Madras School of Economics 2020

ECONOMETRICS TERM PAPER:

DETERMINANTS OF HAPPINESS INDEX

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INTRODUCTION

Much importance has always been given to the income and wealth levels to picturise the development and growth direction of an economy. The most common way to measure and compare the level of development of different countries around the world is the calculation of Gross National Income. GNI might be a very important factor that determines growth of a country; however, it fails to judge the human capital, the most valuable resource that an economy is endowed with. It doesn't account for other factors or domains that affect the wellbeing of a person. To name a few, these are health, psychological well-being, education, arts and culture, environment, governance, time balance, community, social support, material well-being, and work.

The concept of gross national happiness (GNH) was developed by the Kingdom of Bhutan in response to pressures to use Gross National Product as the primary goal and metric for the government. The Bhutanese Gross National Happiness Commission has the mandate to ensure all development policies and plans are formulated and implemented in line with the principles of GNH. The government of Bhutan issued its third GNH report, Compass Towards a Just and Harmonious Society (The Center for Bhutan Studies & GNH Research, 2015), finding that aspects of well-being that had improved included physical health, youth literacy, mental well-being, participation in community events countered by increases in working hours, satisfaction with government performance, and sense of belonging. Taking Bhutan's example, many countries have started relying on more human capital centric indices that measure development like the Human Development Index (HDI). However, HDI doesn't cater to every aspect of well-being, like the Happiness Index does. The GNHI is more subjective in nature and reflects the real happiness and standard of living of the citizens of a country.

According to the World Happiness Report 2018, Finland tops across the world for happiness, closely followed by Norway, Denmark, Iceland, Switzerland and the Netherlands. Nordic countries occupy four out of the five top spots. These nations are known to be very stable, safe and socially progressive. There is very little presence of corruption, and the police and politicians are mostly reliable.

But some of the world's richest nations, including the US and Japan, are found much further down the list which proves the ancient saying that 'Money cannot buy happiness'. The US ranks highly for per capita income; however, it is only ranked 18th out of 156 countries, substantially below most comparably wealthy nations. A major reason is its poor performance in terms of social indicators. Life expectancy in the USA has declined, inequality has risen multifold and the credibility of the government is increasingly being questioned. Cases of obesity, substance abuse (especially the opioid crisis) and depression are rising alarmingly. The US has one of the highest rates of obesity and the highest rate of antidepressant use in the world, contributing it to become one of the largest consumers of antibiotics in the world. This reflects that the citizens of the economic superpower are not happy with the kind of lives they are leading. The plight of the US stands as a relevant example of why economists are increasingly concerned with measuring happiness instead of wealth. The disparity between wealth and happiness has caused policymakers to broaden their scope and look for other

indicators to assess the health of nations, rather than just measuring economic success through GDP. But happiness and well-being of individuals is subjective and notoriously difficult to quantify.

The World Happiness report is based on international surveys in which thousands of respondents were asked to imagine a ladder with steps numbered 0 to 10 and say where they felt they stood. And it cites six significant factors which contribute to happiness; GDP per capita, life expectancy, freedom to make life choices, social support, generosity and corruption levels.

LITERATURE REVIEW

In his paper, **Graham (2005)** analyses happiness by combining the utility approach of economists and well-being surveys one by psychologists. Under 'Happiness Economics', preferences are defined over material and nonmaterial things. Conventionally, utility is taken to be dependent only on income. The happiness economics approach complements the conventional approach by including other measures of well-being other than income, such as health, employment status and civic trust. Considering such measures gives a more holistic and complete perspective of happiness of people. To overcome the limitation of revealed preferences, expressed preferences are used by the means of surveys to try and fully gauge the effect of policy and institutional changes which are not in the hands of individuals. However, there were limitations to this methodology as well. Well-being surveys can have various types of biases. Bias may arise due to phrasing or questions or their placement of questions. Unobserved personality traits can lead to correlated measure errors. The regression based on such data results in a lower R-squared value, reflecting the dependence of happiness on qualitative variables such as emotions, which cannot be measured in numbers. This paper has talked briefly about the Easterlin Paradox. Richard Easterlin, one of the first few economists who looked into happiness economics, studied the relationship between the income of individuals and their happiness. He found that within a society, rich people tend to be happier than poor people. However, the paradox is that rich societies are only marginally happier than poor societies i.e. countries don't get happier as they get richer. As income rises, happiness rises to a point and flattens out beyond it. Humans are thought to be on a 'hedonic treadmill' where aspirations rise as income increases until basic needs are met, post which relative levels of income matter (instead of absolute levels) for well-being. From policy point of view, importance of income is overestimated while that of health and stable employment is under-emphasised, because it can be measured income can be measured in monetary terms. Happiness has also been used to establish relationship between inequality and poverty. The results of this study have been different between developed and developing countries, which could be sign of injustice or opportunity. Even so, it can help understand poverty better. Poverty can be subjective; a rich person might feel he's poor while a poor person might not feel as poor due to a difference in their expectations. This cannot be captured by the data on income, but measurement of happiness can show the effect of such a thing on welfare and well-being. Globalization plays a vital role in reducing poverty and

