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# Connecting GDP Per Capita and Average Life Expectancy

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## ABSTRACT

*Economic growth is a single dimensional concept, one of the most used measures for which is GDP per capita. On the other hand, economic development is a multi-dimensional concept with average life expectancy as the most popular measure. As per economists, economic growth might lead to economic development but not always. This paper sets out to find the exact level of correlation by using the two variables- average life expectancy and GDP per capita. This is done through the analyzation for the data over 5 years of 20 countries out of which 10 are LEDCs and 10 are MEDCs, situated globally. Simple methods such as mean, and standard deviation as well as complex methods including box-and-whisker graphs and Pearson's product-moment correlation are used. This paper accordingly tests various hypotheses and uses the analyzed data to be able to prove if they are correct or not. Suggestions of future methods to improve the conduction of a study as such on a wider scale are also expressed.*

**Research question:** To what extent is there a relationship between the GDPs per capita and the average life expectancy of a country and does this relationship differ for LEDCs and MEDCs?

## Introduction

Is your life duration dependent on how much the people in your society earn on average?

Gross Domestic Product is defined as "the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period." Whereas Gross Domestic Product per capita is a financial metric that measures a country's economic output per person. It is simply calculated by dividing the country's GDP by its population. GDP per capita is the most widely used way to gauge the prosperity of a country based on its economic growth. This is because its components are regularly tracked on a global scale, providing for ease of calculation and usage. At its most basic interpretation, GDP per capita shows the domestic population influence and how much economic production value can be

  

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attributed to each citizen. Alternatively, this translates to a measure of national wealth since GDP market value per person also readily serves as a prosperity measure. (Investopedia, 2021)

Life expectancy is a statistical average of the time (in years) a human being is expected to live, taking into consideration the sex- and age-specific death rates prevailing at the time of birth, for the specific year, in the given country, territory, or geographic area. (WHO,2021) According to the United Nations, the average life expectancy of the population on Earth in 2021 is 72.81 years, excluding the impacts of COVID-19. Apart from being the key metric to assess population health, life expectancy can be used to analyze the standard of living and economic development of a country. If a country has a high standard of living and is economically developed the life expectancy of the country will be higher as proper healthcare and education will be prevalent.

Economic growth has inarguably led to higher levels of development in many countries particularly aiding individuals out of poverty. However, many economists argue that economic growth doesn't always translate to development. Additionally, the level of development varies from country to country. After analyzing the human assets, economic vulnerability, and gross national income per capita of countries, the countries are categorized into Less Economically Developed Countries (LEDCs) and More Economically Developed Countries (MEDCs). LEDCs are countries with a low standard of living and lower GDP, whereas MEDCs are countries with a high standard of living and a higher GDP.

Keeping in mind that life expectancy is a measure of economic development whereas GDP per capita is a measure of economic growth, this paper will be analyzing countries that are MEDC's and others that are LEDC's to find if there is a link between the GDP per capita and the average life expectancy of a country.

**Plan of Action**

The following research will be using secondary sources such as the World Bank for secondary data. The nature of the study is such because, for the data required, primary data collection is not practically possible. Secondary sources used are reliable sources of information.

For 5 years, data of 10 LEDCs and 10 MEDCs will be analyzed. The LEDCs and MEDCs are chosen through random sampling to remove any form of bias, giving all the countries an equal opportunity to be selected. The United Nations' list of less developed (46 countries) and more developed countries (66 countries) was added to an online generator separately. Wherein, 10 LEDCs and 10 MEDCs were randomly picked from the lists.

The MEDCs received from the generator are:

  

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| | | | | |
|---|---|---|---|---|
| Norway | Malaysia | Argentina | United States | France |
| UAE | Australia | UK | Canada | Brazil |

The LEDCs received from the generator are:

| | | | | |
|---|---|---|---|---|
| Bangladesh | Ethiopia | Nepal | Uganda | Yemen |
| Afghanistan | Rwanda | Madagascar | Bhutan | Angola |

In order to analyze my collected data and prove my hypothesis, I will be using statistical methodology such as mean, standard deviation, line of best fit, Pearson's product-moment correlation coefficient as well as box-and-whisker graphs.

Firstly, I will be calculating the mean and standard deviation. The mean will be the average for each country for both the variables; life expectancy and GDP per capita over 5 years of the data that I have collected. This will give one final value making it much easier for further complex statistical methods and enabling me to test my hypothesis about the individual variables.

