Applied Data Science Assignment 2: Statistics and trend

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Data Source: https://data.worldbank.org/

Repository Link: https://github.com/HamzaQureshi12/Second_Assignment.git

Exploring Statistics and Trends in World Bank Data

Abstract – This report explores climate change indicators through World Bank data, presenting analyses of GDP growth, urban population dynamics, and arable land vs. forest area trends. Findings contribute to nuanced understandings of climate-related statistics across select countries, aiding informed decision-making for policymakers, environmentalists, and economists.

GDP Growth Analysis (2010-2022)

Examining annual GDP growth rates for Germany, the U.S., U.K., Pakistan, China, Panama, and Norway reveals distinctive trajectories. Noteworthy trends include Germany's consistent positive growth, a global dip in 2020, and China's pivotal role in post-2020 recovery. Statistical summaries offer insights into each country's economic dynamics, emphasizing China's key role in global economic growth.

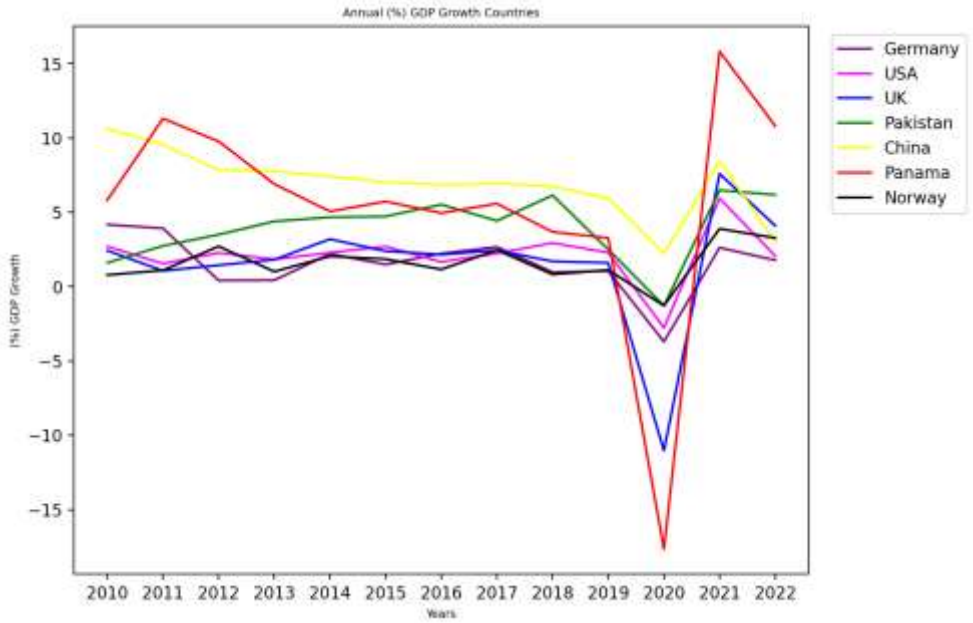

Figure 1: Annual GDP Growth of Selected Countries

Arable Land and Forest Area Analysis

Analysing arable land vs. forest area relationships for seven countries (2010-2022) reveals negative correlations, reflecting the trade-off between agricultural development and forest preservation. Germany exhibits a consistent negative correlation, emphasizing the need for sustainable land-use practices. The analysis provides valuable insights for policymakers, highlighting the importance of balancing agricultural needs with ecological conservation.

