RUNNING HEAD: REGRESSION ANALYSIS

Regression Analysis

 Author

[Name of the Institution]

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***1. Purpose***

 The major purpose of this report is to see if there is any significant relationship between GDP and life satisfaction. This relationship is important for the purpose of policy making of a country. In the recent years, researchers aim to assess the relationship between the living standard of people and economic variables of the country. Any economic policy is aimed at increasing the wellbeing of the people, this wellbeing supports market economy and democracy, and it is important to study if there is any relationship between different indicators of wellbeing.

***2. Background***

(Proto, 2013)analysed the relationship between life satisfaction and GDP on the individual country levels. A positive relationship was found between GDP and life satisfaction in almost all the countries. In the poorer regions, there is a positive relationship between life satisfaction and GDP but the same relationship is negative in the richer regions. A regression model was used to analyse the relationship between GDP and life satisfaction.

 (Gaižutis, 2010) analysed the relationship between GDP and personal life satisfaction. The main purpose of the study was to test Easterlin’s paradox which claims that there is no impact of increase in wealth of nations on life satisfaction of the people. The analysis rejects the Easterlin’s paradox and concludes that there is a positive relationship between standard of living and GDP of a country. Countries are compared with each other and their data is also analysed.

***3. Method***

 There are two variables in this report, average life satisfaction and real GDP per capita. The average life satisfaction is a dependent variable, and GDP per capita is the independent variable. Data on life satisfaction was taken from semi-annual standard Euro barometer surveys conducted in all EU countries. There are a variety of techniques used to sample and interview respondents in Euro barometer survey. Data on GDP was gathered from the Eurostat. In order to eliminate the differences of price levels between countries, the GDP per capita is taken in purchasing power standard terms. Regression model will be used as the data analysis technique which will help us to find the magnitude and direction of the two variables studied.

***4. Results***

|  |  |  |
| --- | --- | --- |
|  | **LS** | **GDP** |
| **Means**  | 6.591 | $39,011.51 |
| **SD** | 0.745327 | $14,006.21 |
| **Min** | 5.2 | $17,122.53 |
| **Max** | 7.5 | $86,788.14 |

 Table 1

The maximum value of life satisfaction is for Norway, Switzerland and Iceland whereas the minimum value is for Greece and Portugal. The highest GDP is for Luxembourg and lowest is for Mexico. The mean is the average of all values and shows the measure of central tendency of the data. The distance of each value from its mean is calculated with the standard deviation. A lower SD for life satisfaction shows a lower dispersion in the data. There is a very high difference between the maximum and minimum value of the GDP which is also apparent in the value of standard deviation of the variable. There is a very high difference between the mean and highest value of GDP which shows the presence of some outlier in the data.

 Fig 1.

Above diagram shows the scatter diagram between GDP per capita and life satisfaction level of the selected countries. There is a positive relationship between life satisfaction and GDP per capita. This relationship is shown by the trend line which passes through the data. There are only one or two points which are away from the trend line. This shows that there is no outlier in the data.

$$Satisfaction= ∝ + β GDP$$

The above equation shows regression equation to show relationship between life satisfaction and GDP. The alpha value shows value of Satisfaction if GDP value is zero. The beta value shows the unit change in satisfaction when a unit change in GDP takes place. This equation will help us to find the level of satisfaction given any level of GDP.

|  |
| --- |
| ***Regression Statistics*** |
| Multiple R | 0.590689172 |
| R Square | 0.348913697 |
| Adjusted R Square | 0.329183809 |
| Standard Error | 0.610448073 |
| Observations | 35 |

 Table 2.

 The above table shows the power of model run in excel. The R-square value shows that there is a 34% variation in the independent variable which is explained by the independent variable. In the context of this study, approximately 35% of variation in life satisfaction is explained by GDP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* |
| Intercept | 5.365181482 | 0.309314 | 17.34542 | 3.78E-18 |
| X Variable 1 | 0.314329537 | 7.47E-06 | 4.205297 | 0.000187 |

 Table 3.

 The above table shows the values related to regression model. If the value of GDP is zero, life satisfaction will be 5.37 which is shown by the coefficient of intercept. A unit change in GDP will bring 0.314 units change in life satisfaction. This relationship is significant which is shown by a P-value of less than 0.05. This means that there is a significant positive relationship between life satisfaction and GDP.

Satisfaction = 5.365+0.314 GDP

There is a statistically significant relationship between life satisfaction and GDP as seen by the p- value of GDP.

 A regression line provides a good fit when the trend line passes through most of the data points (Miles & Shevlin, 2001). In the scatter diagram, we see that there are almost equal number of data points above and below the trend line. Only a few points are away from the trend line which can be considered the outliers.

 When we remove the outliers for GDP, the following table and diagram show the results,

Fig 2.

The above diagram shows a better goodness of fit because there is a small number of values which are away from the trend line.

The power of model increases to 0.49 when these outliers are deleted. This means that 49 % variation in the dependent variable is explained by the dependent variable. The equation will be changed as follows

Satisfaction = 4.55 + 0.551 GDP

***5. Discussion***

 There is a statistically significant relationship between satisfaction and GDP. The major strength of this method is that it is proven to be suitable as it is used by past researchers. Our analysis has shown that there is a significant impact of outliers on the regression equation. This impact is on the intercept and coefficient as well as the goodness of fit of the model. Our findings are consistent with both the articles presented in the literature review which show that there is a positive and significant relationship between GDP and life satisfaction. There are some policy implications which suggest that efforts to increase the GDP will result in an increase in the life satisfaction of people.

***6. Recommendations***

 The first recommendation is to add some more variables in the regression analysis so that it can become more meaningful. This will help us to analyse the assumptions of the regression analysis. An alternate way is to test all the assumptions of regression model before running it.

Time series analysis of the same model can be run to see if there has been any pattern followed by the relationship.

The analysis should be run by deleting the lowest values of the GDP which may give an even better regression model.

Before deciding on the variables to be added to the model, it is recommended to test them for the presence of multicollinearity which shows that there is a significant relationship between some of the independent variables and relationship between these variables and the dependent variable is affected by their relationship.

# ***Bibliography***

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