RELATIONSHIP BETWEEN HAPPINESS AND GDP PER CAPITA GROWTH

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Abstract

Gross Domestic Product (GDP) is often the standard used to measure growth in a country. Some past assumptions also suggest that as GDP per capita grows, so does happiness in a country. However, there are certain outliers that suggest this may not always be the case. In order to investigate the relationship between happiness and GDP, I conducted a two stage regression approach to measure the effect of excess happiness on growth. Excess happiness was captured by the residual happiness from the regression of only happiness on GDP. The second stage included other variables that are indicative of growth, such as the percentage of population that has access to the internet and presence of agriculture employment. My results suggest that once a country reaches a certain level of happiness, excess happiness beyond this tends to dampen growth.

Introduction

What is the relationship between happiness and GDP? Many researchers have attempted to answer this question using different models, however have all been met with challenges. It is complicated to get a clear result, as past trends have shown that if you have more money you are happier, yet there is also research debating that. Should we really expect happiness itself to help with income? If you are happy, you could strive to be happier with more income, or you could be content and stay the same. Happiness and income also create an endogeneity problem because they interact with one another.

In investigating this relationship, I hoped to find out whether or not excess happiness in a country has a dampening effect on GDP per capita (measured through purchasing price parity), along with how it compares to other "well being" factors such as financial and life satisfaction. Should a country with low levels of GDP per capita have a higher than expected happiness level, their citizens could be perceived as "content" with their well being. In this case, what effect would this have on their possibility for growth, if people are satisfied with the way their lives are now? It is also important to understand whether or not these results will predict convergence or divergence between happiness and income.

There are numerous studies on the relationship between standard happiness levels and GDP of a country. However, my approach looks specifically at excess happiness' effect on GDP, combined with social capabilities. I used a panel data set, which merged World Value Survey responses and World Development Indicators data for 1995 through 2014. Combining these two data sources allowed for a holistic view of not just the fiscal measures of various countries, but also social measures. My results concluded that countries with excess happiness tend to see less future growth. The relationship between life satisfaction or financial satisfaction and GDP per capita growth do not have as convincing results.

Literature Review

Previous studies done on economic growth and happiness have conflicting results. "*Social Capability and Economic Growth"* by Johnathan Temple and Paul Johnson used the index of socioeconomic development by Adelman and Morris to study the interaction of economic and non-economic forces in the course of a country's development. In order to characterize social development, Temple and Johnson focused on indicators providing an assessment of social and political participation, the extent of mass communications through newspaper circulation, along with the extent of social mobility through education levels. This data was representative of 74 developing countries between 1957 and 1962. They used a regression of social development on the log of initial income, taking the residuals to be an orthogonal component. As a result, they found a strong correlation between long run growth and social development relative to initial income per capita, with a coefficient of .6. Additionally, the initial income and social development of a country explained 40% of the growth rate variation, giving the belief that using social development indicators would improve growth factors. An especially pertinent factor was variables measuring the level of connectedness within a country, such as internet connections and mobile subscriptions. Overall, Temple and Johnsons results indicate that high levels of social development could predict that countries are converging to a higher steady state level of income.

Another study done on this relationship is "*Happiness and Growth the World Over - Time Series Evidence on the Happiness-Income Paradox"* by Richard Easterlin and Laura Angelescu. This paper revisited Easterlin's original study, which found that at a certain point in time, happiness varies directly with income, but over time this effect does not show. This time, they included not just developed countries, but also those developing and in transition. Their

happiness index was measured through responses to the World Value Survey on life satisfaction. When analysing their data through cross sectional analysis, they found that if rich and poor countries are compared at the same point in time, life satisfaction increases at a decreasing rate with the absolute amount of GDP per capita. While using time series analysis, results showed that for all countries, whether or not they are developed, developing or in transition, there is no significant relationship between the rate of improvement in life satisfaction and growth rate of GDP per capita.