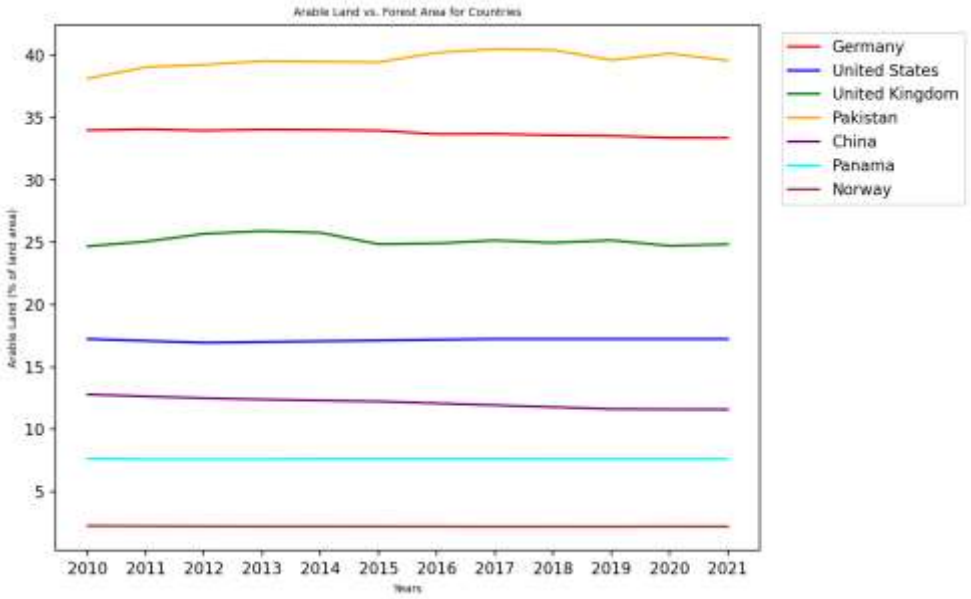

Figure 2: Arable Land Per Year Area of Selected Countries

Urban Population Growth Analysis

Focused on urban population growth (2016-2022) in seven countries, this analysis showcases varying trends. Pakistan leads in growth, while the U.S. and U.K. exhibit slower rates. The analysis provides comparative insights into how nations manage challenges and opportunities associated with urban population growth, aiding policymakers in formulating strategies for sustainable development.

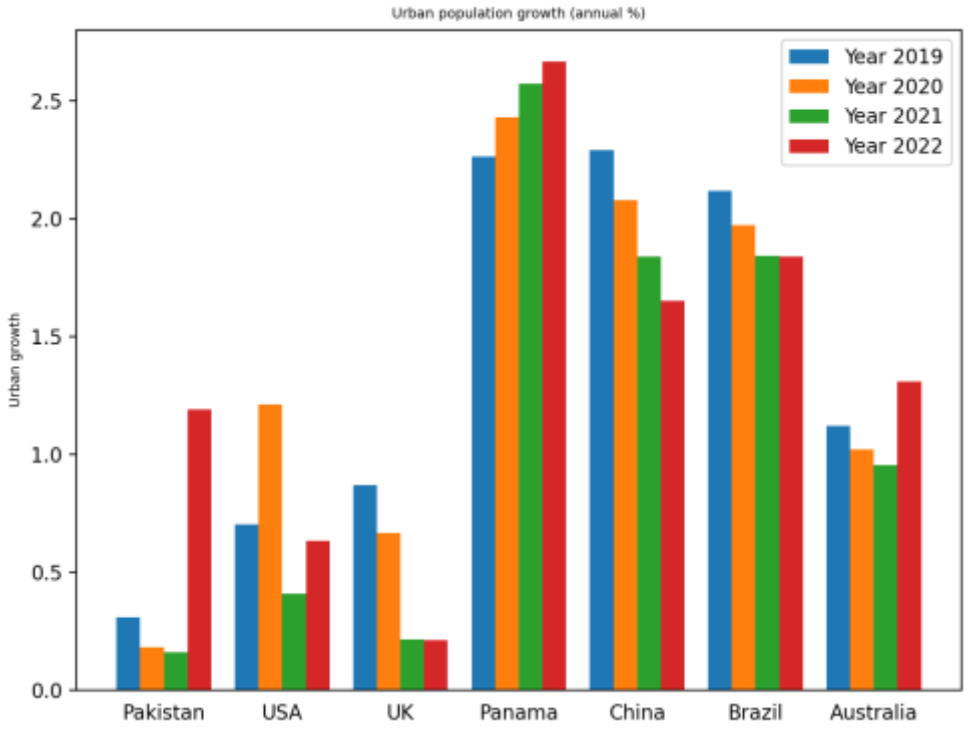

Figure 3: Annual Urban Population Growth of Selected Countries

Analysis Report: Urbanization, Electricity, and Environmental Factors in Germany

Examining key indicators for Germany reveals positive GDP growth, steady urbanization, and a balanced approach to land use. Correlation analyses uncover patterns, including a positive correlation between economic activity and electricity consumption. The negative correlation between forest area and CO2 emissions underscores Germany's commitment to environmental sustainability.

