

The Impact of Knowledge on Economic Growth in the Arab World

أثر المعرفة على النمو الاقتصادي في الوطن العربي

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Abstract

This study investigates the impact of knowledge on economic growth in the Arab World during the time period 2017- 2023, and annual data are uses. To achieve this, descriptive analysis and econometric analysis are relied upon, and panel data are used in the analysis. The study sample consisted of ten Arab countries. The variables in the study model included knowledge, capital, and labor force as independent variables, and economic growth is the dependent variable. The model used in the analysis is the ordinary least square.

The study finds that there is a statistically significant positive impact of knowledge on economic growth at a 10% significance level. And a statistically significant positive impact of both capital and labor on economic growth at a 1% significance level.

Key Words: Knowledge, Economic Growth, Arab World.

الملخص

هدفت هذه الدراسة الى البحث في اثر المعرفة على النمو الاقتصادي في الوطن العربي خلال الفترة الزمنية 2017-2023 وتم استخدام بيانات سنوية. ولتحقيق ذلك تم الاعتماد على التحليل الوصفي والتحليل القياسي و تم استخدام بيانات اللوحة في التحليل، وكانت عينة الدراسة مكونة من عشرة دول من الوطن العربي خلال فترة الدراسة. وتكونت متغيرات نموذج الدراسة من المعرفة، ورأس المال، والعمالة كمتغيرات مستقلة بينما النمو الاقتصادي فهو المتغير التابع.

وبينت الدراسة أن هنالك اثر إيجابياً مقبولاً احصائياً للمعرفة على النمو الاقتصادي عند مستوى معنوية 10% ، وان هنالك اثر إيجابياً مقبولاً احصائياً لكل من راس المال والعمالة على النمو الاقتصادي عند مستوى معنوية 1%.

الكلمات المفتاحية: المعرفة، النمو الاقتصادي، الوطن العربي.

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Introduction

The world that is continuously changing and evolving, to keep up with these changes and developments, societies and individuals must possess a high level of knowledge.

Knowledge is important in the process of economic growth and country improvement since it gives many chances that contribute to economic growth.

Knowledge is wider than information, facts, and data analysis. It is a strong instrument that helps society comprehend the issues and obstacles it faces, while also offering chances to enhance people's lives, also knowledge leads to the necessary economic growth.

The Arab world is now facing several social and economic problems, including poverty, unemployment, and low standard of living. The solution may lie in knowledge investment, as it is possible that successful knowledge investment may help overcome these problems that facing the Arab World. It is possible for the Arab World to solve critical concerns and enhance its entire socioeconomic environment by leveraging knowledge.

Research Objectives and Importance

This study basically aims to investigate the impact of knowledge on economic growth in the Arab World during the period (2017-2023) by utilizing annual data. The topic of the impact of knowledge on economic growth has not been addressed sufficiently in economic literature . As a result, the importance of this study become evident as it attempts to study the impact of knowledge on economic growth in the Arab World.

Research Hypothesis

The main hypothesis that has been formulated:

There is a significant positive impact of knowledge on economic growth in the Arab world.

Theoretical Framework

Knowledge could be defined as a set of knowledge, truths, and aims that people have obtained (Al Salim, 2022). Kharabisha (2014) defined it as the data or truths about anything that a person owns in his mind.

For the purpose of this study, knowledge is defined as defined in MBRF(2017) as the totality of the facts attained by humans, the totality of the perceptions they form about themselves and their surroundings, the accumulation of knowledge, and all the processes related to processing and utilizing it for the development of ideas, concepts, theories, and new usable tools through comprehension, analysis, interpretation, research and advancement.

Types of Knowledge

There are four kinds of knowledge, and they are as follows (Al Ziebi, 2020):

1. Perceptual knowledge or know what: Knowing of differentiating facts, commonly referred to as normal facts.
2. Causal knowledge or know why: It requires more effort than perceptual knowledge to understand systems, rules, and natural phenomena to use them in decision making across various activities.
3. Procedural knowledge or know how: Understanding how the system or process relevant to the job operates and interacts is necessary for doing what is wanted.
4. Know who: Someone who has the ability to successfully do the job.

