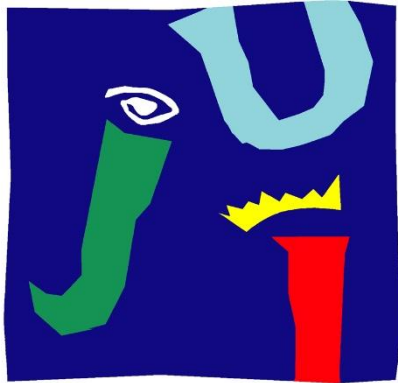


LIFE SATISFACTION DETERMINANTS IN OECD COUNTRIES



**UNIVERSITAT
JAUME I**

Carlos Saura García

al340993@uji.es

Grado en Economía

4ºCurso

Tutor: Jesús Peiró Palomino

Abstract

The objective of this work is to analyse the main determinants that affect people's life satisfaction. In this paper, we review the main ways of measuring life satisfaction in recent times and we criticize the use of GDP in these measurements. We will use the OECD Better Life Index database to perform an empirical analysis of the various aspects that influence life satisfaction. The data used belong to 36 different countries and encompass 10 different objective welfare dimensions. Throughout the work, we made a comparison between the objective welfare data and the life satisfaction data and we delve into which dimensions have the most influence on life satisfaction and whether they affect positively or negatively.

Keywords. Life satisfaction, Happiness, Well-being, GDP, OECD Better Life Index

TABLE OF CONTENTS

1. Introduction	1
2. Literature Review	2
2.1. Life satisfaction: a difficult concept to measure	2
2.2. The use of GDP as a measure of well-being and life satisfaction	3
2.2.1. Criticism and negative aspects of GDP	4
2.3. Others forms to measure the well-being and life satisfaction	5
2.3.1. Indices that “correct” PIB.....	6
2.3.2. Indices that do not use GDP	6
2.3.3. Composite Indices including GDP	6
3. Measuring life satisfaction: OECD Better Life Index.....	7
3.1. Variables’ types	7
3.2. Index Analysis	10
4. Methodology	16
5. Results.....	22
6. Conclusions	29
7. References	32
8. Appendix A	35

List of figures, graphs and tables

Figures

Figure 1. View of economy as a part of a larger system.....	5
---	---

Graphs

Graph 1. Scatter plot for total and life satisfaction values 2013-2017	12
Graph 2. Total and life satisfaction line graph 2013-2017 All countries	14
Graph 3. Total and life satisfaction line graph 2013-2017 Latin American countries....	15
Graph 4. Total and life satisfaction line graph 2013-2017 European countries.....	16

Tables

Table 1. Summary statics data panel	11
Table 2. Correlation panel data 2013-2017 Obs 180.....	13
Table 3. Tests for heteroskedasticity Individual variables.....	18
Table 4. Tests for autocorrelation Individual variables.....	19
Table 5. Tests for heteroskedasticity Variables groups	20
Table 6. Tests for autocorrelation Variables groups	21
Table 7. Linear regression with panel-corrected standard errors Individual variables..	22
Table 8. Linear regression with panel-corrected standard errors Variables groups	23
Table 9. OLS robust, fixed effects and random effects data panel 2013-2017	26
Table 10. Breusch-Pagan test for random effects	28
Table 11. Hausman test.....	29
Table A 1. Average values 2013-2017	35

Life satisfaction determinants in OECD countries

1. Introduction

How happy are people today? How satisfied are people with their lives in different societies? Why are there people with a higher level of happiness in some countries than in others? How do our living conditions affect the level of satisfaction in life? Which are the aspects that affect our happiness?

This type of questions has a very high level of importance in current societies and also for each person that composed these societies. The problem with these questions is that they are very complicated to answer. With the purpose of obtaining an answer, satisfaction in life and happiness are being central topics of research in social sciences and are penetrating everyday as well as increasing their influence on the functioning of the world economy's gears.

The way of measuring life satisfaction in the world has always been linked to economic concepts throughout the twentieth century. GDP per capita was the main indicator of reference during all this time. The great financial crisis of 2008 caused a sharp change in the way of measuring well-being and satisfaction with life. This crisis demonstrated that the measurement of happiness using only economic criteria was obsolete and confirmed the great deficiencies that use the GDP for these measurements. The main ones were the non-differentiation between positive and negative activities for society, the omission of some activities that improve welfare and the indifference regarding the distribution of income in society.

The launch in the first years of the new century by the European Commission of the movement "Beyond the GDP" was also a strong impetus for the search for new ways of measuring. This movement was focused on the development and application of indicators and meters capable of complementing or replacing the GDP. The well-known Stiglitz-Sen-Fitoussi report was one of the achievements of this movement. One of its multiple conclusions was that: the need for more comprehensive welfare measures has also been triggered by deep changes in societies, which, in recent decades, have become more complex with very different standards in all their cities (Stiglitz, Sen and Fitoussi, 2009)

From this moment, a wide range of ideas and options was opened to analyze satisfaction with life. The strictly economic forms of measurement were finally buried and gave way to models with a multitude of variants that analyzed the vast majority of situations that affect the daily life of people. Within this new wave of models, three major groups stood out: the indices with a "corrected" GDP, the composite indices without economic aspects and the composite indices with economic aspects.

In our article, we will use the data provided by the OECD Better Life Index. This index is based on the recommendations of the aforementioned Stiglitz-Sen-Fitoussi report. This index understands well-being as a multidimensional concept. By using the index data, we will try to answer all the questions, but especially the last two: How do our living conditions affect the level of satisfaction in life? and What are the aspects that affect our happiness? We will build an indicator that provides us with an estimate of life satisfaction based on the different aspects of objective well-being offered by the OECD Better Life Index.

In the following section, we will present a literature review. In this literature review, we will analyze the main concepts around life satisfaction, the importance of GDP in life satisfaction and the different indices that have appeared in recent times. In section 3, we will explain the basic characteristics of the OECD Better Life Index, the main peculiarities of each variable and the indicators that make up each of the variables. In this section, we will provide a detailed description of our data with graphics that depict the most striking results. In section 4, we will explain the methodology used to perform our calculations. After that, in section 5, we will analyze the results of these estimates. We will finish with the conclusions section in which we will justify the results obtained. After the conclusions, we will introduce an appendix in which you can observe the main numerical data used throughout our article of the different countries and the distinct variables.

2. Literature Review

2.1. Life satisfaction: a difficult concept to measure

Being happy with own's life is one of the most important aspirations for many people. Generally speaking, most human beings are interested in being happy and in helping other people to be happy. In Rojas (2009), there is an important reflection: progress should be understood as the achievement of a higher level of people's satisfaction and

subjective welfare is an important approach to understand and measure what is relevant to human beings.

According to Ortiz-Ospina and Roser (2019), richer people usually claim that they are happier than poorer people, richer countries usually have higher happiness levels and most countries that have experienced economic growth have seen increasing levels of happiness. Considering these aspects, we can think that income and life satisfaction move together. In the 70s, we found the first works that analyzed GDP in depth and criticized its use as the only indicator of welfare. One of the most important works is that of Richard Easterlin (Easterlin, 1974). Easterlin, after analyzing during a certain period of time the GDP per capita and happiness levels, it demonstrated that these variables were not correlated; this fact is globally known as the "Easterlin Paradox". The "Paradox of Easterlin" defends that an increase in the income of a person produces a greater subjective welfare for that person, but an increase in the average income of a country does not produce a proportional increase in the subjective welfare and the happiness of that country.

In the last few years, it has been analyzed that macroeconomic aspects such as income, GDP or unemployment affect happiness, but there are also other aspects that directly affect people's daily lives and do not relate to the economy. Health, education, the environment or security also have a high influence on happiness. A first approach to understanding the subjective welfare of a population requires the comprehension of the people's satisfaction in those domains where they practice as human beings (Rojas, 2011). Some works conducted by important authors use this type of indicators to analyze happiness (Cummins, 2005) (Argyle, 2013) (Headey and Wearing, 1992). In Rojas (2006), it was focused on this type of work and it was concluded that not all these aspects have the same relevance in the satisfaction with life and that we can also have high happiness if we can reach high levels of satisfaction in some relevant domains, although we can be very dissatisfied in other domains of life. At this point, we could say that satisfaction and happiness with life are totally subjective aspects of welfare, since they do not depend only on numerical data, but on the correlation of forces of a set of variables related to life.

