Bharatiya Vidya Bhavan's

Sardar Patel Institute of Technology

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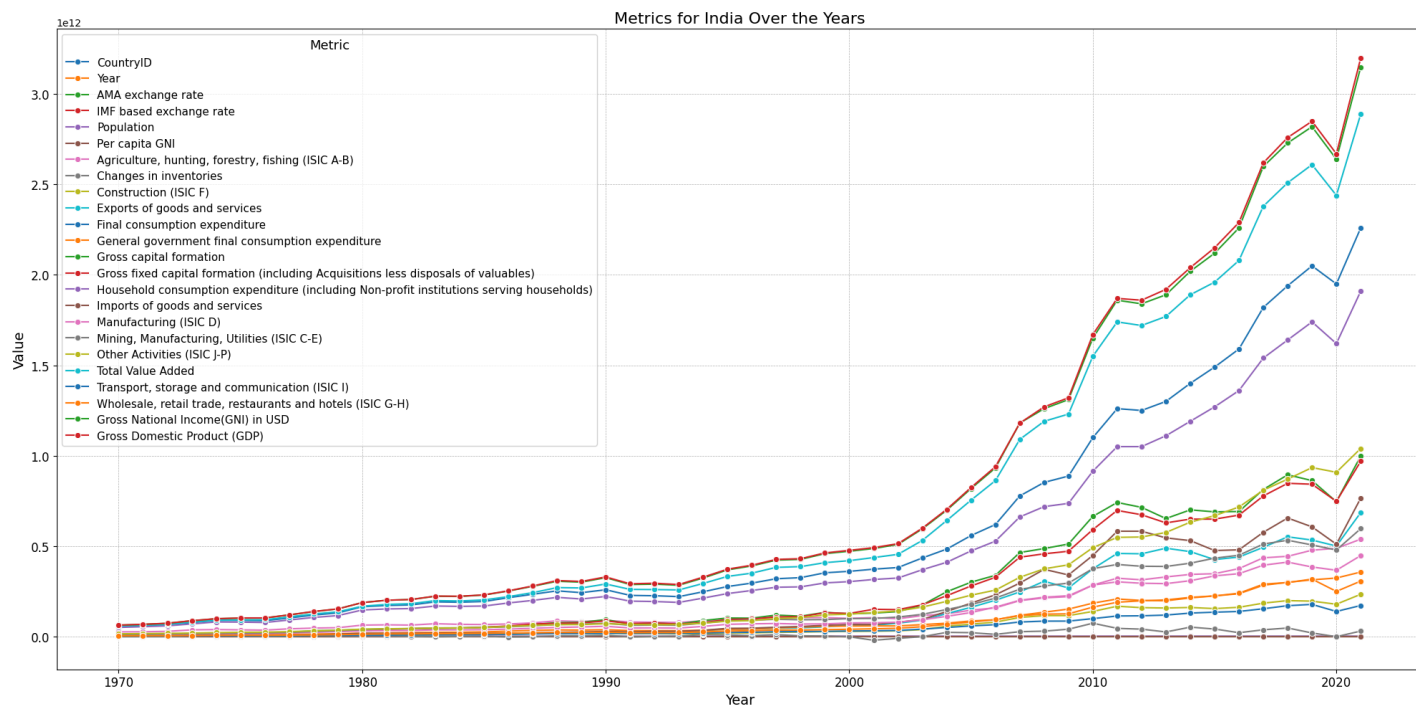
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AIM

Create basic charts using Tableau / Power BI / R / Python / D3.js to be performed on the dataset - Socio economic data

Dataset Link

https://www.kaggle.com/datasets/prasad22/global-economy-indicators

Visualizations

1. India's Performance in various metrics over the years

```
[ ]  # Define a custom color palette
     palette = sns.color_palette('tab10', len(df.columns.drop(['Country','Currency'])))

     # Plot each column over the year
     plt.figure(figsize=(20, 10))

     for idx, column in enumerate(df.columns.drop(['Country','Currency'])):
         sns.lineplot(data=df_India, x='Year', y=column, marker='o', label=column, color=palette[idx])

     # Customize the plot
     plt.title('Metrics for India Over the Years', fontsize=16)
     plt.xlabel('Year', fontsize=14)
     plt.ylabel('Value', fontsize=14)
     plt.legend(title='Metric', title_fontsize='13', fontsize='11', loc='upper left')  # Adjust the legend font size and position
     plt.grid(True, which='both', linestyle='--', linewidth=0.5)
     plt.xticks(fontsize=12)
     plt.yticks(fontsize=12)
     plt.tight_layout()  # Adjusts plot to ensure everything fits without overlapping

     plt.show()
```

The line graph presents a comprehensive overview of India's key economic metrics from 1970 to 2020. It visually depicts the growth trends of various economic indicators, providing valuable insights into India's economic development.

One of the most striking observations is the consistent upward trajectory of most metrics over the decades. This indicates a significant improvement in India's economic performance. Notably, the Gross Domestic Product (GDP) has experienced a substantial increase, reflecting overall economic growth. The Gross National Income (GNI) has also shown a steady rise, indicating an increase in the total income generated by Indian residents.

The graph also reveals the growth of various sectors of the Indian economy. The manufacturing sector has witnessed a significant expansion, contributing to the overall economic growth. The services sector, including transportation, storage, communication, wholesale, retail trade, restaurants, and hotels, has also expanded significantly.

While the graph demonstrates positive trends, it also highlights certain challenges. The population growth rate has been relatively high, which can impact per capita income. The agriculture, hunting, forestry, and fishing sector has shown a relatively slower growth rate compared to other sectors.