Knowledge and Growth Models

There are two models that identify the effect of knowledge on economic growth (Bani-Hani, 2020):

First: The Solow Growth Model: which is based on the production function, and is one of the most important models and has talked about the influence of knowledge on economic progress in the following form:

$$Q = f(A, K, eL) = AL^{\alpha}K^{\beta}$$

Which:

Q: production level.

A: knowledge.

K: physical capital.

eL: effectiveness of labor.

α and β : labor and capital elasticities.

There is a high positive correlation between the quantity of output and knowledge, which includes any technical advancement and innovations. As knowledge grows, labor and capital productivity will grow, resulting in increasing economic growth.

Second: Romer Endogenous Growth Model: which is built on the total production function established in the following form:

$$Y(t) = A L_t^{1-\alpha} K_t^{\alpha+\beta}$$

$$\alpha + \beta = 1$$

Which:

Y(t): total production at time t.

A: knowledge.

L_t : labor at time t.

K_t : capital at time t.

α and β : labor and capital elasticities.

Knowledge is used as a variable alongside institutions in this model, and the economy cannot thrive without it. Knowledge and economic growth have a positive relationship.

Global Knowledge Index

There is a commonly used global index for knowledge (Al Maktoum knowledge foundation, 2022). This index was developed in 2017 in partnership with the UNDP and MBRF by a group of experienced researchers and academicians about knowledge. The main objective of this index is to track the level of knowledge and its results, as well as to analyze the extent to which it contributes to development and economic growth. Furthermore, the index tries to overcome the scarcity of metrics that investigate the interaction between various sectors. This index investigates the condition of knowledge in various nations throughout the world, ranking them in descending order based on their knowledge values. The values of the knowledge index vary from 100 to 0. Where 100 represents the highest value and 0 represents the lowest value. The index comprises seven sub-indices, which are:

1. Pre-University Education

Education may be described as the skills, competences, and other productivity enhancing traits acquired in labor, or, in other words, it is the productivity of a number of laborers included in basic work hours. Education has been defined as an essential element of human capital since investing in education increases worker productivity, reduces the time necessary to carryout activities and enables the transfer of information between human beings, all of which support economic growth, and primary education and secondary education are included (World Economic Forum, 2016).

2. Technical and Vocational Education and Training (TVTE)

TVTE is learning of technologies and related sciences, as well as the building up of practical abilities, attitudes, comprehension, and the information relevant to occupations in many various fields of the economic (Nooruddin, 2017). Technical and vocational education aims to increase production and creativity, inevitably leading to more employment possibilities and, as a result, lower unemployment. Which contributes to increase the profit and encourages economic growth (Chang, 2021).

3. Higher Education

Higher education is important to produce knowledge and enable humans to be involved in scientific investigation and development, which leads to the discovery of better accuracy

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methods for research that contribute to economic growth. Furthermore, higher education seeks to improve human capacities as well as political, economic, and social management for the country and society. All of these factors lead eventually to economic growth (El-Maghraby, 2020).

4. Research Development and Innovation (RDI)

There is a positive correlation between innovation, research, development and economic growth, as research, development and innovation operate to build up knowledge in the community and improve the efficacy of human capital, reducing unemployment as well as poverty rates and the production of modern technologies. All of this contributes to economic growth and development (Akoum, 2016).

5. Information and Communication Technology (ICT)

ICT is described as all of the accumulated and accessible skills, organizational and administrative methods, and physical resources utilized for creating, gathering, processing, and distributing information to humans as well as society. (Saleh & Dabbazi, 2016). Information and communication technology (ICT) industry is essential in creating new employment opportunities and revenue, as well as minimizing the cost of accessing government services, resulting in boosted effectiveness, productivity, and innovation. It also leads to faster delivery of information and expertise, which lowers the cost of production and capital, resulting in a driving force for economic growth (Remeikiene et al., 2021).

