

The Happiness-Income Paradox:

Combining Old and New Insights



Bachelor Thesis

Damien Steenbrink, S4243366

Supervisor: Prof. Dr. Esther-Mirjam Sent

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Abstract

The happiness-income paradox was discovered by Easterlin in 1974 and it is the lack of relation between income and happiness over time as opposed to the cross sectional relation. This paper researched this paradox again and used newer data to find this paradox and explain it. Four theories are used: social norm theory, consumer capital theory, capabilities approach theory and aspiration level theory. The empirical part found the paradox again by using data from the WVS. The cross sectional result, however, had a low R-squared. The relation between income and happiness seems to vanish over time. Two theories can explain this vanishing relation: Consumer capital theory argues that income is used over time to replenish capital reserves and Aspiration level theory argues that people adapt to a new income level. Further research is needed to find out which theory has the best fit to the happiness-income paradox.

Keywords: Easterlin paradox, Income, Happiness, Subjective well-being, Happiness Economics

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1. Introduction

The so-called paradox of happiness sparked interest due to its proof that an increase in per capita real income does not necessarily lead to an increase in happiness. Easterlin (1974) showed that income does not automatically translate into happiness over time as opposed to the relation at a point in time and it is important that this paradox is researched in more depth. If income really has no effect on happiness in the long run then it might be a good idea to put less effort in giving people a higher income, but rather focus on other factors that are more important to happiness. Research in the area of happiness can give insights in the mechanisms behind happiness and make it possible for policy makers to implement policy based on these insights and thus achieve a higher level of happiness.

Easterlin repeated his study on the happiness paradox with more countries and newer data and came to the same conclusion as before, claiming that others (Becker et al., 2008)(Beja, 2014)(Beja, 2015)(Deaton, 2008) that did not come to this result had errors in the statistical analysis (Easterlin et al, 2010). The following question is researched in this paper: Do people gain happiness from increases in income? This paper tackles the question in a few steps. First a brief overview of the major theories and empirics of the relation between income and happiness is given. Secondly an empirical analysis is done using newer data on happiness and income to see whether the Easterlin paradox is still valid and this analysis incorporates a longer time horizon for the panel data analysis to see whether there is a long term relation. The empirical analysis also takes both a demographic factor; average age, and a cultural factor; individualism (Hofstede cultural dimension), into account to give a more robust result. The last step is to combine the theoretical insights with the results found in the empirical analysis to come to an answer.

The paper is structured as follows: the second chapter deals with the theory and empirics concerning the relation between income and happiness, which is the basis for the hypotheses that are tested in the empirical part of the paper. The third chapter describes the variables, data sources and the research method that are used. The fourth chapter gives a summary of the results and ends with a discussion of the empirical research. The final chapter gives limitations of the research, concludes and gives advice for future research.

2. Literature Study

This chapter is structured as follows: Section one gives a summary of measurements and definitions that are the basis of this paper. Section two gives a short summary of the different theories involving the relation between income and happiness. Section three gives an overview of different empirical findings concerning the possible connection between income and happiness. Section four explains Hofstede's cultural dimensions briefly.

2.1 Happiness

The structure of this section is as follows: Subsection one deals with the importance of happiness. Subsection two clarifies the terminology used in this paper. Subsection three gives a summary of different measures of subjective well-being. Subsection four explains the choices that were made.

2.1.1 Importance Happiness

The field of happiness had its first appearance in psychology in the 1970s and it has gained attention in economics as well. Happiness economics is a field that is growing in popularity and studying what does or does not make people happy is valuable for policy makers, because being happy has positive effects and can be a goal for some. Income is an incomplete proxy for human welfare, as was found by many authors like Easterlin (1974). Factors such as economic growth, unemployment, inflation and inequality also play a role in the welfare of people. Research in happiness economics shows that reported subjective well-being is a far better way of measuring individual welfare, because it measures experience utility and not just income (Frey, 2008). Being happy also has side-effects that could potentially benefit society. When people accomplish the goal of well-being, they tend to be more optimistic and are generally more successful in their activities (Bosman and van Winden, 2006).

2.1.2 Subjective Well-Being Explained

Happiness is a broad concept that can encompass several other similar terms. Overall there are three different conceptions of happiness. The first is happiness in the narrow sense and it entails the momentary feelings of joy and pleasure. The second is life satisfaction and it is the overall contentment of life. The last is eudaimonia (the good life) and is the quality of life achieved by developing and fulfilling one's potential (Nettle, 2005). Happiness, however, is difficult to measure and subjective well-being is in a way an attempt to measure happiness that is both practical and is the closest to measuring the actual happiness that people have. When measuring subjective well-being, experienced utility is what you are measuring, which is closer to people's actual behaviour as opposed to decision utility that is based on revealed preferences. What people choose does not necessarily have to be the same as what people want (Frey, 2008). Subjective well-being relies on a person's judgement/evaluation of his or her own happiness, which includes emotional responses and life satisfaction (Diener et al., 1999).

2.1.3 Measuring Subjective Well-Being

There are different ways of measuring subjective well-being. They are all based on an individuals' evaluation of his/her affective state. The measures all try to capture both affect, moods and emotions, and cognition, rational and/or intellectual aspects (Veenhoven, 1993). The following ways of measuring subjective well-being are only a few of the ways that are available:

1. The first way to measure subjective well-being is by asking people about their overall satisfaction with their lives through a survey. One of the surveys that uses this method is the World Values Survey that asks people the following question: 'All things considered, how satisfied are you with your life as a whole these days?' and uses a scale from 1 (dissatisfied) to 10 (satisfied) (Inglehart et al; 2000).
2. The second way to measure subjective well-being is to collect real time information on an individuals' experiences in his/her national environment, called the Experience Sampling Method (ESM). Individuals get a beeper or computer and are asked at random times to answer questions about positive and negative affects as well as the intensity of their feelings (Csikszentmihalyi and Hunter, 2003).

3. The third way to measure subjective well-being is to collect data on the experience a person has over a day by systemic reconstruction the next day, called the Day Reconstruction Method (DRM). Individuals recall the activities undertaken and describe each of these episodes in detail. Then they rate these episodes in either positive or negative affect (Kahneman et al; 2004).
4. The fourth way to measure subjective well-being is to look at the amount of time a day a person is in an unpleasant state, where episodes are unpleasant and the most intense feeling in that episode is a negative one; this method is called the U-index (Kahneman and Krueger, 2006).
5. The fifth way to measure subjective well-being is to scan an individual's brain activities with an fMRI where happy people exhibit greater activity in the left prefrontal cortex, this method is called Brain Imaging (Davidson, 2003).

Surveys are widely used due to their availability of data and their good performance relative to their cost. ESM has higher costs than surveys. DRM allows more refined measures of subjective well-being than surveys, but is rather new and only used on an experimental basis. The U-index is a measure suggested by Kahneman and Krueger (2006). The fMRI method is widely used in neuroeconomics (Loewenstein, Rick and Cohen, 2008). Surveys can have a tendency to be upwardly biased due to the socially desirable responses the respondents believe to be proper (Davis, 1965).

