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Historical Evolution and Calculation of the Human Development Index

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ABSTRACT

The concept of human development emerged as a formal concept in 1990 and is announced annually by the United Nations Development Program (UNDP). Human Development Index (HDI) values are found from income, health and education indices and it is an index that shows people's development levels. HDI identifies the shortcomings of societies and can create solutions for development and form the starting point in sustainable development and investment plans. When we look at the use of HDI, it is not only used for the country, but also the regions and provinces of that country. The aim of this study is to examine the literature extensively and to reveal the historical development and calculation of the Human Development Index.

Keywords: Human Development Index, Purchasing Power Parity, GDP, Health, Education.

Introduction

The relationship between development and economic growth has been the subject of many studies since the early 1900s and continues to be. Studies have examined the relationships between growth and development from different perspectives and taking into account different values. In the 1960s, while development was largely expressed in increases in national income; the main purpose of

development was to transform the production and employment structure into industry and service Sectors other than agriculture. Therefore, in these periods, the expression of national income per capita began to be used as an indicator of the changes in the welfare of the country. However, when the redefinition of the concept of development came to the agenda in the 1970s, the concept of development was defined in accordance with the conditions of the day. The new approach, which aims to define development with its human, social, cultural, environmental and spatial dimensions, besides the concept of economic growth; revealed the importance of considering poverty, unemployment, income distribution and imbalances between regions within the definition of development.

Development is the process of improving the quality of life of all people. There are three equally important aspects in the outlook for development. First; it is the improvement of people's living standards, which is the increase in their incomes, the improvement of their food consumption, health care, education and other conditions along with economic growth. Latter; social, cultural, political institutions, economic systems, and the value given to people, and people's self-confidence. The third is; it is the increase in the freedom of people with the expansion of their options and the increase in the variety of goods and services consumed. It is seen that the United Nations Development Organization takes into account the first definition of development while creating the human development indices.

HUMAN DEVELOPMENT INDEX

Human development is a concept that aims individuals to lead a peaceful and happy life quality, a good education process, and a long and healthy life. The HDI, created by the United Nations, has been published as the "Human Development Report" since 1990. While creating the human development index, it is formed in a way to cover three areas that are important for the socio-economic life of each person, unlike the economic one.

1. Income: a desirable standard of living measured as GDP per capita calculated in purchasing power parity (PPP).

2. Education: information measured as adult literacy rate and school enrolment rate.

3. Health: a healthy and long life, measured as life expectancy at birth.

The HDI is an average measure of the most important human values as well as a summary measure of the concept of human development emphasizing three key dimensions. The HDI is now widely used in academic studies, in the media, and to measure and compare human development progress between countries.

Data belonging to the variables used in the calculation of the human development index are determined by survey studies.

DEVELOPMENT OF THE HUMAN DEVELOPMENT INDEX

Human development is much more than the rise or fall of national income. It is about creating an environment where people can develop their own potential and direct their productive and creative lives in line with their own needs and interests.

Since people are the true wealth of nations, there must be progress in expanding people's choices to lead the lives they choose, and this is much more than economic growth. The concept of human development was mainly developed by Amartya Sen and Mahbub-ul-Haq.

Human development is published as a report every year by the United Nations Development Program (UNDP) and it is not only about economic enrichment, but also about the enrichment of life. Human development is an approach that focuses on people themselves and the opportunities they have.

The concept of human development is based on the capability approach of Amartya Sen. Winner of the Nobel Prize in economics, Sen put forward a new perspective on the understanding of poverty and development with his capability approach. Sen used the capability approach as a framework to use when formulating different policy options to prevent and reduce poverty. His critiques of welfare economics are largely based on the capability approach he developed and the concepts of poverty, equality, development and well-being that he redefined in connection with this approach. Sen, who criticizes them for staying alive, proposes new categories so that we can see all aspects of life options with a capability approach.

The basis of social development is the expansion of capabilities. The success of a society should be evaluated on the basis of the fundamental freedoms or capabilities of its individuals.