2. Area gaps between different metrics over the years

Metrics for India Over the Years
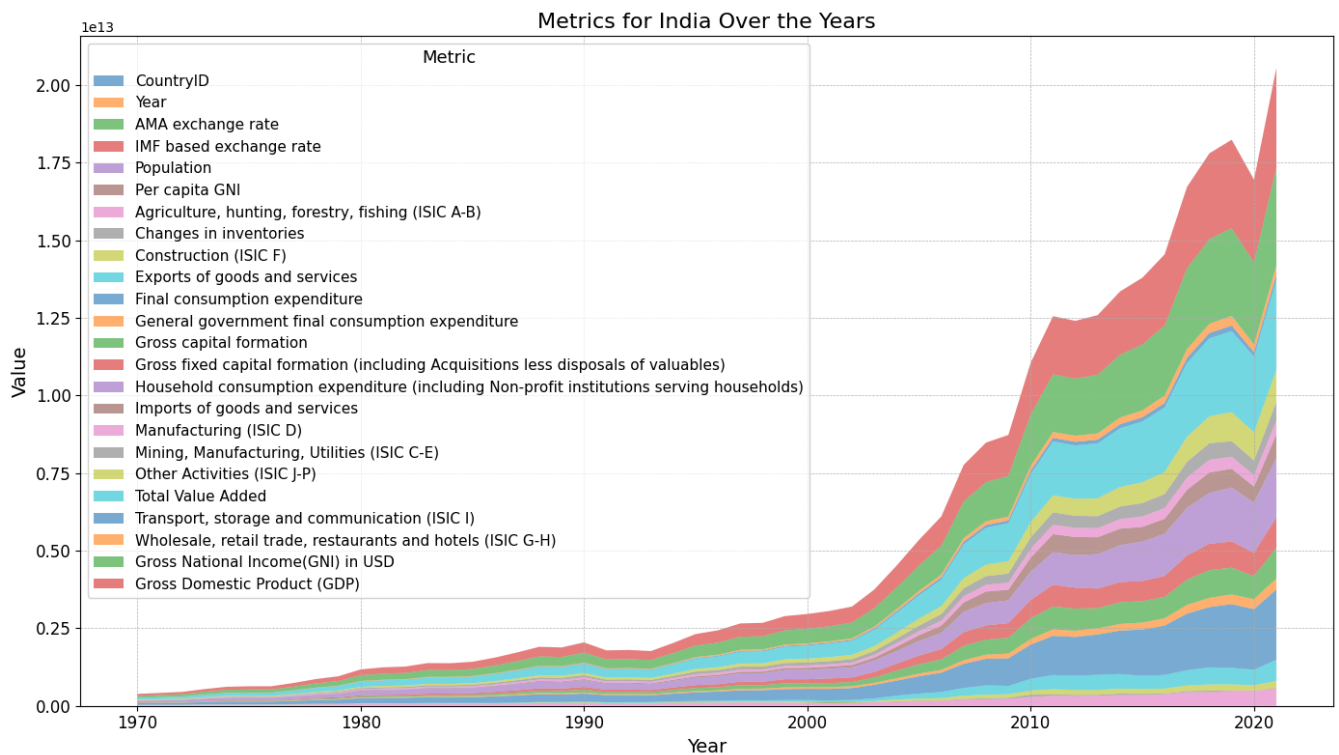
```
plt.figure(figsize=(14, 8))

# Data for stacked area chart
years = df_India['Year']
data_to_stack = [df_India[column] for column in df.columns.drop(['Country','Currency'])]

plt.stackplot(years, data_to_stack, labels=df.columns.drop(['Country','Currency']), alpha=0.6)

plt.title('Metrics for India Over the Years', fontsize=16)
plt.xlabel('Year', fontsize=14)
plt.ylabel('Value', fontsize=14)
plt.legend(title='Metric', title_fontsize='13', fontsize='11', loc='upper left')
plt.grid(True, which='both', linestyle='--', linewidth=0.5)
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.tight_layout()

plt.show()
```

The graph allows for easy comparison of the growth rates of different sectors. For example, it is clear that the services sector has grown more rapidly than the agriculture sector. The relative sizes of the areas at different points in time reveal the changing contributions of each sector to the overall economy. The graph demonstrates a significant increase in India's overall economic growth, as evidenced by the upward trend of the total area. The changing relative sizes of the areas indicate a shift in the composition of India's economy, with a growing emphasis on services and manufacturing. The graph also highlights certain challenges, such as the relatively slower growth of the agriculture sector and the potential impact of population growth on per capita income.
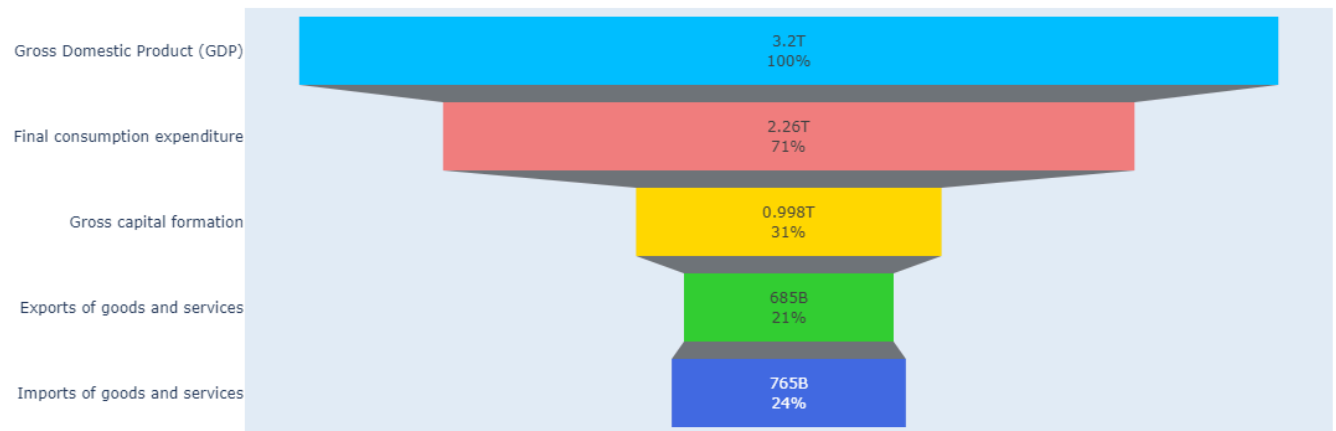
3. Global GDP in 2021

