



Knowledge-Economy Dimensions in Promoting Economic Development - Case Study Of Arab Countries -

 ABAHRI Sofiane*	 MAGHNEM Mohamed
s.abahri@univ-boumerdes.dz	m.maghnem@univ-boumerdes.dz
University of Boumerdes (Algeria)	University of Boumerdes (Algeria)

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Abstract:

The current trends of education at the global level in general and the Arab world, in particular, are heading for the development of education towards the knowledge economy, where it has become an inevitability for education systems, which provides opportunities and challenges in the exploitation of technological capabilities, jobs, and new businesses, and this requires a workforce characterized by special qualities such as creativity, and speed of adaptation to external changes, and based on the above, the problem of the study is determined in the concept of the knowledge economy and its dimensions in promoting economic development in Arab.

Keywords: Knowledge economy, economic development, knowledge economy in the Arab countries, economic development in the Arab countries.

JEL Classification Codes: F41, O1, O53, O55, Q56

*Corresponding author

Introduction :

Knowledge is one of the most important features of the development of human society, as profound positive transformations, in all areas of life, may be achieved through knowledge. It is also the key driver of economic competition through paying attention to the demand for innovations and new technologies, hence the importance of knowledge and the role it is playing at all levels, as there have been many innovations and research that have turned into a commodity that people are willing to obtain in exchange for it.

The transition towards a global economy based on knowledge requires the development of the local community by achieving high levels of knowledge, competence, and technological skill, which leads to a change in the role of the teacher and the learner, in the methods of education, the educational environment, and its equipment, as well as in the educational curricula.

Problem

The problem of the study is to identify the difference produced by the scientific and technological revolution or the so-called information revolution, which led to a large difference between rich countries and poor countries, and the recognized economic gap became limited dimensions in front of the digital divide, which also exists within the same region because The lack of information flows in it sufficiently, which required the underdeveloped countries to catch up with the information revolution, by relying on the knowledge economy to shift towards a knowledge-based economy, leading to the information society.

1. Study Purpose

The study aims to identify the concept of the knowledge economy and determine its features, characteristics, and indicators, while giving an evaluative assessment of the reality of the knowledge economy in the Arab world and its economic dimensions on development in the Arab world.

2. Importance of the study

This study sought to answer a set of questions, the most important of which is the concept of the knowledge economy, the concept of economic development according to

various theories, and the relationship of the knowledge economy to economic development.

3. Studymethodology

In our study of this topic, we used the descriptive approach, which is based on describing the phenomenon by collecting data relating thereto, tabulating and analyzing it, and linking them together to reach the studied phenomenon and the influencing variables.

4. Researchhypothesis

- 1) There are positive effects of the knowledge economy on economic development in Arab countries.
- 2) The Arab countries are seeking to move towards a knowledge economy at an accelerated pace.

5. Researchstructuring

Research division: Accordingly, the content of this research was divided into three basic elements. The first element included the theoretical framework of the knowledge economy, identifying its characteristics and indicators, and highlighting the most important obstacles that turn towards the knowledge economy in the Arab countries. The second element dealt with the evolution of the concept of development, from a theoretical or realistic point of view for the Arab countries. The third and last element was devoted to the positive effects of the knowledge economy in promoting the economic development of the Arab countries.

1. Concept and characteristics of the knowledge economy

1.1. Concept of the knowledge economy

There are several terms used to describe the concept of the knowledge economy, such as information economy, virtual economy, network economy, etc., and all these terms refer directly and reciprocally to the knowledge economy, thus indicating that the designation or concept of the knowledge economy has not received a unanimous consensus related to this term, and therefore we will try in this paragraph to illustrate some opinions and definitions, for example, but not limited to.

The knowledge economy is an economic system whose main component is scientific research in creating and producing wealth, where growth rates are achieved in this economy thanks to the high use of technology in the long term.

The Organization for Cooperation and Development defined the knowledge economy as an economic system based on mechanisms that allow the use of knowledge and information technology on a large scale (Ibrahimi Abderahmen, 2007).

While the Arab Strategic Report considers the knowledge economy as an economic system imposed by technological transformations and the development of electronic commerce.

The United Nations program believes that the establishment of human development is related to the dissemination of knowledge and its employment in all fields to improve the quality of life in all its fields.

The World Bank defines the knowledge economy as the optimal use of technology, ideas, and innovation to achieve economic and social development.

