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The Relationship of Economic Growth And Terrorism with the Human Development Index: A Causality Analysis on MENA Countries

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Abstract. Examining the human development of societies is one of the important economic policy practices of recent times. Therefore, economies steer the sub-components of human development and their policies implemented by researching the factors that affect such sub-components. In this context, the aim of this study is to examine the relationship between economic growth and terrorism with human development in 12 selected MENA countries in the period of 2002-2017 by the panel causality method. The findings obtained as a result of the panel causality analysis show that both terrorism and economic growth have bidirectional causality with the human development index throughout the panel. A causality relationship has also been found in many countries on a country basis.

Keywords. Economic Growth, Human Development Index, Terrorism.

1. Introduction
The concept of economic growth is of great importance in determining the development levels of countries. However, the differences between development and economic growth should not be overlooked. Development does not only mean increasing production and per capita income, but also changing and modernizing the economic and socio-cultural structure in an underdeveloped society. In addition to the increase in per capita income, structural changes such as the change in the efficiency and amount of production factors in general and the increase in the share of the industrial sector in national income and exports are the main components of development. Economic growth, on the other hand, is the constant increase in real Gross Domestic Product (GDP) over time (Han and Kaya, 2018: 2).

After the Second World War, countries turned towards a growth-oriented approach in order to achieve their development goals. Before 1970, the level of development was evaluated on economic facts such as income, capital, investment, and industrialization (Aydın, 2019: 33-34). However, although the countries achieved economic growth after 1970, there has been no improvement in individual living standards. Therefore, with the globalizing world since the 1990s, it has become a worldwide view that it is not right to explain the development levels of
societies only with economic facts and that economic growth should be human-oriented (Erdem and Çelik, 2019: 15).

This new understanding of development has also changed the United Nations Development Program (UNDP) view of development. It has begun to be addressed with a holistic view, including economic growth, human development, and environmental sustainability. This new understanding of development also changed the United Nations Development Program’s (UNDP) view of development, and development began to be addressed with a holistic view, which involves economic growth, human development, and environmental sustainability (Akçiçek, 2015: 5). Within the framework of these developments, the United Nations Development Program (UNDP) has tried to show that the development and development performance of countries can be measured not only in economic dimensions but also in non-economic dimensions with the help of the “Human Development Index (HDI)”, which has been published regularly every year since 1990.

Although the first Human Development Report (1990) puts less emphasis on the place of economic growth in human development, successive human development index reports highlight the importance of economic growth for human development (Awad, 2014: 152). In addition to economic growth, the human development parameters such as life expectancy, the HDI, which is a combination of education elements, unbalanced income distribution in the society, lack of health conditions, and inability to access educational opportunities constitute a source for terrorism (Koçal and Erkenekli, 2016: 36). In this sense, it is of great importance to examine the effect of terrorism on human development as well as economic growth. Since the Middle East and North Africa (MENA) countries had more terrorist incidents in recent years, the effects of terrorism on the HDI will be examined specifically in these countries. Furthermore, the study investigates the relationship between human development, terrorism, and economic growth, which is typically one of the reasons why a poor and backward MENA is ranked lower in the world development league, excluding the oil-rich ones.

This study firstly discusses economic growth and its impact on human development. The second part addresses terrorism and its impact on human development and describes the conceptual framework of the subject. Then, the relevant literature study is included. The fourth part of the study, which is the method and analysis section, the relationship of economic growth and terrorism with the HDI in 12 MENA countries, was tested by causality analysis using data for the period 2002-2017.

2. Economic Growth and Its Impact on Human Development

Human development refers to a multi-perspective approach aiming at a quality level of knowledge and healthy and long life. The human development report has been prepared regularly within the framework of certain parameters since 1990 and it is published regularly every year. This report presents a quantitative approach by converting various socio-economic indicators into a scale in order to view the life level in all countries of the world and make suggestions on what should be done to increase the living standards by revealing the problems that individuals face (UNDP, 1990: 10). The geometric mean of life expectancy index, education index, and income give the HDI value. The HDI takes a value between zero and one. It is desirable that the index value converges to one, indicating high human development. Countries are classified as very high, high, medium, and low human development groups according to the human development index results obtained (Hicks, 1997: 1286).

Economic growth is seen as one of the most important factors in directly enhancing the abilities of the individual and therefore the human development of a nation (Sen, 2000). The impact of economic growth on a country’s human development level can be related to the role
of income distribution at both micro and macro levels. While household consumption at the micro-level is an important element for enhancing human development, achieving economic growth with increased income at the macro level has a strong impact on human development. Economic growth can increase human development by using the abilities of the individual. Households of poor countries use a large part of their income for health and education expenditures, as they cannot benefit from many advantages such as better accommodation, transportation, and entertainment. This allows them to be included in the group of countries that have a greater impact on human development (Ranis, 2004: 4).

