Classification of World Economies

Prediction of Upcoming Growth or Decline

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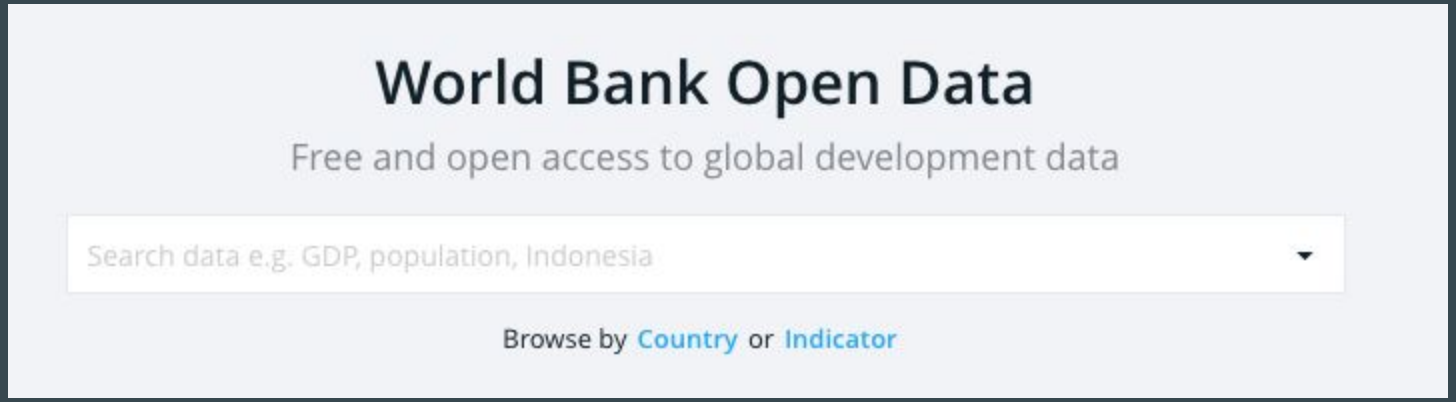
Goal

To use development indicators such as those related to education, health, environment, and economic industry makeup to create a classification model to predict whether an economy would be likely to grow or shrink in any particular upcoming year.

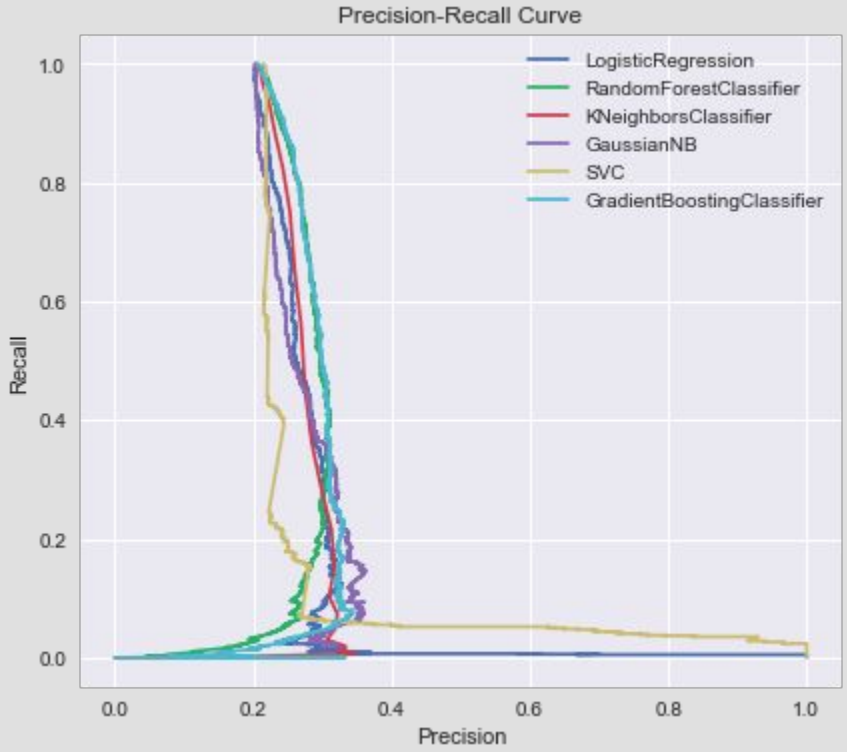
To see if performance of indicators such as those related to the millennium development goals relates to better economic performance and reduced instances of shrinking economies and economic hardships.