The Berkeley Economic Review published a paper titled "*Beyond GDP: Economics and Happiness"* by Seth Bertolucci summarizing the results of data from the United Nations' World Happiness Report. Bertolucci argues that an important factor in the happiness vs GDP debate is how a country's wealth gets spent. His data resulted in a 1% change in GDP per capita correlating with a .3 unit change in happiness. However, when other variables, such as social support and freedom from corruption are included this model explains 75% of the variance in happiness. The variability in happiness for countries is largely due to these other factors, suggesting that there are decreasing returns to human contentment when GDP per capita increases but how it is spent does not change. While this is just the opinion of the author, I believe it is a reasonable explanation.

The final paper I will cover is "*When Economic Growth Doesn't Make Countries Happier"* by Selin Kesebir and Shigehiro Oishi. They sought to determine whether or not income inequality can explain the discrepancies in answering whether or not economic growth increases happiness. The first motivation for inequality as a way to explain the different results is that inequality has been connected with reductions in trust and feelings of fairness, which are predictors of happiness. The second is that income inequality is associated with less social

mobility and increased crime, which can increase stress. To test this theory, they looked at patterns of inequality, happiness and GDP per capita from 34 countries, split into developed and underdeveloped. Their results showed that in both classifications of countries, income inequality was correlated with decreased happiness after controlling for GDP. Inequality also was found to mitigate the positive effect of a country's development on happiness. Especially pertinent was the results specifically from the low income countries, where income growth was detrimental to happiness and inequality contributing to this negative effect, an aspect of the Easterlin Paradox.

Model and Data

My data consists of economic and social indicators for 82 countries from 1995 through 2014. The construction of this data set included merging World Development Indicators (WDI) variables with World Value Survey responses. The World Development Indicators is compiled from the World Bank, which gathers statistics from officially-recognized international sources. It includes information on the financial status of a country along with statistics on concrete social capability indicators such as the percentage of those who obtain secondary education, the percentage of labor force working in agriculture, along with the percentage of the population that has access to the internet. Issues within this subset include data completeness, as some elements were missing for certain years. The World Value Survey conducts a comparative social survey every 5 years. It consists of survey respondents answers on their current level of happiness, financial satisfaction and life satisfaction. Since these results are self-reported, they could potentially be subject to individuals not accurately reporting, or leading questions causing bias in responses.

In choosing variables of interest, I modeled Temple and Johnson's indicators that proved to be the most explanatory - namely extent of mass communication, social mobility and labor force. For these categories, I have the variables internet subscriptions (internetSubs) , average percentage of individuals who completed post secondary education (avgEdu) and the percentage of those employed who work in agriculture (agriEmploy). In addition to these development variables, I included the percentage of government expenditures that is attributed to health care. Life Expectancy is the average years of life at birth. Life Satisfaction and Financial Satisfaction are both on a scale of 1 through 10, with 10 being completely satisfied and 1 being not at all satisfied. The original level of happiness variable was measured on a scale from 1 to 4, with 1 being completely happy and 4 being completely unhappy. In order to have the scale be the same as the other measures of satisfaction, I made all of the values of the happy variable be negative. This way, while running the regression, the coefficients on financial satisfaction, life satisfaction and happiness would have the same sign if they had the same effect, rather than happiness be opposite.

Table 1

Variable	**Observations**	**Mean**	**Std. Deviation**	**Min**	**Max**
Happiness	1,060	-1.88	.32	-3.1	1.17
Life Satisfaction	1,060	2.58	2.17	-4	8.27
Financial Satisfaction	1,060	2.93	2.65	-4	7.73
Life Expectancy	1,417	72.4	7.49	43.07	83.98
Government Health Expenditure	1,022	888.79	1,006.39	6.13	5,281.86
Agriculture Employment	1,424	20.51	18.97	.18	88.04
Internet Subscribers	977	9.80	11.07	.00	43.1
Post Secondary Completion Percentage	1,404	55.06	23.37	2.44	88.89

