

The Role Of Innovation In Sustainable Development In The Selected Countries During The Period (2007-2020)

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ABSTRACT

The study aimed to identify the impact of technological innovation on the sustainable development of the countries of the study sample, which included (Iraq, Tunisia, Egypt and Kuwait) during the period (2007-2020), and the cross-sectional data method was used and the fixed effects model was used to analyze the study variables, and this study resulted in a positive and statistically significant effect of total capital formation and expenditure on research and development as a percentage of GDP on GDP and a negative relationship between labor force and GDP. The study also recommended that governments increase government spending on infrastructure, invest in education and training, and increase government funding for research and development.

Introduction:

The innovations that lead to the introduction of new technology have been since they have known a dynamic engine for the wheel of economic development, and their importance has increased with the era of knowledge that we live in through an increase in productivity in quantity and quality as a result of the introduction of advanced and new technical methods aimed at creating more efficient products that lead to raising the level of competition and occupying a distinguished position in the international market after satisfying the local market and this returns positively to the national income and then achieve high levels of development And sophistication and competition is an endeavor that all countries and economies are trying to distinguish so they work to employ technological innovations, competition for countries means their role in the production of goods and services that receive success in the global market while maintaining the level of per capita national income and this is evident through the investor's orientation to the allocated projects, i.e. the rate of return is competitive means that they have the incentive and are convinced that the facilities with production efficiency through the possibility of reducing the cost With the combined productivity of most state companies, it will lead to an increase in their exports, achieve greater revenues in hard currency, maintain a larger share of the international market and increase the turnover, and the profits achieved are distributed to shareholders who invest their money in efficient investments through spending on research and development on the one hand, obtaining patents and improving the performance of workers on the other hand, All this aims to develop technological innovations and make them more competitive with other countries.

Objective of the study

This study aims to:

- 1- Analysis of economic performance, which was represented by the real GDP of the study sample countries.
- 2- The study of technological innovation , which was represented through spending on research and development of the study sample countries.
- 3- Studying the impact of technological innovation in achieving sustainable development of the study sample countries.

Study problem

The importance of innovation in the field of work and its positive reflection on the productivity and belonging of workers and individuals to their organizations in the public and private sectors is clearly evident, as successful management is that management that imposes how to complete the exploitation of the efficiency and effectiveness of its employees, which achieves its goals with the highest quality and at the lowest cost, so

as to improve the level of creativity for those organizations that seek excellence in performance, and maintain their continuity in a competitive environment as they face renewed challenges, It is variable that requires senior management to adopt policies and strategies, adapted to these challenges to achieve the goals of the organization in a successful manner, due to the rapid and renewed change in the work environment, hence the current study seeks to answer the following questions:

- 1- What is economic and is represented by the real GDP of the sample countries?
- 2- What is the impact of technological innovation on achieving sustainable development of the study sample countries?

Study Model

By returning to the literature and studies related to the subject of the study, the study model was formulated as follows (SANTANA, et al, 2015).

$$ECO_{it} = f(K_{it}, L_{it}, IT_{it})$$

Where:

ECO_{it} : Economic performance represented by the real GDP of the study sample countries.

K_{it} : capital, which was represented by the total fixed capital formation of the study sample countries.

L_{it} : employment which was represented by the labor force of the study sample countries.

IT_{it} : Technological innovation which was represented by R&D spending for the study sample countries.

Study hypotheses

Main hypothesis: There is no positive and statistically significant impact of technological innovation on the sustainable development of the study sample countries.

Previous studies:

study (Maatouk, 2022) entitled: " The Impact of Strategic Leadership Practices on Achieving Sustainable Development: A Field Study on Al-Madar Al-Jadid Company – Tripoli".

The study aimed to identify the impact of strategic leadership practices (setting the strategic direction, developing human capital, enhancing organizational culture with ethical practices, and implementing balanced organizational control) on achieving sustainable development in Al-Madar Al-Jadeed Company - Tripoli. The descriptive analytical approach was used as the appropriate approach to achieve the objectives of the study, as the number of members of the study sample reached (44) employees from the company's administrative leaders. A questionnaire was designed and distributed to the target sample. Descriptive and inferential statistics were used to analyze the data, and the study found that the level of dimensions of strategic leadership practices in the company under study was high, as well as the level of achieving sustainable development in the company was high, and that there is a statistically significant impact of strategic leadership practices on achieving sustainable development in the company under study.

