

Analysis of the relationship between some indicators of sustainable development and economic growth in Iraq for the period (2004-2020)

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KEYWORDS

Gross Domestic Product
Spending on Education
Spending on Health
Unemployment

ABSTRACT The research aims to analyze the relationship between some indicators of sustainable development and economic growth, as well as determine the extent of the impact of sustainable development indicators on the economic growth indicator represented by the gross domestic product in Iraq, through the use of time series to express the nature of the relationship between the variables of the study, and through estimation and analysis Relationship In the applied side in which the ARDL model was used, it was found that there is a long-term equilibrium relationship between some indicators of sustainable development and economic growth in Iraq, in addition to that indicator of sustainable development have an impact on economic growth in Iraq. The study means that sustainable development has contributed in one way or another to achieving economic growth in Iraq.

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1. INTRODUCTION

Sustainable development is a modern topic that has received wide attention at the global level, especially after the world's access to modern technologies. (B. Liu et al., 2023; Q. Liu et al., 2024; Solaymani & Montes, 2023) The concept of sustainable development is a sophisticated concept of old or former development concepts. It considered that the contribution of human capital investment to economic growth was no less important than investing in physical capital and that increasing GDP was a measure of economic growth, focusing on members of society benefiting from the fruits of economic growth more equitably. (Abdi et al., 2022; Baajike et al., 2022; Kindo et al., 2024) It is a state of continuous interaction between human beings and society and between human beings and nature, as human capacity development must be used in the process of economic growth to achieve economic benefits that increase the possibility of

further sustainable development as one of the States seeking to achieve steps on this path, Iraq faced many problems and obstacles related to the realities of the Iraqi economy due to the surrounding circumstances, which engulfed Iraq after 2003 and resulted in military operations and United States occupation, and many subsequent incidents and crises that prevented it from continuing its sustainable development approach (Deng et al., 2023; Solaymani & Montes, 2023; Yu et al., 2023a). These conditions had a direct impact on Iraq's sustainable development indicators In addition to depleting its resources, the process of sustainable development requires a multiplier development effort by decision-makers through the diversification of Iraq's economy and the failure to rely on a single sector to obtain its base through which to embark on a meaningful plan of action through which to achieve the desired goals for achieving sustainable development (Ahmed & Kumalasari, 2023; Anisur Rahman, 2023; Baajike et al., 2022; Luukkanen et al., 2019; Yu et al., 2023b).

2. METHOD

The inductive and deductive Approaches to studying and analyzing the Impact of economic growth on certain indicators of sustainable development during the Duration of the Study, as well as the applied method based on the economic measure- are meant to determine the results of the relationship between study variables.

2.1. Research Structure

The research was divided into three topics. The first topic was devoted to the study of the theoretical and conceptual aspects of sustainable development and economic growth. (Deng et al., 2023; Li et al., 2011; L. Wang, 2011) The second focus was on the development of economic growth and the analysis of some indicators of Iraq's sustainable development during the period of the study and knowledge of the relationship between them. The third focus was on measuring and analyzing the impact of some indicators of sustainable development on Iraq's economic growth. The research concluded with several conclusions and recommendations.

2.2. Research Problem

The Iraqi economy faces many problems, including the irrational use of natural resources, environmental pollution, desertification, low per capita GDP and water, as well as increased openness to the outside world, which directly affects natural resources and their depletion, all of which hurt economic growth. (Deng et al., 2023; Lian, 2024) The problem can therefore be formulated in response to the following questions: To what extent have sustainable development?

3. RESULTS AND DISCUSSION

3.1. Theoretical and Conceptual Framework for sustainable development and economic growth

Economic growth is one of the prerequisites for improving communities' living standards s gross domestic product (GDP) is not only an increase in real per capita income, This increase must be greater than the rate of population growth and be cumulative and sustained over time, while sustainable development indicates the need to conserve and not drain natural resources through sufficiency. (Buranasiri et al., 2024; Jothr et al., 2023; C. Wang et al., 2024) Through this pillar, we will address economic growth and sustainable development through the following:

3.1.1. The Concept of Sustainable Development

Sustainable development is one of the topics the world has taken on in the economic, social, and political arena. If sustainability becomes a

developmental idea, it is spreading in many developing and developed countries alike, so sustainability is not a topic of the day. It is based on a series of reforms that have evolved as a result of inadequate concepts of past development. (Javier Lacárcel et al., 2023; Jha & Rangarajan, 2020; Leal et al., 2024) Many concepts of sustainable development have been identified by the economist Robert Solo as not harming the productive capacity of future generations and bringing them to the same position as the current generation. This speech on sustainability means not only the resources we consume at present and those we inherit for future generations, but also the environment must be taken care of. This environment includes the total productive capacity of the economy (Maher and Ahmad, 2017; (Maulana et al., 2022)).

It can be said that sustainable development can be considered as the means of human beings. It seeks to ensure a balance between environmental aspects through its various and diverse dimensions to ensure the rational development of both natural and human resources by its planned strategy collectively and organizationally to reconcile the needs of the present and the future (Abed et al., 2022; Olojede et al., 2020; Ruban & Rydén, 2019; W. Wang et al., 2023; Zhi & Kang, 2021). Some define it as a dynamic balance in the process of interaction between the population and the absorptive capacity of their environment so that people develop to express their potential without adversely affecting the absorptive capacity of the environment (Ben, 2015). This concept indicates that sustainability focuses on human activities and their ability to meet the needs of individuals without draining the productive resources at their disposal. (Beske-Janssen et al., 2023; Jothr et al., 2023)

Sustainable development is also known as development, which encompasses the various activities of society, by adopting the best means to achieve the best investment of material and human resources in development activities, focusing on the principles of equity in production and consumption and in the distribution of returns, to achieve the well-being of all members of society without damaging the environment or the allocations of future generations (Al-Qureshi, 2010; Maulana et al., 2022).

The FAO Council defines sustainable development as managing and protecting the natural resource base and guiding technical and institutional change in a way that ensures continuous satisfaction of human needs for the present and future generations (Jawarain, 2017) This concept in- dictates that sustainable development is the management and maintenance of the resource base and the direction of technological and institutional changes in a way that ensures that current and future human needs are met continuously. (Baajike et al., 2022; Dmuchowski et al., 2023; Raluca Gh. Popescu & Popescu, 2019) To complement the foregoing,

sustainable development aims at conserving and not draining natural resources through sufficiency, improving the well-being of society by meeting their needs and achieving balance while the present generation and future generations need it.

3.1.2. The Importance of Sustainable Development

The importance of sustainable development comes from the following: (Hashim, 2011; (B. Liu et al., 2023; Q. Liu et al., 2024)

1. The need to preserve and sustain non-renewable natural resources is an important topic, whether in the field of thought or politics. The concept of sustainability has therefore been incorporated into the concept of human development.
2. Reducing pollution and ensuring a better life for generations. Productive expansion, particularly industrial activities in developed countries, has led to higher demand for natural resources and higher pollutants.
3. Improving the cultural, social, economic, and health levels of society.
4. Solving the problems caused by underdevelopment creates new jobs for individuals and society and develops their abilities to work, think, innovate, novate, and innovate.
5. Developing the use of renewable energy materials.

3.1.3. Characteristics of sustainable development

Sustainable development enjoys continuity and communication and therefore has a range of features and characteristics: (Abu Qasr and Jasmine, 2017; Darmayanti et al., 1990; Jothr et al., 2023; Khalaf & Hamad, 2023).

1. It is its long-term development and this is one of the most important features of it, taking the time dimension as the basis for it. It is a development that depends on an appreciation of the possibilities of the present.
2. while taking into account the rights of future generations.
3. The elements of sustainable development cannot be separated from each other as a result of the overlapping quantitative and qualitative dimensions of these elements.
4. It is a multidimensional and interdependent process based on planning and coordination between economic and social development plans on the one hand and environmental development on the other.
5. Taking into account equality and the rights of subsequent generations and balancing the ecological, economic, and social systems.
6. It is an integrated development based on policy coordination and integration.
7. Sustainable development differs from development in general because it is

characterized by overlap and particular complexity about the natural and social nature of development.

