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The Economic - Social Human Development Index: A New Measurement of Human Development

Thaer Ayasreh (•)

ABSTRACT

The main contribution in this paper lies in using the ESHDI with a combination of economic and social indicators which measures achievements of human development. The result is the creation of the Economic-Social Human Development Index (ESHDI) as composite index. The proposed index introduces the ESHDI as an alternative or may be a companion to the HDI. It is a good representative measure of human development takes into account when measuring the level of human development of a country, Firstly: the level of economic human development (expressed as the Economic Human Development Index(EHDI)), which is measuring achievements in two basic dimensions: income dimension and economic policy dimension and Secondly: the level of social human development (expressed as the Social Human Development Index(SHDI)), which is measuring achievements in three basic dimensions: a long and healthy life, knowledge and a decent standard of social living. The sub-indices are then combined into a composite index that measures the average achievements of human development in a country.

The ESHDI is based on four indicators representing the economic human development index and twelve indicators representing the social human development index, whereas the HDI simply assesses the development based upon three equally weighted indicators. Furthermore, Values under the standard normal cumulative distribution curve corresponding to the value of (z) standard have used for scaling indicators on scale between 0 to 1 in this method , leading to the reduction of issues faced by HDI measurements.

The results of the ESHDI are manageable and easily understood, and the value of index between 0 to 1, where the greater is the better. The ESHDI was calculated for 164 countries, member in UN and the measurement has detected more differentiation between developed and underdeveloped countries. In the light of, the results presented here imply that the ESHDI can be a good representative and a measure for human development.

Keywords: Human development, Human development index, Economic-Social Human Development Index, Ranking of countries.

1. Introduction

Development thinking has changed considerably over time starting with the idea that capital investment equals growth and development moving to human resource development (Anand and Ravallion, 1993.p135), and to the adoption of other targets related with the decrease of poverty such as achieving greater justice in the distribution of income, increasing employment, and satisfying the basic needs of the community (UNDP,1997.p15), Then the focus has been on successively to the role of human development (UNDP, 1990.p104-105), the role of markets and policies, the role of institutions and more recently the role of individuals and group empowerment and country ownership (UNDP, 2010.p19).

The human development approach continues to be committed to focusing upon unresolved issues. Such issues range from poverty and deprivation to inequality and insecurity. In addition to the three dimensions of human development measured by HDI, new tables have continually been produced in a steady stream of human development reports, resulting in the creation of new indices designed to supplement the HDI (UNDP, 2010, p. VI) and after considering in the researches have performed by many authors, who suggested the use of a limited number of indicators to measure human development, as well as the human development index is not a comprehensive measure of development (UNDP, 1995, p12).

THE STUDY PROBLEM

One notable indicator used to measure a country's quality of life which has received the most attention is the UNDP's Human Development Index (HDI). Since its inception, the HDI

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has been revised several times to address major criticisms. It measures the average achievements in a country in three basic dimensions of human development: health, education and income. But human development encompasses more than health, education and income. It also includes Economic Policy (Gini Index, Inflation, Unemployment), A decent standard of social living (Access to Infrastructure, gender, Technology Adaption). Lack of quantification is not a reason to neglect or ignore these factors. So this research provides an important contribution to measure human development by proposing a new simple composite index, namely, the Economic-Social Human Development Index (ESHDI), which includes the number of important social and economic indicators, which can be a good representative and a measure for the level of human development in countries. In addition it is proposed as an alternative or a companion to the HDI.

OBJECTIVES OF THE STUDY

This study seeks to achieve the following key objectives:

1- Identify of human development, in terms of the concept and measurement.
2- Create a composite index covers all the dimensions that have been taken in to account other indices to measure human development.

IMPORTANCE OF THE STUDY

The importance of the study is concentrated in creating the ESHDI index to measure human development and the most important characteristic of the ESHDI index compared to other indices is that combines two sub-indices which include 16 indicators in a simple composite measure. Unlike other indices, which include a number of limited variables, the ESHDI index covers all the dimensions that have been taken in to account other indices to measure human development, in addition to the possibility of its application on a wide range of member countries in UN.

The remainder of the present paper is organized as follows: section 2 of this paper presents the manner in which development is measured. Section 3 presents the methodology, while Section 4 presents the results. The final section includes the conclusions of the study.

THE THEORETICAL AND LITERATURE OF HUMAN DEVELOPMENT

Over time, economists began to recognize the insufficiencies in the description of development. This trend in economics led to the emergence of new indicators. The prime goal is not to substitute income-based welfare indicators, but to supplement them with a wider group of indicators which also affect the level of development .So, many attempts are being directed toward including a human accounting in developing indexes that are oriented toward going beyond the GDP economic indicator (Richard and June, 2011).

The first attempt to calculate the composite index of development using multiple indicators went back to the Bennett in 1951 and was in the Combined Consumption Level Index (Bennett, 1951). So, many studies in literature suggest the development of a composite index, such as those represented below in Table 1.

