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The Effect of Human Development on Happiness: A Comparative Study of UN Member States

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Abstract:
The main objectives of this study are to estimate the human development effects on happiness by using economic freedom, economic growth, and income as control variables. The study analyzes the 1080 observations using the panel data from 2008 to 2016 period covered 120 countries. The main explained variable of this study is happiness and major interested explanatory variables are the Human Development Index. The estimation strategy of this study is to apply the fixed and random effect, the Generalized Liner Squire, First in Difference and Linear Dynamic Panel Data /generalized method of moments estimation method. The study estimated the strongly linear positive association and statistically significant result between human development index with happiness in the overall 120 sampling countries. The study investigated the negative relationship between life expectancy and happiness and the positive association between economic growth and income with happiness. The study indicated a positive association between government health expenditures and food on happiness.

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1. Introduction

Happiness is the common purpose of everyone whatever they are categorized in a different race, sex, color, occupation, nationalities, etc. Recognizing the similar meaning with subjective wellbeing, quality of life and life satisfaction, happiness has become a new theme of research at present.The meaning of happiness is quite simple understating although it is very difficult to measure. When we are thinking and raised questions about the main sources and achieving process of happiness, it is quite difficult to answer because happiness is nothing more; it is human thinking, perceptions, and understanding. Therefore, we simply define that happiness is the state of mind or emotional state of wellbeing (Tamir et al. 2017). People in the world are engaging in their professions, walking here and there to looking and finding anything. If someone asks them why they are moving around, ultimately, they are looking happiness. If we ask to anyone, what is their main goal in their lives and what they want? We can assume their answer that they want to be happy; they want to achieve life satisfaction. Therefore we might be concluded that happiness is the major goal of human lives (Kageyama 2012). (Kalmijn 2010) discussed that happiness is considered an important aspect of human life and it has become a growing interest in research in social science during the present context. In the past, a happiness study is limited in individual happiness and it is measured by a simple response from the response of personal question "how happy you are?" But nowadays happiness investigators or researchers are not only interested to estimate the individual happiness scores, but they are also interested to measure the community and nation level of happiness. Happiness is an overall appreciation of life for everyone (Diener et al. 2013).

The main theme of this study is to estimate the relationship between Human Development and Happiness. (Alkire 2010) mentioned the human development index, which was published in 1990 by UNDP which defined human development as a process of enlarging people's choices. The choices lead a long and healthy life, to be educated and to enjoy a decent standard of living. The human development has two aspects, one is the formation of human capabilities and other is use of their acquired capabilities. The Human Development Index (hereafter HDI) is calculated based on three dimensions and four indicators. The three basic dimensions are longevity, knowledge and decent living standard. The indicators are life expectancy at birth, mean years of schooling, expected years of schooling, and Gross National Income (hereafter GNI) per capita. The life Expectancy defined a long life link with various indirect benefits (such as adequate nutrition and good health) that are closely associated with higher life expectancy. Literacy is the first step in the learning of a person; therefore it can become one important measure of human development. The HDI has a positive or negative effect on happiness, the previous empirical studies don't tell us anything, but (Hirai et al. 2016) accepted that happiness is one major part of human development. It is not necessary that the countries with highest HDI index, growth rate and GDP per capita have highest national level of happiness. The data indicated that the country with the lowest economic growth rate and low-income level country have also the highest score of happiness and the highest economic growth country has also a low score of happiness. Therefore this paper is designed to estimate the effect of human development on happiness along with other variables GDP growth, per capita, food per person per day and government health expenditure as the control variables and dummy variables i.e. land and sea linked countries, different continents and different level of income countries.

2. Literature Review

Happiness has become the common and attractive theme and discipline for philosophers, psychologists, sociologists, politicians, economists, and other many researchers. Becoming the new area of study and common issue of all human beings, the researchers and academicians from different disciplines have centralized to study happiness. This is an almost new study phenomenon in the area of economics and which is known as happiness economics in present times. Happiness is not more things, it is just the feelings and realization of the people and it is reflected and affected by the social, economic, cultural, political, geographical, and technological and every marvel of human behavior, which creates joy or happiness, pain, and pleasure among the human beings which is the feeling or mental state of people is related in human daily activities. This study is related to estimate the happiness by human development, Therefore, the literature review in this study is not covering all aspects of happiness studies; the literature is only reviewed the related variables in this study. Many previous studies proved that increased wealth and income has not increased the level of happiness. The previous works of literature motivated that GDP growth rate and GDP per capita couldn't contribute the long run to increase happiness among the life of the people and the nations. The terms happiness has known as a similar meaning of subjective well being, quality of life and life satisfaction in recent decades.

Happiness is the ultimate goal of all human beings and every people of the world wherever and whenever they were in hunter and Stone Age and present context, happiness was the main motto of everyone. (Veenhoven 2010) has written in his paper that the history of agrarian societies has less than 5000 years and most of the time of human spices spent in hunter-gather societies. Since just the last 200 years ago, modern industrial society has come into existence. We noticed that this industrial society is also rapidly transforming into a global society. Therefore whatever, we are talking the hunter and stone age, agrarian or industrial or globalized society, people want to gain happiness and the whole social and economic transformation from one mode of production to another was possible due to the human aspiration to seeking the better life or happiness. The empirical research on happiness studies in economics has a very short history. (Veenhoven 2015)again mentioned that happiness study was the major theme of study in early Greek, where philosophers were used to studying happiness and it is gained renewed interest in the later west enlightenment period. The philosophical perspectives for happiness studies provided many speculations about social conditions. In the twenty century, social science achieved a breakthrough with new methods of empirical research with opened up and possibilities in the areas of a happiness study. Now, the happiness study has become the common research issues among the psychologists, sociologists and economists and others many academicians and researchers. (Sen and Anand 1994)mentioned that HDI is developed in 1990 which has known as the development indicator of each country according to its performance based on income, education and health. The measurement of HDI is expressing from 0 to 1. The range from 0 to 1 has known as the countries with higher score has known as the higher level of development and lower score known as the lower level of development. (Aguna and Kovacevic 2010) discussed the indicator and calculation process of HDI and mentioned that it is calculated by three indicators i.e. a long and healthy life (life expectancy at birth), education index (mean years of schooling and expected years of schooling) and a decent standard of living (GNI per capita PPP US$). Now, the human development index covers 189 countries in the world. (Klugman et al. 2011) mentioned that the human development index has become a great attraction among the policymakers and academic arenas and it has become a great