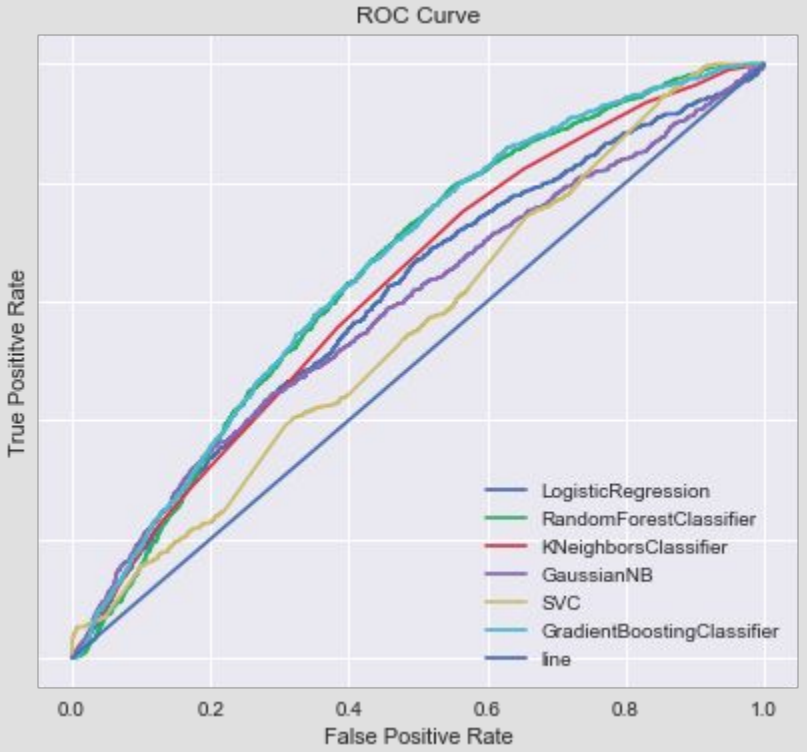
The World Bank Open Data Initiative



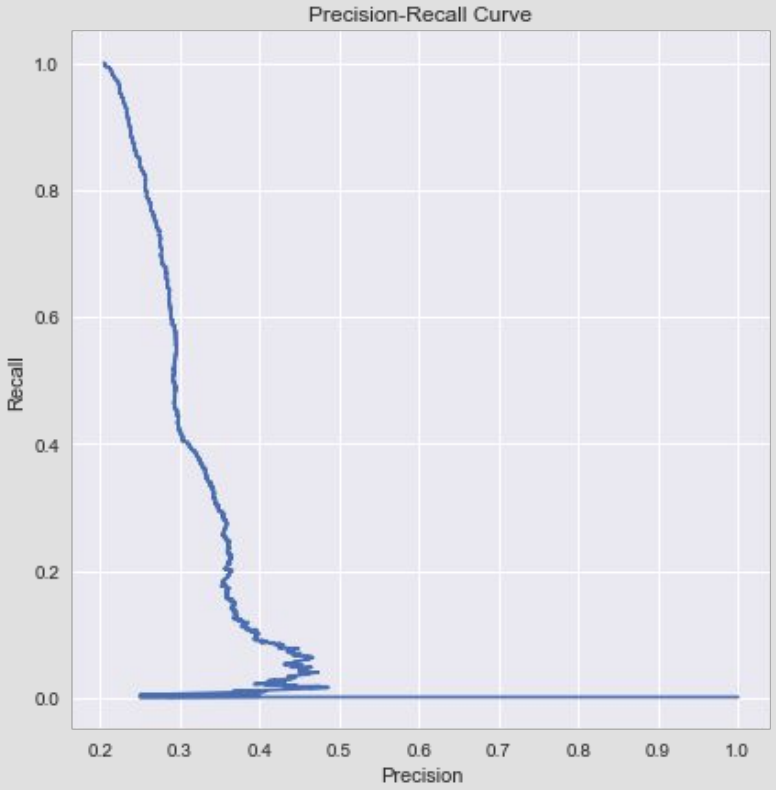
- 263 Country Codes
- 55 years of measurement of 1500+ indicators (14,465 rows)
- 147,000+ individual data points
- Model data reduced to 33 features and 5,566 rows with enough data to be meaningful
- July 2017 release of world development indicators