2.1.4 Happiness: Choices

The overview that was given in this section was to culminate in choices that were made concerning the used measurement and choice of definition that this paper uses in the remaining parts of this paper. There are different conceptions of happiness that can differ quite substantially from author to author and each of these can be quite different. Nettle (2005) gave three of many conceptions of happiness that are used. The second definition, the overall contentment with life (life satisfaction), is the definition that is used in this paper. This definition has the best fit to the variable that is used to measure happiness. Another choice that was made was to use the survey method as the source for happiness data. This method has a wide availability of data and makes it possible to do robust regressions that have a very strong basis. Now we turn to the theories section for an explanation of the link between income and happiness.

2.2 Happiness and Income: Theories

The structure of this section is as follows: Subsection one explains the choice for the four theories that are used. Subsection two explains social norm theory briefly. Subsection three explains consumer capital theory briefly. Subsection four explains capabilities approach theory briefly. Subsection five explains aspiration level theory briefly. Subsection six compares the different theories.

2.2.1 Four theories of Happiness

There are four distinct theories that are described in this section that all try to give an explanation for the relation (or lack of) between income and happiness. Social norm theory was chosen due to its use in Easterlin (1974). The theory was described by Easterlin (1974) to explain the empirical results he found. Consumer capital theory is chosen due to its strength of explanation. Capabilities approach theory is chosen due to its different point of view on income. Aspiration level theory was chosen due to its use in recent papers as an explanation for the easterlin paradox (Frey, 2008).

2.2.2 Social Norm Theory

There is a specific social norm to which different income groups adhere. Being higher on the societal ladder increases happiness due to the acquired status and the higher relative position to others. However, if everybody has experienced an increase in income, the total happiness remains at the same level. In the social norm utility function increasing the position of all would not increase the happiness of all, because happiness is based on the relative position and not absolute position. A higher income under the classical utilitarian position would increase utility while under the social norm position only an increase in income of a few would increase happiness (inequality as a source of happiness).

Formula 1 gives a social norm utility function based on consumption, which can easily be replaced by other variables such as income. Easterlin (1974) came up with this utility function to fit better with his empirical findings on the relation between income and happiness.

Formula 1:
$$U_i = f\left[\frac{C_i}{\sum a_{ij} C_j}\right]$$
 f=Function, C=Consumption, a=Norm, U=Utility

Formula 2:
$$U(x) := \sum_{i \in I} u_i(x).$$

Formula 2 is a standard utility function. People gain utility from pleasure and lose utility from pain and people seek to maximize their total pleasure. There is no comparison with other people, only the absolute levels matter. Maximising the total pleasure, measured by money, is the way to achieve the greatest happiness to the greatest number of people (Grant and Brue, 2013).

There is a clear distinction in the way utility is gained in these two functions. It is a distinction between absolute and relative income which is the main difference that the social norm theory contributed. Social norm theory argues for relative income due to the presence of a social norm as opposed to a standard utility function that only argues from the absolute level (Easterlin, 1974).

2.2.3 Consumer Capital Theory

Fisher emphasises the time dimension in economic transactions. Value has both a time and a quantity dimension. A good in the present has a different value than the same good at a later date. This time dimension also plays a significant role in his views on capital and income (Hoorn and Sent, 2012). He defines capital as a stock of wealth existing at an instant in time and income as the services of wealth. Income of a community is the flow of services rendered by all its instruments. Fisher discerns two types of final income: subjective income and objective income. Subjective income includes all the conscious experiences (sensations, thoughts, feelings and volitions). Positive items of income are desirable while negative items or income are undesirable. People with the same objective income can have a different subjective income due to differences in effort of earning that income. Fisher distinguishes the utility of goods, desirability and the pleasure obtained by these goods. He distinguishes it by stating that 'Pleasure is not the desire, but the satisfaction of the desire'. Fisher distinguishes the concepts using the time dimension. Utility is a state of mind at a point in time while pleasure is an experience of mind through a period of time (Fisher, 1906).

Boulding builds upon Fisher's insights of the income-happiness relation. He states that an expenditure on a good does not signal consumption, but only an asset transfer. Liquid assets are transformed into relatively illiquid assets. Consumption is when it wears down and it is in fact utilization that satisfies preferences. A good is consumed over time due to it depreciating. We derive satisfaction from the capital stock and not from the additions to it such as income. Boulding got inspired by the subjective income concept to introduce the idea of psychic capital. Psychic capital is an accumulation of desirable mental states and most closely related to welfare (Boulding, 1950).

Both Fisher and Boulding find that neither consumption nor (objective) income satisfy preferences. Capital, however, does, and it is ultimately the utilization of one's capital that satisfies one's preferences. This satisfaction of preferences increases the subjective income. Income can even be a bad when it is needed to replenish the capital stock that has been depreciated (Hoorn and Sent, 2012).

2.2.4 Capabilities Approach Theory

The capability approach that was formulated by Amartya Sen and Martha Nussbaum is an approach concerned with well-being and a person's ability to do valuable acts or reach valuable states of being. The capability of a person reflects the alternative combinations of functionings, the things someone manages to do or be, the person can achieve. Quality of life is assessed in terms of the capability to achieve these functionings. There are functionings with differing levels of importance, such as health as a very elementary functioning. Functionings such as self-respect or social integration are less elementary, but still important. Individuals, however, have different preferences for functionings and attach different weights from each other. Value-objects need to be identified and ranked in the capability approach. A major difference to the utility approach used by the social norm and utilitarian approach, is that it does not attach direct importance to the means of living and freedom like real income (Sen, 2007).

There are four different concepts of advantage related to a person. These are well-being achievement, agency achievement, well-being freedom and agency freedom. The functionings in well-being achievement are things such as escaping morbidity and mortality, but also having mobility and being happy. Being happy is complex. For some having money could make them happy and therefore fulfill this functioning. A capability is a set of functionings representing the various alternative combinations of beings and doings a person can choose. In a standard poverty analysis a lot of weight is put on income while it may mislead the identification and evaluation of poverty. Income is not an end but a mean in the capability approach, the mean to achieve certain functionings such as nutrition to an adequate level. The minimum income needed for reaching the minimally acceptable capability levels differs between countries (Sen, 2007).

2.2.5 Aspiration Level Theory

People set goals they try to achieve and once they reach their goal, a new goal is set that they try to achieve again. People have a goal to earn income at a higher level than they do at that time, once they reach the goal the income aspiration shifts again. Higher utility from material goods wears off and the constant or repeated stimulus reduces the hedonic effects and there is thus adaptation. The hedonic adaptation to material goods induces people to aspire to more. People adjust their aspirations to a higher level once they reach a higher level, they want more and more; wants seem to be insatiable. The aspiration of people is based on relative income, people want to earn more than others and gain happiness from having a higher income than other people. People are concerned about their position on the income ladder, they use social comparisons to measure their satisfaction. People constantly draw comparisons from their environment, both past and future expectations. People eventually adapt to their new income level and thus the increase in happiness is only short term and people aspire to a new level once more (Frey, 2008).

