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WORLD ECONOMIC ANALYSIS USING INNDICATORS

Mini Project Report submitted to PSGR Krishnammal College for women in partial fulfillment of the requirements for the award of the degree of

Master of Science in Data Analytics

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1.INTRODUCTION

The world economy or global economy is the economy of all humans of the world, referring to the global economic system, which includes all economic activities which are conducted both, within and between nations, including production, consumption, economic management work in general, exchange of financial values and trade of goods and services. In some contexts, the two terms are distinct "international" or "global economy" being measured separately and distinguished from national economies, while the "world economy" is simply an aggregate of the separate countries' measurements.

Beyond the minimum standard concerning value in production, use and exchange, the definitions, representations, models and valuations of the world economy vary widely. It is inseparable from the geography and ecology of planet Earth.Economic indicators measure the economic activity within a country or economic region. They are usually collected at frequent intervals, often monthly or quarterly, and are usually weighted and indexed according to different criteria allowing for meaningful comparisons between different points in time. A detailed explanation on how the market will be impacted by the event is also highlighted, as is the previous, forecasted and actual data released. Most investors will usually trade the actual release in relation to the forecasted figure. Economic indicators help investors and analysts assess investment opportunities or entire economies as a whole.

An economic indicator is a statistic about an economic activity. Economic indicators allow analysis of economic performance and predictions of future performance. One application of economic indicators is the study of business cycles. Economic indicators include various indices, earnings reports, and economic summaries: for example, the unemployment rate, quits rate housing starts, consumer price index Inverted yield curve, consumer leverage ratio, industrial production, bankruptcies, gross domestic product, broadband internet penetration, retail sales, price index, and money supply changes

1. PROBLEM DESCRIPTION

In business, economic analysis allows to incorporate elements from the economic environment such as inflation, interest rates, exchange rates and GDP growth. The indicators within the Economy section allow us to analyse various aspects of both national and global economic activity. Economics is divided into two categories microeconomics and macroeconomics. Microeconomics is the study of how individuals and companies make decisions to Macroeconomics analyses how an increase or decrease in net exports impacts a nation’s capital account, or how gross domestic product GDP is impacted by the unemployment rate. Macroeconomics focuses on aggregates and econometric correlations allocate scarce resources. Macroeconomics is the study of an economy as a whole. Lagging indicators, which

reflect an economy's historical performance and only change after a trend has been established. They are used to confirm a trend is underway. These include gross domestic product inflation and employment figures.

The main objective is to Analyse the global data using some macro indicators such Corruption, Tourism, Unemployment and Cost of Living all around the World. Inferences are obtained and have paved way for many new opportunities.

3. DATASET DESCRIPTION

S.NO	DATA SET	ATTRIBUTES	SHAPE
1	**Corruption**	• Country • annual_income • corruption_index	(110,3)
2	**Cost of living**	• country • cost_index • monthly_income • purchasing_power	(107,4)
3	**Richest_countries**	• country • gdp_per_capita	(50,2)
4	**Tourism**	• Country • receipts_in_billions • receipts_per_tourist • tourism_in_millions • percentage_of_gdp	(41,5)
5	**Unemployment**	• country • unemployment_rate	(64,2)

4. ANALYSIS AND INTERPRETATION

EDA

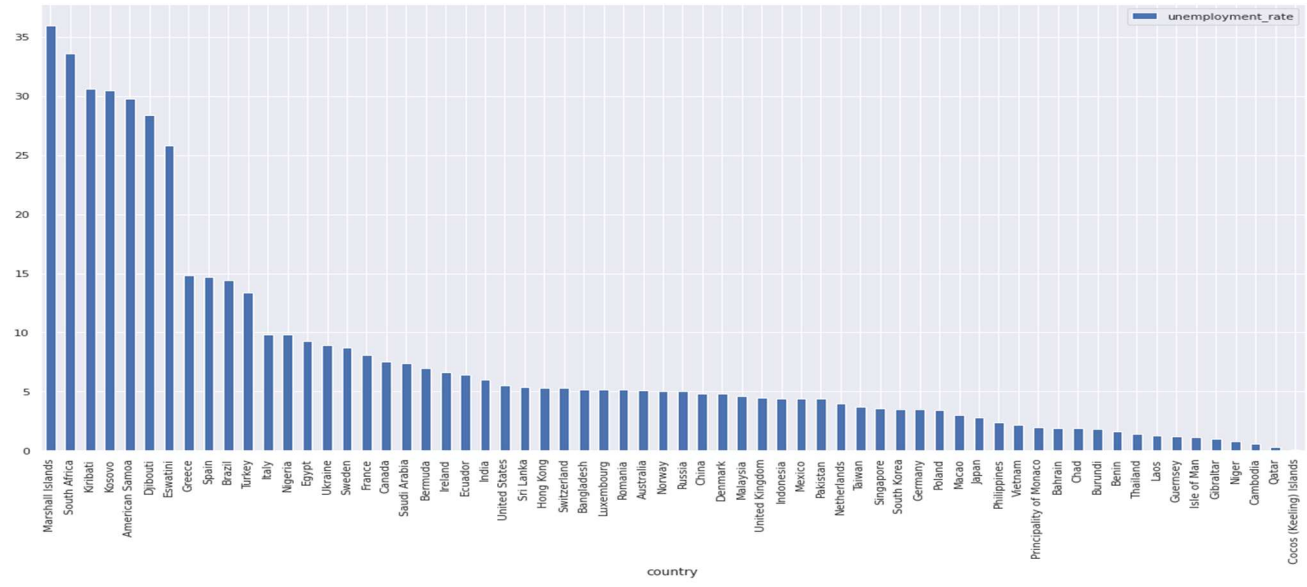
Exploratory Data Analysis is used by data scientists to analyze and investigate data sets and summarize their main characteristics, often employing data visualization methods. It helps determine how best to manipulate data sources to get the answers you need, making It easier for data scientists to discover patterns, spot anomalies, test a hypothesis, or check assumptions.