concern among the media people due to measurement of the country's development through income, health, and education. Therefore, it can be considered as an alternative measure of GDP to estimate the country's development status. The concept of the indicator, HDI was first conceptualized by the Pakistani economist Mahbub ul Haq and Indian economist Amartya Sen and other economists to response to their dissatisfaction with GDP. However, some economists argued that the HDI also is not the absolute indicator to measure country development. It has also some critiques.

The main critiques are that the measurement indicators which are health, education, and income are very familiar in development economics and the issues of education, it covers only the lower level of education. In addition to this, the countries that have a high level of economic growth and GNI per capita, they might have a low level of education and health status, but HDI gives the equal priority to measure the index and even less prioritize the GDP components. This index does not capture other many phenomena like geographical, socio-cultural and political factors, which are the main indicators to measure the country's development. Finally, we may conclude that only the human development index is not sufficient and applicable to provide the overall wellbeing to the people. The development of capabilities analysis is that how people are enabled to live. Nussbaum mentioned that the difference between utility and capability approaches. The utility approach focuses on the individuals' feelings of dissatisfaction or satisfaction and the capability approach focuses on what they are actually to be able. (Bhanojirao 1991) described that HDI is a composite index of four indicators. Its components are to reflect three major dimensions of human development, which are longevity, knowledge, and access to resources. These are to represent three of the essential choices `for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. (Bhanojirao 1991) mentioned that since 1990, the United Nations Development Program has used the Human Development Index (HDI) in its annual Human Development Report. The purpose of the report is to show how well the management of economic growth and human development is improving human well-being in the nations of the world. The inaugural report defined human development as the "process of enlarging people's choices to live a long and healthy life, to be educated, have access to resources needed for a decent standard of living, political freedom, guaranteed human rights and personal self-respect. Longevity is measured using life expectancy at birth. This also serves as a proxy for other aspects of wellbeing such as adequate nutrition and good health.

Knowledge is measured using literacy rate and school enrollment, which are intended to reflect the level of knowledge of the adult population as well as the investment in the youth. "Access to a decent standard of living is measured using GDP adjusted to reflect purchasing power parity and the threshold effect using a logarithm of real GDP per capita. Initially reported for 14 countries, the UN's 2007 report presented HDI results for 177 countries. (Dasgupta and Weale 1992) argued that there are other dimensions, which could equally be regarded as essential, such as law and order, peace, security, and freedom, it has been suggested that the components of the HDI together seem to provide an almost acceptable package of indicators of the level of living at an aggregate level. They further mentioned that since the HDI was first published, it has drawn critiques from many sides. Some critiques claim that it uses the wrong variables and that it is not reflecting the human development idea. In response to critiques of this kind, the UNDP developed additional complementary tools such as the Human Poverty Index, the Gender-Related Development Index, and the

Gender Empowerment Measure. The HDI was the first international attempt to deliver a more comprehensive development measure than GDP. The fact that the HDI is limited to measures of life expectancy, education, and gross national income per capita has been criticized for several reasons. First, the choice of indicators has been criticized as being redundant, as "statistics used in the HDI are so closely correlated with one another that indistinguishable alternative indexes can be created from the same statistics with very different weights(Cavalletti and Corsi 2018). Second, the HDI didn't include environmental indicators at all. The fact that is that there is needed to include some variables to measure the wellbeing of future studies to provide meaningful policy advice.

3. Gap Analysis and Research Questions

From the literature review, it can be concluded that the human development index is the product of the capability approach or existence as the alternative of GDP to measure the human and development progress of the country. The literature review found that there is not ensured that if the HDI is high in any country, there is not a high level of happiness within the country. But on average, it has a positive association with happiness. HDI and happiness both are new phenomena in the area of happiness studies. Therefore, it is difficult to find the available literature about the relation between HDI and happiness. Therefore, this study is designed to find the relation between HDI and happiness. Human Development index only covers the 3 components. The life expectancy defined a long life link with various indirect benefits (such as adequate nutrition and good health) that are closely associated with higher life expectancy. Literacy is the first step in the learning of a person; therefore it can become one important measure of human development. The GNI per capita is also the measure of the economic and income condition of the people. But, it is not out of criticism and there is no study the effects of HDI on happiness based on the income status of the countries, continents, and sea and land-linked countries. Therefore, this study will estimate the effects of human development on happiness not only using the HDI index but also including other control variables like life expectancy, food per person per day, the percentage of government health expenditures and other economic and freedom related variables.

