MAD1 - Analysis of a dataset about African Banking Crisis

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1 African Banking Crisis

A banking crisis reflects the crisis of liquidity and insolvency of one or more banks in the financial system. Due to bank's sizable losses, bank encounters critical liquidity shortage to the extent that this disrupts its ability in repaying the debt contracts and the withdrawals demanded by depositors. This dataset is a derivative of the Reinhart et. al's Global Financial Stability dataset. It is valuable to those who seek to understand the dynamics of financial stability within the African context, since it 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. It was obtained using **Kaggle** at: https://www.kaggle.com/chirin/africa-economic-banking-and-systemic-crisis-data. This document will describe and explain the some correlations found analyzing the dataset.

2 Continuous Variable Analysis

The **USD Exchange Rate** is the amount of local country currency you could exchange for 1 american dollar (USD) and the **Annual CPI Inflation** is the change in the prices of a basket of goods and services that are typically purchased by specific groups of households measured by the **Consumer Price Index(CPI)** . The first measure allows us to verify the quality of the countries' currency comparing it to a normally stable and strong one like the USD and the second measure is useful to see the changes of prices of products in the country.

Figure 1: Standard Deviation of the Annual Cpi Inflation per country

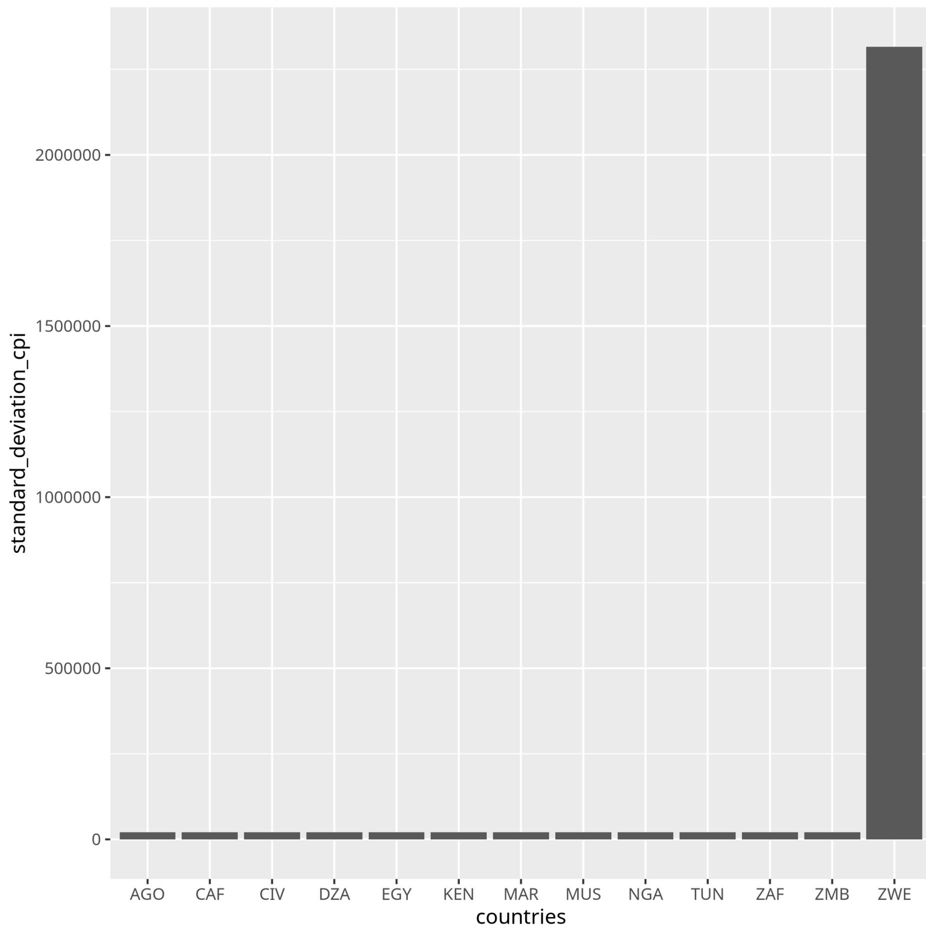
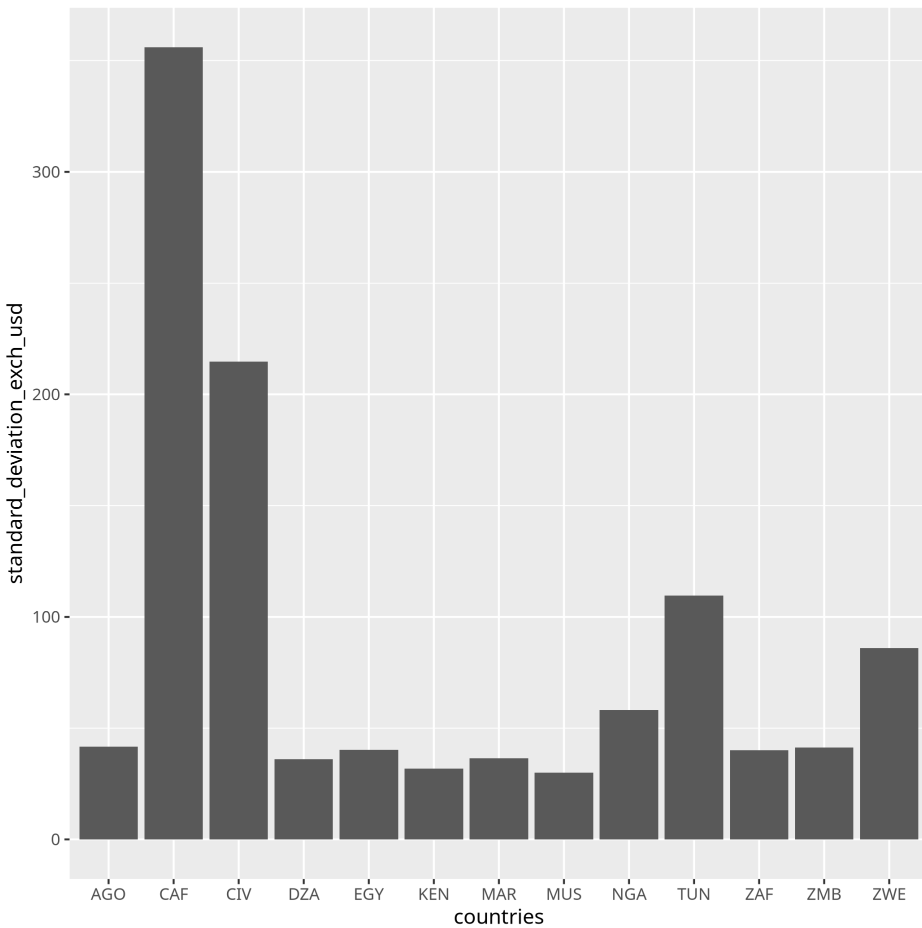


