Human Right Index Analysis

Big Data Project

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1. Pre-treatment

1.1 Presentation

This dataset is about human freedom all over the world. It is available on the following website : https://www.cato.org/human-freedom-index-new. The Cato institute, based in Washington, aims at easing the public comprehension and access regarding liberty, peace, and free market data.

The dataset studied for this course is the latest one available freely on their website. It presents over 100 criteria that are used to give a human freedom grade to countries, and to rank them. In this dataset, we can find a grade for personal freedom and one for economical freedom, which leads in the end to a more general notion of human freedom. The data is given for years 2008 to 2016, which allows to see the evolution of ranking between the countries but also the evolution of single criteria within one country. The latest data of 2018 and 2019 are not available freely on the website, but it allows us to have a critical view on the last figures from 2016.

These data are also the subject of a 408 pages report available on Cato's website. In our study, we chose to highlight 5 points and to represent them in 5 graphs. The very diverse subjects presented by this dataset and its serious source are two reasons for our choice.

1.2 Dataset manipulation

This dataset has the advantage of presenting a lot of information. It has two main categories for economical and personal freedom, and both of them gathered dozens of sub-categories. Each category, criteria, received a grade between 0 and 10, 10 meaning that the country is performing perfectly in this regard.

Since the dataset is very complete, we decided to use only some columns of it for our study. Moreover, we noticed that some data of personal freedom were missing between the year 2014 and 2016. We are aware than this absence can slightly change the conclusion when studying the global evolution over the years. However, this is the case of 6 columns out of 120. This lack being a minority, we decided to still exploit this dataset. Our report will be constructed on the following outline. The first graph is general and shows the differences between region of the world in 2016. Then we will confront human freedom between regions. In a third part, we will focus on human freedom woman's freedom. Then we will study more closely the several indicators of one country. For this study, we chose France. We will finish by another global view on these data with the evolution through the years of the human freedom in countries.

2. Data Analysis

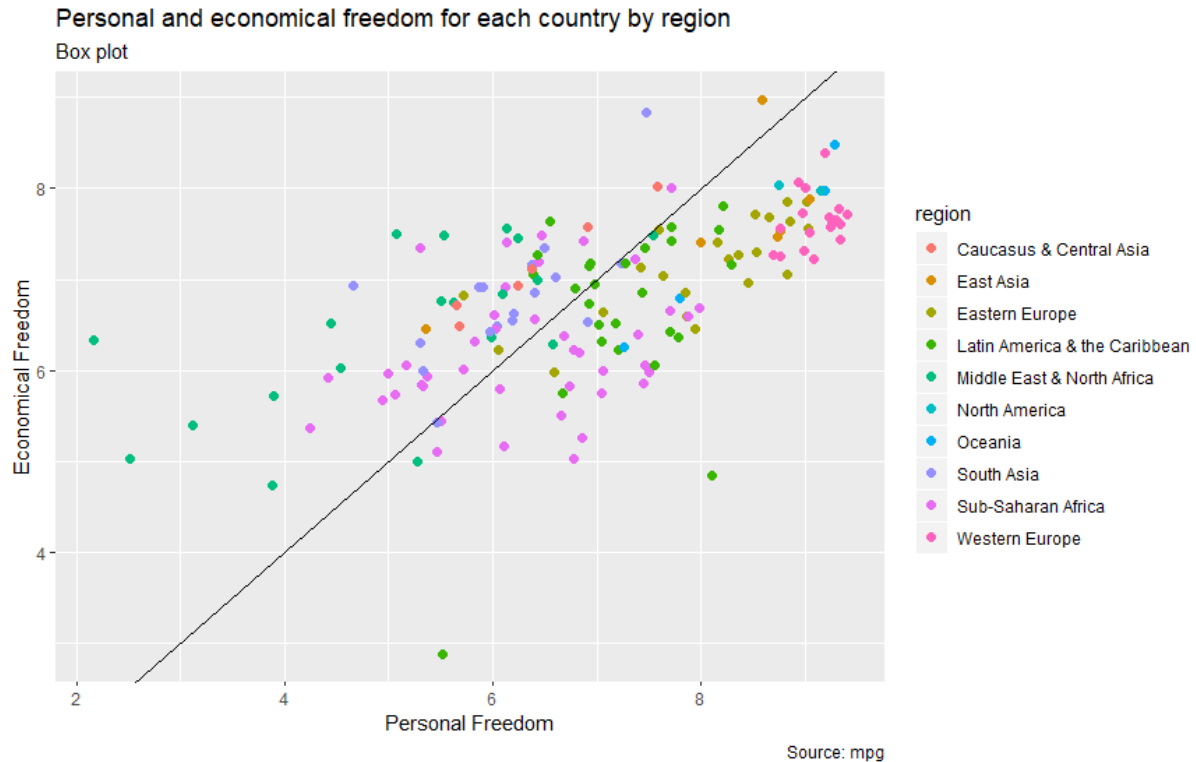## 2.1 Economical and personal freedom in 2016 through the world