The Existing measuring indicators of HDI are not sufficient to measure the overall human development. Therefore this study will introduce the basic variables like food, shelters, security, information technology and international connection for measuring HDI as the control variables. Human Development and Happiness are interrelated and interdependent with each other, but in the field of happiness studies, there is a huge gap that what is the role of human development on happiness. There is no study of HDI on Happiness based on contents and regions, developed and developing countries. Based on the gap of the literature, this study focuses on the effects of Human Development and Freedom on Happiness by using other control variables and dummy variables.

4. Contribution

The main aim of this paper is to measure the relation between the Human Development Index and happiness. It is a new area of study in the field of happiness economics. This paper is estimated the HDI effects on happiness by using the other control variables like life expectancy, the percentage of government health expenditures, food per person per day and other freedom and macroeconomic related variables, which is provided the sufficient literature in the field of happiness economics. In addition to this, the study is provided the basic information to increasing strategies to increase the level of human development of

related countries in their policy goals and programs to achieve the individual and national level happiness.

5. Data and Description of Variables

The study has been used the secondary Panel Data (2008 to 2016) covering the 120 UN member countries of the world obtained and managed from different sources like the World Bank dataset, Human Development Index (Our World Data), Cato Institute, The Heritage Foundation, and The World Happiness Report. In this study, the explained variable (Y) is the happiness and the main explanatory variables are Human Development, Economic Freedom and GDP growth and other variables, life expectancy at birth, human freedom, freedom of life choices, food calorie per day per person and Gini index, which are known as control variables. Besides this, some other variables country income status, connectivity (sea and land), and continents are used in this study as binary (δ) variables. The variables, its descriptions, and sources of data are presented as the following table.

Description of Variables and Data Sources

SN	Variables	Description	Data Sources
1	Predicted Variables		
	Happiness	The data (score) of happiness has obtained from the World Happiness Report, which is a well-known source of cross-country data and research on self-reported happiness and life satisfaction. The source of the happiness scores is based on the Gallup World Poll, a set of nationally representative surveys undertaken in more than 160 countries over 140 languages. In the survey, to evaluate the happiness, the survey asked the question in the poll that is "please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best happiness life and the bottom of the ladder represents the worst happiness life, it is known as the Cantril Ladder, which has used in this study.	Our world in data (Happiness and Life Satisfaction)
2	Explanatory Variables		
2.1	Human Development Index	0=low and 1=high The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions i.e. life expectancy at birth, the education dimension is measured by mean years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering the age. Gross National Income (GNI) measures the standard of living dimension per capita.	Human Development Index Dataset (time series Data)
2.2	Human Freedom	The index has developed including more than 79 different indicators including rule of law, securities, and safety, movement, religion, association and civil society, expression, relationship, size of government, legal systems and property rights, access to sound money, freedom to trade internationally, regulation of credit, labor and business. The Human Freedom score is the most comprehensive score,	The Human Freedom Index, 2017, A global measurement of personal, civil and economic freedom, CATO Institute.

2.3	Economic Freedom	It is known as the fundamental rights of every human to control his or her labor and property, It is an economical society where individuals can work, produce, consume and invest freely. It is measured based on 12 quantitative and qualitative factors based on the four pillars of economic freedom. 1. Rule of Law (property rights, government integrity, and judicial effectiveness) 2. Government Size (government spending, tax burden, and fiscal health) 3. Regularity Efficiency (business freedom, labor freedom, monetary freedom) 4. Open Markets (trade freedom, investment, and financial freedom) The economic freedom score is obtained from the average of the above freedoms, which has graded (0 to 100), less score has known less economic freedom and high scores indicated the high level of economic freedom.	Index of Economic Freedom, The Heritage Foundation, Washington's No 1 think tank
2.4	Freedom of Life Choices	Scaling from 0 to 1, the lower score indicated the low level of freedom of life choices and high score indicated the high level of freedom of life choices	World Happiness Report 2018, Online Data
2.5	Life Expectancy at birth (Total Years)	Life expectancy is the number of years counted from the birth of the person to their survival of life.	The World Bank Dataset
2.6	GDP Growth Rate	The annual percentage growth rate of GDP based on constant local price based on the 2010 US dollar.	The World Bank Dataset
2.7	GDP Per Capita	GDP Per Capita based on current US dollar	The World Bank Dataset
3	Control Variables		
2.8	Government Health Expenditure	Current health expenditure (% of GDP)	The World Bank Dataset
2.9	Gini Index	It is the index of Household income reported in Gallup.	World Happiness Report 2018 (online data)
2.10	Food Per Person	Per day per person, calorie An indicator of survival (food)	Human Development Index (our world in data)
3	Dummy and Binary Variables		
3.1	Asia, Africa, Europe South America, North America, Australia, and Oceania		Continental Analysis
3.2	High-Income Countries, Upper-Middle-Income Countries, Lower Middle-Income Countries, and Low-Income Countries		Analysis based on the Income Status of Countries
3.3	Sea Linked and Land Linked Countries		Analysis based on Sea and Land Linked Countries

Note: the first partial row at top: "which is scaling from (0 to 10). The lower scores indicated the low level of freedom and high scores indicated a high level of freedom."

