The More Income, the More Happiness. How Far?

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The purpose of this article is to identify the level of income in which countries achieve the highest level of happiness, as well as to identify which variables affect happiness according to the level of income of the countries. The methodological approach is based on the Cluster analysis, using the average k method, and the estimation of an econometric model by ordinary least squares. The results reveal that happiness increases with income, but up to a certain amount, according to the per capita income of the countries.

Keywords: happiness, economy of happiness, Easterlin paradox, GDP per capita, Guatemala

INTRODUCTION

In the beginning, economic science included, in some way, happiness in its study topics. Adam Smith (Smith, 1958, pág. 94) stated: "There cannot be a successful and happy society if most of its people are poor." Malthus (Malthus, 1998), when referring to Adam Smith's major work, refers to the fact that he studied the nature and cause of nations' wealth, but that a more interesting investigation was about the causes of nations' happiness. On his side, Jeremy Bentham postulated the "highest principle of happiness", according to which the best society was the one in which citizens were happiest (Gómez, Ruíz, & Vergara, 2008).

The rediscovery of happiness as a study topic in economics occurred in the 1970s, with the publication of the "Easterlin Paradox" or "Happiness Paradox", according to which at income levels below subsistence levels money provides happiness, but at levels above subsistence income there is no positive correspondence between money and happiness (Easterlin, 1974). In other words, money provides happiness up to a certain level. Easterlin explains the "Happiness Paradox" from the point of relative income.

This article has the purpose of providing knowledge about the relationship between income and happiness, finding answers to the following questions: What is the income amount in which countries report the highest level of happiness? What variables define the degree of happiness in countries according to income level? It also intends to determine: What is the difference in the level of happiness according to the poverty condition in Guatemala?

Economy of Happiness

According to Easterlin, the first study on the relationship between income and happiness was published in the 1970s, but the latter began to be more relevant as a research topic for the economy until the first decade of this century, with the publication of several books on the subject, including "Happiness and economics. How the economy and institutions affect well-being" (Frey & Stutzer, 2002), "Happiness:

Lessons from a New Science" (Layard, 2005), "Handbook on the economics of happiness" (Bruni & Porta, 2007) and "The Scientific Study of Happiness" (Rojas, 2009).

The economy's interest in studying happiness arises from the purpose of overcoming the welfare economist approach, in the sense that more income always provides more welfare. The "Easterlin Paradox" showed that this is not the case. The most emblematic cases are those of the United States and Japan. In the first country, between 1946 and 1970, real per capita income increased by almost 60%, but the percentage of people who said they were happy remained unchanged (Bruni & Porta, 2007). In Japan, per capita income increased sixfold between 1958 and 1991, but the percentage of people who said they were satisfied with their lives remained almost unchanged (Frey & Stutzer, 2002). However, one study found a positive relationship between income and happiness, although this relationship is weak in the case of the United States and European countries (Stevensons & Wolfers, 2008).

Happiness is considered to be the concept that most closely approximates well-being (Rojas, 2009). Layard (2005) defines happiness as "feeling good" and considers that happiness can be studied by asking people if they are happy or not, that is, from a self-perception. This methodological approach is questioned by economists, (Ferrer, 2011) but Layard maintains that there is no difference between what people feel and what they say they feel. The subjective approach, adopted by Layard, is opposed to the objective one, which consists of measuring brain waves to determine the degree of happiness (Frey & Stutzer, 2002). This approach, more typical of neuroeconomics, is little used by economists because it is beyond their disciplinary training, as far as the application of neurology is concerned (Rojas, 2009).