hence the inequality, by propagating growth. Happiness surveys can also be used to examine the effects of various macro-economic and public policies. The paper is concluded with a note of caution regarding the usage of the above approach due to biases in data and difference in interpretation, causing difficulty in analysis. Happiness economics can be used to understand implications of well-being on economic and health indicators and delve into behaviour economics to effects of political behaviour. All this can be achieved by procuring better data and development of econometric techniques.

The World Happiness report submitted by John Helliwell, Richard Layard and Jeffrey Sachs focuses on the fact that we live in a world which is on a quest for material gain. It emphasizes that there is no doubt about the fact that higher household incomes generally lead to an improvement in the standard of living of the poor, as they get access to basic needs of life such as adequate food supply, place to live, health care, education, safe water and sanitation. Even a small rise in incomes of the absolutely poor people can lead to a significant rise in their well-being. However, when we consider the other side of the income spectrum, we can see that the basic deprivations have diminished in the high-income world and they have access to amenities which are above basic needs, but these conditions of affluence are leading to their own set of traps. The lifestyles of the rich create negative externalities for the survival of the poor, as we can see how human-induced climate change is affecting people around the globe. Also, we can see that this affluence has led to disorders of development like obesity, diabetes, tobacco—related illness, eating and psychological disorders, addictions to material needs and harmful items like drugs, etc. Another huge problem is the creation of new material wants through persistent and incessant advertising, the aim of which is to create unnecessary wants and longings where none previously existed by relying on psychological weaknesses and unconscious demands of the people.

The report observes that in the case of the U.S., as the incomes increased, richer individuals showed signs of happiness as compared to poor individuals but overtime the society as a whole didn't become happier as it became richer. Many factors can be attributed to this fact, such as disproportionate share of gains, societal factors like loss of social trust and declining confidence in the government, and further quest of people for earning more than others and improving their relative status.

It says that a household's income counts for life satisfaction, but only in a limited way. Other things like community trust, mental and physical health, and the quality of governance and rule of law matter a lot more than we realize. Raising incomes can raise happiness, especially in poor societies, but fostering cooperation and community can do even more, especially in rich societies that have a low marginal utility of income. It is no accident that the happiest countries in the world tend to be high-income countries that also have a high degree of social equality, trust, and quality of governance. In recent years, Denmark has been topping the list, and on the other side, the U.S. has experienced no rise of life satisfaction and happiness for half a century.

The traditional view prevailing in the world is that happiness is somewhat a subjective and vague subject for a country to consider as one of its goals. However, the scenario is changing now and has led to a view that information on happiness of a society can lead to the discovery

of strengths and weaknesses in the economy, so that important policy changes can be made for further enhancement in well-being.

The report talks about two broad measure of happiness, one is affective happiness which captures day-to-day moments of joys and despair and the second is evaluative happiness, which measures the overall satisfaction or frustration of an individual with one's life, both of which are important to determine the overall level of happiness of individuals. Along with this, both external factors, such as income, work, community and governance, and values and religion and personal factors like include mental and physical health, family experience, education, gender, and age lead to determination of well-being.

According to the report, happiness varies systematically across societies and over time simply because of identifiable reasons and ways in which the government designs and implements its policies. Therefore, it makes sense to pursue such policies which not only increase the national income, but also overall public happiness. Bhutan is moving ahead with this idea with its concept of Gross National Happiness (GNH), and other nations are planning to follow the same path in the near future.

The distinctive feature of happiness and other subjective well-being measures is that they offer people the chance to report on the quality of their own lives, reflecting their own histories, personalities and preferences. These are arguably the most democratic of well-being measures, since they reflect not what experts or governments think should define a good life, but instead represent a direct personal judgment. Seen in this light, the subjectivity of happiness is to be seen as a strength rather than a weakness, and hence all countries should realize this and take necessary action for inclusive growth.