Standard Deviation is how far the mean is from the overall value sets. It measures the value of variation that exists and gives a more accurate idea of how the data is distributed. The closer it is to the mean, the better it is and vice-versa. It is a supporting calculation for the mean, helping the reader to analyze the mean more accurately and informing themselves of the reliability of the mean calculation.

Box and whisker graphs are a graphical method of displaying variation in a set of data. They will help the research reaffirm if the hypothesis according to the conclusion of the mean is correct or not. They are very effective and easy to read, as they can summarize data from multiple sources and display the results in a single graph. Box and whisker plots allow for the comparison of data from different categories for easier, more effective decision-making. (ASQ, 2021)

Line of best fit refers to a line through a scatter plot of data points that best expresses the relationship between those points, (Chen,2021) helping us to find the Pearson correlation coefficient and in turn determine the relationship between the two variables.

Pearson's product-moment correlation coefficient is a measure of the strength of a linear association between two variables. It attempts to draw a line of best fit through the data of the two variables and the Pearson correlation coefficient, r, indicates how far away all these data points are to this line of best fit (i.e., how well the data points fit this new model/line of best fit).

  

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(Laerd,2021) This will measure the relationship between the GDPs per capita and average life expectancy.

**Hypothesis**

**Hypothesis 1:** *'MEDCs will have a higher average life expectancy in comparison to LEDCs'*

MEDCs are more developed by nature so they might have more of the necessary facilities and infrastructure in terms of education, sanitation, healthcare and hygiene levels which all can help contribute to a longer and healthier life in comparison to LEDCs, which may potentially lack this quality and availability of infrastructure. Diseases such as AIDS, polio etc. affect LEDCs more as they are unable to provide the medical technology and infrastructure required. For example, 91% of the world's HIV-positive children live in Africa and more than one million adults and children die every year from HIV/AIDS in Africa alone.

**Hypothesis 2:** *'I predict that an LEDC in Asia will have a higher GDP per capita compared to an LEDC in Africa'*

I am of the view that Asian countries are slightly more developed than African countries considering several reasons such as the resource and factor endowment, the support from the government, the support from the Federal Bureau of Investigation (FBI), and the foreign direct investment that flows into the countries.

Countries in Africa also majorly rely only on the trade of primary products, making their economic model very vulnerable as they face consequences of constant price fluctuations and problems in the market. The wide variety of mineral resources in Asia provides the basis for several metallurgical industries. Unlike Africa, Asian countries have changed their reliance on primary product trade towards more manufactured products since World War II giving them a stronger position in the market, allowing for more economic activity and thus higher GDP and GDP per capita. Regardless of talking in the sense of developing or developed countries, Asia as a continent is more economically developed having a higher average GDP per capita compared to Africa.

**Hypothesis 3:** *'I predict that the GDP per capita and average life expectancy of a country's population are dependent on each other'*

A higher GDP per capita means that each individual in the economy has a higher income enabling them to have easier accessibility to infrastructures pertaining to education, healthcare etc. which can increase awareness amongst people about increasing the quality of life leading to a longer and healthier life, utilizing the prevailing healthcare facilities. A higher GDP per capita

  

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also means lower crime rates and gang activities out of desperation for funds, preventing loss of lives. The Population Bulletin has described that individuals in the United States who are more highly educated live longer lives, on average. Strong evidence suggests that educational attainment serves as a fundamental cause of health and life expectancy.