Through these definitions, it is possible to give a comprehensive concept of the knowledge economy, as it represents the economy that generates and spreads knowledge while improving its employment as the cornerstone of wealth creation and growth.

1.2.Characteristics of the knowledge economy

The knowledge economy is characterized by a set of characteristics, the most important of which are :

- ❖ **Innovation:** Linking academic institutions and other research laboratories keeping pace with the knowledge and technology revolution with productive, industrial and commercial institutions to provide and modernize them with the knowledge system and technological developments.
- ❖ **Basic education for economic productivity and competitiveness:** By forming a labor force with skill and creativity by integrating modern technology in training and curricula, within the framework of the growing need to integrate information and communication technology in economic life.
- ❖ **Infrastructure:** Through the provision of an infrastructure based on technology and knowledge to facilitate and speed up the dissemination of information according to local needs.
- ❖ **Promote and encourage scientific research:** as it is the key driver for achieving economic development.

- ❖ **The knowledge economy is open to the world:** it allows the exchange of new knowledge with others in an economic environment based on the promotion of investments in knowledge, information, and innovation.
- ❖ The knowledge economy is knowledge-intensive: it is based mainly on investing in human resources as intellectual capital.
- ❖ **The knowledge economy is characterized by flexibility and rapid change:** to meet the changing needs, as well as openness and global competition as a fully open economy.

1.3. Knowledge economy indicators

The knowledge economy is characterized by a set of indicators through which it is possible to transition this new economy, which relies heavily on technology and knowledge, including (Totiliane, 2006):

1.3.1. Information and Communication Technology Indicator

Realistically, information technology is a very important indicator, as it allows the economy based on technology and communications to promote and build up intensive activities in knowledge, production, and technology dissemination, through the following elements :

- ❖ Working to provide a large return through the exchange of information and in the field of processing.
- ❖ Working to adopt organizational models for optimal use of new capabilities such as information dissemination.
- ❖ Working to develop and create new industries that depend on technology such as electronic commerce and multimedia.

At this scale, the United Nations Conference on Trade and Development for Information and Communication Technology sets some indicators that allow the creation of information and communication technology capabilities between countries, as shown in Table No. (1).

Table No. (1): Indicators of information and communication technology, according to the classification of « UNCTAD »

Index Dimension	Indicators	Sources
Connectivity	<ul style="list-style-type: none"> ▪ Number of Internet classifiers per capita ▪ Number of personal computers per capita ▪ Number of main telephone lines per capita ▪ Number of mobile phone subscriptions per capita 	<ul style="list-style-type: none"> ▪ International Telecommunication Union
Access	<ul style="list-style-type: none"> ▪ Number of Internet receivers per person ▪ Illiteracy, percentage of the population ▪ Per capita gross domestic product ▪ Cost of local laboratories 	<ul style="list-style-type: none"> ▪ International Telecommunication Union ▪ United Nations Statistics Division ▪ International Telecommunication Union
Politics	<ul style="list-style-type: none"> ▪ Existence of an Internet exchange ▪ Competition in local communication ▪ Competition in local lines ▪ Competition in the Internet service providers market 	<ul style="list-style-type: none"> ▪ United Nations Conference on Trade and Development ▪ International Telecommunication Union
Use of telecomtraffic	<ul style="list-style-type: none"> ▪ Internal international traffic ▪ External international traffic 	<ul style="list-style-type: none"> ▪ International Telecommunication Union ▪ International Telecommunication Union

Source: ESCWA, Indicators of Science, Technology and Innovation in a Knowledge-Based Society, United Nations, New York 2003, p. 23

1.3.2. Knowledge and training indicators

Measuring the competencies of individuals is characterized by a kind of difficulty, hence human resources indicators have two main sources; the first is related to data about education and training, and data is related to competencies or workers' occupations. This first source, or the so-called human capital, allows for the assessment of stock and investment in human resources, where education statistics are collected in an international database through UNESCO and the European Union's Department of Statistics, while the second component works on providing stock and investment in human resources.

1.3.3. Research and Development Index.

Two main indicators are used in this component: expenditures allocated to research and development, as well as members of the research and development team, which perform dynamic analyzes and international comparisons.

