Investigation of Easterlin Paradox in Developed Countries in the Context of Income Inequality

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Abstract

It has been questioned, time and again, if money or financial wellbeing can make us happy. Higher incomes and hence more freedom to live life the way that we want to live it, ought to yield happiness and wellbeing to people. However, this might not always be true, as shown by Richard Ainley Easterlin who found out, in his 1974 study that happiness changes with income both within and among nations, but in the long term, happiness and income are not significantly related.One such reason that offers an explanation to this contradictory phenonmenon is income inequality. This paper uses a purely empirical approach to examine the moderating effect that income inequality has for GDP per capita and happiness. More specifically, applying the Ordinary Least Squares Technique (OLS), Fixed Effects Regression on multiple panels, and by the use of an interaction term, this paper analyses the impact of income inequality on the relationship between GDP per capita and self-reported happiness. The findings of this paper reaffirm a significant and negative interactive effect of income inequality on the relationship between economic prosperity and happiness, in economically prosperous nations. Furthermore, it also shows the prevalence of a satiation point beyond which the relationship between economic prosperity and happiness disintegrates, as proposed by the Easterlin Paradox. Lastly, the study also suggests briefly, the policy implications based on the empirical findings in order to provide an insight into how income inequality may pose a threat to happiness and wellbeing of nations across the world.

Keywords: Happiness, Self-Reported Happiness, Standard of Living, Easterlin Paradox, Easterlin Hypothesis, GDP per capita, Subjective Wellbeing

JEL Classification: A13, D63, I31, O57

1.   Introduction

Previously it was considered to be an absurd idea altogether that Happiness was quantifiable, the developments in the field of Happiness Economics have proved otherwise. Various subjective measures like self-reported/subjective

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Happiness and objective measures like quality-of-life indices have made it possible to efficiently measure Happiness. While it is true that solely money doesn't affect Happiness or wellbeing, financial situation surely forms an indispensable component of the overall Happiness of individuals as told by Richard Layard in his landmark book 'Happiness: Lessons from a New Science.' Layard stipulates 7 main factors which influence Happiness namely family relationships, financial situation, work, community and friends, health, personal freedom, personal values (Todaro, 2011). It then follows that higher levels of economic growth and better standard of living in a nation ought to entail higher levels of Happiness for individuals and that the reason that nations aspire to achieve higher levels of productivity to maximize their wellbeing and Happiness.

A great number of research, like those conducted by Oishi, Kesebir and Diener (2011), Zhang and Ma (2013), Ball and Chernova (2007), Zagorski et al. (2013), Stevenson and Wolfers (2008) claim to have found no long term correlation between income levels and Happiness within or across nations and even if there appears a short run relationship, it fades away at higher levels of incomes. This strange phenomenon was first observed Richard Easterlin when he found time series evidence from United States data showing clearly that higher income was not accompanied by a proportional increase in Happiness during the 1946-1970's economic boom in the U.S.A This idea was termed as the famous Easterlin Hypothesis/Paradox by Richard Ainley Easterlin in his study "Does Economic Growth Improve the Human Lot: Some Empirical Evidence". The Paradox posits that "at a given point in time Happiness varies directly with income both among and within nations, but overtime Happiness does not trend upward in correspondence with income growth" (Easterlin and Connor, 2020).

Many empirical studies and data have shown the prevalence of the trend of diminishing levels of Happiness, as GDP rises. As GDP levels in a nation rise, Happiness rises at an increasing rate initially, however as Economic growth continues, the increase in Happiness slows down and increase but at a decreasing rate, receding towards a constant trend. The main reason for this seemingly contradictory phenomenon, as Easterlin argued, is social comparison. That is, people with higher incomes are happier as they compare their incomes to those of the poorer populations and vice versa. In simpler words an individual would rather be happier with a monthly income of $2000 than of only $1000 but he would not be much happier if he learnt that his neighbor or colleague was earning a relative income of $5000, per month. Hence, the apparently higher income of $2000 seems to fade in comparison to the even higher incomes in the society. This weighs on the individuals, who perceive their financial standing in the society to be low as

compared to those around them. Hence, the rise in their incomes do not translate to an increase in the Happiness of these individuals.

A similar concept was developed by James Deusenberry in 1949 when he formulated the Relative Income Hypothesis (RIH), positing that the utility or satisfaction gained from consumption of an individual is extracted from his/her relative standing in the society rather than his Absolute Income status. Although developed through different frameworks, both the RIH and the Easterlin Paradox signify the relevance of social comparison and consequently social welfare, in the pursuit of Happiness and wellbeing. In fact in his original paper, Easterlin (1974) cites and uses the Deusenberry type model as a proof for the prevalence of the RIH.

It is clear therefore that only Economic growth and Prosperity cannot be relied upon, to seek higher levels of Happiness within and among nations and that other factors like relative income also play a role in the process. One such variable that potentially affects this relationship between Economic Growth and Happiness is Income Inequality. This study aims to assess the role of Income Inequality in moderating the relationship between Economic prosperity and Happiness. Hence, this study addresses the following research question:

"Does Income Inequality moderate/alter the relationship between Subjective wellbeing/Happiness and Economic Prosperity?"