GDP in 2021
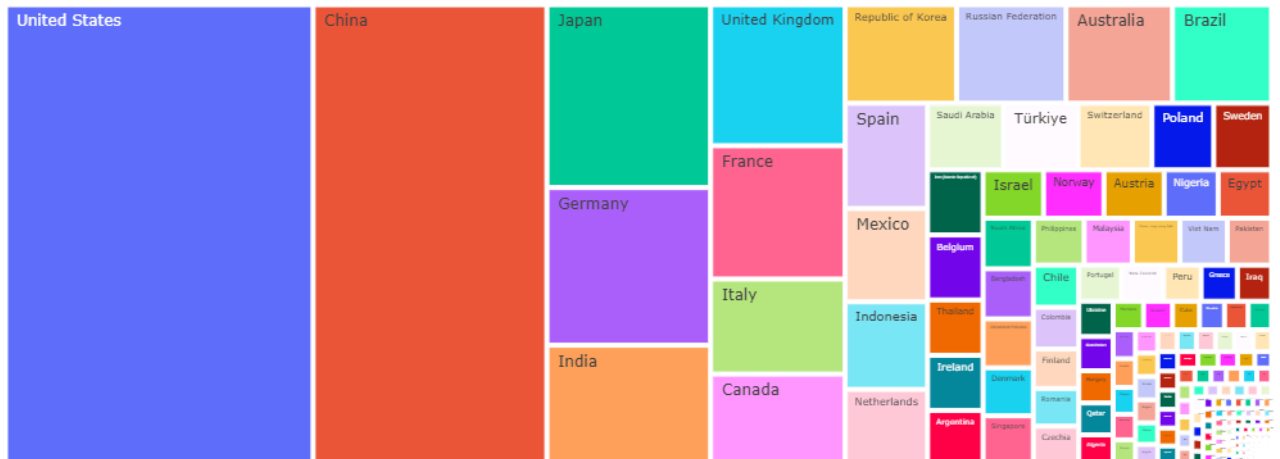
The United States and China are depicted as the largest economies by a significant margin, occupying the majority of the chart area. This reflects their dominant position in the global economy. The chart reveals distinct regional variations in economic size. For example, Europe is represented by a cluster of relatively large economies, including Germany, France, the United Kingdom, and Italy. Asia is also home to several large economies, such as Japan, India, and South Korea. The chart also highlights the presence of several emerging economies, including Brazil, Russia, India, China, and South Africa (BRICS). These economies are represented by relatively large rectangles, indicating their growing economic importance. The chart includes a large number of smaller economies, represented by smaller rectangles. These economies vary in size and geographic location, but collectively contribute to the global economic landscape. The chart clearly illustrates the global economic disparity, with a small number of economies dominating the landscape.
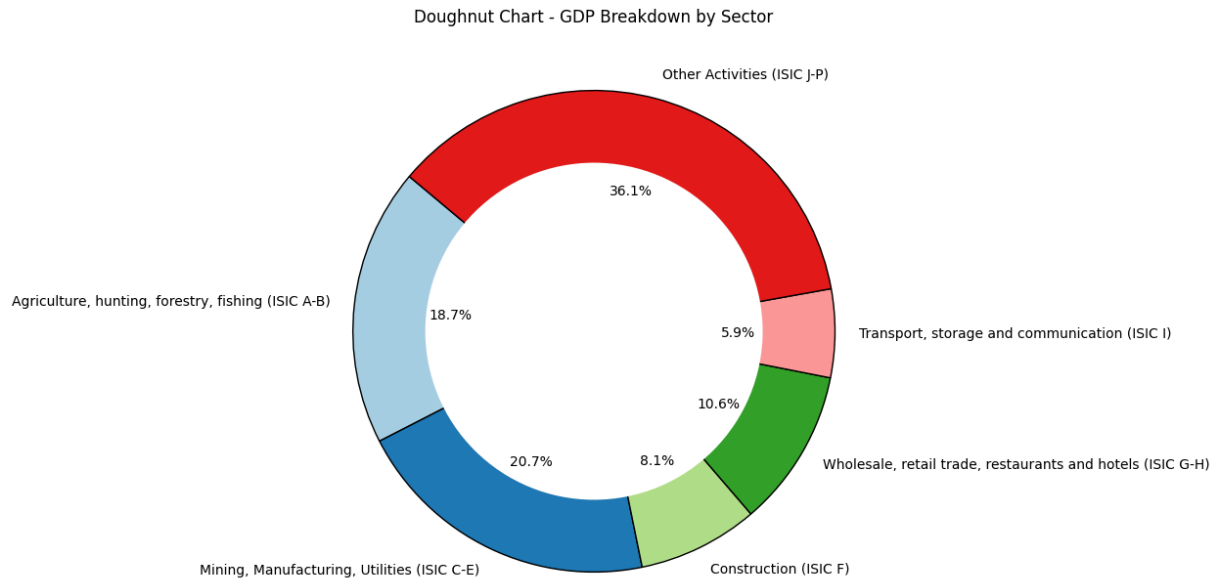
4. GDP contributors

Funnel Chart - Economic Flow to GDP

|	
Gross Domestic Product (GDP)	3.2T 100%
Final consumption expenditure	2.26T 71%
Gross capital formation	0.998T 31%
Exports of goods and services	685B 21%
Imports of goods and services	765B 24%

The funnel chart visually represents the economic flow that contributes to the Gross Domestic Product (GDP) of a country. It shows how different components of the economy contribute to the overall economic output. GDP is the top of the funnel, representing the total economic output of the country. It is the sum of all final goods and services produced within a country's borders during a specific period. Final consumption expenditure is the largest component of GDP, accounting for 71% of the total. It represents the spending by households, businesses, and the government on final goods and services. Gross capital formation accounts for 31% of GDP and represents the investment in fixed assets, such as machinery, equipment, and infrastructure. Exports of goods and services contribute 21% to GDP and represent the value of goods and services sold to other countries. Imports of goods and services are deducted from GDP as it represents the value of goods and services purchased from other countries.