4.1 STATISTICAL INFORMATION ABOUT UNEMPLOYMENT

unemployment_df.describe()

	unemployment_rate
count	64.000000
mean	7.823437
std	8.806685
min	0.100000
25%	2.700000
50%	5.000000
75%	8.250000
max	36.000000

4.2 PLOTTING UNEMPLOYMENT_RATE VS. COUNTRY

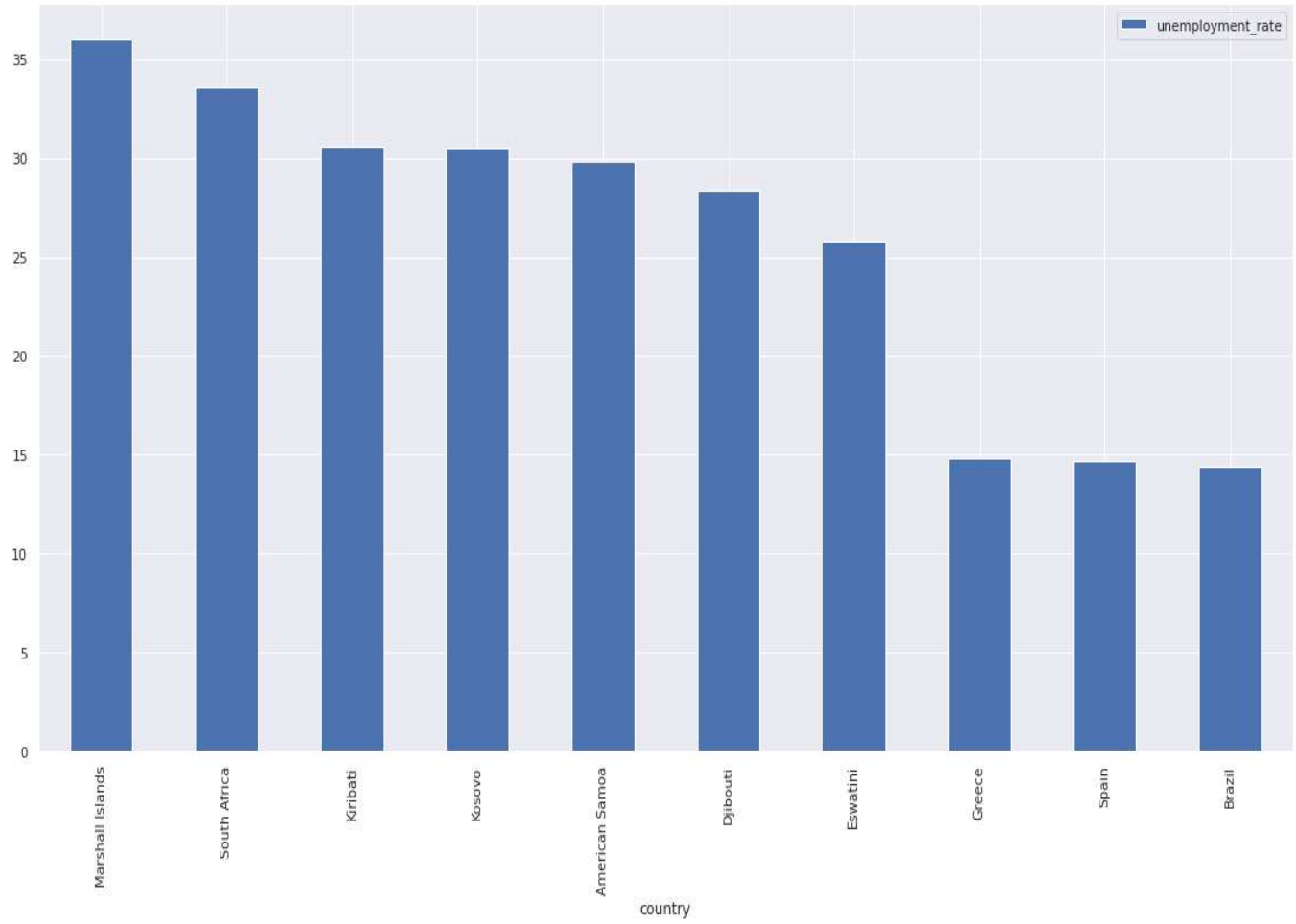


Observation:

From the above graph it can be inferred that only top 11 countries from Data Frame has unemployment rate higher than 10, other countries have employment rate below 10

4.3 TOP 10 COUNTRIES WITH HIGHEST UNEMPLOYMENT RATE

```
top10_unemployment_df=unemployment_df.sort_values(by='unemployment_rate’, ascending=False)[:10]
top10_unemployment_df.plot(x='country', y='unemployment_rate', rot=90, kind='bar', figsize=(20,10))
```

