

Unveiling Global Governance Patterns Through Visual Analytics

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Abstract—This paper explores relationships between governance quality, press freedom, and public trust across countries using a cross-national dataset of socio-political indices. Using Tableau and Python for visualization, we uncover meaningful trends in democracy and trust. Notable findings include a strong positive relationship between democratic strength and press freedom, and a near-normal distribution of public trust in governments. A correlation heatmap further reveals alignment between development and transparency, and highlights the inverse relationship between inequality and institutional trust.

I. INTRODUCTION

Our objective was to uncover global patterns in democracy, inequality, development, and public trust using quantitative indicators from 128 countries. We expected to find a positive association between stronger democratic institutions and higher levels of public trust and press freedom. Through Tableau and Python visualizations, we identified three major insights:

- A strong correlation exists between democracy scores and press freedom.
- Trust in government follows a near-normal distribution across countries.
- Development (HDI) and corruption perceptions are closely tied, suggesting socio-political cohesion in high-HDI nations.

II. DATA & EXPLORATORY ANALYSIS

We used the `country_information.csv` dataset, which contains 12 variables across 128 countries, including:

- **Economic:** Gini Index (inequality), HDI, Corruption Perceptions Index
- **Governance:** Freedom House Index, Economist Democracy Index
- **Public Trust:** Trust in government, media, and science
- **Others:** Health coverage index, Populism score

This dataset is useful for political risk analysis, policy development, or academic studies on democratic resilience. From the correlation heatmap, we observed:

- A negative correlation between the Gini index and trust in government ($r \approx -0.43$)
- Strong alignment between health service quality and democratic strength

- Trust in science is positively related to trust in media ($r \approx 0.62$)

External reports such as Transparency International’s 2024 CPI study support our findings that low corruption and high press freedom often co-occur in mature democracies [6].

III. VISUAL ANALYSIS AND TOOL SELECTION

In our visual analysis, we employed both Tableau and Python to explore key governance-related indicators. Tableau was selected for its capability to produce polished, interactive dashboards, and it effectively illustrated that nations with higher democracy index scores also tend to enjoy greater press freedom, aligning with our theoretical assumptions. Python, on the other hand, was used for two analyses: first, a correlation heatmap generated using Seaborn, which allowed us to visualize multivariate relationships among governance, inequality, and trust indicators, highlighting both positive and negative associations across variables; second, a histogram with KDE overlay that showed trust in government approximates a normal distribution, indicating moderate-to-high trust levels across most countries with only a few outliers exhibiting low trust.

IV. RESULTS

Our visualizations provide a multidimensional understanding of global governance, press freedom, and public trust. Below, we summarize each chart and its key findings, supported by real-world observations and academic references.

1. Tableau Chart – Average Press Freedom by Democracy Index

The Tableau chart visualizes the average Press Freedom Index across different levels of the Economist Democracy Index. We observe a clear upward trend: countries with stronger democratic institutions (democracy index scores of 3 and 4) have significantly higher press freedom values, often exceeding 4.0. This finding aligns with studies that emphasize press freedom as both a contributor to and an outcome of liberal democracy [3]. For example, Norway and Finland — regularly scoring among the top on democracy rankings — are also ranked highest on the 2023 World Press Freedom Index [5]. In contrast, authoritarian or hybrid regimes (democracy

score of 1 or 2), such as Russia or Turkey, show much lower press freedom levels, often due to censorship and state-controlled media [2].

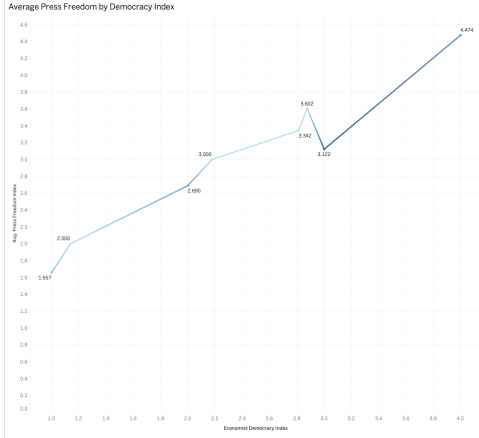


Fig. 1. Embedding-Based Evaluation Layer

2. Python – Correlation Heatmap of Country Indices

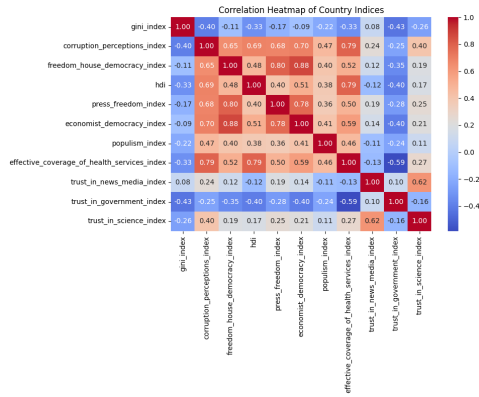


Fig. 2. Embedding-Based Evaluation Layer

The correlation heatmap provides an overview of relationships between all numerical variables. Several notable correlations emerge:

- **Positive correlations:** HDI and Corruption Perceptions Index ($r = 0.48$), Press Freedom and Democracy Index ($r = 0.88$), and Health Coverage with Corruption Perceptions ($r = 0.79$).
- **Negative correlations:** Gini Index with Trust in Government ($r = -0.43$), suggesting that higher inequality reduces political trust.

These trends suggest that higher development and transparency reinforce one another. Scandinavian countries such as Sweden and Denmark, which have high HDI and low corruption, also score highly on health coverage and public trust [4]. In contrast, nations like Venezuela and Nigeria exhibit both poor health indicators and high perceived corruption, validating the negative end of these correlations.

3. Python – Distribution of Trust in Government Index

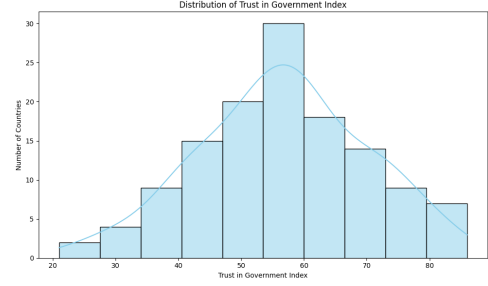


Fig. 3. Embedding-Based Evaluation Layer

The distribution plot of the Trust in Government Index approximates a normal curve with a slight left skew. The majority of countries fall between 45 and 70, indicating moderate trust in governance. However, outliers on the lower end (below 30) suggest deep-rooted institutional skepticism in some regions. For instance, countries with persistent political unrest such as Lebanon or South Africa often report low levels of trust in public institutions [1]. Conversely, countries like Switzerland and Singapore maintain high levels of public trust, supported by strong bureaucratic efficiency and low corruption [7].

This visualization highlights how public sentiment about governance varies significantly across regimes, even when formal democratic structures are in place. Overall, the results underscore the interdependence of development, democracy, and trust. Where transparency, freedom, and service delivery are prioritized, citizens tend to exhibit more trust — a foundational requirement for political legitimacy and democratic sustainability.

V. CONCLUSION

This project demonstrates how data visualization tools like Tableau and Python can offer valuable insights into the socio-political landscape. By combining descriptive statistics with visual storytelling, we better understand how inequality, governance, and trust intersect globally. Future work could include longitudinal or regional comparisons to enhance explanatory depth.

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