5. Sector wise performance

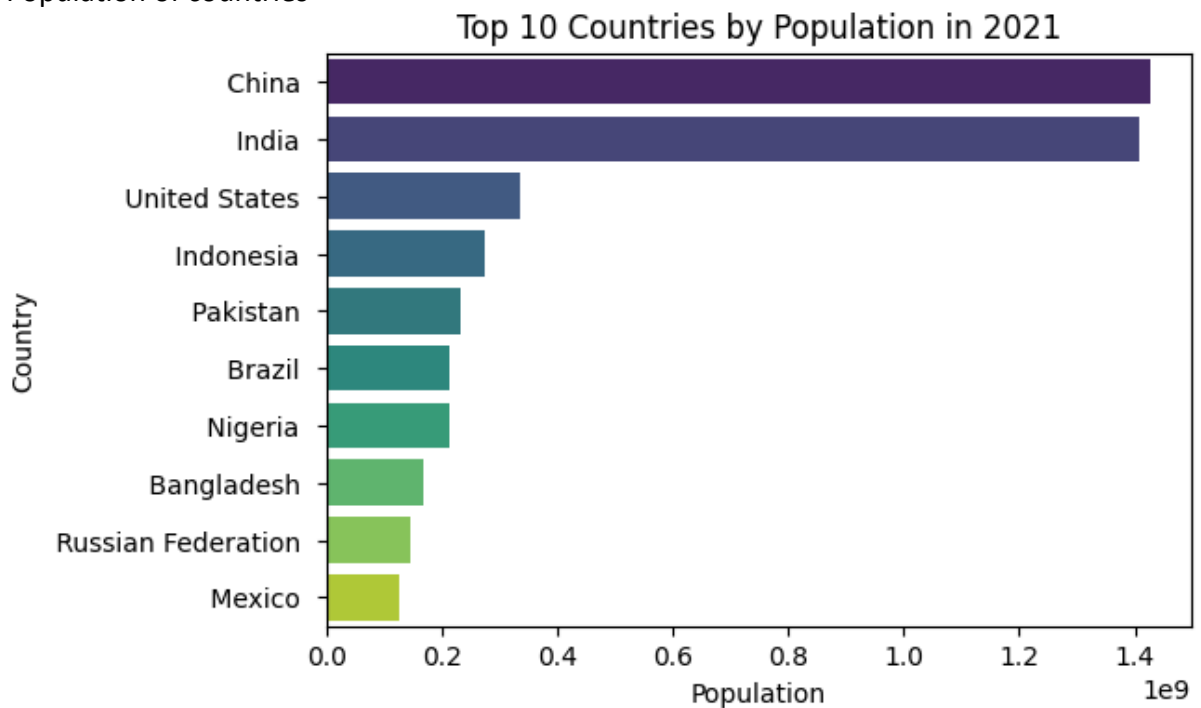Doughnut Chart - GDP Breakdown by Sector

The doughnut chart provides a visual representation of the breakdown of GDP by sector. It illustrates the relative contributions of different sectors to the overall economic output. Other Activities (ISIC J-P) is the largest contributor to GDP, accounting for 36.1%. It encompasses a wide range of activities, including education, health, public administration, and financial services. Agriculture, hunting, forestry, fishing (ISIC A-B) sector contributes 18.7% to GDP, reflecting the importance of agriculture and related industries in the country's economy. Mining, Manufacturing, Utilities (ISIC C-E) sector contributes 20.7% to GDP, highlighting the significance of industrial activities in the economy. Construction (ISIC F) sector accounts for 8.1% of GDP, indicating its role in infrastructure development and economic growth. Wholesale, retail trade, restaurants and hotels (ISIC G-H) sector contributes 10.6% to GDP, reflecting the importance of the service sector in the economy. Transport, storage and communication (ISIC I) sector contributes 5.9% to GDP, highlighting the role of transportation and communication infrastructure in supporting economic activity.

