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Searching for True Happiness

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Abstract

This paper takes a look into what variables might impact an individual's happiness. It utilizes the most recent World Happiness Report along with data collected from the UN. Two regressions were run, the first one using the variables GDP per capita, female and male life expectancy, unemployment rate, literacy rate, and consumer price index with a total of one hundred forty-eight countries. The second regression used the same variables along with corruption rating with a total of fifty-nine countries. It was found that GDP per capita, female life expectancy, and unemployment were the only three significant variables in the first equation and no variables were significant once the degrees of freedom were decreased substantially and corruption rating was added.

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Searching for True Happiness

Introduction

Achieving true happiness is one of the main goals people have in life. However, happiness is a difficult term to define because everyone has their own iteration of what it means to them. If you ask every individual in your family to define happiness, they would most likely have their own definitions, and none would be the exact same. They would also have their own list as to what they believe affects their happiness. The dictionary definition of happiness is “feeling or showing pleasure or contentment.” Again, this looks different for everyone. One person could put a higher value on wealth and a steady income whereas another could place it on friendship and connectedness.

The goal of this paper is to determine which variables are significant to happiness. It will evaluate the effects of GDP per capita, life expectancy, unemployment, literacy rate, corruption rating, and consumer price index. An individual’s happiness comes from a multitude of variables therefore is not solely impacted by a change in a single variable. For example, more money does not necessarily mean more happiness. Three E’s that are important to consider are emotional well-being, economic well-being, and environmental well-being.

This regression analysis will provide information on what affects happiness and even further what affects happiness the most. A lot of people consider financial well-being to be the most impactful variable, but this paper will test that idea.

Literature Review

A main variable that has been studied in regard to happiness has to do with wealth. Boyce et al. (2010), they explored whether or not money can actually buy happiness in comparison to rank. Most studies have included some form of wealth to evaluate an individual's happiness, but Boyce et al. explored whether the actual dollar amount or if how the person perceived their wealth in comparison to others mattered more. People sometimes use the phrase, "money can't buy happiness, but it can buy ____." fill in the blank. According to Boyce et al. (2010), money should be able to buy happiness because it can buy goods which increases an individual's utility. This, in theory, means that the more money you make, the happier you will be. The hypothesis is, if the person is surrounded by people who are richer, they will likely view a detriment to their well-being. If the person, "ranks" lower on the wealth scale, they will experience some level of unhappiness.

Boyce et al. (2010) examined some studies to help prove the idea that people's rank in comparison to others' wealth is more important than their absolute wealth. In each study, it was found that happiness in terms of money depends much more on the comparison to others than the absolute dollar value. This means that a person who is making a six-figure income could experience more unhappiness than a person who makes significantly less if the six-figure earner is surrounded by those who make more than them while the lower earner is surrounded by even those who earn even less. People are constantly comparing themselves to other people. This can lead to a cycle of unhappiness as well as unhealthy competition. If one starts earning more than another today, the one will gain happiness while the other experiences a loss in happiness.

Happiness is determined by more than financial indicators. The World Happiness Report 2020 found that having someone to count on, having a sense of freedom, trust and generosity play a key role in happiness. Helliwell et al. (2020) found that living in a place that you trust the

government and have others to count on has the capability to shrink the well-being gap between those with differing wealth by one-third. This goes to prove that having trust in those in power and those who surround you play a major role in happiness. Further, Helliwell et al. (2020) found that sixty percent of the happiness gap between Nordic countries and Europe as a whole are explained by the difference in trust and social connections. This social support indicator of happiness is echoed in the World Happiness Report in 2018 as well. Helliwell et al. (2018) found that the social support explained thirty-five percent of happiness making it the largest indicator.

Outside of social indicators, gross domestic product (GDP) is a common variable used to predict happiness. Helliwell et al. (2018) found GDP per capita accounted for twenty-six percent of happiness experienced by individuals making it the second largest indicator. It was also found to be the variable that was most unequally distributed with the top ten countries being thirty times higher than the bottom ten. However, even with GDP per capita rising, happiness levels remain about the same and in some cases have declined. Based on this, it is expected that GDP per capita is not the only variable and likely not the most influential variable for happiness.