2.2. The use of GDP as a measure of well-being and life satisfaction

Once an explanation of the concept of satisfaction with life has been made and the different aspects that affect this concept and happiness have been analyzed, it is worthy

to dedicate a special section to develop the GDP issue. In the last few weeks, we can observe that for example in the important Spanish national newspaper *El País* published an article by the author David Pilling called "El PIB y su grave error de cálculo" which talks about the rules by which the GDP is governed, the shortcomings they have when the time to measuring welfare and happiness comes and the problems associated with having it as the only global economic reference (Pilling, 2019).

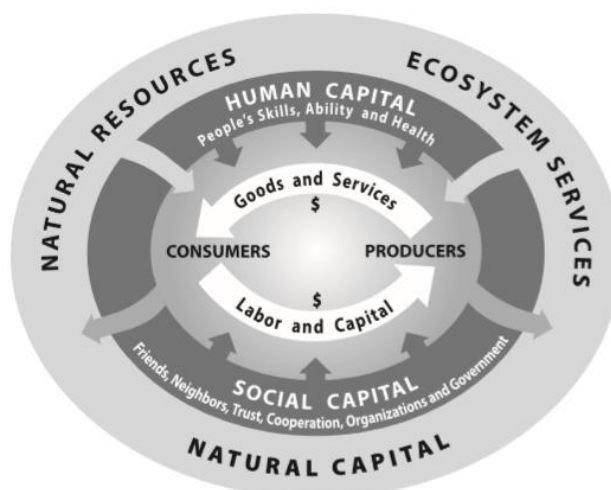
The GDP was created in the 1930s by the economist at the service of the US government Simon Kuznets. During all these years, various economists have warned that GDP is a specialized tool and using this measure to qualify levels of general welfare and happiness is inaccurate and can lead to mistakes.

2.2.1. Criticism and negative aspects of GDP

"The gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage; neither our wisdom nor our learning; neither our compassion nor our devotion to our country; it measures everything, in short, except that which makes life worthwhile. Robert F. Kennedy, 1968"

GDP shows an incomplete picture of the system in which the human economy operates because it only measures monetary transactions related to the production of goods and services. In the next picture, we can see how the GDP reaches only a part of the human economic system and leaves aside part of the social and environmental systems.

Figure 1. View of economy as a part of a larger system



Source: (Costanza et al., 2009), page 8

Figure 1 shows that the economy benefits from social, human and natural capital and the quantity and quality of capital, in turn, is affected by the net investment of the economy. By measuring only the commercialized economic activity (the internal circle), the GDP totally ignores the changes in the natural, social and human components of capital, on which the existence and continued welfare of society depend. As a result, not only does GDP not measure the key aspects of quality of life and life satisfaction, but also encourages activities that are against to the long-term welfare of the community.

Despite having important defects as an individual measure of welfare and satisfaction, GDP or related indicators are used in a large number of multivariate indices because they allow to analyze the economic situation of people in a country, an aspect that affects in greater or lesser measure the satisfaction with life. In Carver and Grimes (2019), it is concluded that a multivariate index is more accurate than an index that only takes income into account. One of the indices that incorporate these measures is the OECD Better Life Index (<http://www.oecdbetterlifeindex.org/>), and in our work, we will base on the data of this index to analyze life satisfaction.

2.3. Others forms to measure the well-being and life satisfaction

In this section, we are going to examine the different categories and types of indices that have appeared lately based on Costanza et al. (2009). The main instigators of this growth of the new indicators have been the availability of information and the growing demand of transparency (Bandura, 2005).

2.3.1. Indices that “correct” PIB

Some alternative indicators of economic welfare use GDP as the main measurement and from this sum or subtract amounts to try to adjust this measurement to reality.

The Genuine Progress Indicator (GPI) uses the GDP data but makes sums or subtractions on it depending on the income inequality, the degradation of the environment, the loss of free time or the benefits from volunteering or domestic work. The GPI has been used in a veritable plethora of articles, for example in Hayashi (2015), the GPI is used to make a comparison between the disparities of rural and urban areas of Japan. The main conclusions highlight that the evaluations of rural societies observing only economic growth provide incomplete and pessimistic perspectives and that the rural-urban disparity measured by the GPI is lower than the one measured by GDP.

2.3.2. Indices that do not use GDP

Some indices do not give any importance to economic activity and only focus on measuring social and environmental activities, welfare and changes in environmental, social or human capital.

The Gross National Happiness Index (HNG) is designed to guide the development of Bhutan based on questions from 9 different areas (psychological welfare, use of time, community vitality, culture, health, education, environmental diversity, standard of living and government). This index has also been exported by other economists to analyze other countries. The conclusions of a study that applied the HNG in Brazil showed that the effects of the "Easterlin Paradox" are confirmed in this country and that the probability of being "unhappy" decreases in the black population compared to that of white population (Ribeiro and Lemos Marinho, 2017).

2.3.3. Composite Indices including GDP

This section will be devoted to presenting the different composite indices that combine a miscellany of different measures in a single number. We will present some indices that combine GDP or GDP variants with social and environmental indices or with welfare measures and the fact that they have a special aspect with the Better Life Index of the OECD, which is part of this group of indices. We will analyse it in a detailed way in the succeeding section because it will be our reference index.

The Planet Happiness Index (HPI) is composed of three major measures: life expectancy at birth, satisfaction with life and the ecological footprint. Some works based on this index have very negative conclusions for western society. In Marks et al. (2006) they conclude that the model followed by developed countries provides a generalized longevity and good satisfaction with life, but it does so through a high counterproductive cost in terms of resource consumption.

3. Measuring life satisfaction: OECD Better Life Index

The reference index to build our model will be the OECD Better Index (<http://www.oecdbetterlifeindex.org/>). This focuses on developing statistics to analyze the aspects of life that affect people and that have a high influence on the quality of their lives. These statistics allow us to expand our knowledge of the issues that drive the welfare of people and countries, and have a deeper knowledge of the needs to achieve a greater progress. We will use the objective welfare data of this index to create a model that allows us to analyze levels of satisfaction with the life of different nations.

3.1. Variables' types

The OECD Better Life Index has 11 fundamental dimensions with data from 2013 to 2017 that allow us to understand the welfare and the way of life of the different countries. In our index, we will use only 10 because one of them is the satisfaction with life that will be the dependent variable of our model. Currently, the index describes the data of the 35 member countries of the OECD and of 3 non-member countries (Brazil, Russia and South Africa). In our model, we will exclude data from Latvia and South Africa because we do not have data for the entire time series for these countries.

We can divide the 10 categories that appear in the index into two large groups: aspects related to material living conditions and aspects related to the quality of life.

The group of aspects related to the material conditions of life is formed by these categories:

- Income and wealth
- Employment and earnings
- Housing conditions

Income and wealth allow us to estimate the current and future consumption possibilities of people. The availability of jobs and their quality affect directly the control over resources, ambitions and self-esteem of people. At least, housing affects aspects such as personal security, privacy and personal space.

The group of aspects related to the quality of life is composed of seven different aspects:

- Health
- Balance work and life
- Education
- Civil engagement and governance
- Community
- Environmental quality
- Personal security

Health is important for life and also affects other aspects such as work and social connections. The conciliation of work with life is important to be able to devote time to unpaid activities and improve productivity and mental health of people. Education is one of the main enhancers of the rise in the standard of living of individuals and societies. Civic commitment and quality of governance have a great importance in the level of control that people have over their lives. Social connections are a basic human need and help to carry out some important objectives (finding a job, feeling safe, being happy, among others). Environmental quality has a direct influence on people's health and on the ability to perform some essential activities in life. Personal safety also affects directly the daily lives of individuals and the carrying out of activities.

From the various variables that formed our model, we will create a new variable called "Total". This variable is formed by the annual arithmetic average of the 10 variables of the model. With the creation of this new variable, we try to have a measure of objective welfare that can be compared with satisfaction with life. In the general framework chosen in the OECD Better Life Index, it was necessary to incorporate indicators linked to each aspect for a correct analysis and comparison of the data. The totality of the indicator data has been extracted from Gallup World Poll databases, databases created by the OECD or data from the different OECD countries.

Now, we are going to name the different indicators used within each aspect in our model:

-Income and Wealth: Household net adjusted disposable income per person; Household net financial wealth per person

-Jobs and Earnings: Employment rate; Long-term unemployment rate; Personal earnings

-Housing Conditions: Number of rooms per person; Dwellings without basic facilities; Housing expenditure

-Health Status: Life expectancy at birth; Self-reported health status

-Community: Quality of support network

-Education: Educational attainment; Student skills; Years in education

-Environment: Air pollution; Water quality

-Civic Engagement: Vote turnout

-Safety: Homicide rate

-Work-Life Balance: Employees working very long hours; Time devoted to leisure and personal care

Within some aspects, we have avoided OECD Better Life Index indicators due to lack of data in all the years analyzed in various countries. We have discarded labour market insecurity in Jobs, stakeholder engagement for developing regulations and consultation on rule-making in Civic Engagement as well as feeling safe walking alone at night and assault rate in Safety.