Figure 2.1 − **Personal and economical freedom for each country by region**

On this chart we plotted the personal and economical freedom for each country by region, expecting some specific results.

First we expected a correlation between those two variables. In order to confirm this expectation we plotted a reference line (y = x) in black. As we can see, most of the points are centered around this line meaning that personal and economical freedom are linked. Only a few countries (less than 10) possess one freedom much lower or higher than the other.

Secondly we were waiting for clusters of points by region. Meaning that every countries of a region are close to each others. We can see that this expectation is really met for two regions: Western Europe and North America (only two countries). For others regions that country are a lot more spread meaning that in the same region big disparities exist in term of freedoms between countries. With some afterthought we can say that our expectation came from the fact that we live in Western Europe and that the variation of freedom between countries is not as consequent as in other regions.

Finally we didn't expected that so many countries of different regions will be plotted on the same area of the graph. At the center of the graph we can nearly see at least one country for each region. We were waiting for a clearer demarcation between African, America Latina and Asian countries. This "surprise" can be explained by the fact that we didn't not anticipated that different factors intervening on economical and personal freedom may compensate themselves.

2.2 Region-based Human Freedom Index study

By looking at the previous chart, we can see that countries from the same world region tend to be grouped in the same place on the index. To confirm this assumption, we can group the dataset by world region. There are twelve world regions, dividing continents into two or three geographical areas. To display a lot of statistical information in one readable chart, we chose to use a box plot.
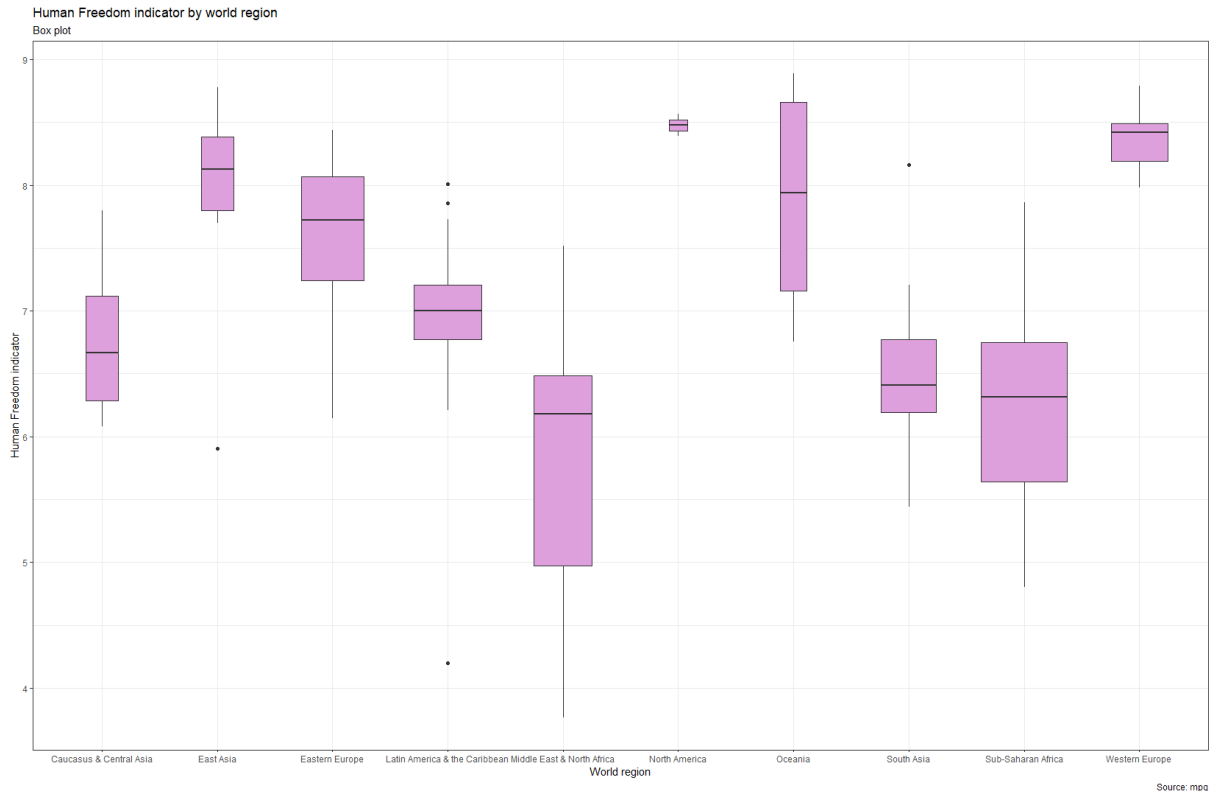

