual_cpi
year
0
25
50
75
100
125
150
175
1940
1950
1960
1970
1980
1990
2000
2010

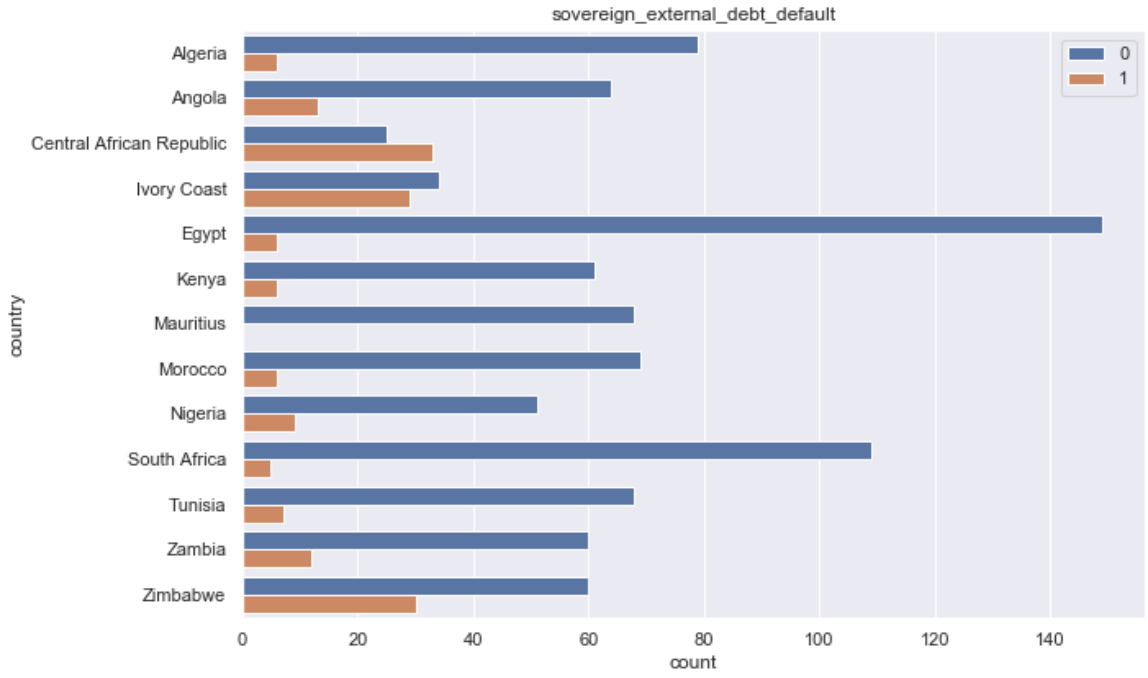

Zimbabwe
1e7
Zimbabwe
INDEPENDENCE
inflation_annual_cpi
year
0.0
0.5
1.0
1.5
2.0
1920
1940
1960
1980
2000

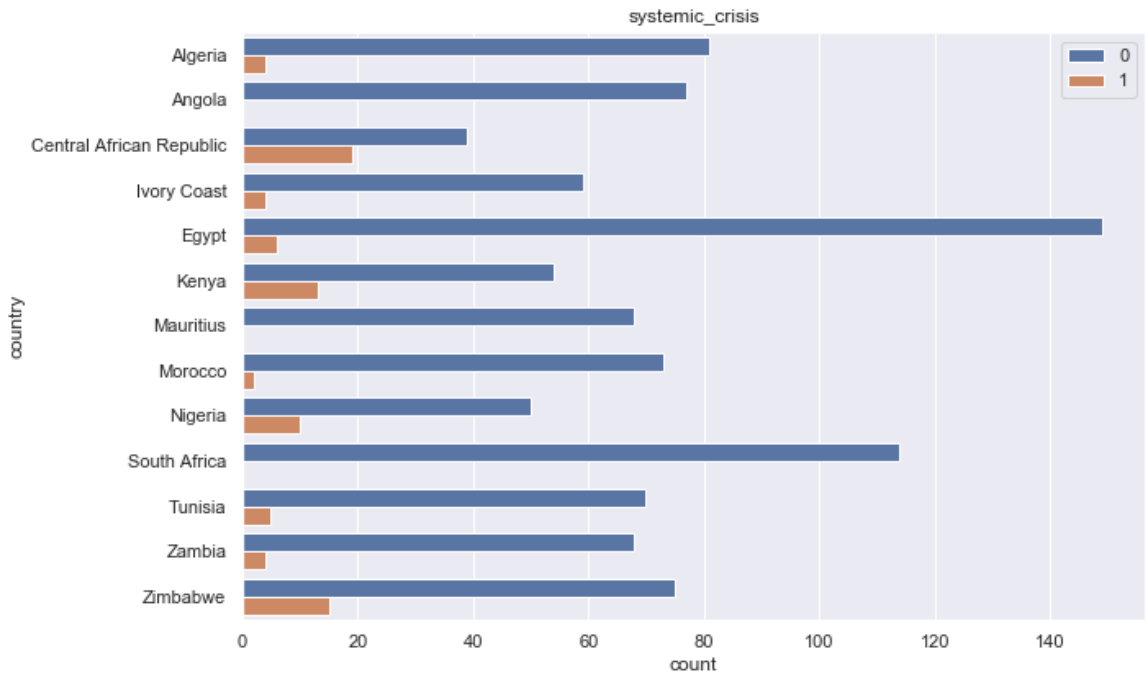
The next Graphs show how many times the country had the types of crisis.