3.2. Index Analysis

The different data of the indicators are expressed in a great variety of units (dollars, years, so many percent, among others) As the unit of measure varies according to the indicators, the direct aggregation of the data is not adequate. In order to normalize the data, we will apply a score between 0 and 10 to each indicator, in which the highest values are associated with a better performance for the indicator.

With regards to the indicators for which the higher values are associated with a better performance, all values below the 4th percentile and above the 96th percentile will be assigned the scores 0 and 10. For the others, the formula applied will be this:

$$\hat{x}_c = \left(\frac{x_c - \min(x)}{\max(x) - \min(x)} \right) \times 10$$

where x_c represents the observed value of the indicator x in the country c

Concerning the indicators for which higher values correspond to lower performances, we assign scores from 10 to 0 to all values below the 4th percentile and above the 96th percentile. The remaining values are inversely encoded using the following formula:

$$\check{x}_c = \left(\frac{\max(x) - x_c}{\max(x) - \min(x)} \right) \times 10$$

In the different aspects with more than one indicator, in order to find the final value of the aspect, we calculate the average of the totality of the indicators.

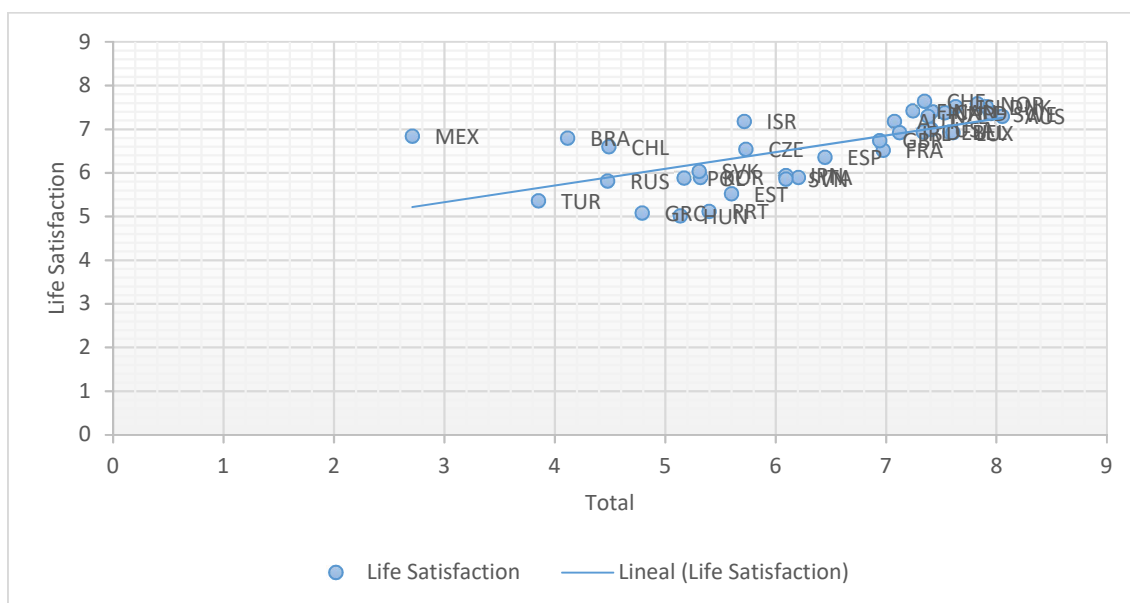
Table 1. Summary statics data panel

Variable	Obs	Mean	Std. Dev.	Min	Max
Housing	180	5.616752	1.467999	1.25	8.870676
Income	180	3.509735	2.218894	0	10
Jobs	180	6.149931	1.933875	.7729926	9.736003
Community	180	6.834333	2.250478	0	10
Education	180	6.336429	1.889135	.3571429	9.508197
Environment	180	6.836276	1.943394	2.073171	10
Civicengag~t	180	5.081463	2.661324	0	10
Health	180	6.838743	1.942149	.3636364	9.346154
Safety	180	8.973854	2.169588	0	10
WorkLifeBare	180	6.883282	1.913792	0	9.803132

We can observe how the average of the 10 variables tend to be between the values of 5 and 6, except Income (3.509) and Safety (8.973). All the minima of the different variables are between 0 and 1 except Environment (2.07) and all the maxima are between 9 and 10 except Housing (8.87).

In the following graph (see Graph 1), we made a comparison between the variable "Total", created previously from the arithmetic average of the aspects that form our model and life satisfaction. We will use a scatter chart to conduct the analysis. The data of "Total" comes from the average of the years between 2013 and 2017 for each country. The life satisfaction data comes from the average of the OECD Better Life Index data between 2013 and 2017 for each country.

Graph 1. Scatter plot for total and life satisfaction values 2013-2017



Source: own elaboration

This graph allows us to observe the high correlation between "Total" and life Satisfaction. We observe how the countries with a lower score in "Total" have higher levels of life satisfaction than those that correspond to them. The most outstanding cases are those of the Latin American countries (Mexico, Brazil and Chile). The main difference between these states and the others is the particular way of giving importance to the aspects. The quality of life in these states is determined mainly by non-governmental community services, social contact and security. While health, money and work are not very significant in the quality of life (Felix and Garcia-Vega, 2012). Other countries that stand out are Russia and Israel since they have levels of life satisfaction almost 1.5 points higher than our "Total" estimate. In most countries that are below a 6 in "Total", we can see how the levels of life satisfaction are higher than those of "Total". In countries that are above 6, we can see the opposite effect: higher levels of "Total" than life satisfaction. These effects are accentuated as we approach the maximum and minimum scores.

Table 2. Correlation panel data 2013-2017 Obs 180

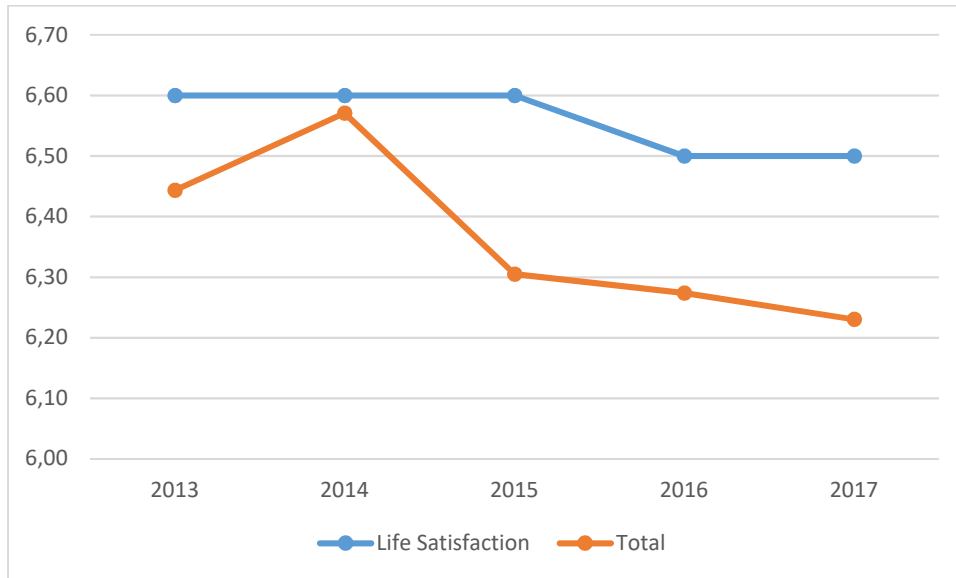
	Housing	Income	Jobs	Community	Education	Environment	Civic engagement	Health	Safety	Work-Life Balance	Life Satisfaction	Total
Housing	1											
Income	0,71204931	1										
Jobs	0,61890683	0,7137202	1									
Community	0,47568434	0,43834384	0,51393086	1								
Education	0,45038972	0,399647	0,48695158	0,47167176	1							
Environment	0,61723986	0,49962036	0,59941577	0,66095633	0,53536291	1						
Civic engagement	0,24254235	0,21905862	0,29579096	0,15912921	-0,04442714	0,17431112	1					
Health	0,65359065	0,63977391	0,47403758	0,50582857	0,27334299	0,53124032	0,318783197	1				
Safety	0,37350433	0,39236798	0,22520081	0,3212294	0,65602722	0,31328683	0,029406833	0,45228769	1			
Work-Life Balance	0,42894865	0,2590531	0,17958604	0,46319031	0,4641736	0,43604262	0,028854563	0,20739722	0,28380519	1		
Life Satisfaction	0,5474495	0,5481124	0,78701619	0,5547245	0,24545996	0,52297271	0,360669843	0,63277876	0,01017675	0,20210306	1	
Total	0,80097736	0,77290413	0,74928327	0,73992312	0,67568331	0,77999176	0,398331878	0,74517459	0,59420123	0,537877417	0,650945766	1

In the correlation table we can see that there is only a negative correlation between Education and Civic Engagement, and it is very low (-0.044), the rest of the correlations are positive with different levels of strength. Among the positive correlations, it can be found the high correlation between Income and Housing (0.712) and Income and Jobs (0.713). The moderate correspondance between Environment and Community (0.66), between Health and Housing (0.653) and between Safety and Education (0.656) also stands out. In the row of the correlations of our created variable "Total", we can analyze how the correlations of this with the rest of the variables are the highest of the whole table.

