

The Influence of COVID-19 on the OECD Economy

Introduction

Predicting how the economy of a country changes over time is a difficult task. However, the aim of this project is to analyse data from 29 OECD member countries, and try to come up with a model, that can accurately guess the wellbeing of a country's economy.

The model will use monthly aggregated coronavirus data along OECD's Composite Leading Indicators (CLI) Index. What monthly COVID-19 variables' change can have noticeable effect on the economic status of OECD member countries? By answering the question, we will have a clearer understanding of the relationships between the input variables, and we will be able to foresee economic growth or decrease in advance and prepare for it accordingly. The model could be used as a tool for anyone who has interest in predicting a country's economic status.

Data Characteristics

There are 9 monthly observations collected from 29 countries resulting in a total of 261 observations of 22 input variables. There are 14 coronavirus related variables and 8 demographic indicators.

The data also includes our output variable, the CLI Index, which describes how a given country's economy performs based on leading economic indicators and predictions, resulting in an index which at 100 points means that the economy is not moving in either direction. If the index falls below 100, it indicates a decrease in performance, if above 100, we can expect growth. However, the change in the index is relatively small from month to month, most of the times below 2 points.

The selected Covid-19 input variables are the following:

- **Total cases:** Total confirmed cases of COVID-19
- **New cases:** New confirmed cases of COVID-19
- **New cases smoothed:** New confirmed cases of COVID-19 (7-day smoothed, summed up per month)
- **Total deaths:** Total deaths attributed to COVID-19
- **New deaths:** New deaths attributed to COVID-19
- **New deaths smoothed:** New deaths attributed to COVID-19 (7-day smoothed, summed up per month)
- **Total cases per million:** Total confirmed cases of COVID-19 per 1,000,000 people
- **New cases per million:** New confirmed cases of COVID-19 per 1,000,000 people
- **New cases smoothed per million:** New confirmed cases of COVID-19 (7-day smoothed, summed up per month) per 1,000,000 people
- **Total deaths per million:** Total deaths attributed to COVID-19 per 1,000,000 people
- **New deaths per million:** New deaths attributed to COVID-19 per 1,000,000 people
- **New deaths smoothed per million:** New deaths attributed to COVID-19 (7-day smoothed, summed up per month) per 1,000,000 people
- **Reproduction rate:** Real-time estimate of the effective reproduction rate (R) of COVID-19. See <https://github.com/crondonm/TrackingR/tree/main/Estimates-Database>
- **Stringency index:** Government Response Stringency Index: composite measure based on 9 response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest response)

These are the included demographic indicators:

- **Population:** Population in 2020
- **Median age:** Median age of the population, UN projection for 2020
- **GDP per capita:** Gross domestic product at purchasing power parity (constant 2011 international dollars), most recent year available
- **Female smokers:** Share of women who smoke, most recent year available
- **Male smokers:** Share of men who smoke, most recent year available
- **Hospital beds per thousand:** Hospital beds per 1,000 people, most recent year available since 2010
- **Life expectancy:** Life expectancy at birth in 2019
- **Human Development Index (HDI):** A composite index measuring average achievement in three basic dimensions of human development — a long and healthy life, knowledge and a decent standard of living. Values for 2019, imported from <http://hdr.undp.org/en/indicators/137506>

We have to keep in mind that the demographic predictors are static per country, meaning that they are not changing from one month to another, rather they are included to give the model a better understanding of the current demographic status of a given country.