Ruut Veenhoven Measures of Gross National Happiness (2007) In this paper he focused on measures of happiness at the societal level, that is, measures of happiness in nations. He called this measure of 'Gross National Happiness". He distinguished happiness from other qualities of life. He considered how happiness can be measured. These measures inform policy makers about the happiness of the great number and assess how well a country is doing in creating greater happiness and allowed comparison across nations and through time. The measures are comparable to economic indicators, such as GNP per head used to indicate how well a country performs in creating wealth. The measures of happiness can also be influenced by policy makers such as freedom and justice. These comparisons over time shows major improvements during the last decade.

Searching for happiness: A cross national analysis of factors affecting well-being using a frontier approach José Manuel Cordero Ferrera, Javier Salinas-Jiménezb, Mar Salinas-Jiménez (2011) In this paper they estimated life satisfaction for individuals considering how they convert their resources into higher levels of happiness. They found that the most efficient individuals in achieving happiness tend to live in northern and central European countries whereas the less efficient individuals are found, in average, in Asian transitional economies. They also that most of the traditional determinants of wellbeing such as age, marital status,

religion or unemployment also have a significant impact on efficiency measures of living standards.

We have chosen to work on this topic as it involves responses of a country's citizens on various interesting aspects which have rarely been given importance by government and other agencies in determining people's happiness. The available data gives extensive information about what people in a country actually think about how their lives fare with respect to these factors. We try to derive meaningful relationships between the happiness level and the variables under consideration. Through our regression model followed by its analysis, we would be able to conclude which variables play a significant role in determining the happiness index and which do not. The results of such a research can be used by the authorities to analyse the problematic areas in their respective countries, and how to resolve them to improve the over-all wellbeing in the economy.

DESCRIPTIVE STATISTICS

The objective of our study is to find how happiness score of a country influenced by GDP per capita, social support, health life expectancy, freedom to make life choices, generosity, and corruption perception. We have taken cross sectional data for 156 countries for the year 2019. Definitions of all the variables have been taken from 'Statistical Appendix 1 for Chapter 2' of World Happiness Report 2019.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Over all Rank	156	78.5	45.1774	1	156
Country	0				
Happiness Score	156	5.40703	1.11309	2.853	7.769
GDP Per Capita	156	0.90226	0.39567	0.00	1.684
Social Support	156	1.20939	0.29949	0.00	1.624
Health Life Expectation	156	0.72537	0.24217	0.00	1.141
Freedom to make life choices	156	0.39298	0.14367	0.00	0.631
Generosity	156	0.18624	0.0962	0.00	0.566
Perception of corruption	156	0.11016	0.09476	0.00	0.453

Happiness score or subjective well-being: This measure is from the Dec 22, 2019 release of the Gallup World Poll (GWP). Unless stated otherwise, it is the national average response to the question of life evaluations. The average happiness score in our study is 5.407032 with the maximum score being 7.769 and minimum is 2.853.

The statistics of **GDP per capita** in purchasing power parity (PPP) at constant 2011 international dollar prices are from the September 15, 1 2019 update of the World Development Indicators (WDI). We have undertaken per-capita GDP for our model. From the scatter plot, we can see that there exists a positive relation between per-capita GDP and the

happiness score. This supports the traditional view that richer countries experience higher degree of happiness. The maximum GDP is 1.684 in Qatar and minimum is 0 of Somalia.