Then, we will employ some line graphs to compare the data of our life satisfaction predictions from the variables of objective welfare through the created variable "Total" and the official life satisfaction data of our model. In the different graphs, we will carry out an analysis and comparison of the data between 2013 and 2017 of the two variables.

Firstly, we will analyze the values of the arithmetic average of the data of the two variables of all the OECD countries of our model.

Graph 2. Total and life satisfaction line graph 2013-2017 All countries

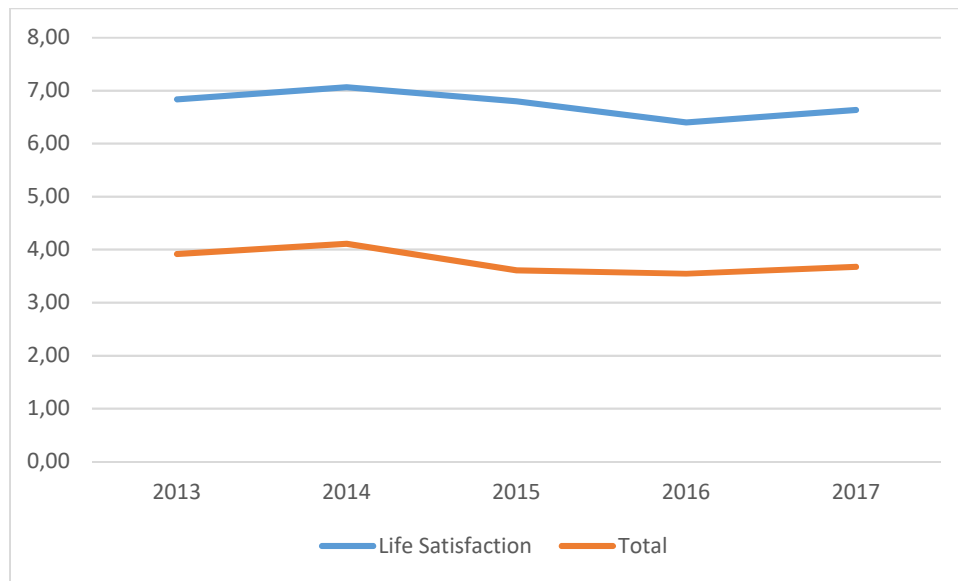


Source: own elaboration

In the preceding graph, we can see that satisfaction with life have remained very constant in this period of time. It had a value of 6.6 in the first three and, in 2016 it decreased to 6.5. The data of "Total" achieved its highest value in 2014 and, then, decreased continuously until 2017. Taking into account the data of all the countries in our model, it can be stated that the variable "Total" approaches the average satisfaction with life. Another outstanding fact that the graph shows us is the worrying decrease in the last years of the objective welfare by means of the variable "Total".

Secondly, we will analyze in detail the data of groups of countries and highlight their peculiarities. We will examine the data of Latin American countries (Mexico, Chile and Brazil) and that of European countries.

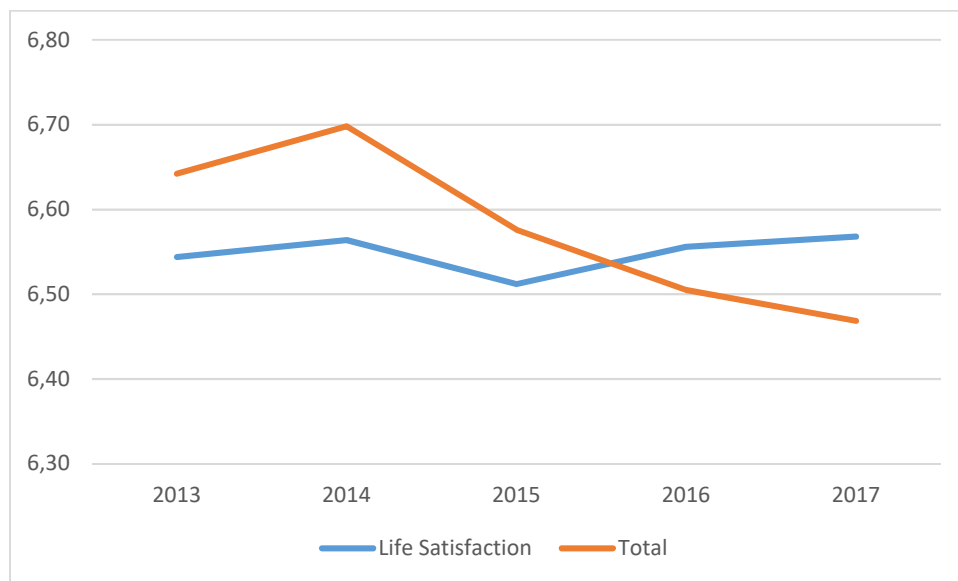
Graph 3. Total and life satisfaction line graph 2013-2017 Latin American countries



Source: own elaboration

In the previous graph, it can be seen only the data of the average of Latin American countries. Additionally, it can be observed that the predictions of the variable "Total" compared to that of the satisfaction with life in these countries are totally erroneous. While the values of satisfaction with life move between 6.5 and 7 in this period, the values of "Total" range between 3.5 and 4. This important distance is due to the peculiar way of value satisfaction with life in these countries. These countries attach great importance to some aspects and very little to others. This fact is what causes the strong deviation between life satisfaction and "Total".

Graph 4. Total and life satisfaction line graph 2013-2017 European countries



Source: own elaboration

Regarding European countries, it is worth highlighting the same as when we analyzed all the countries: the data of "Total" are very close to the real values of satisfaction with life in these countries. The values of satisfaction with life remain steady around 6.55 in these years, while the values of "Total" reached its maximum in 2014 with 6.7 and in the following years, they have decreased to 6.5. The same worrying decrease occurs as in the case of all the countries in our model.

4. Methodology

Our main objective in this study is to analyze to what extent the changes produced in the life satisfaction are associated with the variations in the different variables that represent the different areas that affect our daily lives. In order to verify this empirically, we will use different econometric methodologies

Throughout the study, we will try to analyze and compare the different influences and significances of the different variables in different ways.

To begin with, we will carry out an individual analysis of each variable to avoid the interactions of other variables and to test the influence and significance that each variable has on life satisfaction.

