



CPI Prediction Project

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Background

CPI measures changes in the price level of market basket of consumer goods and services purchased by households. The CPI is a *statistical* estimate constructed using the prices of a sample of representative items whose prices are collected periodically.

Source: Wikipedia

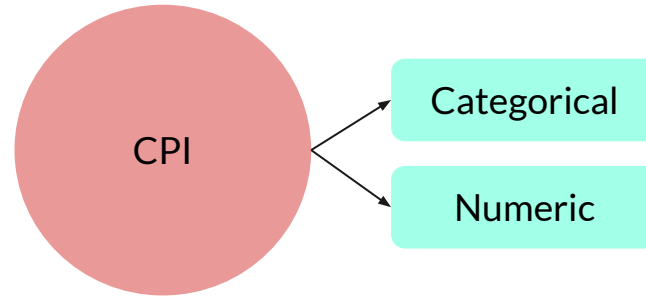
Characteristics of G7 and BRICS

G7, with the seven *largest IMF-described advanced economies in the world*, represent 58% of the global net wealth. The G7 countries also represent more than 46% of the global gross domestic product (GDP) based on nominal values, and more than 32% of the global GDP based on purchasing power parity.

In 2015, the five BRICS countries represent *over 3.1 billion people, or about 41% of the world population*; four out of five members (excluding South Africa at #24) are in the top 10 of the world by population. As of 2018, these five nations have a combined nominal GDP of US\$18.6 trillion, *about 23.2% of the gross world product*, combined GDP (PPP) of around US\$40.55 trillion (32% of World's GDP PPP) and an estimated US\$4.46 trillion in combined foreign reserves.



Variables



GDP

Tech

Rates

Health

Year

Energy

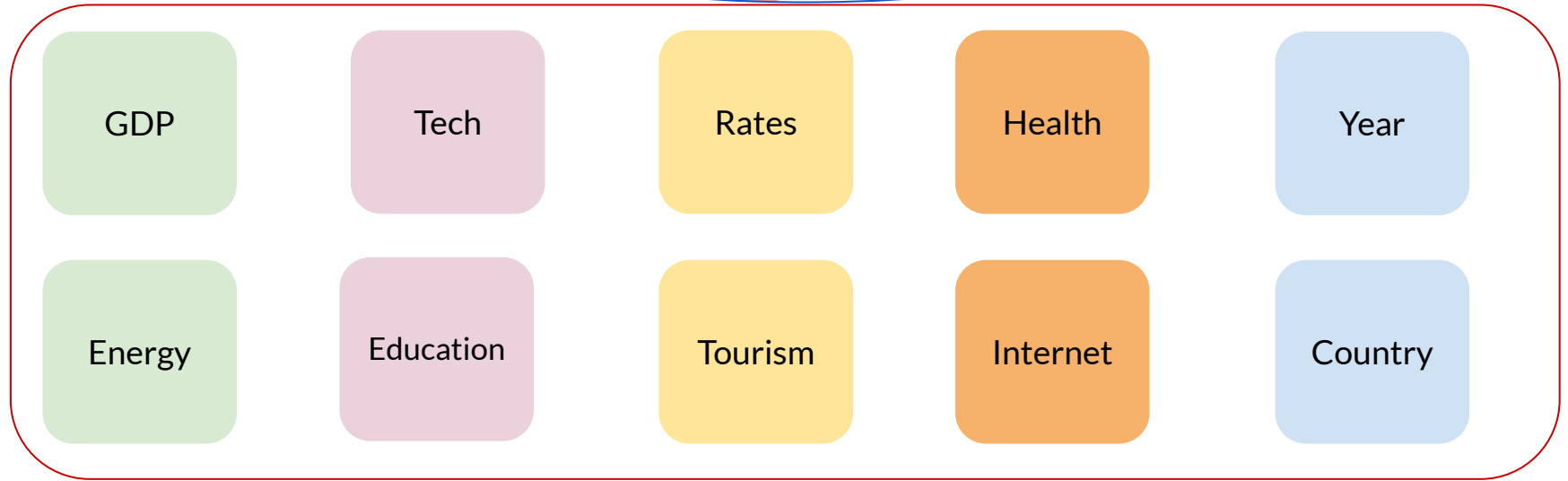
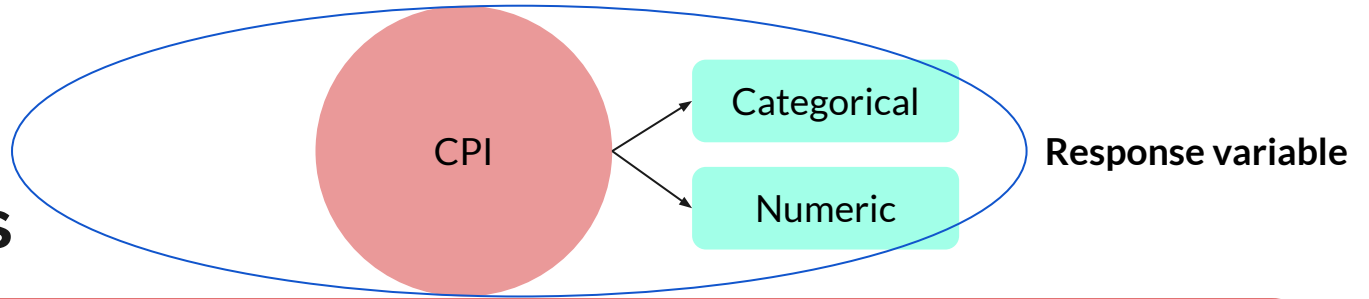
Education