8. Continuing to generate high income that can be reinvested and then perform replacement, replenishment, and maintenance of resources. The need to preserve and sustain non-renewable natural resources is an important topic, whether in the field of thought or politics. The concept of sustainability has therefore been incorporated into the concept of human development.

3.1.4. The concept of economic growth

The concepts of economic growth vary because of different researchers and intellectuals, as well as the different intellectual bases on which such concepts are based. (Awad et al., 2023; Baajike et al., 2022; Raihan et al., 2023) The definitions put forward by the competent writers are many but all of them are in the same sense. In this context, we mention some definitions that touch on economic growth.

Economic growth can be defined as an increase in per capita or labor volume because the increase in output is often accompanied by an increase in population size. (Iqbal Syam, n.d.; Raihan et al., 2023) Therefore, the real estimate of the meaning of prosperity is measured by the average per capita GDP (Awad Et al., 2021) this concept, economic growth means a sustained increase in real per capita income over time and is limited to the per capita income divided by the population.

It is also defined as increasing the economy's ability to expand the production of goods and services over some time compared to another period and can be measured in nominal terms, including inflation, or measured in real terms that do not include inflation (Dagher, 2018)

While who refers to economic growth as the impact of sustained increases in the production of material wealth, technical progress and efficiency of economic systems, as well as investment in capital and human beings, are the main sources of economic growth, because technical progress means the use of new technical methods through innovation and invention as well as the risk element of productive enterprises. (Barnes et al., n.d.; Deng et al., 2023; Lian, 2024) Economic systems show their efficiency by transferring resources to areas that achieve economies of scale and optimal production status, while the capital material and human capital positively affect the worker's productivity and manpower development in terms of training and qualification to the extent that increases the proportion of economically active forces (Awad Et al., 2020).

This concept means that economic growth represents the State's ability to offer a diverse mix of economic

goods to its population. This growing increase in productive- capacity is based on technological progress and institutional and ideological adjustments.(Encinas-Ferrer & Villegas-Zermeño, 2015a; L. Wang, 2011; Yu et al., 2023b)

3.1.5. Importance of Economic Growth

Economic growth is the reflection of economic activity and the proportion of its development. It is of interest to economists and shows its importance as a general indicator reflecting the current economic situation. The high level of income (15%) leads to a reduction in the poverty rate by 20-30%. The importance of economic growth can be represented by the following: (Kafi, 2014).

1. Economic growth raises the standard of living, creates jobs, and reduces unemployment, thereby reducing poverty.
2. Endeavors to improve the health, education, and social standards of members of society.
3. Supporting the balance of payments through the development of economic plans that contribute to implementing and achieving economic stability and contributing to domestic income growth.
4. Providing all basic needs, especially food, at affordable prices commensurate with society's economic capacity. This helps to improve their living conditions.
5. Economic growth contributes to increased income and provides significant assistance to several State institutions in the form that ultimately leads them to self-sufficiency.
6. Supporting important sectors of the State to increase the level of services provided to citizens.

3.1.6. Elements of Economic Growth

Many elements contribute to economic growth, the most important of which can be represented by the following: (Awad Et al., 2020)

1. Technological advances: technological advances in the use of modern technologies in the production process, which contribute to the production of more quantities and are of higher quality and less time, by using the same amount of production elements or less, i.e. optimal exploitation of the production elements.
2. Work: This element is an influential factor in the production process, as it represents the physical and intellectual abilities that human beings can use in the production process. The size of the labor force is linked to the number of active people ready and able to work and to the working hours of each worker. As is known, the increase in the population contributes to the increase in the volume of employment.
3. Capital: This component consists of machinery,

land, buildings, physical assets, and other elements that are involved in the productive process. The financing of this element is done through savings that go to invest. Increasing savings leads to increased investment and thus increased production and income, thereby increasing the capacity for capital formation.

3.2. Development of economic growth and analysis

Development of economic growth and analysis of some dictators of Iraq's sustainable development for the period (2004-2020).