Figure 2: Standard Deviation of the USD Exchange Rate per country

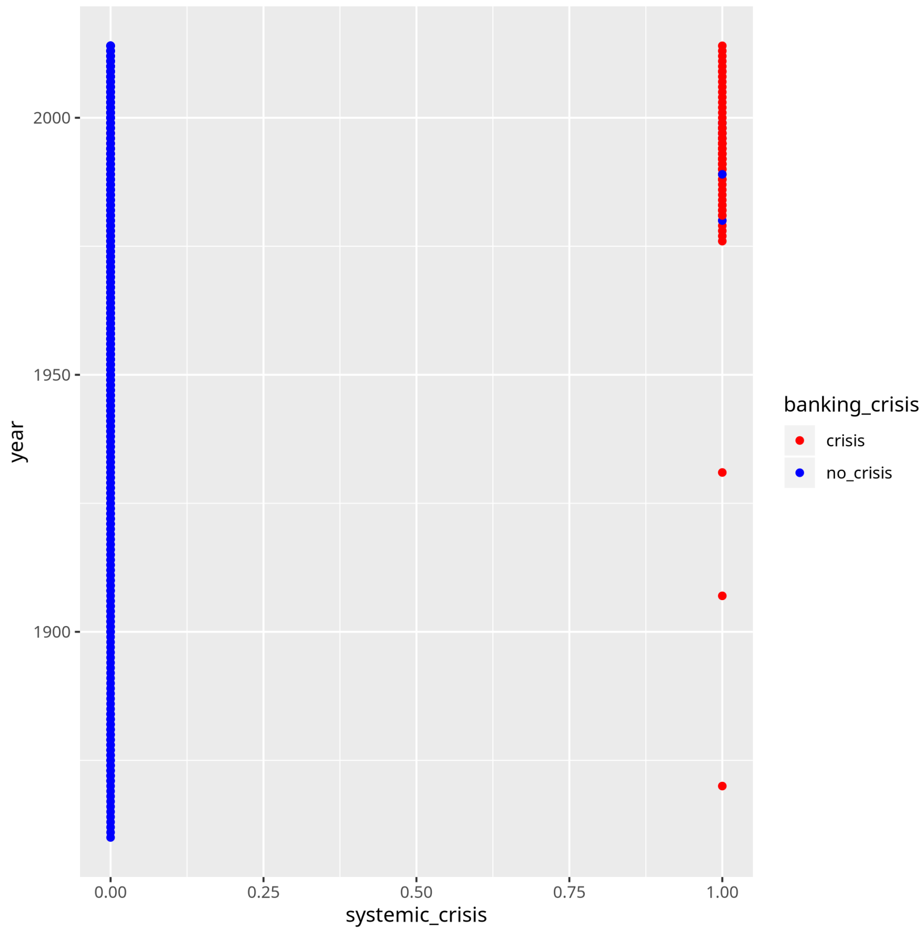


The measured average Annual CPI Inflation of all the countries in the dataset is **20848.89 %** and the average USD Exchange Rate is **43.14083**. According to Figure 1, **Zimbabwe** has an huge mean deviation from the average Annual CPI Inflation, with a very big difference when taking into account the rest of the countries. If we calculate Zimbabwe's average Annual CPI Inflation we obtain a value of **245105.6 %**, which means that during the years, hyperinflation has affected the country more than any other and can explain the destruction of the country's productive sector(agriculture i.e). By analyzing Figure 2 we can verify that the spotlight now goes to the **Central African Republic**. By calculating its average USD Exchange Rate we obtain **367.6861** which is a