Study (Saad Eddin, 2020) entitled: Sustainable local development is an inevitable outcome of the development chronology in economic thought

This study was in its presentation an attempt to study the problem posed, which was formulated as follows: **"To what extent can the academic rooting of development theory and its components be linked to the possibility of reaching the highest levels of application?"** And what we presented in this work was an experience to delve into the merits of local finance, and the entrances to local administration in Algeria represented in regional groups, in addition to trying to highlight the pillars and bonds of sustainable local development in the light of international standards, especially with regard to the environment and preserving the chances of future generations in their right to a decent living, and this can only be achieved by moving the wheel of development projects and programs that tend in this direction, and allocating sufficient natural and financial resources for such projects, Without waste of natural resources with a focus on renewable energies, and good management of local financing collection and spending, we have seen in the course of our research that the various angles of the local development process are not linked except by adapting efficient human resources in a way that achieves the desired goal.

study (Noureddin, 2021) entitled: "The Role of Technological Innovation in Achieving Sustainable Development".

The aim of the study reviewed that with the beginning of the twentieth century appeared radical changes and new concepts where the importance of the economy based on knowledge increased, the strength of any economy is based on the extent of technological progress where the world today is witnessing rapid developments with the emergence of new technologies successive These latter played an important role in the development of societies and achieve their well-being as emerged on the international scene thought calls for the need to pay attention to the environment, especially after the increase in sources of pollution and diversity and the discovery of the dangerous effects that result from This pollution is therefore a new concept has emerged on the ground, which is sustainable development, which is concerned with preserving resources for future generations and achieving economic and social growth . In order to achieve this, institutions rely on

continuous innovations and improvements in their products and services by relying on technological innovation as a strategy aimed at achieving the goals of religious administration, so this paper tried to illustrate how technological innovation can contribute to achieving sustainable development.

Study (Hassi, 2019) entitled : "Empowering Leaders and Management Innovation in the Context of the Hospitality Industry as a Mediating Role for the Creative Climate".

The study aimed to identify the role of empowering leaders and their administrative creativity with the availability of the creative climate as an intermediate variable in the hospitality sector in Morocco. The study was conducted on a sample of all categories of hotels (five-star, four-star, three-star) consisting of (127) hotels from all over Morocco, and the researcher developed a questionnaire for the purposes of the study on (422) managers at all administrative levels, and (414) was retrieved) questionnaire valid for the purposes of analysis, and one of the most important findings of the researcher of the results that the creative climate important role in increasing administrative innovation, and that there is an impact to enable leaders in increasing the level of innovation among workers in hotels, as the level of administrative innovation and empowerment of leaders came at the level of medium relative importance. One of the most important recommendations of the study is that the creative climate is used as an effective tool for the application of management innovation, so hotel management that aims to obtain innovative results should focus on the creative climate and on empowering leaders.

study(Ghosh, 2019) entitled: "Creative Leadership for Innovation in the Workplace: An Applied Study on AP-LAP".

The study aimed to identify the creative leadership of innovation in the workplace. To achieve the objectives of the study, the researcher used the descriptive approach, and the study data was collected through AP-LAP using the questionnaire that was built by the researcher, the following statistical methods were used: analysis of single variance, selection of Pearson correlation coefficient, and regression analysis. The study reached the most important results, that the creativity of leaders is subject to several influences, the most important of which is technical support at work and the level of creativity they have, and the leadership style has positive effects On innovation and creativity.

study (Shafique, Ahmad and Kalyar 2019) entitled: "How Leadership Influences Organizational Creativity and Innovation: Testing Underlying Mechanisms."

The study aimed to identify how the impact of leadership in creativity and organizational innovation, where the researchers developed a questionnaire for the purposes of the study and distributed to (322) male and female employees of small information technology companies in Pakistan. The results of the study showed that ethical leadership is an important element of creativity at the individual and organizational levels, and the results showed that there is a positive relationship between ethical leadership and employee creativity through information sharing and psychological empowerment.

At the organizational level, the results showed that ethical leadership has a positive relationship with organizational innovation, and the level of relative importance of creativity was high.

study (Karatepe, Aboramadan and Dahleez, 2020) entitled: "Is the climate of creativity mediated by the impact of servant leadership on management innovation and innovative behavior in the hotel industry?"