6. Model Specification

This paper designed the following econometric strategies to estimate the effects of human development, on happiness.

$$
\begin{aligned}
\mathcal{Y}_{it} = {}& \beta oit + \beta 1hdiit + \beta 2hfit + \beta 3efit + \beta 4fofliecit + \beta 5gdpgrowthit \\
& + \beta 6gdpcapitait + \beta 7lifeexpecit + \beta 8govhexit + \beta 9foodit + \beta 10giniit \\
& + \delta seait + \delta landit + \delta hiincomeit + \delta uminocmeit + \delta lomiincoemit \\
& + +\delta loincoemit + \delta safricait + \delta asiait + \delta europeit + \delta ausoceit \\
& + \delta namericait + \delta samericait + \mathcal{E}it \quad ------(1)
\end{aligned}
$$

Where
$\mathcal{Y}_{it} = Happiness\ of\ the\ ith\ Country\ in\ Year\ t$
$\beta oit = Y\ Intercept$
$\beta 1hdiit = Human\ Development\ Index\ of\ the\ ith\ country\ in\ time\ t$
$\beta 2hfit = Human\ Freedom\ of\ the\ ith\ country\ in\ time\ t$
$\beta 3efit = Economic\ Freedom\ of\ the\ ith\ country\ in\ time\ t$
$\beta 4fofliecit = Freedom\ of\ life\ choices\ of\ the\ ith\ country\ in\ time\ t$
$\beta 5gdpgrowthit = GDP\ Growth\ Rate\ of\ Ith\ Country\ in\ time\ t$
$\beta 6gdpcapitait = GDP\ per\ capita\ of\ the\ ith\ country\ in\ time\ t$
$\beta 7lifeexpecit = Life\ Expectancy\ of\ the\ ith\ country\ in\ time\ t$
$\beta 8govhexit = \%\ of\ Gov\ Health\ Expenditures\ of\ ith\ Country\ in\ time\ t$
$\beta 9foodit = Food\ Calorie for\ Per\ Person\ Per\ Day\ of\ the\ ith\ country\ in\ time\ t$
$\beta 10giniit = Household\ Based\ Gini\ Index\ of\ the\ Ith\ Country\ in\ time\ t$
$\mathcal{E}it = Errors, Disturbances$

The model consisted mainly of three categorized of binary variables. One is connectivity, which is categorized by sea and land-linked countries. The second binary variable is income status, which is categorized by higher-income status, upper-middle-income status, lower-middle-income status, and lower-income countries. The third dummy variable is the continent, which is categorized by Africa, Asia, Europe, Latin America, North America, Australia, and Oceania. The human development index is the main interesting variable to estimate happiness. Therefore based on the above economic strategies, the following different econometric strategies have designed.

$$
\begin{aligned}
\mathcal{Y}_{it} = {}& \beta oit + \beta 1hdiit + \beta 9foodit + \beta 7lifeexpecit + \beta 5gdpgrowthit \\
& + \beta 6gdpcapitait + \mathcal{E}it ----------(2)
\end{aligned}
$$

$$
\begin{aligned}
\mathcal{Y}_{it} = {}& \beta oit + \beta 1hdiit + \beta 9foodit + \beta 7lifeexpecit + \beta 5gdpgrowthit \\
& + \beta 6gdpcapitait + \delta seait + \delta landit + \mathcal{E}it --(3)
\end{aligned}
$$

$$
\begin{aligned}
\mathcal{Y}_{it} = {}& \beta oit + \beta 1hdiit + \beta 9foodit + \beta 7lifeexpecit + \beta 5gdpgrowthit \\
& + \beta 6gdpcapitait + \delta hiincomeit + \delta uminocmeit + \delta lomiincoemit \\
& + +\delta loincoemit + \mathcal{E}it ------------(4)
\end{aligned}
$$

$$
\begin{aligned}
\mathcal{Y}_{it} = {}& \beta oit + \beta 1hdiit + \beta 9foodit + \beta 7lifeexpecit + \beta 5gdpgrowthit \\
& + \beta 6gdpcapitait + +\delta safricait + \delta asiait + \delta europeit + \delta ausoceit \\
& + \delta namericait + \delta samericait + \mathcal{E}it -----(5)
\end{aligned}
$$

7. Estimation Techniques

The paragraph provides the idea to choose the estimation techniques of the study to investigate the relationship between explained and explanatory variables. Before the selection of the estimation method, some of the major tests have been conducted in this study.

7.1 Test for Multicollinearity

A test of multicollinearity has conducted to verify the correlation among the variables represented in this model. The study used the Variance Inflation Factor (VIF) to detect if there is collinearity among the predictors. It tells us how much amount of multicollinearity exists in the regression analysis. The study investigated that the average Variance Inflation Factor (VIF) is (2.94) and (7.01) for HDI and (5.10) for life expectancy. The main interested independent variable HDI has 7.01 VIF, which is severe collinearity. The VIF measures the impact of collinearity among the independent variables in the model specification, the value of VIF is equal to 1 and greater than 1, there is no presence of multicollinearity. But the value of VIF is more than 10, it is a severe presence of multicollinearity and value of more than 2.5, it is considered as the presence of collinearity in the model. The study found that some value of VIF is near about 10 and average VIF is more than 2.5, which is a cause of concern (Stock and Watson 2008). Therefore, the VIF result indicated and concluded that the collinearity is moderately presence in the model. It violates the rules of the classical regression estimation method and it is not supported by the OLS estimation method. The following table is presented with the details.

Table 7.1 Estimation of Multicollinearity in the Regression model.