extremely higher than the ones from other countries on this dataset. This can lead to the conclusion of the weakness of the currency that is used in this country, the **Central African CFA Franc (XAF)**.

3 Systemic Crisis

A **Systemic Crisis** is a domino effect in which a financial trouble spreads between institutions and markets until it affects the whole monetary and financial system with dire global economic consequences.

Figure 3: Systemic Crisis in all the countries along the years



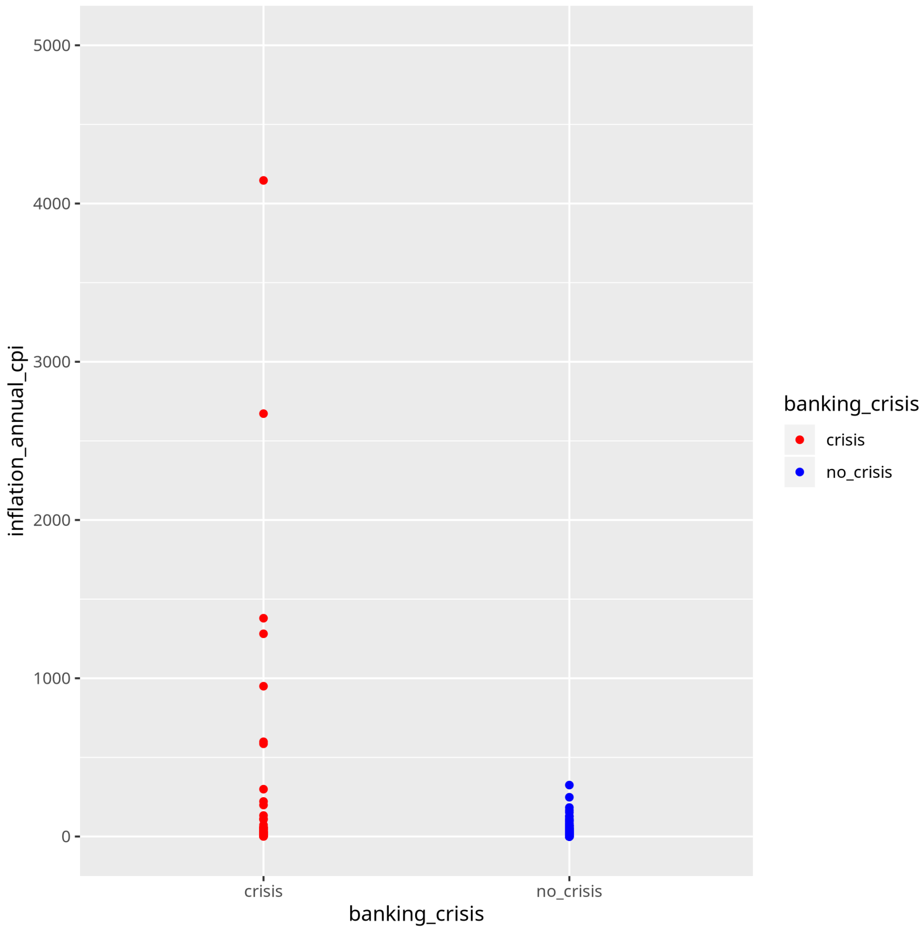
Looking at Figure 3, we can conclude that a financial trouble in a country's economy easily spreads to the banking institutions, as debts need to be payed and either by bank runs(where depositors widthraw huge amounts of money from their accounts fearing bank failure) or by bank panics, it leads to shortage on bank money supply and to a banking crisis.

