



A project of

[Dr. Verena Diersch](#)

for Data Analytics Immersion

with Careerfoundry

[Find the project on Github](#)

[Find the storyboard on Tableau](#)

The Index of Economic Freedom

The Index of Economic Freedom is a yearly report by The Heritage Foundation which lists the economic situation in 184 countries based on 14 indicators: "Property Rights", "Government integrity", "Judicial Effectiveness", "Tax Burden", "Government Spending", "Fiscal Health", "Business Freedom", "Labor Freedom", "Monetary Freedom", "Trade Freedom", "Investment Freedom", and "Financial Freedom". The scoring in these segments leads to an overall Score which places the countries on different positions during the years 1995 - 2022.

To use the data for my Python project I came up with the story that I work as an analyst for The Heritage Foundation and want to know if the Index of Economic Freedom is a valuable tool for advising the U.S. government in questions of economic policy.

Business Questions

- Why do countries rank differently in the Index of Economic Freedom?
- Are there correlations between factors?

Part One of the Analysis

Regression Analysis

"Overall Score" and "Property Rights" show a moderate regression

First I conducted an exploratory data analysis which showed that the indicator "Property Rights" is correlated to the "Overall Score". This led to the hypothesis: "The higher the scoring for Property Rights, the higher the Overall Score for Economic Freedom". A regression analysis further showed that although there is a connection between these two variables, the regression line is only a fairly moderate fit which means that the relationship between the factors is not purely linear but more complex.

Part Two of the Analysis

Cluster Analysis

Clustering the data helps to verify the hypothesis of "Property Rights" being an important factor

Cluster analysis uses mathematical calculations to estimate how all data points could be summarized into categories most sensibly. It showed that both the data points in "Overall Score" and "Property Rights" are grouped around central values that are close to each other. This means that where there is a high "Overall Score" there is a high "Property Rights" score and vice versa. This proves that "Property Rights" definitely highly influences the overall scoring.

Part Three of the Analysis

Plotting a Map with Folium

A good visual overview of global economic data.

Using the Python library folium made it possible to visualize the overall scoring. The Tableau Storyboard, which is linked at the top of this document, also provides a good, interactive way to look at the data for every year from 1995 until 2022.



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Learnings

Presenting the hard facts about an analysis is just one side of the coin. For a researcher that wants to learn how to analyze data with Python – like I did – there are a lot of individual learnings associated to the process of data analysis.

The most interesting thing about conducting research with Python is that you grow in your technical skills but you also rise as a person.

Data Analysis in Python

Libraries

- pandas
- matplotlib
- numpy
- seaborn
- sklearn
- folium
- quandl
- statsmodels

Personal Learnings Part One

Hard Skills

Learning new ways to visualize data and how to conduct advanced data analysis in Python

Learning to get an overview over the data through different exploratory visualizations with seaborn was helpful and interesting. It was also exciting to plot data onto a world map with folium and to make complex mathematical calculations like regression and clustering analysis with sklearn. Using complementary data through an API also allowed for experimenting with time series analysis and forecasting.

Personal Learnings Part Two

Soft Skills

“It works if you are creative” is the mantra for learning data analysis in Python

Doing an elaborate analysis with new coding skills is not always easy. To write the code that worked for my endeavors I had to understand the building blocks that hold the operations together and how to replace and tweak them if needed.

Because I was sourcing open data for this project I had to adjust the basic syntax I was provided with to my own needs which not always went smoothly. I learned consistency, confidence, cooperation with my mentor and tutor, and how to stay with my curiosity even when working with Python got hard.

Where to go from here?

The job hunt needs curiosity, too

My new problem solving and storytelling techniques make me confident in my abilities to thrive. I am also very happy to be able to transition into an industry that provides so much opportunities to learn and apply creative skills.