Aspiration level theory is similar to social norm theory in one major aspect. People are concerned with relative income in both theories. However aspiration level theory has an aspiration level that shifts once a certain threshold is reached, as opposed to the social norm theory where happiness is gained as long as income is above the social norm. There is no adaptation unless the social norm itself shifts up (Frey, 2008).

2.2.6 Comparing the four theories

The four theories can be distinguished between two groups of theories: Absolute and Relative income. The relative income theories are Social Norm Theory and Aspiration Level Theory. The absolute income theories are Consumer Capital Theory and Capabilities Approach Theory.

Social Norm Theory involves a social norm that people adhere to and an increase in income increases your position relative to the social norm and thus increases your happiness. Aspiration Level Theory involves aspiration goals of income that are based on the environment. Once this aspiration level is reached, people adapt to this new level of income and set a new aspiration level. Both of these theories look at relative income in a different way. Social norm theory assumes that as long as you are above the social norm your happiness increases, but it gives no explanation for the paradox. Aspiration Level Theory, however, does give an explanation for the paradox. People that gain income have an increase in happiness for a short time until they adapt to this new level and aspire to earn even more again. It shows that over time the relation vanishes.

Consumer Capital Theory looks at income in a different light. Objective income is the income that is measured and is used to keep the capital stock replenished. Income is therefore a means to achieve happiness and not an end to achieve it. Capabilities Approach Theory also looks at income in a different way. Well-being is achieved when the minimally accepted capability level, a combination of functionings, is reached. Functionings have different weights of importance and income is only one of these functionings, income is one of the many means to reach a minimum capability level. Both of these theories look at income as a means and not as an end. Capabilities approach theory does not give an explanation for the paradox. It does, however, give an explanation for the absent link between income and happiness. The Consumer Capital Theory does give an explanation for the paradox. When countries have a higher income than other countries, they have a bigger capital stock that gives people more happiness. When people gain income they replenish the capital stock to keep the happiness at the same level and thus an increase in income is needed to replenish the stock so that happiness will not decrease. This theory shows that there is in fact no direct relation between income and happiness, but that it runs through capital stock. Income increases the capital stock that in turn increases the happiness.

Hence, Consumer capital theory and aspiration level theory can explain the lack of relation between income and happiness over time. Which one is the most fitting is beyond the scope of this paper.

2.3 Happiness and Income: Empirics

The structure of this section is as follows: Subsection one gives a brief explanation of the Easterlin paradox. Subsection two gives an overview of different empirical findings between countries at a point in time. Subsection three gives an overview of different empirical findings within countries across time. Subsection four gives an overview of empirical studies into the Easterlin paradox as a whole. Subsection five gives a short explanation on reverse causality. Subsection six gives the two hypotheses that are based on the findings in this section.

2.3.1 The Paradox Explained

The Easterlin paradox states that at a point in time both among and within nations, happiness varies directly with income, but over time, happiness does not increase when a country's income increases. The relation between income and happiness changes when adding time into the equation (Easterlin et al, 2010). The hypotheses that are tested in the empirical part of this paper are based on the research of previous authors discussed in this section.

2.3.2 Countries at a Point in Time

Several studies were done on the influence of income on happiness at a point in time between countries and most of them found that people living in rich countries are on average happier than people in poor countries (Caporale et al., 2009)(Diener, Diener and Diener, 1995)(Easterlin, 2010)(Graham, 2005)(Inglehart, 1990)(Ma and Zhang, 2014)(Sacks et al., 2012)(Stevenson and Wolfers, 2013). One of these studies found that there is a certain threshold at around \$10,000 where the average income level has little effect on average subjective well-being (Inglehart, 1990), while others tried to replicate this threshold and could not find any (Sacks et al., 2012)(Stevenson and Wolfers, 2013). Some studies could not find a relation (Easterlin, 1974) or uncovered the bias by accounting for cultural and language differences by grouping countries in six different groups (Helliwell, 2003). Figure 1 and 2 (Appendix A) are examples of how results of the relation between happiness and income differ. In Figure 1 increases in income are not accompanied by increases in happiness while in Figure 2 increases in happiness diminish when income increases.

2.3.3 Countries Across Time

The research in the previous subparagraph used cross-sectional data. Research done on longitudinal data came, for the most part, to a different result where average happiness has remained rather constant in countries over time, while income per capita has risen quite substantially.

This has been found in countries such as the United States, United Kingdom, Belgium and Japan across different time frames (Blanchflower and Oswald, 2004)(Diener and Oishi, 2000)(Diener et al., 2013)(Di Tella and MacCulloch, 2006)(Easterlin, 1974)(Easterlin, 1995)(Frey and Stutzer, 2002)(Kenny, 1999)(Lane, 1998)(Myers, 2000). There is however proof in other countries that there is in fact a positive relationship between income and happiness over time. In Denmark, Germany and Italy there was in fact a positive relation (Diener and Oishi, 2000). Figure 3 (Appendix A) shows the result that was found in Japan, the increase in income does not lead to an increase in happiness as was the case with most cross-sectional studies.

2.3.4 Easterlin Paradox

The different studies in the previous subsections looked at either the relation at a point in time or at the relation across time. There are a lot of studies that research both so that it is possible to give more definitive results. Most of the studies on the Easterlin paradox actually support the paradoxical finding (Bartolini and Sarracino, 2014)(Clark and Oswald, 1996)(Diener and Biswas-Diener, 2002)(Di Tella et al., 2003)(Dynan and Ravina, 2007)(Easterlin, 2010)(Easterlin et al., 2010)(Frijters et al., 2004)(Howell and Howell, 2008)(Sacks et al., 2010)(Senik, 2004), while there are others that did not find this paradox and found a positive relation for both (Becker et al., 2008)(Beja, 2014)(Beja, 2015)(Deaton, 2008). The results, however, are called into question by other studies on the basis of statistical errors and empirical methods used (Easterlin and Sawangfa, 2009)(Krueger, 2008)(Layard et al., 2009). Clark et al. (2008) gives a more complete overview of different studies that are done on the Easterlin paradox.

2.3.5 Reverse Causality

Most research on happiness assumes that the relation between income and happiness is from income to happiness, while the relation might in fact be reversed. People that are more satisfied with their life, have more reason to work hard and thus earn a higher income. Happy people might be more creative and entrepreneurial than unhappy people (Kenny, 1999). For the remainder of this paper, it is assumed that the causation is in fact from income to happiness.

2.3.6 Hypotheses

The hypotheses formulated in this subsection are based on the studies that are referred to in this section of the chapter. There are therefore no references to sources in this section.

Most studies found a positive relation between income and happiness at a point in time. There were, however, other studies that did not find a positive relation.