While the HDI, which is recognized as an important international indicator today, involves developed and developing countries that are members of the UN, the number of countries included in the HDI calculation for 2019 is 189.

3. Terrorism and Its Impact on Human Development
The phenomenon of terrorism is undoubtedly one of the most discussed concepts/problems of today. Despite this much debate, there is no scientific consensus on the concept of “terror”. While terror refers to a state of action that intimidates and terrifies people and spreads great fear; terrorism is the strategy of adopting organized, systematic and continuous acts of terrorism to change the current situation illegally for political purposes. Although terror and terrorism seem to be different concepts, their goals and objectives are similar (Şen, 2015: 18).

Terrorism has bad economic consequences but is also affected by the deterioration of the economy (Estrada et al., 2015: 1066). Human development parameters such as unbalanced income distribution, lack of health conditions, and inability to access educational opportunities in the society are used as propaganda material and tried to be exploited as much as possible. Therefore, according to the human development index, the main reason for the prevalence of terrorist activities in less developed countries is low health, education, and income values. However, these findings do not mean that terrorist acts are encountered only in underdeveloped countries. As a matter of fact, terrorism is likely to occur in national, global, religious, and ethnic nationalist structures. Accordingly, while the efforts of individuals who are in a minority situation and feel excluded in the society to gain the respect they could not obtain through other means, by becoming a member of a terrorist organization, are the factors that cause terrorism; inequality and social injustice in issues such as economy, health and education seem to be the reasons that feed terrorism (Koçal and Erkenekli, 2016: 36). The poor economic performance of countries limits employment and other economic opportunities and also brings impoverishment by creating income inequality. Lack of such economic opportunities, together with socio-economic dynamics, can be a driving force in the increase of terrorism (Estrada et al., 2018: 78).

The Global Terrorism Index covers 163 countries and includes situations where there is direct or indirect exposure to terrorism. While creating this index, not only the number of terrorist incidents was taken into account, but the death, injury, material damage, and psychological trauma experienced after the incident were also taken into account to calculate the violence dimension of terrorist incidents more realistically (GTI Report, 2019).

3. Literature Review
The literature includes studies dealing with the relationship between human development and economic growth, as well as studies dealing with the relationship between economic growth and health, education, and income, which are sub-indices of the human development index. It is observed that studies examining the relationship between human development and economic
growth have an increasing trend, especially after the 2000s. However, it is also seen that there are few empirical studies dealing with the relationship between terrorism and human development. Therefore, it is thought that this study will contribute to the literature in this field. Khan et al. (2018) analyzed the relationship between human development and economic growth and terrorism by long-term ARDL and VECM causality tests, using data and the variables of GDP, electricity consumption, urban population, human development index, and terrorist incidents for the period of 1990-2016 for Pakistan. The finding obtained suggests that the effects of economic growth and electricity consumption on human development are insignificant, whereas terrorism has a negative impact and this relationship involves bidirectional causality. However, it was found that urbanization positively affects human development.

Koçal and Erkenekli (2016) investigated the effect of human development level and cultural values on the emergence of terrorist crimes with the help of global terror and human development index variables. The variables used were analyzed by correlation and regression analysis methods, which are among the quantitative data analysis methods. As a result of the analysis, it was observed that there is a moderately significant negative relationship between terrorist crimes and human development (education level and income level), and a negative but insignificant relationship with life expectancy.

Table 1 chronologically lists the studies examining the relationship between economic growth and education, health, and income variables, which are sub-indices of the human development index, and especially the studies directly addressing the effect of economic growth on the human development index. Accordingly, Table 1 presents selected examples covering different study areas, periods, various methodological approaches, and various findings.