Tourism

Internet

Country

Variables

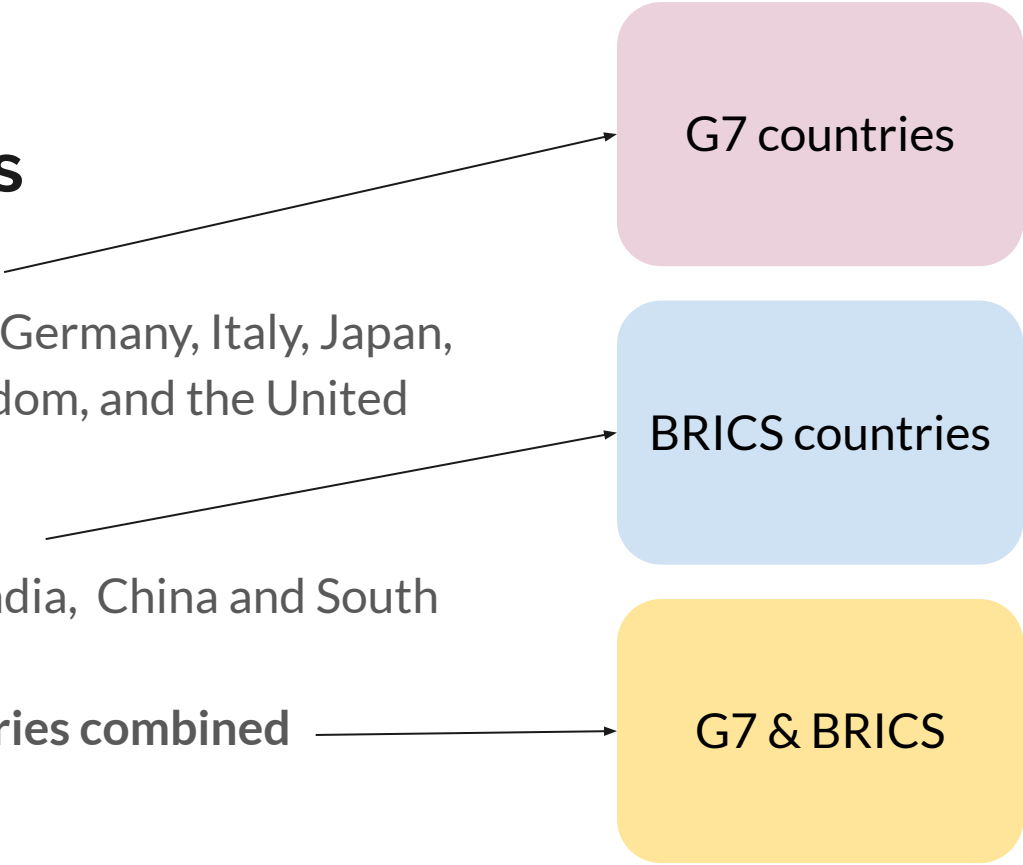


Predictor variables



Three Structures

- **G7 countries**
 - Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States
- **BRICS countries**
 - Brazil, Russia, India, China and South Africa
- **G7 and BRICS countries combined**