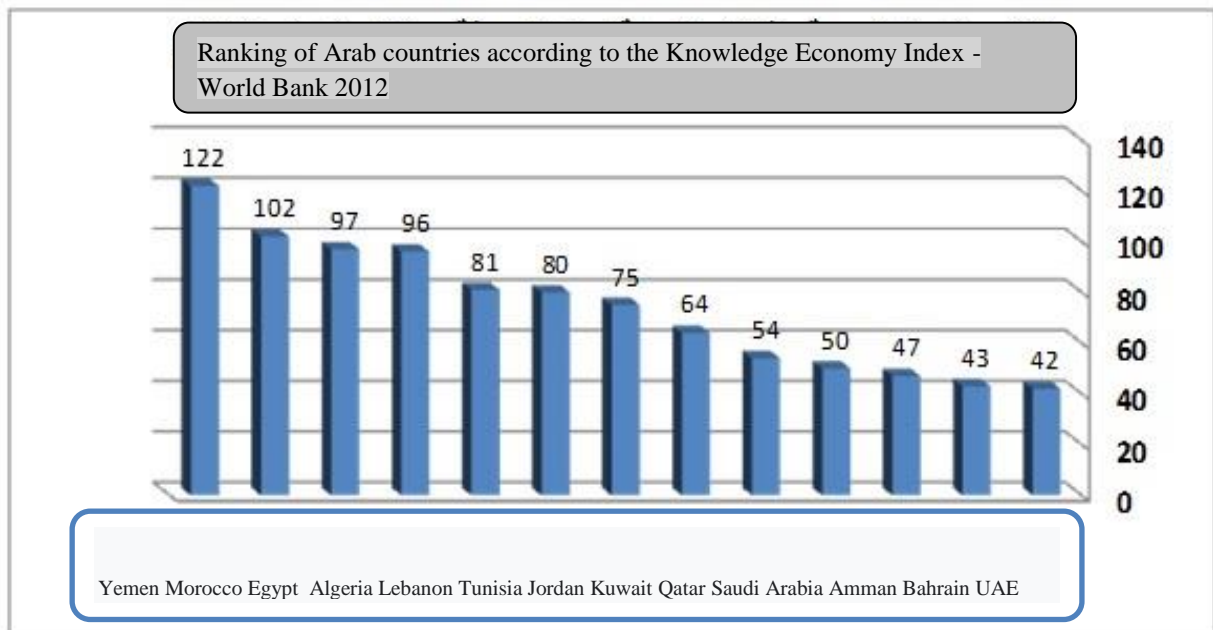
2. Knowledge economy reality in the Arab world

The review of data in Table No. (2) show that the Arab countries do not exist as part of the group of the top 25% of the countries of the world, whose knowledge economy index is in the range of 5.7, while eight Arab countries fall within the group of the second 25% of the countries of the world whose knowledge economy index scores between 5 and 5.7(Kacem).

While seven Arab countries, namely Algeria, Tunisia, Egypt, Morocco, Libya, Syria, and Iraq, rank in the group of the third highest 25% of the countries of the world, and whose knowledge economy index ranges between 5 and 5.2, while the remaining Arab countries rank in the last 25% of the countries of the world, whose knowledge economy index is less than 5.2, such as Mauritania, Sudan, Yemen, and Djibouti.

The Fig 1 shows that the Arab region is less than 7G of the second geographical regions for two indicators and less than 6 of those regions for eleven indicators, while the Arab regions recorded a better indicator related to the average growth of GDP, and this increase is largely due to the improvement of the global crude oil prices.

Fig N 01: Ranking of Arab countries according to the Knowledge Economy Index - World Bank 2012.



Source. Knowledge database for development. World Bank report. 2009

2.1. Information technology reality in the Arab world

The use of the Internet has spread significantly in the last ten years in Arab countries, where the rate of use in most Arab countries reached 21% of the population, which is a low percentage compared to other developed countries in the world. The population of Arab countries uses the Internet at a lower rate than the rate prevailing in high-income countries, and therefore it seems clear that the Arab world is still at a late stage in terms of spreading and using the Internet, due to the lack of infrastructure for information technology and communication network.

2.2. Factors affecting the Arab information society

2.2.1. Infrastructure factors: consisting of the development of the communications network, which operates on the efficiency of modern digital technology, with a large provision of telephone lines as a tool for accessing the Internet. Infrastructure factors also refer to the provision of qualified manpower in the use of the Internet in the Arab region

2.2.2. Economic factors: consisting of the improvement of the income of individuals through an increase in the gross domestic product, with a focus on the quality component, which is linked to international specifications and standards, and resorting to integration as it works to increase growth and prosperity.