On the other hand, Dipietro and Anoruo (2006) found that GDP per capita is a better indicator of happiness than the human capital index or any other human welfare measures. This meant that GDP has more of an impact than health care, education, and even the environment. They go on to state that happiness is also situational such that a poor individual may be willing to give up a clean environment to make sure they have a meal on the table; whereas a rich individual might have the means to purchase more environmentally friendly products. It is still expected that social indicators such as life expectancy and education play a role in happiness. Yet, they found that the Human Development Index (HDI) only accounted for half a percent of

variation in the happiness survey whereas GDP per capita accounted for just under twenty-eight percent.

Differing from Dipietro and Anoruo, Lang (2012) focused on the social indicators in her regression. Lang's regression equation included the human development index (HDI), dispersion of income levels, ethnic diversity percentages, unemployment, corruption percentages, and average precipitation values. HDI includes factors such as a healthy life, access to education, and a relatively decent standard of living. This study did not include GDP in any form unlike many other studies dealing with happiness. However, the study Lang ran found that plentiful precipitation, as well as, low corruption, low unemployment and a high HDI contributed to happiness.

Diving into a specific demographic, Pakseresht et al. (2019) studied pregnant women. The importance of this particular research is that a mother's well-being is incredibly important during the pregnancy for the fetuses' health as well as the mothers. They find that the age of the woman when she conceives plays an important role in determining happiness. This may be due to the increase in health risks associated with a pregnancy at an older age. One study Pakseresht et al. (2019) looked into found happiness to be associated not only with age, but with high education, occupation, marital satisfaction, husband's education, monthly income, the order of pregnancy, planned pregnancy, abortion, fetal death, comorbid diseases history, and husband/parent's support.

In regards to the American people's happiness, it has surprised researchers to see how the United States ranks compared to other countries. America likes to pride itself on being the best and is even home to the "Happiest Place on Earth," Disney World. Helliwell et al. (2018) discovered that the well-being of Americans is being undermined by epidemic diseases, obesity,

substance abuse, specifically opioids, and depression. These things tend to be interconnected with one another such that substance abuse can lead to depression and vice versa. This study on American happiness showed that rising GDP does not always lead to more happiness. Helliwell et al. (2018) found that although America's wealth is on the rise, the social determinants are worsening. Specifically, social support networks have decreased, perception of corruption has risen, and confidence in public institutions has waned. These factors offset any gains in happiness that should have been received from rising GDP and income.

Model

The regression model below (1) was run to measure the happiness levels in countries (Y_i) using the variables GDP per capita, life expectancy, unemployment, literacy rates, and consumer price index. The second regression (2) was run to include corruption rating. These equations were used to run the linear regression. Y_i is the ranking of the countries with 1 being the highest in happiness according to the Happiness Index.

$$(1) Y_i = \beta_0 - \beta_1 \text{GDP}_i - \beta_2 \text{FLE}_i - \beta_3 \text{MLE}_i + \beta_4 \text{UE}_i - \beta_5 \text{LR}_i + \beta_6 \text{CPI}_i$$

$$(2) Y_i = \beta_0 - \beta_1 \text{GDP}_i - \beta_2 \text{FLE}_i - \beta_3 \text{MLE}_i + \beta_4 \text{UE}_i - \beta_5 \text{LR}_i + \beta_6 \text{CPI}_i + \beta_7 \text{CR}_i$$

These equations encompass economic factors, as well as social factors. Happiness is affected by a wide variety of variables, so these chosen variables attempt to cover a broad range of what affects happiness.

GDP_i : Gross Domestic Product per Capita, this is a commonly used variable in studies of happiness. Consistently, it is found to be positive in regression models, but in this case, it is a negative since 1 is considered the top ranking.

FLE_i and MLE_i : Female and Male Life Expectancy, life expectancy is frequently but not consistently used in happiness studies. In this regression, life expectancy is used to account for the influence health has on happiness. These are expected to be negative as well.

UE_i : Unemployment, this is another variable that is occasionally used but not consistently. It is expected to be positive since more unemployment should lead to a higher number (lower level) on the Happiness Index.