A positive formulation of the first hypothesis is used to test the relation.

- Hypothesis 1: *increased income leads to an increased level of happiness between countries at a point in time.*

Most studies did not find a relation between income and happiness over time. There were, however, other studies that did find a positive relation.

A positive formulation of the second hypothesis is used to test the relation.

- Hypothesis 2: *increased income leads to a higher level of happiness over time within countries.*

The Easterlin paradox is found when Hypothesis 1 is accepted and Hypothesis 2 is rejected. When both are accepted or rejected there is no paradox and it is clear in this scenario that there is either a relation or there is not a relation at all. The positive formulation of both hypotheses is necessary to be able to properly test them in the empirical analysis, it is expected that hypothesis 2 will be rejected.

2.4 Hofstede Cultural Dimensions

People are in a way programmed to think, feel and act in a certain pattern. These patterns are a person's mental program that makes it possible to make decisions and act in certain ways. The source of these mental programs lie within the social environment and is called culture, refinement of the mind. Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others. To be able to measure cultural differences between countries it is important to divide culture into different dimensions that can be measured relative to other cultures. There are four main dimensions of culture: (Hofstede et al., 2010).

1. Power Distance: “the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.” (Hofstede et al., 2010, p. 61).
2. Collectivism vs Individualism: “individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onwards are integrated into strong, cohesive ingroups, which throughout people’s lifetime continue to protect them in exchange for unquestioning loyalty.” (Hofstede et al., 2010, p. 92).
3. Femininity vs Masculinity: “a society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough and focused on material success, whereas women are supposed to be more modest, tender and concerned with the quality of life. A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender and concerned with the quality of life.” (Hofstede et al., 2010, p. 140).
4. Uncertainty Avoidance: “the extent to which the members of a culture feel threatened by ambiguous or unknown situations.” (Hofstede et al., 2010; p. 191).

Hofstede et al. (2010) argue that there are specific dimensions to cultures that influences the thought processes of people. One of them is individualism that ranks countries based on the ties between individuals. In a society where individualism dominates it is to be expected that people are less concerned about relative income than people in a society where collectivism dominates. Therefore individualism is used as an indicator in the cross sectional analysis to test whether there are major differences in the relation between income and happiness when distinguishing cultures based on the level of individualism.

3. Research method

This chapter is structured as follows: Section one describes the WVS. Section two describes the data and method that are used in the cross sectional analysis. Section three describes the data and method used in the panel data analysis.

3.1 World Values Survey

The world values survey is a survey held in different countries. The survey is held in so called waves that consist of countries with at least a 1000 individual observations. Each wave covers a time period of 4 years in which different countries participate. The last wave was wave 6 and ran from 2010 to 2014. The survey consists of many questions ranging from health to education. It also consists of two questions concerning happiness. These are the feeling of happiness and life satisfaction. There are also several demographic and cultural questions in the survey of which age was used (WVS, 2015).

3.2 Cross Section

3.2.1 Data

In the cross sectional analysis a few variables were used and the reason to use each of these variables is explained in detail now. The dependent variable that is used to represent happiness is life satisfaction. The reason why life satisfaction was used was due to the bias that was in the feeling of happiness question that the WVS uses, there was a change in the order of answer options between waves. Life satisfaction, however, is a measure that is based more on economic conditions, but it gives similar patterns as the feeling of happiness measure (Easterlin et al, 2010). In the cross sectional analysis the different answer options between waves might not pose an issue, however it does for the panel data analysis. The measures of both types of analysis need to be as close as possible to be able to give definite conclusions of the cross section relation compared to the relation over time. Life satisfaction was obtained by averaging out all the answers to the life satisfaction question from WVS wave 6.

A few independent variables were used in the cross sectional analysis. The first independent variable is the most important one and is a measure for income. GDP per capita was used as a measure for income due to its wide availability in different data sources. The second independent variable is age and is a measure for the average age of the population of a country. This variable was added to test the robustness of the relation between income and happiness and was obtained in a similar way as life satisfaction. The third variable is individualism and is a measure for the degree of individualism in a society. This variable was added to see whether adding a difference in culture would change the significance of the relation.

Data from the cross sectional analysis were taken from three different data sources. The first data source is the WVS, world values survey. This survey collects data from different countries by asking questions to a sample of the people of each country. Each country has at the very least 1000 people in the sample. Data from the latest wave, wave 6, was used in the analysis. Both life satisfaction and age are obtained from WVS wave 6 (WVS, 2015). The second data source is The World DataBank that was used by Easterlin (1974) and Easterlin et al (2010). The World DataBank is a reliable source of data and has a very wide selection of data available. Income was obtained from The World DataBank (The World DataBank, 2015). The third data source is Hofstede et al (2010). This data source has data on 110 different countries on six dimensions of culture. Individualism was the variable that was obtained from this data source.

Countries were selected on their availability of data on life satisfaction and GDP per capita. 57 countries (Appendix C) from WVS are therefore used in the cross section analysis. Only three countries from WVS wave 6 have been excluded: Taiwan, Palestine and Argentina. They were excluded due to missing data on GDP per capita from The World DataBank. Individualism did not have data on all these 57 countries and therefore only 33 countries (Appendix C) were available when adding this variable to the model.

3.2.2 Method

The following hypothesis was tested in the cross sectional analysis:

Increased income leads to an increased level of happiness between countries at a point in time.

The regression was done based on the following:

H0: GDP per capita has no effect on life satisfaction,

Ha: GDP per capita has a positive effect on life satisfaction

It is necessary to do a few tests on the variables to know whether it is possible to use certain models or it is needed to use adjusted models. There were two tests done on the variables. The first test that was done was a test for multicollinearity; correlation between independent variables. This was done with two methods. The first method was a correlation matrix that shows the different correlations of all the variables on a one-to-one basis. The second method was to use the variance inflation factor to verify whether there is indeed multicollinearity. The second test that was done was a test for heteroskedasticity; error terms differ in distance from the regression line. The Breusch-Pagan test was used to test for heteroskedasticity.

In the cross sectional analysis several models were used to test the robustness of the first model. The first model is a regression between GDP per capita and life satisfaction. The other models add other variables such as age and individualism to this regression. The second model adds age and the third model adds individualism. The fourth model adds both age and individualism. All these models use a robust method of determining the standard errors due to the presence of heteroskedasticity in the GDP per capita variable.

3.3 Panel Data

3.3.1 Data

In the panel data analysis the same measures of life satisfaction and GDP per capita were used as a basis for the measures of the panel data analysis. The main difference is the use of growth rates in the panel data analysis. Growth rates have the advantage of having β -values that are directly translatable and

non-stationarity is uncommon in growth rates. Growth rates also make it easier to compare a change in a variable to a change in another variable. These growth rates are calculated as follows:

$$((\text{New}-\text{Old}) * 100) / 100$$

The dependent variable that was used in the panel data analysis was life satisfaction growth and is used as a measure for the change in happiness. The independent variable that was used was GDP per capita growth and is used as a measure for the change in income. Both WVS and The World DataBank were used as data sources for the same reasons as in the cross sectional analysis (WVS, 2015)(The World DataBank, 2015).