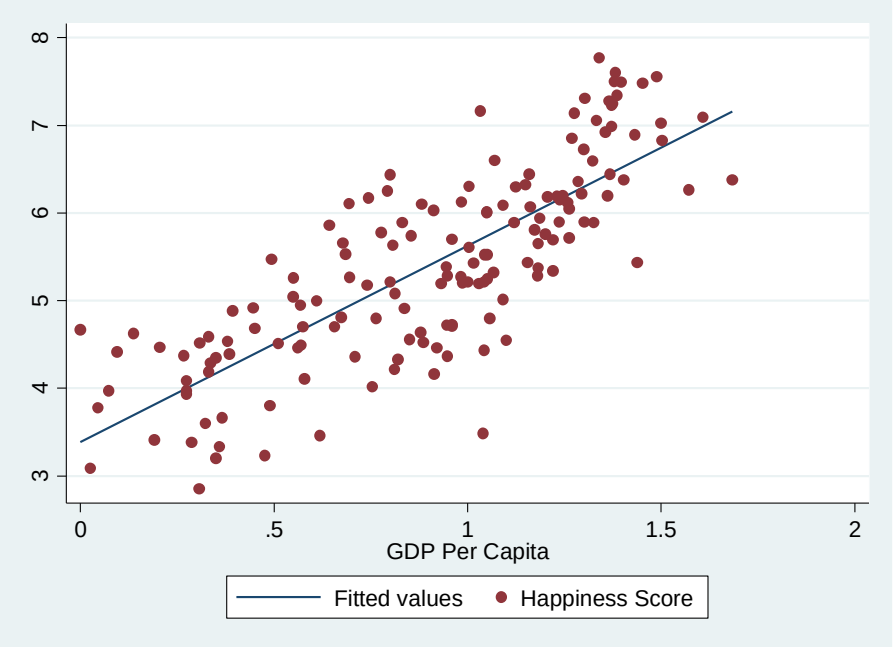


Figure 1(Source: STATA)

Social support (or having someone to count on in times of trouble) is the national average of the binary responses (either 0 or 1) to the GWP question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?" The average score of social support is 1.20939 with the maximum score being 1.624 in Iceland and minimum being 0 in Central African America. From the diagram, we can interpret that people with higher social support tend to be happier than those with less social support.

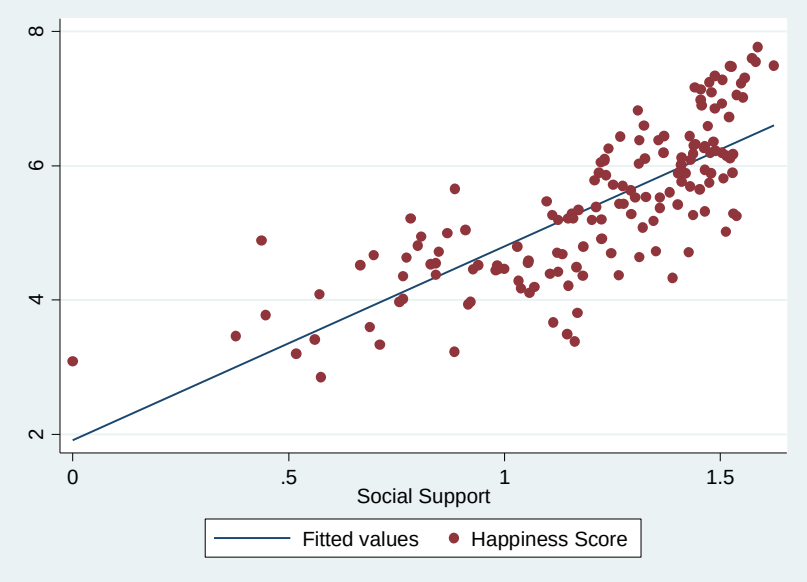


Figure 2(Source: STATA)

Healthy Life Expectancy (HLE): The time series of healthy life expectancy at birth are calculated based on data from the World Health Organization (WHO), the World Development Indicators (WDI), and statistics published in journal articles. In our effort to derive the time series of healthy life expectancy for our sample period 2019 we use WDI's non-health adjusted life expectancy, which is available as time series up to the year 2015, as the basis of our calculation. The average score of Health Life Expectancy is 0.72537and the standard deviation is relatively high with the value of 0.24217. Countries which have good health provisions are expected to live with more a content life. The maximum score for the variable is 1.14 years for Singapore and the minimum is 0 years in Eswatini.

Figure 3(Source: STATA)

Freedom to make life choices is the national average of responses to the GWP question "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?" On a scale of 0 to 1, the average freedom which people get to make life choices is 0.39298. We can observe from the scatter plot that there doesn't exactly exist a clear relationship between the happiness score and this variable. The maximum score is 0.631 in Uzbekistan and the lowest score is 0 in Afghanistan.

Figure 4(Source: STATA)

Generosity is the residual of regressing national average of response to the GWP question "Have you donated money to a charity in the past month?" on GDP per capita. The mean value of generosity is 0.18624 and from this observation, we can say that people's happiness doesn't depend upon how much they donate to charity. The maximum score is 0.566 in Myanmar and the minimum is 0 in Greece.