TABLE (1)
Proposed composite indices to measure development

Bennett 1951	Consumption Level Index
Beckerman and Bacon, 1966	Real Index of Consumption (RIC)
Drewnowski and Scott 1966	Level of Living Index (LLI)
United Nations Research Institute for Social Development (UNRISD), 1970	Socioeconomic Development Index (SID)
McGranahan, et al., 1972	General Index of Development (GID)
Morris, 1979	Physical Quality of Life Index (PQLI)
Camp and Speidel,1987	Human Suffering Index (HSI)
UNDP,1990	Human Development Index (HDI)

One of the most interesting alternatives is the Human Development Index (HDI) that appears to be a leading candidate to serve as an addendum to the GDP indicator as the basis for measuring human progress. The origins of the HDI are found in the annual Human Development Reports of the United Nations Development Programme (UNDP). These were

devised and launched by Pakistani economist Mahbub ul Haq in 1990, who had the explicit purpose "to shift the focus of economic development from national income accounting to people centralized policies".(UNDP 1990, P11-12).

Human development concept appeared in the eighties through the UNDP as a new concept for development to look at people as ends and means of development not only as ends for development. The first report was published in 1990 under the title, "Human Development Report" (Srinivason, 1994, P238), and it defined human development as "the expansion of people's freedoms to live long, healthy and creative lives; to advance other goals they have reason to value; and to engage actively in shaping development equitably and sustainably on a shared planet. People are both the beneficiaries and drivers of human development, as individuals and in groups" (UNDP, 2010.p22).

The concept of human development is deliberately open ended; it is relevant across years, ideologies, cultures and classes. Yet it always needs to be specified by context, and it is subjected to scrutiny and public debate (UNDP, 2010.p22).

Thus stated, human development has three components (UNDP, 2010.p22)

- Well-being: expanding people's real freedoms—so that people can flourish.
- Empowerment and agency: enabling people and groups to act—to drive valuable outcomes.
- Justice: expanding equity, sustaining outcomes over time and respecting human rights and other goals of society.

Human Development is often treated as a multidimensional concept consisting of a number of distinct, separable dimensions (McGillivray and Noorbakhsh, 2004); Theoretical research has identified a number of dimensions. These dimensions can be social, physical, psychological or material in nature (Alkire, 2002). The researchers lean on new indices to capture important aspects of the human development. The first author who suggested and supported significant changes was (Smith, 1993), so there are many studies in literature suggest making radical changes and improvements in the dimensions of the HDI , such as those presented below in Table 2.

TABLE (2)
Proposed composite human development indices

UNDP, 1995	Gender related Development Index (GDI) and the Gender Empowerment Measure (GEM)
Diener, 1995	Combined Quality of Life Indices (CQLI)
Noorbakhsh, 1996	Modified Human Development Index (MHDI)
UNDP, 1997	Human Poverty Index (HPI)
Cherchye and Kuosmanen, 2004	Constructs a meta-index of SD (MISD)
Chatterjee, 2005	Measurement of Human Development: an alternative approach: In this paper first a joint measure of the general level and concentration of the distribution of an ordered qualitative or a quantitative character is proposed. The measure is then applied on the distribution of prospective longevity, educational level and income, and an alternative Human Development Index is set up on that basis.
Borys, T. (2005)	Sustainable development indicators (SDI)
Marchante and Ortegaa, 2006	Augmented version of the Human Development Index (AHDI)
Burd-Sharps, Lewis and Martins (2008)	American Human Development Index (AHDI)
Engineer, King and Roy, 2008	Calculate the modified indices for OECD countries and compare them with the HDI for world countries.
EUROSTAT. (2009)	Sustainable Development in the European Union,(SDI)
New Economic Foundation. (2009).	Happy Planet Index,(HPI)
UNDP, 2010	The Inequality-adjusted HDI (IHDI), The Gender Inequality

	Index (GII), The Multidimensional Poverty Index (MPI)
Niels, 2010	Calibrated human Development Index CDI
Veljko, et al., 2011	Ecological Footprint (EF).
Tolga, Bülent and Hakan, 2011; Srinivasan, 1994; Jordan, 2004	Suggest the use of employment or unemployment dimensions in the HDI

At least 20 composite indices have received international attention in the last four decades (Booysen, 2002). The best known which have received the most attention, is the UNDP's Human Development Index (HDI) (UNDP 1990, p104-105). The Human Development Index (HDI) "is a summarized measure of human development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living"(UNDP, 2011,P168).

The world has moved on since 1990, so the Human Development Report, in addition to three dimensions in HDI, is using indicators more pertinent for evaluating the future progress. The human development approach is motivationally committed to concentrating on what remains undone, and on what demands most attention in the contemporary world, from poverty and deprivation to inequality, insecurity and sustainability. New tables continue to appear in the steady stream of human development reports, and new indices have been revised to supplement the HDI and enrich our evaluation (UNDP 2010, Pvi).