In addition to picking variables similar to Temple and Johnson, to understand the relationship between happiness and income, I did a two stage approach to measure excess happiness. Happiness is measured in three different ways, the expressed level of happiness an individual feels, their current life satisfaction or their current financial satisfaction. For the first stage, I ran three individual regressions. They all consisted of GDP per capita as the independent variable, and the measure of well being (happiness, life satisfaction and financial satisfaction) as the dependent variable for years before 2000. I then took the residual from the first stage, which represents the difference between the actual level of happiness and the predicted level, to use as the measure of excess happiness. For the second stage, I regressed the rate of growth of GDP per capita on this residual, along with other explanatory social capability variables to see how it affects growth during years later than 2000. This regression also included the absolute value of GDP per capita for the previous year.

Model Equations

First Stage Regression:

$$Happiness_{it} = \beta_0 + \beta_{it} GDP \ + \ \varepsilon \qquad (1)$$

This regression only includes the years 1999 and before.

Second Stage Regression:

$$GDPgrowth_{it} = \beta_0 + \beta_{it} X \ + \beta_n excess\ happiness \ + \ \varepsilon; X = other\ social\ capabilities$$

(2)

This regression is for the years past 1999. β_n is the key coefficient of interest.

Results

Results show that excess happiness leads to lower purchasing price parity growth. This relationship may weaken when certain social capability variables are added, but there is still a negative relationship. The first stage regression with happiness as the dependent variable and GDP growth as the independent variable demonstrated a positive statistically significant relationship between the two. Specifically, an one unit increase in GDP per capita correlates to a .000000726 increase in happiness. For the second stage, the most convincing regression is number 4, with the excess happiness and base year variables combined with life expectancy, government expenditure on health care, along with the proportion of agriculture workers. In this case, a one unit increase in excess happiness will on average decrease GDP by .94. When internet subscriptions and average education is added, excess happiness is no longer statistically significant. Education is positively associated with growth, so its inclusion tends to dilute the effect of happiness. However, there is also the reverse to this in that higher growth can lead to more education. Looking at the combination of education and happiness, once you control for education, excess happiness is not as dampening. The correlation between education and happiness is small, only .079. With internet subscriptions, this variable could be biased towards developed countries, who already have a higher purchasing price parity, because their citizens are more likely to have easy access to the internet.

For the other variables of interest, life satisfaction and financial satisfaction, results are not as convincing. These results reflect that of Easterlin and Angelescu's paper, which used the same life satisfaction data and found that there is no relationship between happiness and growth.

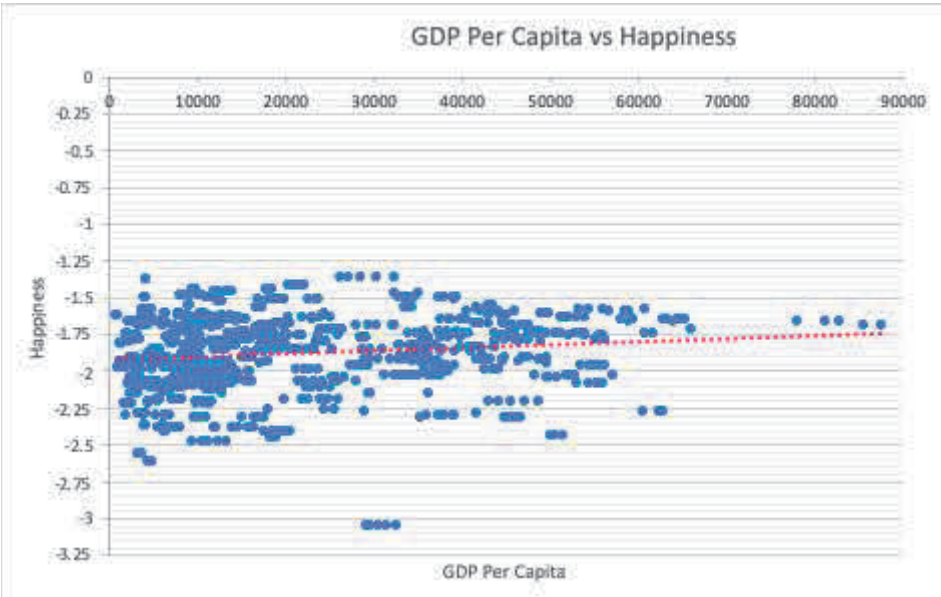
This raises the question debating whether or not one's financial status accurately predicts their overall wellbeing.