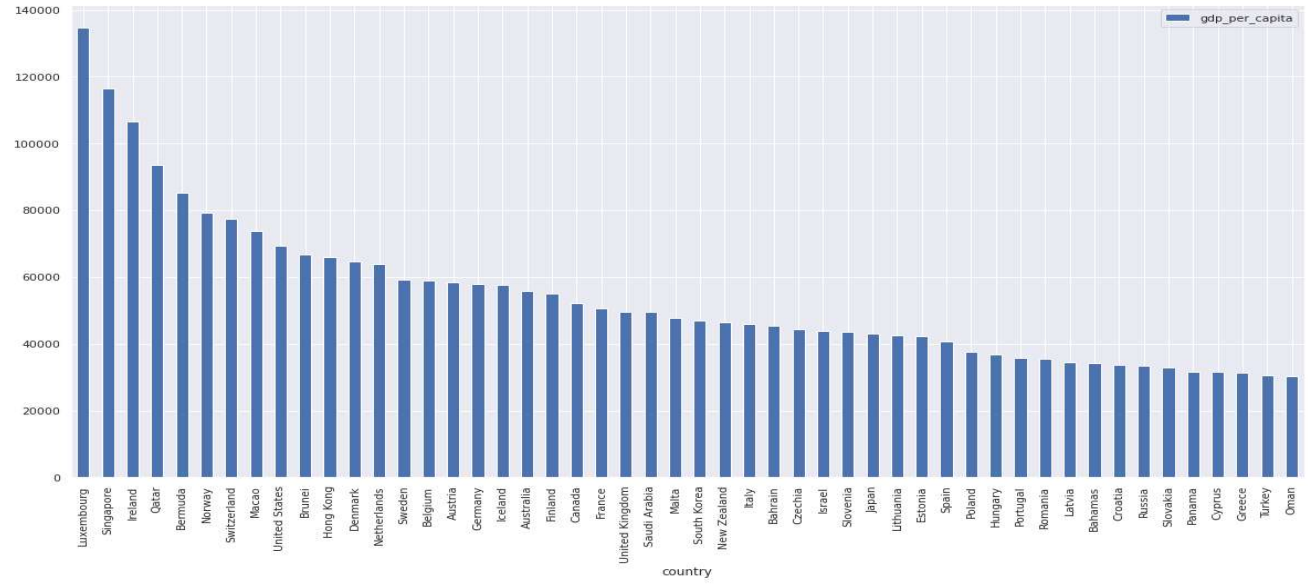


Observation:

Marshall Islands and south Africa are places where unemployment rate is high

4.4 PLOTTING GDP PER CAPITA VS COUNTRY

rich_country_df.plot (x='country', y='gdp_per_capita', rot=90, kind='bar', figsize=(20,10))



In [20]:
```
# The Average gdp per capita across countries
rich_country_df['gdp_per_capita'].mean()
```

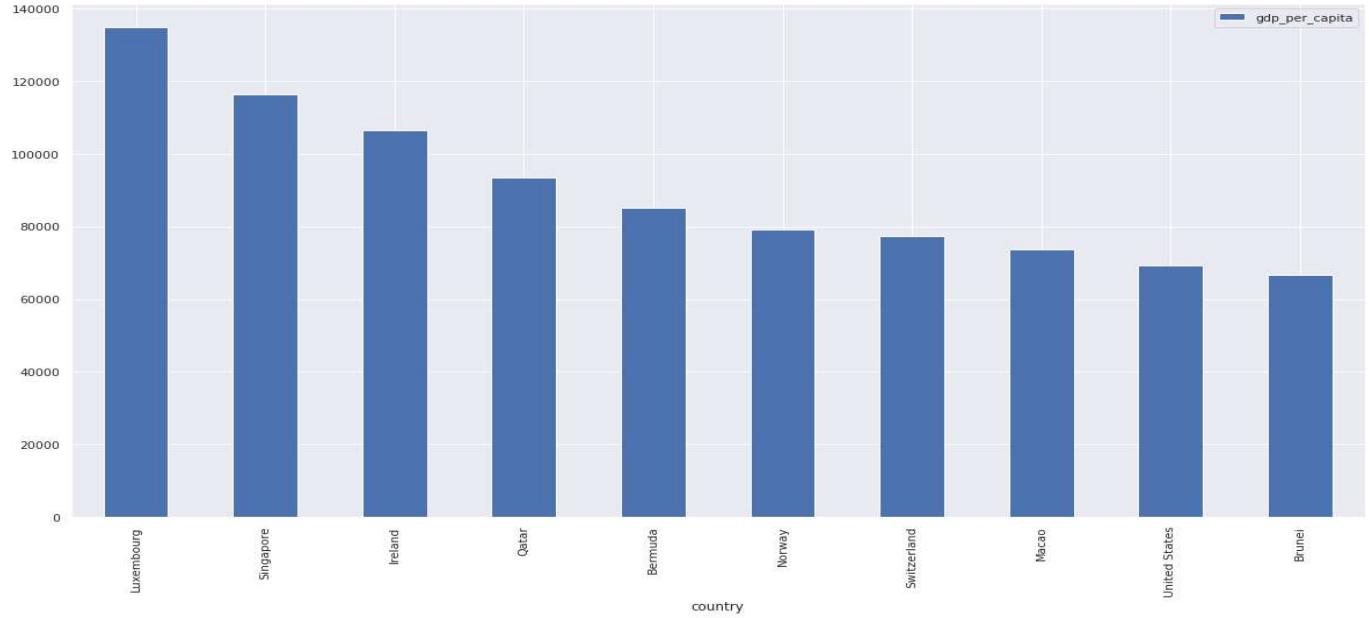
Out[20]:
```
54088.18
```

In [21]:
```
len(rich_country_df[rich_country_df['gdp_per_capita']<54088.18])
```