6. India's GDP contributors in 2021
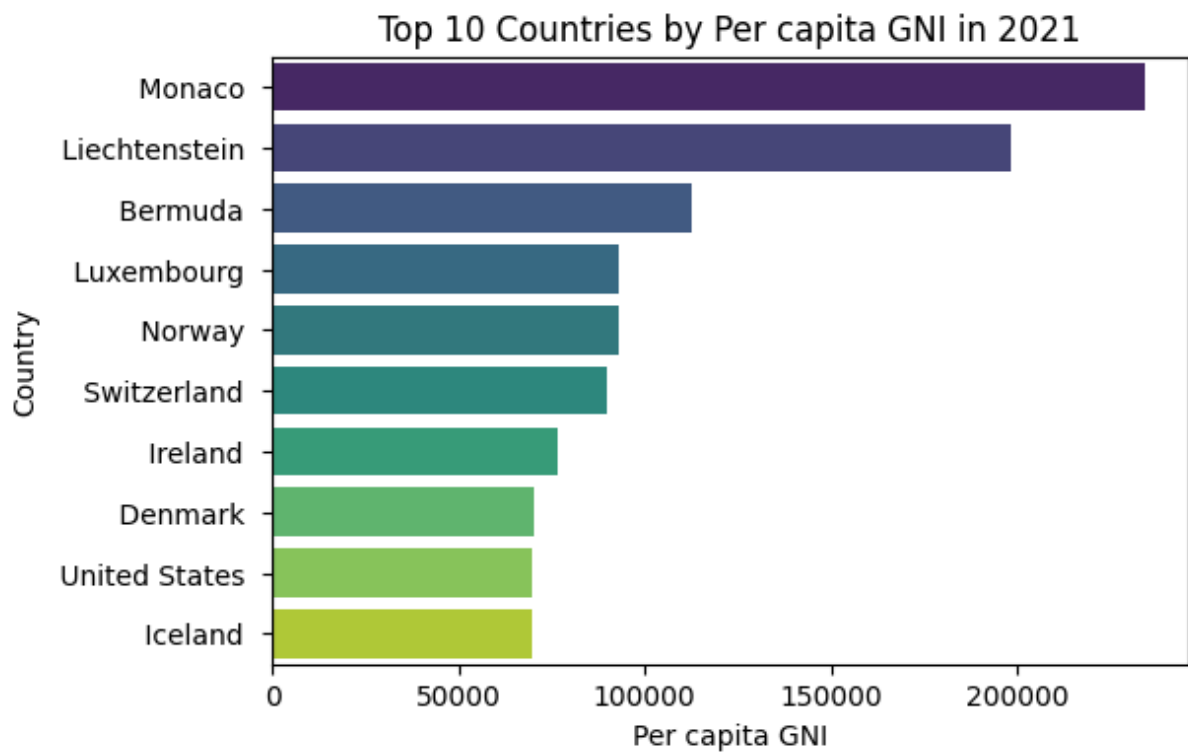

Waterfall Chart - Sectoral Contributions to GDP
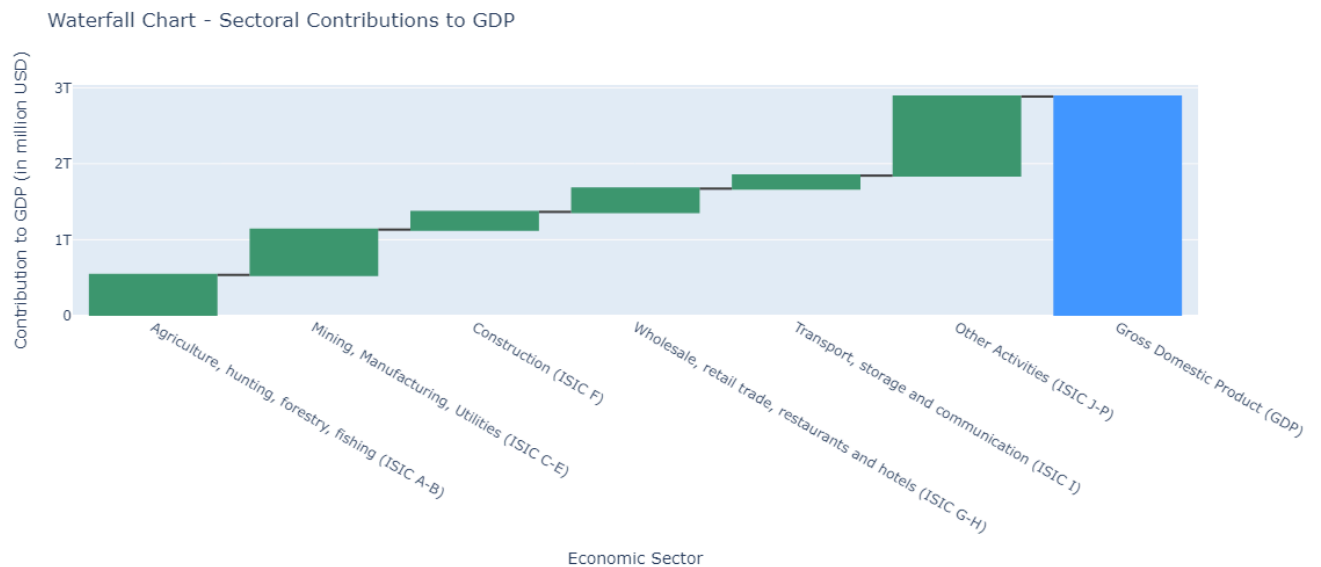
The chart reveals the sectoral composition of the economy, highlighting the dominant sectors and their contributions to GDP. The sectors with positive contributions are the key drivers of economic growth. The chart also illustrates the interdependence of different sectors. Changes in one sector can have ripple effects on others.
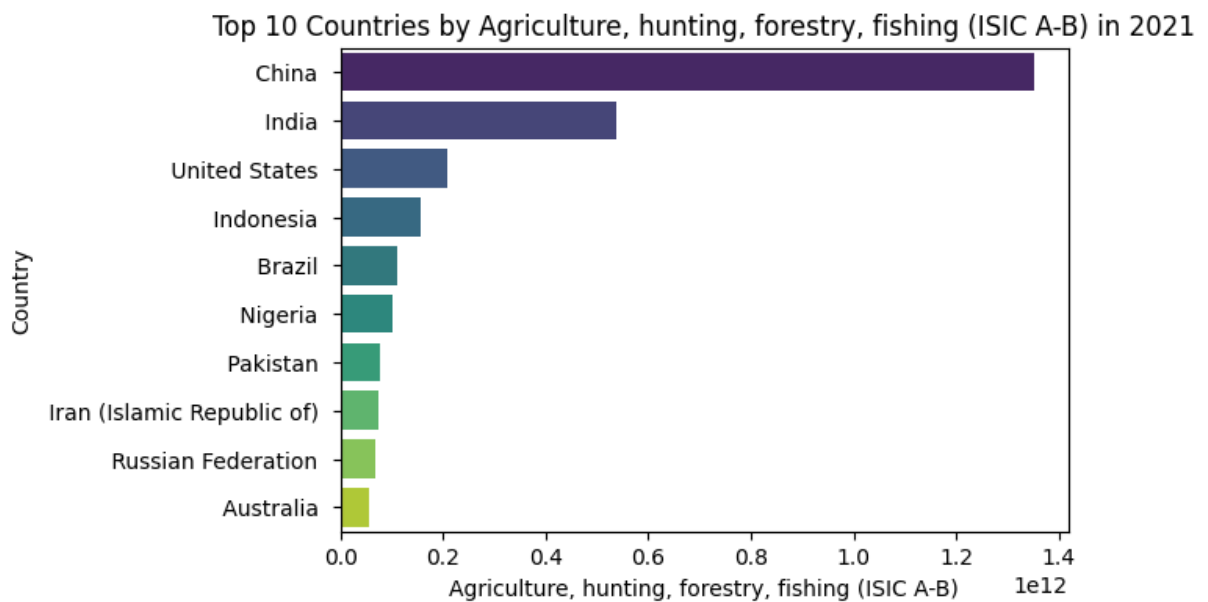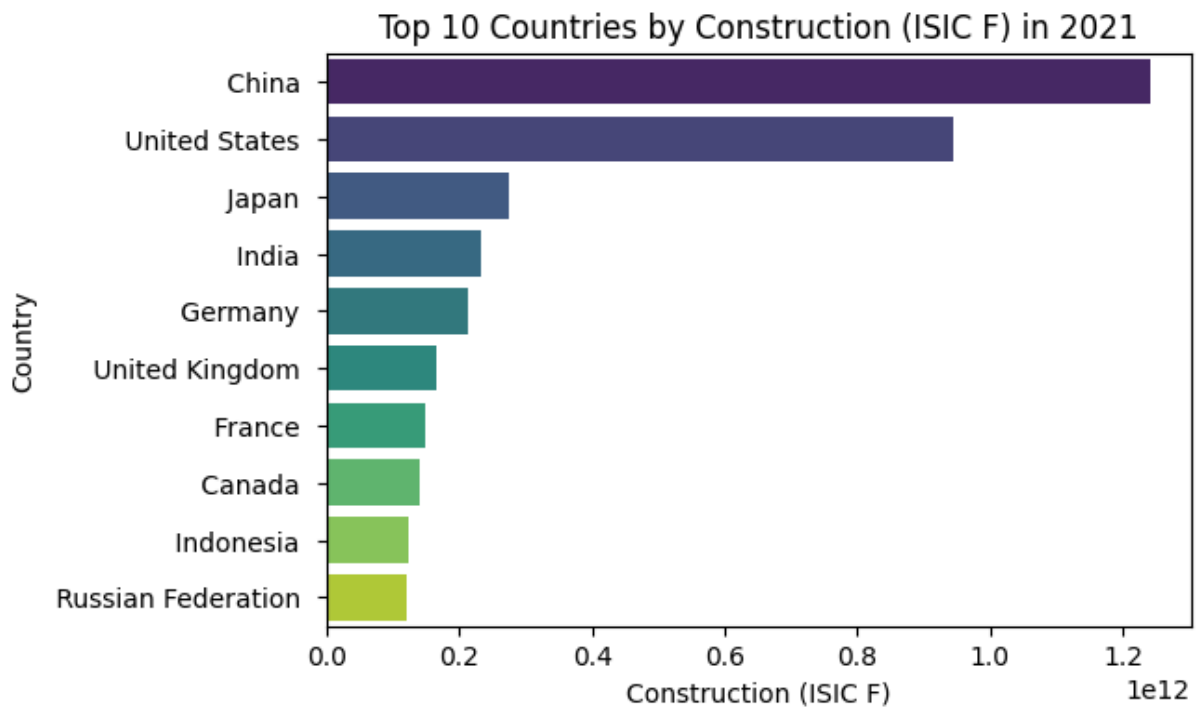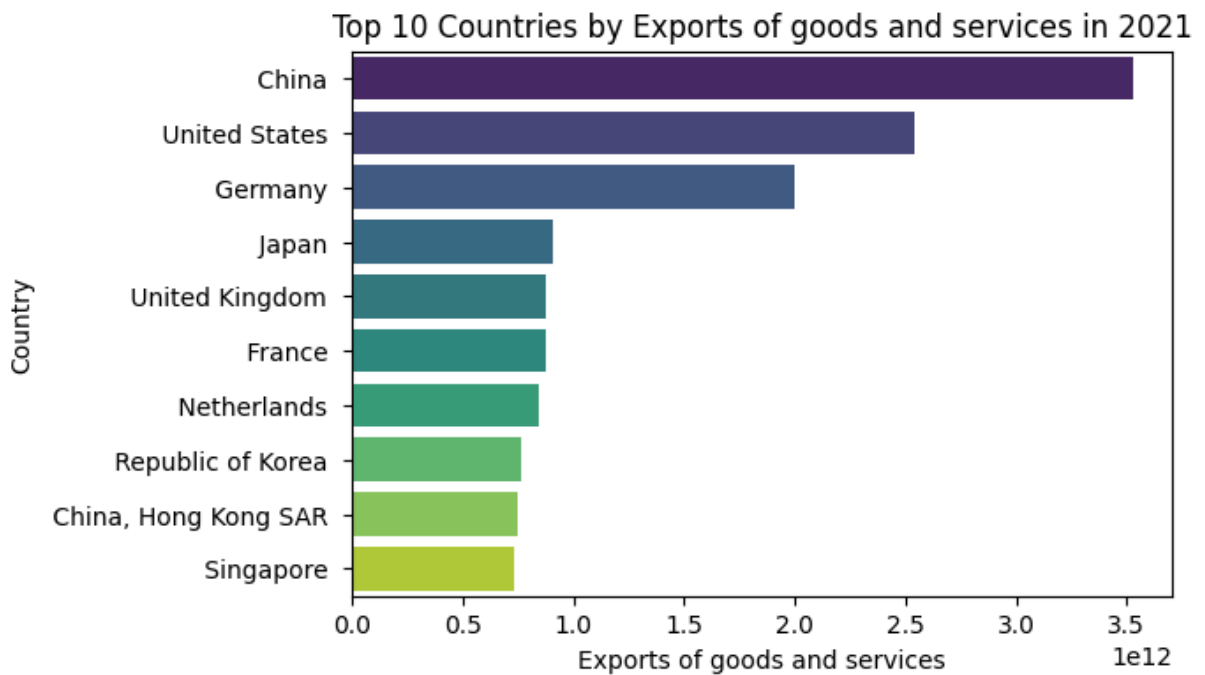
7. Population of countries