3.2.1. The reality of Iraq's economic growth after (2004)

National income and gross domestic product (GDP) are among the most important indicators of economic growth for most countries and Iraq. National income represents the total income earned by factors of production in return for their contribution to the production process of goods and services produced within the national economy over a period that typically represents a year. While GDP indicates the total gross added values achieved by different branches of economic activity over a given period, that is, it represents the total market values of all final goods and services produced in the national economy over a certain period, often a year (Abbas, 2011; Deng et al., 2023; Dwi Saputra & Joniko, n.d.). GDP is also considered one of the most important indicators of economic performance because it is one of the country's primary sources of national income, so we will focus on GDP as an indicator of economic growth Iraq's GDP can be said to be different from the rest of the world, especially those that are similar in terms of growth in available resources and capacities. Due to Iraq's circumstances during the duration of the study, have hurt the overall economic activity, combined with the widespread financial and administrative corruption in some of the joints of the State, which has worked differently in GDP compared to other countries (Awad Et al., 2021; Ahmad et al., 2024; Al-Filali et al., 2023; Baajike et al., 2022; Deng et al., 2023; Lian, 2024; Luukkanen et al., 2019; Soana, 2024; Yu et al., 2023b).

To complement the foregoing, Iraq's gross domestic product (GDP) gives a close picture of the economic reality and the course of its development. When reference is made to Table 1, the GDP has seen an upward trend during the first years in the value of GDP, which has risen from (53235358.7) million dinars in 2004 to (157026061.6) million dinars in 2008, owing to the end of economic sanctions and the economic blockade imposed on Iraq by the Coalition States before 2003. (Yu et al., 2023b; Zhang & Ren, 2011)This has led to increased trade openness to the outside world, which has contributed to an increase in oil exports, thus increasing Iraq's revenues from this commodity, because oil exports occupy the lion's share in the composition of GDP, and then the GDP

has fallen to reach (130643200.4) million dinars in 2009 owing to the decrease due to the global financial crisis, which re- reduced revenues from this sector owing to low oil prices due to low demand globally (Ali, 2023).

Gross domestic product (GDP) data for the period 2010-2013 showed a marked rise as a result of increased exports of the oil sector, owing to an increase in oil prices which contributed significantly to an increase in the sector's revenues, which contributed to an increase in GDP, while in 2015 it declined to reach (194680971.8) million dinars, as a result of the security conditions experienced in Iraq and the accompanying crisis in the decline of oil prices globally. (Agu et al., 2022; Encinas-Ferrer & Villegas-Zermeño, 2015b) This led to a decline in the revenues of this sector, which is dependent on the composition of GDP, which affected the decline in GDP during that period, and then took the GDP up until 2019. (276117000.0) million dinars as a result of the relative improvement in the security situation during that period and subsequently decreased due to the crisis (COVID-19) and the interruption of most life activities, which reduced the oil sector's exports, thereby decreasing revenues and hence the decline of GDP. (Akgül et al., 2022; Marczell et al., 2023; Mulder et al., 2021) From this vision, it can be said that the growth rates witnessed in the Iraqi economy were associated with the abundance of oil revenues, without these rates being reflected in positive changes in the environment of the Iraqi economy. The Iraqi economy is dependent on the exports of one sector, the oil sector, and thus any circumstance the country is experiencing will be reflected in the revenues of that sector, which in turn will be reflected in the country's economic growth rates.

3.2.2. The reality of some of Iraq's sustainable development indicators after 2004

Average per capita GDP This indicator is an important economic indicator that expresses development, The economic significance of this index is highlighted by the fact that it reflects economic growth rates and measures over-output volume. (Esmaeili et al., 2023; Oshakbayev et al., 2022; Shkolnikov et al., 2019) Iraq's average per capita GDP can be explained by reference to Table 2, which shows that the average per capita has seen an upward trend in the early years. From (1961,539) dinars in 2004 to (5135,269) dinars in (2008).

3.2.3. Analysis of the relationship between Iraq's sustainable development indicators and economic growth for the period (2004-2020)

Study variables and functional description To test the study's hypotheses and achieve its objectives, the

independent variable has been identified by some indicators of sustainable development (average per capita GDP, health expenditure, and education expenditure), and the dependent variable of the GDP index. As in table 3:

Results of the stabilization test of study variables After the DAL description of the model is done, we will test the stability of the study variables using the (Eviews10) program to see whether the variables are stable or unstable, i.e. do they contain the root of the unit, with the rank of integration?