Numerous amendments to the human development index have been introduced since its inception to the present time. Three multi-dimensional measures of inequality have been added and poverty to the HDR family of measures (UNDP 2010, P86):

- The Inequality-adjusted HDI (IHDI), estimated for 139 countries, captures the losses in human development due to inequality in health, education and income.
- The Gender Inequality Index (GII), estimated for 138 countries, reveals gender disparities in reproductive health, empowerment and labor market participation.
- The Multi-dimensional Poverty Index (MPI) identifies overlapping deprivations suffered by households in health, education and living standards.

The HDI's strengths—particularly its transparency, simplicity and popular resonance around the world—have kept it at the forefront of the growing array of alternatives to gross domestic product (GDP) in measuring well-being (Anand and Sen, 2000).But the HDI gives only a snapshot of the status of human development in selected areas and thus is not a comprehensive measure of human development (UNDP, 1995.p12). So over the past 20 years, the HDI has been criticized on several bases, including:

1- Most critics take issue with the calculation of the HDI being the simple average of the sum of three equally weighted indices because the absolute value of each component will affect the level of the HDI. The selected extreme values would therefore affect the value of the index and the ranking order (Noorbakhsh, 1996). Since the HDI represents an attainment index, choosing the simple average reflects the idea that each aspect of human development could make a positive and equally important contribution.Thus, the simple averaging of these components in a composite index is questionable, but assigning differing weights has been proven unnecessary (Stapleton and Garrod, 2007). Other suggestions include expanding the HDI to include more dimensions ranging from gender equity to biodiversity (UNDP, 2010.p13).

2- Mahlberg and Obersteiner(2001); Chowdhury and Squire (2006); and Lind (2010) criticize the HDI because of the manner in which each component is weighted: all components are weighted equally. While this is convenient, such an approach is also universally considered to be wrong. The ideal approach would presumably involve weighting individual components in relation to their respective impacts on development.

3- Cuffaro, et al. (2008); Cracolici, et al. (2010); Stapleton and Garrod(2007); and Tolga, et al. (2011) criticize the HDI because of the high correlation between GDP and certain background variables, which typically serves the interests of developed countries. As a result, the HDI is not always parallel with GDP per capita. Countries that are rich in

resources, such as those exporting oil, may have high per capita income levels while ranking low in terms of HDI. For example, while Oman and Saudi Arabia maintained considerably high per capita income levels (approaching US $23,000 in 2007), they only managed to attain 56th and 59th HDI rankings among all nations, respectively (Tolga, et al., 2011).Therefore, in order to highlight such deficiencies, it is beneficial to include further indicators in the calculation of the HDI.

4- Panigrahi and Sivramkrishna(2002); Morse (2003);Osberg and Sharpe (2003);Cherchye, Ooghe and Van Puyenbroeck(2008); and Lind (2010) criticize the HDI for issues concerning variables and ranking, which include:

- The small number of variables (just three) incorporated into the ranking process. Suggestions pertaining to the modification of the HDI to include new variables are prevalent in economics literature.
- The rankings associated with the HDI are often taken too seriously in public discourse. Such ranking may serve primarily as a policy instrument, particularly in high ranking developed countries. Since the underlying statistics are also uncertain, with uncertainty margins of several percent, the third decimal digit in the HDI is uncertain and the ensuing rankings can be at error in several points. Moreover, the rankings are sensitive to all HDI indicators and the reference minimum and maximum values used for scaling purposes.

METHOD OF THE ECONOMIC-SOCIAL HUMAN DEVELOPMENT INDEX (ESHDI)

The ESHDI is a summary measure of human development. It measures the average achievements in a country in two basic sub-indices of human development .

- Economic Human Development Index (EHDI), which is measuring achievements in two basic dimensions: income dimension and economic policy dimension.
- Social Human Development Index (SHDI), which is measuring achievements in three basic dimensions: a long and healthy life, knowledge and a decent standard of social living.

The ESHDI is the simple average of the normalized sub-indices measuring achievements in each index. It is a simple composite measure with a scale of 0 to 1, where the greater is the better.

CREATING THE ECONOMIC-SOCIAL HUMAN DEVELOPMENT INDEX (ESHDI)

The ESHDI measures the average achievements in a country in five basic dimensions of human development. Before the ESHDI itself is calculated, a number of subindices need to be created as follows:

1. Economic Human Development Index (EHDI): The (EHDI) is calculated as simple geometric mean of two basic dimensions :

a. Income dimension, as measured by Gross National Income per capita (GNI per capita) in purchasing power parity (PPP) terms in US dollars.

b. Economic policy dimension, as measured by the arithmetic mean of three indicators: GINI coefficient, Inflation rate, and Unemployment rate .