Top 10 Countries by Population in 2021

8. Per capita GNI

Top 10 Countries by Per capita GNI in 2021

9. Agriculture, hunting, forestry and fishing

Top 10 Countries by Agriculture, hunting, forestry, fishing (ISIC A-B) in 2021

10. Construction and development

Top 10 Countries by Construction (ISIC F) in 2021

11. Export of goods

Top 10 Countries by Exports of goods and services in 2021

12. Gross Capital Formation

Top 10 Countries by Gross capital formation in 2021
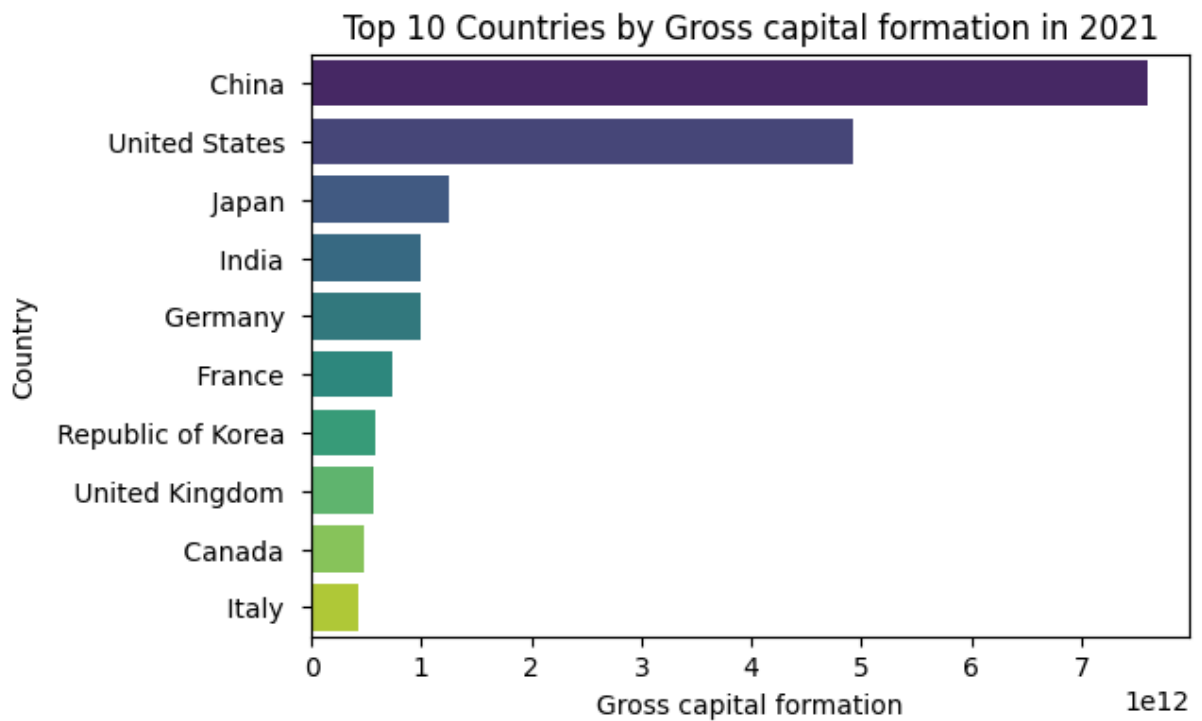
13. Household expenditure