4 Annual CPI Inflation

4.1 Banking Crisis

As already explained the Annual CPI Inflation helps us see a country's population purchasing power.

Figure 4: Annual CPI Inflation in relation with a banking crisis



By analyzing the 4th figure, we can see that after the 500% Annual Inflation CPI threshold, it is practically certain that the country will face a banking crisis. This may be related to the need of the everyday citizen needing more bank loans to fulfill their needs since the the prices are going up.

4.2 Inflation Crisis

An **Inflation Crisis** occurs whenever **hyperinflation** occurs. **Hyperinflation** is a very high and typically accelerating inflation. It quickly erodes the real value of the local currency, as the prices of all goods increase. This causes people to minimize their holdings in that currency as they usually switch to more stable foreign currencies, often the US Dollar.

Figure 5: CPI Inflation in relation with a crisis in inflation in Angola

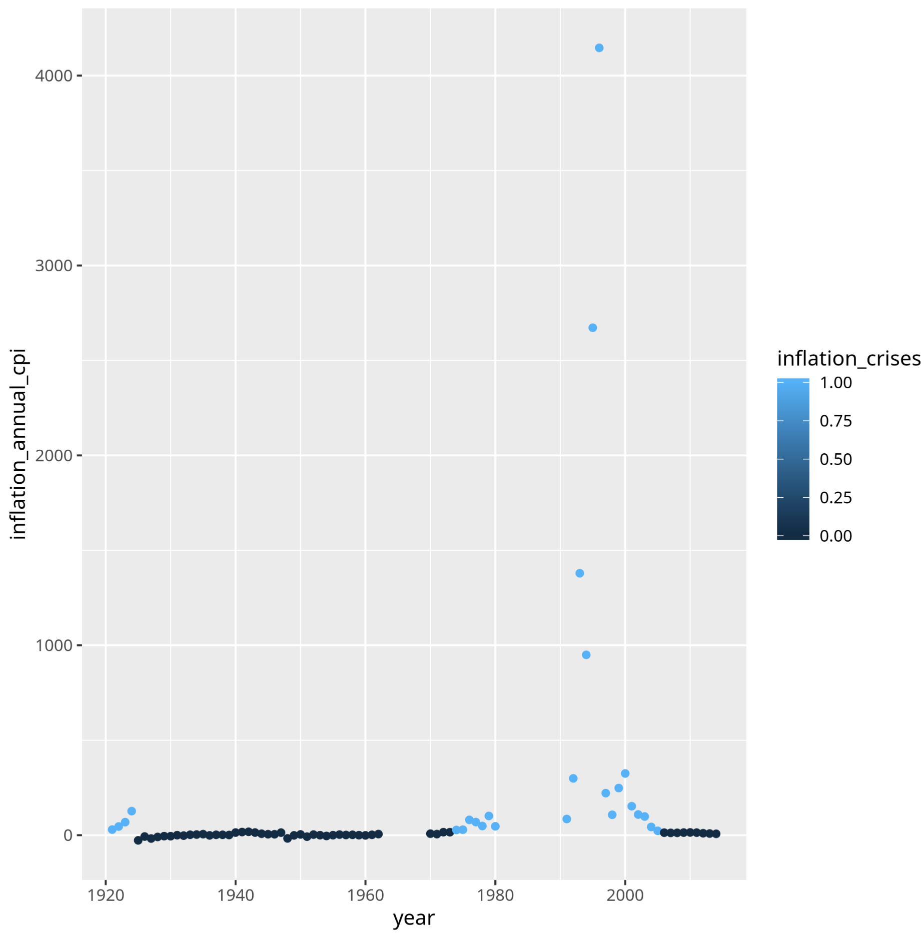


Figure 6: CPI Inflation in relation with a crisis in inflation in Zambia

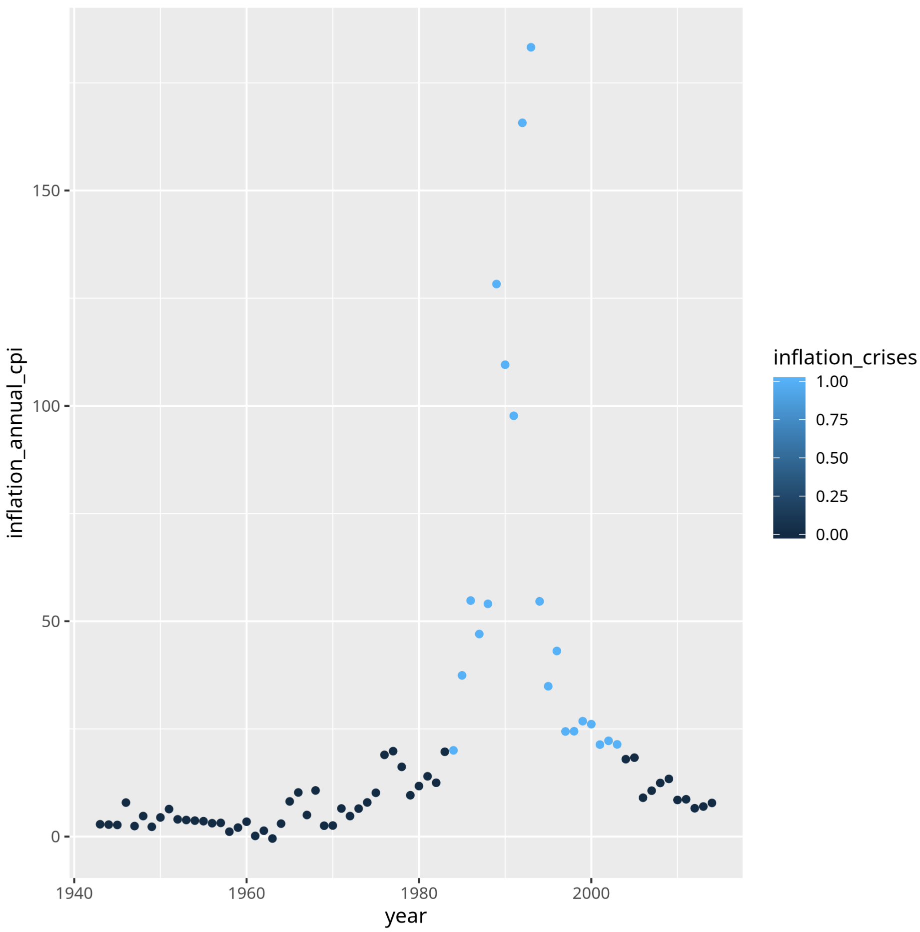
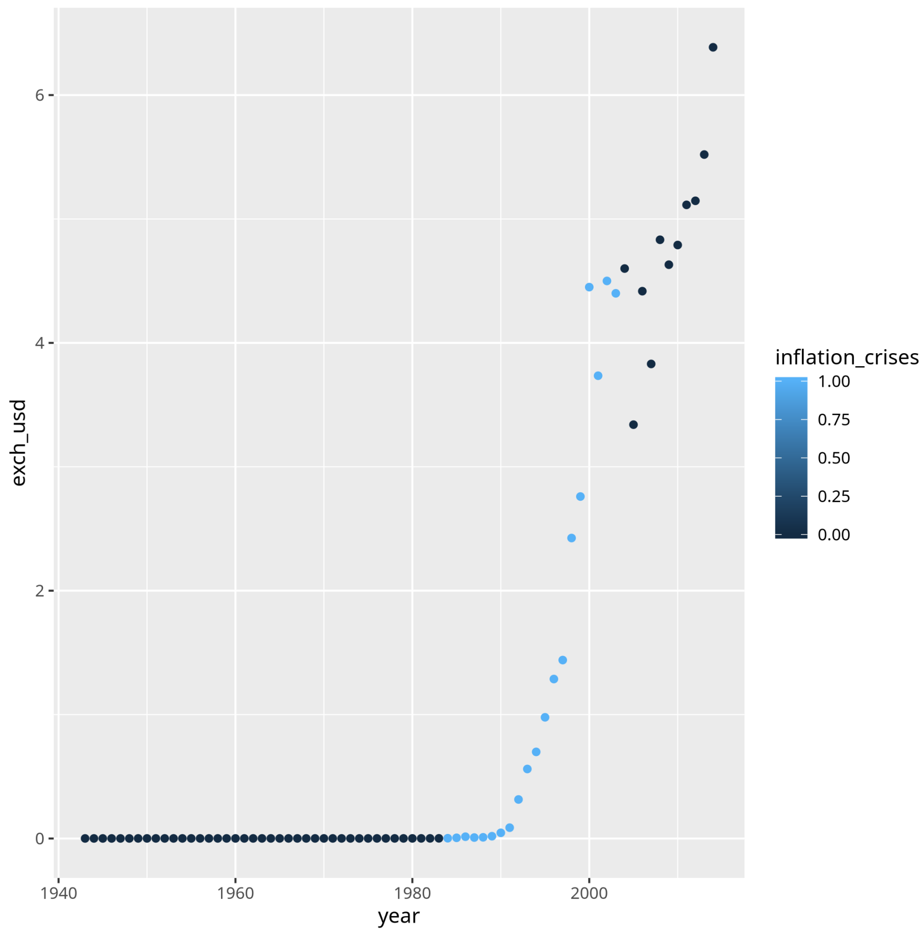