2. Social Human Development Index (SHDI): The (SHDI) is calculated as simple geometric mean of three basic dimensions:

a. A long and healthy life dimension, as measured by life expectancy at birth.

b. Knowledge dimension, as measured by the arithmetic mean of two indicators: expected years of schooling and mean years of schooling.

c. A decent standard of social living dimension, as measured by the weighted mean of three sub- Index:

i. Access to Infrastructure Index, as measured by the arithmetic mean of three indicators: improved water source (% of population with access), improved sanitation facilities (% of population with access and electric power consumption (KWH per capita) .

ii. Gender Index, as measured by the arithmetic mean of three indicators: Shares in parliament, female-male ratio, adolescent fertility rate and maternal mortality ratio.

iii. Technology Adoption Index, as measured by the arithmetic mean of three indicators: Internet users (per 100 people), Fixed and mobile telephone subscribers (per 100 people) and personal computer (per 100 people).

SELECTION OF INDICATORS

Ideally, measures potential measures would exist for each of the broad categories of human development. In practice, however, human development is multidimensional and cannot be reduced to one dimension because such a measure will necessarily include compilations of key economic, social indicators. The vast array of indicators that can be linked with human development makes establishing a designed to measure human development difficult. Firstly, certain categories of human development are difficult to measure (e.g. mental well-being). Such data is typically based upon surveys of achievements and upon the perceptions of observers, the latter of which involving an obvious element of subjectivity. In addition, data are often unavailable or incomplete, with complete data only being available for a small sample of countries. Certain composite indices are constructed from a variety of elements and sources in a manner that leads to criticism and challenges regarding the validity of the index. Thus, limitations and pitfalls are associated with data collection and analysis in the field of human development.

The ambit of the present study is to identify a set of indicators that is more broadly representative of human development. The indicators are selected primarily on the basis of the specific indicator contemporarily being utilized to assess key aspects of human development in the Successive Human Development Reports, including equitable distribution of income; unemployment; inflation; health; education; access to infrastructure; gender; technology adoption, Because of the importance these indicators, and its role in human development , they have received a broad discussion in human development reports and had used in a different composite indices .For example, the Human Development Index, the Inequality adjusted HDI, Gender Inequality Index and Multidimensional Poverty Index, which are the result from efforts to measure human development by the Human Development Report Office (HDRO).Tables 3 and 4, in index, present the economic human development indicators and social human development indicators utilized in the ESHDI.

MAJOR SOURCES OF DATA USED IN THE ECONOMIC SOCIAL HUMAN DEVELOPMENT INDEX (ESHDI)

The ESHDI relies on the following organizations to collect data:

United Nations Development Program (UNDP): This specialized UN office produces international data on Human Development Indicators**.** The details of the indicators used are available at:

http://hdrstats.undp.org/en/indicators/default.html.

World Bank**:** the World Bank produces and compiles data on economic trends, as well as a broad array of other indicators. World Development Indicators is the primary source for most information regarding indicators utilized in the present paper. The details of the indicators used are available at: http://data.worldbank.org/indicator/all

MISSING VALUES

To handle missing data for some countries, the ESHDI relies on country Data from the (UN) United Nation Statistics Division and Central Intelligence Agency's (CIA). The details of the indicators used are available at:

- http://mdgs.un.org/unsd/mdg/Data.aspx
- https://www.cia.gov/library/publications/the world-factbook/ index.html
- If data is not available in the country in any international sources required for the year, using data available in the time series of the country for the nearest year.
- If data is not available in the previous sources, it has been relying on data from the official statistics of the country. Otherwise، the country is not included in the Index. (•)

DATA AVAILABILITY DETERMINES ESHDI COUNTRY COVERAGE

(•) There is not any data about Personal computer (per 100 people) indicator in Timor-Leste in any of the previous sources. So been relying on similar country in South East Asia in terms of the degree of human development and ranking in the Human Development Index for 2012, the country is Pakistan. Personal computer (per 100 people) was 0.5.

Data availability determines the ESHDI country coverage. To enable cross-country comparisons, the ESHDI is, to the extent possible, calculations based on data from leading international data agencies and other credible data sources available at the time of a study case. However, for a number of countries data are missing from these agencies for one or more of the HDI component indicators and the HDR family of indices. The ESHDI was calculated for 164 countries, member in UN for the period 2012 which is the last time period for which data are available in United Nations Development Program (UNDP).

STEPS TO ESTIMATE THE ECONOMIC SOCIAL HUMAN DEVELOPMENT INDEX

There are five steps to calculate the ESHDI:

Step 1. Determine (Goalposts) values

The first step is determining goalposts for each indicator need to be set in order to transform the indicators into indices between 0 and 1. Determination of goalposts is based on calculating the average and standard deviation to all countries under study and for each indicator.

Step 2. Calculating the standardize (x, mean, standard_ dev)

Standardized are calculated for each indicator. The equation for the normalized value is (Kothari, 1978 ، p99):

$$Z = \frac{X - \mu}{\sigma} \text{ ....} (1)$$

Where:

Z= the standard variate or number of standard deviations from x to the mean of the distribution.

X= is the value you want to normalize.

μ=is the arithmetic mean of the distribution.

σ=is the standard deviation of the distribution.