1.1 Limitations of the Study

A major limitation of the study perhaps is the arbitrary selection of the Income Inequality/Gini Coefficient threshold of 0.45 or 45 %. Those nations with an average Gini Coefficient of less than or equal to 0.45 are taken to be low Income Inequality countries whereas those with a Gini Coefficient, higher than 0.45 are classified as high income inequality countries. This classification could have been done based on more reliable sources like intergovernmental organizations or international think tanks but with that in place another requirement, that of the selection of economically advanced nations would not have been met. While carrying out this type of study, it is of utmost importance to choose a sample which includes nations with high GDP per capita rankings as the core purpose of the study is to assess the Easterlin Paradox which centers around the scenario of rapid economic growth and hence eventually higher levels of Incomes. Hence the selection of high income countries, is important to ensure unbiased results. With this constraint in place, it is not possible, unfortunately, to group the nations on the basis of Income Inequality classification by reliable sources as both of these

classifications (that of Income Inequality and the one of GDP ranking) are partially mutually exclusive

2.   Literature Review

Easterlin Paradox has been studied by the academics ever since it was identified by Easterlin (1974). There could be many factors that might offer an explanation of the paradox, however, this study has been carried out in the tradition of those researchers who investigated the paradox in the context of income inequality. This section aims to inform the readers about the distinct positions being taken by the researchers regarding the role of income inequality in shaping the paradoxical relationship between income and happiness.

Many studies have concluded a strong impact of income inequality on the relation between economic prosperity and happiness / life satisfaction levels. Although these studies employed different frameworks and methodologies, they all conclude the prevalence of an indirect effect of income inequality on the relationship between income and happiness. These studies used the concept of relative income to explain how social comparison by individuals, affect happiness. A number of these studies also use the Relative Income Hypothesis (RIH) and the 'utility of consumption' framework to prove that the utility that we gain from consumption depends on our income relative to other peoples' income rather than our absolute income.

In this regard, researchers like Oishi and Kesebir (2015), Stelzner (2021), Boyce, Brown and Moore (2010), Clark, Frijters and Shields (2008), Shi and Li (2019), Wolbring, Keuschnigg and Negele (2011), Luttmer (2004), Mishra, Nielsen and Smyth (2012), Chang (2012), Distante (2012), in their respective studies have held the position that relative income affects happiness rather than absolute income and that social comparison plays a crucial role in determining peoples' happiness. These studies confirmed a significant role of inequality in determining the relationship between income and happiness.

However not all the literature on the issue has been supportive of the notion that inequality offsets the utility gained from higher income levels. A lot of the studies like those conducted by Oishi, Kesebir and Diener (2011), Zhang and Ma (2013), Ball and Chernova (2007), Zagorski et al. (2013), Stevenson and Wolfers (2008) debunked the role of relative income in determining people's happiness and claim that absolute income instead of relative income affects happiness levels. Their studies prove, through empirical evidence that relative income does not necessarily affect happiness levels and income inequality does not necessarily

affect the relationship between income levels and happiness. In addition, a few of the studies disprove the existance of the Easterlin Paradox in the first place and also the existance of a satiation point beyond which Happiness ceases to rise with rising Incomes.

For the control variables in the model, unemployment, crime and inflation were chosen due to their direct relevance to happiness / life-satisfaction, as proposed by the literature. Cheng and Smith (2015) and Londono et al. (2018) explored the relationship between Happiness and Crime Victimization to conclude that being victimized by Crime had a negative effect on individual life-satisfaction level. Bockerman and Iimakunnas (2005) examined the link between subjective wellbeing and unemployment in Finland to conclude that a personal experience of unemployment showed to reduce life-satisfaction among a given set of individuals. Lastly, Ruprah and Luengas (2010) and Blanchflower (2007) have attempted to test how inflation and unemployment affect Life-Satisfaction Levels. They found that both inflation and unemployment had an adverse impact on individuals' life-satisfaction levels

2.1 Literature Gap

Veenhoven's database of Happiness has been used for the study, which uses aggregated survey answers from National Gallup polls from different countries in order to find happiness scores. While this database employs a meticulous method to find happiness scores across nations, there is a general lack of happiness data present in literature on the topic. It would greatly facilitate this research topic if there were surveys conducted to collect data on happiness, that is related to peoples' income or wealth levels. Rather than using subjective happiness data, using more objective or income-oriented happiness data, collected through surveys would be more conducive to this thus research topic as it would appropriate happiness according to the nature of the study which concerns income-based happiness.

3. Methodology

This section comprises of three sub-sections outlining the theoratical framework, sources of data and variable definitions and the model specification.

3.1 Theoretical Framework

The underlying theory that provides a fundamental model for the respectvie research is the Reference Group Theory, (Merton and Kitt 1950; Merton 1968; Hyman and Singer 1968) which posits that people evaluate their status and success relative to the norm set by groups salient to them and includes (but does not require) the possibility that the society as a whole function as a reference group. This theory

provides an insight into why sole income might not make people happier rather their relative incomes and status in a society (reference group) also contributes to their happiness.

In addition, the present study makes use of an interaction term of Income Inequality and GDP per capita to examine the indirect effect of income inequality on the relation between happiness and the standard of living. The indirect effect of income inequality on happiness is tested, first in a micro panel (panel 1) consisting of 24 of developed/transitioning economies (for time period 2011-2020), as classified by World Economic Situation and Prospects (WESP) report (WESP, 2014).

