

Visual Analysis Final

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Abstract—The project seeks to use the given dataset to examine the relationships between governance, social inequality, political freedom, trust in institutions, and development outcomes across countries, providing a holistic understanding of how these factors influence a nation's functioning and the quality of life of its citizens. We use R, Python, and Tableau to understand how the country's features relate to each other. We also discovered patterns and trends with strong correlations.

Index Terms—social inequality, political freedom, development outcomes.

I. EXPLORATORY ANALYSIS

A. Explaining the dataset

This dataset likely analyzes the relationship between political, social, economic, and institutional factors across countries, aiming to understand their correlations and impact on broader issues:

Inequality and Governance: The Gini Index, Corruption Perceptions Index, and Trust in Government Index reveal how inequality, corruption, and public trust affect governance and stability.

Political Systems and Freedoms: The Freedom House Democracy Index, Economist Democracy Index, and Press Freedom Index show the state of democracy, press freedom, and political rights, and their contribution to stability and well-being.

Public Health and Trust: The Effective Coverage of Health Services Index and Trust in Science Index explore healthcare quality and public trust in science, essential for health policy effectiveness.

Social Cohesion and Polarization: The Populism Index, Trust in News Media, and Trust in Government indices examine how populism, media trust, and political polarization influence societal divisions.

Human Development: The Human Development Index (HDI) is analyzed alongside other indices to explore how income, education, and life expectancy correlate with political, economic, and social conditions.

B. Potential use cases

1. Policy Making and Governmental Reform 2. Economic and Social Development Planning 3. Cross-Country Comparative Analysis 4. Risk Assessment for Investment 5. Humanitarian Aid and Crisis Response 6. Public Health Strategy 7. Social Cohesion and Conflict Prevention 8. Media and Communication Strategy 9. International Diplomacy and Relations

C. Dataset correlation analysis

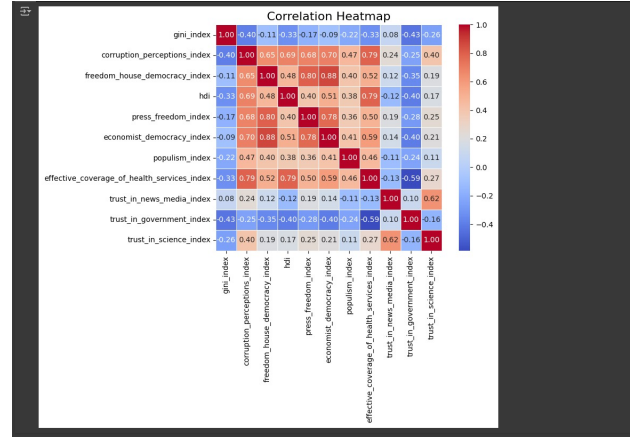


Fig. 1. Dataset Correlation

Countries with higher inequality (Gini Index) have lower HDI (-0.33), higher corruption (-0.40), and lower trust in government (-0.43). Countries with lower corruption have more human development (0.69) and health coverage (0.79) and lesser wealth inequality (-0.40). Countries with high human development (HDI) provide better health coverage (0.79), better democracy (0.48–0.88), and lower inequality. Trust in Government, News Media, and Science are deeply interconnected (0.59–0.62). Countries with populism are more likely to be corrupt (0.47) and are negatively correlated with trust indices.

II. VISUALIZATIONS

A. Human development Index

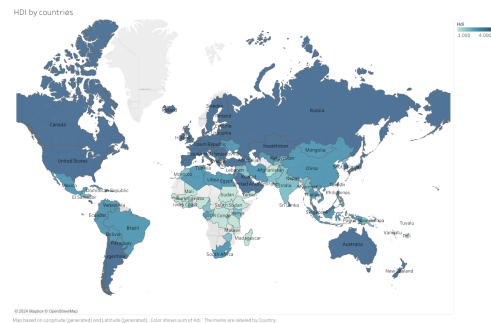


Fig. 2. Human Development Index Distribution

The average HDI around the world is 2.935. European countries have the highest consistent HDI and Gini index. African countries have lower HDI and Gini index.

B. GINI index vs Coverage

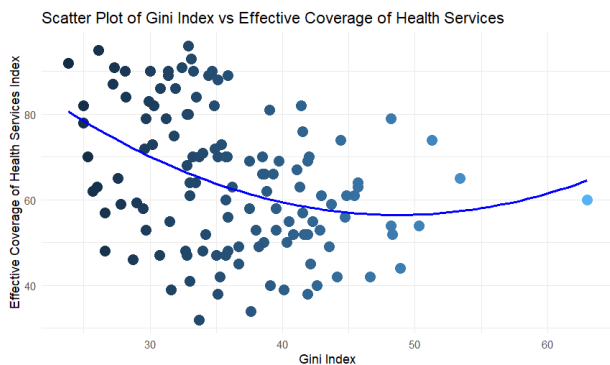


Fig. 3. GINI Index vs Coverage

For countries under a GINI index of 50, the effective health coverage reduces as wealth inequality decreases. On average, most countries have a GINI index in the range of 40 - 50. Most countries have an effective health coverage index of the range 50 - 80.

C. Press freedom by continent

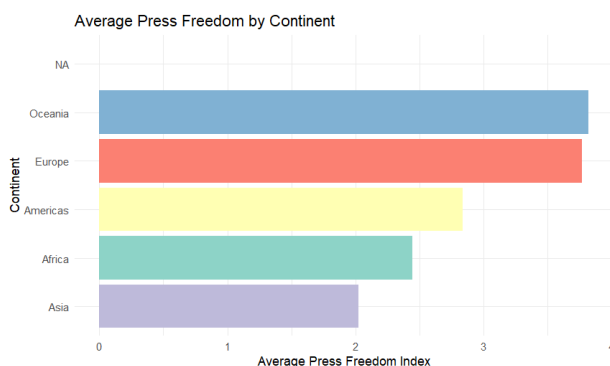


Fig. 4. Press freedom by continent

For a meta analysis, all countries were mapped to the continent belonged to. Then found the average press freedom per continent. Oceania has the highest degree of freedom for the press. Asia has the most restricted press.

D. Corruption by country

Corruption perception index by country



Fig. 5. Press freedom by continent

New Zealand has one of the highest corruption perception index.(88) South Sudan had the lowest. (12) Countries with higher HDI's have higher corruption perception index.

E. Gini Index vs populism Index

3D Visualization of Democracy, Populism, and Inequality

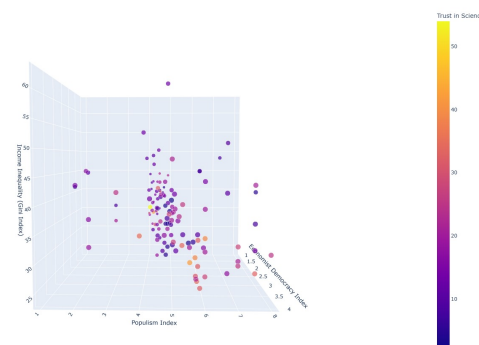


Fig. 6. Press freedom by continent

There is mild correlation between income inequality and populism index as most of the data clumps in the middle, but not enough to make safe predictions.

TECH STACK

Tableau: Map (HDI), Heatmap (Trust in Government), Scatterplot (Trust in News vs Trust in Government), Bubble Chart (Corruption perception index), Bar Chart (Press freedom by country).

R: Bar chart, Scatter plot with curve fitting.

Python: 3D scatter Plot, 2D scatter plot