Detecting the stability of time chains has become very important in estimating standard models to get rid of the problem of false regression when estimating. In addition, stable time chains can get rid of the shocks they encounter and then return to long-term balance, so we will use unit root tests to ensure the stability of time chains. These tests are ADF and PP.

The relationship between certain indicators of sustainable development and Iraq's economic growth for the period (2004-2020) Preliminary assessment of the ARDL model The results of the appropriate (ARDL) model is ARDL (2,0,5,2), to indicate the relationship between the study variables in Iraq, has been done according to the standard (AIC) This model was among the best (20) model to give it the low- est value to this standard as it was automatically identified through the program (Eviews) The results of the statistical tests shown in the above table indicate that they are moral and of quality for the estimated model. (Agu et al., 2022; Konchitchki & Patatoukas, 2014; Marczell et al., 2023; Mulder et al., 2021)

The value of the determination coefficient (R²) has also been shown to be (99%) giving interpretive power to the model, i.e. independent variables explain changes in the dependent variable by (99%) and the remaining ratio of (1%) is due to the influence of other variables not included in the model, and the value (Durbin-Watson statistic) was about (1.902835). This value indicates that the model is devoid of the problem of self-association.

Results of the boundary test for joint integration To test the long-term balanced relationship (common integration) between the dependent variable of (average per capita GDP) and the independent variables of (some sustainable development indicators), the boundary test (Bounds Test) must be conducted taking into account the following points: Compare the value of the count (F) calculated with its tabular value and within critical limits, There is a minimum (LCB: Lower Critical Bound explains whether the thoughtful variables are integrated from Grade (I0) and higher limit (UCB: Upper Critical Bound explains whether the variables are (I1)-class integrated. If the value of (F) is exceeded by the upper limit (UCB), we reject the null hypothesis and accept the alternative hypothesis that there is a common complementarity.

When there is a common integration between variables, the formula is estimated in the long term by

the (Akaike) standard. To identify short-term movements according to the specifications of the ARDL, the error correction model (ECM) is used.

The results of the boundary tests between some of Iraq's indicators of sustainable development and economic growth shown in Table 7 above show that the value of (F- statistic) calculated is about 4.811772, which is greater than the minimum and highest calendar value at a level below (1%) This means rejecting the hypothesis of nowhere and accepting the alternative hypothesis indicating a common integration relationship, i.e. a long-term balance between independent variables and dependent variables. This requires an assessment of the response and the error correction factor.

Long-term and short-term response assessment results After the boundary tests (joint integration) we found a long-term balance between the interpretative variables and the dependent variable, and here the short- and long-term capabilities of the estimated model parameters and the error correction parameter should be obtained. (ECM) The results of the long-term and short-term response assessment according to the (ARDL) model are shown in table (8). The relationship between some of Iraq's indicators of sustainable development and economic growth is as follows:

The error correction parameter indicates a long-term balance between some indicators of sustainable development and economic growth in Iraq for the period 2004- 2020, because the error correction parameter is negative and moral at a lower level (1%), as the parameter indicates a return to balance within (0.002) of time.

Long-term response results show a weak expenditure impact between education expenditure and economic growth because the volume of expenditure on education was not at the required level during the school period.

Long-term response results show a strong and moral exponential impact at a level below (1%) between average GDP per capita and economic growth.

Long-term response results show a strong and moral exponential impact at a level below (1%) between health spending and economic growth.

4. CONCLUSION

The results of the research indicate a long-term balance between certain indicators of sustainable development and economic growth in Iraq during the duration of the study. This demonstrates the research hypothesis, Many economic, social, and environmental indicators that show low growth rates excluding per capita GDP decreased during the duration of the study, Through the implementation of sustainable development indicators in Iraq, Iraq can achieve sustainable development by expanding welfare investments such as those from infrastructure, education, and health, The results of

the study showed a long- term balance between some indicators of sustainable development and economic growth in Iraq during the duration of the study because the wrong correction parameter is negative and moral at a lower level (1%). The parameter indicates a return to balance during (0.002) of time, i.e., changes in sustainable development indicators lead to changes in economic development indicators.

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