2.2.3. Arab countries' efforts to shift towards a knowledge economy

It is noticeable that there is a disparity in terms of interest and awareness of informatics and communications in Arab countries, whether at the level of policies or in terms of implementing strategies related to this field. This disparity lies through adopting the legal and legislative frameworks for informatics and updates by the technological development, as well as working on an encouraging environment for scientific research by allocating an encouraging budget in this field, as well as the development of the scientific potential inherent in the Arab countries with the expansion of opportunities for researchers to work and obtain appropriate allocations. It should be noted that interest in Arab elites and communication and information technology works to increase and accelerate access to the international information network, which represents the number of users of the international information network as a percentage of the population.

2.2.4. Obstacles to the transition toward a knowledge economy in the Arab countries

The need for Arab countries to shift towards a knowledge economy requires giving great priority to spreading knowledge before transferring its results represented in technology, given the availability of absorptive capacity that prepares the environment for the success of knowledge transfer, and Arab universities are working to train job seekers rather than knowledge producers, given that some Arab countries have succeeded in establishing the infrastructure for education and health, but they need to follow some economic policies that rely on competitive advantage and the speed of generation, dissemination, and investment of knowledge. Also, these countries suffer from a weakness in attracting minds, and accordingly, they must reconsider their immigration and polarization policies in the absence of a unified strategic vision among the Arab countries, which remains a major obstacle to the establishment of a knowledge society.

3. The reality of Economic Development in the Arab World

3.1. Concept of economic development

Economic development is defined as the process by which national income increases over a certain period (Khalaf).

Generally, economic development can be defined as the process through which a comprehensive and continuous change occurs accompanied by an increase in the average real income and an improvement in the distribution of income in favor of the

poor class with the emergence of an increase in the quality of life and a structural change in production (Attia, Recent trends in development. University Publishing dar, 1999).

Based on these definitions, the development includes a group of elements, the most important of which are :

3.2.Comprehensiveness: Development is a comprehensive change that not only involves the economic aspect but also extends to other areas such as the political, cultural, and moral fields.

3.2.1.Continuous increase in the average real income: For a long period, suggesting that development is a long-term process.

3.2.2.Improvement in the distribution of income: In favor of the low-income class. In the fifties and sixties of the last century, it was observed that although many developing countries achieved high economic growth rates, the relative share of income for the low-income class was constantly decreasing. This implies that despite the occurrence of economic growth in these countries, the situation of the poor was getting more miserable.

3.2.3.Development theories

The Keynesian theory is considered a successful output to eliminate the crisis of the great depression which struck the world on the one hand, and on the other hand, Marxist ideas, which have always been in contrast with the capitalist system, began to see the light through the emergence of the socialist system in the Soviet Union.

In light of these circumstances, it became necessary for the thinkers and theorists of the capitalist system to deepen their ideas and think about finding solutions that are suitable for both post-Keynesian and neoclassical thoughts. (J., 1993)

Therefore, economists began to divide into different trends, including, but not limited to, the currents that emerged from Keynesian thought :

- ❖ The new Keynesian economic trend, whose most important pioneers are. Akorlof, J. Stiglist, Stanley Fisher, J. Yallin.
- ❖ The Imbalance theory trend, whose founder is the French E. Malnifoud.
- ❖ Post-Keynesien movement, whose most famous pioneers are. Harrod, E. Domar, N. Kaldor, J. Robinson, M. Kalocki and F. Polon.

However, the following trends emanated from the neo-classic :

- ❖ The criticism trend of the so-called Chicago School, which included M.Fridman, A. Schurtz, and K. Bumer.
- ❖ The neoclassical trend, which included many economists such as R.Lucas and P. Romer.

4.The reality of Economic Development in the Arab Countries

According to the United Nations report, between 2010 and 2019, productivity growth in GCC (Gulf Cooperation Council) countries decreased by 0.8 percent, and by 1.5 percent in Arab countries outside the GCC. Moreover, productivity growth in emerging and developing countries in other regions increased by an average of 3.1 percent over the same period, while in advanced economies it rose by 1 percent, with the global average registering an increase of 2.1 percent.

The report shows that most Arab countries witnessed a premature decline in industry, so they currently lack a solid industrial sector(Ashref).

The report also quoted« the economic strategies in most countries of the region focused on service sectors with low added value or the financial and construction sectors. This hindered productivity growth because services are less in need of capital and less open to international competition, which harms economic growth and productivity and leads to an increase in informal employment ».