Variables	Variance Inflation Factor (VIF)	1/VIF
Human Development Index	7.01	0.142725
Life Expectancy	5.10	0.196188
Human Freedom	3.44	0.290798
Economic Freedom	3.01	0.331927
GDP Per Capita	2.77	0.368799
Food Calorie	2.40	0.417316
Gov. Health Expenditures	1.57	0.638799
Freedom of Life Choices	1.50	0.666719
Gini Index	1.35	0.738898
GDP Growth Rate	1.23	0.812005
Mean VIF	2.94	

(Note: Author creates the table)

7.2 Test for Heteroscedasticity

Many methods have been used to check heteroscedasticity. In this study, the Breusch-Pagan/Cook-Weisberg test to investigate the heteroscedasticity problem in the model. The study estimated the Chi2 (1) =8.78 and p-value (0.0030), which has given the result told us the variables fitted in the model; there is no heterogeneity problem in the model (Stock and Watson 2008). Correspondently, this study checked the heteroscedasticity problem by White test and found the Chi2 (65) =211.78 and (p-value = 0.0000), which has also given the significance result. Both results rejected the null hypothesis. If there is a severe heteroscedasticity problem, we can detect it by applying the robustness check. But in this study, there is no heteroscedasticity, means there is no need to apply the robustness check in the estimation techniques.

7.3 Hausman Test

The Hausman test has given the option to choose between fixed and random effect estimation methods. (Lee and Okui 2012) also mentioned that the Hausman test is used to differentiate between a fixed-effect model and random effect model in panel data. The estimated (p-value 0.0000) indicated to choose the fixed effect, but in this study, both random and fixed effect estimation method is used for comparative study. The result of the Hausman test is presented in the following table.

Table 7.3 Estimation of Hausman Test

Variables	Coefficient			
	(b) fe	(B) Re	b-B Differences	sqrt(diag(V_b-V_B)) S.E.
HD Index	1.209745	2.276312	-1.066567	.4927967
Life Expectancy	-.0610856	-.0110081	-.0500775	.0096625
Human Freedom	.0600419	.0385331	.0215088	.0473142
Economic Freedom	.0185656	.0124785	.0060871	.003397
Freedom of Life Choices	.5829285	.604918	-.0219895	.0514902
GDP Growth Rate	.0089235	.0066147	.0023087	.
GDP Per Capita	2.89e-06	.0000145	-.0000116	3.27e-06
Gini Index	-.758109	-.9669824	.2088734	.054926
Gov. Health Expenditures	.0576025	.0422749	.0153276	.0081222
Food Colore Per Person Per Day	.000461	.0002161	.000245	.0001731

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
$$chi2(9) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B)$$
$$= 81.81$$
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

7.4 Test for Endogeneity

The study checked the endogeneity problem in the model and found the omitted variables (human development index) in the second stage regression by adding the Yhat in the original regression, which has given the result of the endogeneity problem in the model (Davidson and MacKinnon 1993). Similarly, the $F_{(1, 1064)} = 55.49$ and small (p-value = 0.0000) indicated that the endogeneity problem in the model.

7.5 Selection of the Estimation Techniques

From the above different tests, the purpose model has found the moderate multicollinearity and endogeneity problem which violets the assumptions of classical regression estimation techniques. Therefore, the OLS estimation method is inconsistent and incomplete in this model. The endogeneity problem is caused by omitted variables; measurement errors and reserve causality indicated the OLS estimator is biased. Equally, the result of the Hausman test has given a strong foundation to select the fixed effect estimation method. Therefore, this

model is needed to select the fixed effects, 2SLS (FD) and GMM estimation techniques. (Bollen and Biesanz 2002)mentioned that Two- Least Square (2SLS) estimation method is used in the structural equation, which is the alternative of OLS estimation method and used to avoid the possible correlation of independent variables with error terms. Therefore, this study is used this estimating technique to avoid the possible correlation between the independent variables with disturbances by selecting the instrument variables. (Gallant and Tauchen 1996) discussed that Linear Dynamic Panel Data (LDPD)/Generalized Method of Moments (GMM) is one econometric estimation method, which is used to solve the issues of simultaneous causality bais, omitted variables, avoid the endogeneity issues and possible heteroscedasticity problem in the model. (Wooldridge 2009) also mentioned that the GMM estimation method addresses the potential problems of endogeneity, reverse causality, multicollinearity, and omitted variables. The above tests found the multicollinearity, endogeneity problems which have given the strong foundation to used two-stage least squares method (2SLS) and Linear Dynamic Panel Data (LDPD) General Method of Movement (GMM) estimation to overcome the possible endogeneity, measurement errors, omitted variables, reverse causality, collinearity and heterogeneity problems. In addition to this, this study is used both fixed and random estimation techniques for the comparison of the result.

7.6 Additional Tests for the Model
In addition to the above tests, this study used different tests for the validity of the model. The Walt Test also used in the estimation process, which has given the result of the significance of the variables. During the process of estimation, the result found that all variables are significant. This study used the Sargen test, which has given the result of over-identification and under-identification of the instrumental variables as well as it has given the significance of the model. After this test, the P-value has given the result that all the instruments variables and using the model in this study is valid.
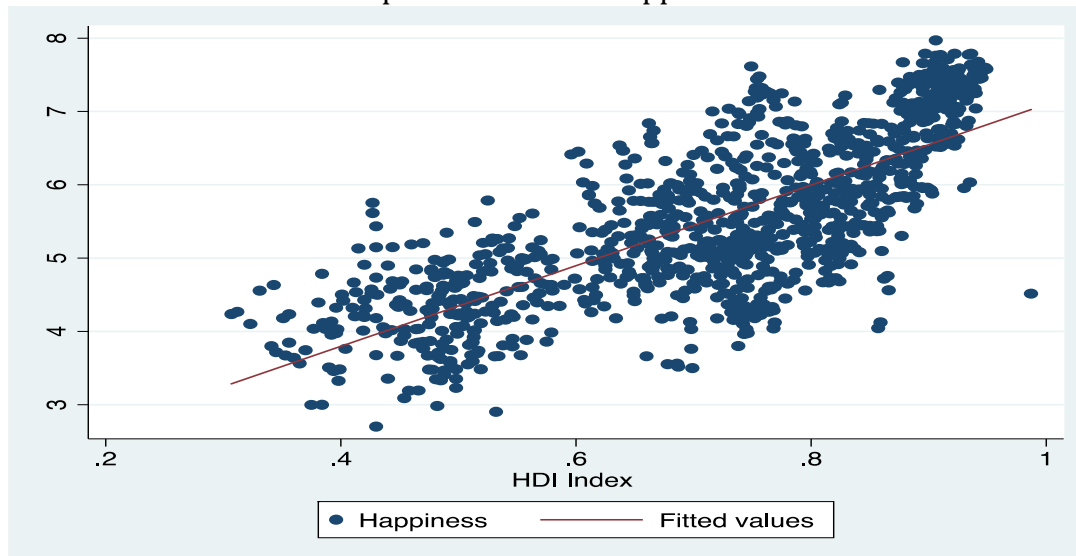
Correspondingly, this study used Arrellano-Bond Autocorrelation Test, which has given the result of using instruments are valid and it is not correlated with other independent variables and disturbances. After running the test, the study found that the z value is very significant and the selected instruments are not correlated with other independent variables and errors.

