

**K. G. Suresh and Pratyush Banerjee**

## **AN ECONOMETRIC INVESTIGATION OF THE DETERMINANTS OF SUSTAINABLE WELLBEING OF COUNTRIES**

### **ABSTRACT**

In this study, we intended to analyze the socioeconomic, political and environment factors affecting the sustainable wellbeing of nations (measured by the Happy Planet Index), for a sample of 108 countries for the year 2009. The empirical evidence showed that Human Development Index (HDI), Carbon emission, political freedom and colonial background of nations are significant predictors of the sustainable wellbeing of nations. HDI has a direct effect on HPI of nations, while the level of carbon emission is negatively related with HPI. The HPI levels among different political regimes are different, while the countries without colonial background are better off in terms of achieving sustainable wellbeing than countries with colonial background.

*Key Words: happiness, sustainable wellbeing, HPI, multiple regression*

**K. G. Suresh**

*IBS-Hyderabad, IFHE University, Hyderabad, India*

**Pratyush Banerjee**

*IBS-Hyderabad, IFHE University, Hyderabad, India*

**Correspondence: K. G. Suresh**

Address: IBS Hyderabad, IFHE University, Dontanpally, Pin-501203

E-mail: sureshkg2020@gmail.com

Tel: 91-818-5921465

## INTRODUCTION

During the 20<sup>th</sup> century and the first decade of the 21<sup>st</sup> century, economists at academic and policy making circles have made momentous progress in ensuring significant improvement in the material wellbeing of the people in terms of income and other macroeconomic indicators. But whether this material progress has improved the happiness or subjective wellbeing of people is an unanswered question in economic literature. This issue has been getting the attention of economists and policy makers<sup>1</sup> and the branch of happiness economics has been attracting the attention of empirical researchers in recent years (MacKerron and Mourato, 2009; Welsch, 2009).

Economic researchers and policymakers have acknowledged the importance of considering the concept of subjective wellbeing over prevailing measures such as gross domestic product (GDP) as an indicator of a progressive and healthy society (Blanchflower and Oswald, 2005; Tukker et al., 2008; Veenhoven, 2007). Oswald (1997) rightly observed that “the relevance of economic performance is that it may be a means to an end. That end is not the consumption of beef burgers, nor the accumulation of television sets, nor the vanquishing of some high level of interest rates, but rather the enrichment of mankind's feeling of wellbeing. Economic things matter only in so far as they make people happier.”

But as Kahneman and Krueger (2006) noted, “subjective wellbeing measures features of individuals’ perceptions of their experiences, not their utility as economists typically conceive of it.” Kahneman and Krueger (2006) continue that “acceptance of self-reported measures of wellbeing, subject to the many caveats that subjective measurement requires, could have a profound impact on economics. First, subjective measures of wellbeing would enable welfare analysis in a more direct way that could be a useful complement to the traditional welfare analysis. Second, currently available results suggest that those interested in maximizing society’s welfare should shift their attention from an emphasis on increasing consumption opportunities to an emphasis on increasing social contacts. Third, a focus on subjective wellbeing could lead to a shift in emphasis from the importance of income in determining a person’s wellbeing toward the importance of his or her rank in

---

<sup>1</sup> Following the conference on the need for developing new measures of development beyond GDP organized by European parliament, OECD, WWF and European commission, the European commission released an EU road map for developing new measures of development. As a continuation of this the British government announced that it is considering using an indicator of wellbeing.

society. Fourth, although life satisfaction is relatively stable and displays considerable adaptation, it can be affected by changes in the allocation of time and, at least in the short run, by changes in circumstances.”

However, what good is it to feel happy, if happiness cannot be sustained? From this argument, a recent theme has started to receive importance in the field of wellbeing studies- that of the concept of sustainable wellbeing (Tukker et al., 2008). Sustainable wellbeing refers to the degree to which a society can provide its members with the basic amenities conducive to higher life satisfaction, keeping in mind the natural resource capacity of the society in question (Veenhoven, 2007). One factor which can have a huge impact on the level of sustainable wellbeing of countries is the ecological footprint of different countries (Costanza, 2000). The ecological footprint denotes "the total area of productive land and water ecosystems required to produce the resources that the population consumes and assimilate the wastes that the population produces, wherever on earth that land and water is located" (Costanza, 2000; Rees, 2002). Hence, countries should make strategic objectives to make optimal utilization of the natural resources in order to meet the basic needs of their citizens essential to maintain high life expectancy and higher life satisfaction. Thus, subjective wellbeing should not be considered as a discrete cognition; rather it should be viewed as a continuously persisting belief about one's life. With this background the present paper is intended to examine the influence of socio-economic and political factors (identified from the literature) on the sustainable wellbeing of countries and to test the main hypothesis in the literature regarding the same. Earlier studies have looked into the issue of happiness/subjective wellbeing without taking the sustainability factor into account. In this aspect, our study takes a novel approach.

