



ANALYSIS OF FACTORS AFFECTING GDP

Presented By
PRANALI CHIPKAR

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INTRODUCTION

- The objective of this analysis is to gain insights into the factors that significantly influence the economic growth of countries, as measured by Gross Domestic Product at Purchasing Power Parity (GDP_PPP)
- The analysis is based on a comprehensive dataset spanning the years 2016 to 2022, encompassing scores for nine key factors and corresponding GDP_PPP values for multiple countries
- These factors include Entrepreneurship, Quality of Life, Social Purpose, Cultural Influence, Open for Business, Heritage, Adventure, Power, and Movers.
- The dataset allows us to examine the relationship between these factors and GDP_PPP over time, providing valuable insights into the drivers of economic prosperity across different nations

METHODOLOGY

OVERVIEW OF METHODS USED

1 REGRESSION ANALYSIS

- Regression analysis is a statistical technique used to analyze the relationship between one or more independent variables.
- In our analysis, we employed regression analysis to investigate how the various independent variables, such as Entrepreneurship, Quality of Life, Social Purpose, etc., influence the dependent variable, GDP_PPP.
- By estimating regression coefficients, we can quantify the magnitude and direction of the impact each factor has on GDP_PPP, thereby identifying which factors are most strongly associated with economic growth.

2 CLUSTER ANALYSIS

- Cluster analysis, specifically K-means clustering, is a data segmentation technique used to partition a dataset into distinct groups, or clusters, based on similarities between observations.
- In our analysis, we applied K-means clustering to group countries into clusters based on their similarities in factor scores.
- By clustering countries with similar factor profiles together, we can identify patterns and heterogeneity in the importance of factors across different clusters. This allows us to gain insights into how different groups of countries prioritize and exhibit characteristics related to economic growth.

KEY FINDINGS

- 1 Most important factor across all countries for improving GDP_PPP :** Entrepreneurship emerges as the most significant factor contributing to economic growth across all countries. This suggests that fostering entrepreneurial activities and creating an environment conducive to innovation and business development is crucial for enhancing GDP_PPP.
- 2 Effect of each factor on GDP_PPP (Regression coefficients) :** Entrepreneurship, Cultural Influence, and Social Purpose have the most significant positive impact on GDP_PPP, with each unit increase in these factors associated with substantial increases in GDP_PPP (\$604.34, \$456.06, and \$98.65, respectively). Quality of Life and an open business environment also contribute positively, albeit to a lesser extent. Adventure, Power, Heritage, and Movers positively influence GDP_PPP, but with smaller effects compared to the aforementioned factors. Overall, fostering entrepreneurship, cultural vibrancy, and social engagement is crucial for driving sustainable economic growth.
- 3 Factors which are most important for countries (heterogeneity), and grouped them into segments:** Adventure and Business-driven economies emphasize attracting tourists and fostering business environments. Entrepreneurship and Social Development-focuses economies prioritize fostering entrepreneurship and improving social well-being. Cultural and Heritage-rich economies focus on preserving and promoting their cultural heritage. Dynamic and Migrant-friendly economies aim to attract talent and facilitate migration. Geopolitical and Soft Power economies focus on projecting influence and power on the global stage.

REGRESSION ANALYSIS RESULTS

- **Entrepreneurship:** Lithuania and United Arab Emirates demonstrate the importance of supportive environments for startups, with strong positive coefficients (e.g., Lithuania: 1290.94).
- **Quality of Life:** Belgium and Australia show that investments in healthcare and education correlate with higher GDP_PPP (e.g., Australia: -539.71).
- **Social Purpose:** Tanzania and Slovakia illustrate the positive impact of social welfare initiatives on economic growth (e.g., Tanzania: 570.34).
- **Cultural Influence:** Lithuania and Iraq highlight the economic benefits of promoting cultural heritage and arts (e.g., Iraq: 51.78).
- **Open for Business:** United Arab Emirates and Lithuania indicate that business-friendly policies contribute to economic prosperity (e.g., UAE: -231.72).
- **Adventure:** Switzerland and Paraguay demonstrate the positive effect of adventure tourism on GDP_PPP (e.g., Switzerland: 629.90).
- **Power:** Iraq and United Arab Emirates show that geopolitical influence positively impacts economic output (e.g., Iraq: 895.35).
- **Heritage:** Lithuania and Slovakia emphasize the economic value of preserving cultural heritage sites (e.g., Lithuania: -1063.26).
- **Movers:** Zambia and United Arab Emirates indicate that attracting skilled migrants positively influences GDP_PPP (e.g., Zambia: 239.67).