Secondly, we will make several regressions using groups of variables to compare the results that these estimates give us and to see what the differences between them are. We will have three different groups: the one formed by the variables that have to do with the living conditions, the group of variables related to life quality and, finally, a group with all the variables. In this part, we will use the form of estimating: linear regression with panel-corrected standard errors

Last but not least, we will develop a regression study that includes the set of variables. In this study, we will apply different forms of estimation that will allow us to have stronger evidence to make our conclusions less sensitive to the limitations of our study. These shapes will be Pooled Ordinary Least Squares, Fixed Effects and Random Effects

In the first part of the empirical analysis, we estimate the following models:

$$Lisa_{it} = \beta_0 + \beta_1 Hou + \mu_{it} \quad (1)$$

$$Lisa_{it} = \beta_0 + \beta_1 Inc + \mu_{it} \quad (2)$$

$$Lisa_{it} = \beta_0 + \beta_1 Job + \mu_{it} \quad (3)$$

$$Lisa_{it} = \beta_0 + \beta_1 Com + \mu_{it} \quad (4)$$

$$Lisa_{it} = \beta_0 + \beta_1 Edu + \mu_{it} \quad (5)$$

$$Lisa_{it} = \beta_0 + \beta_1 Env + \mu_{it} \quad (6)$$

$$Lisa_{it} = \beta_0 + \beta_1 Cien + \mu_{it} \quad (7)$$

$$Lisa_{it} = \beta_0 + \beta_1 Hea + \mu_{it} \quad (8)$$

$$Lisa_{it} = \beta_0 + \beta_1 Saf + \mu_{it} \quad (9)$$

$$Lisa_{it} = \beta_0 + \beta_1 Wlba + \mu_{it} \quad (10)$$

Lisa represents life satisfaction for each country and Hou, Inc, Job, Com, Edu, Env, Cien, Hea, Saf, Wlba represent the different variables for well-being in these countries. Concretely the variables used represent the indicators as it follows:

1. *Hou* represents the Housing variable
2. *Inc* represents the Income variable
3. *Job* represents the Jobs variable
4. *Com* represents the Community variable
5. *Edu* represents the Education variable
6. *Env* represents the Environment
7. *Cien* represents the Civic Engagement variable
8. *Hea* represents the Health variable

9. *Saf* represents the Safety variable

10. *Wlba* represents the Work-Life Balance variable

Through the estimation of these equations, we seek to identify the individual relation between each variable and life satisfaction. It will be of utmost importance to analyze the influence of an increase in these variables so as to see if these produce higher life satisfaction.

Before calculating the equations, we have done a previous work of heteroskedasticity analysis and serial autocorrelation. These tests gave us some results in which some of our models suffered from heteroskedasticity problems and most of them from serial autocorrelation. So as to overcome these problems, we will perform a regression that takes into account these deficiencies and therefore, the probability of rejecting the null hypothesis when it should not be rejected is less now. We have applied this type of regression for all our models

Table 3. Tests for heteroskedasticity Individual variables

<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Hou</p> <p>chi2(1) = 2.51 Prob > chi2 = 0.1134</p>	<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Com</p> <p>chi2(1) = 11.24 Prob > chi2 = 0.0008</p>
<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Inc</p> <p>chi2(1) = 9.66 Prob > chi2 = 0.0019</p>	<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Edu</p> <p>chi2(1) = 6.48 Prob > chi2 = 0.0109</p>
<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Job</p> <p>chi2(1) = 11.08 Prob > chi2 = 0.0009</p>	<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Env</p> <p>chi2(1) = 0.80 Prob > chi2 = 0.3698</p>
<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Cien</p> <p>chi2(1) = 13.19 Prob > chi2 = 0.0003</p>	<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Saf</p> <p>chi2(1) = 0.92 Prob > chi2 = 0.3364</p>
<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Hea</p> <p>chi2(1) = 4.18 Prob > chi2 = 0.0408</p>	<p>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance Variables: Wlba</p> <p>chi2(1) = 0.28 Prob > chi2 = 0.5971</p>

Table 4. Tests for autocorrelation Individual variables

<p>Lisa Hou</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 8.346 Prob > F = 0.0066</p>	<p>Lisa Edu</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 8.945 Prob > F = 0.0051</p>
<p>Lisa Inc</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 11.418 Prob > F = 0.0018</p>	<p>Lisa Env</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 9.477 Prob > F = 0.0040</p>
<p>Lisa Job</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 7.120 Prob > F = 0.0115</p>	<p>Lisa Cien</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 9.240 Prob > F = 0.0045</p>
<p>Lisa Com</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 6.305 Prob > F = 0.0168</p>	<p>Lisa Hea</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 8.503 Prob > F = 0.0062</p>
<p>Lisa Saf</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 8.612 Prob > F = 0.0059</p>	<p>Lisa Wlba</p> <p>Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 8.821 Prob > F = 0.0054</p>

In the following regressions, we test the null hypothesis that the coefficient on the different indicators is equal to zero ($H_0: \beta = 0$) and the alternative that the coefficient is different from zero ($H_1: \beta \neq 0$). The chosen levels of significance are 10 % (*), 5 % (**) and 1 % (***).

In the second part, we are going to gather the variables in different groups. We will make three different equations: an equation with the variables that have to do with the material life conditions, another with the variables that are associated with the life quality and finally, one with the variables totality.

$$Lisa_{it} = \beta_0 + \beta_1 Hou + \beta_2 Inc + \beta_3 Job + u_{it} \quad (11)$$

$$Lisa_{it} = \beta_0 + \beta_1 Com + \beta_2 Edu + \beta_3 Env + \beta_4 Cien + \beta_5 Hea + \beta_6 Saf + \beta_7 Wlba + u_{it} \quad (12)$$

$$Lisa_{it} = \beta_0 + \beta_1 Hou + \beta_2 Inc + \beta_3 Job + \beta_4 Com + \beta_5 Edu + \beta_6 Env + \beta_7 Cien + \beta_8 Hea + \beta_9 Saf + \beta_{10} Wlba + u_{it} \quad (13)$$

In this part of the study, we will conduct a detailed analysis of each of the equations and the effects of the different individual variables within them. We will also compare how the significance, the sign and the importance of the variables have changed along the different equations.

As previously stated, we have tested the presence of heteroscedasticity with the Breusch-Pagan test for each model. We reject the null hypothesis of no heteroscedasticity in all cases.

Table 5. Tests for heteroskedasticity Variables groups

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: Hou Inc Job	
chi2(3)	= 26.67
Prob > chi2	= 0.0000
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: Com Edu Env Cien Hea Saf Wlba	
chi2(7)	= 52.40
Prob > chi2	= 0.0000
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: Hou Inc Job Com Edu Env Cien Hea Saf Wlba	
chi2(10)	= 54.70
Prob > chi2	= 0.0000

We carried out the Wooldridge test to verify if our equations had autocorrelation. We reject the no autocorrelation null hypothesis in all cases.

Table 6. Tests for autocorrelation Variables groups

<pre>Lisa Hou Inc Job Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 7.655 Prob > F = 0.0090 Lisa Com Edu Env Cien Hea Saf Wlba Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 6.190 Prob > F = 0.0178 Lisa Hou Inc Job Com Edu Env Cien Hea Saf Wlba Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation F(1, 35) = 5.970 Prob > F = 0.0197</pre>

In order to conduct this part of our project, we will employ regressions that take into consideration these two problems

Once again, in our regressions, we have raised the null hypothesis that the coefficient is equal to zero ($H_0: \beta = 0$) and the alternative that the coefficient is different from zero ($H_1: \beta \neq 0$). The chosen levels of the test are 10 % (*), 5 % (**) and 1 % (***)

In the last part, a regression analysis will be carried out that contains all the variables together. We will use different estimates. These estimates will be Pooled Ordinary Least Squares, Fixed Effects and Random Effects. Once the three estimates have been calculated, we will analyze them individually and we will make a comparison with the others. So as to finish this part, we will use the Breusch-Pagan test and the Hausman test to verify which is the estimation type that provides us with more accurate and appropriate results.

Additionally, in our regressions, we have raised the null hypothesis that the coefficient is equal to zero ($H_0: \beta = 0$) and the alternative that the coefficient is different from zero ($H_1: \beta \neq 0$). The chosen levels of the test are 10 % (*), 5 % (**) and 1 % (***)

5. Results

According to the statics shown in the descriptive section, we might predict a positive sign in all the coefficients β_1 . We expect positive coefficients for the independent variables because the increase of the variables have to cause an increase in the life satisfaction

Furthermore, we also expect the coefficients of determination to be related to the correlation between variables analysed above. We expect the equation (3) to have a high coefficient of determination and equation (8) to have a very low coefficient of determination

Table 7. Linear regression with panel-corrected standard errors Individual variables

Variable	eq_1	eq_2	eq_3	eq_4	eq_5	eq_6	eq_7	eq_8	eq_9	eq_10
Hou	.19337247***									
Inc		.179257***								
Job			.27796531***							
Com				.09026273***						
Edu					.08685302**					
Env						.13431333***				
Cien							.05684398***			
Hea								.25060059***		
Saf									.0082882	
Wlba										.0391312
_cons	5.490157***	5.9577315***	4.9040417***	5.9923324***	6.0515059***	5.6850486***	6.2981746***	4.8798228***	6.5185225***	6.3198004***
N	180	180	180	180	180	180	180	180	180	180
r2	.92782412	.93894409	.94627354	.93389132	.93097746	.91614883	.92930162	.94021622	.92335995	.92767871
legend: * p<.1; ** p<.05; *** p<.01										

Table 7 displays the results for the first ten regressions. The results obtained are as expected in all of our variables. All variables have a positive coefficient. There is a statically strong evidence at 1% level of significance for all the variables except for Education (5% level of significance), Safety and Work-Life Balance. In our estimations it appears that Safety and Work-Life Balance is not significant at any level.