Figure 7: USD Exchange rate in relation with a crisis in inflation in Zambia



By analyzing Figures 5 and 6, we can visualize that whenever there is an **Inflation Crisis** in these countries, that act as an example to a more general case in Africa, hyperinflation occurs which leads to the result portrayed by Figure 6 where we can see Zambia's currency getting weaker as the Exchange Rate to the USD is getting higher.

5 Independence

Most of the countries in this dataset were old European colonies with no **independence** until the 20th century. **Angola**, for example, was a **Portuguese** colony and only got its independence on 1974 after 13 years of war. This greatly affected the countries' economies.

Figure 8: Independence of African Countries along the years and the relation with a banking crisis

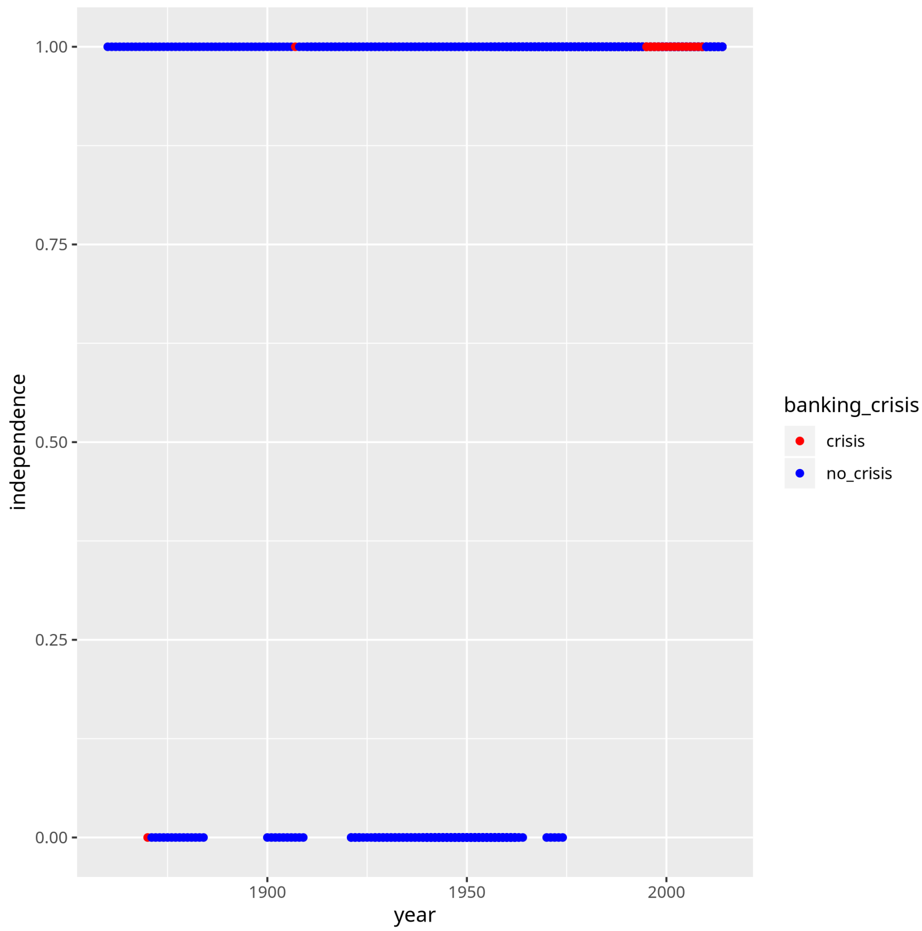
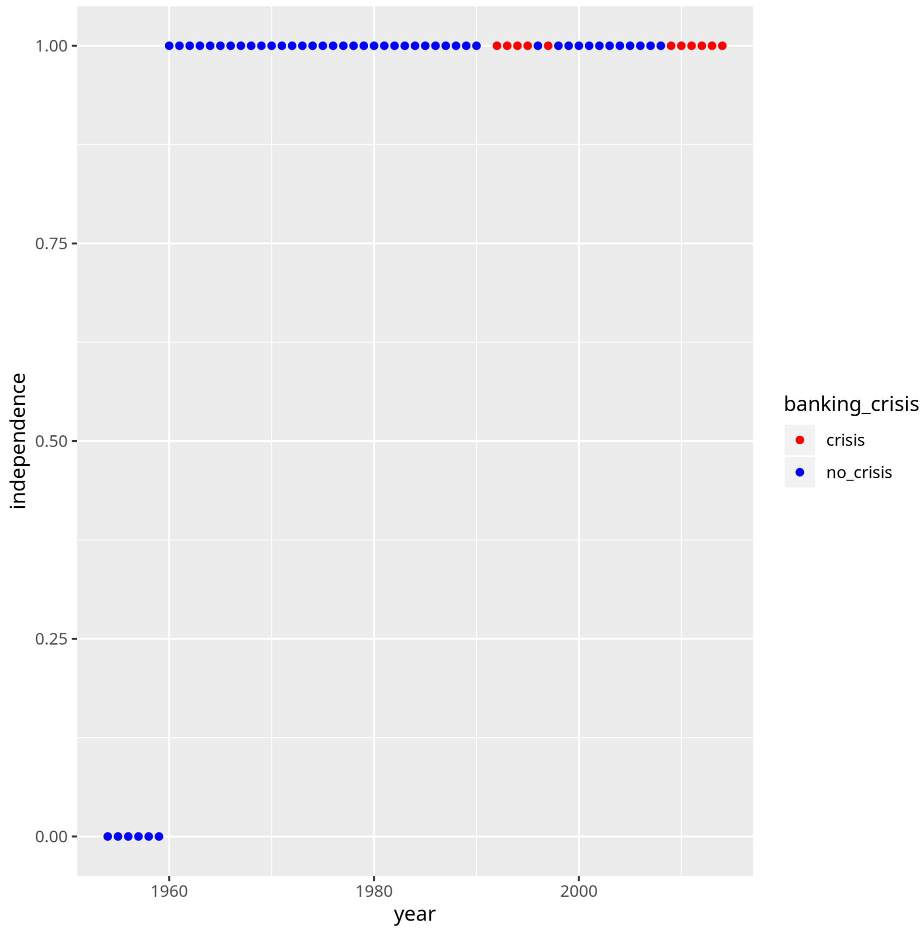


Figure 9: Independence of Nigeria along the years and the relation with a banking crisis



Both figures show that the banking crises only started after these countries obtained **independence**. Originally the sovereign states assured these provinces financial stability aided by trade they provided in terms of resources. Of course this meant these countries were not independent neither they were free, and so they each started their own battles to independence. However after that, generically, many of them ended up in years of civil war and revolutions for government control, which ended up having devastating results to the countries' economies and resulting in banking failures.