## **REVIEW OF LITERATURE**

Veenhoven (1989) has defined happiness as "the degree to which an individual evaluates the overall quality of his life-as-a-whole positively." The essence of the term "happiness" may be captured through different terminologies- subjective wellbeing, welfare and quality of life being a few of them (Veenhoven, 2000; Peterson, Park, and Seligman, 2005). Often, terms with similar connotations have been used to capture the notion of happiness- the most prominent one being, quality of life, welfare and subjective wellbeing (Veenhoven, 2000; 2008). Quality of life has been viewed as being made up of two facets- an objective quality of life and a subjective quality of life. Similarly, welfare has been conceptualized to

consist of four distinct dimensions- subjective wellbeing, deprivation, dissonance and adaptation. Subjective wellbeing refers to the tendency of judging life positively and feeling good about it. Deprivation refers to the extent to which the people have access to major benefits of a civilized society. The degree to which there is a visible gap between the policy makers' statements of welfare initiatives and actual welfare implementation is referred to as the dissonance. Adaptation is the appraisal of this reality by a country's citizen that they are left with no choice but to accept to live a discontented life (Veenhoven, 2008).

As elucidated by Diener and his associates, "thus a person is said to have high [subjective wellbeing] if she or he experiences life satisfaction and frequent joy and only infrequently experiences unpleasant emotions such as sadness or anger. On the contrary, a person is said to have low [subjective wellbeing] if she or he is dissatisfied with life, experience little joy and affection and frequently feels negative emotions such as anger or anxiety" (Diener, Suh, and Oishi, 1997). However, regardless of the connotations, the feeling that the word *happiness* conveys is that of one's sense of fulfillment of dreams and the complacency associated with a sense of achievement of such dreams in one's life. Philosophers and social observers have tried to summarize this latent desire for fulfillment in life among human beings through the development of theories of happiness such as livability theory and comparison theory (Peterson et al., 2005; Veenhoven, 2007).

We did not consider happiness or subjective wellbeing as our direct variable of interest. Rather, we were interested in knowing how long societies can sustain their present levels of happiness given the constraints of natural resources. Human beings have a long and dark history of destroying nature's resources. With the rise of consumerism, the developed world has seen a huge euphoria in people regarding buying and selling of consumer durable products, most of which are nondegradable. How long can we sustain our make-believe happy world, if we keep on destroying Mother Nature in the name of hedonic pleasures? To develop a healthy and happy society of future, we should be concerned about maintaining a harmonious relation with our environment because the latter is essential for having improved life expectancy and life satisfaction- the two vital components of subjective wellbeing. Hence we took sustainable wellbeing as our indicator of societal wellbeing.

Theories on subjective wellbeing have emphasized that the initial precondition to feel happy is to be satisfied with the basic amenities of life. According to the livability theory (Hagerty, 1997), "people make judgments on their life satisfaction based on the degree to

which universal human needs are met." This means economic factors such as living standards, income, education, job opportunities, purchasing power and life security may play significant role in the formation of the general perceptions of an individual's satisfaction with life. Hence people in rich countries are expected to be happier than people in poor countries. But Easterlin (1995) found that some of the economically more developed countries in the world scored lower in happiness compared to certain less developed countries.

This apparent anomaly in human behavior which is in contradiction to what economic theories suggest is referred to as the "Easterlin Paradox" (Duncan, 2005; Easterlin, 1995; Oswald, 1997; Veenhoven, 1989). Easterlin (1995, 2001) states that people with more income tend to be happier than those with less income only up to a certain point of time. However, over an extended period, perceptions about happiness will not change, although income levels increased substantially. Recent research in the field of economic development has found some support on behalf of Easterlin's claims <sup>2</sup> (Brockman, Delhey, Welzel, and Yuan, 2008; Tukker et al., 2008; Veenhoven, 2000). Hence economic development may only serve to fulfill the basic life's needs for people. That is why, in the long run, increase in wealth may not result in increased life satisfaction and greater happiness.

Going by the postulates of the livability theory, Human Development Index (HDI) should help in better attaining the objective needs such as better health facilities, better education and higher income and consequently, lead to higher levels of life satisfaction. Blanchflower and Oswald (2005) however presented results contrary to this logic. They found that although Australia ranked third in the 2004 HDI report, it ranked much lower compared to other countries in happiness indices. In efforts to find the reasons behind the findings of Blanchflower and Oswald (2005) and Leigh and Wolfers (2005) conducted a cross-national study of happiness levels of 78 countries using the World Values Survey (WVS) compiled by Veenhoven (2007) and found that Australia did not present a paradoxical riddle as far as its association with human development and happiness goes. However, Leigh and Wolfers (2005) reported anomalies in the cases of Brazil, Chile, Philippines and Mexico. The eastern bloc countries (Bulgaria, Russia, Latvia, Slovakia,

---

<sup>2</sup>Easterlin paradox can be explained with Maslow's need hierarchy theory, which states that individuals first try to satisfy lower order needs such as food, shelter and security, and once they are satisfied with these, they urge for higher level needs such as recognition, fame and self-actualization.