IMPORTANCE OF EACH FACTOR IN SPECIFIC COUNTRIES

Entrepreneurship

Lithuania and United Arab Emirates

Quality of Life

Belgium and Australia

Social Purpose

Tanzania and Slovakia

Cultural Influence

Lithuania and Iraq

Open for Business

United Arab Emirates and Lithuania

Adventures

Switzerland and Paraguay

Power

Iraq and United Arab Emirates

Heritage

Lithuania and Slovakia

Movers

Zambia and United Arab Emirates

CLUSTER ANALYSIS RESULTS

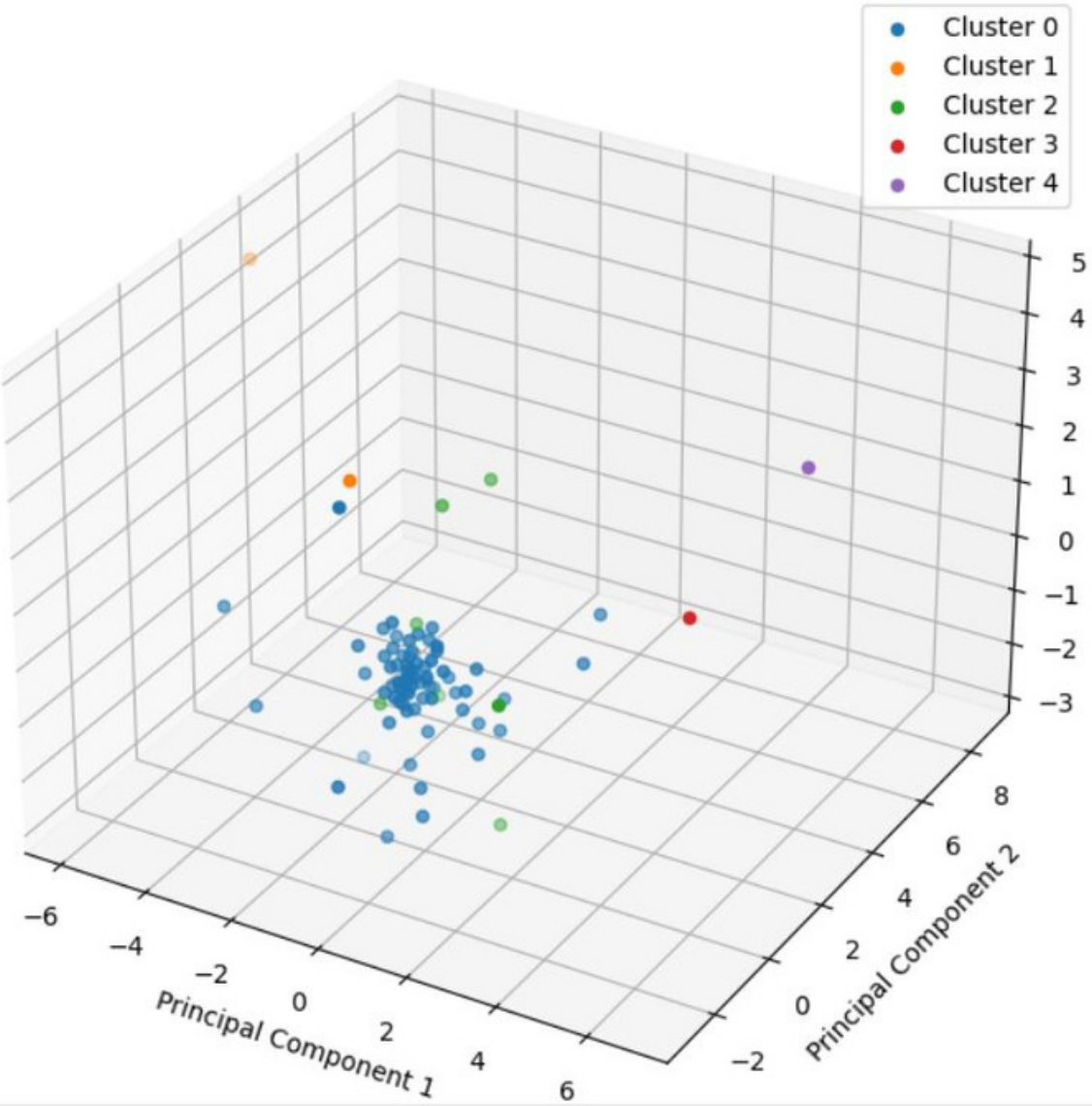
- Based on the analysis conducted, we can observe heterogeneity in the factors that are most important for different countries. We have grouped the countries into segments based on the dominant factors influencing their GDP:

Segmentation Based on Dominant Factors:

