



The Long-Term Effects of Human Capital on Innovation and Economic Growth in the Countries of the Mena Region

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Abstract

Purpose – Human capital is an important factor for economic innovation and development, however, the long-term impact of human capital on current economic innovation and development, especially in the Mena region, is still unclear. Therefore, the purpose of this study is to investigate the long-term effects of human capital on innovation and economic growth in the countries of the Mena region for the period 2010-2019.

Design/methodology/approach –The research data was collected from the World Bank website database. Statistical methods and dynamic panel data techniques were used to analyze the data.

Findings –The results of this study showed that human capital has a positive and significant effect on innovation and economic growth in the countries of the Mena region. Also, population density in some age groups (more literate people) has a significant effect on patent rates in MENA member countries.

Keywords Human Capital, Innovation, Economic Growth, Mena Region.

Paper type Research paper

Introduction

Innovation is one of the main drivers of economic growth. Every society needs innovation to achieve the goals of a knowledge-based economy in the path of sustainable economic growth and development. In developed countries, innovation plays a key role in infrastructure change and economic growth. In the current age, which is known as the Information age, human capital is considered as an economic advantage when it has high knowledge and intellectual power, which most economists use as one of the main factors in the difference in economic growth between developing countries and developed countries raise.

Human capital is a supplement to physical capital and makes it possible to use physical capital more appropriately. The experience of developed countries and various studies in the field of economic growth of countries over time or among countries has shown that explaining the rate of economic growth only through conventional factors such as capital and labor, does not give accurate results. A key variable must be included in the growth models.

Literature

Global markets are constantly challenging countries. Increasing complexity and change, globalization, customer needs, and fierce competition are the conditions that countries face today. Therefore, product development and innovation are critical to survival and success in these conditions, and countries are always looking for ways to escape uncertainty and reach conditions that can predict the future and make the necessary arrangements for it. Creativity and innovation continue to be critical building blocks for successful economies in successful countries.

Innovation is a meaningful change that takes place to improve routine services and processes and create new values for stakeholders and focuses on leadership to achieve new dimensions of performance. Schumpeter (1912, 1939) argued that economic growth represents a slow and progressive change of the economic system, resulting from exogenous factors of the economic system that is innovation. Innovation is formed in a social, political, and institutional context that is strongly tied to the economic characteristics of each region. Interactions between different parts of the region, including the technical, commercial, legal, social, and financial sectors, contribute to the development, protection, financing, or legislation in the field of innovation and technology (Doloreux, D., & Parto, S., 2005). Innovation is a geographically and regionally dependent process in which local competencies such as resources, institutions, public and cultural values are the main drivers. In general, different regions and countries can ensure long-term development by changing the type of innovation management (Ferrara et al. 2012).

In this regard, human capital according to time, experience, goals, and capabilities in the organization can play an important role in innovation performance. Human capital innovation has been a dominant element in economic literature since the early 1960s when economists were trying to come up with a convincing explanation for a considerable amount of unjustifiable economic growth. However, Human capital began to enter economic growth patterns as a factor of production in the late 1980s. Lack of innovation is one of the main reasons for the low level of economic growth in developing countries. economic growth will stay low, as long as these countries do not improve their innovation and training in the use of science and knowledge, as well as their professional skills, labor efficiency, and capital effectiveness.

Therefore, human capital is considered as the most important ability to gain a competitive advantage between countries and also the main intangible asset of any country and human capital can be considered as the basis for improving the quality and productivity of all economic processes g (Ellinger 2005).

On the other hand, economic growth is one of the goals that every economy pursues and the reason for this is to achieve many benefits and advantages that are achieved in the process of growth. Economic growth is a steady increase in GDP. In the meantime, education is the main axis of economic growth, because the experience of developed countries shows that explaining the rate of economic growth only through physical capital and the working population is insufficient and incorrect. In addition to these two, other factors have intensified the economic growth of these communities. These factors, known as surplus or residual value, are the main

reason for increasing the productivity of capital and human capital. The capital factor has been the first concept and factor impacting economic growth in growth patterns. Changes in the accumulation of physical capital explained changes in productivity or economic growth. As a result, the higher the distribution of physical capital in a country, the faster its economic growth should be. However, the experience of developed countries and different studies on country economic growth have demonstrated that conventional factors such as capital and labor do not accurately explain the rate of economic growth and that human capital is required. Growth models should be included as the main variable. So, the fact is that not all economic change can be explained by physical accumulation. Therefore, it is important to pay attention to the types of capital, of which human capital is one of the most important. The role of human resources in the process of economic growth from the perspective of economic theories has undergone significant changes over time. These transformations cover a range from the concept of the labor force, which is based solely on physical capabilities, to the concept of human capital, which is based on the accumulation of knowledge, skills, and experience.