The development theory as an extension of basic capabilities also constitutes the starting point of a human-centered development and development approach. The level and breadth of capabilities are factors to be taken into account when evaluating an individual's quality of life (Sen, 1999).

Although the variables used in the calculation of the HDI have not changed, there have been periodic changes in the methods from 1990 to 2010. When the first HDI was published in 1990, the HDI had a few key features. The main variables in the calculation of the HDI are literacy, real GDP per capita and life expectancy. The income indicator was calculated by taking the logarithm of real GDP per capita. In calculating the HDI, all key variables are weighted equally. Purpose of this; It is to show that the variables have equal importance for the lives of individuals. In the first report in 1990, GDP per capita, literacy rate and life expectancy at birth were considered as income, education and health indicators, respectively. The minimum and maximum values of each indicator were determined. Considering these values, a unitless scale ranging from 0 to 1 was obtained.

As an education indicator, the duration of school attendance of individuals was added to the HDI calculation in 1991 (Şeker, 2011: 4). The purpose of adding this new variable is the idea that it will show the phenomenon of high levels of talent and will help to differentiate especially industrialized countries (UNDP, 1991: 15). The reason for giving 2/3 weight to adult literacy rate is; education of this variable. Participation is better representative of stock variables.

COMPONENTS OF THE HUMAN DEVELOPMENT INDEX

The human development index is a frequently used method. The variables required to calculate the HDI are; life expectancy at birth, literacy and schooling rates, and income per capita in purchasing power parity.

Life Expectancy at Birth

Life expectancy at birth is the average number of years a new-born can expect to live. In order to calculate life expectancy at birth, it is necessary to know the age-specific death numbers for a given calendar year. Life expectancy is the first factor in the Index and results from healthy, regular and adequate nutrition. Life expectancy is closely related to health. Medicine, doctors and hospitals are important factors in health. In addition, food and the environment are just as important as these factors. In addition, it is increasingly emerging that the level of health knowledge of the mother is one of the most important conditions for longevity. Life expectancy is an indicator of the level of

health of a population as a whole, and people living in societies with average and high life expectancies tend to be healthier.

In fact, the values indicating longevity are not directly related to the quality of health in a lifetime. It is possible to live 80 years in poor health or 20 years or less in perfect health before some unexpected death (Hicks, 1997: 1285).

A healthy diet is very important for a long and healthy life. In the work of Glewwe and Jacoby (1995); they discussed how malnutrition could affect children's well-being throughout their lifetime and concluded that malnutrition, especially in low-income countries, is an important factor in delaying school-age children's enrolment and increasing the school-starting age. They stated that with the delay in this process, the welfare level of children who have insufficient health and nutrition opportunities will have a negative impact throughout their lives.

Literacy and Schooling Rate

Knowledge is the second basic factor in human development and one of the measures used to determine the level of knowledge is literacy and schooling rate. Literacy; It is the first step a person takes towards learning and knowledge. Adult literacy rate and schooling rate are two important variables in the Education index. The schooling rate included in the index is the ratio of students enrolled at a given education level, regardless of age, to the population of official school age at that level. For the calculation of the education index, information about the literacy rate and schooling rate provided by the household income index is used. The enrolment rate is the concept that shows what percentage of the population is in school**.**

The variables that affect the demand for education are as follows.

1. Personal factors (age, biological characteristics, cognitive abilities, interests, future expectations),
2. Economic factors (cost of education, income level, income expectations, choice of profession, information about the market),
3. Socio-cultural factors (family origin, gender),
4. Institutional factors (education system, other institutions),

It can be said that the education variable affects the level of human development more than other variables. Because the increase in education level provides an increase in the Education Index value

used in the calculation of HDI. In addition, it allows individuals with a high level of education to improve both their living conditions and income levels. These improvements will cause an increase in the values of other indices used in calculating the HDI.