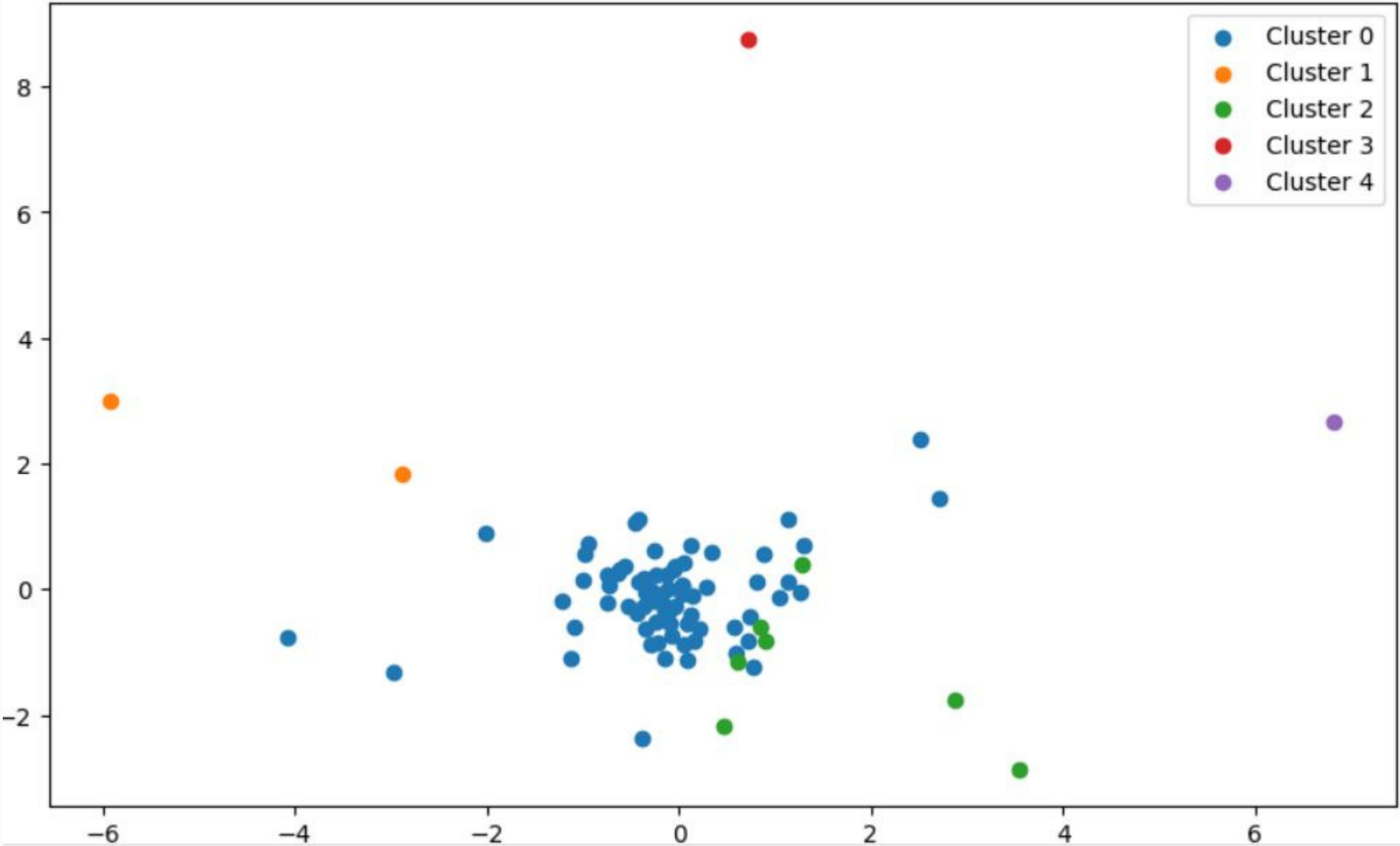
- **Adventure and Business-driven Economies:**
These countries prioritize factors such as adventure, open for business, and power.
Example countries: Switzerland, Australia, United States, Japan, Germany.
- **Entrepreneurship and Social Development-focused Economies:**
These countries emphasize entrepreneurship, social purpose, and quality of life.
Example countries: Tanzania, El Salvador, Bangladesh, Cambodia, Cameroon.
- **Cultural and Heritage-rich Economies:**
These countries have a strong focus on cultural influence and heritage.
Example countries: Lithuania, Slovakia, Turkey, Greece, Italy.
- **Dynamic and Migrant-friendly Economies:**
These countries value factors like entrepreneurship and movers
Example countries: Canada, France, United Kingdom, Sweden, Belgium.
- **Geopolitical and Soft Power Economies:**
These countries prioritize factors like power and cultural influence.
Example countries: Iraq, Uzbekistan, Paraguay, Angola, South Africa.