Then the same panel (panel 1) is increased to a time period of T = 21 years, and made into panel 2, which is tested on a similar pattern using Fixed Effect Regression. Then panel 2 is split into two alternating panels, panel 2.1 and panel 2.2, on the basis of Income Inequality, with N=12 countries and T=21 years, each. Panel 2.1 is considered to be high Income Inequality countries dataset while Panel 2.2 is taken to be low Income Inequality countries dataset. This classification is done arbitrarily; average score of Gini Coefficients of individual countries, for the time span of 21 years (2000-2020) was taken and compared to an arbitrary Income Inequality/ Gini Coefficient threshold of 0.45 or 45 %. The nations with an average score less than or equal to this arbitrary threshold were classified as low-Income Inequality nations whereas those with a higher average score were classified as high-Income Inequality nations. The fixed effects regression is then run on these two macro panels (T > N)

3.2   Data and Variables

This subsection contains information about data description and the variables' description to help the reader understand results in it true context

3.2.1   Data Description

The data used in the study was taken for the time period 2011-2020 (panel 1) and 2000-2020 (panel 2, 2.1 and 2.2), from various sources as mentioned below. A Fixed Effects regression analysis was then applied to the empirical models of the 4 panels used in the study, as portrayed in section 3.3. The research employs a purely econometric, hence empirical approach, to examine if and how income inequality affects the relationship between standard of living and Happiness.

3.2.2   Variables Description

The proxy variable that is used for Happiness is Self-Reported Happiness and it refers to the subjective appreciation of life as a whole as analyzed by survey studies conducted on general population in countries. It has been taken from Veenhoven World Database for Happiness. The proxy variable that is used for standard of living is GDP per capita (current US$). It is taken from World Bank, World Development Indicators. It shows the total gross value contributed by all residents of a country who are producers. The proxy variable used for Income Inequality is the Gini Coefficient and it is extracted from the World Inequality Database (WID). It refers to the dispersion or spread of income or distribution of wealth in a population.

The proxy variable used for Crime is Intentional Homicide (per 100,000 people). It indicates the homicide/murder that is caused to an individual on purpose due to disputes. The proxy used for unemployment is the percentage of total labor force unemployed, reported by the national estimate. It shows the component of labor force that does not presently have any work but is actively looking for it. The proxy for Inflation is inflation rate which is measured by annual percentage change in consumer prices. It refers to the yearly percentage change in the cost of consumers' basket. The source of Crime, Unemployment and Inflation is The World Bank, World Development Indicators.

3.3   Model Specification

3.3.1   Scatter plots

Figure 1. Panel 1 scatter plot of Happiness and GDP per capita
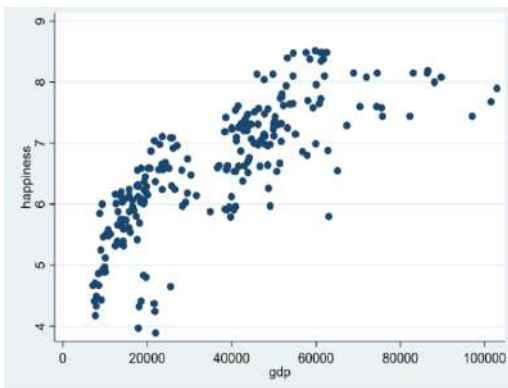
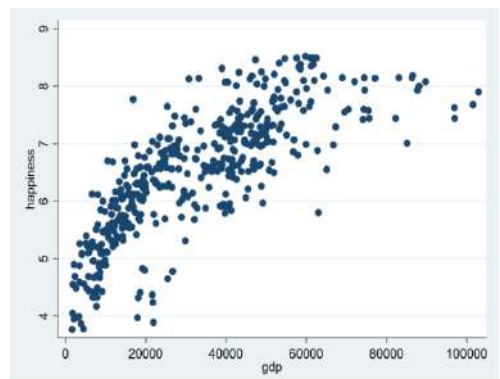**Figure 2. Panel 2 scatter plot of Happiness and GDP per capita**

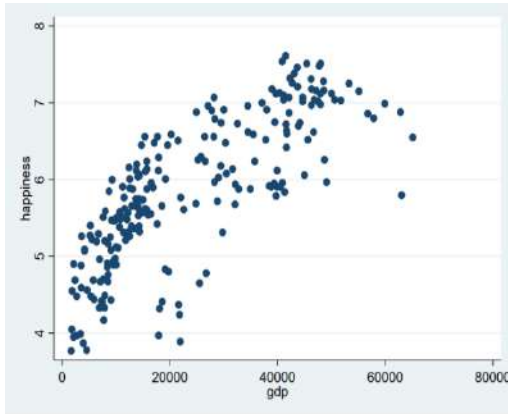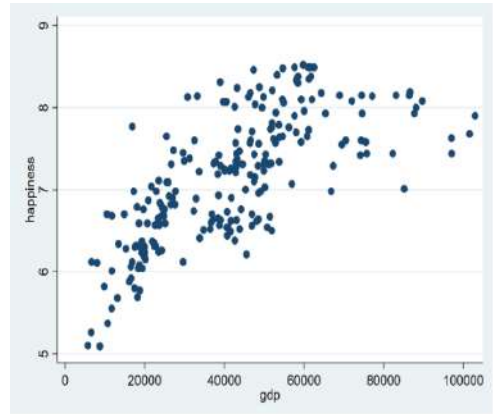**Figure 3. Panel 2.1 scatter plot of Happiness and GDP per capita**

Figure 4. Panel 2.2 scatter plot of Happiness and GDP per capita

The model specification of the regression includes a squared term for the variable of GDP per capita; PC^2. This serves as a way to examine how Happiness varies with GDP per capita at higher levels of GDP per capita and if the relationship of Self–Reported Happiness with GDP per capita is different at the higher levels of income or not.

The following scatter plots of the four panels (Panel 1, 2, 2.1 and 2.2) can be seen to exhibit a non-linear relationship between GDP per capita and Happiness in all the cases. It can also be seen that at lower levels of standard of living, Happiness has a strong positive relationship with GDP per capita but as the income levels continue to rise, the rise in Happiness no longer remains proportional at the higher levels of standard of living. This aspect corresponds to the underlying arguments of Easterlin Hypothesis which argues that at a given point in time, Happiness might vary directly with income, but this trend fades over time, with successive increases in the Standard of Living.