Figure 2.2 – Human Freedom Index by world region

The X axis represents regions, with one box associated with each one. Let's describe the characteristics of each box:

- The width of the box indicates the size of the region so the larger the box, the higher the number of countries in the region.

- The black line inside the box represents the median value.

- The up and bottom borders of the box indicate the first and third quarter.

- The line extending from the box goes all the way to the max and min values.

- The eventual dots isolated from the box represent outliers.

From this chart, we can draw a few conclusions. First, as expected, the known rich regions such as Western Europe or North America are very high on the scale with a very low deviation between countries. Also, some regions like East Asia or Latin America have a pretty compact dataset, with some big outliers compared to the rest. In the case of East Asia, China has a significantly lower score than all surrounding countries, mainly because of personal freedom issues. Finally we have regions with lower scores and a big deviation, especially in Africa where there are countries with instable economies and governments.

2.3 Subsaharan Africa woman freedom study

In order to try and understand the low score and high deviation of African regions, we decided to focus our study on one of them. The biggest region of our dataset is Sub-Saharan Africa, with 42 countries. It has the second worst median Human Freedom Index of all regions. We are going to look at how some indicators directly influence others, pulling countries down on the index. The following chart is a correlation between Woman freedom and Religion restrictions in Sub-Saharan Africa countries.
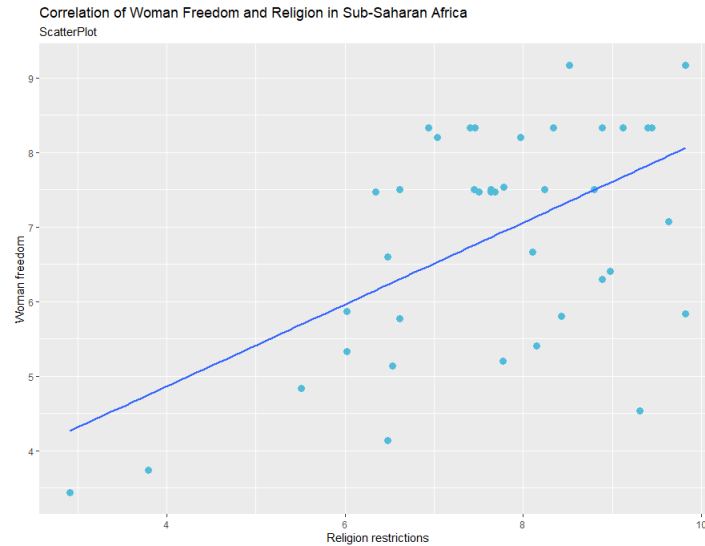

Figure 2.3 – How religion restrictions influence woman freedom

It is to be noted that a high score in the "Religion restrictions" category means that the country has low restrictions, which can be a little counter-intuitive. We can see from the chart that our assumption is confirmed, and religion restrictions are indeed influencing woman freedom. This highlights a key point, which is that most of the indicators of this dataset are heavily influencing each other. Countries who do really well in some areas are likely to succeed in others, and unfortunately the same can be said for countries who struggle with key human issues like corruption or woman freedom.