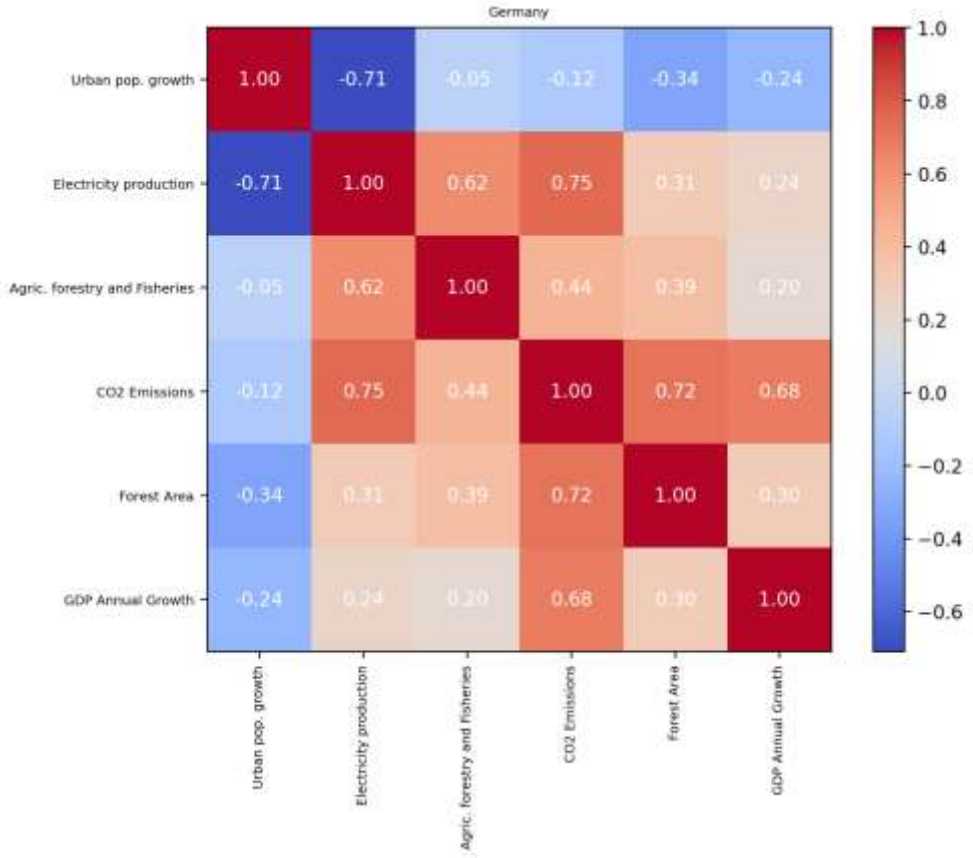

Figure 4: Analysis Report: Urbanization, Electricity, and Environmental Factors in Germany

Correlation Matrix (Panama)

The correlation matrix for Panama reveals intriguing relationships between different economic indicators. Surprisingly, electricity production exhibits a negative correlation with urban population growth, implying that urbanization may lead to more energy-efficient practices. The analysis emphasizes the need for holistic approaches in urban development, considering environmental sustainability and energy efficiency.

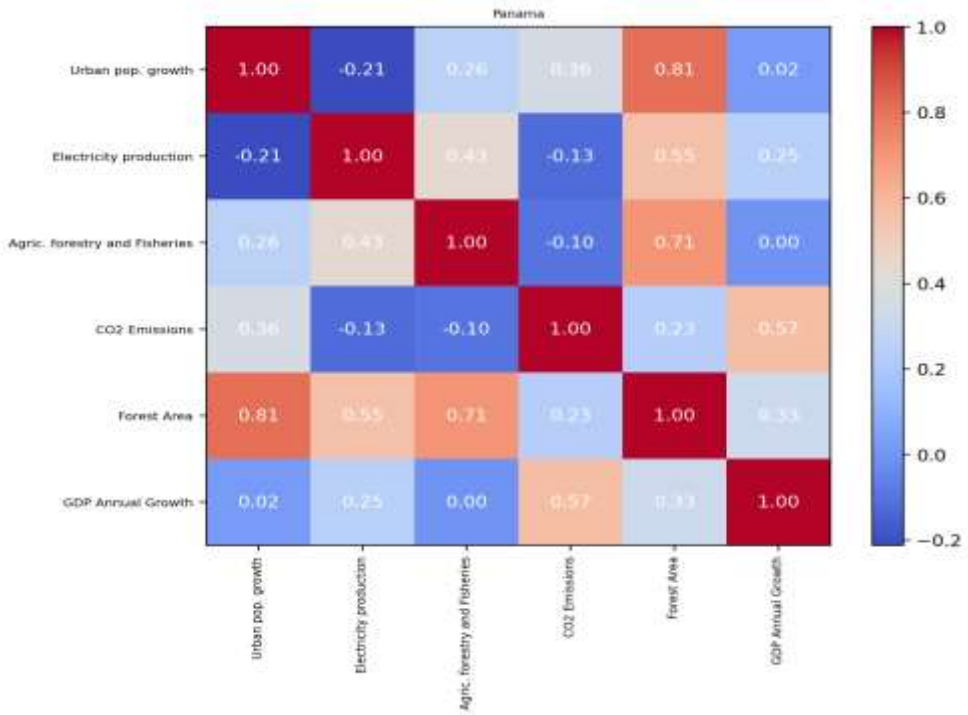

Figure 5: Analysis Report: Urbanization, Electricity, and Environmental Factors in Panama

Analysis for Agriculture, Forestry, and Fishing (% of GDP):

This Analysis illustrates the percentage contribution of agriculture, forestry, and fishing to GDP for selected countries from 2010 to 2022. Germany and the United States maintain consistently low values, around 1% or less, indicating a reduced reliance on these sectors. In contrast, Pakistan exhibits a significant contribution, hovering around 23%, reflecting a substantial dependency on agriculture. China, despite its rapid industrialization, maintains a moderate contribution around 8-9%. The analysis suggests varying degrees of economic diversification among these nations, with some prioritizing the development of non-agricultural sectors.