Hungary, Poland, the Czech Rep. and Slovenia) also showed reverse trend in the association between happiness and human development.<sup>3</sup> Gerdtham and Johannesson (1997) have analysed the relationship between happiness and a set of socioeconomic variables and found that happiness is positively related with income and education and negatively related with unemployment, urbanisation, being single and male gender. While they found a U-shape relationship between age and happiness, implying happiness levels of people in the age group of 45 to 64 is lower. Gerdtham and Johannesson's (1997) findings on the relations between happiness with income and unemployment were supported by Namazie and Sanfey (1998) in the context of a transition economy such as Kyrgyzstan. But they found less correlation between happiness with education and gender.

A contradictory view is that subjective wellbeing is a relative phenomenon, dependent on the living conditions in which an individual has to survive (Veenhoven, 1991). There may not be any fixed benchmark for a person to feel happy. This logic of happiness formation has been advocated by the comparison theory which states that happiness does not depend on real quality of life but changes in living conditions have short-term effects on happiness perceptions of individuals and people tend to be happier after difficult times (Hagerty, 1997; Veenhoven, 1991). Consumer price index (CPI) is an economic indicator which may be used as a measure for such comparisons (Easterlin, 1995; Kahneman and Krueger, 2006). Hagerty (1997) conducted a 25-year time series analysis of 8 countries to examine the relationship between GDP and CPI change on happiness levels. His study gave support for both livability theory and comparison theory. The researchers who advocate comparison theory (Easterlin, 1995; Kahneman and Krueger, 2006) hold the view that happiness perceptions are formed not through an objective evaluation of need gratification but through constant comparison with relative standards which change with time.

---

<sup>3</sup> A study by Lelkes (2006) also found evidence of the decrease in happiness in the Eastern Bloc countries. Lelkes attributed such dip in happiness in that particular region to the factor of economic transition that these countries were facing at that time. Most of these countries have been under socialist economy during the regime of the United Socialist Sovereign Republic (USSR). After disintegration of the USSR, these countries started a transition towards market based economy. This created an increase in the unemployment rate and resulted in the general dissatisfaction with life.

The literature on wellbeing economics has seen a significant increase in recent times (MacKerron and Mourato, 2009). In this study, we hoped to contribute to the literature by analyzing the influence of a set of socioeconomic and political variables on happiness for a cross-section of a sample of 108 counties. Our study is different from other studies in the field in many respects. First, among the very few cross national studies in the literature, no study has considered 108 countries as in this study. Second, we intended to empirically test the important theories in the happiness literature such as liveability theory, comparison theory and the Easterlin paradox. Third, this was the first empirical study considering the colonial background of countries in happiness levels, as well as environmental predictors of happiness.

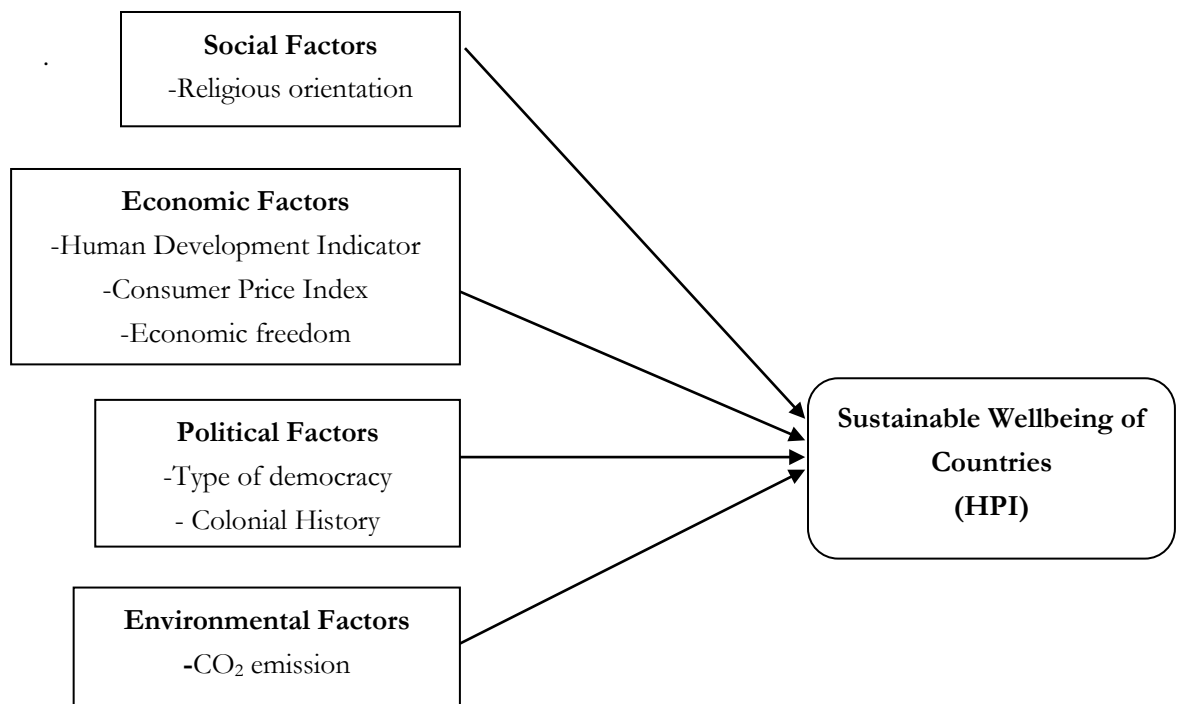
Last but not the least; we decided to consider the sustainable wellbeing rather than subjective wellbeing as our dependent variable of interest. We decided that rather than exploring present levels of subjective wellbeing or happiness, we should concentrate on understanding how long societies can sustain the present level of subjective wellbeing in the future, because such measures can help us get a better picture of how and at what cost we are achieving our happiness. To gauge that, we needed to consider happiness, keeping into account one vital aspect of sustainable life satisfaction- the ecological footprint. The ecological footprint of a country can limit the extent to which the resources of a country can be allocated optimally to its population, hence affecting the overall human development process. Recently, one happiness index known as the happy planet index (HPI) has been developed which incorporated the ecological footprint as a measure of global hectares of land and water (gha) of a country and gives an indication of the level of sustainable wellbeing of countries (Tucker et al., 2008). In this study, we used the Happy Planet Index (HPI) as a measure of sustainable national wellbeing, and we empirically tested how various socioeconomic variables were related to the development of sustainable wellbeing.