In the following table, we can observe the equations data formed by the different groups of variables.

**Table 8. Linear regression with panel-corrected standard errors
Variables groups**

Variable	eq_11	eq_12	eq_13
Hou	.07502329*		-.00726169
Inc	-.00627852		-.06554247***
Job	.26555411***		.27774676***
Com		.05577688**	.0427343***
Edu		.11257344***	.01671393
Env		.00485416	-.0434517**
Cien		.03578965**	.0123381
Hea		.25303129***	.22568395***
Saf		-.17514513***	-.13767642***
Wlba		.00426752	.03943151**
_cons	4.5720788***	5.1090574***	4.423879***
N	180	180	180
r2	.94065525	.94800149	.94354907
legend: * p<.1; ** p<.05; *** p<.01			

Three of the ten variables in our model are related to the material life conditions. In this part, we will carry out an analysis of them. These variables are Housing, Income and Job.

In equation (11), we observe the regression of the variables set linked to the material conditions of life. In this regression, we can perceive how not all the variables are statistically significant. In the Job variable we have sufficient evidence to say that it is statistically significant at a level of 1% and we also observe that the Housing variable is significant at a level of 10%. On the other hand, in Income, we do not have enough evidence to highlight the significance of this variable.

In this regression, we expected the three variables to have a positive sign and that an increase in their values would also increase the life satisfaction values. Nonetheless we can see how Income has a negative value, but since this variable is not significant, this negative value does not affect life satisfaction. In this equation, the increase in the different employment indicators have the greatest influence on the life satisfaction increase.

Now, we will analyze the variables equation that affect directly people's quality of life. The variables that make up this set are: Community, Education, Environment, Civic Engagement, Health, Safety and Work-Life Balance

In equation (12), we see the regression of the variables set related to life quality. In this regression, we observe three different significance levels. In the Education, Health and Safety variables, we have enough evidence to state that they are statistically meaningful at a level of 1%, while in the Community and Civic Engagement, variables they are significant at a level of 5%. In Environment and Work-Life Balance, we have no evidence to be able to say that these variables are significant.

We expected that in equation (12), all the variables will affect life satisfaction positively, but we can see how positive and negative signs appear. The variables Community, Education, Environment, Civic Engagement, Health and Work-Life Balance affect life satisfaction positively and Safety affects negatively. The effects of the safety aspects have the highest negative incidence within our model and the indicators linked to health have the highest positive impact. Equation (12) demonstrates that a model without any type of economic variable also allows us to analyze, in detail, the life satisfaction as we explained earlier in the "Indices that do not use GDP" section.

Once analysed the variables equation that affect directly people's quality of life, it is worth conducting an analysis of the equation with all the variables of our model.

Equation (13) consists of all the variables that appear in our model. In the regression, we observe how in Income, Job, Community, Health and Safety variables, we have enough evidence to say that they are statistically meaningful at a level of 1%. Environment and Work-Life Balance are statistically meaningful at a level of 5%. In Housing, Education and Civic Engagement, we can not find sufficient evidence and we conclude that these variables are not significant.

The variables Job, Community, Education, Civic Engagement, Health and Work-Life Balance affect life satisfaction positively, while an increase in Housing, Income, Environment and Safety has a negative effect on people's life satisfaction. The increase in the values of the job aspects and people's health improvement are the factors that affect more strongly the increases of the life satisfaction. Conversely, an increase in the country security is what causes the greatest effect in reducing life satisfaction. The salient negative security effects in our model may have been caused by the extremely

low security values in some countries of our model (Latin Americans) and by the indirect effects caused by including a large number of variants. The results that this equation gives us are closely related to the conclusions of Costanza et al. (2004), in which it is pointed out that beyond a certain point increases in material welfare (in this case income and housing conditions) have negative effects on multiple aspects of society and therefore, on satisfaction with life. Although our model is formed by linear regressions, the high level of material welfare of the countries analyzed allows us to corroborate these conclusions.

In order to finish the analysis of the equations in Table 6, we are going to make a data comparison that we have been provided with.

We can see how the variables signs, effects and significances have changed in the three equations. The Housing effects change both sign and significance. In equation (11), an increase in Housing affects life satisfaction positively and we have evidence that it is statistically significant at 10%, while in equation (13), an increase in Housing affects the life satisfaction negatively and the variable is not significant. The Income significance changes in the equations. In equation (11), this variable is not meaningful and in equation (13), it is statistically significant at 1%. With the income data, we can see how an increase in income does not produce an increase in life satisfaction in any of the equations and thus, we can confirm that the Easterlin Paradox is fulfilled. The variables Job, Health and Safety maintain their signs and significances in the different equations. The variable Community maintains its sign, but increases its significance in equation (13) compared to equation (12). The variables Education and Civic Engagement change their significance in the equations. In equation (12), they are significant at 1% and 5% respectively and in equation (13), they are not notable. Environment changes sign and significance. In equation (12), they have a positive sign and it is not significant, and in equation (13), it has a negative sign and it is significant at 5%. Work-Life Balance maintains the sign, but changes its significance. In equation (12), it is not significant and in equation (13), it is significant at 5%. Concerning the constant of the three equations, we have sufficient evidence to say that it is statistically significant at 1% in each of them.

The succeeding table contains the data of the different results that we have applied to the equation with all the variables of our index.

Table 9. OLS robust, fixed effects and random effects data panel 2013-2017

Variable	eq_OLS	eq_FE	eq_RE
Hou	-.03020543	.04244133	.04302925
Inc	-.07634286***	-.02840616	-.03248121
Job	.30904212***	.11654486***	.19879575***
Com	.04661953***	.05502331***	.04364149***
Edu	.01605715	-.01229335	.00001009
Env	-.05787453***	-.01291869	-.01844366
Cien	.00750704	.01786055	.02038791*
Hea	.24000183***	-.00341889	.17066855***
Saf	-.13776041***	-.09333341*	-.11659943***
Wlba	.04721751***	.05745664*	.04007428*
_cons	4.3368502***	5.902208***	4.57002***
N	180	180	180
r2	.85119114	.2033369	
legend: * p<.1; ** p<.05; *** p<.01			

In the equation (OLS), we observe the results of our model according to the Robust Pooled Ordinary Least Squares estimation. In the data, we see how in the variables Income, Job, Community, Environment, Health, Safety and Work-Life Balance, we have enough evidence to say that they are statistically significant at a level of 1%. In Housing, Education and Civic Engagement, we can not find enough evidence and we conclude that these variables are not significant.

Job, Community, Education, Civic Engagement, Health and Work-Life Balance variables positively affect life satisfaction in a positive way, while an increase in Housing, Income, Environment and Safety has a negative effect on people life satisfaction.

In the equation (FE), we see the results of our model according to the fixed effects estimation. In the calculations, we observe two different levels of significance. In the variables Job and Community, we have enough evidence to say that they are statistically significant at a level of 1% and in Safety and Work-Life Balance, we have evidence to state that they are statistically significant at a level of 10%.

We also observed that variables have different effects on life satisfaction. The Housing, Job, Community, Civic Engagement and Work-Life Balance variables positively affect life satisfaction positively and Income, Education, Environment, Health and Safety affect

negatively. An increase in the Job variable would cause a greater increase in life satisfaction and an increase in the citizens' safety would cause the greatest decrease in life satisfaction.

In the equation (RE), we see the analysis of the same model, but in this case, using the random effects estimation. In this equation, we see that there are several significant variables in the model. In the variables Job, Community, Health and Safety, we have enough evidence to say that they are statistically significant at 1% and in the variables Civic Engagement and Work-Life Balance, at 10%. The rest of the variables are not significant.

In the random effects estimation, all variables affect life satisfaction in a positive way, except Income, Environment and Safety. The improvement in jobs is what causes a greater increase in citizens' life satisfaction. The improvement in the security conditions of the countries causes the greatest negative effects on the society's life satisfaction.

On the basis of the preceding information, we will make a comparison of the three estimates.