Per Capita Income by Gross Domestic Product

Income is the third essential element of human development. Income is a necessary tool for a decent life and for obtaining basic goods and services. Gross Domestic Product (GDP) per capita is used for income data. Since income per capita can be easily obtained as an income indicator, it can give precise information about the income level of countries. However, per capita income data are not suitable for comparisons, considering the deterioration caused by non-tradable goods and services, taxes, and changes in exchange rates. Therefore, real GDP per capita values according to purchasing power parity (PPP) are used to control resources.

According to the World Bank, family income affects the age at which a child is enrolled in school, his ability to continue with further education and the benefits of education.

THE EVOLUTION OF THE HUMAN DEVELOPMENT INDEX

HDI, which is used in the measurement of human development, has undergone significant changes and has been developed over time. Changes in this development process are very important to understand and correctly interpret the indices related to human development levels that HDI has revealed in different years. It is therefore useful to explain and consider the evolution towards HDI.

When HDR was first released in 1990, HDI had a few key features. The first is that HDI was created from a deprivation perspective. First, a deprivation search was conducted for each variable and the mean deprivation composition was defined. Then, when the mean deprivation compound was subtracted from the number “1”, the resulting number represented HDI (UNDP, 1990: 109). In the calculation of the index, life expectancy, literacy and real GDP per capita variables were determined as the main variables. The income indicator is calculated by taking the logarithm of real GDP per capita. The formula defines the measure of deprivation for each of these three basic variables. For each of the key variables, the deprivation experience is weighted equally. The reason for this is that all dimensions within HDI have equal importance as philosophy and are equally necessary for the creation of human capabilities (UNDP, 1990: 109; UNDP, 1999: 12).

With the demands of those interested in academic studies, political reactions and development problems, a number of new methodological regulations were introduced to HDI in 1991. The first of these arrangements, starting from 1991, is to abandon the roundabout way in the calculation of HDI and switch to the direct calculation method. Accordingly, the human deprivation index will no longer be calculated and subtracted from the "1" figure. In order to directly obtain HDI, three sub-indices will be created first. These indices are indices that express the three basic dimensions of human development. Another innovation introduced in HDR, which was published in 1991, is the addition of the schooling rate as a second element. This second element was designed with the intention of demonstrating the phenomenon of high levels of talent and helping to differentiate industrialized countries in particular (UNDP, 1991: 15). Adult literacy was given a weight of 2/3, and the enrolment rate was 1/3. The reason why adult literacy is given a weight of 2/3 is that this variable better represents the stock variables of participation in education.

Also, HDR in 1991 has the distinction of being the first Report to correct the income component of HDI, taking into account inequality. The 1990 measurements give averages that mask wide inequality in the entire population. With the said development in HDI in 1991, a more sensitive calculation was brought to the income distribution in the countries. Completely similar methods were used in 1992 and 1993 as well.

In 1994, a new change was made in the determination of the poverty line. According to the new regulation, the income limit value supported by PPP has been determined as the world average global value. Another change in 1994 was that income inequality it is the abandonment of the use of the Gini coefficient in measurement. This is because no country has a very good income distribution and the income distributional-adjusted, which means multiplying the Gini coefficient with HDI, reduces all HDI values. Another of the changes in 1994 was the method change in the selection of the maximum and minimum values for the three elements of HDI. In 1994, when the maximum and minimum values of the HDI published every year were fixed for comparable and more realistic analyses by years, the maximum value of the life expectancy at birth variable was fixed as 85 years and the minimum value as 25 years with the future long-term perspective. These values are predicted by demography and medical science (UNDP, 1994: 92). These values were used in all reports, including the 2005 Report (UNDP, 2005: 341).

In HDR, published in 1995, the education index applied from 1991 to 1994 was developed. The schooling year's variable has been replaced by the composition of the gross enrolment rate in primary, secondary and higher education institutions. The education index in HDI is formed by the variables of schooling rate and literacy rate instead of the average year of education variable. The education index has been formed in this way since 1995, including 2005 (UNDP, 2005: 341).