This study aimed to propose a model that examines in mediating the climate of creativity the impact of servant leadership on administrative innovation and innovative behavior, and the data collected from Arab hotel employees in Palestine were used to measure the aforementioned links through modeling structural equations. The study found that the climate of creativity mediates the impact of servant leadership on administrative innovation and innovative behavior, and the study recommended the need for Senior management with a high level of commitment to the philosophy of servant leadership, which fosters a climate of creativity and innovative behavior in an environment that highlights SEL practices effective servant leadership, they will be more keen to contribute to the company by demonstrating innovative behavior at high levels.

- Commenting on previous studies:

Previous studies have confirmed a set of important results related to the impact of technological innovation in achieving sustainable development for the study sample countries, so it is considered a good input for further research on this topic, and this study differed from previous studies in that despite the importance of previous research and studies and their additions to the literature on the subject, the current study is characterized by its specialization in analyzing the problem of the impact of technological innovation in achieving sustainable development for the study sample countries., and in terms of the period of time in which the study was carried out during the period (2007-2020).

Theoretical framework for technological innovation and sustainable development

The first topic: the axis of technological innovation:

Global developments, especially the means of communication and information technology, have led to reducing the life cycle of the product through the merger of the boom stage with the stage of emergence of products, which means that imitators bring these products very quickly coinciding with the duration of the appearance of the product, which makes these products take the traditional character after a short period of their appearance and the innovative element disappears in them, so innovative activities occupy great importance in ensuring the continuity of productive institutions in the market and their expansion by finding commodity alternatives. For traditional products, the economic ideas brought by economic schools have focused on the role of technological innovation activities in achieving economic growth and development since the emergence of the classical school, which considered these activities one of the main factors of production after labor and capital, but it occupied the forefront among these factors after the emergence of the ideas of the economist Joseph Schumpeter in the second decade of the twentieth century, as the economist Simon Kuznets pointed out in his definition of economic growth for the element of innovations and considered it a necessary condition for achieving this growth. Therefore, all countries of the world seek to possess the innovative capabilities that qualify them to achieve remarkable progress in various fields, and the different countries of the world have been spending huge sums on these activities and their components in order to ensure the leading position and leadership of these activities in developed countries and through which developing countries are trying to reduce the economic gap between them and countries (Al-Obaidi, 2022).

Innovation is a decisive and catalyst factor in technological change and economic performance, and innovation in the fifties and sixties of the last century refers to linear progress starting from the initial conception of the idea at the level of basic research to express it with an actual and realistic application, the traditional concept of innovation is "the application of technological knowledge and the generation of a new or improved product or service, while the modern concept to take into account other aspects of the innovative process, including legislative and regulatory aspects (Marghalani, 2020).

There are those who view innovation from a narrow perspective of technological progress as "the organized effort aimed at using the results of scientific research in developing methods of performing production processes in a broad sense, which includes services and administrative activities, with the aim of reaching new methods that are supposed to be more feasible for society." Doing business. Widespread practices in the global economy have proven that innovation has shifted from a strict and specific scientific concept to a comprehensive concept covering a wide range of activities from discovery to the practical application of new knowledge in order to meet the needs of consumers (Boumediene, 2013).

Accordingly, technological innovation is one of the main determinants of the success and superiority of economic institutions, especially at the present time, as it is characterized by successive and continuous changes and developments, and increasing reliance on technology and knowledge, which led to increased competition, and this is what made economic institutions interested in technological innovation to meet these challenges (Al-Qudah & Al-Nsour, 2019).

There is a clear discrepancy between the concept of innovation and creativity, as the concept of creativity refers to "the production of new ideas and new inventions", while innovation "corresponds to the application of new and creative ideas and the implementation of inventions", and in this regard Schumpeter distinguished between invention and innovation as basic sources of technological knowledge that are sources of economic growth, as Schumpeter emphasizes. Invention expresses a purely scientific phenomenon carried out by engineers and scientists, while innovation reflects a technological-economic phenomenon in which invention turns into innovation by businessmen and regulators when invention is used in the production process. Innovation is organically linked to the process of economic development and works to stimulate economic growth by innovating new products and production methods, opening new markets, and developing new resources and organizational forms (Al-Burhan, Analysis of the technological gap in the knowledge economy environment (Al-Obaidi, 2022).