## **ECONOMETRIC MODEL, DATA AND VARIABLES**

Based on the existing literature on wellbeing research, we have identified the potential socio-political, economic and environmental variables, which may be related to the sustainable wellbeing of countries. A pictorial representation of the estimated model is given in Figure 1. As shown in the figure, we are examining the effect of social, economic, political and environmental factors on the sustainable wellbeing of countries. Following Lewis, Maltby, and Burkinshaw (2000) we incorporated religion as a potential social

variable in the present study. Livability theory postulates that economic factors such as income, education and purchasing power play an important role in affecting individual happiness. Following the livability theory, we incorporated the education and income indices from the Human Development Index (HDI) provided by the Human Development Report of UNDP as an indicator of the economic variables such as education and standard of living.<sup>4</sup> Another economic variable mentioned in the comparison theory and not incorporated in HDI variable is the cost of living. We used the CPI as an indicator of the cost of living in a country. Data on CPI of different countries was obtained from the World Development Indicators (WDI) database provided by the World Bank (2009).

**Figure 1. Conceptual framework of sustainable wellbeing of countries**



---

<sup>4</sup> Blanchflower and Oswald (2005) and Leigh and Wolfers (2005) used Human Development Index (HDI), as a proxy for the economic factors.



We also considered the economic freedom of countries as a possible economic predictor of sustainable wellbeing. This is because of the plausible effect of economic policies (such as socialist and liberal) on fulfillment of career dreams, self-esteem, availability of consumer goods and the possible increase in the consumer choice. We used the Economic Freedom Index (EFI) provided by the Heritage Foundation.<sup>5</sup> This index varies from 0 to 100, where 100 indicates highest level of economic freedom.

Previous research has also found that wellbeing of countries is dependent on variables such as political freedom (Frey and Stutzer, 2000; 2001) and the impact of colonial history (Iyer, 2004; Mahoney and vom Hau, 2005). As an indicator of political freedom; we incorporated the Democratic Freedom Index (DFI) provided by the Economist Intelligence Unit. Information regarding the colonial history and religious orientation of countries are given in Central Intelligence Agency (CIA) World Factbook.

From the environmental point of view, we considered the impact of the growing menace of global warming on the overall sustenance of life on this planet (Welsch, 2006). A cross-national study by Welsch (2006) of ten European countries showed that air pollution had a significant influence on the subjective wellbeing of countries. The alarming rate at which the natural resources of countries are getting depleted, the ecological balance of the world is hinging on a very delicate thread (Tukker et al., 2008). Add to that, the ever increasing emission of greenhouse gases have added to the growing issue of environmental pollution. What far reaching consequences can such phenomena have in store for our planet's future? There have been some miniscule efforts in certain discrete pockets to raise concern over such issues in the past but in vain. In the new millennium, however, a global shift in the mindset of people has taken place ([www.happyplanetindex.org](http://www.happyplanetindex.org)). Policies are being implemented to control the emission of harmful pollutants in the atmosphere, and the quest is on for a cleaner and greener energy

---

<sup>5</sup>“Economic freedom is the fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please. In economically free societies, governments allow labor, capital, and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself” <http://www.heritage.org/index/about>. The heritage foundation measures economic freedom based on 10 qualitative and quantitative factors such as property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, financial freedom.

source. One such pollution control policy is related with the control of carbon gas emission. Developed countries have already started to take measures to check carbon emission, and the developing countries are fast catching up. As an indicator of environmental consciousness, the per capita carbon emission was used in our study. This data was available in the website of Energy Information Administration of the United States.