LR_i : Literacy Rate, education is often talked about leading to happiness because it leads to higher employment rate and higher income which cycle back to higher happiness rates. This variable is expected to be negative since it increases happiness.

CPI_i : Consumer Price Index, this variable accounts for inflation. This variable is expected to be positive.

CR_i : Corruption Rating, more recent studies have incorporated a trust variable especially in regard to trusting government officials. Due to the limited data regarding corruption rating, it was not included in the first regression equation. This variable is also expected to be positive.

Expected Signs

GDP_i	-
FLE_i	-
MLE_i	-
UE_i	+
LR_i	-
CPI_i	+
CR_i	+

Data and Results

After running OLS regression through Stata, the equations came out to be:

$$(1) Y_i = 288.8422 - 0.0007751 GDP_i - 3.666048 FLE_i + 0.7635108 MLE_i + 1.125595 UE_i + 0.1400338 LR_i + 0.0055957 CPI_i$$

$$(2) Y_i = 279.0294 - 0.0018066 GDP_i - 1.264345 FLE_i - 1.081883 MLE_i + 0.3201486 UE_i + 0.0948068 LR_i + 0.0028254 CPI_i - 7.327363 CR_i$$

Tables are provided below.

For equation (1), there were a total of one hundred forty-eight countries counted for. Male life expectancy and literacy rates both have unexpected signs. Further, according to the p-values, male life expectancy, literacy rates and consumer price index all are insignificant. It is possible that one or more of these is an irrelevant variable or there are possibly omitted variables. Corruption rating does not fix this issue as shown in equation (2) and its p-values.

For equation (2), there were a total of fifty-nine countries counted for. Literacy rate has an unexpected sign and so does corruption rating. No variables in this equation were significant. This could be due to a couple reasons such as a mishap in the testing, an omitted variable, or not enough observations. Another possibility for the insignificance could be because the fifty-nine countries accounted for are on the lower end of the Happiness Index and some of these variables could be irrelevant to them. The $\overline{R^2}$ fell quite a bit due to the loss in degrees in freedom, but some of the fall could be due to irrelevant variables.

Tests for multicollinearity and heteroskedasticity were also run. Both equations showed possible multicollinearity between male and female life expectancy. This can be ignored because the life expectancy of a man is not a function of the life expectancy of a woman. As for

heteroskedasticity, both equations had relatively high p-values meaning that they fail to reject the null of homoskedasticity.

Summary Statistics

Equation (1)

Variable	Obs	Mean	Std. Dev.	Min	Max
A	148	77.15	44.46	1.00	153.00
GDP	148	15318.91	21166.02	290.40	117369.50
FLE	148	74.99	8.22	54.80	87.50
MLE	148	70.06	7.72	50.40	81.80
UE	148	6.93	5.42	0.50	28.50
LR	148	91.19	14.88	26.56	100.00
CPI	148	185.86	395.90	100.00	4584.00

Equation (2)

Variable	Obs	Mean	Std. Dev.	Min	Max
A	59	110.61	30.38	38.00	153.00
GDP	59	1977.14	1805.69	290.40	10330.60
FLE	59	68.17	7.12	54.80	80.40
MLE	59	63.85	6.21	50.40	77.10
UE	59	6.35	5.36	0.50	26.50
LR	59	81.49	18.51	26.56	100.00
CR	59	2.73	0.56	1.50	4.50
CPI	59	233.64	578.41	102.00	4584.00

Regression Output

Equation (1)

Source	SS	df	MS	Number of obs = 148
-----+-----				F(6, 141) = 53.40
Model	201818.061	6	33636.3435	Prob > F = 0.0000
Residual	88812.6685	141	629.877081	R-squared = 0.6944
-----+-----				Adj R-squared = 0.6814
Total	290630.73	147	1977.07979	Root MSE = 25.097

Y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDP	0.00	0.00	-5.57	0.00	(-0.0010502) - (-0.0004999)
FLE	-3.67	1.16	-3.16	0.00	(-5.956799) - (-1.375298)
MLE	0.76	1.17	0.65	0.51	(-1.546121) - 3.073143