6. Economy

The economic sector is classified as one of the most significant parts of the global knowledge index, as well as the one that interacts with most of the other sub- indicators. This has left an influence on the qualitative relationship between the concept of the economy, its constituents and other sectors (Al Maktoum knowledge foundation, 2022).

7. General Enabling Environment (GEE)

The environment is a collection of components which must exist to make it possible for anything to occur (Meyer & Meyer, 2016). The most important aim of the environment is to develop an approach that allows businesses to progress and thrive, which is reflected in the development of new jobs possibilities, thereby lowering poverty and unemployment rates. As a result, this has a helpful impact on economic growth (Meyer & Neethling, 2017).

These sub-indices collectively contribute to the overall knowledge index.

Economic Growth

There are several main reasons that leads to economic growth, and they as follow (Todaro, 2020):

1- Population Growth and Labor Force

This refers to an increase in the society's population and labor force. Labor is an important component of growth since it causes increased production, which leads to a rise in national output. The rise in population and labor supply are the foundation for growing employment and the labor force. Several economic models, such as the Solow growth model and Romer endogenous model discussed earlier, have concentrated on labor and its size, where labor is an important factor in increasing output, because most economic theories are based on the production function, where the link between labor and output is a positive one. There is a positive relationship between labor and economic growth, where an increase in productivity resulting from an increase in labor contributes to a rise in individual income. This leads to an increase in spending and consequently, a rise in demand for goods and services, creating new employment opportunities. All of these lead to economic growth.

2- Capital Accumulation

It is all new investment in human resources, physical equipment, and land. Capital is described as the supplies, tools, and money needed to establish and run a business or any other form of enterprise and make a profit. Capital is classified into two types: physical capital and human capital. Capital is an important as labor, and it has been talked about in different models of economics where capital and economic growth have a causal relationship. Capital is important because it creates new opportunities, as seen by increased investment prospects leading to economic growth.

There is a positive relationship between capital and economic growth, as increasing capital helps create employment opportunities and encourages effective investment in technology. This, in turn, leads to higher productivity, opening new avenues for international trade and the exchange of goods and services between countries, all of these things leading to economic growth.

3- Technological Advancement

It is the changes that describe the technical aspects of production processes and the nature of the generated items, involve increasing output levels with the same level of inputs, offering labor or capital saving, and improving the quality of the commodities, all of above contributes to economic growth.

Previous Studies:

Studies that have discussed the impact of knowledge on economic growth are very limited, as it has been difficult to find studies that directly address the effect of knowledge on economic growth.

Study of Hamdan (2013) investigates the effect of labor on economic growth in Palestine over the period 1995- 2010. The study uses Solow model, which is based on the production function, in order to determine the impact of labor on economic growth, the result of time series analysis shows the economic variables are not stable throughout the time but become stationary after initial differencing. The Johansen test is used on the research variables, demonstrating that they are cointegrated. The study finds that the labor and capital elasticities are 0.63 and 0.53, respectively, and these factors explained 78.8% of the variation in economic growth, as a result, the technological development proportion is 21.2%.

Furthermore, Shahid (2014) examines the relationship between labor, capital, and economic growth in Pakistan during the period 1980-2012. The study uses the Cointegration and Vector Error Correction model to investigate the long run and short run relationships between the variables. The study finds that in the short run, economic growth and labor have a negative relationship, and the capital have a positive relationship, and coefficients of these variables are as follows GDP -0.24, capital 0.087, and labor -0.076.

Additionally, Palickov (2014) examines the relationship between knowledge economy and economic growth and economic level of the countries in a group of the world economy countries during the time period 2001-2011. The study uses regression analysis for this investigation. The findings show that there is a relationship between knowledge economy and economic levels, which indicates more investment in knowledge will reflect on economic advancement, with a coefficient of 0.31 for this relationship.

In addition, (Nikoloski et al.,2015) in their study find out the important of capital for economic development, particularly in developing countries, and demonstrate the importance of increasing production factors, including capital, which has a greater impact on economic development in developing countries than in less developed countries.