3.3.2   Empirical Model

The following section shows the empirical model and specifies the dependent and independent variables. Fixed Effects Regression model was used for all the panels using OLS method.

Table 1. Empirical Model Specification

	Proxy	Data Source
Dependent Variable		
I. Happiness	Self-Reported Happiness (SRH)	Veenhoven's World Database of Happiness
Independent Variable		
I. Standard of living	GDP per capita (Current US$) (PC)	World Bank, World Development Indicators
II. Income Inequality	Gini Coefficient (Adult-Equal Split) Pre-Tax National Income (GC)	World Inequality Database (WID)
III. Crime	Intentional Homicide (per 100,000 people) (Cr)	World Bank, World Development Indicators
IV. Unemployment	Unemployment, total (% of total labor force, national estimate) (Un)	World Bank, World Development Indicators
V. Inflation	consumer prices (annual %) (In)	World Bank, World Development Indicators

Functional Form of the Model

$$SRH = f(\ PC,\ GC,\ Cr,\ Un,\ In)$$

Econometric model of the former functional form is

$$SRH_{it} = \beta_1 PC_{it} + \beta_2 PC^2_{it} + \beta_3 GC_{it} + \beta_4 (GC_{it}*PC_{it}) + \beta_5 Cr_{it} + \beta_6 Un_{it} + \beta_7 In_{it} + \varepsilon_i + \mu_{it}$$

Where,

β = regression co-efficient of variables

ε = Aggregate term of the model intercept (β_0) and the unobserved, time-invariant heterogeneities across the countries (Z_i) i.e ($\beta_0 + \beta_8 Z_i$)

Note that any variation in ε_i comes directly from Z_i and that since ε_i is a time invariant term, it has only 'i' in the subscript as the 't' or time component is irrelevent.

μ = Random error term

PC = Per Capita Income

PC^2 = Squared term of Per Capita Income

GC = Gini Coefficient

GC*PC = Interaction Term of Gini Coefficient and Per Capita Income

Cr = Crime

Un = Unemployment

In = Inflation

3.3.3   Panel Countries

3.3.3.1 Panel 1, 2, 2.1, and 2.2

The countries that constitute panels 1, 2, 2.1 and 2.2 are shown in the Table A2 (Appendix A).

4.   Results and Discussion

The study adopts a purely empirical/quantitative approach using OLS, Fixed Effect regression applied to 2 macro panels (panel 2.1 and 2.2) and 2 micro panels (panel 1 and 2) in testing how Income Inequality affects the relationship between Income Levels and Happiness across nations. This was examined with the use of an interaction term/product term (PC*GC). The regression also showed the relationship of SRH with Standard of Living, Income Inequality, Crime (Cr), Unemployment (Un) and Inflation (In).

4.1   Empirical Results

Table 2. Results for Panel 1

Variables	Coefficients	P-Value
PC	0.0001458	0.000
PC squared	-2.56e-10	0.017
GC	8.957117	0.000
PCGC	-0.0002478	0.000
Cr	0.0349324	0.412
Un	-0.763672	0.000
In	-0.0108232	0.386
-cons	2.235954	0.000

Number of Observations	203	R-Square 0.37	
Number of Countries	24		
P-Value	0.000		

Panel 1: The model has an overall R-squared value 0.3763. This means that 37% of the variation in the dependent variable is predicted from the independent variables. The coefficient of GDP per capita (PC) is significant ($p < 0.05$) and has a value of 0.0001458 indicating that one unit rise in GDP per capita causes a 0.0001458 units rise in Self-Reported Happiness. This is, by no means a small effect as it means that a rise in GDP per capita of 10,000 U.S $ leads to a 1.458 units rise in happiness level of individuals. It is important to note that a 1.458 units rise in Happiness where Happiness is measured on a scale of 1 to 10 marks a prominent change in Happiness levels. Improved Standard of Living (SRH) does make people happier as shown by the positive correlation between GDP per capita and Happiness. However, this rise in Happiness is tapered off at higher levels of GDP per capita as shown by the coefficient of squared per capita term (PCsquared). The significant ($p < 0.05$) and negative coefficient of PCsquared of magnitude -2.56e – 10 units indicates that the rise in Happiness due to GDP per capita, tapers off/diminishes by -2.56e – 10 units, at higher levels of GDP per capita. This affirms the first part of Easterlin's Hypothesis that although in the short run Economic prosperity and Happiness are correlated, at higher levels of GDP per capita, Happiness and Economic prosperity are not significantly related.