The report highlights the manufacturing industry sector rates in the national Gross domestic product (GDP) in the region. This rate was very low in Lebanon with 3.1 percent in the national GDP in 2020 compared to 8.3 percent in 2008, 3 percent in 2020 for Iraq while it remained stable over the past 20 years, 6 percent in 2020 for Kuwait as it maintained its stability over the past 20 years.

The proportion of the manufacturing industry in GDP is relatively low in Qatar and Oman, where the percentage of this sector was 7 percent in 2020, medium in Saudi Arabia (13 percent, but it is growing), and relatively high in Jordan (17 percent in 2020), but it is declining as it recorded 21.2 percent in 2008. In Syria, the rate was stable at 15 percent before the conflict began in 2011, although current data is not available.

Surveyed regional business leaders identified barriers to productivity growth arising from faulty business environments. Challenges included political instability, lack of access to credit for investment and financing of working capital, lax tax system, and lack of access to electricity - the latter being one of the most important concerns in non-GCC countries.

Business leaders also pointed out the insufficient market size. Since the region's exports are only one-third of its potential, the report estimates that promoting regional integration through the removal of trade barriers and the creation of trade zones belonging to a unified market could significantly increase the export potential of the region.

The report recommends a set of policies for countries in the region to reform their national development strategies and prioritize productivity growth, diversification, and structural change during the post-COVID-19 recovery period.

The report underlines that the most urgent priority now is to focus economic strategies on diversification in oil-dependent countries and on broader structural change in non-oil countries. To achieve this, the report recommends a well-managed privatization process to move away from the renter economic systems in the region that mainly cover the high-income population, through the design and implementation of industrial development and productivity policies.

By taking a closer look at the latest available collected data on Arab countries, the state of their economic development is revealed, as the data of the Unified Arab Economic Report (2017) of the Arab Monetary Fund indicates a decline in the gross domestic product at current prices in the Arab countries from about \$2437 billion in 2015 to about \$2347 billion in 2016, thus the average GDP per capita decreased from about 6832 dollars to about 6420 dollars, while the growth rate of the domestic product at constant prices declined from about 3.2% in 2015 to about 1.7% in 2016, and declined from about 4% in 2015 to about 2.5% in 2016 AD in GCC countries.

As for the share of the sectors of economic activity in the GDP, and the decline that occurred in these sectors,

The situation reflects the outcome of the Arab countries that pride themselves on development. Indicators of the sectoral structure of the GDP showed that the agricultural output in the agricultural sector is estimated at current prices at about \$142.1 billion in 2016, with 5.8% of the GDP, but declined to about 1.4% compared to 2015.

The per capita share of agricultural output reached about \$389 in 2016, which generally reflects the low contribution of the agricultural sector to the gross domestic product, despite absorbing a high percentage of the labor force (about 20%), primarily due to the low percentage of land exploited for agricultural production, as it represents about 60% of the arable land area, in addition to the water crisis and the technological

gap between the outputs of agricultural research on the one hand, and the requirements of agricultural development on the other.

As for the industrial sector, the indicators of the sectoral structure of the GDP showed that the total industrial output of the Arab countries amounted to about \$701 billion in 2016, at a rate of 29% of the Arab GDP, compared to 32.9% in 2015. In 2016, the contributions of the extractive industries recorded a significant decline in the gross domestic product of the Arab countries, which amounted to about 18.8% compared to 21.9% in 2015, as a result of the continued decline in oil prices.

As for the manufacturing industries, which are an important indicator of economic development, their performance indicators showed negative results, as value-added declined from \$268.1 billion in 2015 to \$259.5 billion in 2016, i.e. by 3.2%. The percentage of the contributions of the manufacturing industries during 2016 was about 11.1% of the gross domestic product of the Arab countries, thus highlighting the weakness of the components of economic development in the Arab countries, considering that the entire industry sector provides job opportunities for about 17.8% of the total Arab workforce. The per capita industrial output for 2016 was about \$1,917.

The reality reveals that the structure of the Arab economy shows a clear distortion in the main productive sectors, especially the industrial sector and the manufacturing industry in particular, which highlights the Arab economy's readiness and its dependence mainly on the extractive industries, which are mostly represented in oil and gas, in addition to the service sector which accounts for the largest share of the gross domestic product of the Arab countries. All of this reflects the inability of the Arab countries to create sustainable development from which the current generation will benefit and bequeath to succeeding generations.

Despite many countries seeking the name of the economic reform program to raise the banner of development, this reform was a formal reform devoid of content and clinging to appearances. Rather, some countries mortgaged their economy and resources to the International Monetary Fund and completely surrendered.