It should be noted that the signal of standardized values have to be changed for indicators, which related inversely with human development, so that negative values become positive and positive values become negative. This will be done by multiplying the standardized value in the negative one (-1). For example, countries with low GINI index are better than those with a high value, where the GINI index is related inversely with the human development. Increase in the GINI index would lead to an inequitable distribution of income which would entail increase the number of poor. Hereinafter, the indicators relate inversely with the human development:

- Inflation, consumer prices (annual %).
- Unemployment rate.
- Gini index.
- Adolescent fertility rate (births per 1,000 women ages 15-19).
- Mortality rate, infant (per 1,000 live births).

Step 3. Finding NORMSDIST(z)

After calculating standardized for each indicator, finding NORMSDIST(z) is the following step. It should be noted that has been using the NORMSDIST(z) just for the purpose of converting values to a uniform scale in the form of a percentage range between 0 to 1 without making sure that countries follow a normal distribution or not.

Step 4. Calculating the sub-indices

After finding normsdist, sub-indices need to be calculated as follows:

− Economic Human Development Index (EHDI): The (EHDI) is calculated as simple geometric mean of two basic dimensions as shown in Table 1. by applying the following formula:

$$EHDI = \left(D_{Income}^{1/2} \cdot D_{Eco.Policy}^{1/2} \right) \text{..... } (2)$$

- Income dimension is calculated by applying the normsdist of GNP per capita.
- Economic Policy is calculated by applying the following formula:

$$E.P = \left(\frac{N.IR + N.GINI + N.UR}{3} \right) \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

− Social Human Development Index (SHDI): The (SHDI) is calculated as simple geometric mean of three basic index as shown in Table 2. by applying the following formula:

$$SHDI = \left(D_{Health}^{1/3} \cdot D_{Education}^{1/3} \cdot D_{\text{A decent standard of social living}}^{1/3} \right) \ldots (4)$$

- Health dimension is calculated by applying the normsdist of N.LEB
- Education dimension is calculated by applying the following formula:

$$ED = \left(\frac{N.MYS + N.EYS}{2} \right) \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

- A decent standard of social living dimension is calculated by applying weighted mean as the following formula:

Where:

$$SLD = \left(\frac{II \times 3 + GI \times 3 + TAI \times 3}{9} \right) \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

$$II = \left(\frac{N.IWS + N.ISF + N.EPC}{3} \right) \ldots\ldots\ldots\ldots\ldots\ldots (7)$$

$$GI = \left(\frac{N.AFR + N.MMR + N.SP}{3} \right) \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

$$TAI = \left(\frac{N.IU + N.FMS + N.PC}{3} \right) \ldots\ldots\ldots\ldots\ldots\ldots (9)$$

Where:
N.GNP: Normsdist of Gross National Income.
N.IR= Normsdist of Inflation Rate.
N.GINI= Normsdist of Gini Index.
N.UR= Normsdist of Unemployment Rate.
N.LEB= Normsdist of Life Expectancy at Birth, total (years).
N.MYS= Normsdist of Mean Years of Schooling.
N. EYS= Normsdist of Expected Years of Schooling.
II= Infrastructure Index.
N.IWS= Normsdist of Improved Water Source (% of population with access).
N.ISF= Normsdist of Improved Sanitation Facilities (% of population with access).
N.EPC= Normsdist of Electric Power Consumption (kWh per capita).
GI= Gender Index.
N.AFR= Normsdist of Adolescent Fertility Rate (births per 1,000 women ages 15-19).
N.MMR= Normsdist of Maternal Mortality Ratio.
N.SP= Normsdist of Share in parliaments of FemaleMale Ratio (%).
TAI=Technology Adaption Index.
N.IU= Normsdist of Internet Users (per 100 people).
N.FMS= Normsdist of Fixed and Mobile Cellular Subscriptions (per 100 people).
N.PC= Normsdist of Personal Computer (per 100 people).

Step 5. Aggregating the sub-indices to produce the Economic- Social Human Development Index

The ESHDI is the simple average of the sub-indices:

$$ESHDI = \left[\left(EHDI \times \frac{1}{2} \right) + \left(SHDI \times \frac{1}{2} \right) \right] \ldots\ldots\ldots\ldots (10)$$

The values of index range between 0-1, where values close to 0 refer to very low level of human development. On other hand, values close to 1 simply means that the country has a very high level of human development. Figure 1, below, shows a graphical presentation of the calculation of the ESHDI.

Countries are generally classified into four groups on the basis of economic human development index and Social human development index:

1- Countries that have economic and social human development higher than arithmetic mean for all countries under study.
2- Countries that have economic and social human development less than arithmetic mean for all countries under study.
3- Countries that have economic human development higher than general mean and social human development less than arithmetic mean for all countries under study.
4- Countries that have economic human development less than general arithmetic mean and social human development higher than arithmetic mean for all countries under study.