G7 countries

BRICS countries

G7 & BRICS



Two designs for predicting CPI

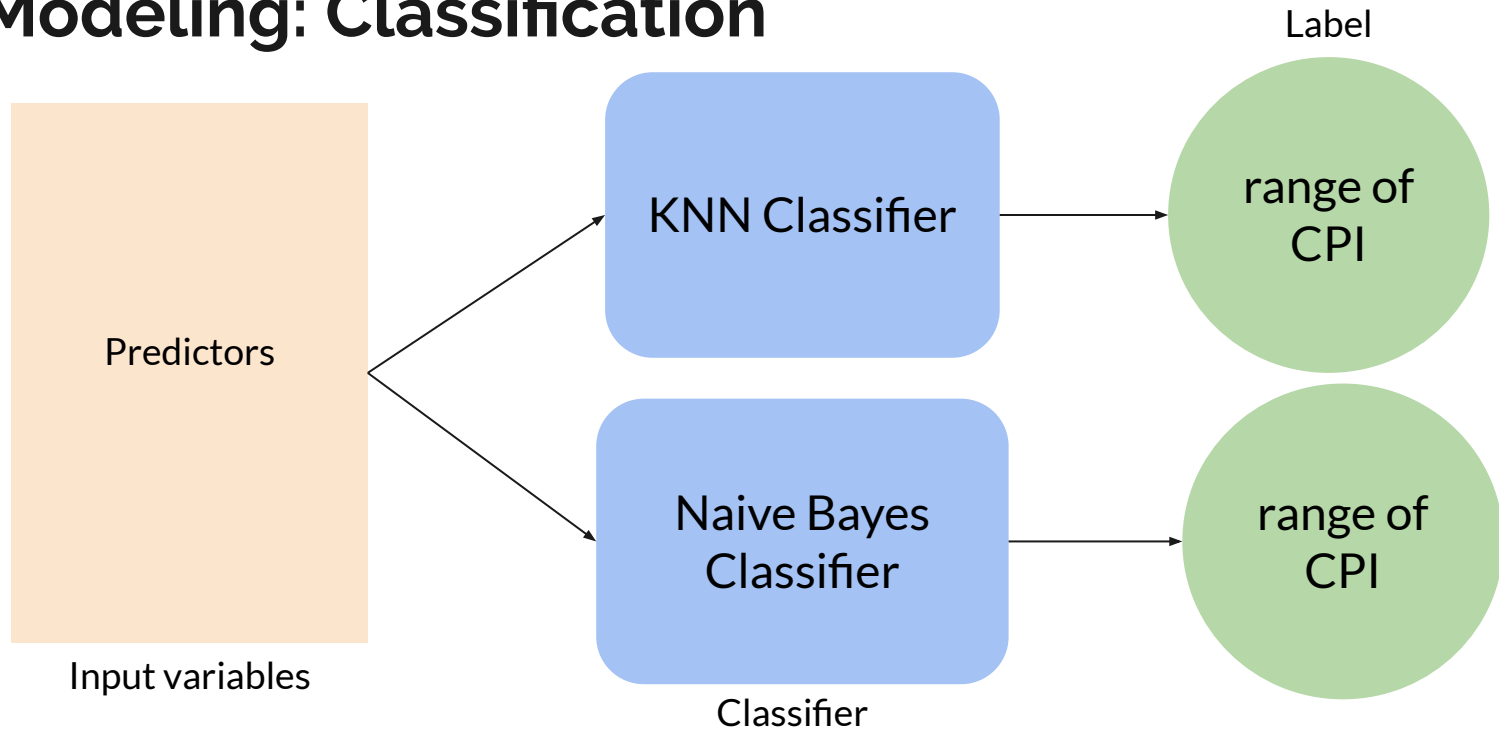
Classification on CPI
range
(categorical)

Classification

Prediction on CPI value
(numeric)

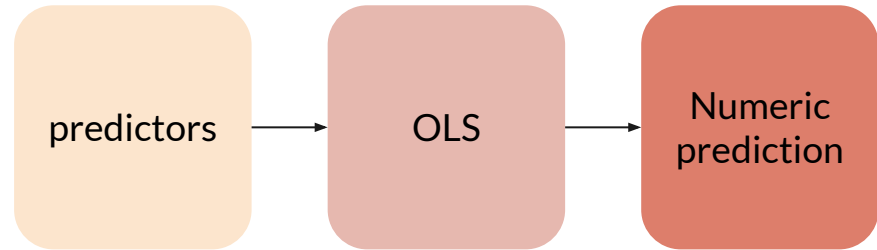
Regression

Modeling: Classification





Analysis: Regression



Model for G7: $\text{CPI} \sim \text{GDP} + \text{Energy} + \text{Health} + \text{C}(\text{Country})$

Model for BRICS: $\text{CPI} \sim \sqrt{\text{GDP}} + \text{Energy} + \text{Internet} + \text{Health} + \text{C}(\text{Country})$

Model for two groups combined:

$\text{CPI} \sim \sqrt{\text{GDP}} + \text{Energy} + \text{Internet} + \text{Health} + \text{Tech} + \text{C}(\text{Country}) + \text{C}(\text{Group})$



Thanks for listening!