After two consecutive years of contraction, the value of the gross domestic product at current prices in Arab countries increased in 2017 by 8.3 percent. The Arab countries as a group recorded a growth rate at constant prices of about 0.1 percent. The growth rate was estimated at 7.0 percent in the major oil-exporting Arab countries, compared to 1.3 percent in the group of other Arab countries. The average per capita GDP at current prices in the Arab countries as a whole was about \$5,979 compared to

\$5,889 in 2016, thus achieving a growth rate of about 5.1 percent, compared to a contraction of about 4.5 percent in 2016. Regarding the sectoral structure of GDP, the year 2017 witnessed an increase in the share of commodity production sectors as a result of the high relative importance of the extractive industries sector at the expense of the rest of the sectors as a result of the increase in international oil prices during the year. Accordingly, the sector achieved the highest growth rate at current prices, with an average of about 5.21 percent, compared to a contraction of about 7.16 percent in 2016. In terms of distributing output by expenditure items, consumer spending contributed by about 9.68 percent of the total output, although it witnessed a decline as a reflection of government spending control programs that were adopted in 2017 in many Arab countries, following investment spending, which contributed about 27 percent, then a resource gap of about 1.4 percent.

4.1. Agricultural sectoral developments

The agricultural output of the Arab countries amounted to about \$3.138 billion in 2017, i.e. a contraction of about 8.2 percent compared to the levels of agricultural output recorded in 2016, which led to a decline in the ratio of agricultural output to GDP at current prices from 0.6 percent in 2016 to 6.5 percent in 2017.

Per capita agricultural output averaged about 366 dollars in dollars, due to the decline in the exchange rate of national currencies by 4.4 percent.

The reason for the decline in the growth of agricultural output, valued against the dollar, in some agricultural Arab countries, such as Egypt by 4.77 percent, Yemen by 4.29 percent, and Tunisia by 6.12 percent

In addition to structural factors such as migration to cities and the growth of the service and industrial sectors, the limited land, and water resources represent the most important obstacles to agricultural development. In 2016, the cultivated land area constituted about 1.38 percent of the arable area, of which the total renewable traditional water resources are estimated to be about 274 billion cubic meters about 5.67 percent with an average per capita share in 2017 of about 662 cubic meters.

The number of workers in the agricultural sector in the Arab countries decreased in 2016 by 3.2 percent, and therefore agricultural labor became about 3.18 percent of the total labor force. Migration from the countryside to the city is considered one of the most important reasons for this decline and is at the forefront of the obstacles facing agricultural development in Arab countries. In terms of agricultural foreign trade, the

agricultural trade deficit of the Arab countries increased from about \$60 billion in 2015 to about \$62 billion in 2016, i.e. an increase of 3.3 percent.

The food gap in the Arab countries amounted to about \$33 billion in 2016, in light of the decrease in the food self-sufficiency rate for several major food commodities, led by cereals by 38 percent, wheat by 34 percent, oils by 32 percent, and barley by 28 percent.

4.2. Industry

The industry sector in the Arab countries has maintained its pivotal role in the Arab economy thanks to the high growth rate of the extractive industries sector, which reflects the remarkable improvement in oil prices in global markets. The industrial output in the Arab countries grew in 2017 by about 14 percent, as it increased from 6.691 billion dollars in 2016 to about 8.787 billion dollars in 2017. The industrial output of the Arab countries contributed about 9.31 percent of the total GDP for the year 2017, distributed between 7.21 percent for the extractive industries, and 2.10 percent for the manufacturing industries. The industrial sector contributed to providing job opportunities for about 7.17 percent of the Arab workforce. The sector also contributed to advancing development efforts and rates of foreign trade and increasing national income, as the average Arab per capita share of industrial output in 2017 was about \$081.2 compared to about \$1,710 in 2016. The Arab extractive and manufacturing industries achieved significant results in 2017. Arab production of oil decreased by 4.1 percent, within the framework of the commitment of the Arab countries to the agreement of the countries produce about 4.24 million barrels/day,

CONCLUSION:

Research and development is the primary activity of countries in achieving development, security, and active participation in global civilizational progress. In addition, investment in the field of basic and applied research, whether it takes place in universities, specialized research centers, or productive economic institutions, is justified by the great return of this investment at the national and institutional levels. The qualified human element plays the greatest role in revitalizing scientific research in terms of generating, transferring, and exploiting scientific knowledge. Research also plays its role in developing human competencies and providing revenues that ensure their development to achieve comprehensive economic and social development.

