## Overview

Our project, **Analyzing Economic Indicators and Political Violence in the Philippines**, applies Data Science techniques to extract insights about the relationship between Philippine economic indicators (PHP exchange rate, Internal debt, Foreign investment, GDP, GNI, etc.) and the number of recorded political violence in the country.

### MOTIVATION

The Philippines has long been riddled by persistent social issues such as poverty, unemployment, crime, and political violence. Among these, political violence stands out as a critical concern, manifesting through events, strategies, and effects that extensively impact society. Research has been pivotal in assessing this phenomenon in governance contexts to understand the financial incentives and costs of this complex phenomenon. Studies have explored how factors such as economic growth, inequality, and institutional weaknesses shape political violence, offering insights into the underlying dynamics of conflict such as insurgency, communal violence, and economic criminality. This study delights the necessity for proactive, evidence-based governance strategies to address these challenges effectively.

### PROBLEM

Political violence in the Philippines is a multifaceted issue fueled by various social, economic, and political factors. Historical legacies such as colonialism, martial law, and the enduring influence of powerful families contribute to the complexity of the issue. Economic instability, in addition to a lack of transparent governance, or lack of accountability, exacerbates social grievances, leading to widespread unrest. Moreover, geopolitical tensions and external influences further complicate the dynamics of political violence. Addressing these challenges requires a comprehensive approach that addresses the root causes of political violence and promotes peace and stability in the region.

### SOLUTION

Utilizing data science techniques to analyze economic data allows us to identify correlations between economic indicators and political violence in the Philippines. By leveraging advanced statistical methods and machine learning algorithms, we can uncover hidden patterns and trends in the Philippines, shedding light on the factors influencing the occurrence of political violence and offering evidence-based insights to policymakers. Additional issues in economic dynamics, such as income inequality and unemployment, exacerbate political grievances, fueling social unrest. Our approach aims to provide a comprehensive understanding of these complex interactions, facilitating informed decision-making and promoting peace and stability.

## Background Study

Carothers and Dickinson (2020) highlighted the global landscape characterized by a significant decline in the perceived efficacy of democratic governance as a cause of social unrest. This phenomenon stems from a combination of factors, including economic disparities, corruption, and the rise of populist movements worldwide. These factors collectively contribute to the erosion of trust in democratic institutions and exacerbate social tensions, leading to widespread discontent and instability. The study underscores the interconnectedness of these factors and their cumulative impact on the stability of democratic systems globally, emphasizing the urgent need for addressing these challenges to mitigate the risks of social unrest and political instability.

For more information, visit the Carnegie Endowment for International Peace (CEIP).

### Objectives

1. To identify and analyze the correlation between various economic indicators such as the PHP exchange rate, internal debt, foreign investment, GDP, GNI, and other relevant factors with the number of recorded political violence incidents in the Philippines.
2. To understand the underlying dynamics and patterns of the identified relationships between economic conditions and political violence, including socio-economic disparities, inequality, and governance.
3. To provide evidence-based insights to inform decision-making and policy formulation aimed at addressing economic challenges and promoting sustainable development goal (SDG) 16 (Peace, Justice, and Strong Institutions).
4. To assist the government in addressing the issue of rising political violence by offering evidence-based recommendations and interventions tailored to the identified data-driven insights.

### Research Hypothesis

**Null Hypothesis (H0)**

None of the Philippines' economic indicators can correlate with the number of recorded political violence incidents.

**Alternative Hypothesis (H1)**

Some of the Philippines' economic indicators, or a combination of them, affect the number of recorded political violence in the country.

### Data

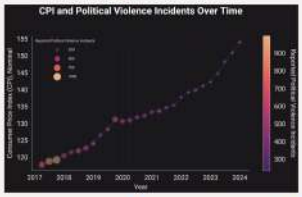
We looked at publicly available and credible databanks.

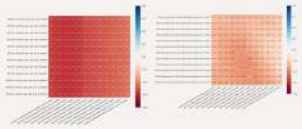
Specifically, we looked at data by Kaggle from Philippines and Kaggle and we looked at World Bank's data catalog dataset on Philippines Economic Indicators.

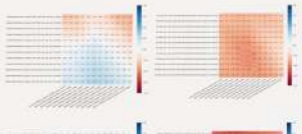
We looked mainly political violence in the Philippines from 2017 up to the present. World Indicators, Bank Indicators, Income, and other Economic Indicators (PHP, political violence data, Gross Income, Debtor, and Investments).

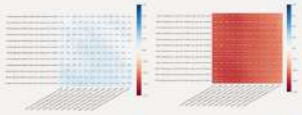
Data was obtained

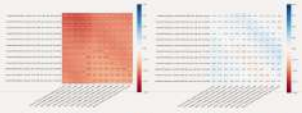
## PLOTS

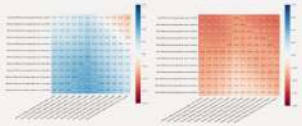


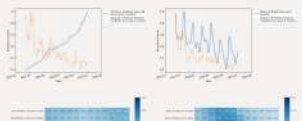





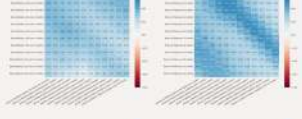


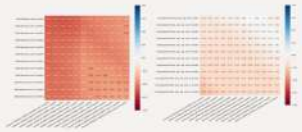












## Methods

methods

## Results

Is there a correlation between the Philippines's economic indicators (PHP exchange rate, Internal debt, foreign investment, GDP, GNI, etc.) and the number of recorded political violence in the country?

No

Hypothesis: none of the indicators displayed a strong correlation with the number of recorded political violence in the country. Even if the indicators displayed a moderate correlation (0.60 - 0.79), it is not enough to reject the null hypothesis.

**Which economic indicator is most correlated with the number of recorded political violence occurred in the Philippines?**

Trade of Trade and CPI

Trade of Trade displayed the strongest positive correlation with a correlation coefficient of 0.86. Meanwhile, CPI displayed the strongest negative correlation with a correlation coefficient of -0.78.

## DATABAES

**KRYLLE**

Krylle Joshua Logroño

Krylle is a 4th year BS Computer Science student at the University of the Philippines Diliman. He is a member of the Philippine Delegation for Asian Mathematical Olympiad and a member of Kamanyang Organization and a member gathering for those under the Department of Computer Science - Algorithm and Complexity Laboratory. While the whole team works together for this project, Krylle focuses on the data wrangling, cleaning, and analysis. He is also responsible for the presentation.

**AARON**

Aaron Lyle Tanael

Aaron is a 4th year BS Computer Science student at the University of the Philippines Diliman. He is a member of the Philippine Delegation for Asian Mathematical Olympiad and a member gathering for those under the Department of Computer Science - Algorithm and Complexity Laboratory. While the whole team works together for this project, Aaron focuses on the data wrangling, cleaning, and analysis. He is also responsible for the presentation.

**EARL**

Earl Wilmar Magno

Earl is a 4th year BS Computer Science student at the University of the Philippines Diliman. He is a member of the Philippine Delegation for Asian Mathematical Olympiad and a member gathering for those under the Department of Computer Science - Algorithm and Complexity Laboratory. While the whole team works together for this project, Earl focuses on the data wrangling, cleaning, and analysis. He is also responsible for the presentation.

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