The variable Housing is not significant in any of the estimates. Housing has a negative sign in the OLS equation, but has a positive sign in the FE and RE equations instead. Income has a negative effect on life satisfaction in all equations, but is only significant (at a level of 1%) in the OLS equation. Job and Community have a positive sign and 1% significance in all equations. Moreover, the variable Education is not significant in any equation. An increase in Education affects life satisfaction negatively in the FE equation and positively in the OLS and RE equation. Environment negatively affects life satisfaction in all three equations, but is only significant (1%) in the OLS equation. Civic engagement has positive effects on all three equations, but is only significant at 10% in the RE equation. The variable Health affects life satisfaction in the OLS and RE equation in a positive way and we also have evidence that it is statistically significant in both cases at a level of 1%. In the equation FE, it has a negative sign and is not significant. An increase in Safety entails decreases in citizen satisfaction in the three equations. We have evidence that is statistically significant at 1% in the OLS equation and in the RE and that it is significant at 10% in the FE equation. The Work-Life Balance variable has a positive sign in the three equations and is also significant in the three of them. They have a significance level of 1% in the OLS equation and 10% in the FE and RE equation.

Finally, we will apply the Breusch and Pagan test formulating the Lagrange Multiplier test for random effects. This test will allow us to know if it is more appropriate and more accurate to use the random effects model or the Pooled Ordinary Least Squares model. We calculate the test and we observe that we have enough evidence to say that it is preferable to use the random effects estimate instead of the Pooled Ordinary Least Squares.

Table 10. Breusch-Pagan test for random effects

Breusch and Pagan Lagrangian multiplier test for random effects		
$Lisa[C,t] = Xb + u[C] + e[C,t]$		
Estimated results:		
	Var	sd = sqrt(Var)
Lisa	.6334112	.7958714
e	.0269439	.1641458
u	.0864138	.2939623
Test: Var(u) = 0		
	chibar2(01) =	138.09
	Prob > chibar2 =	0.0000

Once the Breusch and Pagan test has been carried out, we will also carry out the Hausman test to verify if it is more appropriate to use the estimates with fixed effects or the estimates with random effects. The Hausman test calculations demonstrates that the estimators of random effects and fixed effects differ systematically and therefore, we should use the estimation of the fixed effects

Table 11. Hausman test

	— Coefficients —		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) eq_FE	(B) eq_RE		
Hou	.0424413	.0430293	-.0005879	.0157026
Inc	-.0284062	-.0324812	.0040751	.0472845
Job	.1165449	.1987957	-.0822509	.0240915
Com	.0550233	.0436415	.0113818	.0081101
Edu	-.0122933	.0000101	-.0123034	.0349886
Env	-.0129187	-.0184437	.005525	.0109255
Cien	.0178606	.0203879	-.0025274	.0083787
Hea	-.0034189	.1706685	-.1740874	.0694098
Saf	-.0933334	-.1165994	.023266	.0436597
Wlba	.0574566	.0400743	.0173824	.0270129

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$\chi^2(10) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$
 = 23.66
 Prob>chi2 = 0.0086

6. Conclusions

Throughout our article, we have delved into a current issue such as people's life satisfaction. Notwithstanding that this topic has different aspects, in this article, we have focused especially on the aspects that affect the life satisfaction and on what the influence they have is.

We decided to examine the study of life satisfaction because it is a subject that has to do with the daily life of people and societies. In addition to this, in recent years, there have been important advances in the analysis of this area and important academic works that have allowed us to have much more extensive and detailed information.

In the literature review, we have made an analysis of the main studies and advances made in the last 20 years regarding the well-being and life satisfaction field. We have based our calculations and models taking into account the guidelines of these studies. In the literature review and in our calculations, we have also given special importance to the income and GDP aspects and its influence on our field of research. We have made a comparison between the conclusions of our estimates and the Easterlin Paradox.

During the description of the data used in our work, we have obtained the first conclusions. From the creation of the indicator "Total" that grouped us in a single value the different valuations of the aspects of the objective welfare analyzed in our model, we conclude that the people welfare of the OECD countries are suffering a constant decrease since 2014. This downward trend can also be seen clearly if we analyze only the countries of Europe. This conclusion is an extremely worrisome fact that endangers the welfare society and should alert the authorities of developed countries

This part also highlights the wide difference between the values of objective well-being and satisfaction with life in Latin American countries. Objective well-being has much lower levels than life satisfaction levels. In order to explain this fact, we agree with the conclusions of Rojas (2006): people give a much higher importance to some aspects of life than others, citizens can have great happiness if it reaches high levels of well-being in some relevant domains, although it has low levels in other domains of life.

When making our econometric estimations we have put in value the different types of indices explained in the literary review. Additionally we have made estimations with indices with variables related to the material conditions of life that include economic aspects, indices with variables related to the quality of life and indices with the set of aspects that affect our lives.

Taking into account the equation with estimates using fixed effects, the equation with all of our variables and the material conditions of life and quality of life equations, we can conclude that employment, community and security are the only aspects that are significant in all these equations. Increases in quality in the field of employment and the community positively affect life satisfaction and the effects of increased security, surprisingly negatively affect life satisfaction.

All our equations show us this outstanding phenomenon regarding the safety of people: increases in security cause a decrease in the citizens' life satisfaction. We consider that this curious effect may be caused by the strong contrast between the low safety values and the high life satisfaction values in some countries of our model and also by the indirect effects and the signs distortion due to the inclusion of multiple variables in our models.

Estimates from our econometric calculations have also allowed us to see that increases in income negatively affect life satisfaction in all our models and forms of estimation. This

fact allows us to corroborate the conclusions of the "Easterlin Paradox", highlighting the inaccuracy and inability to use economic measures to measure happiness and assess the multiple deficiencies of this type of economic aggregates.

We are aware of the multiple temporal and sample limitations that our work has. With the completion of this work, we encourage future students to carry out projects that encompass a longer time span, with a greater number of countries and aspects to continue deepening knowledge of this very interesting topic.

7. References

Argyle, M., 2013. *The Psychology of Happiness*. 2nd ed. [online] London: Routledge. Available at: <<https://www.taylorfrancis.com/books/9781315812212>> [Accessed 30 Mar. 2019].

Bandura, R., 2005. *Measuring Country Performance and State Behavior: A Survey of Composite Indices*. [online] New York: United Nations Development Programme, Office of Development Studies. Available at: <[http://www.undp.org/content/dam/undp/library/corporate/Development Studies/measuring_country_performance_2005.pdf](http://www.undp.org/content/dam/undp/library/corporate/Development%20Studies/measuring_country_performance_2005.pdf)> [Accessed 19 Mar. 2019].

Carver, T. and Grimes, A., 2019. Income or Consumption: Which Better Predicts Subjective Well-Being? *Review of Income and Wealth*, [online] pp.1–25. Available at: <<http://doi.wiley.com/10.1111/roiw.12414>> [Accessed 28 Mar. 2019].

Costanza, R., Erickson, J., Fligger, K., Adams, A., Adams, C., Altschuler, B., Balter, S., Fisher, B., Hike, J., Kelly, J., Kerr, T., McCauley, M., Montone, K., Rauch, M., Schmiedeskamp, K., Saxton, D., Sparacino, L., Tusinski, W. and Williams, L., 2004. Estimates of the Genuine Progress Indicator (GPI) for Vermont, Chittenden County and Burlington, from 1950 to 2000. *Ecological Economics*, [online] 51(1–2), pp.139–155. Available at: <<https://www.sciencedirect.com/science/article/pii/S0921800904002307>> [Accessed 29 May 2019].

Costanza, R., Hart, M., Posner, S. and Talberth, J., 2009. Beyond GDP: The Need for New Measures of Progress. *The Pardee Papers*, [online] 4, pp.10–21. Available at: <<https://www.bu.edu/pardee/files/documents/PP-004-GDP.pdf>> [Accessed 18 Feb. 2019].

Cummins, R.A., 2005. The Domains of Life Satisfaction: An Attempt to Order Chaos. In: *Citation Classics from Social Indicators Research*. [online] Berlin/Heidelberg: Springer-Verlag, pp.559–584. Available at: <http://link.springer.com/10.1007/1-4020-3742-2_19> [Accessed 30 Mar. 2019].

Easterlin, R., 1974. Does Economic Growth Improve the Human Lot? Some Empirical Evidence. *Nations and Households in Economic Growth*, [online] pp.89–125. Available at: <<https://www.sciencedirect.com/science/article/pii/B9780122050503500087>>

[Accessed 31 May 2019].

Felix, R. and Garcia-Vega, J., 2012. Quality of Life in Mexico: A Formative Measurement Approach. *Applied Research in Quality of Life*, [online] 7(3), pp.223–238. Available at: <<http://link.springer.com/10.1007/s11482-011-9164-4>> [Accessed 14 Apr. 2019].