## RESULTS AND ANALYSIS

We have estimated the following model first to examine the determinants of happiness across countries.

$$Y(\text{HPI})_i = \beta_0 + \beta_1(\text{HDI})_i + \beta_2(\text{GDP}) + \beta_3(\text{CO}_2) + \beta_4(\text{Religion dummy}) + \beta_5(\text{Democracy})_i + \beta_6(\text{CPI})_i + \beta_7(\text{EFI})_i + \beta_8(\text{Colonization dummy})_i + U_i \quad (1)$$

We have used the dummy for examining the effect of religion and colonial history on happiness of people. For religion, we have used code 1 for Christian countries and 0 for non-Christian countries (includes Islamic countries and others, which includes secular and communist countries). So the  $\beta_4$  will indicate the difference of happiness between Christian countries and non-Christian countries. Similarly, we have used dummy for the colonial history of countries also. We used 1 for the presence of colonial history and 0 in the absence of colonial history. So the coefficient  $\beta_8$  indicate the difference of happiness between previously colonized countries and non-colonized countries. HDI is used a proxy for income, health and education. The descriptive statistics of the data are given in Table 1 given below.

**Table 1. Descriptive statistics and correlation diagnostics**

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Happiness Index (HPI)	3.7409	.28766	1.000	.321*	-.007	-.052	.116	.254*	-.022	-.142	-.031	-.615*	.413*	.347*	.059
2.CO <sub>2</sub> Emission	.6973	1.71544	.321*	1.000	.401*	-.370*	.570*	.182**	.465*	-.461*	.286*	-.405*	.803*	.935*	.224**
3. Colonization	.4352	.49809	-.007	.401*	1.000	-.103	.261*	-.009	.271*	-.101	.180**	.139	.368*	.359*	.120
4. Consumer Price Index (CPI)	4.8391	.14725	-.052	-.370*	-.103	1.000	-.423*	-.104	-.370*	.357*	-.477*	.087	-.189**	-.454*	-.057
5. Democracy	6.1204	2.10326	.116	.570*	.261*	-.423*	1.000	.273*	.680*	-.259*	.415*	-.060	.581*	.642*	.541*
6. Flawed democracy	.3241	.47021	.254	.182**	-.009	-.104	.273*	1.000	-.380*	-.390*	.078	-.067	.264*	.210**	.333*
7. Full democracy	.2315	.42375	-.022	.465*	.271*	-.370*	.680*	-.380*	1.000	-.309*	.272*	-.011	.390*	.499*	.232**
8. Hybrid democracy	.2407	.42953	-.142	-.461*	-.101	.357*	-.259*	-.390*	-.309*	1.000	-.114	.067	-.324*	-.454*	-.106
9.Economic freedom	4.1205	.15990	-.031	.286*	.180**	-.477*	.415*	.078	.272*	-.114	1.000	-.009	.241**	.345*	.241**
10. Death rate	2.0986	.39768	-.615	-.405*	.139	.087	-.060	-.067	-.011	.067	-.009	1.000	-.363*	-.381*	.134
11. Education	-.2365	.28423	.413	.803*	.368*	-.189**	.581*	.264*	.390*	-.324*	.241**	-.363*	1.000	.776*	.401*
12. Income	-.3960	.36910	.347	.935*	.359*	-.454*	.642*	.210**	.499*	-.454*	.345*	-.381*	.776*	1.000	.302*
13. Religion	.5926	.49364	.059	.224**	.120	-.057	.541*	.333*	.232**	-.106	.241**	.134	.401*	.302*	1.000

Note: \*p&lt;.01, \*\*p&lt;.001

From Table 1, it is observed that happiness is positively correlated with carbon emission ( $r=0.321$ ,  $p<0.01$ ), flawed democracy ( $r=0.254$ ,  $p<0.01$ ), and HDI in terms of income ( $r=0.413$ ,  $p<0.01$ ) and education ( $r=0.347$ ,  $p<0.01$ ) and negatively correlated with the mortality/death rate ( $r=-0.615$ ,  $p<0.01$ ). Hence we have used HDI as a proxy for education, income and health.

The results of model 1 are given in Table 2. As shown in the table the significant F statistic indicates that the predictor variables are related to the dependent variable and the  $R^2$  is 0.30. Among the beta coefficients, coefficient for HDI, colonization dummy and democracy are significant. The HDI coefficient is significant at 1% and the expected positive beta coefficient implies that the HPI is positively related with the HDI. The beta coefficient value 0.79 indicates that a 10% increase in HDI value will increase the HPI by 7.9%. The coefficient of dummy variable for colonization is significant at 5% and the negative value of the coefficient implies that the non-colonised countries are happier than the countries with colonial history. The democracy variables are significant only at 10% and the sign of the coefficient is negative against the expected positive sign. The variables like income (per capita GDP), CPI, economic freedom and religion dummy are not significant in the estimation of Model 1. Since the JB test is insignificant, we are accepting the null hypothesis of normality of residuals in the estimated model. The White Test for Heteroscedasticity also provides positive result implying that the model is free from the problem of Heteroscedasticity. Following the Economic Intelligence Unit reports on Democracy Index, we have classified the countries as full democracy, flawed democracy, hybrid democracy and authoritarian regime based on the democracy index value. We are expecting a difference in wellbeing level across different political systems, since the democratic countries provide more opportunities to the citizens to participate in the political process to solve the grievances. This can be again justified on the grounds that since we are examining sustainable wellbeing, people's participation and campaign for environmental protection can be more in democratic countries than in non-democratic countries.