Out[21]:
```
30
```

30 countries out of 50 have gdp_per_capita lower than Average

4.5 PLOTTING GDP PER CAPITA VS COUNTRY FOR TOP 10 COUNTRIES WITH RESPECT TO GDP

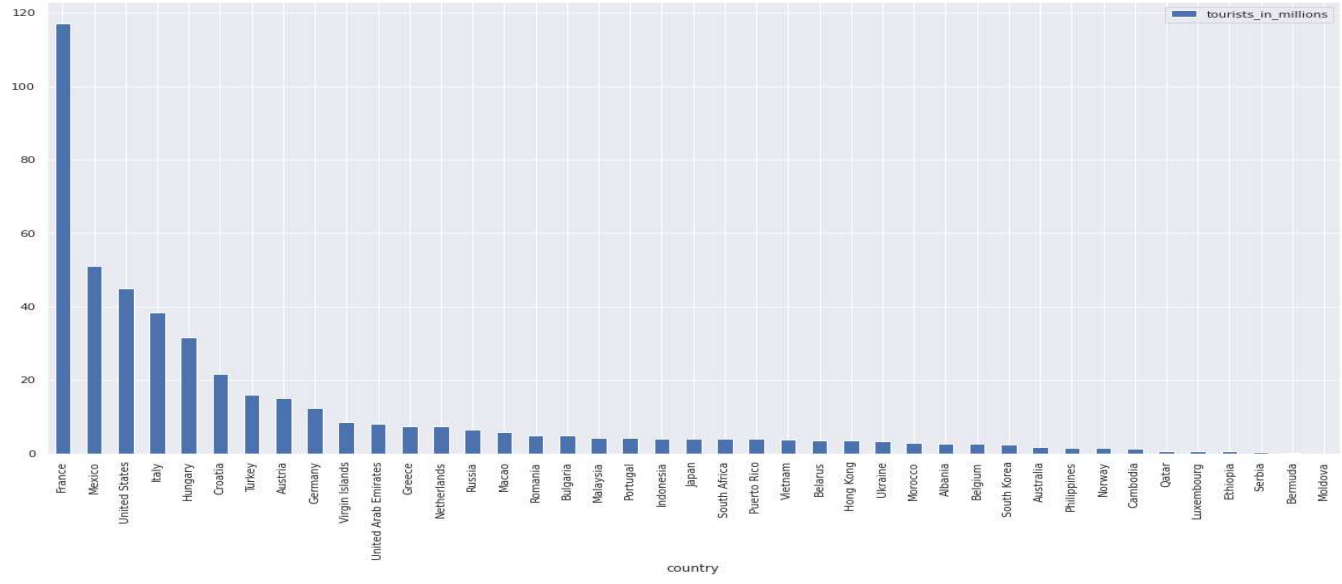


Observation:

Luxemburg and Singapore are higher among other top countries of GDP

4.6 COUNTRY VS TOURISTS IN MILLIONS

tourists_in_millions_tourism_df = tourism_df.sort_values(by='tourists_in_millions',ascending=False)
tourists_in_millions_tourism_df.plot(y='tourists_in_millions', x='country', rot=90, kind='bar', figsize=(20,10))



In [37]:

```
# Top 3 countries according to tourists
tourism_df.sort_values(by='tourists_in_millions',ascending=False)[:3]
```

Out[37]:

	country	tourists_in_millions	receipts_in_billions	receipts_per_tourist	percentage_of_gdp
0	France	117.1	35.96	307	1.2
1	Mexico	51.1	11.45	224	0.9
2	United States	45.0	84.21	1870	0.4

Observation:

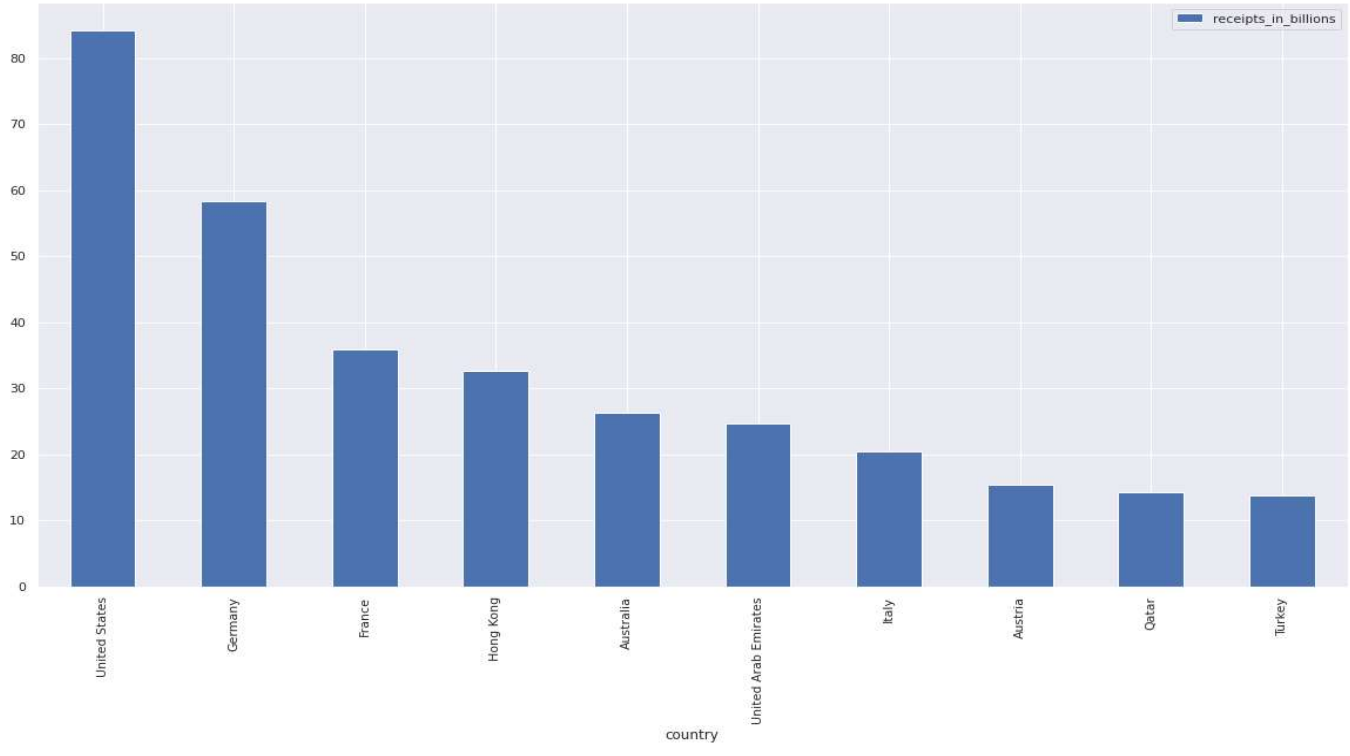
The no.of tourists visiting "France" is more than double compared to "Mexico" which is standing at 2nd position in terms of 'tourists_in_millions'. The no.of tourists visiting France is thus affecting average