Studies on the factors that generate economic growth suggest that the main factors of production (labor, capital, and land) account for less than half of the growth percentage, with the rest attributed to unknown factors such as technological advancements and increased productivity. The qualitative factor influencing the production process is human capital, which cannot be explained by the labor factor and does not seem to have a source other than the learner. Therefore, to study how this variable affects the amount and its important effects on the rate of innovation and economic growth, it is necessary to study this factor and its effects in different societies and according to their economic characteristics.

The countries of Mena, or the countries of the Middle East and North Africa, are among the major oil-producing countries. The economies of these countries are closely related to global changes in oil prices. This region is one of the oldest oil fields in the world. As a result, the oil reserves of the countries in this region have decreased more than in other regions of the world. In recent decades, many of these countries have made physical and human investments in various sectors to reduce their dependence on the oil industry, one of which is a human investment. On the other hand, most of these countries, despite their abundant oil and physical resources, have a large unemployed population. so, this study identifies the position of human capital and its role in innovation and economic growth, to make optimal use of these capabilities (oil and physical resources). It can be used to regulate the economic relations of the Mena countries and increase their economic growth. The question that arises is what are the long-term effects of human capital on innovation and economic growth in the countries of the Mena region?

Economic and financial development and innovation have become a necessity in many countries to achieve the goals of sustainable development. human capital plays a very important role in the innovation and economic growth and development of different societies. However, it is still unknown how human capital influences innovation and economic growth, as well as the short- and long-term effects of human capital on economic growth and development. Therefore, in order to better understand human capital and its economic effects, it is necessary to study this

factor and its effects in different societies, including the member countries of Mena, and according to their economic characteristics.

Research purposes

- Study the long-term effects of human capital on innovation and economic growth in the countries of the Mena region.
- Study the long-term effects of human capital on the rate of patents in the countries of the Mena region.
- Study the long-term effects of human capital on literacy in the Mena region.
- Study the long-term effects of human capital on GDP in the countries of the Mena region.

Hypotheses

- The human capital factor has a significant effect on the rate of patents in the countries of the Mena region.
- The population density in some age groups has a significant effect on the rate of patent registration in MENA member countries.
- The factor of human capital has a significant effect on GDP in the countries of the Mena region.

Definitions

Human capital: N. Bontis, N. C. Dragonetti, K. Jacobsen a G. Roos defined human capital as the human factor in the organization; the combined intelligence, skills, and expertise that gives the organization its distinctive character. The human elements of the organization are those that are capable of learning, changing, innovating, and providing the creative thrust which if properly motivated can ensure the long-run survival of the organization (1999).

Innovation: In its modern sense, it means "a new idea, a creative thought, a new form of device or method." Innovation is the application of new ideas resulting from creativity. Innovation is the implementation of a creative idea that is presented as a new product or service.

Economic growth: it is simply the increase in a country's production in a given year compared to its value in the base year. An increase in GDP or GDP in the year in question relative to its value in a base year is economic growth. The reason that base-year prices are used to calculate economic growth is that the calculated increase in GDP is due to an increase in output and the effect of rising prices (inflation) is eliminated.

Human capital, innovation, and economic growth

Human capital is one of the most important dimensions and capacities in the economic growth and development of any country, which has been confirmed in most domestic and international studies that have been done in this field. Most economists agree that what ultimately determines a country's economic and social development is its "human resources" and that the importance

and role of human capital in the process of economic growth and development is no less than physical capital (Liang, et al., 2012). The significant records of countries such as Japan, Taiwan, Hong Kong, South Korea, and other economies with rapidly growing Southeast Asia highlight the importance and role of human capital in economic growth. These countries, which often do not have many natural resources, have succeeded in experiencing rapid growth because they have trained, skilled, and hard-working people who have encouraged their growth at different stages of their development (Robinson and Roy 2015). This does not negate the importance of physical capital and machinery in modern economies; however, the efficient operation of this equipment and machinery requires labor, skilled managers, and creative entrepreneurs in the economy. Human resources and skilled and efficient workforce play a key role in achieving sustainable and balanced development of society and are identified as the core of the knowledge-based economy, which basically can create, innovate, produce, and exploit new ideas in addition to Has employment and entrepreneurial skills and previous experience.

Mena Region

Mena, referring to the Middle East and North Africa, is a term used to describe major oil-producing countries in the Middle East and North Africa region. It borders Morocco in northwestern Africa and extends to Iran, the easternmost country in the Middle East. The region has 60% of the world's oil resources and 45% of its gas resources. The economies of these countries are closely related to global changes in oil prices. This region is one of the oldest oil fields in the world. As a result, the country's oil reserves in this region have decreased more than in other parts of the world, and the wear and tear of drilling and oil extraction equipment are more evident. Islam has long been the main religion in the Mena region.