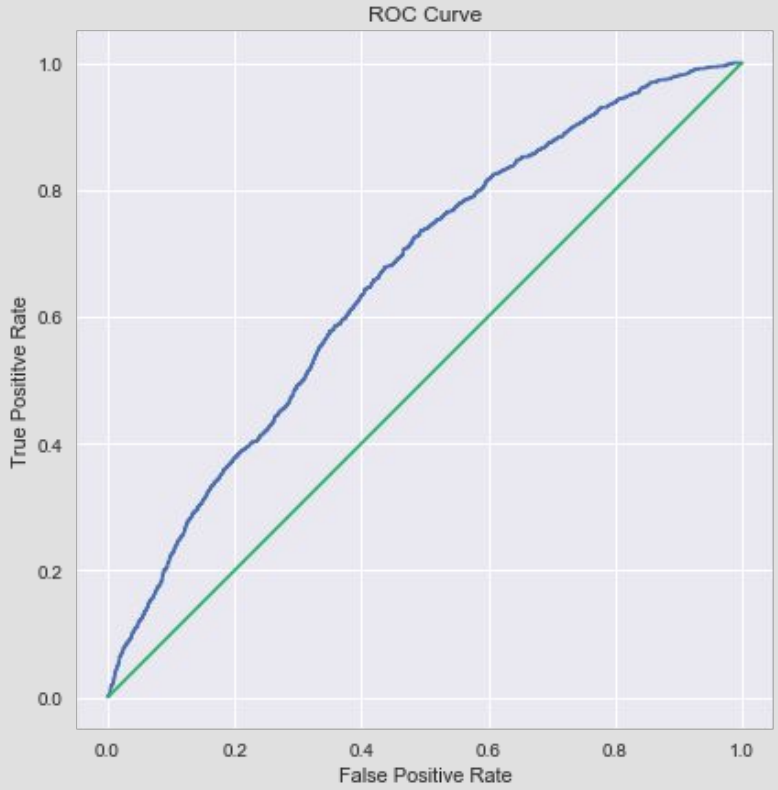
Model Choice





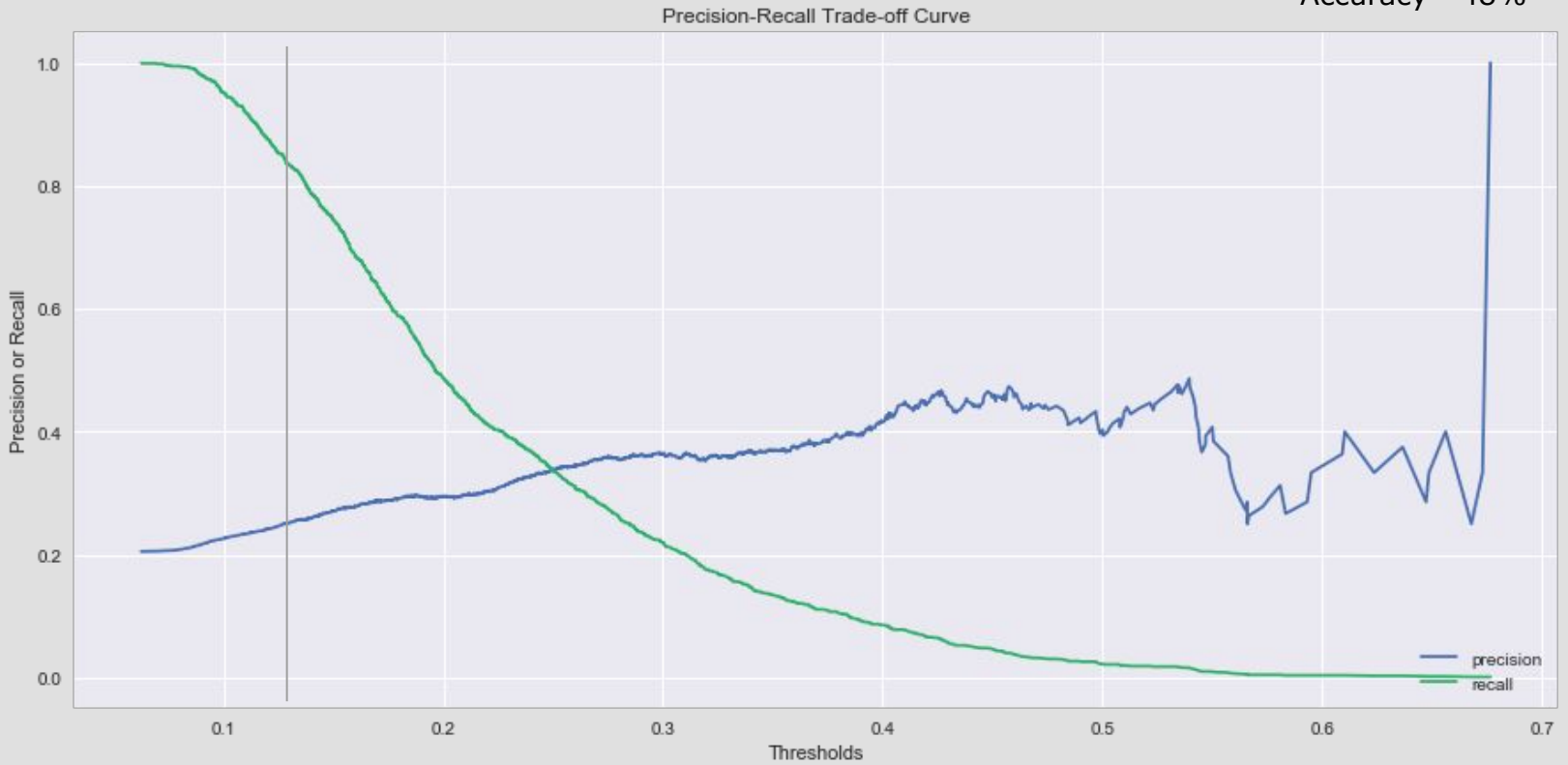