Table 2

	(1) growthFinal	(2) growthFinal	(3) growthFinal	(4) growthFinal	(5) growthFinal	(6) growthFinal
Base Year GDP	0.00000780**	0.00000841**	0.00000650*	0.00000651*	0.00000297	0.00000360
	(3.1)	(3.3)	(2.5)	(2.5)	(1.2)	(1.5)
ExcessHappiness	-1.211***	-1.329***	-0.964*	-0.941*	-0.442	-0.594
	(-3.3)	(-3.6)	(-2.5)	(-2.5)	(-1.2)	(-1.7)
Life Expectancy		0.000683**	-0.0000122	0.000293	0.000310	
		(2.9)	(-0.0)	(1.1)	(1.0)	
Gov Health Spending			-0.00000921***	-0.00000897***	-0.00000463	
			(-3.6)	(-3.6)	(-1.6)	
Agriculture Employ				0.000334**	0.000602***	
				(3.1)	(5.5)	
Internet Subscript~s					-0.000832***	-0.000970***
					(-4.4)	(-6.3)
Post Secondary %					0.000479***	0.000440***
					(7.7)	(6.9)
Constant	-2.437**	-2.726***	-1.930*	-1.916*	-0.921	-1.192
	(-3.3)	(-3.6)	(-2.5)	(-2.5)	(-1.2)	(-1.7)
Observations	1050	1050	992	992	858	905
Adjusted R-squared	0.060	0.067	0.091	0.099	0.201	0.140

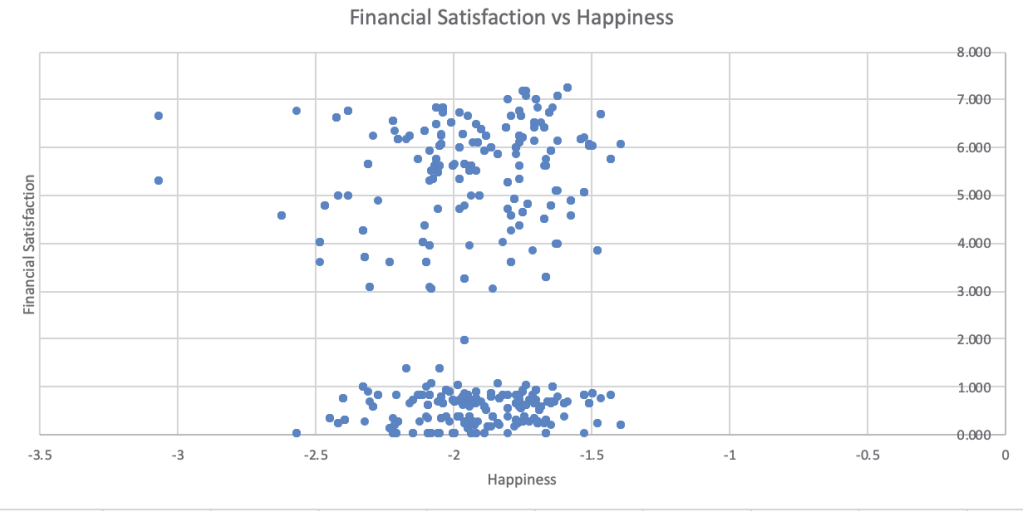
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Graph 1. GDP Per Capita vs Happiness levels