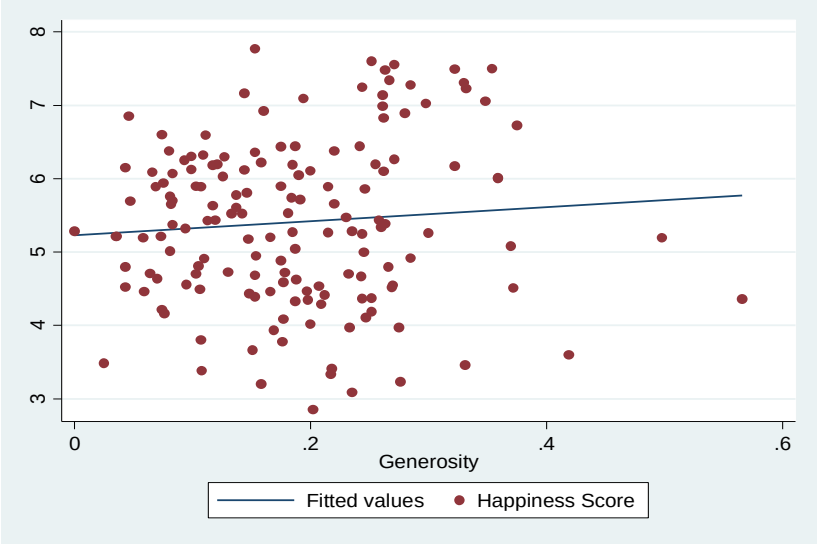


Figure 5(Source: STATA)

Corruption Perception: The measure is the national average of the survey responses to two questions in the GWP: "Is corruption widespread throughout the government or not" and "Is corruption widespread within businesses or not?" The overall perception is just the average of the two 0-or-1 responses. In case the perception of government corruption is missing, we use the perception of business corruption as the overall perception. The corruption perception at the national level is just the average response of the overall perception at the individual level. The average perception of corruption across countries in our model is 0.1106 and from the diagram, there is slight positive relationship of this variable with the happiness score. The maximum score is 0.453 in Singapore and the lowest is 0 in Moldova.

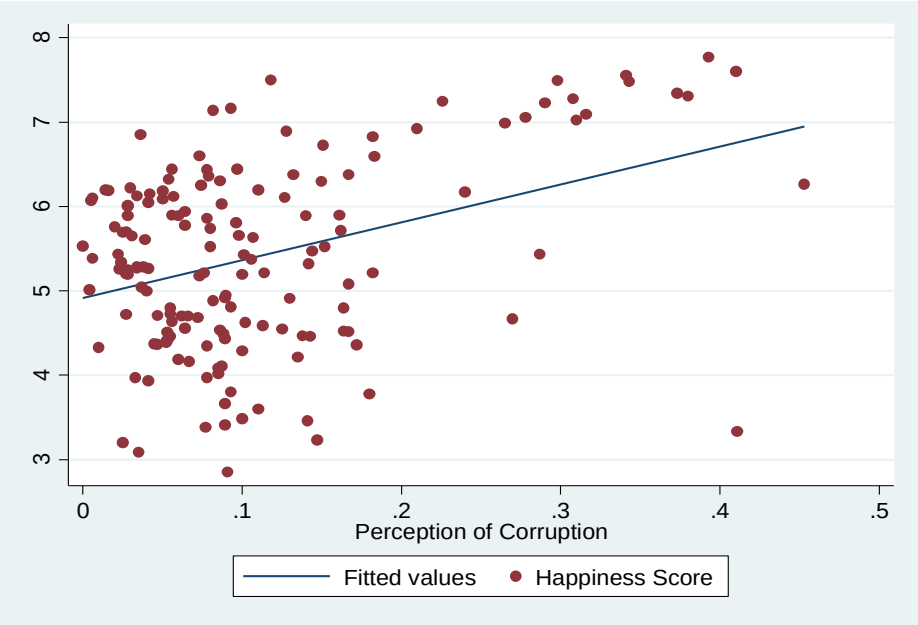


Figure 6(Source: STATA)

ECONOMETRIC METHODOLOGY

Data from The World Happiness Report 2018 was heavily relied upon. The data set includes 156 countries for the year 2019, which was the most recent year with a relatively higher number of observations. 7 variables have been taken into account in the data set. They are as follows:

Table 2: Summary of Variables

Variable	Abbreviations	Year	Source
Happiness Score	Happiness Score	2019	World Happiness Report 2019
GDP Per Capita	GDP Per Capita	2019	World Happiness Report 2019
Social Support	Social Support	2019	World Happiness Report 2019
Health Life Expectancy	Health Life Expectancy	2019	World Happiness Report 2019
Freedom to make Life Choice	Freedom to make Life Choice	2019	World Happiness Report 2019
Generosity	Generosity	2019	World Happiness Report 2019
Perception of Corruption	Perception of Corruption	2019	World Happiness Report 2019

The table above lists the variables that have been included in the study. Out of these, Happiness Score is the dependent variable while the rest are explanatory variables. The objective of the study is to see how these variables affect the Happiness score of a country. Given these variables, the model considered is as follows –

$$\mathbf{Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + u}$$

Here,

Y= Happiness score

X_1= GDP per capita

X_2= Social Support

X_3 = Healthy life expectancy at birth

X_4= Freedom to make life choices

X_5= Generosity

X_6= Perceptions of corruption

When running multiple linear regressions, it is imperative to consider the 6 **Gauss Markov assumptions**. Following are the assumptions that need to be taken into account-

1. Linearity: In the population model, the dependent variable, Y, is related to the independent variable, X, and the error (or disturbance), u, as

$Y = \beta_0 + \beta_1 X + u$

Where, β_0 and β_1 are the population intercept and slope parameters, respectively. Linearity in parameters in our model is especially satisfied by the explicit specifications of the model.

2. Full Rank: There is no exact linear relationship among any of the independent variables in the model. This assumption will be necessary for estimation of the parameters of the model. In our model, the explanatory variables are not perfectly correlated with each other, ensuring that the full rank assumption is satisfied.

3. Exogeneity of the independent variables: This states that the expected value of the disturbance at observation *i* in the sample is not a function of the independent variables observed at any observation, including this one. This means that the independent variables will not carry useful information for prediction of u. In our model, the expected value of the disturbance given the independent variable is 0.831 which is not equal to zero. Therefore, this assumption is not satisfied model. Knowing this assumption isn't necessarily satisfied indicates that we should interpret the results with caution.

4. Homoscedasticity and non-autocorrelation: This assumption states that the variance of the unobservable, u, conditional on x, is constant. This is known as the homoscedasticity or "constant variance" assumption. The error u has the same variance given any value of the explanatory variable. In other words, $Var(u|x) = \sigma^2$. In our model, we checked homoscedasticity using Breusch-Pagan Test at 5% level of significance.

5. Exogenously generated data: X may be fixed or random but if it is generated by a mechanism that is not correlated to u. In our model, our independent variables are not related to e. Hence this assumption is satisfied.

6. Normality of error terms: The disturbances are normally distributed with mean zero.

TESTS

Heteroscedasticity: To check the presence of Heteroscedasticity, we used Breusch-Pagan Test. It begins by assuming the heteroscedasticity. It begins by allowing the heteroscedasticity process to be a function of one or more of independent variables, and it's usually applied by assuming that heteroscedasticity may be a linear function of all independent variables in the model.

Multicollinearity: The Gauss–Markov theorem states that among all linear unbiased estimators, the least squares estimator has the smallest variance. We used variance inflation factor (VIF), $1/ (1- R^2_k.)$, for each coefficient in a regression as a diagnostic statistic. As can be

seen, the VIF for a variable shows the increase in Var[b_k] that can be attributable to the fact that this variable is not orthogonal to the other variables in the model.

Normality of errors: The normality of errors has been checked by plotting the histogram of residuals with normal distribution curve, and then compared.

REGRESSION ANALYSIS

The happiness score was regressed on per capita GDP, social support, healthy life expectancy at birth, freedom to make life choices, generosity and perceptions of corruption, and obtained the following results:

Table 3: Summary Statistics of regression

Source	**SS**	**df**	**MS**	Number of obs:	156
				F (6,149)	87.67
Model	149.650094	6	24.9416823	Prob > F	0
Residual	42.3882828	149	0.28448512	R-squared	0.7793
				Adj R-squared	0.7704
Total	192.038377	155	1.23895727	Root MSE	0.53337