Confusion Curves



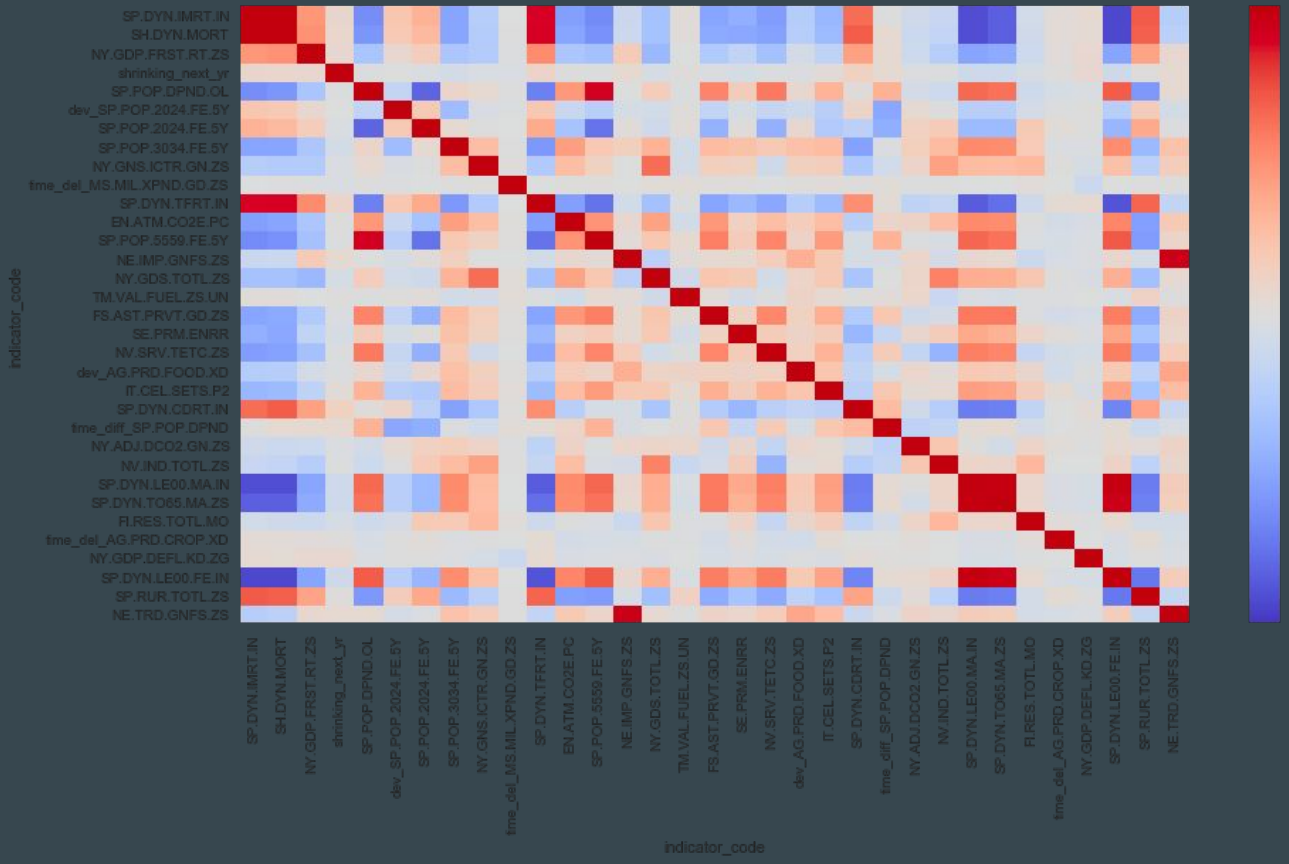


Choice of Threshold

Precision - 25.5%
Recall - 82.6%
F1 Score - 0.389
Log-Loss - 0.48
ROC AUC - 0.66
Accuracy - 48%