Through the above definitions, technological innovation can be defined as "radical innovations involving technology that cause profound changes in productivity that affect the life cycle of a product from the design, dissemination, marketing, improvement, and deterioration that stimulate economic growth and improve social and economic well-being as well as preserve the environment" (Al-Dhala'in, 2021).

Second: Types of technological innovation:

Technological innovation is one of the types of innovations and is characterized by a degree of innovation divided into two categories:

1- Radical technological innovation: represents a new idea that appears by chance without previous links that lead to a radical change of the current situation and more comprehensively is every change to the above in its field is characterized by a long period of application and spread, represents a break in the evaluation of technical methods of production or in technology, as well as an evaluation of vocational rehabilitation separating between technological innovation and the last so-called innovation cycle, which extends between ten to fifteen years. It does not require new ideas, and it is a technological innovation with improvement that does not need new skills, it is not characterized by the technological sector, it falls within the cycle of radical

innovation and these innovations occur according to developments in technology in order to keep pace with them on the one hand and face the intense competition in this field on the other hand.

Third: Technology Innovation Centers:

These centers include technology incubators that undertake innovation and technological progress (accounting research and legal services) (creation of electronic networks, resource development and policy development).

Innovation centers also submit proposals for small projects to improve production and members of innovation centers have access to research facilities and university laboratories (Al-Dhalain, 2021).

The second topic: the axis of sustainable development:

The subject of sustainable development has known the world's attention during the past two decades, and this is at the global economic, social and environmental level, as development sustainability has become a global school of thought spread in most countries of the world adopted by governments, organizations and popular and official bodies and demanding its application in many forums, and sustainable development means providing the individual with the necessary experiences, knowledge and trends, as well as accustoming him to useful habits, knowledge and experiences alone are not enough, so the individual must get used to habits related to maintaining Resources, especially non-renewable, and good use of income, thinking about others around him and thinking about the future of future generations (Ismail, 2017). It also meets the needs of the present without abandoning future generations in meeting their needs, as it is clear from this concept the future vision to ensure the continuity of the productivity of natural resources without causing harm to the environment and the preservation of human rights now and in the future (Al-Obaidi, 2020).

Sustainable Development Goals:

This requires not to deplete natural resources when contemporary generations meet their energy needs, that is, the duty of this generation is to adopt sustainable development that is achieved through the interaction between the economy, society and the environment in a way that achieves social justice, and preserves the environment from pollution and natural resources from depletion, The ideal goal of sustainable development is to reconcile economic development and preserve the environment, stimulate growth, meet human needs, ensure a stable population level, maintain and enhance the resource base, achieve a better quality of life for the population, enhance the population's awareness of existing environmental problems, achieve rational exploitation and use of resources, achieve technical economic growth that preserves natural capital, which includes natural and environmental resources, and all this requires the concerted efforts of society groups (Maatouk, 2022).

Through its mechanisms and content, sustainable development tries to achieve a set of goals that can be summarized as follows (UNIDO, 2023):

- 1 . Achieving a better quality of life for the population: Sustainable development, through the planning and implementation of development policies, attempts to improve the quality of life of the population in society socially, economically and psychologically, by focusing on the qualitative aspects of growth, not quantity, in a fair and acceptable manner.
- 2 - Respect for the natural environment: Sustainable development focuses on the relationship between the activities of the population and the environment, and deals with natural systems and their content as the basis of human life, it is simply development that accommodates the sensitive relationship between the natural environment and the built environment, and works to develop this relationship to be a relationship of integration and harmony.
- 3 - Enhancing the awareness of the population of environmental problems: This is done by developing individuals' sense of responsibility towards environmental problems, and urging them to participate effectively in creating appropriate solutions to them through their participation in the preparation, implementation, follow-up and evaluation of sustainable development programs and projects.
- 1- Achieving the rational exploitation of natural resources: Sustainable development treats natural resources as finite resources, so it prevents their depletion or destruction and works to use and employ them rationally.
- 2- Linking modern technology to serve the goals of society: This is achieved by educating the population about the importance of various technologies for the development process, and how to use the available and new ones to improve the quality of life of society and achieve its desired goals, without resulting in negative environmental risks and effects, or at least that these risks and effects are controlled in the sense of appropriate solutions to them.
- 3- Bringing about appropriate and continuous change in the needs and priorities of society: This is done in a way that suits the capabilities of society and allows achieving a balance through which economic development can be activated, all environmental problems can be controlled, and appropriate solutions can be developed.