Table 1. Empirical Studies on the Economic Growth and Human Development Index

| Authors (Study Year) | Methods | Variables | Study Location(s) and (Period) | Findings |
|----------------------|---------|-----------|-------------------------------|----------|
| Ranis et al. (2000)  | Regression Analysis | GDP, Social Expenditure | 1960-1992 36 and 75 Developing Countries | Bidirectional causality relationship |
| Shahbaz et al. (2011) | Causality Test (Hurlin 2004) | Education Index, Life Index, GDP | 1971-2000 10 Asian Countries | HDI causes GDP |
| Abraham and Ahmed (2011) | ECM | HDI, GDP | 1975-2008 Nigeria | GDP-HDI significant long-term relationship |
| Sharifi-Renani et al. (2012) | Regression Analysis | HDI, Education Index, Health Index, GDP | 1980-2010 MENA Countries | HDI positively affects GDP |
| Bundala (2012) | Multiple Regression Analysis | HDI, GDP | 2011 40 Countries | Strong relationship between HDI and GDP |
| Awad et al. (2014) | ARDL | HDI, GDP, Employment | 1990-2016 Sudan | The positive contribution of education and employment levels to economic growth |
4. Data and Methodology
This study examines the effects of economic growth and terrorism on the human development index in MENA countries. The MENA countries selected for the analysis are as follows; Algeria, Bahrain, Egypt, Iran, Jordan, Israel, Kuwait, Morocco, Saudi Arabia, Tunisia, Yemen, and Iraq.

The analysis used an annual series for the period 2002-2017. The available data for all countries used were taken into account when determining the period interval to be analyzed. Furthermore, the variables used in the analysis were determined considering the commonly used data in the literature.

Table 2. Variable description and sources of data

| Variable | Variable Description                  | Data Source | Period      |
|----------|--------------------------------------|-------------|-------------|
| HDI      | Human Development Index              | UNDP        | 2002-2017   |

Wang et al. (2018) found that education level has a positive effect on the human development index. They used Two-Stage OLS GMM VECM to analyze the relationship between education, HDI, GDP, CO2 emission, openness, renewable energy consumption, and urban population. The period of analysis was 1990-2014 for Pakistan.

Aykırı and Bulut (2018) examined the relationship between the HDI and GDP using the VECM Granger Causality Test. They found a bidirectional causality relationship between the HDI and GDP for Turkey during the period 1990-2015.

Erdem and Çelik (2019) used the ARDL Dumitrescu-Hurlin Causality Test to analyze the relationship between the HDI and GDP. They found a bidirectional causality relationship between the HDI and GDP for 33 African countries during the period 1995-2014.

Aydın (2019) used the Hacker and Hatemi-J ARDL DOLS FMOLS to analyze the relationship between the HDI and GDP. They found that GDP increase HDI and that increases in HDI support GDP for Turkey during the period 1990-2017.

Balcı and Özcan (2019) used the Pedroni Cointegration Test and Causality Test to analyze the relationship between GDP and HDI. They found a positive and significant bidirectional causality relationship for 54 OIC countries during the period 2005-2017.

Chikalipah and Makine (2019) used the VECM to analyze the relationship between GDP and HDI. They found that GDP has an impact on HDI in the long run for Zambia during the period 1970-2015.

Appiah et al. (2019) used the FEM REM to analyze the relationship between GDP and HDI. They found that the relationship between GDP and HDI has a positive sign and significant for 5 African countries during the period 1990-2015.
In this context, the human development index, which is composed of education, income, and life expectancy components, which express human development, was obtained from the human development report, which includes 185 countries worldwide (UNDP, 2019 Human Development Report). The human development index takes a value between zero and one (0-1). Data on the indicator of terrorism has been obtained by using the Global Terrorism Index Report. In the report, the highest value was determined as 10 and the lowest value as 0. GDP per capita obtained from the World Bank database were used as the indicator of economic growth.

The model used in causality analysis in the study was determined as follows:

\[ HDI_{it} = \alpha_0 + \beta_1TER_{it} + u_{it} \quad (1) \]
\[ HDI_{it} = \alpha_0 + \beta_1GDPPC_{it} + u_{it} \quad (2) \]

Where \( i=1,...,N \) refers to the number of cross-sections, and \( t=1,...,N \) refers to the time dimension.

### 4.1. Panel Causality Analysis

Recently, it has become more common to test the causality relationship within the framework of the panel. For this reason, many methods were developed to examine the direction of causality. One of these methods is the panel causality method of Emirmahmutoğlu and Kose (2011). Emirmahmutoğlu and Kose (2011) simply extended the Toda-Yamamoto approach to the Granger time series analysis form for panel data sets. This panel causality approach takes into account the transnational heterogeneity, regardless of whether variables are stationary or cointegrated. In addition to this flexibility, it also takes into account the cross-sectional dependency because the critical values for panel statistics are derived from bootstrap distributions (Özcan, 2016; Özcan et al., 2017).

As can be seen in Table 3 and Table 4, the obtained estimation results suggest that the causality relationship between the human development index and economic growth and terrorism at different significance levels is theoretically and statistically significant.