FIGURE 2: Classification ofthe Four Groups

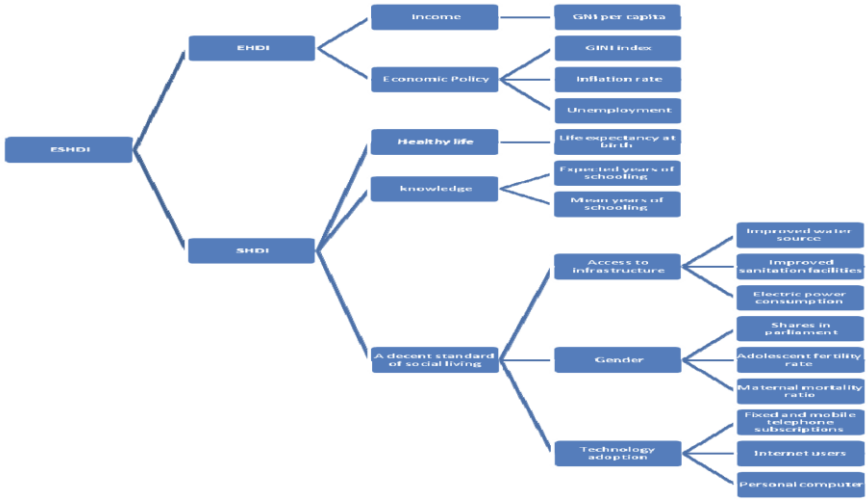

FIGURE 1. Calculating the Social-Economic Development Index—graphical presentation

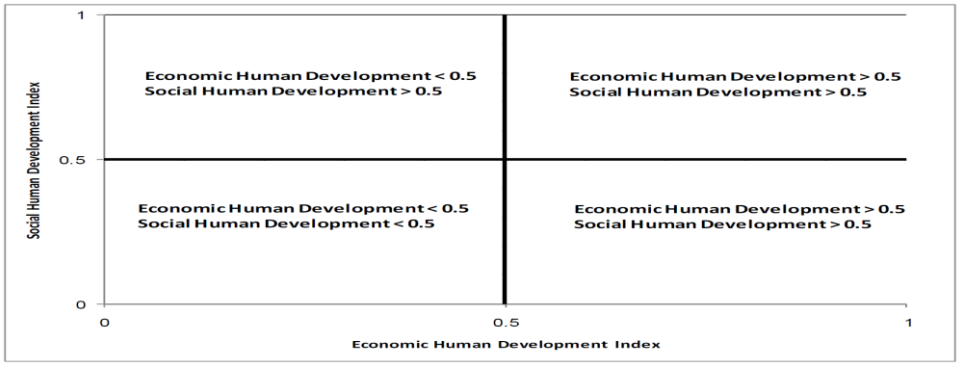

FIGURE 2: Classification of the Four Groups

Note: Arithmetic mean to all countries under study =0.50

EXAMPLE: NORWAY

The following steps to estimate the ESHDI in Norway:

Step 1. Determine (Goalposts) values by calculating the mean and standard deviation for all countries under study for each indicator in 2005.

Tables (5) in index illustrates indicators human development, respectively, in Norway and the calculation of the goalposts (on level all countries) in 2012.

Step 2. Calculate the standardize (x, mean, standard_ dev) for each indicator.

Step 3. Finding Normsdist (z)

Tables (6) in index illustrates standardized and Normsdist (z).

Note: The sign of standardized GINI index, inflation rate, unemployment rate, adolescent fertility rate, and maternal mortality ratio have changed because the indicators are inversely related with human development.

Step 4. Calculating sub-indices

1. Calculating Economic Human Development Index (EHDI) by applying the following formula:

$$EHDI = \left(D_{Income}^{1/2} \cdot D_{Eco.Policy}^{1/2} \right) \ldots\ldots\ldots\ldots (11)$$

- Income Dimension= 0.996
- Economic Policy Dimension=

$$\frac{0.942 + 0.776 + 0.768}{3} = 0.829 \ldots\ldots\ldots\ldots (12)$$

$$EHDI = \left(0.996^{1/2} \times 0.829^{1/2} \right) = 0.909 \ldots\ldots\ldots\ldots (13)$$

2. Calculating Social Human Development Index (SHDI) by applying the following formula:

$$SHDI = \left(D_{Health}^{1/3} \cdot D_{Education}^{1/3} \cdot D_{\text{A decentstandardof socialliving}}^{1/3} \right) \ldots\ldots (14)$$

- Health Dimension = 0.885
- Education Dimension

$$= \frac{0.950 + 0.947}{2} = 0.948 \ldots\ldots\ldots\ldots (15)$$

- A decent standard of social living dimension is calculated by applying weighted mean as the following formula:

$$SLD = \left(\frac{II \times 3 + GI \times 3 + TAI \times 3}{9} \right) \ldots\ldots\ldots\ldots (16)$$