In their study of the conditions of different countries in terms of economic growth, economists unanimously agree that natural resources are not the only ones responsible for the growth differences between countries. Lester Thurow believes that there are new sources of competition. (natural resources, capital, technology, skills). Natural resources are essentially excluded from the competition equation. Possession of natural resources is no longer the path to wealth, and not owning them constitutes a barrier in the face of wealth. Japan does not have natural resources, but it is rich, and Argentina does, but it is not rich. Perhaps the lack of natural resources is an advantage. The Japanese have the best steel industry in the world even though they do not have iron ore or coal, and to some extent, they are the best precisely because they do not have iron ore or coal. They are not tied down to local supply sources of poor quality and high cost, and they do not need to buy British coal or low-quality American iron ore, but rather they can buy the best quality at the most appropriate price.

Inherited wealth is no longer important, and technology is being turned upside down. New technical products ranked second, while technological approach or technology development ranked first. However, the level of education and skill of the workforce are the decisive competitive weapon in this century.

The availability of capital at the enterprise level has become significantly less important in the competitive equation. We will find there factories in poor countries that can be matched in capital intensity to existing factories in rich countries. To some extent, these factories will be owned by local institutions that can access global financial markets, and to some extent, these factories will serve as offshore production facilities for multinational companies that bring with them access (domestic or international) to global financial markets. In any

case, far fewer workers are guaranteed high wages simply because they were born in rich countries.

Thurow believes there are seven major industries: microelectronics, biotechnology, new materials industries, civil aviation, telecommunications, robots and industrial machinery, and computers and operating software. These industries share a common feature that they are all industries of mental energy. Any of them can be located anywhere on Earth. The place depends on who can regulate the mental energy dominating these industries. So the comparative advantage will be man-made

Since technology stands behind man-made comparative advantage, research and development are of crucial importance. The reasons for paying attention to spending on

research and development lie in adding an addition to the global knowledge stock for a single country. Research and development (Lester, 1995):

- It enables understanding and assimilation of other knowledge in the global stock;
- Build skills for workers that enable them to effectively use knowledge;
- It enables a country to be the first in acquiring and using additions from the global stock of knowledge, and therefore it grants benefits and power to the leader who controls knowledge, based on Francis Bacon's saying, "Knowledge is power."

From the point of view of both Cohen & Levinthal, "research and development develops new knowledge and also enables companies to understand the origin of knowledge elsewhere" (Cohen & Levinthal, 1989).

The use or dissemination of technology may be affected by research and development. Several factors fall within this issue, including:

- The availability of long-term financing for technology investments;
- The availability of capital to operate new companies;
- The extent to which workers have skills;
- Attitudes towards risk;
- Conditions available in macroeconomics;
- The spread of information technology;
- The political environment and tax policy.

Regarding the Arab countries, the available international statistics indicate the modest performance of the research and development sector compared to some other developing countries. For example, the average spending on research and development relative to the GDP for the period 1989-2000 in Tunisia, which is considered one of the best-performing Arab countries in this field, was only 0.45%. This figure is only one-sixth of what South Korea spends on research and development. The same applies to the performance of Arab countries in the field of publishing scientific articles, as the number of publications in South Korea for the year 1999 reached six times what was published in Egypt, which is considered one of the best-performing Arab countries in this field.

This huge technical breakthrough and the resulting changes in the traditional sources of growth and the industrial and vocational structures led to the consolidation of the relationship between knowledge and development and the emergence of the so-

called "knowledge-based economy". It is expected that this type of economy, which was created in the past and will be created in the future, by those pioneering knowledge and information industries, becomes the main engine for the prosperity of the countries of the world over the coming decades. In light of this; it will become impossible for any country to remain outside its framework. In this context, projections made in the United States of America indicate that the number of workers in industrial research and development activities will increase from (642,300) in the year 2000 AD to about (886,000) in the year 2010 AD, i.e. by An increase of about (38%)(Abdullah, 2002).

The contribution of knowledge to Arab foreign trade, and to the formation of competitive advantages for Arab countries compared to other countries such as South Korea and Malaysia, whose share of high-knowledge industries in their exports jumped over the past decade from 22% to 29% in Korea and from 31% to 44% in Malaysia.