**Table 3: Panel Causality Results (TER, HDI)**

| Country | Lag | Statistic | p-value | HDI≠>TER | Statistic | p-value |
|---------|-----|-----------|---------|----------|-----------|---------|
| Algeria | 2.000 | 1.061 | 0.588 | 7.151** | 0.028 |
| Bahrain | 1.000 | 1.511 | 0.219 | 0.121 | 0.728 |
| Egypt | 1.000 | 0.986 | 0.321 | 0.056 | 0.813 |
| Iran | 2.000 | 10.369*** | 0.006 | 2.083 | 0.353 |
| Jordan | 2.000 | 4.524 | 0.104 | 7.872** | 0.020 |
| Kuwait | 1.000 | 0.015 | 0.903 | 0.019 | 0.892 |
| Morocco | 2.000 | 6.556** | 0.038 | 15.381*** | 0.000 |
| S.Arabia | 2.000 | 8.432** | 0.015 | 3.248 | 0.197 |
| Tunisia | 1.000 | 4.821** | 0.028 | 0.126 | 0.723 |
| Yemen | 2.000 | 0.056 | 0.972 | 14.091*** | 0.001 |
| Iraq | 1.000 | 0.102 | 0.750 | 1.656 | 0.198 |
| Israel | 1.000 | 2.793* | 0.095 | 1.032 | 0.310 |

1 In order to save space, the details of bootstrapping method is not outlined here. An interested reader is referred to Emirmahmutoglu and Kose (2011).
When examined Table 3, the relationship between terrorism and the human development index is observed. The findings obtained show that a causal relationship from terror to human development index exists in Iran, Morocco, Saudi Arabia, Tunisia, and Israel. In other words, it is concluded that terrorism is a cause of human development. Similarly, for the entire panel, it proves that terrorism is the cause of human development. On the other hand, in the hypothesis that the Human Development is not the cause of terrorism, the null hypothesis is rejected in countries such as Algeria, Jordan, Morocco, and Yemen, and it is concluded that human development is the cause of terrorism. There is causality from human development to terror for the entire panel.

Table 4. Panel Causality Results (GDPPC, HDI)

| Country | GDPPC≠>HDI | HDI≠>GDPPC |
|---------|------------|------------|
| Algeria | 2.013      | 0.353      | 0.552      |
| Iran    | 0.961      | 0.509      | 0.475      |
| Jordan  | 7.985      | 0.650      | 0.722      |
| Egypt   | 0.794      | 7.825      | 0.020      |
| Bahrain | 4.650*     | 0.017      | 0.991      |
| Morocco | 3.891      | 0.346      | 0.841      |
| S.Arabia| 3.507      | 1.527      | 0.466      |
| Tunisia | 1.170      | 0.968      | 0.325      |
| Yemen   | 1.729      | 0.079      | 0.961      |
| Iraq    | 4.803*     | 11.361***  | 0.003      |
| Israel  | 1.651      | 0.762      | 0.383      |

The causality relationship obtained through Table 4 shows that for Bahrain, Jordan, and Iraq, it moves from economic growth to human development index. For the entire panel, it is concluded that economic growth at a significance level of 5% is the cause of human development. On the other hand, the hypothesis that human development is the cause of economic growth is valid in Egypt, Kuwait, and Iraq. For the entire panel, human development appears to be the cause of economic growth.

5. Conclusion

This study examines the economy of the MENA countries, which is a multi-layered and complex region in the context of the relationship between human development and economic growth and terrorism. The causality test developed by Emirmahmutoğlu and Kose (2011) is used in the analysis that used the data for the period of 2002-2017.

The findings obtained as a result of empirical analysis show that there is a causal relationship from terror to human development index in Iran, Morocco, Saudi Arabia, Tunisia, and Israel, and it was concluded that human development is the cause of terror in countries such as Algeria, Jordan, Morocco, and Yemen. While the findings in the causality test results of the
economic growth and human development index are from economic growth to the human development index for Bahrain, Jordan, and Iraq, it was concluded that human development is the cause of economic growth in Egypt, Kuwait, and Iraq. Considering the panel-wide result, bidirectional causality was identified between per capita economic growth and human development index.

When the findings obtained as a result of the analysis were evaluated, it was concluded that both terror and economic growth are in a bidirectional causal relationship with the human development index and affect each other. These findings gave results that support the literature (Khan et al. 2018). The causality relationship that arises considering the many factors related to human development such as economic, socio-cultural, education, health, and living standards of selected MENA countries used in the analysis emphasizes the significance of the terror and concept of economic growth in the development of countries. Therefore, economic growth targets implemented in countries and anti-terror policies implemented will play a vital role in the welfare of the society and higher life quality and ensure that they are at the top of the human development index reports.

In addition to the analysis, future researchers may also use Panel cointegration tests based on the causality relationships found in the study.

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