DAT405 Assignment 1 – Group 111

Jihad Almahal - (6 hrs)
Oscar Karbin -(6 hrs)

February 15, 2023

1 GDP per capita vs Life expectancy

1.1 Python application for scatter plot of GDP per capita vs Life expectancy, assumptions and motivations when selecting data

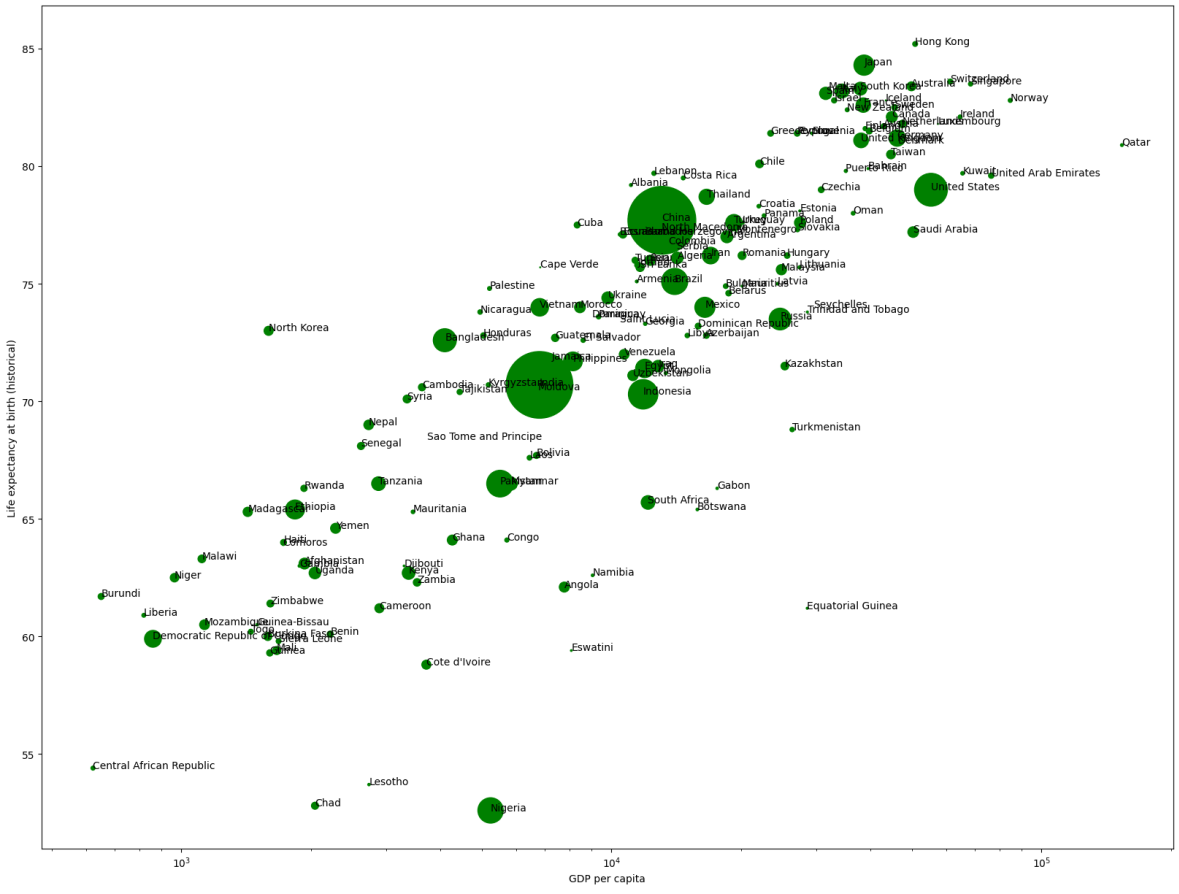

Figure 1: Life expectancy (Years) vs. GDP per capita (USD), year 2018

We got the dataset Comparing GDP per capita and life expectancy from the OurWorldInData website

[1]. The dataset contained information about the country's throughout many years we thought it will be difficult to illustrate several years without more plots, so we decided to choose 1 year and show it in out figure and the year would be 2018.