Figure 6. Local Maximum of the Graph of GDP per capita and Self-Reported Happiness
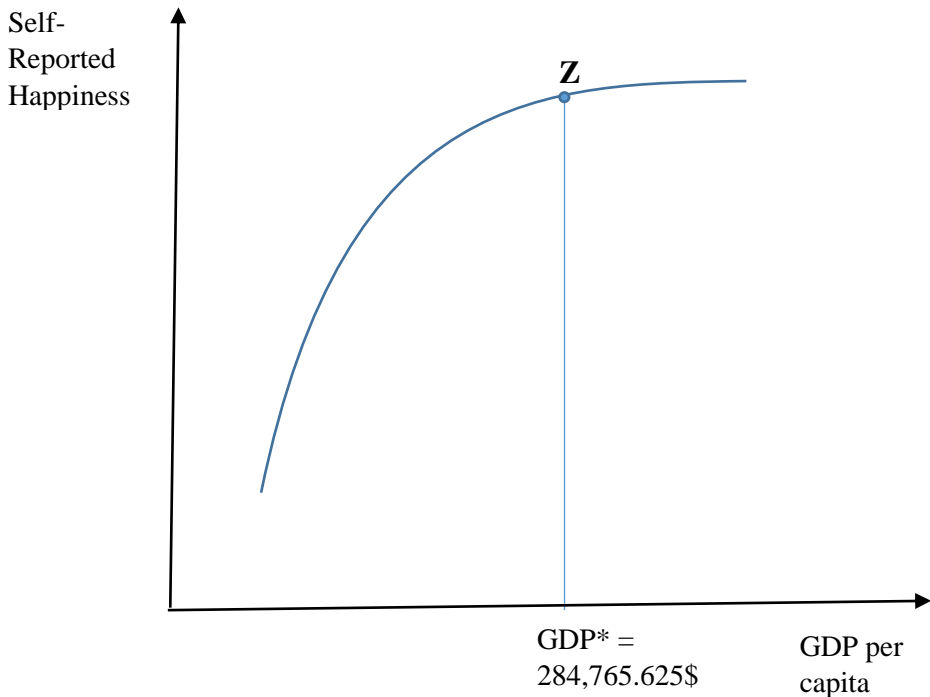
To analyze this in detail, consider the above figure. We can deduce from the regression results, since the coefficient of GDP per capita is 0.0001458 and the coefficient of GDP per capita squared is -2.56e-10 , that the equational form of the parabolic function will be,

$$y = \ 0.0001458x - 0.000000000256x^2$$

and that the graph of the equation will be an inverted parabola, as shown in the above figure. Point Z forms the local maximum and is a stationary point (a point where the derivative of a function is zero). The value of GDP per capita at point Z is calculated by equating the derivative of the above equation to zero and finding the value of x.

$$\frac{dy}{dx} = 0.0001458 - 0.000000000512x$$

$$0.0001458 - 0.000000000512x = 0$$

$$x = 284,765.625 \ \$$$

A simple sign analysis reveals that at a lesser value of x , the derivative of the function ($\frac{dy}{dx}$) has a positive sign (increasing function) and for values greater than $x = 284,765.625\$$ the derivative of the function has a negative sign (decreasing function). Therefore, Point Z forms a local maximum and the value of GDP per capita at this point is 284,765.625$.

Hence, $x = 284,765.625\$$ (local maximum) is the threshold level of income, theoretically viewing, above which the rate of increase of Happiness tapers off. Just as proposed by Easterlin, improving the Standard of Living in and across nations can boost Happiness levels but only until a point, beyond which the correlation between the two variable breaks apart as they are no longer, strongly positively correlated. In our framework, this saturation point of income is found to be at a value of $x = 284,765.625\$$. This means that below this level of income, a rise in incomes cause a rise in Happiness levels across nations but after this level of income, rises in incomes no longer contribute rise in levels of Happiness, as beyond this point the latter variable begins to show a negative effect on SRH.

The second part of Easterlin Hypothesis, that the reason for this contradiction (decorrelation between Economic prosperity and Happiness in long run) is social comparison, is affirmed by the Interaction term coefficient. Firstly, it is important to note that the interaction term (PCGC) has a significant coefficient ($p < 0.05$), affirming the significant indirect effect of Income Inequality on Happiness. This significance shows that the impact of Standard of Living on

Happiness, depends on the level of Income Inequality. Secondly, the coefficient of the interaction term is negative and has a value of 0.0002478, indicating that Income Inequality reduces the positive impact of GDP per capita on Happiness. This means that the effect of GDP per capita on Happiness levels is decreased by 0.0002478 units when incorporating the effects of Income Inequality, compared to when seen without the effect of Income Inequality. Put simply, as Income Inequality rises, the rise in Happiness due to GDP per capita tapers off and hence more positive the Income Inequality is, the more negative the effect of Standard of Living on Happiness becomes.

Hence, the results of the regression reinforce the two core concept of the Easterlin hypothesis; The Happiness levels across nations rise with an increase in the Standard of Living at lower levels of GDP per capita, at higher levels, this positive correlation tapers off and that the reason for this is Income Inequality. When people compare the rise in their incomes to the disproportionately larger rise in incomes of those around them, they are no more as happy. Hence, social comparison affects how people view themselves on the various financial pedestals, across nations.

Moving towards the impact of Crime (Cr) on Self –Reported Happiness (SRH), it can be seen that crime has an insignificant impact on Happiness levels across nations as reflected by a p-value of greater than 5%. Unemployment (Un) has a significant and negative coefficient of -0.0763672 indicating that a unit rise unemployment causes 0.0763672 units decrease in Self-Reported Happiness (SRH). Lastly, Inflation (In) shows an insignificant impact on Happiness levels across countries.

Income Inequality (GC) has a significant (p<0.05) and positive effect on Happiness as shown by a coefficient of 8.95. It means that a single unit rise in Income Inequality causes Happiness to rise by 8.95 units. Since the scale of Income Inequality is 0-1 units, diving the above coefficient by 10 implies that a 0.1 unit rise in Income Inequality causes Happiness to rise by 0.89 units, where Happiness has a scale of 1-10 units. Although these findings might seem contradictory in light of the wide literature present on Income Inequality's adverse effect on Happiness, new findings on the issue propose that Inequality might contribute to Happiness in nations.

Yu and Wang (2017) prove the prevalence of an inverted U-shaped curve between the two variables on the account that initially Happiness rises with rising Income Inequality due to the signal effect which means that people are happier as they view Income Inequality as a sign of social and upward mobility. After all, the

social comparison by aspiring citizens with the richer co-citizens fosters their expectations that they can work hard to narrow the Inequality Gap. This also provides them with the fervor to try to improve their socio-financial status. However, as Income Inequality increases to higher levels the Happiness of people begins to decline due to the jealousy effect as people view their co-citizens who are too rich, as rivals.