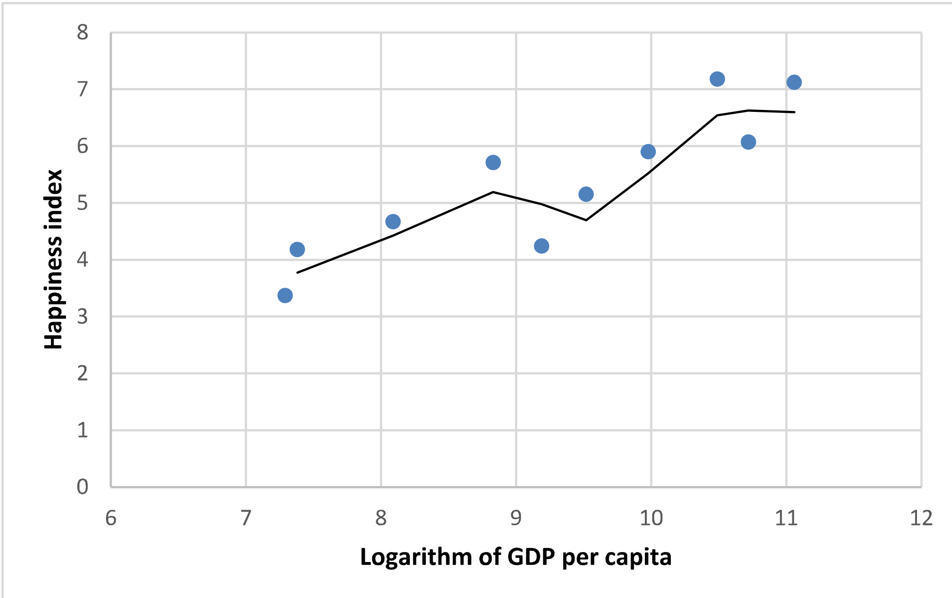
The study of happiness gained importance in the last decade, to the point that in 2012, with the support of the United Nations, the first edition of the World Happiness Report was published. Based on the data available in this study and others, such as the Latinobarómetro, studies on happiness economy have been carried out at a Latin American level,(Días, 2013)(Oxa, Arancibia, & Campero, 2014) or at a country level, such as Colombia (Vega, 2016) and Spain (Nuñez, Ravina, & Ahumada, 2018).

Relationship Between Income and Happiness

The principle stated by Easterlin was validated by the winners of the 2002 and 2015 Nobel Prize in Economics, who jointly published research that determined at US$ 75,000.00 per year the income threshold that provides happiness in the U.S. population. Higher incomes have a marginal impact on happiness (Kahneman & Deaton, 2010). Of course, the income threshold that provides happiness depends on the country's per capita income level.

In this article, in order to analyze the relationship between income and happiness, a sample of 127 countries was selected, using the variables GDP per capita, as an income indicator, and life satisfaction, as a happiness indicator, in an ascending scale from 1 to 10. The data was taken from the World Happiness Report 2017 (Helliwell, Layard, & Sachs, 2017). The technique used was Clustering, according to the k-means method, which allowed to classify them in 10 groups with similar average of GDP per inhabitant and happiness, using the SPSS software (see graph 1). The results suggest that there is indeed a positive relationship between income and happiness, but at a certain level this relationship no longer exists, as postulated by Easterlin's paradox (1974). From a certain threshold the marginal probability of happiness regarding income is zero.

FIGURE 1
GDP PER CAPITA AND HAPPINESS



Source: Own preparation, based on Helliwell, Layard, & Sachs, 2017.

In countries with a low per capita GDP of around US$ 1,000.00 per year, increases in income result in greater happiness up to the threshold of around US$ 7,000.00 per year. For countries with a high per capita GDP, above US$ 10,000.00 per year, the threshold is almost US$ 70,000.00 per year, which is close to the figure obtained for the United States (Kahneman & Deaton, 2010).

Factors Influencing Happiness

In order to identify how much income contributes towards generating happiness, it was decided to estimate an econometric model according to the following specification:

$$S_i = \alpha + \sum_k \beta_k xk,_{ii} + \varepsilon_{it}$$

where S_i the happiness declared by the individual i, explained variable, and xk the vector of individual characteristics, explicative variables, which include income, measured by the GDP per inhabitant, social support, life expectancy, freedom of choice and generosity. The data for the sample of 127 was obtained from the World Happiness Report 2017(Helliwell, Layard, & Sachs, 2017). The following table shows the model results:

TABLE 1
ECONOMETRIC MODEL USED TO EXPLAIN HAPPINESS BETWEEN COUNTRIES.

Variables	Coefficient	Deviation Typical	Statistical t	P value
Constant	-3.20007	0.433595	-7.38	2.12e-011 ***
GDP log per inhabitant	0.39168	0.082887	4.725	6.21e-06 ***
Social Support	2.49532	0.596658	4.182	5.47e-05 ***
Life expectancy	0.02647	0.0115767	2.287	0.0239 **

Freedom of choice	1.68839	0.432809	3.901	0.0002 ***
Generosity	1.03431	0.362415	2.854	0.0051 ***
Mean of the variable. dep. 5.416545 D.T. of the variable. dep. 1.148085				
Residual sum of squares 36.61339 D.T. of the regression 0.547823				
R-square 0.781280 R-square corrected 0.772316				
F(5, 122) 87,15823 p-value (of F) 1.39e-38				
Log-likelihood -101.5207 Akaike's criterion 215.0414				
Schwarz criterion 232,1536 Hannan-Quinn criterion 221.9942				

Source: Own preparation, based on Helliwell, Layard, & Sachs, 2017.