CALCULATION OF HUMAN DEVELOPMENT INDEX

The index calculation took its final form by making changes in 2010. The education component, which is calculated from the variables of literacy rate and schooling rate before 2010, is calculated according to the average schooling year and expected schooling year variables after 2010. Similarly, instead of the per capita gross domestic product (GDP) variable in the income component, the per capita gross domestic income variable is included in the formula. In the calculation of the human development index, first, indices are created from the indicators belonging to the elements of the concept of human development. Indicators of life expectancy at birth, adult literacy rate and gross enrolment rate, and real GDP per capita by PPP that "reflects cost of living regionally"; are converted to life expectancy index, education index and income index, respectively. HDI is obtained from these indices. While creating the HDI, the variables are turned into numbers by the scaling method. At this stage, the largest and smallest values for the variables are determined and the difference between these values forms the scales. When converting variables into numbers, the difference between the observed value and the smallest value is determined, and then this difference is shown as the ratio of the difference between the largest and smallest values. In this way, the indices take values between 0 and 1. There are two important reasons for scaling and converting variables into numerical data. First, the variables that make up the HDI have different units. This process is necessary to eliminate the difference between units and to reach pure numbers. The second is that it allows the numerical values obtained to be compared at the international level.

While creating the indices that make up the HDI, the minimum and maximum values are converted to a value between 0 and 1. The Human Development Index is analyzed in three dimensions: a healthy and long life, calculated by life expectancy at birth; level of knowledge and education as measured by adult literacy rate and primary, high school and tertiary school enrolment rates; It is the standard of living measured by real GDP per capita calculated according to the PPP.

Three indices have equal weight in the calculation of the HDI. The life expectancy index is obtained from life expectancy data at birth. The income index is also calculated by taking into account the per capita income. The education index consists of adult literacy rate and combined schooling rate indicators. Indicators do not have equal weight in the calculation of the education index. The adult literacy index affects the education index by 2/3 and the schooling index by 1/3.

Calculation of Life Expectancy Index

The highest and lowest age limits were determined as 85 and 25, respectively, and considering this range, the life expectancy index was calculated to take a value between 0 and 1.

Calculation of Education Index

To reach the education index, a value between 0 and 1 was given, using the range of 0-100 for the adult literacy index (over 15 and 15 years of age) and the schooling index.

Calculation of Income Index

The Income Index is measured in GDP per capita adjusted for PPP. While using the index, $100 is taken as per capita income, while $40,000 is used as the top-level income. In the income index, the logarithm function is used. Based on this usage, the income index takes a value between 0 and 1.

Calculation of the Human Development Index:

While calculating the Human Development Index, it is calculated by taking the arithmetic average of the Life Expectancy Index, Education Index and Income Index. The calculated HDI index value takes a value between 0 and 1. Values close to 0 indicate a lower level of human development, while a value close to 1 indicates a high level of human development. $0 < HDI < 0.499$ “low human development”, $0.500 < HDI < 0.799$ “medium human development”, $0.800 < HDI < 1,000$ “high human development”

CONCLUSION

The real wealth of a nation is its people. The basic philosophy of the human development approach is to create environments that provide for the satisfaction of the basic needs of the individuals of a nation as well as the higher-level needs. The understanding of development, which sees the development of nations in numerical values expressing economic growth and growth, weakened

after the 1980s and left its place to the understanding of human development. This approach sees the increase in production and wealth as a prerequisite, a beginning and puts people at the center of development. This understanding, which takes its philosophical and intellectual foundations from the 'capability approach' developed by the famous economist Amartya Sen, has been implemented by UNDP by a team led by Mahbub ul Haq. Different indices such as HDI have been developed to evaluate different dimensions of human development, and it has become possible to compare countries in terms of human development through the Human Development Reports prepared since 1990. Since the day it was published, studies have been carried out on indexes, indicators and calculation methods that reflect human development, and new indices that can measure different dimensions of development are tried to be developed.

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