**Data Collection:**

| Less Economically Developed Countries | | | | | | |
|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2017 | 2018 |
| Asia | **Afghanistan** | | | | | |
| | GDP per capita | 613.86 | 578.47 | 509.22 | 519.89 | 493.76 |
| | Average Life expectancy | 62.97 | 63.38 | 63.76 | 64.13 | 64.49 |
| | | | | | | |
| | **Bangladesh** | | | | | |
| | GDP per capita | 1118.87 | 1248.45 | 1401.56 | 1563.77 | 1698.13 |
| | Average life expectancy | 71.23 | 71.51 | 71.79 | 72.05 | 73.32 |
| | | | | | | |
| | **Bhutan** | | | | | |
| | GDP per capita | 2652.23 | 2752.63 | 2930.57 | 3286.60 | 3243.48 |
| | Average Life expectancy | 70.05 | 70.42 | 70.78 | 71.13 | 71.46 |
| | | | | | | |
| | **Nepal** | | | | | |
| | GDP per capita | 844.85 | 901.75 | 899.52 | 1048.45 | 1178.53 |
| | Average Life expectancy | 69.17 | 69.52 | 69.85 | 70.17 | 70.48 |
| | | | | | | |
| | **Yemen** | | | | | |
| | GDP per capita | 1674.00 | 1601.83 | 1138.60 | 960.53 | 824.12 |
| | Average Life expectancy | 66.07 | 66.09 | 66.09 | 66.09 | 66.10 |
| | | | | | | |
| Africa | **Angola** | | | | | |
| | GDP per capita | 5408.41 | 4166.98 | 3506.07 | 4095.81 | 3289.64 |
| | Average life expectancy | 58.78 | 59.4 | 59.93 | 60.38 | 60.78 |
| | | | | | | |
| | **Ethiopia** | | | | | |
| | GDP per capita | 566.93 | 640.54 | 717.12 | 768.52 | 771.52 |
| | Average life expectancy | 64.55 | 65.05 | 65.48 | 65.87 | 66.24 |
| | | | | | | |
| | **Madagascar** | | | | | |
| | GDP per capita | 530.86 | 467.24 | 475.96 | 515.29 | 518.40 |
| | Average life expectancy | 65.13 | 65.54 | 65.93 | 66.31 | 66.68 |
| | | | | | | |
| | **Rwanda** | | | | | |
| | GDP per capita | 743.56 | 751.08 | 744.76 | 772.32 | 783.64 |
| | Average life expectancy | 66.88 | 67.45 | 67.93 | 68.34 | 68.70 |
| | | | | | | |
| | **Uganda** | | | | | |
| | GDP per capita | 879.73 | 843.63 | 733.40 | 746.83 | 770.26 |
| | Average life expectancy | 60.67 | 61.37 | 61.99 | 62.52 | 62.97 |

  

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| More Economically Developed Countries | | | | | | |
|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2017 | 2018 |
| Asia | Malaysia | | | | | |
| | GDP Per capita | 11319.06 | 9955.24 | 9817.79 | 10259.30 | 11377.65 |
| | Average Life Expectancy | 75.27 | 75.46 | 75.65 | 75.83 | 76.00 |
| | | | | | | |
| | United Arab Emirates | | | | | |
| | GDP Per capita | 43751.81 | 38663.40 | 38141.87 | 40644.79 | 43839.32 |
| | Average Life Expectancy | 77.10 | 77.29 | 77.47 | 77.65 | 77.81 |
| | | | | | | |
| Australia | Australia | | | | | |
| | GDP Per capita | 62510.79 | 56755.72 | 49971.13 | 54027.97 | 57354.96 |
| | Average Life expectancy | 82.30 | 82.40 | 82.45 | 82.50 | 82.75 |
| | | | | | | |
| Europe | France | | | | | |
| | GDP Per capita | 43011.26 | 36638.18 | 37037.37 | 38685.26 | 41572.49 |
| | Average Life expectancy | 82.72 | 82.32 | 82.57 | 82.58 | 82.72 |
| | | | | | | |
| | Norway | | | | | |
| | GDP Per capita | 97019.18 | 74355.52 | 70460.56 | 75496.75 | 82267.81 |
| | Average Life expectancy | 82.10 | 82.30 | 82.41 | 82.61 | 82.76 |
| | | | | | | |
| | United Kingdom | | | | | |
| | GDP Per capita | 47452.20 | 45039.24 | 41048.35 | 40304.72 | 42992.80 |
| | Average Life expectancy | 81.30 | 80.96 | 81.16 | 81.26 | 81.26 |
| | | | | | | |
| North America | Canada | | | | | |
| | GDP Per capita | 50956.00 | 43596.14 | 42315.60 | 45129.36 | 46454.74 |
| | Average Life expectancy | 81.80 | 81.90 | 81.90 | 81.90 | 82.05 |
| | | | | | | |
| | United States | | | | | |
| | GDP Per capita | 55049.99 | 56863.37 | 58021.40 | 60109.66 | 63064.42 |
| | Average Life expectancy | 78.84 | 78.69 | 78.54 | 78.54 | 78.64 |
| | | | | | | |
| South America | Argentina | | | | | |
| | GDP per capita | 12334.80 | 13789.06 | 12790.24 | 14613.04 | 11633.50 |
| | Average Life expectancy | 75.91 | 76.07 | 76.22 | 76.37 | 76.52 |
| | | | | | | |
| | Brazil | | | | | |
| | GDP per capita | 12112.59 | 8814.00 | 8710.10 | 9928.64 | 9151.45 |
| | Average Life expectancy | 74.75 | 74.99 | 75.23 | 75.46 | 75.67 |