Moreover, Zulu and Banda (2015) investigate the effect of labor productivity on economic growth in Mauritius and South Africa. The study finds that increasing physical capital investment has a positive impact on labor productivity, which in return has a positive effect on

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economic performance. And capital accumulation proved to drive production growth at a quicker rate in both nations cited. Furthermore, both countries require a trained workforce to keep the rate of production and economic expansion going. It has been noted that unskilled labor has a negative impact on economic growth due to a mismatch in necessary skills. As a result, skilled labor is critical for sustaining economic growth, and efforts should be directed toward developing relevant skills through proper training in order to boost productivity.

Additionally (Trujillo et al., 2020) aims at analyzing a number of variables, such as knowledge transfer, intellectual capital accumulation, workforce education levels, innovation skills, and their influence on economic growth in Mexico during the 2008-2016 period. To accomplish their goals, the study uses a panel model. The findings reveal that lowering the level of labor with low education attainment and raising capital accumulation contributes to increasing output, which leads to economic growth; similarly, the opposite is true for the level of labor education.

Moreover, Zaitri and Chouikat, (2020) investigates the impact of human capital on economic growth in a group of Arab countries, which is Algeria, Tunisia, Morocco, Saudi Arabia, Jordan, Bahrain, Sudan, and United Arab Emirates, during the period 1980- 2017. The study established a long term structural relationship among variables that exhibited cointegration, enabling them to estimate an error correction model. The findings show there is a statistically significant positive relationship between human capital and economic growth in the long term, with a coefficient of 0.67 for this relationship.

Furthermore, Aouar and Kerrousch ,(2021) investigate the impact of knowledge economy on economic growth in a sample of 88 developed countries during the period 2000- 2018. The model is estimates using the GMM method, the knowledge economy is expressed in several variables , which are ICT, innovation, and institutional economic system, the results shows that there is a relationship between knowledge economy and economic growth, with coefficients of these variables being 0.011, 0.1,and 0.023, respectively.

Moreover, Shobande and Asongu, (2021) investigate whether knowledge drives economic growth in both Nigeria and South Africa for the period 1987-2019. Using the Vector Autoregressive and Vector Error Correction approach. The result shows that the variables had a similar integration, demonstrating an interacting relationship between knowledge and economic growth in both nations. The variables show rapid convergence near their long-term average values. In the short term, knowledge shows that it stimulates economic growth in Nigeria, which is linked to educational spending.

Bosaleh and Sinuni, (2021) investigate the relationship between investment in the knowledge and economic growth in Algeria for the period from 1980 to 2018. The cointegration model is employed in this investigation. According to the study, there is a weak relationship between knowledge and economic growth. The reason for this is the lack of available data and the difficulty in identifying an appropriate variable for quantifying investment on knowledge.

Definition of the Study Variables

The model of this study takes the following form:

$$Y_t = F(GKI_t, L_t, K_t)$$

Depending on the production functions the standard model is formulated.

Dependent Variable

- **Y_t** = Gross Domestic Product (GDP): expresses as the aggregate sum of all goods and services produced in a country during a specified period of time, usually one year. The data is in current US dollars and was obtained from the World bank, and the values are in billions of dollars.

Independent Variables

- **GKI_t**= Global Knowledge Index (GKI): an index of the knowledge variable aims to offering a measure of knowledge and its importance in achieving economic growth and is taken from Mohammad Bin Rashid Al Maktoum Foundation's database.
- **K_t** = Gross Capital Formation can be defined as the gross domestic fixed capital formation, which is a measure of investment in fixed assets in all their forms that occurs in the economy over a specific time, in addition to the amount of change in the level of inventory, which can be expressed in goods held by firms to face expected and unexpected fluctuations in production and sale. The data is obtained from The World Bank and the data is in current US dollars, and the values are in billions of dollars.
- **L_t** = Total Labor Force, the labor force is made up of people who work hard mentally or physically to produce goods or services within a set period of time. The data obtained from The World Bank, and the values are in millions.

Diagnostic Tests

The researcher uses statistical tests for the study variable to be sure that the results achieve a meaningful estimate. And this estimator has the best linear unbiased estimator (BLUE) features and aims to be free of any statistical problems related to the model variables.

