

Causality relationship between Income Inequality and Life Satisfaction in European Countries: Does Income Inequality Affect Life Satisfaction?

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Abstract:

This paper examines the interaction between life satisfaction and income inequality in European nations from 2006 to 2016. The key finding of the analysis and the results show that countries that promote collectivism tend to have people with higher life satisfaction than countries which promote individualism. In general, individuals prefer to live in a country where they have stable disposable income, freedom in the way they are thinking, trust in their government and policies, a healthy life expectancy, and social support and generosity from peers. With this in mind, it raises the question, “where does income inequality fit into this?” By using macro-level data from various sources, our results show that income inequality affects life satisfaction positively. Yet, our results also show that when the top or bottom 10% has access to higher income, life satisfaction is affected negatively.

JEL Classification: D63, I31

Key Words: Life Satisfaction, Income Inequality, Europe

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1.0 - Introduction

For a long period of time, life satisfaction has been a factor that has been overlooked by many countries, which even failed to differentiate happiness and life satisfaction. Indeed, even though they share some characteristics, they are different. Happiness, on the one hand, is an emotional state that one possesses when he or she has positive or pleasant emotions on a particular matter; there are different level of happiness that varies based on one's own criteria (Seligman, 2011). Happiness can last an instant just like it can last for years. On the other hand, life satisfaction is the degree to which a person positively evaluates the overall quality of his or her life (Beenhoven, 1996). In other terms, life satisfaction is how much one likes the life he or she is having.

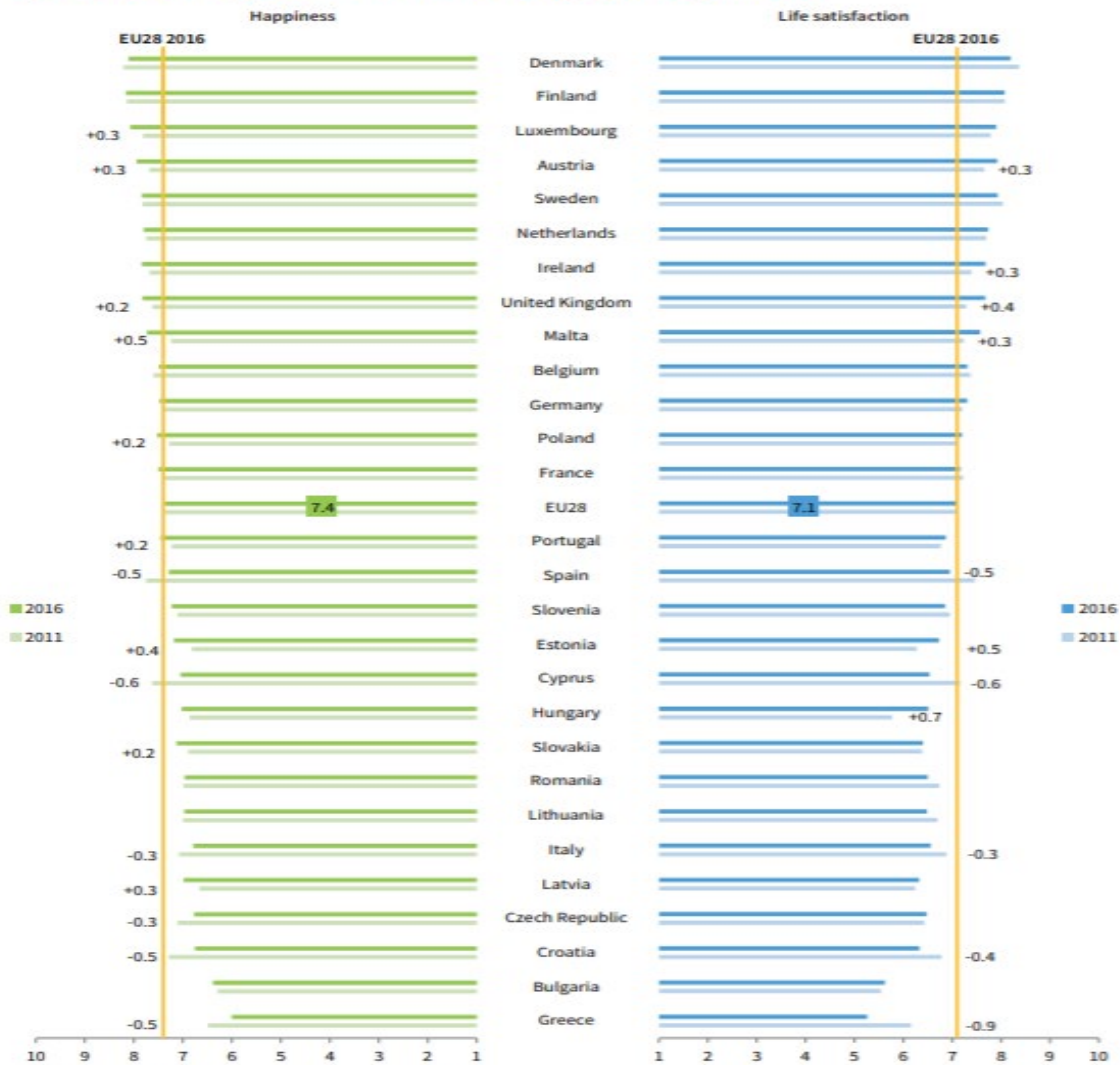
In this paper, the goal is to demonstrate if people care about income inequality and how much of that factor affects their life satisfaction. Studying people's life satisfaction is extremely important for many reasons. First, satisfied people are more productive, in every aspect of life, than unsatisfied people. Second, satisfied people are less likely to start a rebellion, which would unbalance a country, unbalance its economy, and jeopardize foreign trades since countries are less likely to conduct business with unbalanced economies. Lastly, people with high satisfaction are on average healthier than unsatisfied people. A healthy population is important to a nation's economy because it makes people able to work harder and longer.