The variables in this model are statistically significant and explain 78% of the happiness level declared by people in each country. Social support is the variable that most affects happiness, which means that people are happy to have the support of family or friends when they need it. Income has a lower incidence for people's happiness, only higher than life expectancy. In sociological terms, this means that social capital is more important than economic capital for people's happiness. Generosity towards others is also a relevant element that contributes to happiness. This fact contradicts the assumption of neoclassical economics that places the human being as selfish to achieve his/her own happiness.

The model was also estimated according to the income level of the countries, for which the 127 countries in the sample were divided into two groups, one of low income, under US$ 10,000.00, and another one of high income, over US$ 10,000.00. The first group consists of 42 countries and the second of 85. The results of the model for low-income countries are shown below:

TABLE 2
ECONOMETRIC MODEL TO EXPLAIN HAPPINESS IN LOW INCOME COUNTRIES

Variables	Coefficient	Deviation Typical	Statistical t	P value
Constant	−2.08955	0.638522	−3.272	0.0016 ***
GDP log per inhabitant	0.250924	0.107236	2.34	0.0217 **
Social Support	2.44711	0.675573	3.622	0.0005 ***
Life expectancy	0.0293071	0.0135584	2.162	0.0336 **
Freedom of choice	1.58242	0.524624	3.016	0.0034 ***
Generosity	0.275974	0.493409	0.5593	0.5775
Mean of the variable. dep. 4.893847 D.T. of the variable. dep. 0.916052				
Residual sum of squares 27.44433 D.T. of the regression 0.582082				
R-square 0.619711 R-square corrected 0.596236				
F(5, 81) 26.39916 p-value (of F) 1.00e-15				
Log-likelihood −73.25960 Akaike's criterion 158.5192				
Schwarz criterion 173.3146 Hannan-Quinn criterion 164.4769				

Source: Own preparation, based on Helliwell, Layard, & Sachs, 2017.

The model results indicate that social support is the variable with the greatest incidence on self-perception of happiness, followed by the variable freedom of choice, both of which are statistically significant (see Table 3). Happiness shows a positive and statistically significant relationship with income, but the incidence is low. The generosity variable is not significant in explaining the happiness of people living in low-income countries. The goodness of fit is considerable.

The results of the model for low-income countries are shown below:

TABLE 3
ECONOMETRIC MODEL TO EXPLAIN HAPPINESS IN HIGH-INCOME COUNTRIES

Variables	Coefficient	Deviation Typical	Statistical t	P value
Constant	−1.30704	3.07723	−0.4247	0.6736
GDP log per inhabitant	0.332139	0.23007	1.444	0.1575
Social Support	3.52266	1.53085	2.301	0.0273 **
Life expectancy	−0.000283465	0.0239414	−0.01184	0.9906
Freedom of choice	1.41935	0.760796	1.866	0.0703 *
Generosity	2.16566	0.576818	3.754	0.0006 ***
Mean of the variable. dep. 6.517026 D.T. of the variable. dep. 0.718287				
Residual sum of squares 5.913981 D.T. of the regression 0.405311				
R-square 0.720424 R-square corrected 0.681594				
F(5, 36) 18.55326 p-value (of F) 4.36e-09				
Log-likelihood −18.42806 Akaike's criterion 48.85612				
Schwarz criterion 59.28213 Hannan-Quinn criterion 52.67766				