The statistical tests for the research variables include two stages, first perform Collinearity test to ensure that there is no multicollinearity among the explanatory variables, and in the second stage, the Hausman test is used to select which model to utilize the fixed effect test or the random effect test. Ultimately, estimation will be carried out using the most suitable model.

Multicollinearity Test

When there is linear relationship between explanatory variables, linear correlation occurs, which raises the standard error in the estimated variable and has a negative effect on the statistical (t-value), resulting in the estimated variable statistically insignificant. The correlation coefficients (ρ) between the explanatory variables can be analyzed in order to establish the absence of linear correlation. Researchers use the Variance Inflation Factors Test (VIF) to ensure that there is no linear relationship between explanatory variables. In this test, linear regression analysis is carried out between the explanatory variables, with the assumption that one of the explicating variables is the dependent variable and the other variables are independent variables. The VIF test uses the determination coefficient (R_j^2) for each explanatory variable, with the exception of variable j , where the following formula is used:

$$VIF_j = \frac{1}{1 - R_j^2} \quad (4.9)$$

In general, if the VIF is above 4 or tolerance below 0.25 indicates that multicollinearity might exist, and further investigation is required. When VIF is higher than 10 or tolerance is lower than 0.1, there is significant multicollinearity that needs to be corrected.

The results of this test are reported in table (1).

according to the next table, it is obvious that the VIF values of all explanatory variables are less than 4 and the tolerance is more than 0.25. As a result, we are able to deduce that there is no linear correlation between explanatory variables.

Table (1) Variance Inflation Factors Test

Variable	VIF	$Tolerance = \frac{1}{VIF}$
GKI	1.168253	0.5889790
CAPITAL	1.371569	0.729092

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LABOR	1.232959	0.8110570
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Source: Output of E-Views 10

Hausman Test

After ensuring that there is no statistical problem with the research variables, the study model is estimated using linear regression analysis panel data. In this research, a Hausman test for random effects is used to establish the correct estimate model, whether fixed effect or random effect, the table (2) shows these effects.

The null hypothesis in the Hausman test indicates that the Random effect model is an appropriate model, whereas the alternative hypothesis implies that the Fixed effect model is an appropriate model. If the probability is more than 5% the null hypothesis is accepted and if the probability is less than 5% the alternative hypothesis is accepted.

The results of this test are reported in the table (2).

Table (2) Hausman Test

The null hypothesis refers to not rejecting the model of random effect	Chi- square χ^2	Degree of freedom	Probability
	4.109569	3	0.2499*

Source: Output of EViews 10

Note: * Indicates the Acceptance of Null Hypothesis at a Significance Level of 5%.

Table (2) illustrates that the null hypothesis is accepted at a 5% level of significance, as the Chi- square value is 4.109569 with a probability of 0.2499. Therefore, the appropriate model for estimating regression in this study is the random effect model.

The Estimation Results of the Research Model

After carrying out the Hausman test, it became obvious that the random effect model is the most suitable approach for estimation. Table (3) provides the findings of estimating the impact of knowledge on economic growth.

Table (3) The Estimation Results of the Research Model

Dependent Variable		GDP	
Random Effect			
Independent Variable	Coefficient	T-Statistic	Probability
C	-1.37E+11	-1.752278	0.0844**
GKI	2.97E+09	1.808467	0.0751**
CAPITAL	3.244339	14.14352	0.00*
LABOR	6078.116	2.977565	0.0041*
R- Squared	0.839816	F- Statistic	115.3422
Adjusted R- Squared	0.832535	Probability	0.00*

Source: Output of EViews 10

Note: * Significant at less than 1%, ** Significant at less than 10%.

The above table displays the result of the OLS analysis, which shows that the value of R^2 was 0.839816, implying that the independent variables explained about 0.84 of the variations of the dependent variable. The coefficient of the knowledge is 2.97E+09, with a statistically significant and positive effect at less than 10% significance level, implying that an increase in knowledge by one unit leads to an increase in GDP by 2.97E+09%, the results of this study are consistent with the result of (Trujillo et al., 2020), (Shobande and Asongu, 2021), and Palickov (2014) studies, and contradicts the result of the (Bosaleh and Sinuni, 2021) study.