Top 10 Countries by Household consumption expenditure (including Non-profit institutions serving households) in 2021
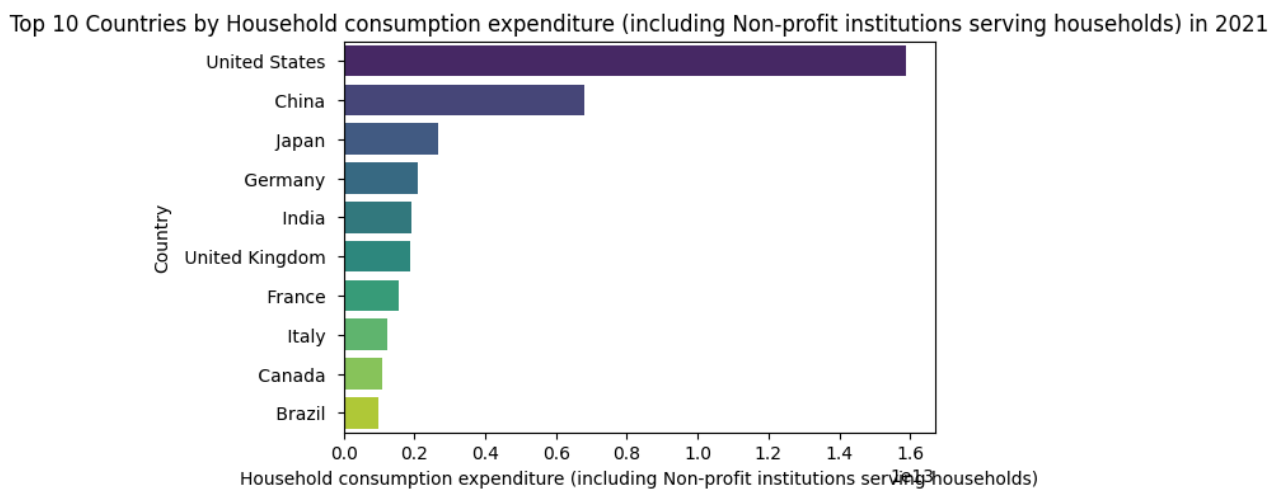
14. Import of goods and services
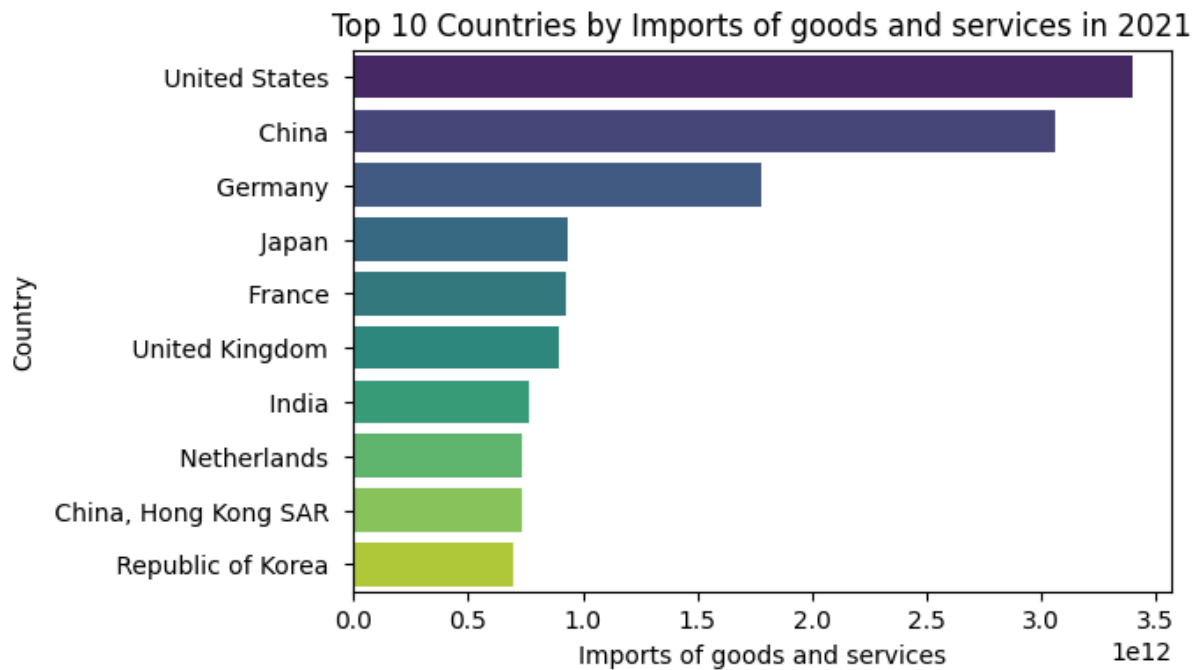
Top 10 Countries by Imports of goods and services in 2021