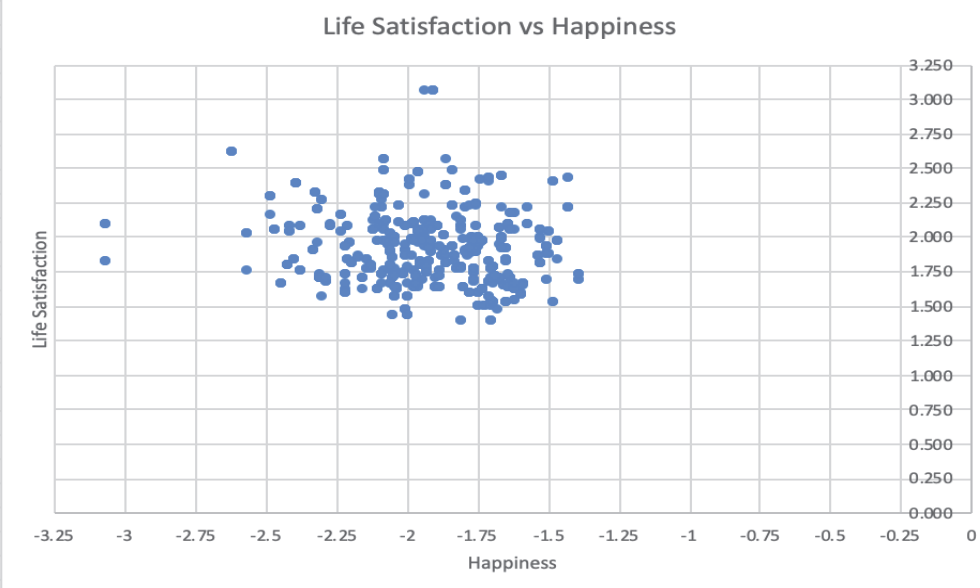


This graph demonstrates various points of interests. While there is a positive linear relationship between GDP per capita and happiness, some points are clear outliers. For instance, the Philippines have a GDP per capita of $4,312, yet they are one of the happiest countries at a level of 1.6. On the other hand, Albania has a GDP per capita of $5,032 yet a much lower happiness level at 2.6. Meanwhile, the majority of low income countries have a low level of happiness. This suggests that low income countries have a wide range of happiness, which this paper tries to exploit and investigate.

Graph 2. Financial Satisfaction vs Happiness Levels



Graph 3. Life Satisfaction vs Happiness Levels



Conclusion

Countries that have excess happiness on average experience slower long term GDP per capita growth. These results are interesting, as it raises questions about why this is. One possible solution could be the level of "content" their citizens feel. Should they be happy with how their lives currently are, there is less incentive to try and improve the future. While this could potentially not harm developed countries, in countries where there is widespread poverty, this excess happiness could keep them relatively impoverished. With persistent poverty, there is still a subspace of individuals that turn to crime, child labor and other similar means to make money. If individuals are content with this state of their country, this could be a potential cause of concern should it grow to a further extent due to no interference.

The validity of gross domestic product delivering happiness has been questioned in both statistical research papers and philosophy. In 1970, the fourth King of Bhutan developed the concept of Gross National Happiness, which would be the primary measure of progressive development over Gross Domestic Product in Bhutan. This stemmed from Bhutan's ancient legal code, where in 1692 it was stated that Bhutanese laws must promote happiness for all its citizens. Bhutan has since measured its growth in equal terms of human and economic development. The concept of a gross national happiness scale could be influential in predicting a more holistic view of growth within countries. Just beyond their GDP, it is important to measure the well being of its citizens and how that could impact subsequent development.

Future research on this subject matter should look into the impact of COVID-19 on the relationship between excess happiness and GDP. An interesting take would be to compare countries with varying levels of COVID-19 deaths and see whether excess happiness had different results on subsequent growth after widespread vaccinations.

At the end of the day, excess happiness tends to dampen future GDP growth. The level to which this should be concerning depends upon the country that is experiencing this effect. Should it be a country that has high excess happiness, yet has high rates of poverty and crime, this level of content should be evaluated. They may allow their present happiness to overshadow true impediments to growth, such as crime, education and corruption. However, if a country that is already developed has excess happiness, citizens that are "content" are not as concerned, for it will not lead to a cyclical impoverishment.

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