This paper will differ to other research papers by focusing on Western European countries, using the most recent information to run a time series data, running a fixed and random effect model to interpret the results, and looking at the effect of income inequality on a broad scale. Since our paper focuses on West Europe, we include countries such as Belgium, France, Luxembourg, Germany, and the alike.

The rest of the paper is organized as follows: Section 2 will focus on the trend between happiness and life satisfaction in the European Union; Section 3 gives a brief literature review; Section 4 states the Data and Empirical Methodology; Section 5 presents and interprets the empirical result; Section 6 discusses the results and provides the limitations of the study, which will be followed by Section 7, the conclusion.

2.0 - Happiness and Life Satisfaction Trends in the European Union

Figure 1: Trends in happiness and life satisfaction levels, by country, 2011–2016



Notes: Numbers at the end of the bars indicate statistically significant changes in scores since 2011. T-tests were used to measure significance using the Bonferroni correction. Life satisfaction and happiness are measured on a scale of 1 to 10 with the following questions: Q4 'All things considered, how satisfied would you say you are with your life these days? Please tell me on a scale of 1 to 10, where 1 means very dissatisfied and 10 means very satisfied'; Q5 'Taking all things together on a scale of 1 to 10, how happy would you say you are? Here 1 means you are very unhappy and 10 means you are very happy'. EU28 data.

This graph shows the average level of happiness and the average level of life satisfaction for each country of the European Union (EU28) from 2011 (light green for happiness and light blue for life satisfaction) to 2016 (dark green for happiness and dark blue for life satisfaction). From 2011 to 2016, the average happiness level for the European Union countries was 7.4 while the average life satisfaction level was 7.1. Both averages are represented by a straight yellow line. Based on the graph, 11 out of 28 countries have managed to be above the average happiness level while 13 out of 28 did so for the average life satisfaction level. Based on the numbers, we can posit that on average people in the European Union are happy and satisfied with their lives because there is not a single country that scored under five in any category.

An interesting correlation to notice is the fact that countries with high level of happiness have high level of life satisfaction and countries with low level of happiness have low level of life satisfaction. This correlation is accurate because if one is happy in general, he or she is likely to be satisfied with his or her life. Regarding the rankings, there was not a drastic change among the top and bottom five; the top five countries in 2011 were still in the top five in 2016 and it went the same way for the bottom five with the exception of Croatia, which experienced the biggest drop in the rankings.