- Infrastructure Index=

$$\frac{0.796 + 0.821 + 1}{3} = 0.872 \ldots\ldots\ldots\ldots (17)$$

- Gender Index=

$$\frac{0.978 + 0.836 + 0.762}{3} = 0.859 \ldots\ldots\ldots\ldots (18)$$

- Technology Adaption Index=

$$\frac{0.973 + 0.776 + 0.978}{3} = 0.909 \ldots\ldots\ldots\ldots (19)$$

$$SLD = \left(\frac{0.872 \times 3 + 0.859 \times 3 + 0.909 \times 3}{9} \right) = 0.880 \ldots\ldots\ldots\ldots (20)$$

Step 5. Aggregating the sub-indices to produce the ESHDI
The ESHDI is the simple average of the sub-indices:

$$ESHDI = \left[\left(0.909 \times \frac{1}{2} \right) + \left(0.904 \times \frac{1}{2} \right) \right] = 0.906 \ldots\ldots\ldots\ldots (21)$$

The following Figure 3 illustrates an example on the Economic Human Development Index and Social Human Development Index for four countries namely: Norway, Brazil, Haiti, and Equatorial Guinea.

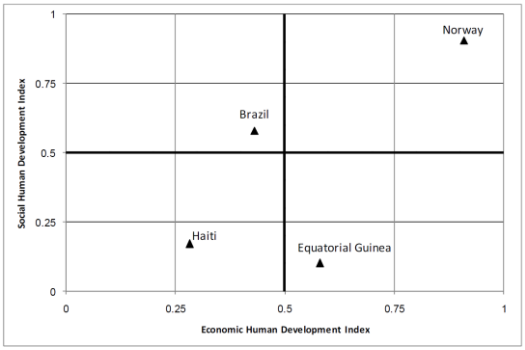

FIGURE 3. ESHDI in Four Countries: Norway, Brazil, Haiti, and Equatorial Guinea.
Note: Arithmetic mean to all countries under study =0.50
RESULTS

The ESHDI classifications are statistical and based on hierarchical cluster analysis by furthest clustering method. Following analysis, the countries are classified into the four following groups:

1- Countries with a very high level of human development, where the value of index is higher than (0.797).
2- Countries with a high level of human development, where the value of index is between (0.78-0.555).
3- Countries with a medium level of human development, where the value of index is between (0.544-0.306).
4- Countries a low level of human development, where the value of index is less than (0.30).

Because there are (164) countries, the four groups do not have the same number of countries: the very high ESHDI group have (22) countries, the high have (43) countries, the medium have (60) countries, and the low have (39) countries. Table (7)in index illustrates the result of the ESHDI.

Major contribution to the ESHDI is measured the level of human development in the countries. According to the ESHDI, 22 countries attain very high level of human development due to their respective high achievements in economic and social dimensions of human development. Additionally, the fact that the 22 countries are typically described as "top performers" can be explained by the fact that progress in economic dimensions and social dimensions are generally viewed as a driver in successful human development. The Norway ranks highest in this category, followed by Sweden and Australia. The category consists of some European countries, USA, Japan, New Zealand, Canada, Israel and South Korea. Moreover, 43 countries attained a high level of human development. Italy ranks highest in this category, followed by the Czech Republic and Singapore. The number of countries with a medium level of human development 48 countries. Azerbaijan ranks highest in this category, followed by Bosnia and Herzegovina. The country in this category are typically described as less-developed countries. In addition, 39 countries attain a low level of human development. Botswana attains the highest position in this category, followed by Madagascar. The countries in this category are typically described as least-developed countries.

Interestingly, some countries attain a very high level of human development according to HDI in this category (UNDP2013 ،p. 144-147), but attain a high level of human development according to the ESHDI, such as Italy, Cyprus, and United Arab Emirate. In addition ، some countries attain a high level of human development according to the HDI in this category, but attain a medium level of human development according to the ESHDI, such as Brazil, Tunisia, and Algeria. Moreover، some countries attain a medium level of human development according to the HDI in this category, but attain a low level of human development according to the ESHDI, such as, Cape Verde, Swaziland. On other hand, some countries attain a low level of human development according to the HDI in this category, but attain a medium level of human development according to the ESHDI, such as، Pakistan, Bangladesh. The explanation for the variance in status is that the HDI assesses development based upon only three equally weighted indicators, while the ESHDI assesses development in terms of both economic human development index and social human development index, which are calculated based upon sixteen indicators in their respective indices. Therefore, some countries attain levels of economic and social human development above the level of average for countries under study.

It should be noted that some countries have economic human development index (EHDI) and human social development index (SHDI)that is higher than the level of average countries under study, such as European countries and the United States, Israel, South Korea and others. There are also countries where the level of SHDI is very high and the level of EHDI is high or medium, such as Italy, Spain, Greece, Poland, Portugal, Hungary... etc. In contrast, there are countries where the level of EHDI is very high and the level of SHDI is high or medium, such as countries of the Arabian Gulf. In addition, there are countries where the level of EHDI and SHDI are close, such as Turkey, Azerbaijan, Malaysia, Libya, Kazakhstan, China and Thailand… etc .Finally, there are countries where the level of EHDI and SHDI are low, such as Afghanistan, Lesotho, Mozambique, Chad, Sudan, Nepal, Madagascar... etc.