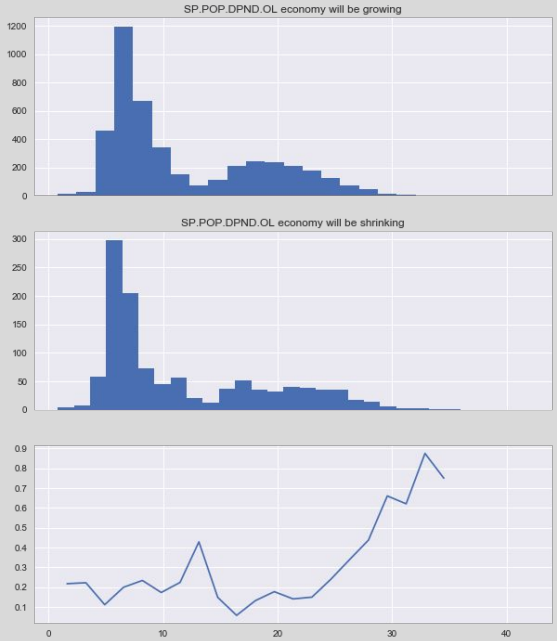


Interesting Features



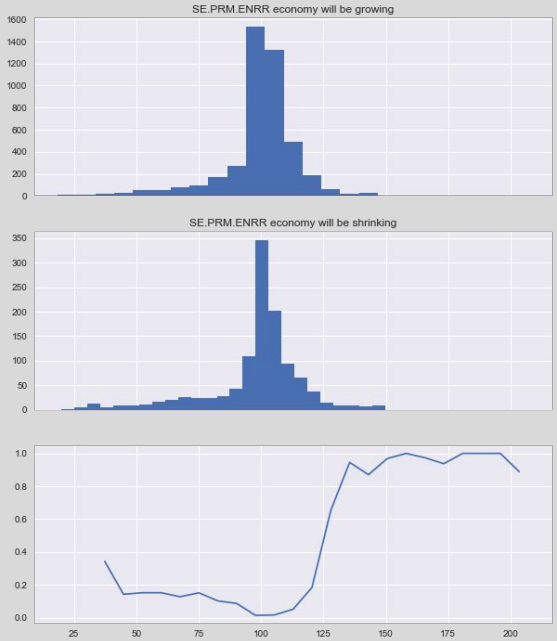
Interesting Features

59 Age dependency ratio, old (% of working-age po...
Name: indicator_name, dtype: object



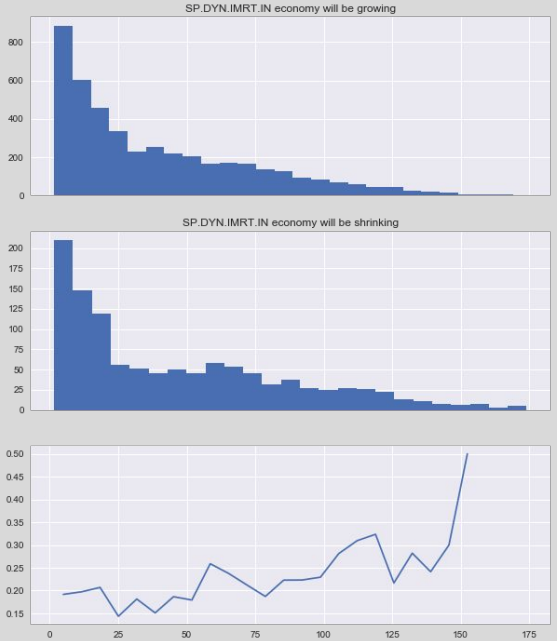
Age Dependency Ratio

191 School enrollment, primary (% gross)
Name: indicator_name, dtype: object



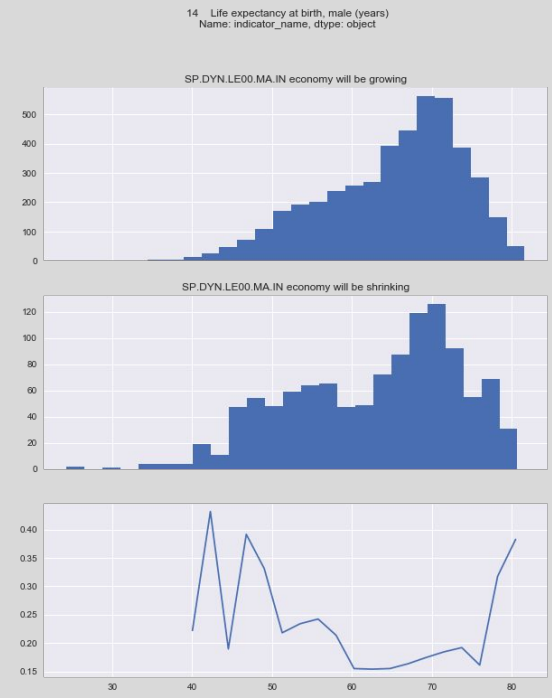
Primary School Enrollment

81 Mortality rate, infant (per 1,000 live births)
Name: indicator_name, dtype: object

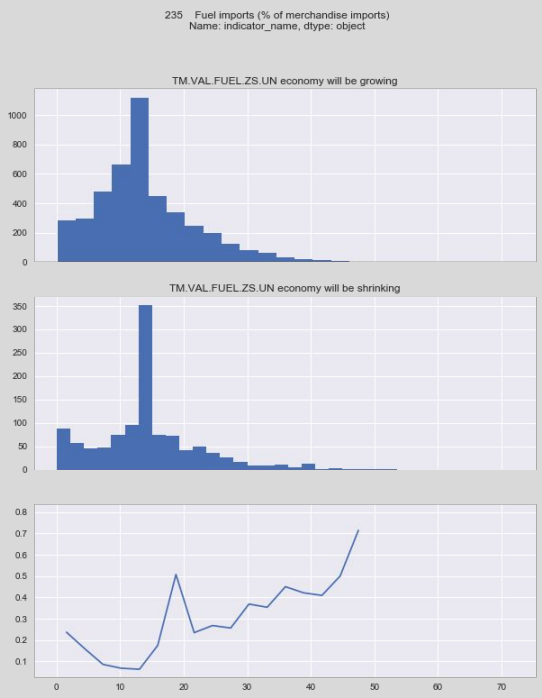


Infant Mortality Rate

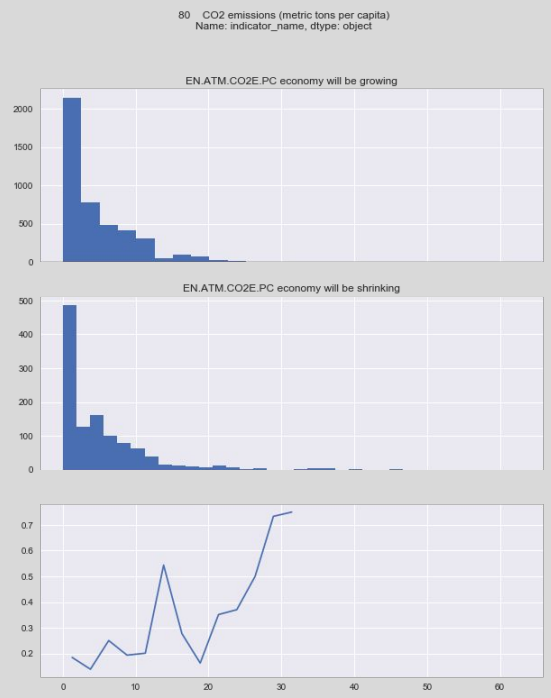
Interesting Features



Life Expectancy - Male

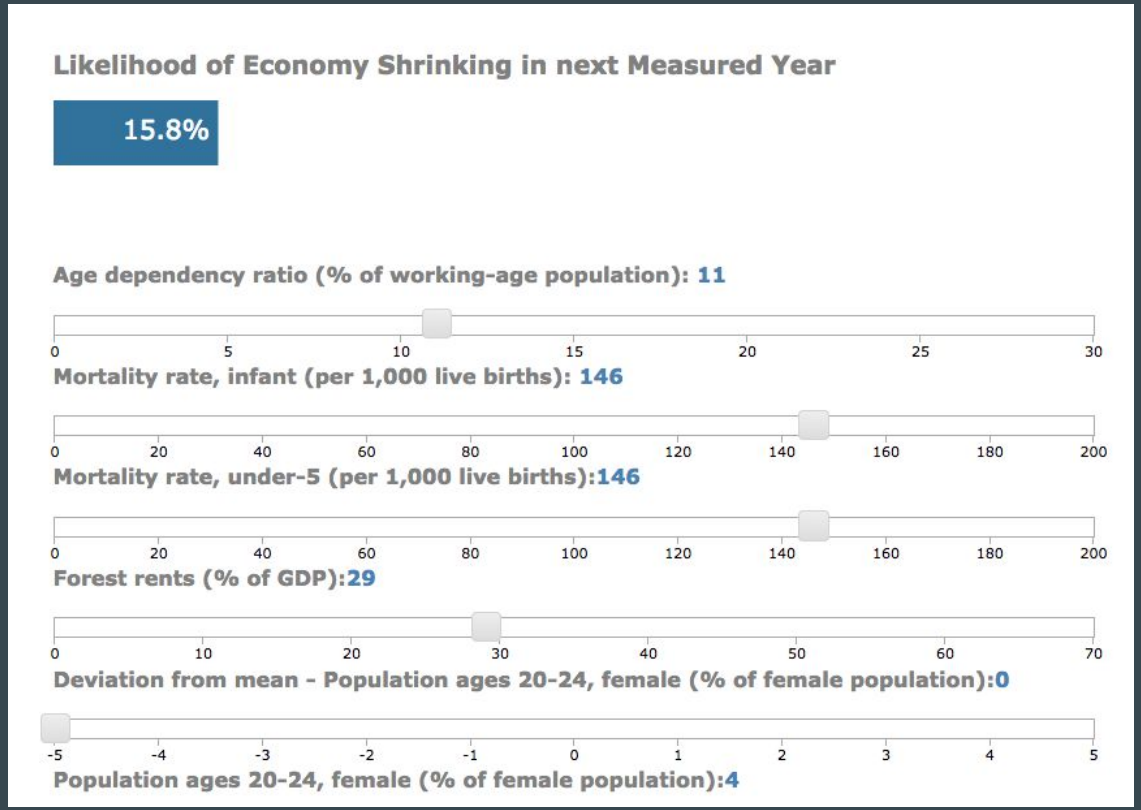


Fuel Imports



CO_2 emissions/capita

Playing with Predictions



Suggested Future Work

- Use of proxy data for countries that have missing data