Furthermore, Ingram and Katic (2017) also reach to the conclusions that Income Inequality leads to Higher Subjective Wellbeing. This, they argue is because of the view that unfairness in a society causes poverty and that hard work indeed leads to success. In such a society, the motivation to win increases as people know they will get the payoff of their hard work and when people have high goals/pursuit of self-improvement, it automatically boosts their Subjective Wellbeing and Happiness.

Table 3. Results for Panel 2

Variables		Coefficients	P-Value
PC		0.0002117	0.000
PC squared		-3.37e-10	0.000
GC		12.65386	0.000
PCGC		-0.0003678	0.000
Cr		-0.0705885	0.000
Un		-0.0453767	0.000
In		-0.0188262	0.014
-cons		0.1879024	0.049
Number of Observations	395	R-Squared 0.44	
Number of Countries	24		
P-Value	0.000		

Panel 2: When the time period, T is raised to 21 years as in panel 2, almost similar results are observed as seen in regression 1. The overall R-squared for regression 2 is 0.4461 indicating that 44.61% of the variation in the dependent

variable, namely Self-Reported Happiness is attributable to the independent variables. This regression model has a higher overall R-squared value compared to the regression 1 model indicating that this model captures a larger part of variance in the dependent variable than the previous regression model.

Moving on to the coefficient of GDP per capita we observe that it is significant ($p < 0.05$) and has a value of 0.0002117 indicating that one unit rise in GDP per capita causes a 0.0002117units rise in Self-Reported Happiness. More specifically a rise in GDP per capita of 10,000 U.S $ causes Happiness to rise by 2.11 units, where Happiness is measured on a scale of 1 to 10 units.In other words, Happiness increase by more than two-tenths when incomes rise by 10,000 U.S $. Here too, Improved Standard of Living (SRH) makes people happier as shown by the positive correlation between GDP per capita and Happiness but this rise in Happiness is mitigated as GDP per capita continues to rise. This is shown by the coefficient of PC^2 which is significant ($p < 0.05$) and has a magnitude of $-3.37e - 10$ units, indicating that the positive impact of GDP per capita on Happiness decreases by $-3.37e - 10$ units, as GDP per capita continues to rise. The optimal level of Income beyond which Happiness levels begin to taper off is $x = 314,094.95$$. The interaction term, like in regression 1 is significant and negative having a value of 0.0003678. This shows that Income Inequality negatively affects the relationship between GDP per capita and Self-Reported Happiness. Specifically, the effect of GDP per capita on Happiness levels is decreased by 0.0003678 units when seen in combination with Income Inequality, compared to when seen without the effects of Income Inequality. It is important to note that the interactive effect for this regression is more negative as compared to regression 1 and Income Inequality has a more adverse effect on the relationship between GDP per capita and Happiness levels across nations. Hence, here too the coefficients attest to the Easterlin's Hypothesis in that in the long run (at higher GDP per capita levels), Income doesn't contribute to increase in Happiness and that the reason for this is Income Inequality.

Moving towards the impact of Crime (Cr) on Self –Reported Happiness (SRH), it can be seen that Crime has a significant impact on Happiness levels across nations as reflected by a p-value of less than 5%. A coefficient of -0.0705885 shows that a unit rise in Crime (Cr) causes 0.0705885 units decrease in Self-Reported Happiness. Unemployment (Un), also has a significant effect ($p < 0.05$) and a negative coefficient of 0.0453767 indicating that a unit rise unemployment (Un) causes 0.0453767 units decrease in Self-Reported Happiness (SRH). Inflation (In) is seen to have a significant and negative impact on Happiness. A coefficient of -0.0188262 means that one-unit rise in the rate of Inflation (In) causes 0.0188262

units decrease in Self-Reported Happiness (SRH). Income Inequality has a significant (p<0.05) and positive impact on Happiness as stipulated by the results of this regression. A unit rise in Income Inequality causes Happiness to rise by 12.6 units and as the scale of Income Inequality is from 0 to 1, it follows that a 0.1 unit rise in Income Inequality causes Happiness to rise by 1.26 units.

OLS Results for Panel 2.1

Panel 2.1 and Panel 2.2: When panel 2, consisting of N=24 countries was split into two alternating panels, one of High Income Inequality Nations (N=12 countries) and the other of Low Income Inequality Nations (N=12 countries), similar regression results were observed for only the High Income Inequality Panel (panel 2.1). Regression 3 (panel 2.1) is shown to have an overall R-squared value of 0.3814; Independent variables account for 38.14% variation in the dependent variable. GDP per capita has a significant (p < 0.05) coefficient of value 0.000242 indicating direct correlation between Income and Happiness. Specifically, a unit rise in GDP per capita causes Self-Reported Happiness to rise by 0.000242 units. As the GDP per capita levels continue to rise (PC^2), we observe a negative coefficient of magnitude 6.36e-10, indicating that at higher levels of GDP per capita, any rise in incomes, has a diminishing effect on Self-Reported Happiness (SRH) and hence tapers of the rise in Happiness by 6.36e-10 units. The optimal level of Income above which Happiness levels begin to taper off is $x = 190,551.18\$$. Out of all the regressions, the following regression has the lowest threshold level of income $x = 190,551.18\$$, above which Happiness levels begin to taper off.

