World Development Indicators and Trends across Multiple Countries (2010-2019)

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# Introduction

Global economic development research is a complex and dynamic topic shaped by a plethora of indicators, policies, and trends. Over the last decade (2010-2019), the world has seen a dynamic interaction of forces influencing economic growth, employment rates, inflation, international commerce, and a variety of other critical aspects of development in many countries.

For many years, the World Bank has released the World Development Indicators (WDIs), which are an asset for evaluating the state of the world economy and development patterns. These indicators cover a broad range of data, such as trade as a percentage of GDP, GDP growth, unemployment rates, tariff rates, and consumer price inflation. The WDIs offer a wealth of data that enables scholars and decision-makers to assess global economic shifts and take well-informed actions.

This research aims to investigate the economic performance and trends in several countries from the years 2010 to 2019 by using the WDIs as a framework. To make insightful comparisons we shall make use of Regression analysis to understand the relationships between variables and make a relevant conclusion based on the results.

## Research objectives

* To Examine Trends in Key World Development Indicators
* To Identify Correlations and Relationships between variables
* To Identify and explain any notable deviations or anomalies in the development trends and indicators

## Research question

What are the key trends seen in the changes in the GDP growth rate (gdp\_growth) between 2010 and 2019 across different countries?

# Methodology

This section describes the procedures used to gather, handle, and evaluate data on global development indicators and trends from various nations between 2010 and 2019.

## Data sources

Our primary data source was the World Bank which is an important source of international economic and social data. In the World Bank website, we accessed the World Development Indicators databank, which offers a wealth of social, financial, and economic information for many nations throughout the given time frame.

## Data collection

To gather data, each of the chosen indicators for the countries under study had to have a yearly data point obtained. A constant time frame for comparative analysis was ensured by gathering these data points for the years 2010 to 2019.

## Data analysis

Regression analysis was utilized to investigate the relationships and dependencies among different global development indicators and to simulate the possible influence of one indicator on another. One effective statistical technique that lets us measure the direction and strength of correlations between variables is regression analysis. Within the context of our study, it facilitates our comprehension of how changes in one indicator could impact changes in another.

### Selection of variables

We chose the relevant variables (independent and dependent) for our regression analysis by taking into account our research goals and the questions we wanted to answer. Our dependent variable was the GDP growth while the independent variables were (unemp\_rate, tariff\_rate inflat\_cpi , trade\_gdp adj\_gdp\_growth, adj\_unemp\_rate, adj\_tariff\_rate, adj\_inflat\_cpi, adj\_trade\_gdp)

### Model specification

Multiple regression analysis was employed because it enables simultaneous evaluation of several independent variables. The following is an expression of our regression model's general form:

# Results and findings

## Regression

Having used excel for the purpose of this analysis, we achieved the following results

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.865286 |  |  |  |  |  |  |  |
| R Square | 0.74872 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.723593 |  |  |  |  |  |  |  |
| Standard Error | 1.907362 |  |  |  |  |  |  |  |
| Observations | 100 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 9 | 975.5991 | 108.3999 | 29.79632 | 2.36E-23 |  |  |  |
| Residual | 90 | 327.4227 | 3.63803 |  |  |  |  |  |
| Total | 99 | 1303.022 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.695543 | 0.549135 | 4.90871 | 4.06E-06 | 1.604591 | 3.786494 | 1.604591 | 3.786494 |
| unemp\_rate | 0.274628 | 0.1073 | 2.559433 | 0.012153 | 0.061457 | 0.4878 | 0.061457 | 0.4878 |
| tariff\_rate | -0.01729 | 0.055078 | -0.31388 | 0.754337 | -0.12671 | 0.092135 | -0.12671 | 0.092135 |
| inflat\_cpi | -0.18441 | 0.026674 | -6.91344 | 6.61E-10 | -0.2374 | -0.13142 | -0.2374 | -0.13142 |
| trade\_gdp | 0.008569 | 0.002561 | 3.346021 | 0.001197 | 0.003481 | 0.013656 | 0.003481 | 0.013656 |
| adj\_gdp\_growth | 1 | 0.082109 | 12.17894 | 9.82E-21 | 0.836876 | 1.163124 | 0.836876 | 1.163124 |
| adj\_unemp\_rate | 0.184409 | 0.110151 | 1.674142 | 0.097575 | -0.03443 | 0.403243 | -0.03443 | 0.403243 |
| adj\_tariff\_rate | -0.27463 | 0.292559 | -0.93871 | 0.350391 | -0.85585 | 0.30659 | -0.85585 | 0.30659 |
| adj\_inflat\_cpi | 0.017288 | 0.071711 | 0.241079 | 0.810042 | -0.12518 | 0.159755 | -0.12518 | 0.159755 |
| adj\_trade\_gdp | -0.00857 | 0.02217 | -0.3865 | 0.700039 | -0.05261 | 0.035475 | -0.05261 | 0.035475 |

With a multiple R-squared value of 0.7487, the independent variables in the model can account for around 75% of the variance in the dependent variable. This implies that there is a respectably strong correlation between the independent and dependent variables.

The model's adjusted R-squared, which takes into consideration the quantity of independent variables, is 0.7236. Although this adjusted number is marginally less than the multiple R-squared, it still shows that the model and the data are well-fitted.

The implication of this results could mean that, the independent variables greatly influence the dependent variable.

## Hypothesis

**Hypothesis 1**

There is no significant relationship between inflation (inflat\_cpi) and the dependent variable.

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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4.212125 | 0.545817 | 7.717096 | 1.01E-11 | 3.128968 | 5.295282 | 3.128968 | 5.295282 |
| inflat\_cpi | -0.17787 | 0.043918 | -4.05001 | 0.000103 | -0.26502 | -0.09071 | -0.26502 | -0.09071 |

At 95% confidence level the significant value of p < 0.01 therefore we reject the null hypothesis and accept the alternate hypothesis H1.

**Hypothesis 2**

Null Hypothesis (H0): The adjusted inflat\_cpi has no significant impact on the tarrif\_rate variable.

Alternative Hypothesis (H1): The adjusted GDP inflat\_cpi has a significant impact on the tarrif\_rate.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |  |
| Intercept | 4.915096 | 1.042767 | 4.713512 | 8.06E-06 | 2.845758 | 6.984433 | 2.845758 | 6.984433 |  |
| inflat\_cpi | 0.022426 | 0.083903 | 0.267283 | 0.789813 | -0.14408 | 0.188929 | -0.14408 | 0.188929 |  |

At 95% confidence level the significant value of p > 0.05 therefore we accept the null hypothesis. The results show that the adjusted GDP inflation rate (inflat\_cpi) has no statistically significant effect on the tariff rate variable, hence refuting the alternative hypothesis (H1).