8. Effect of Human Development on Happiness
The Human Development Index (HDI) and Happiness in the novel study area in the field of economics. Only limited studies have been conducted to assess the relationship between the human development index and happiness. The erstwhile studies discovered the positive association between HDI and happiness. (Murat and Gürsakal 2015) estimated the very strong meaningful recognized positive relation between HDI and happiness. (Lane 2017) also investigated a positive association between the human development index and happiness and (Ram Pillarisetti and Van Den Bergh 2013) also found a very strong positive association between HDI and happiness.

8. 1 Relationship between Human Development and Happiness
A scatterplot is used for interpreting the statistical data to show the relationship between human development and happiness. In the following scatterplot, The HDI is presented in the horizontal line (X-axis) and the happiness score presented in a vertical line (Y-axis). The regression line indicated the linear relation between the human development index and happiness and the result estimated to the positive relationship between HDI and happiness. The following chart shows the detailed result.

Chart 8.1 Effects of Human Development Index on Happiness

(Note: Author creates the Chart)

8.2 Overall Empirical Result

HDI is one of the major indicators to measure the socio-economic as well as the human development of any country and it is the main explanatory variable to estimate its effect on happiness in this study. The estimating model, which is developed in this study to investigate the effect of explanatory variables to explained the variables estimated the various test and found all the tests have given acceptable and significant results. The F test (19.76) (p-value 0.0000) has given the result that the model has been best fitted on the dataset. The Hausman test estimated the Chi2 (81.81) and (p-value 0.000), which has given the foundation to choose the fixed effect estimation method. The Wald test in the random effect estimation method found Chi2 (363.74) and (p-value 0.0000) and Chi2 (4859.71) and (p-value 0.000) in Linear Dynamic Panel Data (LDPD) have given the result of significance of the parameters. The Sargen test is used to test the validity of the model and finding the higher (p-value i.e. 0.7010) in First in Difference (FD) and (p-value 0.987) in LDPD have given the very significant result. The findings of the p-value of the Sargen test proved that the designed model of this study is valid and significant. The Arrellano-Bond autocorrelation test is the test of autocorrelation between the instruments variables and disturbances; the finding p-value is more than (0.05) i.e. (0.1) has proved that there is no serial autocorrelation problem between the instruments and errors in the model.

This study has been used the different estimation methods for the comparison of the coefficient. The study found that the fixed and first in indifference method estimated only the positive but insignificant relation of the main interested variables i.e. human development index on happiness. But the Random effect and Linear Dynamic Panel Data (LDPD) estimation method found that very positive significant result which is (2.276***) in the Random effect estimation method and (4.646***) in linear dynamic panel data estimation method respectively in the 0.01% significance level. (Kageyama 2012) investigated the negative association between life expectancy and happiness. He mentioned that in the old age there is a link to many psychological factors. There are many factors associated with the negative relationship between life expectancy and happiness. The factors socioeconomic and social security system, chances to become widow and widowhood are the main causes of unhappiness among the people in their old age. As the similar findings of Kageyama, this

study also estimated the very interesting result that the association between life expectancy and happiness has a negative association. The coefficient (-0.0611***) in the fixed effect estimation method and (-0.0625***) in linear dynamic panel data (LDPD) model found a negative relation of life expectancy on happiness at 0.01% significant level. Equally, the explanatory variable of human freedom has indicated a positive association with happiness but statistically not significant. The explanatory variables economic freedom and freedom of life choices and happiness have a positive association and statistically significant result at 0.01% significance level in fixed, random and linear dynamic panel data estimation method.

The result indicated the GDP growth and GDP per capita have a positive association on happiness and growth has only significant at 0.05 % level in fixed effect estimation method and GDP per capita has only significance at 0.01 % level in the random effect estimation method. The unequal distribution of wealth and income, i.e. inequality which is represented by the Gini index, has a negative association with happiness and it is statistically significant at 0.01% level. If the Gini increase by 1%, the happiness decreased by (-0.758***) in fixed effect and (-0.967***) in the random effect estimation method respectively. The study estimated the positive association between the percentage of government health expenditure and food per person per day (calorie) on happiness. The details estimation results are presented in the following table.