The selection of countries was done on the basis of the availability of data on life satisfaction and GDP per capita over a longer time horizon. 10 Countries (Appendix C) are therefore used in the panel data analysis. These 10 countries have data from at least 4 different WVS waves. This is necessary to measure the long term effects of income on happiness. Peru has the lowest time span between the first and last wave that were measured and this was still 10 years. Taking a longer time span is at the expense of the number of total observations, which might lead to different results. A longer time horizon, however, helps in removing static that leads to unfounded significant results. It would have also been possible to take countries that have participated in all waves, but that would have left only four countries with a total of 23 observations as opposed to the 40 observations from 4 different waves in 10 countries.

3.3.2 Method

The following hypothesis was tested in the panel data analysis:

Increased income leads to a higher level of happiness over time within countries.

The regression was done based on the following:

- H0: GDP per capita growth has no effect on life satisfaction growth
- Ha: GDP per capita growth has a positive effect on life satisfaction growth

It is necessary to conduct a few tests on the variables to know whether it is possible to use certain models or it is needed to use adjusted models. The first test that was done was a test for autocorrelation; correlation with itself over time, and for this a Durbin-Watson test was used. The second test that was done was a test for stationarity. When dependent and independent variables are both non-stationary, a relation that is found between them can be due to them both increasing or decreasing over time. A Fisher-Type test was used to test for stationarity due to an unbalanced data set. The last test that was done was a test for heteroskedasticity; error terms differ in distance from the regression line. The Breusch-Pagan test was used to test for heteroskedasticity.

In the panel data analysis there were several models used to account for differences between the different countries in different ways. First of all a pooled regression model was used to see whether there is a relation when taking all countries as one. The second model is a GLS model that corrects for first order autocorrelation and contemporaneous correlation, non-stationarity of variables in the same direction. The third and fourth model are fixed effects models that distinguish countries by the differences in fixed effects. The fourth model also corrects for first order autocorrelation. The fifth and sixth model are random effects models that distinguish countries based on both variable and fixed effects by adding a second error term. The sixth model also corrects for first order autocorrelation.

4. Results

This chapter is structured as follows: Section one gives an overview of the results found from the cross sectional analysis, using the models and tests described in the previous chapter. Section two gives an overview of the results found from the panel data analysis, using the models and tests described in the previous chapter. Section three discusses the results of the empirical research.

4.1 Cross Section

The first thing that was done, was to draw a graph with all the points from all 57 countries to see at first glance whether it is possible to see a relationship between GDP per capita and life satisfaction. It is clear from figure 4 (Appendix A) that there is indeed a relation between the two variables. Most observations are however in the lower GDP per capita range with a high variation in life satisfaction. Inglehart (1990) showed that past the income level of \$10.000, the relation between income and happiness reduces significantly. This might also be the case in figure 4 where there is a strong increase in life satisfaction up until this point. After that point the relation is weaker with only a small increase in life satisfaction from big increases in GDP per capita.

The cross sectional analysis uses four models. Each of these models has a different combination of independent variables. Before regressing each of these four models, there are a few tests that need to be done so that the regression models can be adjusted based on these test results. The first test is multicollinearity with a correlation matrix. The results of this can be found in table 1 (Appendix B). At first glance GDP per capita has a significant correlation with all the other variables, including the dependent variable. Further analysis into multicollinearity is necessary based on table 1 and for this the Vif is calculated for both age and individualism in relation to GDP per capita, the main independent variable in this analysis. Age has a Vif of 1.31 while individualism has a Vif of 1.59. Both are under 5 and therefore multicollinearity is not an issue for the analysis.

The final test is the Breusch-Pagan test, which is a test that searches for heteroskedasticity in the variable. In figure 4 it is clear that there is a big variation in life satisfaction at low values of GDP per capita while the variation is low at higher values of GDP per capita. Therefore it is to be expected that heteroskedasticity is present and the Breusch-Pagan test gave a Chi2 of 7.31 with a p-value of 0.0069 so there is indeed heteroskedasticity. The OLS estimate is therefore not BLUE anymore due to heteroskedasticity. The β -values are still good estimates under OLS with heteroskedasticity. The standard errors, however, will not be the proper values anymore. To account for heteroskedasticity the robust method of measuring the standard errors is used for all four models.

The first model has one independent and one dependent variable that are at the core of this paper.

In this model GDP per capita is significant even at the 1 percent level and there is an R-Squared of 0.14, which is in line with the R-Squared that Graham and Pettinato (2002) found in their cross sectional analysis. The second model adds age as a control variable to the analysis, which lowers the t-value of GDP per capita only slightly. However, it remains significant at the 1 percent level. The R-Squared also remains unaltered at 0.14. The third model adds individualism to the analysis and unlike the second model, this changes the significance of GDP per capita so much that GDP per capita is insignificant in the third model with only a t-value of 1.11. The R-Squared is also lower with only a value of 0.07. The fourth model adds both age and individualism to the first model and shows similar results to the third model where GDP per capita is insignificant. The full regression results can be found in table 2 (Appendix B).

GDP per capita and life satisfaction indeed have a significant relation at a point in time. The R-Squared however is only 0.14, which shows that income is only a small part of the determinants of life satisfaction and it requires not only income, but also other factors such as education and health for people to have a high degree of life satisfaction. Hypothesis 1 is therefore accepted and the positive relation between GDP per capita and life satisfaction is a fact when looking at countries at a point in time.

4.2 Panel Data

In the panel data analysis the same steps were used as in the cross sectional analysis.

The first thing that was done in the panel data analysis was to draw a graph containing all the points in time of the different countries using life satisfaction growth and GDP per capita growth as variables. When looking at figure 5 (Appendix A) it is not possible to see a relation between GDP per capita growth and life satisfaction growth. It looks like an increase in income has no effect on life satisfaction.

The panel data analysis uses six models. All these models have the same variables but different methods of estimating the variable coefficients, standard errors and t-values. There are a few tests that need to be done with the variables so that the regression models have the best estimates and are as unbiased as possible. Autocorrelation was the first test that was done and this was measured through the use of the

Durbin-Watson method. The Rho that came out of this test was -.19 which is roughly a DW of 2.38. Autocorrelation is therefore not present in this analysis.

The second test that was done was a test for (non)-stationarity and this was done with a fisher-type test due to the panel data being unbalanced. Both variables are significantly stationary, both have a P-value of 0.0000. The last test that was done was the Breusch-Pagan test for heteroskedasticity. Figure 5 has quite a strong variation in the position of the points across the whole graph, so heteroskedasticity cannot be seen from this figure as opposed to figure 4 from the cross sectional analysis. The Breusch-Pagan test gave a Chi2 of 11.77 with a p-value of 0.0006 so there is heteroskedasticity in the panel data as well. Therefore the robust method of measuring the standard errors is used for acquiring the standard errors and the t-values.