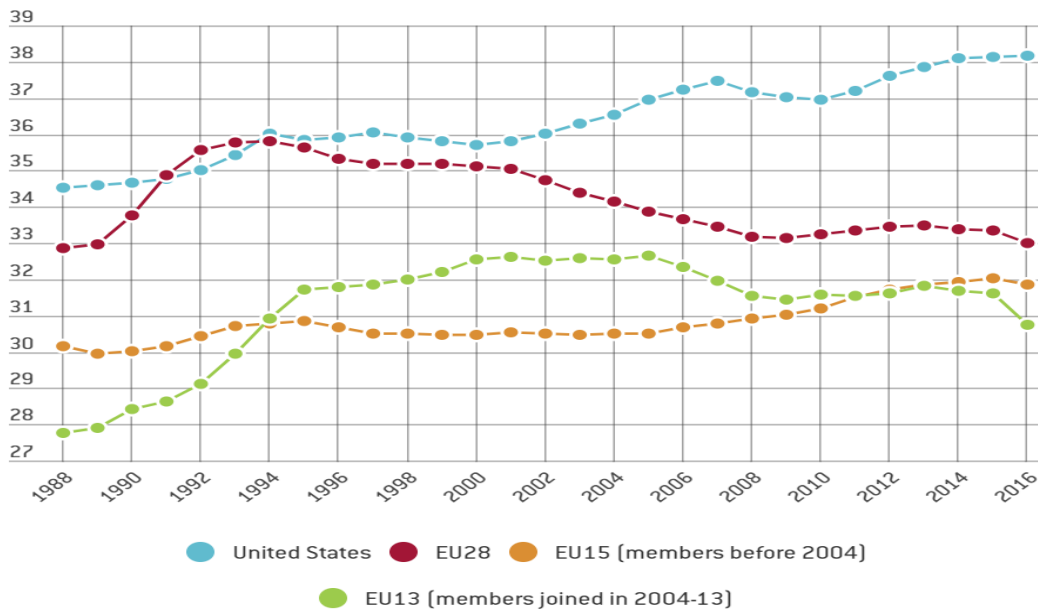
When we individually look at the trend for each country, 11 of them have noticeable changes. Greece, Croatia, Italy, Cyprus, and Spain experienced some decrease in both happiness and life satisfaction from 2011 to 2016 meaning that people believed their lives got worst off as time went by. Greece in particular got hammered by a 5% decrease in happiness and a 9% decrease in life satisfaction. Similarly, Cyprus experienced a 6% decrease in both happiness and life satisfaction. It is definitely a matter that needs to be addressed by the Cyprian government

because due to those decreases, Cyprus fell below the European Union average in both categories.

On the other hand, Hungary, Estonia, Malta, the United Kingdom, Ireland, and Austria experienced some increase in both happiness and life satisfaction from 2011 to 2016 meaning that people believed their lives went better off as time went by. This is particularly true for Hungary, which increased its population's life satisfaction by 7% within that time period. Even though Hungary is still under the European Union average, the future seems to be bright if it keeps the same tendency.

2.1 - Income Inequality Trends in the European Union

Figure 1: Gini coefficient of income inequality in the EU and the US, 1988-2016



In the European Union, the income-inequality trend seems to decrease even though the coefficient in 2016 was the same as in 1988. With the current policies, no factors indicate whether income inequality will stay constant or skyrocket just like the United States.

3.0 - Literature Review

According to Verne (2010), the whole purpose of the study is to show how much does the average person care about income inequality in his or her country; plus, whether or not income inequality affects one's life satisfaction positively or negatively. Bubbico and Freytag (2018) propose some hints to answer those questions because they state numerous factors responsible for income inequality in Europe. Regarding how much each of those factors affect people on a daily basis, we should be comfortable in determining the impact of income inequality on citizens' life satisfaction.

To start off, labor market is a factor responsible for income inequality due to the fact that each individual receives a different wage. As Bubbico and Freytag (2018) mention, "wages are a function of the market price of skills required for a job." Wages follow the law of demand and supply; if there are a lot of available workers, and thus a high supply, for few jobs, and thus a low demand, the wage those workers will receive will be low because employers are looking for employees that will do the most hours of work for the cheapest salary. On the contrary, if there are few workers, and thus low supply, for a lot of jobs, and thus high supply, employers are almost willing to pay anything to get employees since they do not want to run out of business (Leung, 2015). Since wages are necessities to pay bills and put food on one's table, it is definitely a factor that will greatly impact the average person.

A second reason stated by Bubbico and Freytag (2018) is education. With a higher level of education, people offer specific skills that people with lower level of education cannot provide. Therefore, due to the scarcity of those specific skills, a higher wage is granted. It is also important to emphasize that even among highly educated people there is competition; not everyone has the same quality of education and because of that, there might still be a difference

in wages. The competitive aspect of the job search might lead to tension among individuals, which means that education probably impact the average person noticeably.