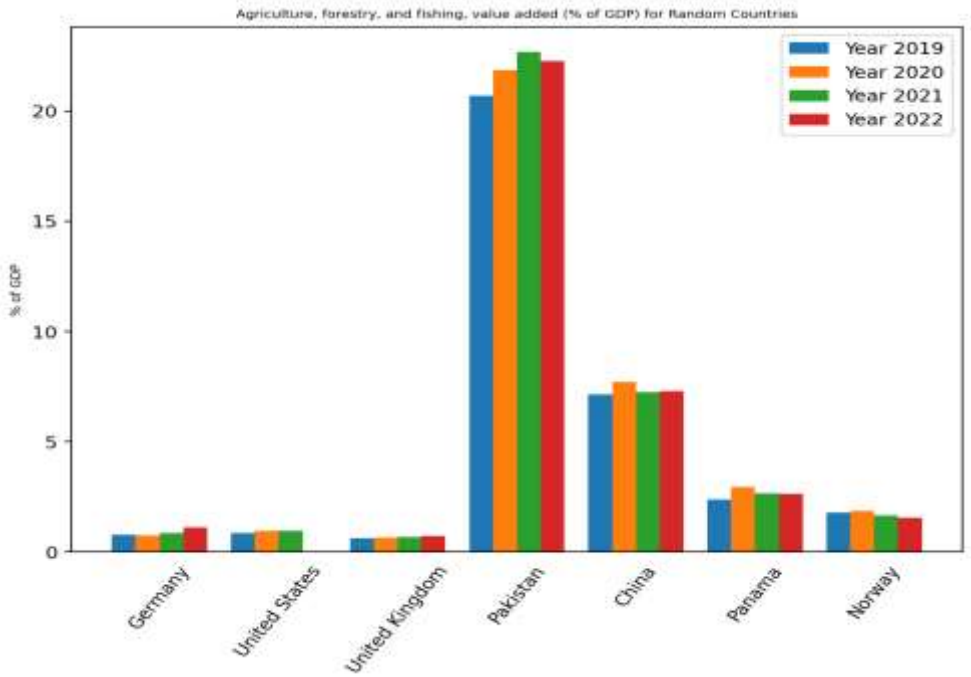

Figure 6: Analysis of Agriculture, Forestry, and Fishing Contribution to GDP (%)

Analysis for Electricity Production:

The multiple line plot provides a glimpse into the electricity production trends for selected countries from 2010 to 2022. The analysis highlights the diverse energy production strategies and capacities among these nations.

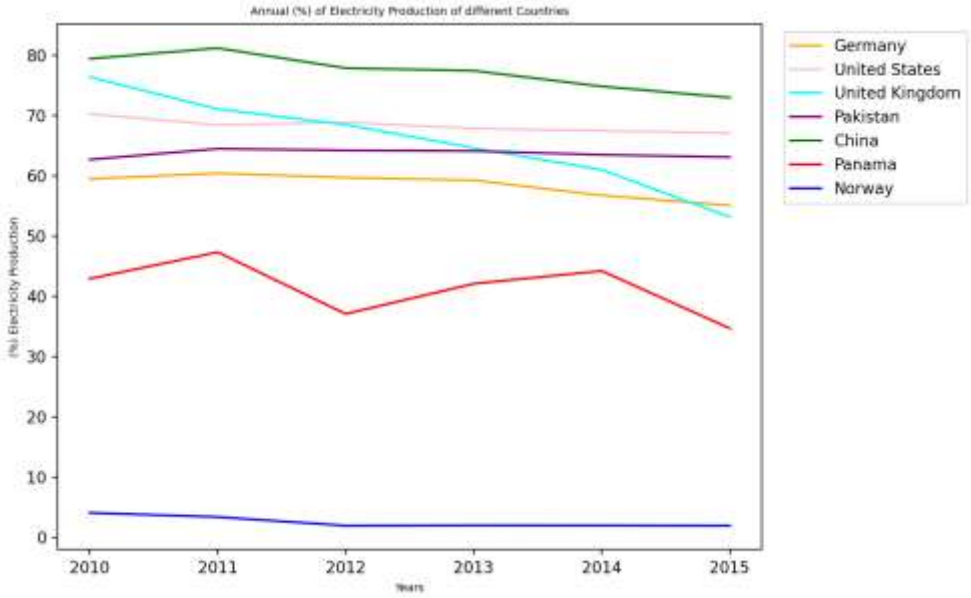

Figure 7: Annual (%) of Electricity Production of Different Countries