**Table 2. Regression result for model 1**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	4.883348	1.394694	3.501377	0.0007
HDI	1.378852	0.256149	5.382997	0.0000
GDP	0.078220	0.211104	0.370526	0.7118
CO <sub>2</sub>	-0.114164	0.044591	-2.560242	0.0120
Religion	-0.043646	0.058941	-0.740502	0.4607
Democracy	-0.031872	0.017280	-1.844398	0.0681
CPI	0.166765	0.200743	0.830739	0.4081
Economic freedom	-0.256051	0.172675	-1.482847	0.1413
Colonial background	-0.101332	0.051154	-1.980915	0.0504
R-squared	0.363500	S.E. of regression		0.238593
Adjusted R-squared	0.312065	F-statistic		7.067(0.000)

To examine the difference of sustainable wellbeing among the above mentioned group of countries we have used as dummy variables. Hence Model 1 is augmented with the dummy variables for the group of full democracy, flawed democracy, hybrid democracy and authoritarian regime. So Model 1 becomes

$$Y(\text{HPI})_i = \beta_0 + \beta_1(\text{HDI})_i + \beta_2(\text{GDP})_i + \beta_3(\text{CO}_2)_i + \beta_4(\text{Religion dummy})_i + \beta_5(\text{Democracy index})_i + \beta_6(D_1) + \beta_7(D_2) + \beta_8(D_3) + \beta_9(\text{CPI})_i + \beta_{10}(\text{EFI})_i + \beta_{11}(\text{Colonization dummy})_i + U_i \quad (2)$$

$D_1 = 1$  for full democratic countries and 0 in all other cases,  $D_2 = 1$  for flawed democratic countries and 0 for all other, and  $D_3 = 1$  for hybrid democracies and 0 for all the other four systems.  $\beta_5$  indicates the beta coefficient for the authoritarian regimes,  $\beta_5 - \beta_6$  is the differential coefficient of authoritarian regime and full democracy,  $\beta_5 - \beta_7$  is the differential coefficient of authoritarian regime and flawed democracy and  $\beta_5 - \beta_8$  is the differential coefficient of authoritarian regime and hybrid democracies. The results of Model 2 are given in the following Table 2. Since the White test for Heteroscedasticity provides negative results (indicates the presence of Heteroscedasticity) in the original model<sup>6</sup>, we have re-estimated Model 2 for correcting the standard error by using White heteroscedasticity-consistent standard errors and covariance method. The model is free from other statistical problems such as multicollinearity and non-normality of residual.

<sup>6</sup> The result is not given in this paper and may be obtained by a request to the author

The result of Model 3 indicates that the sustainable wellbeing levels in different group of countries such as full democracy, flawed democracy, hybrid democracy and authoritarian regime were different. The mean HPI value for authoritarian regime ( $\beta_4$ ) is -0.09. The difference between the mean HPI of authoritarian regime and full democracy is 0.36, but it is not significant at even 10% level. The difference between the happiness levels of authoritarian regime and flawed democracy is 0.40 and the mean happiness value of flawed democracy is turns out to be -0.49 and it is significant at 5% level of significance. Similarly, the difference between the mean HPI value of authoritarian regime and hybrid democracy is also significant and the mean value of hybrid democracy turned out to be -0.36 which was greater than the mean value of authoritarian regimes. So the sustainable wellbeing levels of flawed democracy and hybrid regimes were found to be higher than those of authoritarian regime. But interestingly the HPI levels of full democracy and authoritarian regimes were not significantly different. Similar to the results of model 1, the other significant coefficients are of HDI and colonization along with the constant term.

Since, the wellbeing level of full democracy countries and the authoritarian regime countries were not significantly different in the previous model and most of the full democratic countries were high income developed countries, we proceeded to examine the difference in happiness level, if any, across developed and developing countries. This analysis was important, as the *Easterlin Paradox* says that the economically developed countries have less happiness scores compared to the developing countries.

