COMPARATIVE ANALYSIS OF METHODS FOR DETERMINING THE HAPPINESS DEGREE OF NATIONS

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Abstract:
The paper is structured in several sections. The "presentation highlighting indicators of the degree of" happiness "(HDI, GINI, HPI) shows a brief overview of these and how they were calculated, the" Methodology "details the statistical methods used, a particular focus on determining the factors that influence happiness, the work concluding with some conclusions drawn in the comparative analysis of methodologies for calculating indicators. The data used in this study come from the Human Development Report issued by UNDP (United Nations Development Programme), the report "The (Un) Happy Planet Index" conducted by the New Economic Foundation, the studies carried out by Eurostat and the World Bank. Variables analyzed refer to two lines of study and interest such as human development and happiness associated to nations.

Key words: *Economy of happiness, Happy Planet Index, Human development Index, GINI Index*

JEL classification: *O10, O57*

INTRODUCTION

Many authors consider specific notions of happiness, wealth and life satisfaction as equivalent (Ferrer I, Carbonell A., "Income and well-being: an empirical Analysis of the comparison income effect"). This issue, of happiness, wealth and personal satisfaction is not a novelty to the world of science, being approached by many economists, psychologists, sociologists; they try to unravel the "mystery" to find out what makes us happy or unhappy. The following articles refer to different factors, as well as an explanation of the concept "happiness". Thus, "Why does Income Growth fail to make us happier? Searching for the treadmills behind the paradox of happiness" (2006), Binswanger M. added two other concepts, in addition to those already existing in the literature (hedonic treadmill, positional treadmill), namely those of: multi-option treadmill and time-saving treadmill. All these four forms of lifestyle have an effect on happiness of an individual.

There is a tendency for people to relate to the reference group, his lifestyle, and more runs as the happiness, all are less happy, and allocating increasingly less time for personal pleasures and in the article "Why Growth Is not making us happier? Utility on the hedonic treadmill "(Keely IC 2005) examines the welfare function as a dependent on income growth and variety of consumer goods. The conclusion reached is that although income and continuously growing range of products in developed countries, this growth does not lead to an evolution in the same sense of happiness only until a certain point. Alberto Alesina and co-authors in "Inequality and happiness: it is Europeans and Americans different?" (2004) studied the effect of inequality on the happiness of the individual in society, making a comparison between Europeans and Americans coming to the conclusion that individuals tend to consider less happy when it shows a greater disparity between social classes.

A study conducted in Russia ("Does Happiness Pay? An exploration based on panel date from Russia," Graham C. et al. 2004) and published in the Journal of Economic Behavior & Organization showed that there are many different elements that affect human welfare, some of which are determined by individual behavior: self-esteem, optimism, and the other is determined by socio-economic and demographic variables: changes in marital status, income fluctuations, level of education. People with high levels of happiness were more likely to increase their future income.

INDICATORS REGRADING THE DEGREE OF HAPINESS

Human Development Index (HDI) is an important alternative to other traditional indicators in measuring human development, such as GDP or GDP adjusted ("The human development index: a critical review", Ambuja D, Sagar, Adil Najam 1998). According to the United Nations Development Programme, the organization has developed methodology to calculate this index, "development is much more than the extension of income and wealth […] is an extension of a process of broadening the horizon of choices you can make a man" (UNDP 1990). This process is a continuous change and adaptation, but it highlights three characteristics in the choice of people who are constant, and the final outcome of these elections should be a long and healthy life, and a decent standard of life that can be achieved only through proper education.