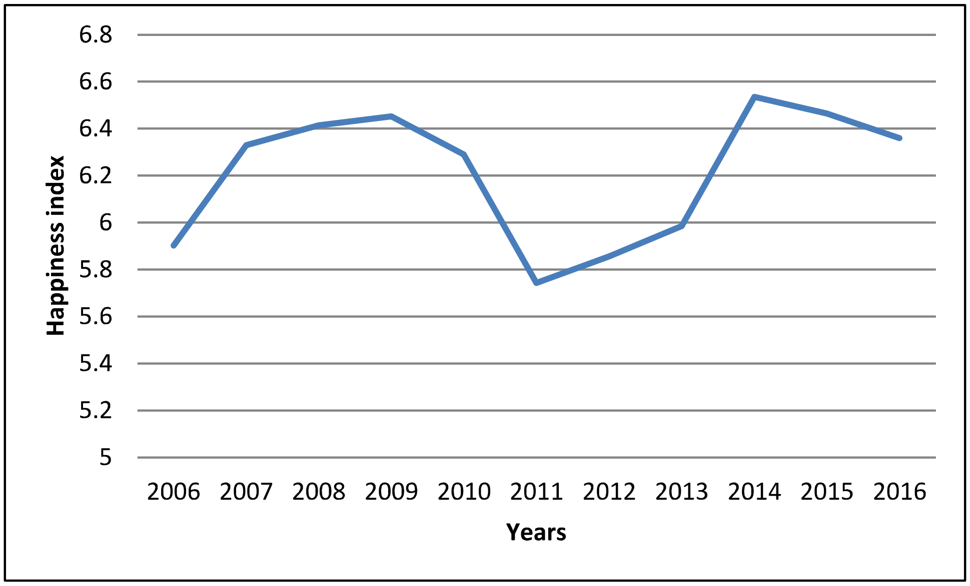
The first characteristic of the model is that the income variable is not statistically significant, although it does show a positive relationship between income and happiness. The result is in accordance with the "Easterlin Paradox", although it should be clarified that, methodologically, this paradox is based on a time series and not on a cross-sectional study. The second remarkable aspect is that the social support variable is the one that has the greatest incidence, as is the case in low-income countries. In high-income countries the generosity variable has a greater impact on people's happiness than in low-income countries.

Guatemala, a Poor but Happy Country

Guatemala is a country where most of the population lives in poverty, but is happy, according to the World Happiness Report 2017(Helliwell, Layard, & Sachs, 2017). The report places Guatemala in the 29th position out of 155 countries and with a happiness index similar to that of high-income countries such as the United Kingdom and France. The same applies to other countries with income disparities but similar happiness rates, such as Nigeria and Germany (Layard, 2005). How to explain this phenomenon? It is, at first sight, contradictory, considering the premise that in general money makes happiness, and it finds its explanation from the economy in Easterlin's paradox, according to which at lower than subsistence levels of income money provides happiness (Easterlin, 1974).

Guatemala is a contradiction to Adam Smith's statement, referred to at the beginning of this article. The contradiction is even greater if we consider the increase, although with fluctuation, in the happiness index in the period 2006 to 2016 (see Chart 2), since between 2006 and 2014 the poverty rate increased from 51% to 59%.

FIGURE 2
GUATEMALA HAPPINESS INDEX



Source: Own preparation, based on Helliwell, Layard, & Sachs, 2017.

The drop in the happiness index during the years 2010 and 2011 can be explained through the perception of economic downturn on the country which caused the effect of the international economic crisis, since the GDP per capita grew in those years and shows a growing trend. Although the happiness index also shows a growing trend, seen from end to end, in most recent years there has been a downward shift, which suggests that the perception of happiness among Guatemalans has a decreasing marginal return to the increase in GDP per capita.

People in poverty conditions in Guatemala declare a high level of happiness, according to data analysis from the Latinobarómetro survey (Corporación Latinobarómetro, 2016), which includes a question about the level of life satisfaction, a variable used to measure happiness (see Table 4). Of the total number of interviewees, 82% said they were very or fairly satisfied with life.

TABLE 4
HAPPINESS LEVEL ACCORDING TO POVERTY LEVEL

Level	Poorer	Richer	Number
Very satisfied	37%	46%	377
Pretty satisfied	43%	46%	430
Not very satisfied	18%	7%	164
Not satisfied at all	2%	2%	20
Total	100%	100%	983

Source: Own preparation, based on Latinobarómetro, 2016.

The survey also includes a question regarding personal perception according to poverty level on a scale of 1 to 10, being 1 the poorest and 10 the richest. These data were grouped in both categories, the first one included the answers in the scale from 1 to 5 and the second one in the following scale. In the "Poorer" category, 80% said they were very or fairly satisfied with life, which means they felt a high level of happiness, while in the "Richer" category, the percentage was 92%. The difference between the two groups is statistically significant, which contrasts with the statement of the "Easterlin Paradox" that at levels higher than subsistence income the relationship between income and happiness is weak.

CONCLUSIONS

The estimated cross-sectional econometric model indicates that there is a positive relationship between income and happiness, with a low incidence of income on happiness. In low-income countries this variable is related to happiness, while in high-income countries it is not. In both countries the variable with the highest incidence is social support.

The data show a decreasing marginal propensity for happiness regarding income from a threshold close to US$ 7,000.00 for low-income countries and US$ 70,000.00 for high-income countries.

In the case of Guatemala, the data show statistically significant differences in happiness according to poverty level.

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