The capital coefficient records 3.244339 and it is statistically significant as well as positive impact at less than 1% significance level, implying that increasing capital by one unit results in an increase in GDP by 3.244339%, the results of this study are consistent with the result of (Nikoloski et al.,2015) and (Zaitri and Chouikat, 2020) studies.

With regards to labor, the coefficient has a value of 6078.116 and a statistically significant and positive effect at less than significance level of 1%, meaning that increasing labor by one unit leads to an increase in economic growth by 6078.116%, the results of this study are consistent with the result of (Hamdan, 2013) , (Shahid, 2014), and (Zulu and Banda, 2015) studies.

Additionally, the F-statistic value indicates the importance of the regression model utilized in this research. The probability value for the F test indicates that the model is accepted and has a high statistical significance.

The results of this study were consistent with economic theory, while increasing either knowledge, or capital, or labor leads to an increase in economic growth. Also, the results of this study are consistent with the hypothesis, which includes that there is a positive impact of knowledge on economic growth.

Results and Recommendations

Results

There are several results reached by the study, which can be summarized as follows:

- The results of the study show that there is a positive impact at a 10% significance level of the level of knowledge on economic growth in the Arab World.
- The results of the study show that there is a positive impact at a 10% significance level of capital on economic growth in the Arab World, as increasing capital increasing the economic growth.
- The results of the study show that there is a positive impact at a 10% significance level of labor force on economic growth in the Arab World, and the increase in the size of labor force is reflected positively in economic growth.

Recommendations

Depending on the previous result obtained from the study, the following recommendations can be provided:

- The Arab World shall develop strategic plans that directly contributes to raising the level of knowledge, given the positive relationship between the knowledge and economic growth. This, in turn, will reflect positively on the growth and prosperity of the Arab World.
- The Arab World shall adopt strategies that contribute to raising its level of capital, given the positive relationship between the economic growth and capital.
- The Arab World must concentrate on improving the labor force role and increasing its size, given the positive relationship between labor force and economic growth, and its impact on boosting economic development.

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Appendix A

Table (3-1) Gross Domestic Product in the Arab World in Billions of Dollars (\$B) (in Current Prices)

	2017	2018	2019	2020	2021	2022	2023
Bahrain	35.47	37.80	38.65	34.62	39.30	44.39	46.38 *
Egypt	248.36	262.58	318.67	383.81	424.67	476.74	538.92 *
Jordan	41.60	43.37	44.50	43.57	45.11	47.45	48.69 *
Kuwait	120.68	138.20	136.19	105.94	136.79	184.55	200.23*
Mauritania	6.80	7.47	8.06	8.40	9.99	10.37	11.25 *
Morocco	118.54	127.34	128.92	121.34	142.86	134.18	137.50 *
Oman	80.85	91.50	88.06	75.90	88.19	114.66	122.67 *
Qatar	161.09	183.33	176.37	144.41	179.67	237.29	255.67 *
Saudi Arabia	714.99	846.58	838.56	734.27	868.58	1108.14	1205.26 *
United Arab Emirates	390.51	427.04	417.98	349.47	415.20	507.53	534.13 *
Highest value	714.99	846.58	838.56	734.27	868.58	1108.14	1205.26
Lowest value	6.80	7.47	8.06	8.40	9.99	10.37	11.25
Average	191.889	216.521	219.596	200.173	235.036	286.53	310.07

Source: The World Bank, Data Bank, GDP, 2023. <https://databank.worldbank.org/>

Note: * Was Estimated by Researcher Using the Continuous Growth Rate Equation.