All the models in the panel data analysis share the same variables that are at the core of this paper. In the first model a pooled regression is estimated and there are no significant results found. It may, however, be true that each country does not have the same behaviour and in a pooled regression it is assumed they share the same behaviour. To account for contemporaneous correlation the second model uses the GLS regression method. There are, however, also no significant results found in this model. The third model uses a fixed effect model to account for the fixed differences between countries that might influence the result. This model finds a significant result for GDPG however it is only significant at a 90% significance level. The R-Squared is low as well, an R-Squared of only 0.05 points to a lack of relation.

The fourth model adds a correction for autocorrelation to the fixed effects model. In this model there is again no significant result and the R-Squared is now 0.00. The fifth model uses a random effects model to account for both fixed and variable differences between countries that might influence the result. This model also finds no significant relation between the variables. The last model adds a correction for autocorrelation to the random effects model. However, the significance does not improve enough to

become significant. Almost all models give an R-Squared that are at such a level that there is no relation between the variables. The full regression results can be found in table 3 (Appendix B).

GDP per capita and life satisfaction do not have a significant relation over time. There is only one significant result, found in model 3, that is only significant at the 90% significance level. Over time the relation between income and happiness disappears, while other factors might become more important for life satisfaction. Hypothesis 2 is rejected based on the regression results and there is no relation between GDP per capita and life satisfaction over a long period of time.

4.3 Discussion Results

The empirical analysis had two distinct parts and both parts were necessary to test whether the Easterlin paradox is still valid using the newest data that is available. In short the answer is yes, there is indeed proof that the Easterlin paradox is still valid. There is, however, explanation needed for some of the results that were found.

The first part of the empirical analysis was a cross sectional analysis. It is clear from the graph (figure 4) that was drawn that there is a relation between income (GDP per capita) and happiness (life satisfaction). There is, however, a lot of variation at the lower income levels that is an issue for the analysis. The test for heteroskedasticity proved that there is indeed a difference in variation across the variables that is significant. The results of the regressions point to a significant relation between income and happiness. The R-squared, however, was 0.14. This shows us that income is only a minor part of happiness. The

magnitude of the variable also shows us that income has little effect. An increase in income of 5000 will increase life satisfaction with only 0.1 points. This shows us that a significant and positive relation might exist, but is so weak that it almost loses its usefulness. There is one last thing that might seem odd, adding Individualism to the equation removes the significance of income. While adding age did not make income insignificant at all. Both variables have a similar multicollinearity to income. Overall the significant relation between income and happiness is only a weak one.

The second part of the empirical analysis was a panel data analysis. The graph (figure 5) in this analysis did not seem to contain any relation at all. There is one thing that seems odd and that is the amount of negative happiness growth, almost half of the points are in this negative area. Heteroskedasticity was also present in the variables of this analysis, even more so than in the cross sectional analysis. Other tests that were done all showed either insignificant results or the significant results were of a positive nature. The results of the regressions point to an insignificant relation between income growth and happiness growth. Not a single model gave a significant result at the 95% confidence level. The R-squared of 0.05 also points to an absent relation. Overall there is no significant relation between income growth and happiness growth. Over time the relation between income and happiness disappears completely.

5. Discussion and Conclusion

5.1 Limitations

The research done in this paper had several limitations. Availability of data was one of the major issues that made it significantly more difficult to give a full picture of the relation between income and happiness over time. The availability of cross sectional data was in contrast at a proper level with 57 countries and only 3 countries that were excluded based on lack of data. The unavailability of panel data of a lot of countries made it more difficult to draw definite conclusions about the relation between income and happiness. The panel data analysis was forced to use not more than 10 countries that had at the very least data over 10 years apart so that it was possible to look at the long run relationship of income to happiness. Only a few countries participated in all 6 waves of the WVS so it was necessary to also add

countries with fewer WVS waves up until there were at least 40 observations in total, as opposed to 23 observations that would have been possible with the 4 countries that participated in all 6 waves.

Life satisfaction as a proxy for happiness has been used by Easterlin (2010) to research the relation between income and happiness and is also used by this research. The question that could be asked here is whether life satisfaction is indeed a good proxy for happiness and this might in fact question the results found. Heteroskedasticity is another major concern in the statistical analysis. The measure of income shows heteroskedasticity both in the cross sectional analysis and panel data analysis that invalidate statistical tests of significance. Therefore a different way of measuring the standard errors was used that is less efficient than using OLS.

The last limitation has to do with biases in the data. The choice of life satisfaction over another happiness indicator was to prevent having to deal with this bias in the empirical research that was done. However, there can still be a bias in the data due to the people that take part in the surveys. Self-selecting bias could be present, which lowers the external validity and makes it more difficult to draw definite conclusions. Using surveys has the benefit that it is possible to use a panel data analysis that can deal with errors more easily than a cross sectional or time series analysis.

5.2 Conclusion

This paper is another attempt to give an answer to the Easterlin paradox. Many others have also tried to explain this paradox with either an empirical or theoretical explanation. This paper has tried to give a complete picture by giving both empirical and theoretical explanations for the Easterlin paradox. This was done in three steps. The first step was to give an overview of all the major theories trying to explain the relation between income and happiness. Four theories were chosen for this purpose: social norm theory, consumer capital theory, capabilities approach theory and aspiration level theory. The second step was to try and find the Easterlin paradox again by using newer data from the WVS and looking at the long run relation of income and happiness. The Easterlin paradox was indeed found in the empirical analysis, though with a weak significance in the cross sectional analysis. The third and last step is to answer the research question and is dealt with in this subsection.

There appear to be two distinct theories that can explain the paradox as was discussed in the literature study and they both see income in distinct ways. Consumer Capital Theory and Aspiration Level Theory both have a clear answer to the Easterlin paradox. We now know that even nowadays the Easterlin paradox is still prevalent and that there are plenty of theories that try to explain the link between income and happiness. Both old (consumer capital) and new (aspiration level) theoretical insights can give us an answer to the paradox. Further research into Consumer Capital Theory and Aspiration Level Theory is needed to ascertain which is the most fitting theory that can explain the Easterlin paradox. For now it is enough to state that income is not the key to happiness and we need to turn to other factors to achieve happiness.

Appendix A: Graphs

Figure 1: Personal Happiness Rating and GNP per head (Easterlin, 1974).