The methodology for calculating this index is highlighted in the following steps:

$$x - index = \frac{x - \min(x)}{\max(x) - \min(x)}$$

In the next stage after passing the HDI calculation formula:

$$HDI = \frac{LEindex + 2/3 \cdot ALindex + 1/3 \cdot GER + GDPindex}{4}$$

Where:

- ✓ LE IS life expectancy, that life expectancy Index (life expectancy);
- ✓ Adult Literacy Rate is the LRA, that the percentage of people aged over 15, who can read and write a short description about their daily life Combined Gross Enrollment Ratio CGER is, that the percentage number of pupils enrolled in primary, secondary and high school students from the total should be enrolled in the three cycles, given their age
- ✓ GDP is GDP per capita at PPP in USD, ie GDP per capita calculated in a currency standard (PPP Purchasing power parity)

For each dimension value of the indicator is measured on a scale from 0 - minimum 1 - maximum. Thus, life expectancy at birth has a minimum of 25 years and a maximum of 85 years, literacy and schooling are contained in the interval [0, 100]% and GDP per capita (PPP $) belongs to [100, 40 000] (UNDP 1997, p. 122).

HDI's calculation that involves finding the arithmetic mean of the three components can not be sustained, because it assumes a perfect substitution between components (Dessau 1991). In the case of determining the current level of human development country which recorded a lower level of the three components will have a lower HDI, and vice versa, which does not reflect a real level of development. Thus, the article published by Ambuja d Sagar, Adil Najam is proposed a new methodology for calculating the HDI by introducing multiplicative scheme.

HDR report was removed from the original goal, measuring progress in human development and HDI focuses exclusively on national performance and ranking, ignoring the aspect of development from a global perspective.

Stephen Morse, in his article „*Putting the pieces back together again: an illustration of the problem of interpreting development indicators using an African case study*" argues that development is a complex concept that incorporates social characteristics, economic and environmental and related indicators development must surprise this complexity in any context. HDI ignores the environment and in particular the relationship between environmental impact of country development and actual development of this country. The report NEF (New Economic Foundation): "***The (Un) Happy Planet Index***" (July 2006), an improved alternative to HDI's a site represents ***HPI (Happy Planet Index).*** This new indicator takes into account both objective data and subjective but does not use income as an explicit variable and take into account the planet's resources leading to a long and happy life. Development goal is to provide high standards of human welfare taking into account the responsible conduct of resource consumption. HPI's reflect how each country in the analysis (178) fulfills the above-mentioned objective.

Happiness index is calculated according to three indicators:

- ✓ Ecological footprint (environmental impact), measures the human impact on the environment through their consumption.
- ✓ Hypothetical scores that can be obtained from HPI for certain levels of the three component dimensions are shown in Table. 1.
- ✓ Life satisfaction (satisfaction of living). American Psychologist Ed Diener defines the concept of welfare as being composed of three dimensions: feelings, positive and negative emotions, life satisfaction. Life satisfaction is the individual's perception of his life. This assessment in international research is the answer given by respondents to the question: "How satisfied are you at present relative to your old life?" On a scale from 0 (very dissatisfied) to 10 (extremely satisfied) . Clearly this method is not perfect, ideal as a subjective approach through a series of questions to capture several aspects of respondent's life. However, this question is generally accepted worldwide as an indicator of human welfare due to the comparison results with other national statistics.
- ✓ Life-expectancy (life expectancy).

Table 1: Hypothetical HPI scores and related dimensions

	Life satisfaction	*Life expectancy*	*Footprint*	*HPI*
High level of welfare/acceptable level/ Footprint	7.00	75.00	1.80	61.80
High level of welfare/acceptable level/ Footprint	7.00	75.00	5.40	38.00
High level of welfare/acceptable level/ Footprint	5.00	50.00	0.50	38.00
Ideal score	8.20	82.00	1.50	83.50

GINI coefficient measures the degree of inequality of income levels, representing an average difference between income of all persons. Coefficient which shows the size of the total income would be redistributed if you would like to obtain an

equal distribution of income. GINI coefficient is a measure of dispersion most commonly used to measure inequality in terms of revenue. It is defined as a rate which takes values between 0 and 1: the numerator being the area ranging between Lorenz curve of income distribution and the right for a uniform distribution of income and the denominator in the right area of uniform distribution.