**Table 3. Regression result for model 2**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	5.106608	1.705823	2.993633	0.0035
HDI	1.307436	0.348353	3.753194	0.0003
GDP	0.104996	0.276764	0.379370	0.7053
CO <sub>2</sub>	-0.099543	0.049344	-2.017342	0.0465
Religion	-0.078004	0.054672	-1.426769	0.1569
Democracy	-0.079478	0.038870	-2.044697	0.0436
Democracy (flawed)	0.323444	0.162751	1.987358	0.0497
Democracy (full)	0.265963	0.227176	1.170736	0.2446
Democracy (hybrid)	0.204389	0.116340	1.756821	0.0821
CPI	0.107300	0.252422	0.425083	0.6717
Economic freedom	-0.223498	0.179817	-1.242924	0.2169
Colonial background	-0.101245	0.051754	-1.956272	0.0533
R-squared	0.413262	S.E. of regression		0.232628
Adjusted R-squared	0.346032	F-statistic		6.14(0.000)

We considered the Organization for Economic Co-operation and Development (OECD) countries as the economically developed countries and other countries as developing countries. Out of the total 108 countries under study, we identified 33 countries as developed countries <sup>7</sup> and the rest 75 countries as developing countries. For the estimation purpose, we augmented the Model 2 by using dummy variable 1 for developed countries and 0 for developing countries. The differential coefficient in this estimation indicated the difference of HPI between developed and developing countries. Interestingly, our differential coefficient for level of development was negative and significant. The coefficient -0.18 indicated that the HPI levels in developing countries were higher than that of developed countries. This supported the finding of Easterlin that the happiness level of developed countries is less compared to the developing countries.

## CONCLUSION

In this study, we examined the macroeconomic, socio-political and environmental factors influencing the sustainable wellbeing levels of a cross section of 108 countries for the year 2009. We used CPI, HDI, colonial background, religion, democracy, carbon emission and economic freedom as independent variables against the HPI as the dependent variable. The estimated results indicated that the sustainable wellbeing of people was directly related with the level of human development and the wellbeing level was low in countries with colonial history. These findings provided support for our proposition that country level HDI may have a significant influence on the continuing wellbeing of countries. This was expected as such developments have positive impact on life expectancy, income and education of people over a long period. At the same time, the result that countries with colonial background were less happy indicates that colonial rule may not have led to sustained overall development of the colonies. On the contrary, such rules may have exhausted the colonies of their internal economic resources which have hindered the development of these countries post independence, which may be the reason why these colonies have not been able to optimize their resources for achieving sustainable wellbeing. This finding provided empirical evidence of Iyer's (2004) propositions.

Another significant determinant of HPI was the level of democratic freedom. The HPI levels in flawed democracy and hybrid democracy were found to be higher than that of authoritarian regime. But interestingly the wellbeing levels of authoritarian regime and

---

<sup>7</sup> We have 33 OECD countries in our sample and this is considered as developed countries.

full democracy were not different. This gave indications that greater freedom in democratic orientations may lead to citizens of countries to believe in equanimity. Such perceptions of egalitarianism may be necessary for developing a sense of a liberal society. Being part of such a society may have contributed to higher perceptions about happy life years among citizens of such countries. Contrastingly, authoritarian societies will not allow their citizens to feel free to express themselves. Such restrictions towards freedom of thought and speech may be a cause of dissatisfaction for people living in such societies. Thus our findings corroborated Frey and Stutzer (2000) and Veenhoven's (2000) presumptions that subjective wellbeing/happiness was a function of freedom.

Carbon emission was found to be negatively related with HPI, which substantiated the importance of having an efficient pollution control mechanism to maintain sustained development in countries. Future studies may incorporate other environmental parameters to further validate this finding. We could not find any significant relationship between religious orientation and HPI levels at the country level, just as Lewis et al. (2005) could not establish any relationship between the two in individual level studies. We, however, expected to find some relationship between religion and happiness as the literature gave indications that Christian religious ideologies were supposed to be more liberal, and hence more conducive towards attaining life satisfaction compared with other religious orders (Hefner, 1998). The majority of countries in our study were also Christian. One reason for obtaining this result may be the fact that the majority of the countries in our study were of Christian origin, but the different types of Christian practices- catholic, protestant and evangelist- were not considered separately in our analysis. Different branches of Christianity may preach different perceptions of happiness altogether. More refinement is required to get a better picture about the impact of religion on sustainable wellbeing. Overall, our model explained a significant amount of variation in happiness across countries in terms of social, political, economic and environmental factors. Other factors such as individual freedom for life choices and racial biases may be tested in future studies.

## REFERENCES

- Blanchflower, D. G. and A. J. Oswald. 2005. Happiness and the human development index: The paradox of Australia. *Australian Economic Review* 38: 307-318.
- Brockman, H., J., Delhey, C. Welzel, and H. Yuan. 2009. The China puzzle: Falling happiness in a rising economy. *Journal of Happiness Studies* 10: 387-405.