The Impact of Knowledge on Economic Growth in the Arab World

Appendix B

Table (3-2) Knowledge Index in the Arab World

	2017	2018	2019	2020	2021	2022	2023
Bahrain	49.9	51	51.2	50.9	52.2	47.4	48.1
Egypt	39.6	39	42.5	45	40.7	40.5	42.6
Jordan	46	44.7	44.5	43.9	41	40	41.2
Kuwait	47	49.9	46.5	45.8	54.5	50.1	52.4
Mauritania	29	30	26.3	25.6	28.2	29.2	29.2
Morocco	43	41.3	41.2	42.6	43.5	42.4	42.5
Oman	43.6	47.8	48.7	47.5	51.6	48	47.1
Qatar	50.5	51.3	51.6	54.2	56	54.1	54.8
Saudi Arabia	45	46.9	48.4	50.9	51.9	51.1	54.5
United Arab Emirates	58.8	61.9	63.7	66.1	63.1	58.9	60.5
Highest value	58.8	61.9	63.7	66.1	63.1	58.9	60.5
Lowest value	29	30	26.3	25.6	28.2	29.2	29.2
Average	45.24	46.38	46.46	47.25	48.27	46.17	47.29

Source: Knoema Website. Available at: <https://knoema.com/infographics/aomssce/global-knowledge-index>

Appendix C

Table (3-3) Gross Capital Formation in the Arab World in Billions of Dollars (\$B) (in Current Prices).

	2017	2018	2019	2020	2021	2022	2023
Bahrain	11.68	13.33	12.61	12.15	10.05	9.67*	9.30*
Egypt	42.58	49.12	63.90	61.39	64.42	81.13	91.59*
Jordan	10.28	10.56	9.52	9.16*	8.81*	8.48*	8.15*
Kuwait	33.46	34.97	34.07	34.37*	34.68*	34.99*	35.31*
Mauritania	2.57	3.47	3.78	3.93	5.71	6.89	8.25*
Morocco	37.52	40.92	39.44	34.92	44.36	43.31	44.56*
Oman	27.36	28.98	23.65	20.96	19.76	18.15*	16.67*
Qatar	68.64	74.54	77.13	63.32	65.90	65.23*	64.57*

Saudi Arabia	205.89	221.15	237.27	203.33	218.25	302.25	325.45*
United Arab Emirates	97.54	99.26	93.72	79.63	74.24*	69.22*	64.54*
Highest value	205.89	221.15	237.27	203.33	218.25	302.25	325.45
Lowest value	2.57	3.47	3.78	3.93	5.71	6.89	8.25
Average	53.752	57.63	59.509	52.316	54.618	63.932	66.839

Source: The World Bank, Data Bank, Gross Capital Formation, 2023.

<https://databank.worldbank.org/>

Note: * Was Estimated by Researcher Using the Continuous Growth Rate Equation.

Appendix D

Table (3-4) Total Labor Force in the Arab World in Millions (M)

	2017	2018	2019	2020	2021	2022	2023
Bahrain	0.83	0.86	0.86	0.83	0.82	0.84	0.84 *
Egypt	30.42	29.89	29.70	29.81	30.22	31.16	31.31 *
Jordan	2.69	2.70	2.79	2.92	2.97	3.04	3.11 *
Kuwait	2.37	2.49	2.56	2.41	2.35	2.41	2.42 *
Mauritania	0.96	0.99	1.02	1.05	1.08	1.12	1.16 *
Morocco	11.69	11.84	11.99	11.62	12.28	12.53	12.70 *
Oman	2.48	2.49	2.44	2.20	2.16	2.24	2.19 *
Qatar	2.04	2.08	2.09	2.04	1.99	2	1.99 *
Saudi Arabia	13.92	14.52	15.48	15.99	15.68	15.91	16.33 *
United Arab Emirates	6.32	6.40	6.47	6.49	6.46	6.57	6.63 *
Highest value	30.42	29.89	29.70	29.81	30.22	31.16	31.31
Lowest value	0.83	0.86	0.86	0.83	0.82	0.84	0.84
Average	7.372	7.426	7.54	7.536	7.601	7.782	7.868

Source: The World Bank, Data Bank, Labor force, 2023. <https://databank.worldbank.org/>

Note: * Are Estimated by Researcher Using the Continuous Growth Rate Equation.