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**Data Processing:**

| MEDCs | | |
|---|---|---|
| | $\mu$ | $\sigma$ |
| **Argentina** | | |
| GDP per capita | 13032.13 | 1180.379 |
| Average Life expectancy | 76.22 | 0.24 |
| | | |
| **Australia** | | |
| GDP per capita | 56124.12 | 4608.595 |
| Average Life expectancy | 82.48 | 0.168 |
| | | |
| **Brazil** | | |
| GDP per capita | 9743.35 | 1407.948 |
| Average Life expectancy | 75.22 | 0.366 |
| | | |
| **Canada** | | |
| GDP per capita | 45690.37 | 3331.6929 |
| Average Life expectancy | 81.91 | 0.089 |
| | | |
| **France** | | |
| GDP per capita | 39388.91 | 2805.387 |
| Average Life expectancy | 82.58 | 0.163 |
| | | |
| **Malaysia** | | |
| GDP per capita | 10545.81 | 750.126 |
| Average Life expectancy | 75.64 | 0.289 |
| | | |
| **Norway** | | |
| GDP per capita | 79919.96 | 10463.076 |
| Average Life expectancy | 82.44 | 0.257 |
| | | |
| **United Arab Emirates** | | |
| GDP per capita | 41008.24 | 2710.565 |
| Average Life expectancy | 77.46 | 0.285 |
| | | |
| **United Kingdom** | | |
| GDP per capita | 43367.46 | 2931.677 |
| Average Life expectancy | 81.19 | 0.139 |
| | | |
| **United States** | | |
| GDP per capita | 58621.77 | 3088.728 |
| Average Life expectancy | 78.65 | 0.126 |

| LEDCs | | |
|---|---|---|
| | $\mu$ | $\sigma$ |
| **Afghanistan** | | |
| GDP per capita | 543.04 | 50.939 |
| Average Life expectancy | 63.74 | 0.6 |
| | | |
| **Angola** | | |
| GDP per capita | 4093.38 | 825.478 |
| Average Life expectancy | 59.85 | 0.792 |
| | | |
| **Bangladesh** | | |
| GDP per capita | 1406.16 | 233.192 |
| Average Life expectancy | 71.78 | 0.429 |
| | | |
| **Bhutan** | | |
| GDP per capita | 2973.1 | 284.939 |
| Average Life expectancy | 70.77 | 0.56 |
| | | |
| **Ethiopia** | | |
| GDP per capita | 629.93 | 88.174 |
| Average Life expectancy | 65.44 | 0.667 |
| | | |
| **Madagascar** | | |
| GDP per capita | 501.55 | 28.127 |
| Average Life expectancy | 65.92 | 0.612 |
| | | |
| **Nepal** | | |
| GDP per capita | 974.62 | 136.765 |
| Average Life expectancy | 69.84 | 0.518 |
| | | |
| **Rwanda** | | |
| GDP per capita | 759.07 | 17.947 |
| Average Life expectancy | 67.86 | 0.718 |
| | | |
| **Uganda** | | |
| GDP per capita | 794.77 | 63.781 |
| Average Life expectancy | 61.9 | 0.913 |
| | | |
| **Yemen** | | |
| GDP per capita | 1239.82 | 380.993 |
| Average Life expectancy | 66.08 | 0.011 |

  