The interaction term, is significant with a p-value less than 5% and negative with a value of 0.0003693, indicating that Income Inequality negatively affects the relationship between GDP per capita and Self-Reported Happiness. The effect of GDP per capita on Happiness levels is reduced by 0.0003693 units when seen in combination with Income Inequality, compared to when seen without the effects of Income Inequality. From this regression as well we see an attestation of the Easterlin's Hypothesis in that in the long run (at higher GDP per capita levels), Income doesn't contribute to increase in Happiness and that the reason for this is Income Inequality, as affirmed by a significant and negative interaction term coefficient.

Table 4 Results for Panel 2.1

Variables		Coefficients	P-Value
PC		0.000242	0.000
PC squared		-6.36e-10	0.011
GC		10.77598	0.000
PCGC		-0.0003693	0.000
Cr		-0.062674	0.005
Un		-0.0464715	0.000
In		-0.0032074	0.736
-cons		0.2580095	0.026
Number of Observations	196	R-Square 0.38	
Number of Countries	12		
P-Value	0.000		

Crime (Cr) has a significant and negative impact on Self-Reported Happiness (SRH). A negative coefficient of 0.062674 indicated that a unit rise in Crime (Cr) causes 0.062674 units decrease in Self-Reported Happiness (SRH). Unemployment (Un) too has a significant coefficient with a p-value less than 5%. A negative coefficient of value 0.0464715 shows that a unit rise in Unemployment (Un) causes Self-Reported Happiness (SRH) to decrease by 0.0464715 units. Inflation has an insignificant effect on Self-Reported Happiness. In this panel regression too, Income Inequality (GC) has a significant ($p<0.05$) and positive impact on Happiness. A unit rise in Income Inequality causes Happiness to rise by 10.77 units and as the scale of Income Inequality is from 0 to 1, it follows that a 0.1 unit rise in Income Inequality causes Happiness to rise by 1.077 units.

In the Low Income Inequality Panel regression however, it was seen that almost all variables except for Unemployment (Un) and Inflation (In) had an insignificant p value ($p > 0.05$). Per capita, $PC^{2,}$, Income Inequality (GC), Interaction Term (GCPC), all have an insignificant impact on Self-Reported Happiness. Unemployment (Un) has a significant ($p < 0.05$) and negative impact on Happiness as shown by a negative coefficient of 0.0458624. Hence, a unit rise

in Unemployment (Un) causes Self-Reported Happiness to fall by 0.0458624 units. Similarly, Inflation (In) too has a significant and negative impact on Happiness. A negative coefficient of 0.042693 shows that one-unit rise in the Rate of Inflation (In) causes a 0.042693 units decrease in Self-Reported Happiness (SRH). This model however has the highest R-squared value, compared to other regression models, of 0.5719 indicating that 57.19% of the variation in the dependent variable is captured by the model (independent variables). It is important to note that the fact that most of the p-values for the variables of GDP per capita, per capita squared term as well as interaction term are insignificant, is reminiscent of the relevance of income inequality for the relationship between happiness and income. Since income inequality is low in panel 2.2, perhaps that is why the main variables specially the interaction term is insignificant, reflecting that in the countries where income inequality is low, the relationship between income and happiness is not really a subject of income inequality. This in turn affirms the propositions of this research.

Table 5. Results for Panel 2.2

Variables		Coefficients	P-Value
PC		0.0000604	0.071
PC squared		-3.07e-11	0.610
GC		2.933744	0.415
PCGC		-0.0001219	0.122
Cr		-0.0634445	0.310
Un		-0.0458624	0.012
In		-0.042693	0.003
-cons		6.014155	0.001
Number of Observations	211	R-Square 0.57	
Number of Countries	12		
P-Value	-		

A series of tests were carried out on this in order to see whether the variables fit the model. Modified Wald Test for Group-wise heteroscedasticity was used to test for heteroscedasticity, whereas Wooldridge Test for Autocorrelation was used to test for autocorrelation. In regression 1 (panel 1) both heteroscedasticity and autocorrelation were detected and consequently treated using the robust errors and serial correlation correction, respectively. In regression 2 (panel 2) as well, both autocorrelation and heteroscedasticity were detected and treated. Similarly, for regression 3 (panel 2.1), both autocorrelation and heteroscedasticity were detected and treated. In regression 4 (panel 2.2) however only heteroscedasticity was detected and treated whereas no autocorrelation was found in the data.

4.   Conclusions

A summary of the four regressions has been presented in the Regression Results Summary Table A1 given in the Appendix A of this research paper. It can be seen that in all of the regressions except for regression 4, Standard of Living as measured by GDP Per Capita shows a significant and positive coefficient, indicating that as the Standard of Living across nations rises, the Happiness levels rise as well. Then, the coefficient of GDP^2 term is seen to have a significant ($p < 0.05$) and negative coefficient in all the regressions indicating that GDP per capita reduces Happiness at higher levels of GDP per capita. This affirms Easterlin Hypothesis' first proposition that in the long run, Incremental Income does not significantly contribute to a rise in Happiness Levels. From our results, it is clear that although at lower levels of GDP per capita, a rise in Incomes contributes significantly to rises in Happiness across nations but as GDP per capita continues to increase, the rise in Happiness dampens and begin to taper off, as shown by the negative coefficient of GDP^2 term. Hence at higher levels of GDP per capita, this positive relationship between GDP per capita and SRH doesn't hold.

The interaction term, on the other hand, is also significant for all regressions except for regression 4, indicating that Inequality does have a significant, indirect effect on Happiness; it alters the relationship between GDP per capita and SRH. This means that GDP per capita affects Happiness differently at different levels of Income Inequality. As Income Inequality rises, the increase in Happiness caused by GDP per capita declines. This is reminiscent of what the negtive sign of out interaction term in the regressions, demonstrate; Income Inequality has an adverse effect on the relationship between GDP per capita and Happiness. This also affirms the diminishing effect, Income Inequality has for the relationship between Standard of Living and Happiness.

