

# DOPP 2023W: Exercise 2 Report

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## 1 Introduction

The aim of this project was to identify conditions associated with the presence of skilled workers born in a foreign country, thus the initial question ” *What conditions are associated (correlate) with immigration of skilled people?*”. By analyzing a range of different factors, chosen through a combination of our own understanding of migration and referring to relevant domain materials, which we afterwards grouped in one of two categories (i.e., economic, social), we sought to uncover insights that could inform decision-making related to policies to attract and retain skilled labor.

## 2 Findings

The map (see 1a) shows the number of migrants with tertiary education proportional to the population. One can observe that amount of foreign-born skilled workers tends to be lower in Eastern Europe. The highest values are observed in Ireland and Sweden.

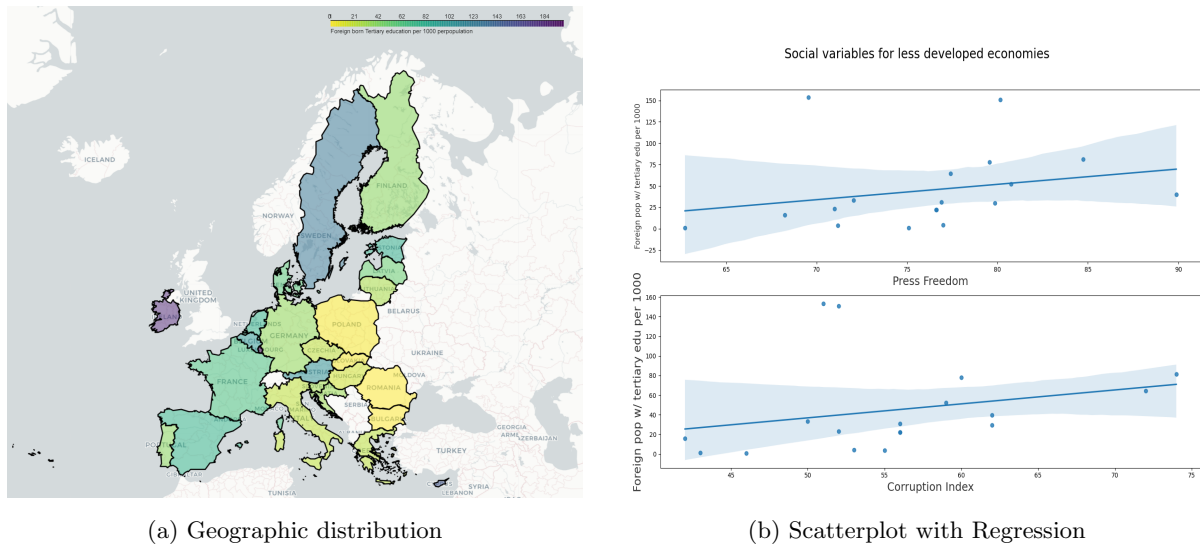


Figure 1: Visualizations

### 2.1 Economic factors

Our analysis revealed a noteworthy correlation between economic conditions (GDP per capita being a specially relevant variable) and immigration patterns - the richer a country is, the more foreign-born population with tertiary education it usually has.

Upon performing a cluster analysis **only** on economic features, two main clusters were identified, one pertaining to **economically developed** countries: Ireland, Luxembourg, Belgium, Germany, Netherlands, Denmark, Sweden, Austria and Finland, and the other to economically **less developed** countries: France, Cyprus, Italy, Greece, Spain, Czechia, Malta, Estonia, Slovenia, Hungary, Romania, Slovakia, Latvia, Croatia, Lithuania, Poland, Bulgaria and Portugal.

In general, it can be asserted that regions characterized by robust economic opportunities exhibit elevated proportions of foreign-born skilled workers. However, it alone cannot explain the proportion

of foreign-born educated people in countries, as shown by the big gaps existing between countries with similar economic metrics that we chose.

## 2.2 Social factors

Having identified the two "economic" clusters, even though still having sizable differences, the next step was to analyze the impact of social features, such as migration policies (through MIPEX), corruption, press freedom, and English proficiency.

By examining the effect of social features individually on each cluster, we aim to keep economic variables "constant", and assess how the number of educated migrants varies with social conditions within richer and poorer countries respectively.

Overall, we found that that social variables can sometimes offer a plausible explanation between gaps between countries, but our data is not able to account for the differences between all countries.

We also employed the K-Nearest Neighbors (KNN) algorithm on each cluster, as well as on the entire dataset, and afterwards the one-tailed two-sample t-test for significance testing. A discernible influence of social factors on immigration trends emerged, particularly in regions characterized by lower economic prosperity. Our results show that, among poor countries, social factors are a slightly stronger predictor for the presence of educated foreigners

This discovery underscores the significance of prioritizing social aspects, particularly emphasizing freedom of press and corruption (see 1b), to augment the overall appeal for skilled professionals. This holds particularly true for less economically developed regions, where bolstering social factors can serve as a key strategy in attracting talent. Conversely, in wealthier countries, our analysis suggests that social factors may not exert as pronounced an influence. This phenomenon can be attributed to the already satisfactory levels of social conditions in affluent nations.

Nevertheless, it is imperative to approach this observation with caution, as statistical tests indicate that the disparity between the two clusters lacks statistical significance for common significance levels.

## 2.3 Limitations

While our analysis yielded valuable insights, additional data, such as the origin of migrants and their migration timelines, would enhance the accuracy of our findings, and better understand migration patterns. However, accessing this data proved to be difficult.

## 2.4 Additional considerations and recommendations

It became apparent during our analysis that a deeper understanding of specific cultural, social and historic reasons is essential to understanding migration trends. Collaborating with domain experts would refine our analysis and provide more accurate understanding of the phenomena and particular hurdles and opportunities provided by a country, which can't be described as a variable.

Despite the differences the EU is a fairly homogeneous continent, as it requires certain economic and legal standards. Therefore the comparison with other regions of the world might bare deeper insight into the effect of social factors like freedom of press and corruption. Additionally, comparing Europe with regions like North America, particularly Canada, known for its attractive point system for skilled migrants, could provide valuable insights.