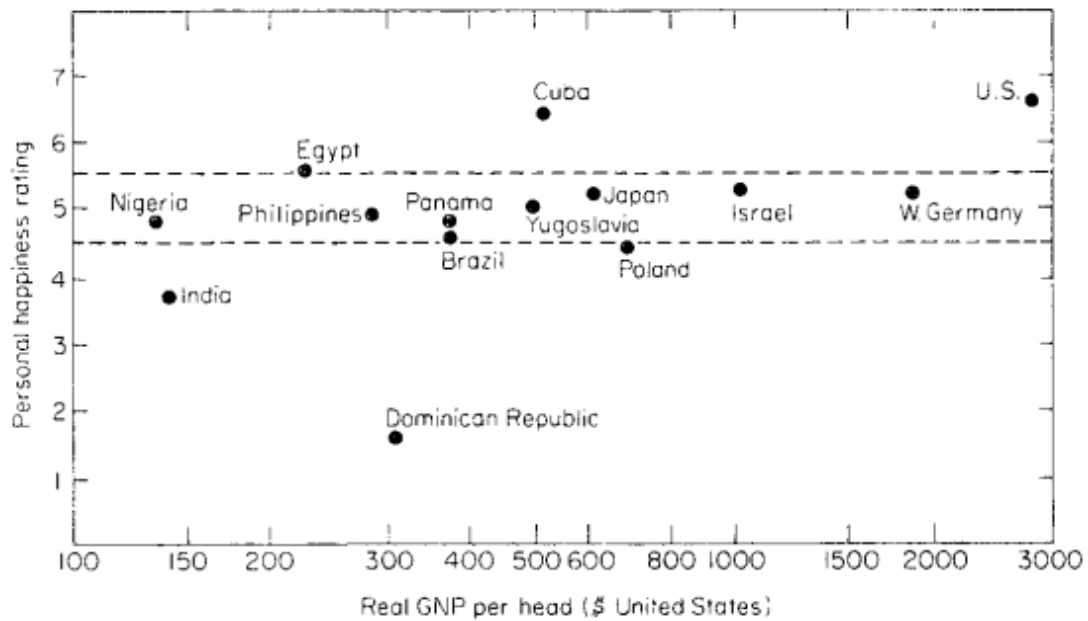


Figure 2: Happiness and Income per Capita (Graham and Pettinato, 2002).

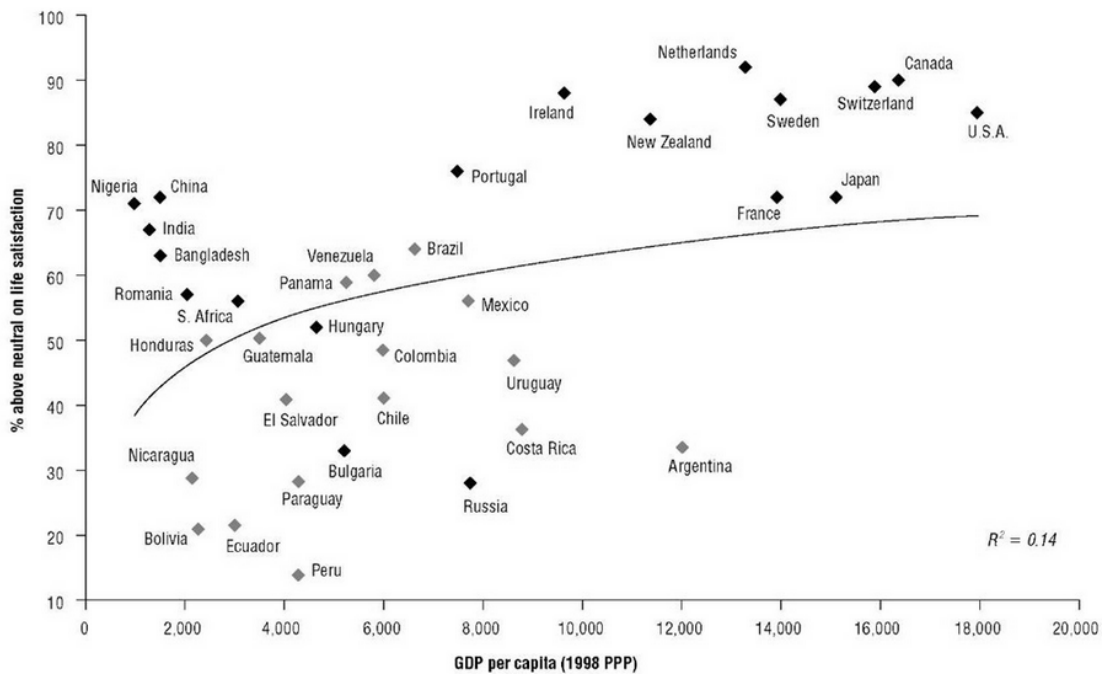


Figure 3: Happiness and Income per Capita in Japan (Frey and Stutzer, 2002).

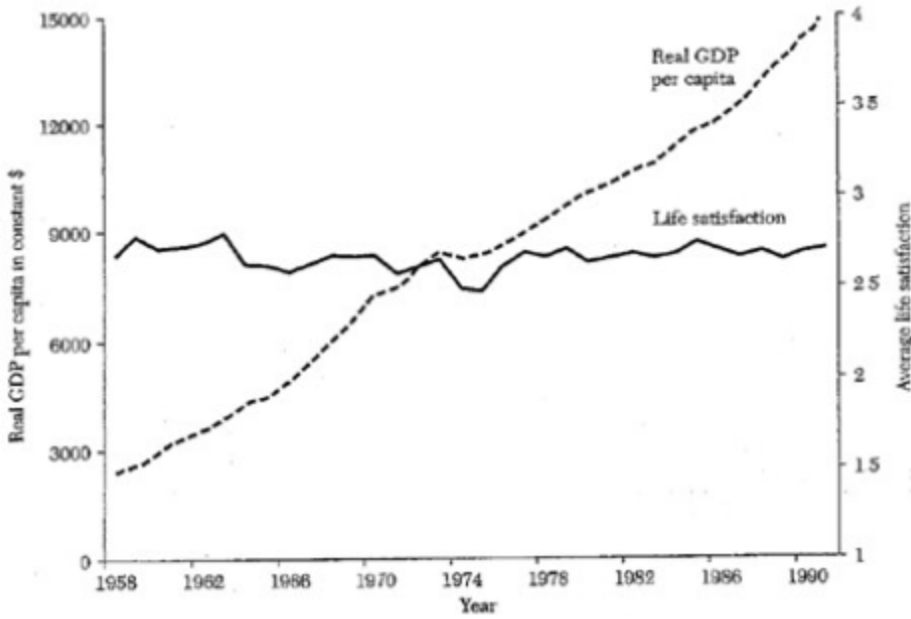


Figure 4: average life satisfaction and GDP per capita.