4.7 COUNTRY VS RECEIPTS IN BILLIONS

top10_receipts_in_billions_tourism_df=tourism_df.sort_values(by='receipts_in_billions',ascending=False)[:10]

top10_receipts_in_billions_tourism_df[['country','receipts_in_billions','tourists_in_millions']]

top10_receipts_in_billions_tourism_df.plot(y='receipts_in_billions', x='country', rot=90, kind='bar', figsize=(20,10))

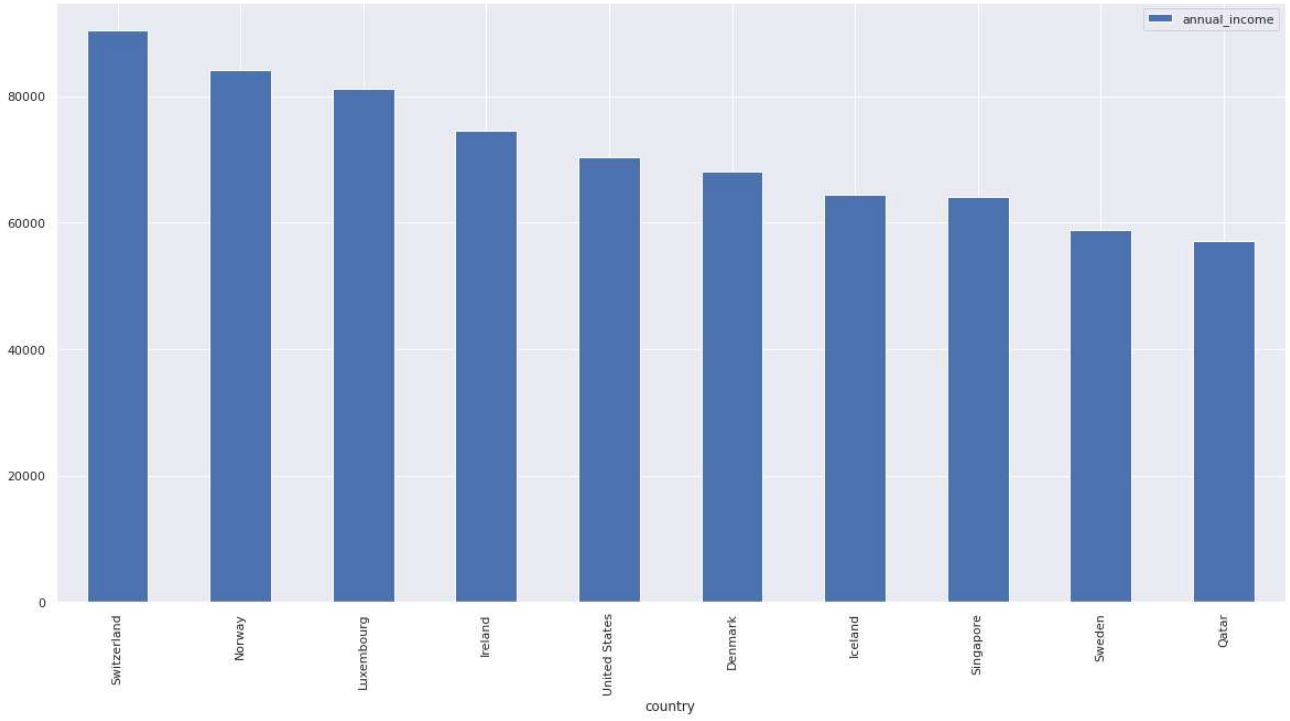


Observation:

The no.of visitors for France is much greater than that of United States but the receipts_in_billions is less than half compared to United States. This because the receipts_per_tourist is greater in the case of United States and thus the Total no.of Receipts.