Hayashi, T., 2015. Measuring rural–urban disparity with the Genuine Progress Indicator: A case study in Japan. *Ecological Economics*, [online] 120, pp.260–271. Available at: <<https://www.sciencedirect.com/science/article/pii/S0921800915004383?via%3Dihub>> [Accessed 3 Apr. 2019].

Headey, B. and Wearing, A., 1992. *Understanding happiness: A theory of subjective well-being*. [online] Melbourne: Longman Cheshire. Available at: <https://worlddatabaseofhappiness.eur.nl/hap_bib/freetexts/headey_b_1992.pdf> [Accessed 30 Mar. 2019].

Marks, N., Abdallah, S., Simms, A. and Thompson, S., 2006. *The (un)happy planet index: An index of human well-being and environmental impact*. London: New Economics Foundation.

Ortiz-Ospina, E. and Roser, M., 2019. Happiness and Life Satisfaction. *Our World in Data*. [online] Available at: <<https://ourworldindata.org/happiness-and-life-satisfaction>> [Accessed 30 Mar. 2019].

Pilling, D., 2019. El PIB y su grave error de cálculo. *El País (Online edition)*. [online] Available at: <https://elpais.com/elpais/2019/02/01/ideas/1549019762_629559.html> [Accessed 16 Feb. 2019].

Ribeiro, L.L. and Lemos Marinho, E.L., 2017. Gross National Happiness in Brazil: An analysis of its determinants. *Economia*, [online] 18(2), pp.156–167. Available at: <<https://www.sciencedirect.com/science/article/pii/S1517758015300321>> [Accessed 3 Apr. 2019].

Rojas, M., 2006. Life satisfaction and satisfaction in domains of life: is it a simple relationship? *Journal of Happiness Studies*, [online] 7(4), pp.467–497. Available at:

<<http://link.springer.com/10.1007/s10902-006-9009-2>> [Accessed 29 Mar. 2019].

Rojas, M., 2009. Progress and Wellbeing as it is Experienced by People. In: *Measuring the progress of societies: reflections from Mexico*. [online] Mexico: Scientific and Technological Consultative Forum, pp.67–74. Available at: <http://foroconsultivo.org.mx/libros_editados/midiendo_el_progreso_ingles.pdf> [Accessed 2 Apr. 2019].

Rojas, M., 2011. El bienestar subjetivo: su contribución a la apreciación y la consecución del progreso y el bienestar humano. *Realidad, datos y espacio. Revista Internacional de Estadística y Geografía*, [online] 2(1), pp.64–77. Available at: <https://www.inegi.org.mx/RDE/rde_02/doctos/rde_02_art4.pdf> [Accessed 1 Apr. 2019].

Stiglitz, J., Sen, A.K. and Fitoussi, J.-P., 2009. *Report by the commission on the measurement of economic performance and social progress*. [online] Paris: Commission on the Measurement of Economic Performance and Social Progress. Available at: <<https://ec.europa.eu/eurostat/documents/118025/118123/Fitoussi+Commission+report>> [Accessed 4 Feb. 2019].

8. Appendix A

Table A 1. Average values 2013-2017

Pais	t	Housing	Income	Jobs	Community	Education	Environment	Civic engagement	Health	Safety	Work-Life Balance	Total	Life satisfaction
Australia	2013-2017	7.48	4.88	8.13	8.44	7.98	9.03	10.00	9.19	9.76	5.65	8.05	7.30
Austria	2013-2017	5.84	5.00	7.82	7.98	6.54	7.36	6.32	7.44	9.92	6.55	7.08	7.18
Belgium	2013-2017	6.94	5.78	6.39	7.53	7.28	6.57	9.19	7.67	9.62	8.81	7.58	6.94
Brazil	2013-2017	3.76	0.10	4.60	6.79	1.58	5.79	6.88	4.74	0.23	6.67	4.12	6.80
Canada	2013-2017	7.72	5.50	7.96	8.33	7.46	8.33	3.49	9.16	9.50	6.76	7.42	7.40
Chile	2013-2017	4.03	1.02	4.76	4.41	3.96	3.41	3.60	5.58	8.41	5.73	4.49	6.60
Czech Republic	2013-2017	4.50	1.76	5.34	6.15	7.49	6.96	2.57	5.53	9.70	7.31	5.73	6.54
Denmark	2013-2017	5.81	4.15	8.06	9.07	7.81	8.73	8.78	7.28	9.86	9.51	7.91	7.52
Estonia	2013-2017	4.58	0.98	4.75	6.48	7.71	7.80	3.53	4.31	8.32	7.55	5.60	5.52
Finland	2013-2017	6.22	3.45	6.99	8.53	9.17	8.99	4.66	7.22	9.45	7.79	7.25	7.42
France	2013-2017	6.33	4.77	6.00	6.75	5.75	7.45	6.91	7.70	9.81	8.27	6.97	6.52
Germany	2013-2017	6.37	5.04	7.55	8.01	7.80	8.25	5.30	6.94	9.89	8.23	7.34	6.94
Greece	2013-2017	4.00	1.68	1.32	2.77	5.77	4.43	3.35	7.84	9.55	7.21	4.79	5.08
Hungary	2013-2017	4.17	1.13	4.04	5.28	6.44	6.21	2.51	4.08	9.59	7.91	5.14	5.02
Iceland	2013-2017	5.50	3.84	9.07	9.75	7.27	9.31	7.46	8.62	9.86	5.62	7.63	7.52
Ireland	2013-2017	7.28	3.17	5.60	9.25	7.07	7.85	4.65	8.51	9.77	8.09	7.12	6.92
Israel	2013-2017	4.26	3.53	6.20	5.95	5.27	4.13	4.67	8.81	9.31	5.04	5.72	7.18
Italy	2013-2017	4.97	4.24	4.41	6.88	4.84	5.28	6.28	7.68	9.80	7.71	6.21	5.90
Japan	2013-2017	4.79	5.50	7.08	6.95	7.94	6.72	2.01	5.02	9.98	4.94	6.09	5.94
Korea	2013-2017	5.87	2.26	6.60	1.05	7.84	4.24	6.29	4.65	9.54	4.86	5.32	5.90
Luxembourg	2013-2017	6.67	6.78	7.97	7.07	4.76	7.66	9.64	7.84	9.63	8.05	7.61	6.92
Mexico	2013-2017	3.92	0.51	4.64	1.45	0.65	4.55	3.30	4.63	1.29	2.17	2.71	6.84
Netherlands	2013-2017	7.06	5.22	8.08	7.25	7.38	6.95	6.35	8.11	9.76	9.16	7.53	7.38
New Zealand	2013-2017	6.68	3.23	7.44	9.16	7.10	8.78	6.21	9.26	9.59	6.36	7.38	7.30
Norway	2013-2017	7.70	4.00	8.61	8.36	7.13	9.23	6.61	8.18	9.70	8.74	7.83	7.58
Poland	2013-2017	3.79	1.29	4.64	6.62	8.04	4.93	1.49	4.89	9.72	6.30	5.17	5.88
Portugal	2013-2017	6.36	2.38	3.97	5.17	4.35	7.69	1.99	5.43	9.70	6.95	5.40	5.12
Russia	2013-2017	3.69	1.09	5.70	6.37	6.22	3.69	3.75	0.60	5.52	8.15	4.48	5.82
Slovak Republic	2013-2017	3.92	1.34	3.30	6.99	5.98	6.84	2.44	5.19	9.64	7.44	5.31	6.04
Slovenia	2013-2017	6.05	1.94	5.42	7.34	7.57	6.92	2.06	6.62	9.91	7.11	6.09	5.86
Spain	2013-2017	6.49	2.75	3.43	8.71	5.22	5.70	4.89	8.38	9.84	9.05	6.45	6.36
Sweden	2013-2017	6.48	5.00	7.69	7.70	7.83	9.54	8.42	8.73	9.75	8.34	7.95	7.36
Switzerland	2013-2017	6.27	7.53	9.20	8.67	7.38	7.98	0.09	9.10	9.89	7.39	7.35	7.64
Turkey	2013-2017	2.52	0.58	3.32	3.61	2.45	2.99	8.69	5.18	9.21	0.00	3.85	5.36
United Kingdom	2013-2017	6.06	4.91	7.31	8.25	6.17	8.32	4.12	7.86	9.92	6.50	6.94	6.74
United States	2013-2017	8.14	10.00	8.00	6.95	6.88	7.52	4.43	8.20	8.12	5.86	7.41	7.00