Table 8.2: Effect of Overall Indicators on Happiness

VARIABLES	Model 1			
	FE	RE	FD	LDPD
HDI	1.210	2.276***	1.432	4.646***
	(0.750)	(0.566)	(0.905)	(0.577)
Life Expectancy	-0.0611***	-0.0110	-0.0746*	-0.0625***
	(0.0139)	(0.00995)	(0.0410)	(0.00952)
Human Freedom	0.0600	0.0385	0.00537	0.0321
	(0.0706)	(0.0524)	(0.0866)	(0.0402)
Economic Freedom	0.0186***	0.0125***	0.00594	0.0179***
	(0.00591)	(0.00484)	(0.00805)	(0.00634)
Freedom life Choice	0.583***	0.605***	0.376**	4.550***
	(0.163)	(0.155)	(0.168)	(0.281)
GDP Growth Rate	0.00892**	0.00661*	0.00566	
	(0.00367)	(0.00370)	(0.0109)	
GDP Per Capita	2.89e-06	1.45e-05***		
	(4.32e-06)	(2.83e-06)	-0.222	
Gini Index	-0.758***	-0.967***	(0.208)	-0.904**
	(0.212)	(0.204)		(0.356)
Gov Health Exp (%)	0.0576***	0.0423***		
	(0.0152)	(0.0129)		
Food (calorie)	0.000461**	0.000216*	-0.000108	0.000464***
	(0.000217)	(0.000131)	(0.000272)	(0.000122)
Constant	5.611***	2.471***	0.0186	1.097**
	(0.962)	(0.548)	(0.0185)	(0.490)
Observations	1,075	1,075	955	1,076
R-squared	0.078		0.013	
Number of Country	120	120	120	120

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(Note: Author creates the table)

8.3 Human Development on Happiness by Sea and Land Linked Countries

Alternatively, the overall empirical result, this study developed a different econometric strategy to estimate the relationship between human development and happiness by using the selected explanatory variables, which are food calorie per person per day, life expectancy, GDP growth rate and GDP per capita. The model 2, estimated between the relationship between HDI and happiness along with the above-mentioned variables and model 3 shows the relationship between HDI with happiness by using the binary variables i.e. Sea and Land linked countries. The various tests in model 2 have given the validity of the model. The p-value of the Hausman test i.e. (Chi2 49.26) and (p-value 0.0000) has provided the foundation to choose a fixed effect, F test 5.63 (p-value 0.0000) has given the result of best fit of the model. The Wald test, (Chi2 275.87) and (p-value 0.0000) in the random effect estimation method and (Chi2 7684.96) and (p-value 0.000) in LDPD estimation method has given the result of significance of the parameters. The Sargen statistics (Chi2 71.78) and (p-value 0.328) have proved that the validity of the model. The Arrellano-Bond Autocorrelation test has given the result AR (2) (-4.19) and Z (p value=0.2) has proved that there is no autocorrelation between the selected instrument variables and error terms. Similarly, the F test has found the same result in model 3 has given the result of the best fit of model into the data and the Wald test Chi2 (274.10) and (p-value 0.000) in random effect estimation method and Chi2 (7677.7) and (p-value 0.000) in LDPD has given the result of the significance of the parameters. The Sargen statistics, i.e. Chi2 (71.51) and (p-value 0.271) has given the result of the validity of the model and AR (2) -4.18 and Z (p-value 0.2) has given the result of there is no autocorrelation of selected instruments with errors, which are used in LDPD estimation method.

The estimation coefficients tell us that the human development index has a very strong positive association with happiness in all estimation methods in model 2. The coefficients are found (1.575**), (2.661***) (5.255***) in FE, RE and LDPD estimation method which are all statistically significant at 0.01% level of significance. Similarly, using the dummy variables sea linked and land-linked countries, this study investigated the same result in Model -3, but some coefficients in RE estimation and LDPD estimation method are a little bit different than the model 2. Model 3 has given the result; the human development index of sea-linked countries has a more positive association with happiness. The details are presented in the following table.

Table: 8.3 Effect of Human Development on Happiness by Land and Sea linked Countries

Variables	Model 2			Model 3		
	FE	RE	LDPD	FE	RE	LDPD
HDI	1.575**	2.661***	5.255***	1.575**	2.635***	5.249***
	(0.764)	(0.579)	(0.469)	(0.764)	(0.581)	(0.469)
Food Calorie	0.000703***	0.000301**	0.000132	0.000703***	0.000296**	0.000137
	(0.000216)	(0.000135)	(0.000108)	(0.000216)	(0.000136)	(0.000108)
Life Expectancy	-0.0547***	-0.00629	-0.0496***	-0.0547***	-0.00727	-0.0477***
	(0.0138)	(0.0101)	(0.00856)	(0.0138)	(0.0102)	(0.00888)
GDP Growth Rate	0.00665*	0.00537	0.00983***	0.00665*	0.00546	0.0101***
	(0.00362)	(0.00366)	(0.00303)	(0.00362)	(0.00366)	(0.00305)
GDP Per Capita	4.66e-06	1.90e-05***	2.32e-05***	4.66e-06	1.89e-05***	2.32e-05***

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	(4.41e-06)	(2.77e-06)	(1.18e-06)	(4.41e-06)	(2.77e-06)	(1.18e-06)
Land Linked				-	-	-
Sea Linked					0.104	-0.0936
					(0.150)	(0.116)
Constant	6.234***	2.901***	4.584***	6.234***	2.923***	4.513***
	(0.829)	(0.513)	(0.395)	(0.829)	(0.515)	(0.405)
Observations	1,078	1,078	1,078	1,078	1,078	1,078
R-Squared	0.029			0.029		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