4.8 TOP 10 COUNTRIES WITH HIGHEST ANNUAL INCOME

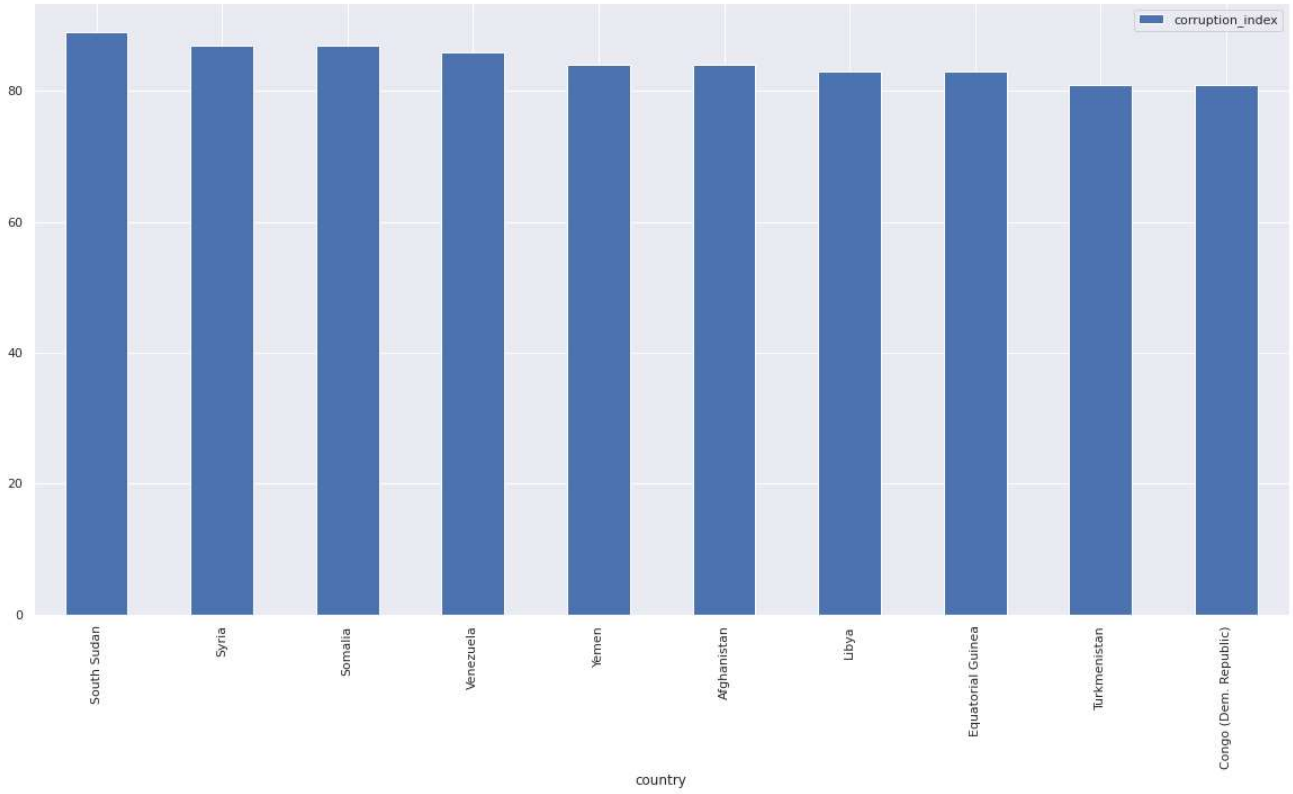
```
top10_annual_income_corruption_df=corruption_df.sort_values(by='annual_income',ascending=False)[:10]
top10_annual_income_corruption_df.plot(y='annual_income', x='country', rot=90, kind='bar', figsize=(20,10))
```



4.9 COUNTRY VS CORRUPTION INDEX

```
corruption_index_corruption_df = corruption_df.sort_values(by='corruption_index',ascending=False)
corruption_index_corruption_df.plot(y='corruption_index', x='country', rot=90, kind='bar', figsize=(20,10))
```

top10_corruption_index_corruption_df=corruption_df.sort_values(by='corruption_index',ascending=False)[:10]
top10_corruption_index_corruption_df



TOP 3 FROM WITH HIGHEST ANNUAL INCOME IN CORRUPTION INDEX RANKINGS

display(corruption_index_corruption_df[corruption_index_corruption_df['country'] == 'Switzerland'])
display(corruption_index_corruption_df[corruption_index_corruption_df['country'] == 'Norway'])
display(corruption_index_corruption_df[corruption_index_corruption_df['country'] == 'Luxembourg'])

	country	annual_income	corruption_index
6	Switzerland	90360	16

	country	annual_income	corruption_index
3	Norway	84090	15

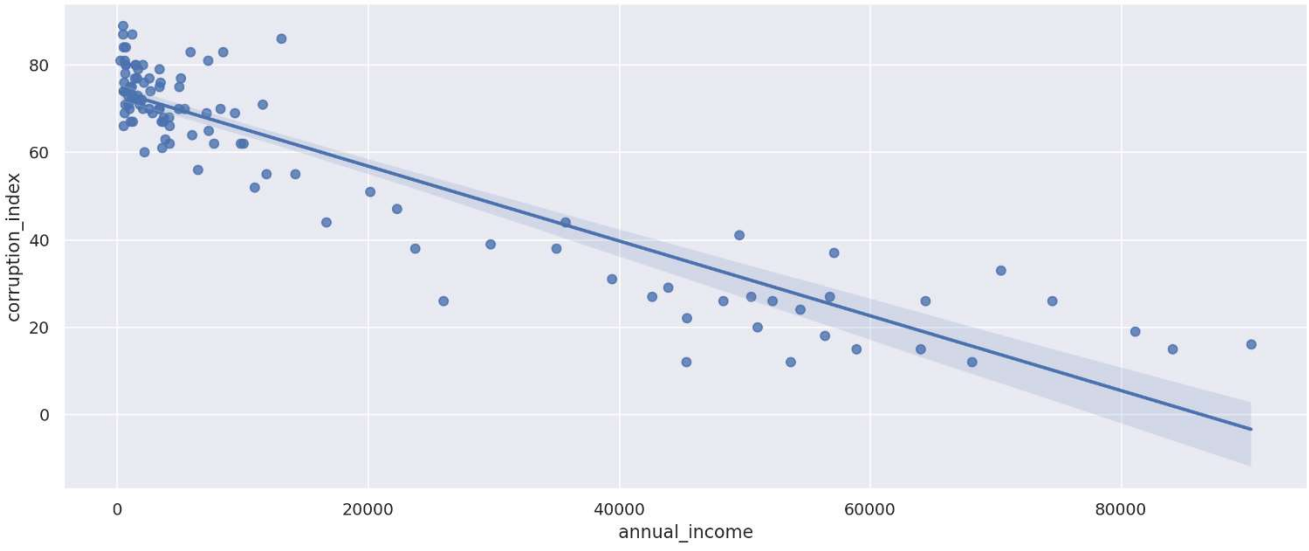
	country	annual_income	corruption_index
8	Luxembourg	81110	19