- Central Intelligence Agency (CIA). The World Factbook. Available at: <https://www.cia.gov/library/publications/the-world-factbook/>.
- Costanza, R. 2000. The dynamics of the ecological footprint concept. *Ecological Economics* 32: 341-345.
- Diener, E., E. Suh, and S. Oishi. 1997. Recent findings on subjective wellbeing. *Indian Journal of Clinical Psychology* 24: 25-41.
- Duncan, O. 2005. Does money buy happiness? *Social Indicators Research* 26: 137-144.
- Easterlin, R. A. 1995. Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior and Organization* 27: 35-47.
- Easterlin, R. A. 2001. Income and happiness: towards a unified theory. *The Economic Journal* 111: 465-484.
- Economic Intelligence Unit. 2010. Democracy index. Available at: [http://www.eiu.com/public/topical\\_report.aspx?campaignid=demo2010](http://www.eiu.com/public/topical_report.aspx?campaignid=demo2010).
- Energy Information administration of the United States. Available at: <http://www.eia.gov/tools/models/datatools.cfm>.
- Frey, B. S. and A. Stutzer. 2000. Happiness prospers in democracy. *Journal of Happiness Studies* 1: 79-102.
- Frey, B. S. and A. Stutzer. 2001. What can economists learn from happiness research? *Journal of Economic Literature* 40: 402-435.
- Gerdtham, U. G. and M. Johannesson. 1997. The relationship between happiness, health and socio-economic factors: Results based on Swedish micro data. *Journal of Socio-economics* 30: 553-557.
- Hagerty, M. R. 1997. Unifying livability and comparison theory: cross-national time-series analysis of life-satisfaction. *Social Indicators Research* 47: 343-356.
- Hefner, R. W. 1998. Multiple modernities: Christianity, Islam and Hinduism in a globalizing age. *Annual Review of Anthropology* 27: 83-104.
- Iyer, L. 2004. The long-term impact of colonial rule: Evidence from India. Harvard Business School research paper, Boston, MA.
- Kahneman, D. and A. B. Krueger. 2006. Development in the measurement of subjective wellbeing. *Journal of Economic Perspective* 20: 3-24.
- Leigh, A. and J. Wolfers. 2005. Happiness and the human development index: Australia is not a paradox. *Australian Economic Review* 39: 176-184.
- Lelkes, O. 2006. Tasting freedom: Happiness, religion and economic transition. *Journal of Economic Behavior and Organization* 59: 173-194.

- Lewis, C. A., J. Maltby, and S. Burkinshaw. 2000. Religion and happiness: Still no association. *Journal of Beliefs and Values* 21: 232-236.
- Lewis, C.A., J. Maltby, and L. Day. 2005. Religious orientation, religious coping and happiness among UK adults. *Personality and Individual Differences* 38: 1193-1202.
- MacKerron, G. and S. Mourato. 2009. Life satisfaction and air quality in London. *Ecological Economics* 68: 1441-1453.
- Mahoney, J. and M. vom Hau. 2005. Colonial states and economic development in Spanish America". In M. Lange and D. Rueschmeyer, editors, *States and development: Historical antecedents of stagnation and advance*. New York: Palgrave Macmillan (92-116).
- Namazie, C. Z. and P. Sanfey. 1998. Happiness in transition: The case of Kyrgyzstan. *LSE STICERD Research Paper* No. 40. Available at: <http://ssrn.com/abstract=1094786>.
- Oswald, A. J. 1997. Happiness and Economic Performance. *Economic Journal* 107: 1815-1831.
- Peterson, C., N. Park, and M. E. P. Seligman. 2005. Orientations to happiness and life satisfaction: the full life versus the empty life. *Journal of Happiness Studies* 6: 25-41.
- Rees, W. E. 2002. An ecological economics perspective on sustainability and prospects for ending poverty. *Population and Environment* 24: 15-46.
- Tukker, A., S. Emmert, M. Charter, C. Vezzoli, E. Sto, M. M. Andersen, T. Geerken, U. Tischner, and S. Lahlou. 2008. Fostering change to sustainable consumption and production: An evidence based view. *Journal of Cleaner Production* 16: 1218-1225.
- Veenhoven, R. 1989. National wealth and individual happiness. In K. Gruenert and F. Oelender, editors, *Understanding Human Behavior*. Dordrecht: Kluwer Academic publishers (9-32).
- Veenhoven, R. 1991. Is happiness relative? *Social Indicator Research* 24: 1-34.
- Veenhoven, R. 2000. Freedom and happiness: a comparative study of 46 countries in the early 1990s. In E. Diener and E. M. Suh, editors, *Culture and subjective wellbeing*. Cambridge, MA: MIT Press (257-288).
- Veenhoven, R. 2007. Measures of gross national happiness. Presentation at OECD Conference on measurability and policy relevance of happiness, April 2-3, Rome.
- Veenhoven, R. 2008. Sociological theories of subjective wellbeing. In E. Michael and L. Randy, editors, *The science of subjective wellbeing: A tribute to Ed Diener*. New York: Guilford Publications (44-61).
- Welsch, H. 2006. Environment and happiness: Valuation of air pollution using life satisfaction data. *Ecological Economics* 58: 801-813.

- Welsch, H. 2009. Implications of happiness research for environmental economics. *Ecological Economics* 68: 2735-2742.
- World Bank. 2009. World Development Indicators 2009. Available at: <http://data.worldbank.org/data-catalog/world-development-indicators>.