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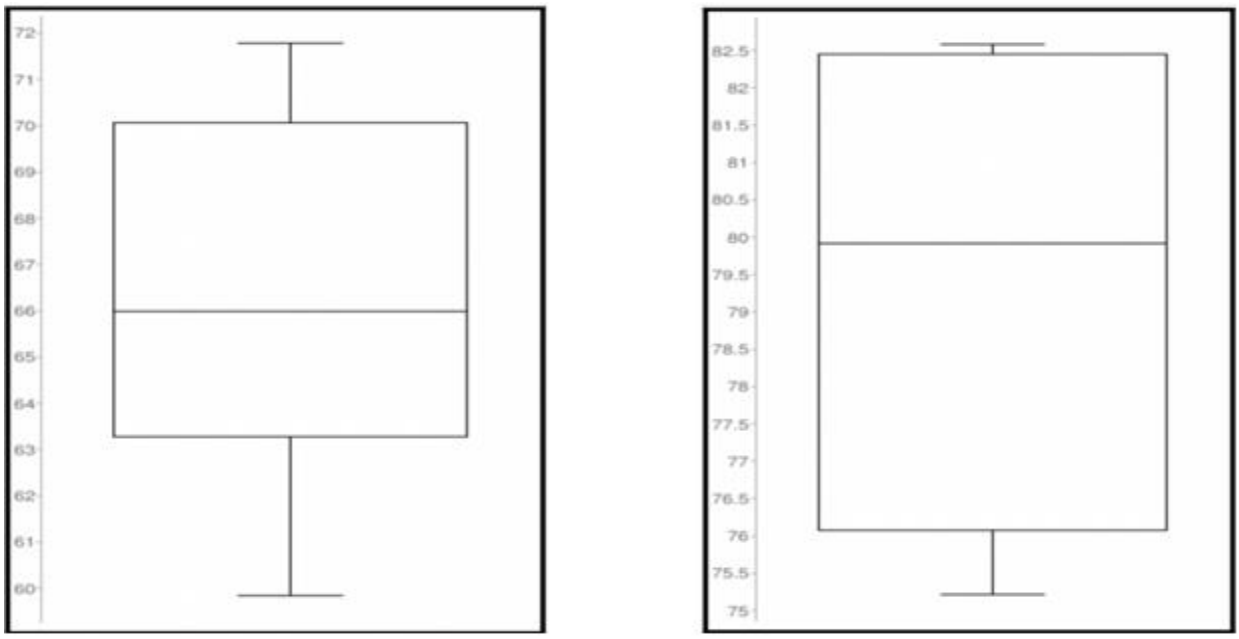
In reference to Hypothesis 1, it was expected that MEDCs will have a higher average life expectancy (at birth) in comparison to LEDCs. This claim proves to be correct. For example, it is seen that France has an average life expectancy of 82.58 and Brazil of 75.22, both of which are MEDCs. Whereas an LEDC such as Angola has an average life expectancy of 59.85. Considering another example, Bangladesh has an average life expectancy of 71.78, which is still lower than any MEDC on the list.

| **Average Life Expectancy based on the box-and-whisker diagram** | | |
|---|---|---|
| | **LEDCs** | **MEDCs** |
| Lowest Value | 59.85 | 75.22 |
| Q1 | 63.28 | 76.075 |
| Q2 | 66 | 79.92 |
| Q3 | 70.0725 | 82.45 |
| Highest Value | 71.78 | 82.58 |




*Box graph 1: LEDCs Average Life Expectancy*

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When comparing the average life expectancy using the box-and-whisker graphs between LEDCs and MEDCs, we can agree with 'Hypothesis 1' as the data reveals that the median value for average life expectancy in LEDCs (66) is lower than the median value of MEDCs (79.92). The lowest value for the average life expectancy in MEDCs (75.22) is higher than the highest value for the average life expectancy in LEDCs (71.78). This means that the duration of life is higher in MEDCs than in LEDCs.

Therefore, the first hypothesis, which states that: **'**MEDCs will have a higher average life expectancy in comparison to LEDCs' is true

| LEDCs | | | |
|---|---|---|---|
| | | $\mu$ | $\sigma$ |
| Asia | **Afghanistan** | | |
| | GDP per capita | 543.04 | 50.939 |
| | Average Life expectancy | 63.74 | 0.6 |
| | | | |
| | **Bangladesh** | | |
| | GDP per capita | 1406.16 | 233.192 |
| | Average Life expectancy | 71.78 | 0.429 |
| | | | |
| | **Bhutan** | | |
| | GDP per capita | 2973.1 | 284.939 |
| | Average Life expectancy | 70.77 | 0.56 |
| | | | |
| | **Nepal** | | |
| | GDP per capita | 974.62 | 136.765 |
| | Average Life expectancy | 69.84 | 0.518 |
| | | | |
| | **Yemen** | | |
| | GDP per capita | 1239.82 | 380.993 |
| | Average Life expectancy | 66.08 | 0.011 |
| | | | |
| Africa | **Angola** | | |
| | GDP per capita | 4093.38 | 825.478 |
| | Average Life expectancy | 59.85 | 0.792 |
| | | | |
| | **Ethiopia** | | |
| | GDP per capita | 629.93 | 88.174 |
| | Average Life expectancy | 65.44 | 0.667 |
| | | | |
| | **Madagascar** | | |
| | GDP per capita | 501.55 | 28.127 |
| | Average Life expectancy | 65.92 | 0.612 |
| | | | |
| | **Rwanda** | | |
| | GDP per capita | 759.07 | 17.947 |
| | Average Life expectancy | 67.86 | 0.718 |
| | | | |
| | **Uganda** | | |
| | GDP per capita | 794.77 | 63.781 |
| | Average Life expectancy | 61.9 | 0.913 |