Observation:

The Countries listed above are following the correlation of -0.916669 between annual_income and corruption_index.

4.10 ANNUAL INCOME VS CORRUPTION INDEX

```
plt.figure(figsize=(15,6),dpi=200)
sns.regplot(data=corruption_df, x='annual_income', y='corruption_index', marker="o")
plt.show();
```



Observation:

There is a clear negative linear relation between annual income and corruption index and it can be seen from the Above scatter plot. If annual income increases corruption index decreases for a country and vice versa.

4.11 CHECKING FOR CORRELATION BETWEEN VARIOUS COLUMNS IN THE COST OF LIVING

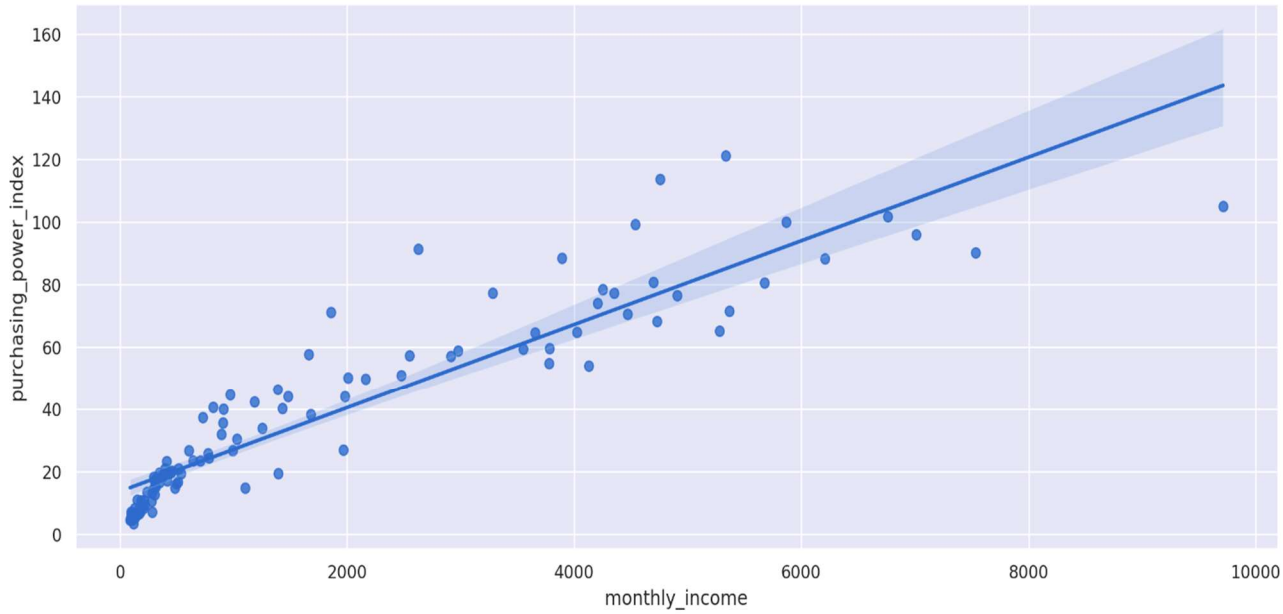
In [72]:

```
# Heatmap for cost_of_living_df

plt.figure(figsize=(4,2),dpi=200)
sns.heatmap(cost_of_living_df.corr(),annot=True)
plt.show();
```