We noted from the table that the ranking of countries according to the ESHDI does not differ much from HDI, It is striking that the top countries that have the ESHDI and the HDI typically described as Developed countries, and countries with a medium development typically described as less-developed countries. We can say that most of European countries in addition to Australia and New Zealand, Canada, Singapore, Israel, South Korea and United Arab Emirates are in the top 30 .According to the ESHDI; Norway comes in first rank, followed by Sweden then Australia, Germany and Switzerland.

Discussion and Concluding Remarks

The main contribution of this paper lies in the utilization of a combination of indicators (economic and social) to measure human development. The result is the creation of the Economic-Social Human Development Index (ESHDI). The ESHDI is a good representative measure of human development because provides a better indication of the general level of human development in a specific country at a certain period of time. The measurement detects more differentiation between developed and underdeveloped countries. Finally, the ESHDI is designed to be applied for both developed and underdeveloped countries, as well as their potential application to counties or governorates within a given country.

The proposed index introduces the ESHDI as an alternative or a companion to the HDI. The ESHDI takes into account the level of economic human development (expressed as the Economic Human Development Index) and the level of social human development (expressed as the Social Human Development Index) when measuring the level of human development of a country. The subindices are then combined into a composite index to provide a ranking of the level of development in the country. The ESHDI is based on four indicators representing the economic human development index and twelve indicators representing the social human development index, whereas the HDI simply assesses the development based upon three equally weighted indicators. When the ESHDI indicators are combined, they form a composite index that measures the average achievements of human development in a country. Furthermore, NORMSDIST(z) values are used for scaling in this method, leading to the reduction of issues faced by HDI measurements, including the effects of extreme values among the limited number of indices/indicators on country ranking; the use of reference minimums and maximums for purposes of scaling; the inaccuracy of the underlying statistics; the reliance upon a small pool of variables for the measurement of the level of development; and the high correlation between GDP and certain background variables that primarily serves the interests of developed countries. The results of the ESHDI is manageable and easily understood, while addressing the inherent issues associated with the HDI that hassled to significant criticism of the measure.

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دليل التنمية البشرية الاجتماعي- الاقتصادي: مقياس جديد للتنمية البشرية

ثائر عياصرة (•)

ملخص

إن الإسهام الرئيس لهذه الدارسة يكمن في استخدام ESHDI مع مجموعة من المؤشرات الاقتصادية والاجتماعية التي تقيس الإنجازات في التنمية البشرية، والنتيجة هي تطوير دليل التنمية البشرية الاقتصادية–الاجتماعية (ESHDI) المركب، ويمكن أن يعد الدليل المقترح بديلاً أو مصاحبًا لدليل التنمية البشرية، فهو مقياس ممثل للتنمية البشرية يأخذ بالاعتبار عند قياس مستوى التنمية البشرية للبلد، أولا: مستوى التنمية البشرية الاقتصادية (معبرا عنها بدليل التنمية البشرية الاقتصادية (EHDI) الذي يقيس الإنجازات التي تحققت في بعدين أساسيين: بعد الدخل وبعد السياسات الاقتصادية، وثانيا: مستوى التنمية البشرية الاجتماعية (معبرا عنها بدليل التنمية البشرية الاجتماعية (SHDI) الذي يقيس الإنجازات التي تحققت في ثلاثة أبعاد أساسية، وهي: حياة طويلة وصحية، والمعرفة، ومستوى لائق من المعيشة الاجتماعية، ثم يتم الجمع بين الأدلة الفرعية في مؤشر مركب يقيس متوسط إنجازات التنمية البشرية في الدولة.

ويستند ESHDI على أربعة مؤشرات تمثل دليل التنمية البشرية الاقتصادية واثني عشر مؤشرا تمثل دليل التنمية البشرية الاجتماعية، في حين أن دليل التنمية البشرية يقيم التنمية القائمة على ثلاثة مؤشرات موزونة على حد سواء، وعلاوة على ذلك، يستخدم ESHDI القيم تحت المنحنى الطبيعي المعياري المقابلة لقيمة (z) المعيارية لتنميط المؤشرات في مقياس يتراوح بين 0 إلى 1، مما يؤدي إلى الحد من القضايا التي توجّه إلى قياسات دليل التنمية البشرية.

إن نتائج ESHDI يمكن فهمها بسهولة، وتتراوح قيمة الدليل بين 0 إلى 1، فكلما ارتفعت قيمة الدليل كانت أفضل، وقد تم احتساب ESHDI لـ 164 دولة عضو في الأمم المتحدة، وقد كشف القياس عن مزيد من التمايز بين البلدان المتقدمة والمتخلفة، وفي ضوء ذلك، فإن النتائج المعروضة هنا تدل على أن ESHDI يمكن أن يكون ممثلا جيدا ومقياسا للتنمية البشرية.

الكلمات الدالة: التنمية البشرية، دليل التنمية البشرية، دليل التنمية البشرية الاقتصادي–الاجتماعي، ترتيب الدول.

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