There is no doubt that these fundamental transformations and changes that have been monitored in many countries of the world - especially the industrialized and newly industrialized ones - during the past two decades, represent today the most important major trends that are increasingly affecting and shaping the future of contemporary global civilization and its development during the first decades of the 21st century. Those trends from which many indications of great importance to economic, social, and industrial development can be deduced, and from them.

- The emergence of the unified global economy and market makes it difficult for any country to achieve desired economic growth rates outside the scope of this unified economy and market.
- Orientation towards the global market and finding a competitive advantage for national goods and services is the main engine for exports and then economic and industrial development.
- Material wealth represented in raw materials, natural resources, machines, tools, and other traditional sources of growth is not the basis for bringing about economic development; Indeed, science, technology, and innovation have become the main determinants of comparative advantage and the necessary and decisive means to achieve high growth rates for the national economy.
- The renewal, creativity, and innovation in technology, the development of productivity, and the maintenance of high levels of total quality are important knowledge elements in the new production system and are vital for economic growth.

Results:

The study concluded that communication and information technology are the most important potential for changing the economic structure in the Arab world to shift towards a knowledge economy and the acquisition and assimilation of knowledge in society to stimulate investments in the field of knowledge production. Success in this does not depend on technology alone, but rather on the presence of capital Knowledge able to interact with it, advanced management, and an advanced educational system.

The study shows that there is a reciprocal relationship between the economic and social structures on the one hand, and knowledge on the other hand, where knowledge affects the state of economic development, so the higher the degree of knowledge, the higher levels of human development will be achieved, and vice versa, because the quality of education and the level of technical development The pattern of production used, the level of investment in science and technology, knowledge activity, and the level of culture of the members of society are of great importance in crystallizing the mentality of the members of society, the level of economic development, and the level of economic activity reflects the size and quality of the demand for knowledge.

The study concluded that the knowledge economy is based on the acceleration of the pace of knowledge and technical development, and high technology in the field of the Internet opened a wide field for the development of electronic commerce, and the commercial exchange of products and services, which constituted a revolution that caused a major change in the financial, commercial and organizational activity of banks, and represents trade Electronic most important areas of the knowledge economy. However, the size of the participation of Arab countries, in general, is still weak in benefiting from the advantages and benefits of electronic commerce and electronic banking. The volume of Arab electronic commerce is estimated at \$3 billion in 2002, which represents 0.2% of the total global electronic commerce. This represents a challenge at the level of the Arab economies, which lack basic ingredients and infrastructure.

The study concluded that Arab culture, including what it includes, constitutes basic ingredients for the establishment of an Arab economic model that encourages knowledge. It represents in its content a fundamental issue with a regional and strategic dimension to establish an Arab economic power, in light of international changes, the era of globalization, and the knowledge economy. And the current regional and

international blocs, to enhance the competitive capabilities of the economies of the Arab countries and escalate the rates of economic growth.

Referrals and references:

- Abdullah, A.-R. (2002). *The National Policy for Science and Technology and its Role in the Growth of the Saudi Economy*. Riyadh: Symposium on the future vision of the Saudi economy .
- Alla, M. (2014). *The knowledge economy and its role in achieving economic and social development Arab Countries-Gulf Cooperation Council as model*. Dubai Digital Library.
- Ashref, D. (n.d.). Economic development in the Arab countries between tangible reality and raised slogans. *Society Magazine*.
- Attia, A. M. (1999). *Recent trends in development university publishing* . Dar Alexandria.
- Cohen, W., & Levinthal, D. (1989). Innovation and Learning: The Two Faces of R&D. *Economic Journal*, 99, 569-596.
- Ibrahimi Abderahmen, A. F. (2007). *Curriculum and knowledge economy*. Amman: Dar Al Maysara for publishing and distribution.
- J., B. (1993). *Health and Economic Growth .Evidence. Macroeconomic Environnement and Health*. World Health Organization.
- Kacem, K. M. (n.d.). The role of knowledge economy mechanisms in enhancing the competitiveness of the Arab industry. *Arab Industrial Development Journal*, 70.
- Khalaf, F. H. (n.d.). *Development and economic planning*. Jordan: The world of modern books.
- Lester, T. (1995). *The Rivals: The opponent : the Next Economic Battle Between Japan, Europe and America, translated by Muhammad Farid*. Abu Dhabi: Emirates Center for strategic studies and research.
- Totiliane, M. (2006). *Indicators of the knowledge economy and the position of women in their development.Publications*. Lebanon: Arab Institute for training and statistical research.