VISUALIZATIONS OF DIFFERENT CLUSTERS

Clusters Visualized in 3D

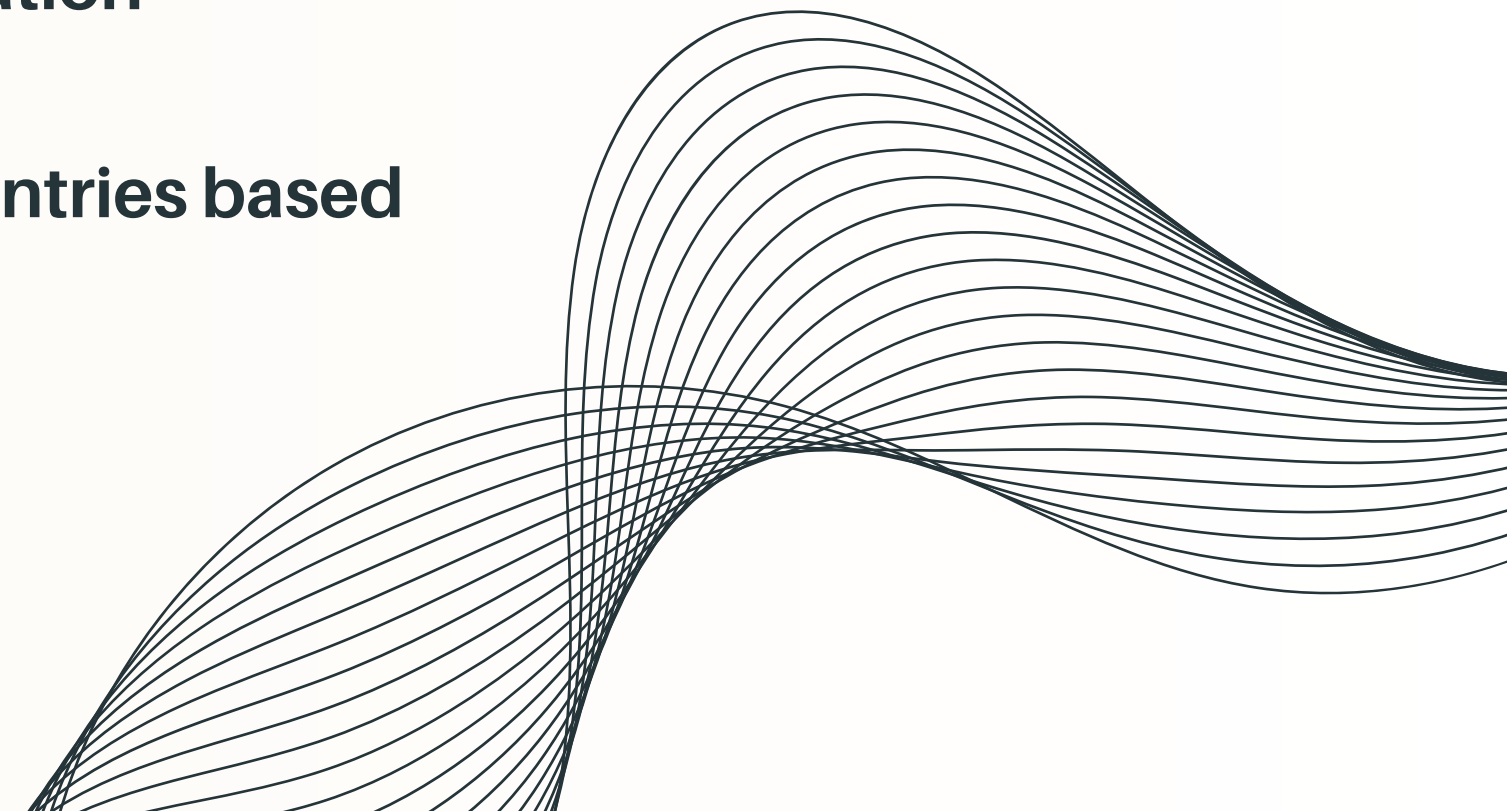


Clusters visualized in 2D



CONCLUSION

- The conclusion drawn from the regression and cluster analysis results is that economic growth and development are influenced by a complex interplay of factors that vary significantly across different countries.
- The regression analysis provides insights into the specific factors that have a significant impact on GDP_PPP, highlighting the importance of entrepreneurship, quality of life, social purpose, cultural influence, openness for business, adventure, power, heritage, and migration patterns.
- Meanwhile, the cluster analysis reveals distinct groups of countries based on the importance they attribute to these factors, indicating heterogeneity in economic development strategies.



REFERENCES

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- <https://andrewcharlesjones.github.io/journal/reduced-rank-regression.html>