In addition, Leung (2015), claims that growth in technology widens income gap. Due to the improve of technology, many blue-collar workers have been replaced by computers and machines since they can work longer, faster, and at a cheapest cost. Leung (2015) states jobs involving repetitive tasks such as packing and manufacturing have been eliminated for the most part. As a result of that, wages for unskilled workers is even lower than it used to be. An increase unemployment rate for unskilled workers is definitely a factor that will negatively impact the life satisfaction of the average unskilled worker. It is also important to keep in mind that with technology improving day after day, white-collar jobs might be in jeopardy someday; with artificial intelligence, it may be a matter of time before robots perform intellectual jobs. This would ultimately lead to the question, “is an improving technology increasing our life satisfaction?” which would be interesting to study in another project.

Finally, Bubbico and Freytag (2018) mention that income inequality in Europe has not drastically changed over the year. In accordance with Leung (2015), all auteurs agree that income inequality should not be neglected. Leung (2015) states that inequality is a vicious cycle because the rich get richer and the poor get poorer due to a theoretical process called “wealth concentration.” The process is as followed, “since rich people already hold wealth, they have the resources to invest and accumulate more wealth for themselves.” The effects of wealth concentration benefit the offspring of rich people because they have a clear economic advantage on their peers. With that advantage, they have access to better education and other privileges in life. With this in mind, life satisfaction for rich families is probably high, but can we say the same about the average Western European?

4.0 - Data and Empirical Methodology

4.1 – Data

The study uses time series data from 2006 to 2016. Data were obtained from the United Nation University. Summary statistics for the data are provided in Table 1.

Table 1 Summary Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
year	132	2011	3.18651	2006	2016
LogV23	132	2.005423	0.0323954	1.957274	2.073172
gini_reporcd	132	30.61242	2.250117	26.3	34.4
d1	132	3.243788	0.2530112	2.6	3.7
top5	132	14.56439	1.366129	12.1	17.1
d10	132	24.28924	1.576921	20.7	27.1
PPP_GDP_PC	132	52803.56	19079.48	37495	98951
mean_usd	132	24153.97	29421.01	15504	258225
median_usd	132	17545.61	2531.104	13339	22868

4.2 - Empirical Model

Following Verne (2010) this study adapted the target variable as life satisfaction and modified the dependent variables. We have suppressed variables such as, “age” and “gender” because we are focusing our results on a macro level.

The model can be written as follow:

$$\text{LogV23} = \beta_0 + \beta_1 * \text{Gini_Reported} + \beta_2 * \text{d1} + \beta_3 * \text{q5} + \beta_4 * \text{d10} + \beta_5 * \text{PPP_GDP_PC} + \beta_6 * \text{mean_usd} + \beta_7 * \text{median_usd} + \varepsilon$$

LogV23 represents life satisfaction and it is used as an endogenous variable. Life satisfaction is interpreted in percentage to make it easier to understand.

There are seven independent variables, which are explained as followed; first, “Gini_Reported” represents the gini index. The second variable, “d1” represents the proportion

of the resources in a country that is owned by the bottom 10%. The third variable, “q5” represents the proportion of the resources in a country that is owned by the top 20%. The fourth variable, “d10” represents the proportion of the resources in a country that is owned by the top 10%. The fifth variable, “PPP_GDP_PC” represents the PPP GDP per capita of a country. The sixth variable, “Mean_usd” represents the average salary of an individual measured in US dollars. The last variable, “Median_usd” represents the median salary of the population measured in US dollars.

5.0 – Empirical Results

The empirical estimation results are presented in Table 2. Because of the log in front of V23, every interpretation of life satisfaction will be in percentage. Soon after running a fixed effect and a random effect, the Hausman test recommends to focus on the fixed-effect model for the interpretation (see Appendix A for results of random effect).