2.4 Does France deserve its motto ?

The goal of this chat was to determine if France deserves it's motto : Liberty, Equality and Fraternity. We choose the liberty of expression, the equality in front of the law (right of law) and the identity and relationship score to represent those variables.

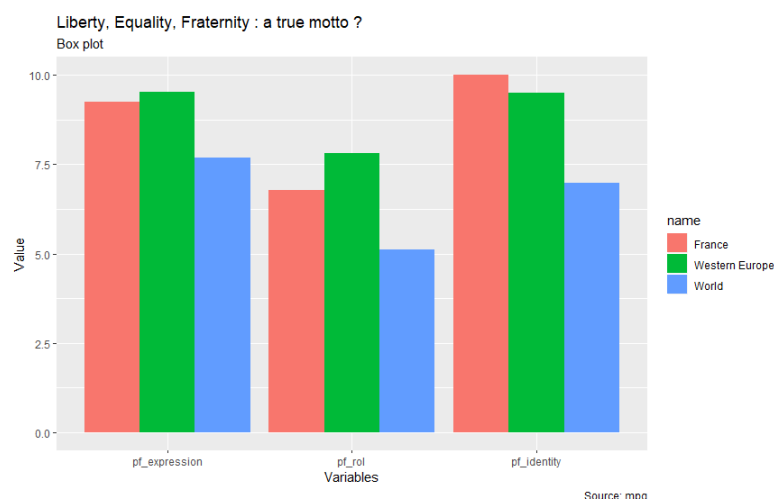We compare those variables with average European and worldwide values.

Figure 2.4 – Liberty, Equality, Fraternity : a true motto ?

We see that even if compare to the rest of the world France is higher, compare to its neighbors France doesn't deserve it's motto.

2.5 Evolution through time of human freedom in some regions

To conclude this report (realized from the beginning to the end without the use of a mouse...) we thought that it would be nice to plot a global evolution of human freedom through time. We were expecting to have few variations for stable regions and a global variation close to zero.
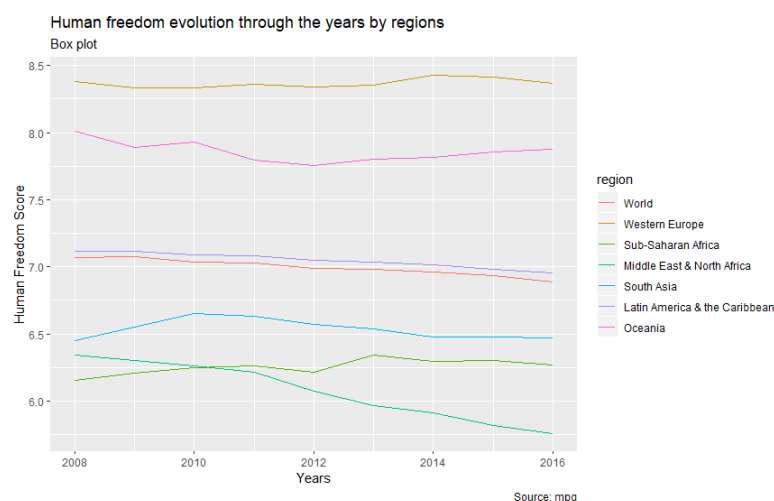

Figure 2.5 – Human freedom evolution through the years by region

We see that the Sub-Saharan African region is the only region that show a very big decrease in human freedom score. This result was expected because of the multiple wars and the state of politic in these region.

What we didn't expect was the slow but constant decrease of the worldwide human freedom, because even if today we start to feel this decrease we didn't thought it had started so many years ago. We think that if more recent data were available the decrease would have accelerated year by year.