UE	1.13	0.40	2.79	0.01	.326851 - 1.924338
LR	0.14	0.24	0.58	0.56	(-.3341024) - .6141701
CPI	0.01	0.01	1.02	0.31	(-.0052373) - .0164288
_cons	288.84	25.32	11.41	0.00	238.779 - 338.9055

Equation (2)

Source	SS	df	MS	Number of obs = 59
-----+-----				F(7, 51) = 3.98
Model	18918.8556	7	2702.69365	Prob > F = 0.0015
Residual	34595.1783	51	678.33683	R-squared = 0.3535
-----+-----				Adj R-squared = 0.2648
Total	53514.0339	58	922.655757	Root MSE = 26.045

Y	Coef.	Std. Err.	t	P> t 	[95% Conf. Interval]
GDP	0.00	0.00	-0.69	0.49	(-.0070494) - .0034363
FLE	-1.26	2.04	-0.62	0.54	(-5.35387) - 2.825181
MLE	-1.08	2.16	-0.50	0.62	(-5.413629) - 3.249863
UE	0.32	0.70	0.45	0.65	(-1.094878) - 1.735176
LR	0.09	0.28	0.34	0.74	(-.4729908) - .6626045
CR	-7.33	6.54	-1.12	0.27	(-20.4554) - 5.800751
CPI	0.00	0.01	0.43	0.67	(-.0104355) - .0160862
_cons	279.03	47.00	5.94	0.00	184.6668 - 373.3921

Equation (1) with Robust Standard Errors

Number of obs = 148
 F(6, 141) = 71.12
 Prob > F = 0.0000
 R-squared = 0.6944
 Root MSE = 25.097

Y	Coef.	Robust Std. Err.	t	P> t 	[95% Conf. Interval]
GDP	0.00	0.00	-5.28	0.00	(-.0010651) - (-.0004851)
FLE	-3.67	1.09	-3.37	0.00	(-5.818668) - (-1.513429)
MLE	0.76	1.07	0.72	0.48	(-1.344338) - 2.87136
UE	1.13	0.37	3.01	0.00	.3867853 - 1.864404
LR	0.14	0.22	0.64	0.53	(-.2952106) - .5752783
CPI	0.01	0.00	2.35	0.02	.0008879 - .0103036
_cons	288.84	24.27	11.90	0.00	240.8578 - 336.8267

Equation (2) with Robust Standard Errors

Number of obs = 59
 F(7, 51) = 19.39

Prob > F = 0.0000
 R-squared = 0.3535
 Root MSE = 26.045

Y	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
GDP	0.00	0.00	-0.72	0.48	(-.0068433) - .0032301
FLE	-1.26	2.10	-0.60	0.55	(-5.474545) - 2.945855
MLE	-1.08	2.18	-0.50	0.62	(-5.4602) - 3.296434
UE	0.32	0.58	0.55	0.58	(-.8409314) - 1.481229
LR	0.09	0.23	0.41	0.69	(-.3728115) - .5624252
CR	-7.33	6.45	-1.14	0.26	(-20.27264) - 5.617915
CPI	0.00	0.00	1.00	0.32	(-.0028616) - .0085124
_cons	279.03	45.37	6.15	0.00	187.9488 - 370.1101

Conclusion

It is important to understand what leads to happiness because happier people are typically more productive. Happier people live longer, healthier lives. Happier people are also more willing to help out others and are more trusting which creates a cycle of improving well-being (Helliwell 2020). It fosters an atmosphere for growth and productivity.

My regression found GDP per capita, female life expectancy, and unemployment to be the only significant variables in equation (1) while no variables were significant in equation (2).

All models have potential to have omitted variables or irrelevant variables used. One or both of these could have been the issue with these regression equations. With more time, it would be interesting to play around with the current and new variables. Additionally, in future studies, it would be beneficial to find data relating to environmental indicators. People are becoming more environmentally conscious and this most likely has an effect on people's happiness now. Another possible variable to explore that was not included is generosity. There are many studies that show giving leads to higher happiness. Overall, this paper recognizes that there are many factors that contribute to happiness and more research should be done on the

aspects of life that affect happiness. These factors are going to vary in significance from person to person. With that being said, there may never be a solidified equation to determine happiness. Everyone is creating their own equations and is in charge of their own happiness. So, go out and find joy in the world.

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