15. Manufacturing

Top 10 Countries by Manufacturing (ISIC D) in 2021

16. Mining and utilities

Top 10 Countries by Mining, Manufacturing, Utilities (ISIC C-E) in 2021

17. Transport, Storage and Communication

Top 10 Countries by Transport, storage and communication (ISIC I) in 2021
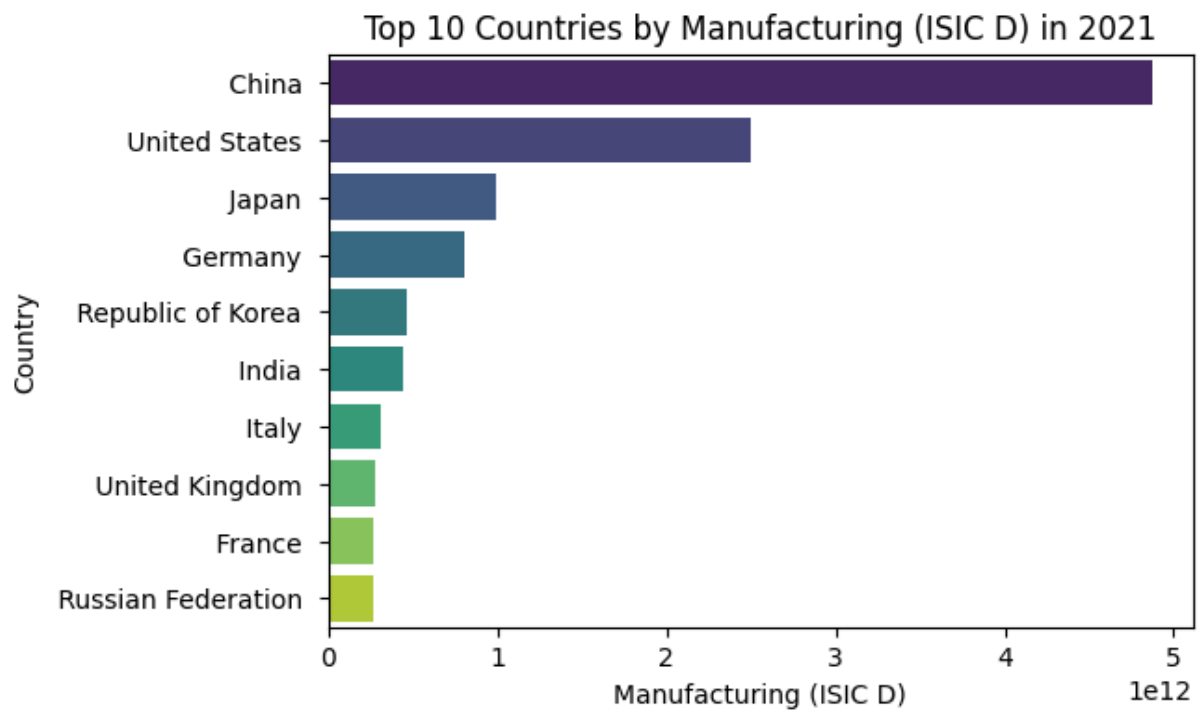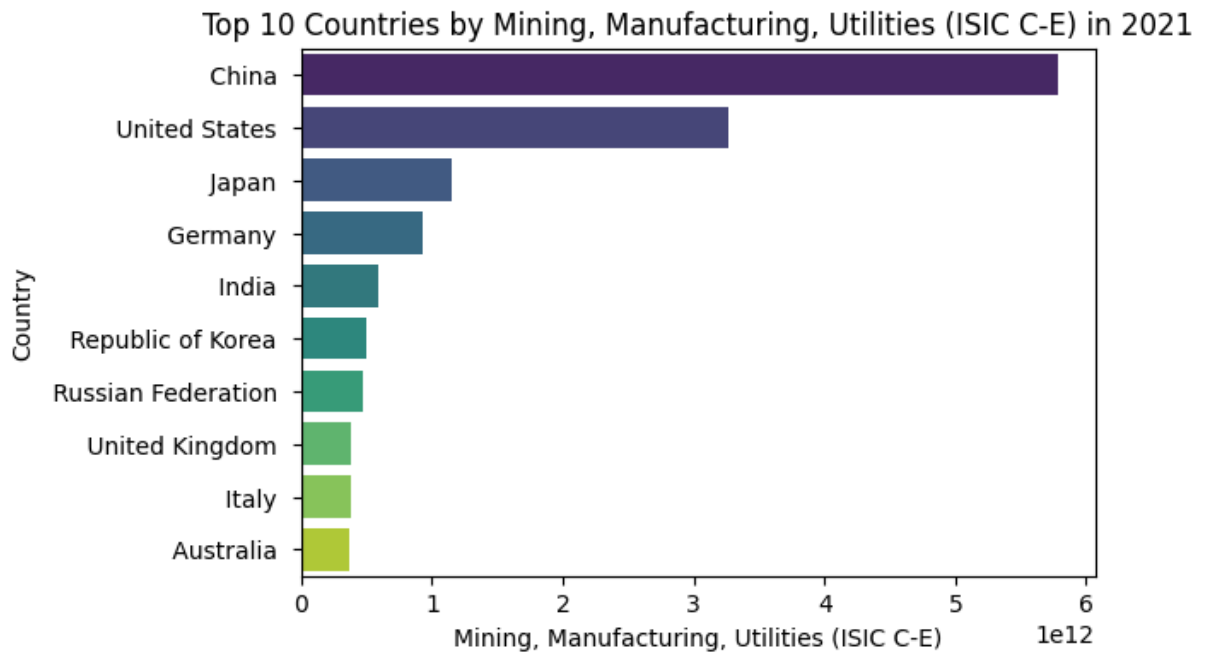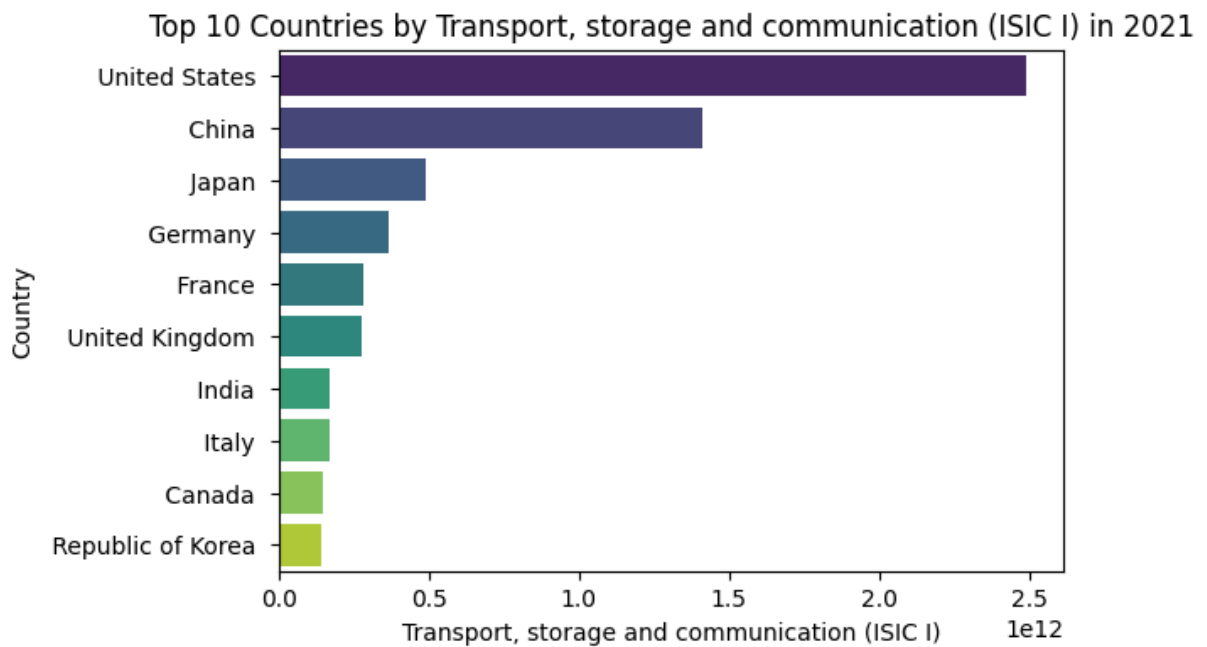
18. Business Development

Top 10 Countries by Wholesale, retail trade, restaurants and hotels (ISIC G-H) in 2021