8.4 Human Development and Happiness by Income Status and Continents

This chapter analyzes the estimation between the human development index and happiness by using the dummy variables i.e. the income status and continent. By using the dummy variables income status of the country, the estimation between HDI and happiness has discovered a positive relationship and significance at the 0.01% level. The estimated various tests by using the binary variables i.e. income status of the country in model 4, the Hausman test Chi2 (34.64) and (p-value 0.000) has given the result to choose fixed estimation method and the F-test 4.71 (p-value 0.0001) has proved that the best fit of model into data and Wald test Chi2 (302.68) and (p-value 0.000) in random effect and Chi2 (7706.9) and (p-value (0.000) has given the result of significance of the parameters. The Sargen statistics Chi2 (71.37) and (p-value 0.220) have given the result of the validity of the model and AR (2) 4.19 and (p-value 0.2) has proved that there is no autocorrelation between selected instruments and disturbances. The result of model 4 has given the description higher-income countries have a more positive association of human development on happiness than lower-income countries. Likewise, upper-middle-income countries have a more positive association between human development and happiness. Equally, model 5 also estimated the various tests by using countries based on continents. The Hausman test estimation i.e. Chi2 (20.22) and (p-value 0.0005) has indicated that to choose the fixed effect estimation method and the F test i.e. 5.63 (p-value 0.0000) told us the best fit of a model into data. The Wald test i.e. Chi2 (514.53) and (p-value 0.000) in random effect estimation method and Chi2 (7930.2) and (p-value (0.000) in LDPD has given the result of the significance of the parameters. The Sargen statistics i.e. Chi2 (71.73) (p-value 0.221) has indicated that the validity of the model and AR (2) 4.46 (p-value 0.22) indicated that there is no autocorrelation between selected instruments and disturbances.

The model 5 estimates the association between HDI and happiness by using the binary variables of continents, the result shows that the strong positive association between human development and happiness which is significant only 0.05% level in fixed effect estimation method, 0.01 % level of significance in random effect estimation method and only 0.1 percent level of significance in LDPD estimation method. The model 5 has given a further result that the Austrian and Ocean region has a more positive association between human development and happiness and the least association in the African continent. The human development index of Asian countries is a more positive association than European, North and South American counties. The details of the result are resented in the following table.

Table: 8.4 Effect of HDI on Happiness by Income and Continents

Variables	Model 4			Model 5		
	FE	RE	LDPD	FE	RE	LDPD
HDI	1.588**	1.591**	4.280***	1.575**	2.272***	1.236*
	(0.765)	(0.627)	(0.613)	(0.764)	(0.535)	(0.686)
Food Calorie	0.000705***	0.000207	0.000153	0.000703***	0.000456***	0.00116***
	(0.000216)	(0.000136)	(0.000138)	(0.000216)	(0.000124)	(0.000187)
Life Expectancy	-0.0554***	-0.00897	-0.0377***	-0.0547***	-0.0246**	-0.0258***
	(0.0139)	(0.0100)	(0.00904)	(0.0138)	(0.00984)	(0.00944)
GDP Growth Rate	0.00666*	0.00608*	0.0119***	0.00665*	0.00568	0.00574*
	(0.00362)	(0.00365)	(0.00312)	(0.00362)	(0.00363)	(0.00320)
GDP Per Capita	4.69e-06	1.67e-05***	2.41e-05***	4.66e-06	2.24e-05***	2.59e-05***
	(4.42e-06)	(3.17e-06)	(1.79e-06)	(4.41e-06)	(2.50e-06)	(1.89e-06)
High Income				-	-	-
Upper M. Countries	0.154	-1.040***	0.173			
	(0.389)	(0.257)	(0.238)			
Lower M. Countries		-0.547***	-0.383*			
		(0.203)	(0.201)			
Lower Countries		-0.282*	0.183*			
		(0.169)	(0.109)			
Africa					-	-
Asia					0.509***	-1.270***
					(0.150)	(0.182)
Aus and Oceania					1.233***	2.093***
					(0.374)	(0.307)
Europe					0.451***	-0.528***
					(0.171)	(0.188)
N. America					1.240***	-0.506***
					(0.193)	(0.189)
S. America					1.481***	0.604***
					(0.201)	(0.195)
Constant	6.252***	4.523***	4.360***	6.234***	3.456***	3.206***
	(0.830)	(0.652)	(0.623)	(0.829)	(0.499)	(0.604)
Observations	1,078	1,078		1,078	1,078	1,078
R-Squared	0.029			0.029		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(Note: Author creates the table)

9. Conclusions and Recommendation

The findings of the study provide a strong foundation that the high rank of the human development indexes provides a high level of happiness among the people. We know that HDI is the composite index of life expectancy, health (life expectancy at birth), education (expected years of schooling and average years of schooling in the adult population) and income (measured by gross national income (GNI) per capita (PPP US$). Therefore to create happiness among the people, the government should be adopting the policy to promote health, education and gross national income. But, it has a somewhat negative association with happiness, the policymakers should be focused on the additional social and economic aspects in their policy goals, the HDI components are not only enough to increase the level of happiness.

In addition to this, the study discovered an interesting finding that life expectancy has a negative association with happiness. It may be the cause of illness in old age, lack of social security policy of the government and in the old age, it is chanced to lack caring and they must live single due to the chances of widowhood and widow. Every people will to the longevity of his or her life, but his or her long life may the cause of unhappy due to the proper policies to address their problems in old age. Therefore every government needs to adopt the policies and programs leading to provide social security, health service and care to the old people to change their unhappiness to happiness in the old age of the people.

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