Table 4: Summary Statistics of variables

Variables	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**
Happiness Score					
GDP Per Capita	0.7885463	0.2222096	3.55	0.001	[0.3494573, 1.227635]
Social Support	1.117216	0.2377263	4.7	0.00	[0.6474655, 1.586966]
Health Life Expectation	1.065347	0.336583	3.17	0.002	[0.4002545, 1.730439]
Freedom to make life Choice	1.459257	0.3751249	3.89	0.00	[0.718005, 2.200509]
Generosity	0.4732962	0.4908725	0.96	0.337	[-0.4966744, 1.443267]
Perception of Corruption	0.9752105	0.5363909	1.82	0.071	[-0.084705, 2.035126]
_cons	1.802598	0.2102831	8.57	0.00	[1.387076, 2.21812]

The R^2 value is .7793, which means that 77.93% of the variation in Happiness core (regressand) is explained by our chosen explanatory variables(regressors). Out of 6 independent variables, 2 are insignificant at 5% level of significance.

GDP Per Capita: The p-value for GDP Per Capita is 0.001, which is lower than 5% level of significance. Hence, the hypothesis $\beta_2 = 0$ will be rejected. The β can be interpreted as – 1% increase in GDP per capita would lead to a 0.7885 unit increase in the Happiness Score. B_1 is coming out to be positive, which authenticates our previous result that GDP per capita has a

direct relationship with Happiness of a country. GDP per capita is a very important factor in determining the economic performance of a country. It is a fundamental driver of well-being and hence, happiness as it defines the ability to meet ones' basic needs and beyond. However, income of an individual usually indicates how well they can achieve their material well-being, but happiness is not only about the material well-being. It includes other aspects too, such as social, physical and mental wellbeing to name a few. So, GDP per capita is a vital in assessing the happiness observed in a country, but measure of happiness is not just restricted to this variable.

Social Support: It turns out to be a significant variable, with p-value as 0. B_2 = 1.1172 is positive, which means that on an average, if the degree of social support increases for everyone in the country, then the happiness score will rise. A positive correlation between social support and happiness score implies that if people have friends, relatives and others to call upon in times of need, they are mentally at peace and hence at a better place than others. This has a direct impact on their mental well-being as they know they have someone to trust and rely upon when faced with unseen circumstances. Leading life without any kind of social interaction becomes very difficult and effects ones' state of mind. Therefore, it is important to be connected with the society to improve your level of happiness.

Healthy life expectancy: The p-value obtained from regression is low 0.002, which is not rejected at 5% level of significance, thus rendering the variable significant, which is higher than the standard deviation of other variables. The result of β_3 = 1.0653 simply implies a positive relation between healthy life expectancy and the happiness score, which is expected. Health life expectancy at birth is a crucial indicator of quality of life, as it is an indicator of physical well-being. Difference in provision of health and related services across countries determines the life expectancy at birth, and this provision is not dependent only on wealth of the country, but also on how much importance a country places on well-being of its citizens.

Freedom to make life choices: The p-value obtained is 0, which is significant at 5% level of significance. The value of the coefficient obtained, that is β_4 =1.4592 states that there is a direct relation between Happiness score and freedom to make life choices. The ability to make life choices is dependent on various factors, such as opportunities available in a country, restrictions by the way of laws and regulations present in a country and societal factor. This leads to a major discrepancy across countries about how its citizens go about leading the life they wish for. Happiness level would be higher in a country where its government respects the wishes of citizens and makes amends to fulfil them.

Generosity: This variable turns out to be insignificant as the p-value is 0.337. It can be said that donating to charity doesn't have an impact on one's level of happiness. This could be because for donating to charity, an individual should have reasonable amount of resources (cash or kind) which may not be the case for most countries, since the wealth across nations is concentrated only in a few countries. People in most countries are not able to meet their basic requirements, so expecting donation from them is not rational.

Corruption perception: The p-value obtained is 0.071 which is greater than α = 5%, and so the variable is insignificant. Hence, the hypothesis $\beta_6 = 0$ cannot be rejected. The value of β_6

=0.9752 indicates a positive relation between Happiness Score and Perception of Corruption in a country. As the corruption or perceptions about corruption rise in an economy, people lose faith in their country. The negative sign was anticipated. The survey used to collect the data asked whether corruption was widespread throughout the government and within business. Wherever corruption is present, there is accumulation of gain by a few, leaving others at loss. This leads to frustration and dissatisfaction among people against the government as well as business entities, clearly a sign of decline in their level of happiness.