GDP per capita differs across MENA countries. Although on average, MENA is classified as a high-income region, countries are not homogenous (Alerasoul, S.M., and Samimi, A.J., 2009) countries are grouped as high, six upper-middle (Altın, O. and Kaya, A., 2009) five lower-middle (Arrow, K., 1962) and two (Azimi, N.A.,2018) low-income countries according to WB 2018 economies' classification (Beck, N. and Katz, J.N., 1995). In particular, GCC has the highest GDP per capita; namely, United Arab Emirates (UAE), Kuwait, Saudi Arabia's GDP per capita \$41K, \$35K, and \$17K. On the contrary, Palestine and Egypt have the least per capita \$2.7K, in 2016 (WDI, 2018).

About 91.2% of the population of this region is equal to 315 million Muslims. These countries are Iran, Algeria, Bahrain, Djibouti, Jordan, Saudi Arabia, Yemen, Morocco, Oman, UAE, Egypt, Iraq, Palestine., Kuwait, Lebanon, Libya, Malta, Tunisia, West Bank. Since April 2003, the International Monetary Fund has used the term Mena in its statistical analysis, which includes the same countries as before, plus Afghanistan and Pakistan. The word Mena also means the same countries as Mena along with Turkey. According to the International Monetary Fund, oil-exporting countries in the Mena region will experience an average of 0.4 percent economic growth in 2019. Among the determinants of this growth are the following: Significant decline in Iran's economic activity Declining oil production, restrictive domestic financial conditions, and monetary conditions of some economies. The reasons for the relative failure of

the MENA countries in attracting foreign direct investment despite having abundant oil and gas resources should be sought in the political, social, and economic structure of these countries, which is accompanied by relative and political instability and unexpected shocks such as the Arab Spring, the war in Syria, and Iran's economic sanctions.

Data and methodology

In this study, the following model has been used to investigate the long-term effects of human capital on innovation and economic growth:

$$\ln(\text{Patents}/C_j) = \beta_0 + \beta_1 H_j + X_j + \varepsilon_j$$

$$\ln(\text{GDP}/C_j) = \beta_0 + \beta_1 H_j + X_j + \varepsilon_j$$

(Patents/c): the number of patents per million inhabitants

(GDP/c): Per capita gross domestic product

H: the human capital indicator,

X: other explanatory variables

Table 1: The variables used in the models along with the abbreviation and the source of their collection:

Variable	obs
ABBC	170
Patents/c	7
GDP/c	153
Literacy	170
Mortality	59
Fertility	127

Table 2: Results of the study of the effect of human capital on the rate of patents in the countries of Mena region

	Possibility	F	Coefficients
Variable	.0120	5.36524	.331452
ABBC	.008	8.5201	.023654
Pop. density	.007	4.2354	.23410
Mortality	.026	2.3827	.08941
Fertility	.021	2.4849	.017029
R-squared	.602144		

The coefficient of variable human capital is statistically significant at the 95% level. This result indicates that human capital in the countries of the Mena region has increased the rate of patents in these countries during the period under review. Also, regarding the effect of population density in age groups on the rate of invention, it was found that the results are statistically significant at a 95% confidence level. This result indicates that the population density in some age groups in the countries of the Mena region has increased the rate of patents in these countries during the period under review.

Regarding the variables of mortality rate and birth rate, the results are not statistically significant at a 95% confidence level. This indicates that the rate of mortality and birth in the countries of the Mena region has increased the rate of patents in these countries during the period under review.

Conclusion

The findings of this paper show that human capital has a positive and significant effect on the rate of patents and national per capita production, and also the population density in some age groups has a significant effect on the rate of patents in MENA members countries. Patents are one of the most important performance indicators of science and technology, which can indicate the effectiveness of research and development costs. Therefore, it can be considered as an important complement to other information sources for measuring scientific and technological information of countries. Inventions in the countries of the Mena region are more important due to the dependence of their countries on the source of oil revenue and can take them out of being single products and contribute to their growth and development. So, they will need skilled and trained human capital to accomplish this. Human capital has taken on a new meaning for companies and organizations in today's competitive world, and it has had a significant impact on their lives. Human capital is a factor that affects organizational growth and survival more than any other factor. All organizations seek to attract and, more importantly, retain and develop the best people to carry out their current processes and future activities, so that they can achieve predetermined goals and strategies. If a country has efficient human capital, it can offer the final goods and services with the highest quality in the market and lead to an increase in GDP.

In a country, growing and improving human capital-related indicators including literacy, employee skills, health and life expectancy, per capita income, and other related indicators contribute to achieving economic development and efficiency goals. Therefore, the development of any country requires the importance of human capital and efforts to improve the indicators related to it.

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