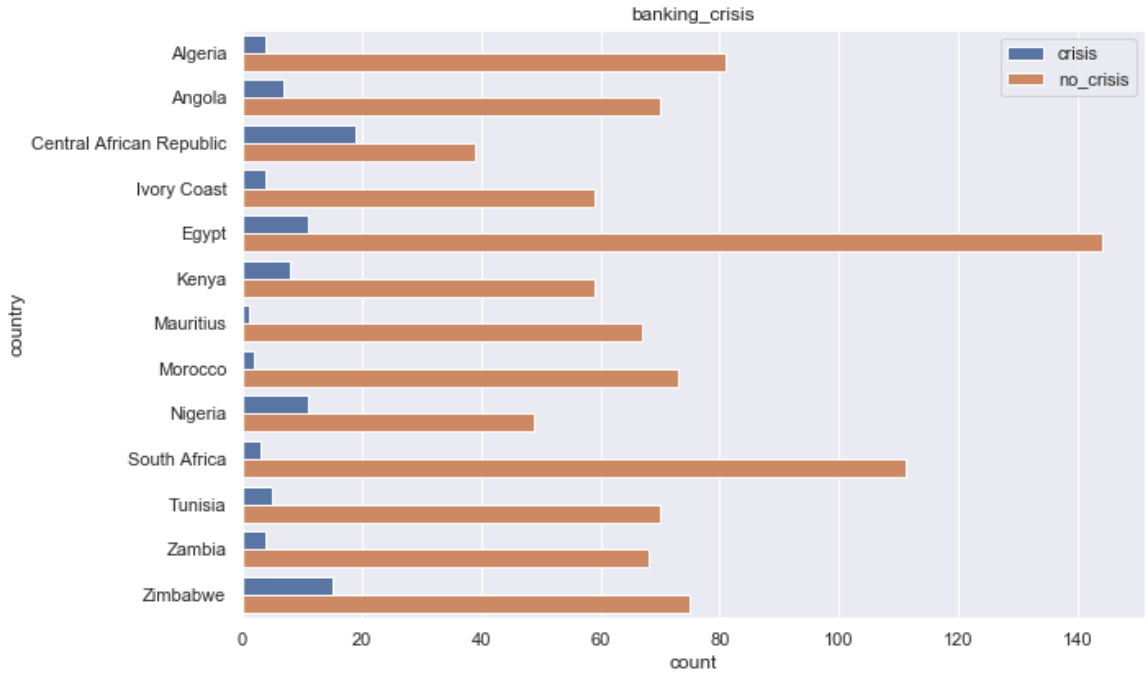





inflation_crises
Algeria
Angola
Central African Republic
Ivory Coast
Egypt
Kenya
Mauritius
Morocco
Nigeria
South Africa
Tunisia
Zambia
Zimbabwe
country
0
1
0
20
40
60
80
100
120
140
count


sovereign_external_debt_default
Algeria
Angola
Central African Republic
Ivory Coast
Egypt
Kenya
Mauritius
Morocco
Nigeria
South Africa
Tunisia
Zambia
Zimbabwe
country
0
1
0
20
40
60
80
100
120
140
count





The countries that suffered the most from a general crisis were Central African Republic, Egypt, Kenya, Nigeria and Zimbabwe. The graph suggests that countries may have different types of crises, but some are stronger than others, that is, external crises are the ones that most harm a country because the country is owing resources to other countries and this too It hurts that the country has an inflation crisis.

Conclusion

Through the analysis of Africa crisis, I was able to answer the questions I asked myself at the beginning. For a country to suffer a general crisis it must have an external and internal debt crisis for its economy to go down and this causes the country's population to move to other places and cause an inflation crisis.

When I analyzed the graphs that show the annual CPI Inflation rate before and after the country's independence. I concluded that countries have some factors that cause instability in inflation after their independence and in the same way it can be seen that there were more general crises after the independence of the country.