In reference to Hypothesis 2, it was expected that LEDCs in Asia will have a higher GDP per capita (US$) in comparison to LEDCs in Africa. This claim proves to be correct. For example, it is seen that Bangladesh has a GDP per capita of 1406.16 and Nepal of 974.62, both of which are

  

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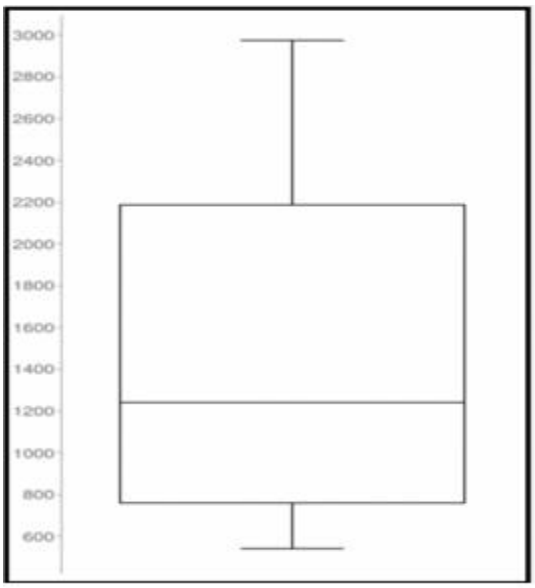
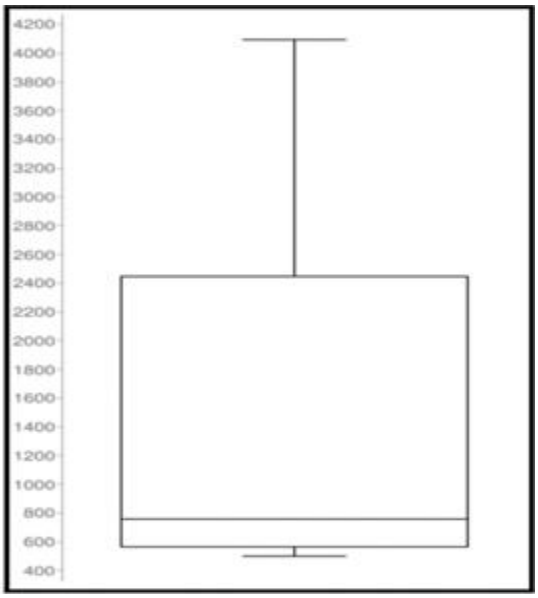
LEDCs in Asia. Whereas, an LEDC in Africa, such as Ethiopia or Uganda only have a GDP per capita (US$) of 629.93 and 794.77 respectively.

The anomaly to this Hypothesis is Angola, which is an LEDC in Africa but has a GDP per capita of 4093.38, which is higher than all of the LEDCs in Asia. Angola is one of the LEDC's which is endowed with natural resources particularly diamonds. Even though they haven't been able to exploit their resources fully because of a lack of foreign direct investment, they still have generated quite a bit of economic activity from it, still categorizing it as an LEDC.

| **GDP per capita based on the box-and-whisker diagram** | | |
|---|---|---|
| | **LEDC in Asia** | **LEDC in Africa** |
| Lowest Value | 543.04 | 501.55 |
| Q1 | 758.83 | 565.74 |
| Q2 | 1239.82 | 759.07 |
| Q3 | 2189.63 | 2444.075 |
| Highest Value | 2973.1 | 4093.38 |