Table 2: Results Fixed Effect Model (R-Square = 0.7688)

LogV23	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gini_Reported	0.0037522	0.0022516	1.67	0.102	-0.0007639	0.0082683
d1	-0.0096147	0.0075906	-1.27	0.211	-0.0248395	0.00561
q5	-0.0011911	0.0010065	-1.18	0.242	-0.00321	0.0008277
d10	-0.0065743	0.0029421	-2.23	0.03	-0.0124755	-0.0006731
PPP_GDP_PC	-3.71E-07	6.09E-07	-0.61	0.545	-1.59E-06	8.50E-07
mean_usd	5.75E-08	3.06E-08	1.88	0.066	-3.83E-09	1.19E-07
median_usd	6.94E-06	1.64E-06	4.24	0	3.66E-06	0.0000102
_cons	1.995153	0.0641591	31.1	0	1.866466	2.12384

Out of the seven variables, three are significant: “d10” at 5%, “mean_usd” at 10%, and “median_usd” at 1%. The model shows a positive relationship between Gini_Reported and life satisfaction; a 1-unit increase in Gini_Reported will increase life satisfaction by 0.37522%, ceteris paribus. On the contrary, the variable “d1” has a negative relationship with life satisfaction; a 1-unit increase in d1 will decrease life satisfaction by 0.96147%, ceteris paribus. Similarly to d1, are the variable “q5” and “d10”; a 1-unit increase in q5 will decrease life satisfaction by 0.11911%, ceteris paribus while a 1-unit increase in d10 decreases life satisfaction by 0.65743%, ceteris paribus. The variables PPP_GDP_PC, mean_usd, and median_usd have little impact on life satisfaction. A 1-unit increase in any of those variables has literally no effect on life satisfaction.

6.0 – Discussion and Limitation of the Studies

It was a big surprise to see that in our model, the coefficient of gini_reported was positive since we expected a negative one. Indeed, as income inequalities increase, some real disadvantages occur that include higher unemployment, higher crime rate, lower educational achievements, and lower health. Those type of issues cannot be taken lightly by any economy and must be addressed immediately otherwise, there will ultimately be a slower economic growth. Even though the coefficient is not gigantically positive, it would be interesting to understand the reasons behind its positivity.

In parallel, there was no surprise in regards to the coefficients of d1, q5, and d10; indeed, if one takes the resources from nine different groups to allocate them to one particular group, the majority of the people will be unsatisfied, which will result in a decrease of life satisfaction. In regards to PPP_GDP_PC, mean_usd, and median_usd, it was expected that their impact on life

satisfaction would be pale since we are looking at the impact of life satisfaction from a macro prospective.

In regard to our studies, many limitations must be mentioned; the first one is the lack of diversity in the data. All the countries we chose are located in West Europe and have approximately the same GDP per capita and, they have many cultural aspects in common. Thus, we cannot apply those results in countries such as Japan or South Korea since they do not share the same cultures nor values, meaning that the factors affecting life satisfaction in those countries might be different. Similarly, we cannot apply those results to low-income and middle-income countries since they have different concerns, such as corruption, that are not as significant for high-income countries. Lastly, most Western European nations already have very high life satisfaction (we can look at Denmark, Sweden, and Netherlands to illustrate this) and therefore, there is little room for improvement.

7.0 – Conclusion

In summary, it appears that as income inequality increases, Western Europeans' life satisfaction increases as well. As mentioned previously, this is quite a surprising outcome since our results also indicate that when the top or bottom 10% get access to more resources, Western Europeans' life satisfaction decreases, which somehow contradicts the main result. A reason that might explained the fact that the Gini index's coefficient is positive might be based on where inequality is drawn and/or which social class gets its resources taken away. Indeed, our results imply that when people at the bottom get richer, it creates more animosity than when the rich get richer. Another aspect to also consider is the fact that the positive relationship between life satisfaction and the Gini coefficient might increase to a certain point before dropping off. Nonetheless, even if both variables are positively correlated, this does not mean that countries

should aim to increase income inequality because income inequality has drastic disadvantages such as higher crime rates and a slower economic growth.

Appendix A - Results Random Effect (R-Square = 0.8827)

LogV23	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
gini_reped	0.0063564	0.0036165	1.76	0.079	-0.0007319	0.0134446
d1	0.0088451	0.0118652	0.75	0.456	-0.0144102	0.0321004
top5	0.0017588	0.0017741	0.99	0.321	-0.0017184	0.0052361
d10	-0.0108838	0.0043441	-2.51	0.012	-0.0193981	-0.0023695
PPP_GDP_PC	5.69E-07	2.34E-07	2.43	0.015	1.11E-07	1.03E-06
mean_usd	5.22E-08	5.74E-08	0.91	0.363	-6.03E-08	1.65E-07
median_usd	7.16E-06	1.66E-06	4.3	0	3.90E-06	0.0000104
_cons	1.863926	0.0650526	28.65	0	1.736426	1.991427

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