Analysis and hypothesis testing

This chapter reviews the results of statistical tests in order to confirm the hypotheses of the study and in order to test the hypotheses of the study, tools were used to analyze cross-sectional data over time (Panel Data) in

order to know the impact of technological innovation on the sustainable development of the Arab countries of the study sample during the period (2007-2020).

4.1 Study model

By returning to the literature and studies related to the subject of study, the study model was formulated as follows (SANTANA, Naja, et al, 2015).

$$ECO_{it} = f(K_{it}, L_{it}, IT_{it})$$

Where:

ECO_{it} : Economic performance represented by the real GDP of the study sample countries.

K_{it} : capital, which was represented by the total fixed capital formation of the study sample countries.

L_{it} : employment which was represented by the labor force of the study sample countries.

IT_{it} : Technological innovation which was represented by R&D spending for the study sample countries.

4.2 Descriptive statistics of study variables

The statistical descriptive method aims to clarify all the variables that were used in the study, through the most important statistical criteria (arithmetic mean, standard deviation, largest and lowest value) as shown in Table (4-1).

Table (4-1) Statistical description of the study variables

	ECO	K	L	IT
Mean	153801.1789	27698.03143	10.55622645	0.358390893
Median	142955.906	29222.62872	5.456217	0.285885
Maximum	365252.6513	55199.31663	29.254321	0.96218
Minimum	38914.07835	5237.306215	1.299336	0.03
Std. Dev.	88768.46184	13903.40153	10.37132244	0.295560329

Source: Prepared by the researcher based on the results of the EViews program

Table (4-1) shows the standard deviation, mean, and the lowest and largest value of the study variables, where the arithmetic mean of the gross domestic product (**ECO**) was approximately 153801.1789 million US dollars, and the standard deviation was 88768.46184, which means that the values deviate from the mean by 88768.46184, and the largest value was 365252.6513 and the lowest value was 38914.07835.

As for the variable of gross fixed capital formation (**K**), its arithmetic mean was 27698.03143 million US dollars and the standard deviation was 13903.40153, which means that the values deviate from its average by 13903.40153 and the largest value was 55199.31663 and the lowest value was 5237.306215 million US dollars. While the labor force variable (**L**) had an arithmetic mean of 10.556 and a standard deviation of 10.37, which means that the values deviate from its mean by 10.37, and the largest value was 29.25 and the lowest value was 1.299.

While the variable of R&D expenditure as a percentage of gross domestic product (**IT**) was arithmetic mean of 0.358% and the standard deviation was 0.295%, which means that the values deviate from the average by 0.295%, and the largest value was 0.96% and the lowest value was 0.03%.

4.3 Time Series Stillness Test

These tests are used in order to detect the stability of time series in the standard model in the study, and in order to estimate the study model, it is necessary to start conducting unit root tests in order to know the degree of stability of the study variables and to know the degree of their integration, depending on the most common test (Im, Pesaran and Shin W-stat) as this test was applied for each variable separately and the following results were reached as shown in Table (4-2).

Table (4-2) Stability of study variables

Variables	At the level		At the first difference		Total
	Statistical value	Significance	Statistical value	Significance	
ECO	-0.08774	0.4650	-2.2546	0.0120	Stable at the first difference
K	-0.56157	0.2872	-2.8806	0.0020	Stable at the first difference
EMP	2.754867	0.9970	-2.2249	0.0130	Stable at the first difference
BRANCH	-1.486699	0.06854	-2.14034	0.0161	Stable at the first difference

Source: Prepared by the researcher based on the results of the EViews program

It is noted from Table (5) that the variables were all stable at the first difference.

4.4 Multilink Testing

The multiple correlation test was performed through Pearson's correlation as shown in Table (4-3).

Table (4-3) Pearson's correlation results between the independent variables of the study

	ECO	K	L	IT
ECO	1	-	-	-
K	0.627	1	-	-
L	0.584	0.515	1	-
IT	-0.28	-0.263	0.233	1

Source: Prepared by the researcher based on the results of the EViews 13 program

One of the most important tests that can be done and confirmed is the multiple correlation test in order to ensure that the correlation between the variables used in the study model does not have high correlation problems in order to obtain non-fake results when conducting regression, and Table (4-4) shows that there is no high correlation between the variables, as all correlations were less than 80%.