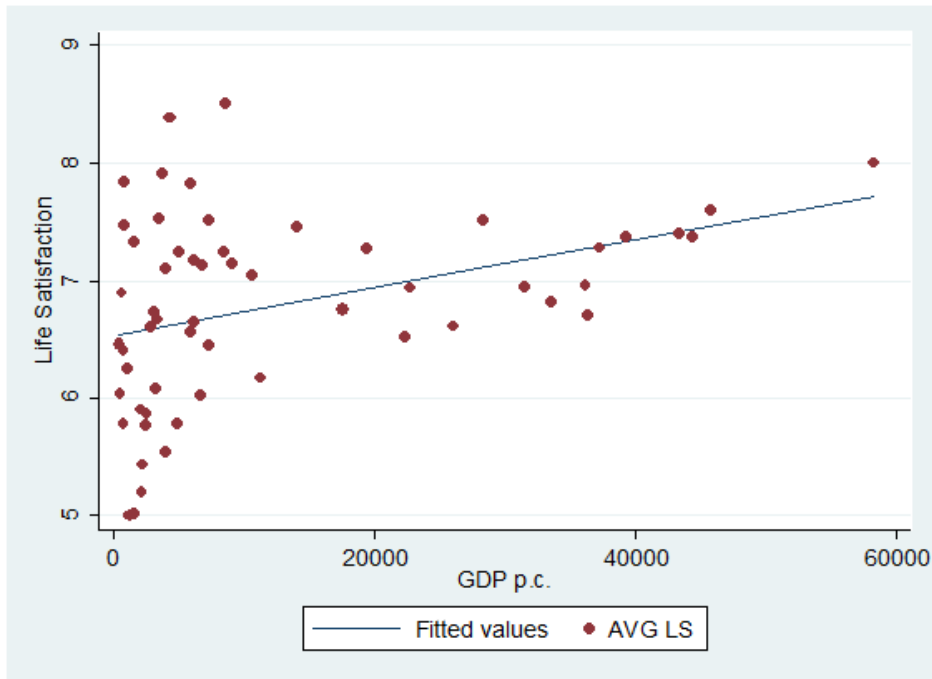
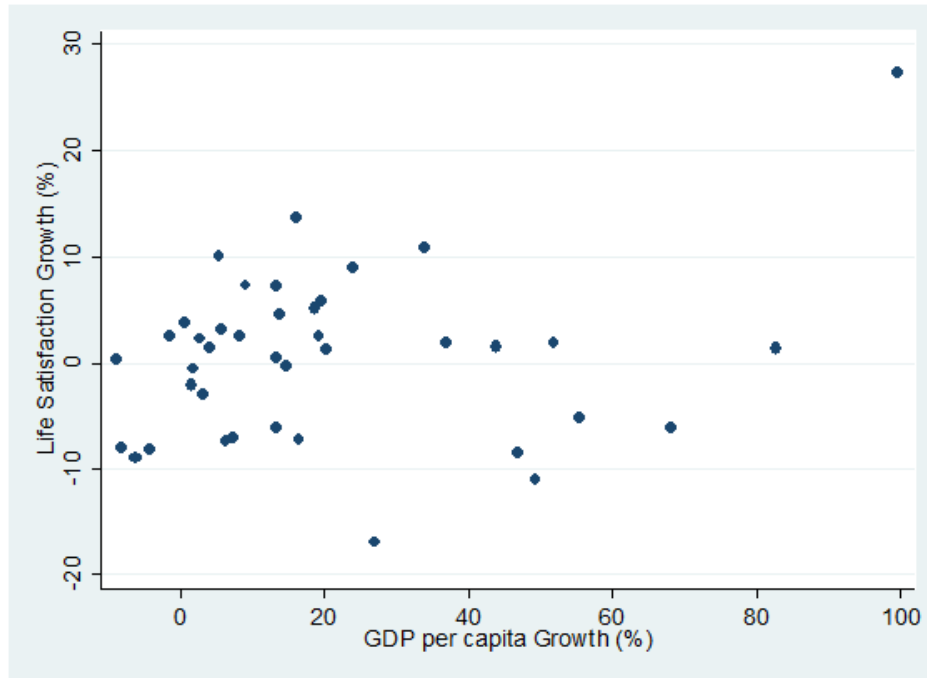


Figure 5: life satisfaction growth and GDP per capita growth.



Appendix B: Tables

Table 1: multicollinearity.

*	AVGLS	GDPPC	AVGAGE	IDV
AVGLS	1			
GDPPC	0.3717* (0.0044)	1		
AVGAGE	0.1414 (0.2939)	0.4843* (0.0001)	1	
IDV	-0.1216 (0.5004)	0.6079* (0.0002)	0.5891* (0.0003)	1

Note: P-Value between parentheses; * significant correlation.

Table 2: cross section regression.

Cross Section	Model 1	Model 2	Model 3	Model 4
Intercept	6.54*** (43.62)	6.84*** (10.38)	7.23*** (31.16)	7.37*** (4.88)
GDPPC	0.00002*** (4.26)	0.00002*** (3.73)	0.000014 (1.11)	0.000015 (1.10)
AVGAGE	-----	-0.0075 (-0.46)	-----	-0.0037 (-0.10)
IDV	-----	-----	-0.0090 (-1.25)	-0.0087 (-1.11)
R ²	0.14	0.14	0.07	0.07
No. of Obs.	57	57	33	33

Note: t-statistic between parentheses; *, **, *** significant at the 10, 5, 1 percent level respectively.

Table 3: panel data regression.

Panel Data	Pooled	GLS	FE	FE (DW)	RE	RE (DW)
Intercept	-0.96 (-0.55)	0.19 (0.16)	-3.09 (-1.79)	-1.70 (-0.54)	-1.57 (-1.22)	-1.39 (-0.74)
GDPG	0.075 (0.71)	0.023 (0.49)	0.178* (2.13)	0.199 (1.06)	0.106 (1.16)	0.093 (1.66)
R ²	0.05	-----	0.05	0.00	0.05	0.05
No. of Obs.	40	40	40	40	40	40

Note: t-statistic between parentheses; *, **, *** significant at the 10, 5, 1 percent level respectively.

Appendix C: Countries

57 Countries Cross Section (Without Individualism)

Spain, Sweden, Qatar, Trinidad, Japan, South Korea, Morocco, United States, Armenia, Malaysia, Uruguay, Russia, Azerbaijan, Belarus, Ukraine, Estonia, Uzbekistan, Kyrgystan, Nigeria, Zimbabwe, Ghana, Cyprus, Kazakhstan, Mexico, Romania, Philippines, New Zealand, Peru, Rwanda, Pakistan, Singapore, Chile, Poland, Turkey, Egypt, China, Netherlands, Australia, Colombia, Slovenia, Ecuador, South Africa, Germany, Thailand, Libya, Iraq, Yemen, Lebanon, Tunisia, Algeria, Jordan, Bahrain, Brazil, Hong Kong, Kuwait, India and Georgia.

33 Countries Cross Section (Individualism)

Spain, Sweden, Trinidad, Japan, South Korea, Morocco, United States, Malaysia, Uruguay, Russia, Estonia, Mexico, Romania, Philippines, New Zealand, Peru, Pakistan, Singapore, Chile, Poland, Turkey, China, Netherlands, Australia, Colombia, Slovenia, Ecuador, South Africa, Germany, Thailand, Brazil, Hong Kong and India.

10 Countries Panel Data

Japan, Mexico, South Korea, South Africa, Chile, China, India, Spain, Peru and United States.

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