Lorenz curve is a representation of income distribution and show the percentage of total income y% x% of households had. Percentage of households is plotted on the axis OX, and income as a percentage, the axis OY. For each point on the curve can make a statement such as "20% of all households have 10% of total revenue. A perfectly equal income distribution would be one in which every person has the same income. In contrast, a perfectly unequal distribution would be one in which one person holds all the income and the rest have nothing.

GINI index is the Gini coefficient expressed in percentage (GINI coefficient * 100). The values used in this study are those calculated by the United Nations. There is a GINI index calculated by the CIA. The biggest advantage of using GINI is that it's a measure of inequality is regarded as a rate, not variable across populations unrepresentative as GDP or GDP per capita and can be used to compare income distribution in different sectors or countries. GDP is criticized for failing to capture changes for the entire population, while GINI shows how income distribution has changed for the rich and poor. Most developed countries have a coefficient between 0.24 and 0.36, while the United States of America, the Gini coefficient is greater than 0.4. Americans face a stronger inequality in terms of income distribution. GINI coefficient for the whole world was estimated between 0.56 and 0.66.

METHODOLOGY

Cluster Analysis

The purpose of cluster analysis is the group of individuals identified through a series of attributes as a small number of homogeneous classes. Individuals from the same class should be more like each other by the values of variables, while classes up to be as different (Everitt et al. 2001). The aim is to minimize the residual variant obtained within classes and maximize the explicit version of the class.

In cluster analysis there are two categories of classification techniques, namely the hierarchical and non-hierarchical. Hierarchical method, the method variance (Ward's method) is trying to generate groups by minimizing variant within each group. Groups must be defined for the measures of similarity and dissimilarity between the countries studied. Similarities or differences between countries expressed using Squared Euclidean Distance.

To determine the threshold number of groups is used for classification. It represents the grouping from which groups created can be considered very heterogeneous, and below this threshold is considered to be homogeneous groups.

Econometric Model

Multiple linear regression model is used to study the relation of a dependent variable Y and k-1 endogenous variables independent / exogenous variable and a perturbation. In multiple regression analysis is necessary to resolve the following issues:

- ✓ identifying variables regression model;
- ✓ defining the classical model assumptions, regression testing, and the results are determined according to methods that can be used to estimate parameters;
- ✓ estimation;
- ✓ making predictions based on model endogenous variables.

Linear regression model is based on a set of hypotheses that describe the shape model and relationships between variables, the variable nature of waste, etc.. These assumptions concern the following issues:

- ✓ linearity model;
- ✓ to identify the parameters model;
- ✓ disturbance variable has mean 0 for each observation;
- ✓ disturbance variable has a constant dispersion;
- ✓ disturbance variable is not auto-correlated;
- ✓ non-Stochastic repressors (X is a matrix that contains known constant, with no character string variable, so the only source of variation in the model for
- ✓ endogenous variables is represented by variable residual);
- ✓ disturbance variable is normally distributed with mean 0 and dispersion constant different from 0.

Calculation of the ratio determination is based on the decomposition of variation depending on the factors included in the regression model and random factors unregistered. Dependence is calculated to measure the link between endogenous variables and factors of regression.

A.C. Harvey considers the following criteria for assessing the quality of a model:

- ✓ simplicity - a perfect model can describe reality;
- ✓ identify - to have a single estimate for each parameter;
- ✓ of determination - the model should explain as much of the variation of Y variables through;
- ✓ theoretical consistency – the sign of regression coefficients to correspond with the theory;
- ✓ power prediction.

CONCLUSIONS

International Forum of the G8 (Group of Eight), comprising Canada, France, Germany, Italy, Japan, Britain, Russia, USA focuses 65% of world economic power, as well as the military (7 of these countries occupying the top positions the ranking of the most powerful states in military terms). UK, USA, Russia and France had 98% of the declared nuclear weapons.

Although the G8 forum members consider to be the world's leading industrialized democracies (the classification criterion used is the GDP), when taking into account other indicators this remains debatable.