4.5 Multicollinearity test

Table (4-4) VIF Test Results

Variable	VIF
K	1.726
L	1.698
IT	1.341

Source: Prepared by the researcher based on the results of the EViews program

Table 4 shows.4) The results of multicollinearity for the independent variables in the study, in order to ensure that there is no accurate linear relationship between the variables (multicollinearity) was done test (factor inflation Variation: VIF) where it was found that all independent variables in the standard model did not exceed the value of VIF have the amount 10 .as shown in Table (5.4) and this means that there is no linear relationship between the independent variables according to (Hair, Anderson, Tatham and. Black, 1995)

Breusch-Pagan test results for heterogeneity of data residual

The (Breusch-Pagan) test was used to detect the problem of heterogeneity of random error limit variance in the study model through three steps, the first by estimating the regression equation for the three models, then estimating the error, then estimating the equation of regression squares for the three models, and then testing the significance of the regression model, and the model is considered free of heterogeneity problems if the value of the test indication is greater than 5%, as shown in Table (5.4).

Table (5.4): Breusch-Pagan test results

Prob.	Value	Study Form
0.0739	-1.786	

Source: Prepared by the researcher based on the results of the EViews program

It is noted from Table (5.4) that the p-value was greater than 5%, and this indicates that the study model is free of heterogeneity problems.

Trade-off between models used

To determine which models are most suitable for use in the analysis, there are three options: F-Test to compare between the combined regression model PRM and the fixed effects model FEM, and the Lagrange multiplier test (LM) proposed by Breusch and Pagan (1980), to compare between the combined regression model PRM and the random effects model REM, and the third Haussmann test to compare the REM & FEM models. The tests were as follows:

Table (6.4) Comparison between study models

Test Type	Test Value	P-value
F test	25.87226	0.0000
Haussmann Test	77.61679	0.0000
LM Test	3.4529	(0.0631)

Source: Prepared by the researcher based on the results of the EViews program

As shown in Table (6.4), the probability value of the F test was less than 0.05 and this result means that the Fixed effects model (FEM) is more appropriate than the Pooled regression model (PRM), as it was shown through the Haussmann test that the p-value was less than 0.05, which means that the fixed effects model is more appropriate than the random effects model, either the LM test) The p-value was also greater than 0.05, which means that the combined regression model PRM is more suitable than the random effects model REM, and through the three tests the fixed effects model is the most appropriate.

Hypothesis testing

To test the first hypothesis, the model was estimated through the Fixed effects model (FEM) and the results were as shown in Table (7.4).

Table (8.4) Fixed effects model for the study model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
K	0.5461	0.0864	6.3172	0.0000
L	-0.3062	0.1169	-2.6175	0.0212
IT	0.2452	0.0737	3.3246	0.0054
C	17.707	3.0195	5.86451	0.0000
R ² =65%		Prob(F-statistic) =0.0000		

Source: Prepared by the researcher based on the results of the EViews program - The probability value F-statistic has reached (0.0.0000), which is statistically significant and indicates that the model is valid to measure the impact of independent variables on the dependent variable, and the coefficient of determination reached 65%, which means that 65% of the changes in the independent variables are explained in the GDP.

- The parameter of gross fixed capital formation was positive and statistically significant, which means that the change of one unit in gross fixed capital formation leads to an increase in GDP by 0.55%, and therefore the first sub-hypothesis, which states that there is no statistically significant effect of total fixed capital formation at a significance level less than 0.05 on the GDP of the study sample countries, is rejected, and the alternative hypothesis, which states that there is an effect of Statistically significant of the total fixed capital formation at a level of significance less than 0.05 on the GDP of the study sample countries.
- The labor force parameter of the study sample countries was negative and statistically significant, and this means that the change by one unit in the labor force of the study sample countries leads to a decrease in GDP by 0.31%, and therefore the first sub-hypothesis, which states that there is no statistically significant effect of the labor force of the study sample countries, is rejected at a level of significance less than 0.05 on the GDP of the study sample countries, and the alternative hypothesis is accepted, which states that there is an effect of Statistical significance of the labor force of the study sample countries at a level of significance less than 0.05 on the GDP of the study sample countries.
- The parameter of R&D expenditure as a percentage of GDP was positive and statistically significant, meaning that the change of one unit in R&D expenditure as a percentage of GDP leads to an increase in GDP by 0.25%, and therefore the first sub-hypothesis is rejected, which states that there is no statistically significant effect of R&D expenditure as a percentage of GDP at a significance level of less than 0.05 on GDP. Accept the alternative hypothesis that states that there is a statistically significant effect of spending on research and development as a percentage of GDP at a level of significance less than 0.05 on the GDP of the study sample countries.