- Analysis of spending on MDGs, debt forgiveness, and indicator response
- Election prediction
- Addition of data for world economic/indicator trends proxies
- Reducing personal bias in initial indicator selection and explanation

Interesting Features

- Annual Inflation Rate
- Carbon Dioxide Damage (% of GNI)
- Industry, value added (% of GDP)
- Total Reserves in Months of Imports
- School enrollment, primary (% gross)
- Mobile cellular subscriptions (per 100 people)
- Fuel imports (% of merchandise imports)
- Domestic credit to private sector (% of GDP)
- Trade (% of GDP)
- Services, etc., value added (% of GDP)
- Imports of goods and services (% of GDP)
- Gross domestic savings (% of GDP)
- Gross savings (% of GNI)
- CO2 emissions (metric tons per capita)
- Deviation from mean - Food production index (2004-2006 = 100)
- Change from previous year in Crop production index (2004-2006 = 100)
- Forest rents (% of GDP)
- Rate of Change of Military expenditure (% of GDP)
- Death rate, crude (per 1,000 people)
- Life expectancy at birth, female (years)
- Life expectancy at birth, male (years)
- Survival to age 65, male (% of cohort)
- Fertility rate, total (births per woman)
- Mortality rate, infant (per 1,000 live births)
- Mortality rate, under-5 (per 1,000 live births)
- Rural population (% of total population)
- Population ages 20-24, female (% of female population)
- Deviation from mean - Population ages 20-24, female (% of female population)
- Population ages 30-34, female (% of female population)
- Population ages 55-59, female (% of female population)
- Age dependency ratio, old (% of working-age population)
- Rate of Change of Age dependency ratio (% of working-age population)