GDP Per capita- LEDCs in Asia




GDP Per capita- LEDC in Africa

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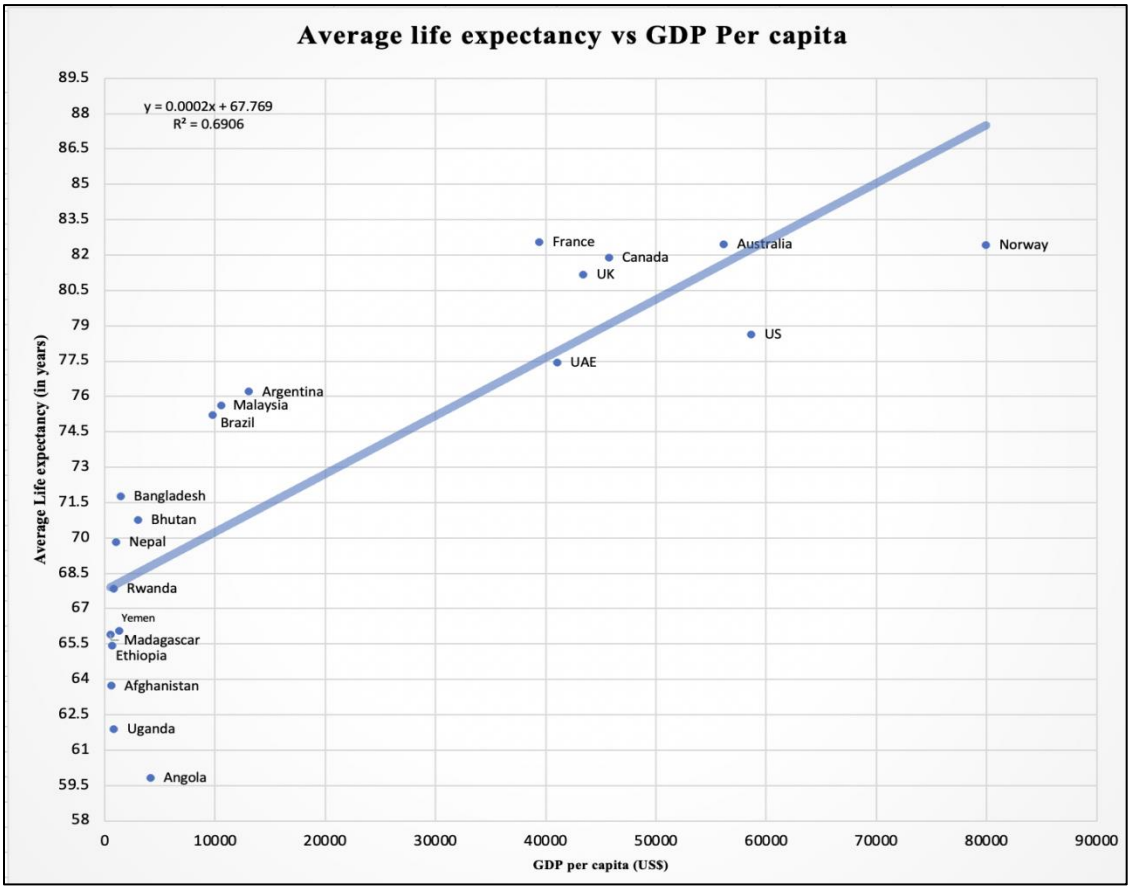
When comparing the GDP per capita using the box-and-whisker graphs between LEDCs in Asia and Africa we can agree with 'Hypothesis 2' as the data reveals that the median value for GDP per capita in LEDCs in Africa (759.07) is lower than the median value of LEDCs in Asia (1239.82). Thus, the income per person in the community is higher on average in LEDCs in Asia. It is evident from the box-and-whisker diagram that countries that are categorized as LEDCs in Asia will naturally have a higher GDP per capita than LEDCs in Africa.

Therefore, the second hypothesis, which says that *'I predict that an LEDC in Asia will have a higher GDP per capita compared to an LEDC in Africa'* is also proved correct.

**Pearson's product-moment correlation**




$R^2 = 0.6906$

$R = \sqrt{0.6906}$

$R = 0.83102346537$

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Therefore, according to the R-value that is **0.831**, the relationship between average life expectancy (at birth) and GDP per capita has a ***strong positive correlation***. This means that average life expectancy and GDP per capita have a very strong relationship. Thus, suggested that as the GDP per capita increases, so does the average life expectancy, representing a proportional relationship.

Therefore, the third hypothesis, which is that: *'I predict that the GDP per capita and average life expectancy of a country's population are dependent on each other'* is proved true.

**Evaluation:**

| **Strengths** | **How it helped the study** |
|---|---|
| The year set chosen (2014-2018) | Data was collected for all the 5 years for all the 20 countries. This data of varied years helped get a mean value which is more accurate than using a single value for the variables. Furthermore, pre-covid years were taken to prevent the effects of covid on average life expectancy numbers and faulty results due to the pandemic. |
| Division of MEDC's and LEDC's | The division allowed for countries with varying economic levels to be taken into consideration, making the study stronger. Additionally, it also enabled the results to be better informed through consideration of several social, human and economic factors. |
| Countries representing varying continents | Using different countries from each continent permitted this to be a global study, providing variety to the research paper. This also helps to consider how the connection between life expectancy and GDP Per capita remains the same. |
| Mathematical methods | A mix of simple and complex methods was used to provide variety. Throughout the entire study, to prevent any form of bias, random sampling was used. In terms of testing my main hypothesis (3) Pearson's product-moment correlation was used which is one of the most credited methods for correlation calculation. |