Results

Through the results of hypothesis tests, the results of the study are as follows:

- 1- There is a positive and statistically significant effect of the total fixed capital formation was on the GDP of the Arab countries in the study sample, and this result is due to several reasons, the most important of which is the oil and gas sector as it is considered a major source of income for many Arab countries. When oil prices rise, governments have more money to invest in gross fixed capital formation, which can lead to increased production, productivity and employment, which can boost GDP, and also try Many Arab countries diversify their economies away from oil and gas and this requires investment in new sectors, such as manufacturing, tourism and agriculture, gross fixed capital formation can help finance this investment and promote economic growth, and many Arab countries suffer from poor infrastructure, which may hinder economic growth, so gross fixed capital formation improves infrastructure, such as roads, bridges and power grids, and many Arab countries have young populations, but they They lack the skills to compete in the global economy, so gross fixed capital formation can help improve education and training, which can boost productivity and economic growth.
- 2- There is a negative and statistically significant relationship between the labor force and the GDP of the countries in the study sample, and this result can be explained by the fact that the labor force in some Arab countries is not as productive as it can be, due to a number of factors, including poor education and training, lack of access to technology, and authoritarian governments that stifle innovation, and unemployment is a major problem in many Arab countries, due to a number of factors, including the decline of the oil sector, The lack of economic diversification, the influx of refugees from neighboring countries, and the presence of disguised unemployment is also a problem in many Arab countries, and this means that people work in jobs that do not use their skills and education, and this can lead to low productivity and low GDP growth, and

quality education can help improve labor force productivity and promote economic growth, and political instability can discourage investment and lead to low GDP growth. Total.

3- The existence of a positive and statistically significant relationship of spending on research and development as a percentage of GDP on GDP in the Arab countries of the study sample, and this result can be attributed to the fact that the countries in the study sample all rely heavily on oil and gas exports, and are looking to diversify their economies away from these sectors, research and development can help promote economic growth by developing new industries and creating jobs, as well as the need to improve infrastructure. All these countries have a weak infrastructure, which may hinder economic growth, which can help research and development improve infrastructure, such as roads, bridges and power grids, and this can make it easier for companies to operate and can promote economic growth, and there is also a need to improve education and training. All of these countries have young populations, but they lack the skills to compete in the global economy. All governments of these countries provide financial support for research and development. This helped increase R&D spending and contributed to the positive relationship between R&D and GDP

Recommendations

From the above findings, the study recommends the following:

- 1- Governments in these countries can increase their spending on infrastructure by investing in roads, bridges, airports and other transport projects. They can also invest in energy, water and telecommunications infrastructure. Governments can create a conducive business environment by reducing the regulatory burden on businesses and by providing access to skilled workers. They can also boost competition by opening markets to foreign investment.
- 2- Governments should invest in education and training as one of the main reasons for the negative relationship between the workforce and GDP in these countries is the shortage of skilled labor, governments can also invest in education and training programs to help workers develop the skills they need to be productive in the workforce, governments can also create jobs by investing in infrastructure, manufacturing and other sectors that have the potential to create jobs, and attract foreign investment from In improving the business environment and providing incentives for companies to invest in these countries, structural issues must also be addressed, there are also a number of structural issues that need to be addressed in order to improve the relationship between the workforce and GDP in these countries, including corruption, bureaucracy and lack of transparency.
- 3- Governments can increase funding for R&D by providing grants and subsidies to companies and universities, they can also establish research centers and institutes to support R&D activities, governments can create a business environment conducive to R&D by providing tax breaks and other incentives for companies conducting R&D. They can also reduce the regulatory burden on companies conducting R&D, and governments can also promote public-private partnerships in By providing funding and support for joint ventures between companies and universities, governments can attract foreign investment in R&D by providing tax breaks and other incentives to foreign companies conducting R&D in these countries.

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