# **Examining Government Spending and Foreign Investments on GDP and Inflation**

## **Research Objectives:**

* Analyze the impact of government spending on GDP.
* Evaluate the effect of government spending on GDP growth.
* Examine the relationship between government spending and the inflation rate.
* Assess the role of foreign investment in influencing income levels.
* Determine the effect of foreign investment on GDP.
* Analyze the impact of foreign investment on the inflation rate.

## **Research Questions:**

### A. Time Series Analysis

* How do inflation and GDP growth trends evolve over time for different regions?
* Can time series forecasting models predict future GDP growth rates and inflation levels based on historical data?
* How do foreign outflow trends evolve over time across regions, and how do they relate to GDP growth?
* Can time series models predict the long-term effects of government education investment on GDP growth trends?

### B. Hypothesis Testing - Statistical Comparisons

* Is there a significant difference in GDP growth rates between high-income and low-income countries? (T-Test)
* Do income levels significantly impact inflation trends across regions? (Reframed as a broader focus to replace duplication)
* Is there a significant relationship between foreign investment levels and a country's inflation rates? (Chi-Square Test)
* Does government spending primarily on infrastructure lead to lower inflation compared to other spending types? (Introduced a new question)
* Does the proportion of foreign investment to GDP differ significantly between low income and high income countries? (T-Test)
* Do countries with higher military spending exhibit higher inflation rates?
* Do countries with higher foreign outflows experience significantly different inflation rates compared to countries with lower outflows? (T-Test)
* Is there a significant relationship between the proportion of government education investment and GDP growth? (Regression Analysis)
* Do low-income countries allocate significantly less government spending to education compared to high-income countries? (Chi-Square Test)

### C. Multiple Linear Regression (MLR) - Predicting Outcomes

* How do foreign investment, government spending, and inflation collectively impact GDP?
* How do foreign investment, government spending, and inflation collectively impact GDP growth?
* What role does foreign investment play in shaping economic growth trends?
* How does government expenditure on the military influence GDP growth?
* What are the primary determinants of a country's inflation rate?
* How do foreign inflows, foreign outflows, and government education investment collectively impact GDP growth?
* How does the combination of education investment and government spending on infrastructure influence inflation and economic stability?
* What role do foreign outflows play in shaping inflation dynamics alongside domestic investment in education?

### D. Classification - Categorizing Countries Based on Economic Factors

* Can economic indicators classify countries into high-growth vs. low-growth categories? (Logistic Regression)
* Which macroeconomic indicators best predict a country's ability to manage inflation effectively? (Decision Tree)
* Which countries are most likely to attract significant foreign investments? (Random Forest)
* Does a country's inflation rate serve as a predictor for its ability to achieve long-term economic growth? (Naïve Bayes)
* Can we identify countries most at risk of high inflation due to excessive foreign investment? (Random Forest)
* How accurately can foreign investment categorize countries into high-growth or low-growth economies? (KNN)
* Can we predict whether a country’s inflation rate will exceed a specified threshold? (KNN)
* Can macroeconomic indicators, including foreign outflows and education investment, classify countries into high- and low-income categories? (Logistic Regression)
* How effectively can government education investment predict a country’s ability to achieve high economic growth rates? (Decision Tree)
* Are countries with higher levels of foreign outflows more likely to face economic growth slowdowns? (Random Forest)
* Can the proportion of government education spending to total spending effectively classify countries by GDP growth categories (e.g., high growth vs. low growth)? (Logistic Regression)
* Can government spending metrics (e.g., total spending, spending growth, and military spending proportions) categorize countries into high-inflation vs. low-inflation regions? (Random Forest)

### E. Clustering - Identifying Economic Factors

* Are there distinct clusters of countries based on income levels, economic growth, inflation, and foreign investment patterns? (K-Means Clustering)
* Can clustering identify unique patterns among countries with similar GDP growth trajectories but different inflation rates?
* Do countries with similar levels of foreign investment cluster together based on income levels, inflation, and GDP growth?
* Do countries with similar education investment levels cluster together based on GDP growth and inflation patterns? (K-Means Clustering)
* Can clustering reveal unique economic patterns among countries with high foreign inflows but significant outflows?
* Are there identifiable clusters of countries where government education investment correlates strongly with economic resilience and social development?

### F. Neural Networks - Deep Learning for Economic Forecasting

* Can a neural network model predict GDP growth more accurately than traditional regression models?
* Can neural networks forecast a country’s foreign investment potential based on historical economic indicators?
* How accurately can neural networks forecast the GDP growth of low-income countries compared to traditional statistical models?
* Can neural networks predict the impact of changes in foreign outflows on GDP growth more effectively than traditional models?
* How accurately can a neural network model forecast the long-term effects of government education investment on reducing income inequality?