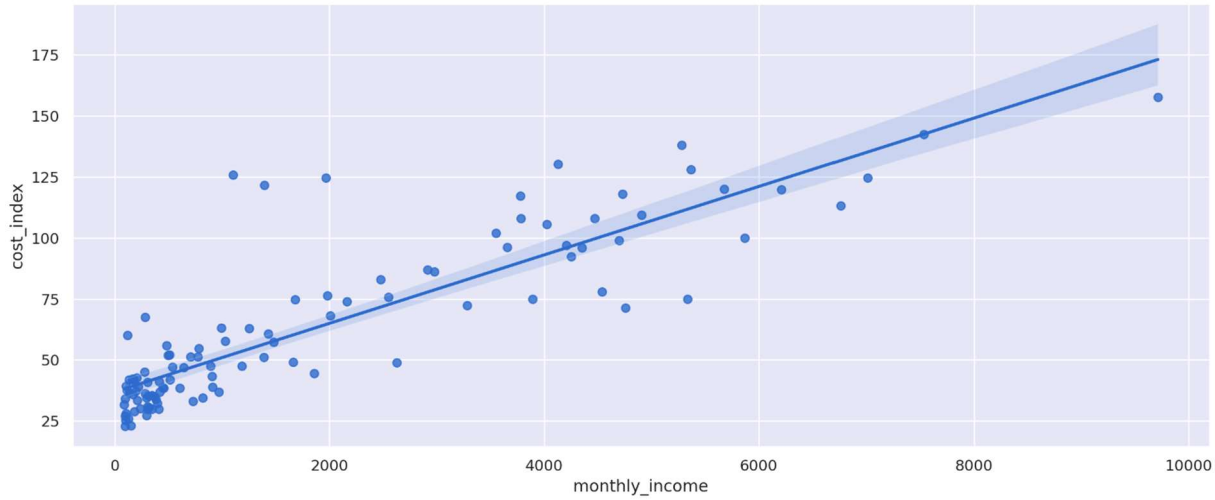
4.12 MONTHLY INCOME VS PURCHASING POWER INDEX FOR ALL THE COUNTRIES

```
plt.figure(figsize=(15,6),dpi=200)
sns.regplot(data=cost_of_living_df, x='monthly_income', y='purchasing_power_index', marker="o")
plt.show();
```

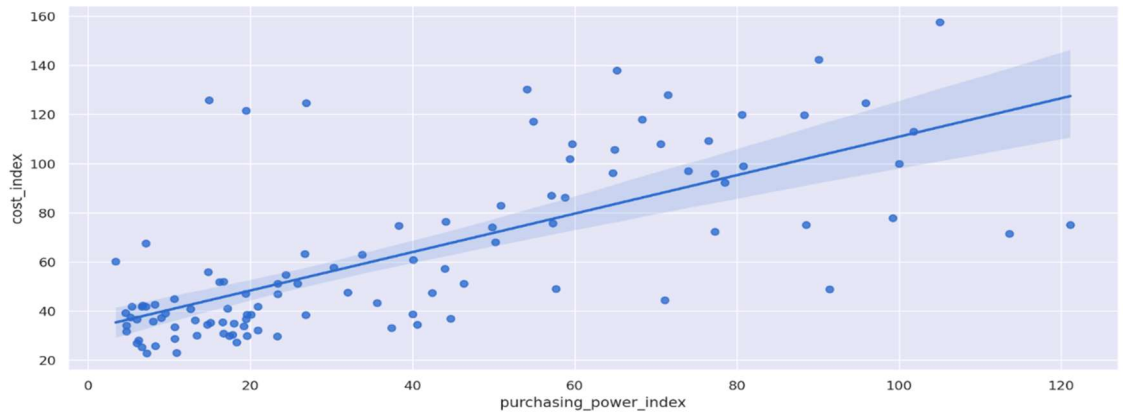


In [76]:

```
# monthly_income Vs. cost_index for all the countries
plt.figure(figsize=(15,6),dpi=200)
sns.regplot(data=cost_of_living_df, x='monthly_income', y='cost_index', marker="o")
plt.show();
```



In [77]:
```
# purchasing_power_index Vs. cost_index for all the countries
plt.figure(figsize=(15,6),dpi=200)
sns.regplot(data=cost_of_living_df, x='purchasing_power_index', y='cost_index', marker="o")
plt.show();
```



Observation:

There is a clear positive linear relationship between "monthly_income", "purchasing_power_index" and "cost_index".

4.12 TOP 10 COUNTRIES IN ACCORDANCE WITH PURCHASING POWER INDEX

monthly_income_cost_of_living_df=cost_of_living_df.sort_values(by='monthly_income',ascending=False)
top10_monthly_income_cost_of_living_df=cost_of_living_df.sort_values(by='monthly_income',ascending=False)[:10]
top10_monthly_income_cost_of_living_df

	country	cost_index	monthly_income	purchasing_power_index
0	Bermuda	157.6	9712	105.0
1	Switzerland	142.4	7530	90.1
7	Norway	124.6	7008	95.9
13	Luxembourg	113.1	6759	101.8
10	Ireland	119.8	6210	88.3
19	United States	100.0	5869	100.0
9	Denmark	119.9	5676	80.6
4	Iceland	128.0	5368	71.5
31	Singapore	75.0	5334	121.1
2	Cayman Islands	137.9	5281	65.2

1.Average of monthly_income across countries:

```
monthly_income_cost_of_living_df['monthly_income'].mean()
```

Output: 1826.5327102803737

2.No.of countries with montly_income above Average

```
len(monthly_income_cost_of_living_df[monthly_income_cost_of_living_df['monthly_income'] >= (monthly_income_cost_of_living_df['monthly_income'].mean())])
```

Output:37

3.Average of purchasing_power_index across countries

```
purchasing_power_index_cost_of_living_df['purchasing_power_index'].mean()
```

Output:38.15046728971962

4.No. of countries with purchasing_power_index above Average

```
len(purchasing_power_index_cost_of_living_df[purchasing_power_index_cost_of_living_df['purchasing_power_index']>=(purchasing_power_index_cost_of_living_df['purchasing_power_index'].mean())])
```

OUTPUT: 45

Observation:

The Countries - Bermuda, Switzerland and Norway are top 3 in terms of montly_income and continue to exist in top 10 interms of purchasing_power_index and cost_index, which indicates the strong positive correlation between the features.

5.Conclusion

As analysis shows, the constant flow of data can obscure underlying trends. Decisions have to be taken in a realistic way, unhindered by reading of economic data released almost daily that covers all aspects of the economic sphere. But the sheer breadth of these releases and the underlying complexity that they may not convey in the headline release means tools to help to improve one's understanding are required.

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