We also filtered out countries that had no information available in the dataset for the year 2018. How big a country's point is decided by its population. Some minor additional changes we made was to remove rows of data that represented the entire world.

1.2 Which countries have a life expectancy higher than one standard deviation above the mean?

To find which countries that have one standard deviation above the mean. We simply calculated the sum of the mean and the standard deviation. With this sum we could create a new data-frame that only contains countries with a greater life expectancy.

15	Austria	81.7
22	Belgium	81.5
39	Canada	82.1
55	Cyprus	81.4
59	Denmark	81.0
78	Finland	81.6
80	France	82.6
86	Germany	81.2
89	Greece	81.4
102	Hong Kong	85.2
104	Iceland	82.8
109	Ireland	82.1
111	Israel	82.8
112	Italy	83.2
114	Japan	84.3
140	Luxembourg	81.8
147	Malta	83.3
168	Netherlands	81.8
170	New Zealand	82.4
180	Norway	82.8
192	Portugal	81.4
194	Qatar	80.9
214	Singapore	83.5
217	Slovenia	81.4
223	South Korea	83.3
226	Spain	83.1
231	Sweden	82.5
232	Switzerland	83.6
234	Taiwan	80.5
252	United Kingdom	81.1

Figure 2: Countries that have a life expectancy higher than one standard deviation above the mean

1.3 Which countries have high life expectancy but have low GDP? Motivate how you have chosen to define "high" and "low".

We calculated the GDP by using this formula GDP = GDP per capita x Population. Then we calculated all country's which had High life expectancy above the mean and GDP below the man, and this generated a list of 74 countries that fulfill the criteria

We then chose reduce the number of countries by making a more strict definition of high and low. We did that by applying the filter : Life expectancy >Mean + standard deviation and GDP <Mean - standard deviation. The table that we got after this step is shown below.

Austria	Belgium
Cyprus	Denmark
Finland	Greece
Hong Kong	Iceland
Ireland	Israel
Luxembourg	Malta
New Zealand	Norway
Portugal	Qatar
Singapore	Slovenia
Sweden	Switzerland

This methodology of using mean and standard deviation to define "high" and "low" is appropriate as it considers the distribution of data and ensures that the threshold for "high" and "low" is not arbitrary. This approach also eliminates outliers that might have skewed the results. By using this method, you can more accurately identify countries that have both "high" life expectancy and "low" GDP compared to the global average.

1.4 Does every strong economy (normally indicated by GDP) have high life expectancy?

Not necessarily. While a strong economy can provide resources for healthcare and other factors that contribute to high life expectancy, other factors such as access to healthcare can also play a significant role. There are many examples of countries with high GDP that do not have correspondingly high life expectancy, and vice versa.

A country can have high GDP simply because they have a large population or a small portion of people are very wealthy , for example India which has a GDP of 2 700 billion USD while Canada has a GDP of 1 725 billion USD, but a significantly higher life expectancy than India[2].

1.5 Related to question d, what would happen if you use GDP per capita as an indicator of strong economy? Explain the results you obtained, and discuss any insights you get from comparing the results of d and e.

Using GDP per capita as an indicator of a strong economy provides a more nuanced understanding of the relationship between economic strength and life expectancy. This is because GDP per capita takes into account the average wealth of a country's citizens, rather than just the overall size of the economy.

Comparing the results obtained from using GDP per capita with those obtained from using total GDP gives insights into whether the overall size of a country's economy or the average wealth of its citizens is more closely related to life expectancy.

A high proportion of countries with high GDP per capita also have high life expectancy, this suggests that a strong economy, as measured by the average wealth of citizens, is associated with better health outcomes.

In conclusion the comparison of results obtained from using GDP per capita and total GDP indicates that the average wealth of a country's citizens is more closely related to life expectancy than the overall size of the economy.

References

[1] https://ourworldindata.org/

[2] https://countryeconomy.com/countries/compare/canada/india?sc=XE24