TEST RESULTS

Multicollinearity

We suspected the presence of multicollinearity in our model for checking whether our hypothesis is in violation of this assumption, we calculated the Variance Inflation Factor (VIF). The results are as follows:

Table 5: VIF

Variable	VIF	1/VIF
GDP Per Capita	4.21	0.237425
Health Life Expectation	3.62	0.276243
Social Support	2.76	0.362079
Freedom to make life choices	1.58	0.631894
Perception of corruption	1.41	0.710374
Generosity	1.22	0.823001
Mean VIF	2.47	

The presence of multicollinearity amongst the independent variables is confirmed according to our test when the value of VIF comes out to be greater than 10. However, this is not the case since the VIF Value for all the variables is less than 10. Increasing sample size is a way to ensure that the problem of multicollinearity doesn't exist in the model. Hence, our prescribed model doesn't violate the CLRM assumption of no multicollinearity among the regressors.

Homoscedasticity

Since the data used in our model is cross-sectional, we ran the 'Breusch-Pagan test' for checking the presence of Heteroscedasticity in our model. The results are as follows:

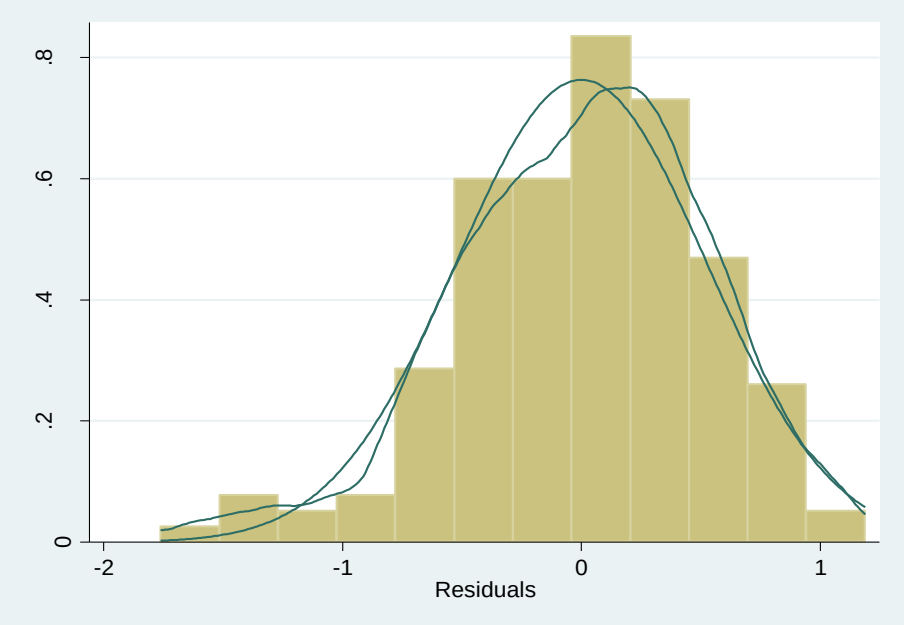
Table 6: Breusch-Pagan Test

Ho: Constant variance
Variables: fitted values of hs
Chi2(6) = 22.47
Prob > chi2 = 0.0010

At 5% level of significance, the null hypothesis of constant variance is not rejected. Therefore, our model is free from heteroscedasticity.

Normality of Residuals

Normality of errors is a CLRM assumption that is seldom fulfilled. To check whether the residuals in our model are normally distributed or not, a histogram with the error density has been plotted along with the normal distribution curve for comparison. From the figure, we can see that the errors are not normally distributed. They are slightly negatively skewed, approximately normally distributed. Non-normality of error terms does not make the estimated coefficients biased; thus, our analysis of individual regression coefficients still holds.



CONCLUSION

Happiness has a major influence on the quality of life one wants to lead. Happiness is subjective, and hence there is no quantitative way to define it. Quantitative factors such as GDP per capita and life expectancy at birth are not sufficient to determine the level of happiness in a country. Therefore, we take other factors such as social support, freedom to make life choices, perception of corruption, and generosity into account to measure how satisfied people are with the lives they are leading.

To establish a significant relation between Happiness Score and its potential determinants, a model has been constructed using the method of Ordinary Least Squares (OLS) on STATA. GDP per capita, social support, healthy life expectancy and freedom to make life choices are observed to have a positive linear relationship with the Happiness Score Generosity and perception of Corruption turn out to be insignificant in our model. The model was tested for the violation of the crucial assumptions of the CLRM. OLS Model doesn't violate any of the major assumptions and hence, it produces best linear unbiased estimators.

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