  

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| Limitations | Effect on the study |
|---|---|
| Secondary Data Collection | The LEDC list is very limited, and by nature only includes countries from Asia and Africa. The countries categorized as LEDCs is not in any individual's hand to change. The division has been done by data analysts and research centers, and the list is provided by the United Nations, which is what was followed for this research paper. This is one limitation; I might not be able to improve since it is a geographical fact about how the LEDCs are situated. Considering this, there is a possibility that an LEDC in any other continent mentioned in any other list was missed by mistake. This could be omitted in future research allowing for surety.<br><br>Additionally, to gather the data, I relied predominantly on secondary data for my research project, as this seemed to be the most suitable method. I did have to take into consideration that official websites might show figures that rather are untrue due to different purposes, such as either to impress the public or gain sympathy from them. |
| Incomplete and inaccurate data for the LEDCs | The low-income countries with a lower GDP per capita don't have complete and reliable mortality data which necessitates the application of modelling to estimate life expectancy. The LEDCs also deal with a lot of government frauds and deceit which causes them to have a low transparency score and high Corruption Perceptions Index. To improve my study, I could eliminate the countries that have extreme impacts of the following but consider countries with a moderate impact by these indexes, considering it as a factor for their economic levels. |
| Year sets (2014-2018) | The 5 years set chosen was 2014-2018 since |

  

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| | |
|---|---|
| | the data sets for 2019 and 2020 for the countries chosen had several empty data, therefore I couldn't get the most recent data. Next time, I could extend my research by taking the data for more years and searching up several data banks to get the data for the most recent years. |
| Mathematical methods | Mathematical methods used were a mix of simple and complex methods, it would have been better if I could have used several more complex methods such as normal distribution and chi-square test to prove my claims. |

**Conclusion:**

According to traditional economic knowledge, economic growth is a one-dimensional concept whereas economic development is a multi-dimensional concept pertaining to society and well-fare. The assumption that economic growth always leads to economic development has always caused a lot of ambiguity. To a great extent, it can inarguably be said that economic growth can help get people out of poverty and provide better access to infrastructures such as healthcare and education, in turn, increasing the average life expectancy which is a measure of economic development. This paper set out to explore the connection between the two measures of life expectancy and GDP per capita in further detail.

Analyses throughout the research paper were made through simple and complex mathematical methods, using averages, standard deviation, and line of best fit, Pearson's product-moment correlation coefficient, and box-and-whisker graphs. By analyzing the raw data with such diverse statistical methods, a conclusion was drawn up in relation to Hypothesis 3 and to answer the research question, "*What is the relationship between the GDPs per capita and the average life expectancy of a country and does this relationship differ for LEDCs and MEDCs?"*

The conclusion, therefore, states that an increase in the GDP per capita levels does in fact lead to an increase in the average life expectancy of a country, irrespective of it being an LEDC or MEDC. This is based on the result of Pearson's product-moment correlation coefficient resulting in an R-value of 0.831 reinstating that there is a strong positive correlation and proving Hypothesis 3 to be correct.

  

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Moreover, the mean analysis for life expectancy for both LEDCs and MEDCs gives us the insight that MEDCs will in fact have a higher life expectancy, compared to LEDCs as was expected through the first hypothesis. Box-and-whisker graphs also proved this claim through the LEDCs and MEDCs highest values, lowest values and quartiles. Using similar methods as for Hypotheses 1, LEDCs in Asia also proved to have a higher GDP Per capita, in comparison to LEDCs in Africa, with the exception of Angola (an LEDC in Africa). The box-and-whisker graphs along with the mean of the GDP per capitas' of the countries have proved hypothesis 2 to be true too. The double analyses allowed for more accuracy in the conclusion about the relation and the hypotheses, making the study stronger.

The research has proved a strong correlation between economic growth and economic development. This correlation is worth exploring as it can help countries' economic management. Research like this can be conducted on a larger scale with a wider data range and more mathematical methods, to definitely prove if the correlation is as strong as the study has proven it to be. On the basis of which, higher levels of economic growth in a country will always lead to better development as long as it is in proper hands, shall be accepted. Several times as countries go through economic growth, corruption throughout the country prevents economic development. Lack of transparency and corruption might influence the increase in the levels of GDP per capita and Life expectancy, which might prove the connection to be false and incorrect.

Hence, it is vital for the prosperity of the country and of its people that the country's economic revenue generated from economic activity is used more effectively. Policies for effective handling of the money which translates into better living standards and life expectancy for the people, need to be made.

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