If you would consider the HDI as an indicator of the hierarchy's industrialized democracies, the current group of eight would remain only Canada, Japan and USA, they ranked the last three positions are among the most developed eight states. The other "components" of the G8 should be in descending order of level of human development, Norway, Iceland, Australia, Ireland and Sweden. However, if the G8 would take into account the happiest eight countries of the world and the lowest negative impact on the environment (HPI), then none of the existing States would not occupy positions that are today. In the hierarchy's HPI these countries occupy the last places, is still the top ranked Italy in position 66.

For developed countries, with significant increases Footprint and GDP is due to a reduction of over 50% of the happiness index, while life expectancy is not changed, and life satisfaction increases slightly. In contrast, for countries with a low development level, life satisfaction is the main cause of the modification level HPI. This means that, nationwide, the most significant increases in welfare is due to a low to moderate income. Countries with high levels of human development levels are considered to be the most suitable places for their residence. These countries have an excellent system of

health care, GDP per capita and a high level of education. According to the latest report of the United Nations, Human Development Report 2009, the three countries are Norway, Ireland and Austria. You might think that many of the inhabitants of these countries are very satisfied with their lives. But most states labeled as being well developed (after HDI) had a mediocre level of welfare.

A factor ignored by the HDI is the price paid by rich countries for welfare. For example, the Norwegians consume on average 3.5 times more than their share of the world's resources would go to them (Footprint size quantified value, the components of the HPI). Since resources are scarce worldwide, it is unlikely that all countries to "buy" welfare for the same price that western developed countries obtained. But a high level of resource consumption do not necessarily lead to high levels of wealth and, what is most important, it can achieve a high level of welfare and a lower consumption of resources. HPI provides precise data about the fact that the model of economic development there is a certain threshold. More specifically, once GDP per capita reached a certain level, economic growth has negative effects, causing more harm than good and lower welfare for future generations with a very small or 0 for the current generation. This hypothesis was initially proposed in the "Index of Sustainable Economic Welfare." This is well illustrated by the three Mediterranean countries: Greece, Portugal and Spain. All three have had that form of government until the military dictatorship in 1970 and joined the EU in 80 years. Can be regarded as a typical example of a successful development. While the welfare of the inhabitants had won, the negative impact on the environment is much more pronounced and continues to grow.

HPI proposes another way, namely the need for development to remain within a moderate consumption of resources and to take into account the personal satisfaction of residents. While various hypotheses have been issued relative to the elements, factors that influence happiness. In most studies have highlighted the dependence of happiness against income, income growth and increased happiness leading up to a certain point, at which point no longer changes the income increase happiness levels. But happiness is influenced not only their own income, but also that of the reference group, individuals are especially happy with how their income is higher than the reference group (Carbonell I Ferrer in 2005, "Income and well-being: an empirical Analysis of the comparison income effect "). This study attempted to find other factors that determine your happiness. To quantify happiness was considered as a dependent variable life satisfaction, with a sign of equivalence between these two concepts. It was noted above that life satisfaction is determined in quantitative research in response to the question: "How satisfied are you at present relative to your old life?" Life satisfaction is explained by 77% HDI, and as more factors are introduced in the model this proportion increases to 83%.

The most important factor that influences happiness is the level of human development. This indicator encompasses life expectancy at birth, adult literacy and schooling, and GDP per capita. There is a strong correlation between life satisfaction and HDI (0.879), this being due to the fact that the size and level of development helps to increase personal satisfaction and well being of individuals. The country has a higher level of development; the resident population has access to a quality education system, which ensures an adequate job training, and thus a higher income. All these factors combine to increase an individual's happiness level.

Recent psychological research shows that people who pay more important materials issues such as money, fame, physical appearance and properties they own are less satisfied with their lives than those who consider these things less important. Psychologist Tim kasseri says that the desire for material possessions are an extrinsic motivation (motivation is not valuable in itself, shows a need to be accepted by others.)

Life satisfaction is positively correlated with variables such as loyalty, creativity, desire for adventure and negatively with a stable government, well-being. In other words, loyalty and creativity of those who believes that the most important attributes are happier than others.

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