Furthermore, when we split panel 2 intro panel 2.1 and panel 2.2 based on Income Inequality, some noteworthy conclusions were drawn from the results. Regression 3/ panel 2.1 (Relatively High Income Inequality Panel), has the most negative interaction term out of all the regression interaction terms indicating that in countries where Income Inequality is high, Inequality has the most severe tapering off effect on Happiness; it cuts down the rate of change of Happiness by the largest proportion. This again highlights the adverse role of Income Inequality on the relationship between Income and Happiness.

Secondly, it is also noteworthy that regression 3 has the lowest threshold levels of income, above which Happiness levels begin to diminish with rising incomes. This provides an insight into the deduction that in countries where Income Inequality is high, people start losing their sense of Happiness at comparatively lower income levels, indicating that in these countries Income Inequality begins to alter GDP's impact on Happiness levels sooner (at lower income levels) than other panels. The fact that these two phenomena are observed for the High Income Inequality Panels and not in other panels reiterates the negative impact of Income Inequality on the relationship between Happiness and Income levels.

Easterlin concluded his paper by emphasizing that his study doesn't necessarily call for a shift in focus from promoting improved standards of living to reducing Income Inequality, in order to improve welfare (Easterlin, 1974). The main emphasis of this study, however was on the role of Income Inequality as a moderator between Standard of Living and Happiness. Income Inequality significantly and negatively altered the impact of Standard of Living on Happiness and therefore it is in the best interests of nations, if they are to ensure the Subjective Wellbeing and Happiness of their citizens, to prescribe to policies aimed at ensuring a more equitable income distribution.

5.1   Policy Implications

The results clearly reflect the disutility of higher incomes beyond certain income levels. After these threshold levels, as income no more contributes to happiness among citizens, owing to the rising income inequality. Therefore, it is suggested that nations shift focus from merely aspiring for higher incomes, to adopting measures to reduce income inequality and ensure overall welfare.

The threshold Income levels of $x = 284,765.625$, $x = 314,094.95$\$, $x = 190,551.18$\$ of panels 1, 2 and 2.1 respectively, represent the local maximum point of Income (GDP per capita), beyond which the positive relationship between GDP per capita and Happiness disintegrates as GDP rise begins to cut down Happiness.

Although presently no country has as high, a level of income but in the future, as the incomes, of specially the prosperous nations, continue to rise and cross this income pedestal then these countries ought to be faced with the paradox of declining Happiness with rising income levels. Then, these nations would eventually have to switch their focus from merely aspiring for higher incomes to other factors also, one of which is Income Inequality. It then follows that measures to reduce Income Inequality and ensure a more equitable dispersion of incomes would become necessary if nations are to ensure the Well-being of their citizens.

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Appendix A

Table A1. Regression Results Summary

	Regression 1 (panel 1) Micro panel T = 10 years N = 24 nations	Regression 2 (panel 2) Micro panel T = 21 years N = 24 nations	Regression 3 (panel 2.1) Macro panel T = 21 years N = 12 nations	Regression 4 (panel 2.2) Macro panel T = 21 years N = 12 nations
R-Squared:				
(Within)	0.4705	0.7294	0.7094	0.3744
(Between)	0.3838	0.4730	0.3655	0.6545
(Overall)	0.3763	0.4461	0.3814	0.5719
PC (Coefficient)	0.0001458**	0.0002117**	0.000242**	0.0000604
PC^2 (Coefficient)	$-2.56e-10$*	$-3.37e-10$**	$-6.36e-10$*	$-3.07e-11$
GC (Coefficient)	8.957117**	12.65386**	10.77598**	2.933743
GC*PC (Coefficient)	-0.0002478**	-0.0003678**	-0.0003693**	-0.0001219
Cr (Coefficient)	0.0349324	-0.0705885**	-0.062674**	-0.0634445
Un (Coefficient)	-0.0763672**	-0.0453767**	-0.0464715**	-0.0458624*
In (Coefficient)	-0.0108232	-0.0188262*	-0.0032074	-0.042693**
Constant	2.235954	0.1879024	0.2580095	6.014155

* $p < 0.05$ (the coefficients with single steric are significant at 5% significance level) ** $p < 0.01$ (the coefficients with double steric are significant at 1% significance level)

Table A2: Panel 1, 2, 2.1, 2.2 Countries

Countries in Panel 1 & 2		Panel 2.1 countries: High Income Inequality Panel (Gini Coefficient > 0.45)	Panel 2.2 countries: Low Income Inequality Panel (Gini Coefficient ≤ 0.45)
1. U.S.A	13.Czech Republic	1. U.S.A	1. Czech Republic
2. U.K	14. Finland	2. U.K	2. Finland
3. Spain	15. Austria	3. Spain	3. Austria
4. Greece	16. Slovakia	4. Greece	4. Slovakia
5. Bulgaria	17. Sweden	5. Bulgaria	5. Sweden
6. Romania	18. Norway	6. Romania	6. Norway
7. Latvia	19. New Zealand	7. Latvia	7. New Zealand
8. Lithuania	20. Slovenia	8. Lithuania	8. Slovenia
9. Poland	21. Switzerland	9. Poland	9. Switzerland
10. Germany	22. France	10. Germany	10. France
11. Japan	23. Denmark	11. Japan	11. Denmark
12. Russia	24. Iceland	12. Russia	12. Iceland