

Received: December 2023 Accepted: January 2024

DOI: <https://doi.org/10.58262/ks.v12i2.142>

The Impact of the Use of Artificial Intelligence on the Economic Growth (The Case of Jordan)

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Abstract

The study aimed to identify the impact of artificial intelligence on the economic growth of the country. The study used the descriptive statistical approach and the multivariate approach to analyze the data collected using the statistical package (SPSS), on a sample of (200) employees selected randomly and distributed across various sectors of the country and selected randomly. After referring to previous studies and literature, a questionnaire tool was designed and distributed electronically to collect data from the study's participants. The results of the study showed a statistically significant effect between artificial intelligence in its dimensions (neural networks, expert systems, and fuzzy logic system) on economic growth. Based on these results, the study recommends the necessity of training employees in various private and government sectors on artificial intelligence techniques, providing them with applied and theoretical skills as well as teaching them how to use these applications. In addition, the study recommends supporting various government sectors to build a technological infrastructure capable of creating artificial intelligence applications within these sectors.

Keywords: *artificial intelligence, economic growth, expert system.*

Introduction

The global economy is witnessing business models supported by artificial intelligence as a major economic engine that doubles the volume of economic growth and increases the efficiency of the workforce by 40%, as the self-driving vehicle economy will reach \$7 trillion and the Internet will reach \$15 trillion of GDP over the next twenty years (Hamet & Tremblay, 2017). AI stimulates growth by replacing capital with labor, whether in the production of goods and services or in the production of ideas. However, AI can hinder economic growth if combined with inappropriate competition policy. Moreover, the contribution to the global macro economy can keep pace with the industrial revolutions, by boosting labor productivity, and we may need to adapt to work alongside machines in new ways (Aghion et al., 2019).

Artificial intelligence aims to use machines to simulate the cognitive abilities and functions of the human brain to replace some of the humans' mental work, which not only improves productivity, but can also improve it and generate many jobs with high cognitive intensity and thus influence the structure of work (Holzinger et al., 2019). Therefore, developed and developing countries hastened to include the strategies and applications of artificial intelligence in their economic plans because of their added value to economic growth and technological progress, as well as their benefits in reducing costs, increasing productivity, reducing risks, and

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raising competitive standards for countries of the world (Jiang et al.,2022). While there is a rapid race between humans and machines, artificial intelligence in the twenty-first century has managed to invent a constellation of technologies that have served humanity, such as smart systems in cities, robots, cars and self-driving planes. It has been addressed problems that have eluded scientists for decades (Ertel, 2018). Hence, the AI revolution has had a positive impact on economic growth, by increasing job opportunities and reducing unemployment rates. This indicates that frictions in the labor market should be the prime suspect in any positive correlation one might find between automation and employment, which in turn indicates the importance of labor market policies in determining the impact of achievement on total employment. It is therefore important for policy makers to consider proactive approaches when the implications of artificial intelligence for economic growth are revealed (Jackson, 2019).

The relationship between artificial intelligence and economic sectors has grown more complex over time. Economic sectors have started to adopt and utilize artificial intelligence techniques in a variety of industries, primarily to address economic crises and economic downturns. Numerous experiences illustrate that artificial intelligence plays a vital role in enhancing various economic sectors. For instance, in the financial sector, artificial intelligence has contributed to improving the quality of financial services, significantly reducing costs, and developing innovative business models (Bredt, 2019). Furthermore, the applications of artificial intelligence have expanded to the energy sector, where it has enhanced electricity production and increased sustainability within the energy industry. Particularly, artificial intelligence plays a crucial role in improving the healthcare sector, contributing to the development of electronic medical record management and enhancing surgical procedures and healthcare in general (Bajwa, 2021).

Accordingly, artificial intelligence is a core technology that drives the global technological revolution and industrial change and seizes new opportunities for economic development, through the enhancement of service quality, economic policy design and implementation. However, there are many challenges facing artificial intelligence that in turn affect economic growth such as the widening and growing gap between rich and poor, in addition to social conflicts due to unreasonable industrial structures (Flasiński,2016). Hence, the aim of this study is to shed light on the positive impact that artificial intelligence can have on different economic sectors, as well as the challenges and prospects of using it to enhance the economic environment and national productivity. The following sections of this study are organized as follows: section two contains the literature review, which discuss the existing body of the knowledge. Section three contains the research methodology. Section four provides analysis of the results. Section five summarizes the main findings and recommendations.

Literature Review

Artificial Intelligence

Although the term artificial intelligence (AI) has appeared in the literature as early as the mid-1950s, there is still some confusion regarding its exact definition and context. The term artificial intelligence has developed itself over the years since it was coined in 1956 by "John McCarthy and others" at Dartmouth University. This machine is called "smart" (Chang, 2020). Early efforts in the development of artificial intelligence focused on creating machines and software that could simulate the human mind, which led to the creation of expert systems in the sixties

of the twentieth century, relying on the basis of experts in various fields. It has always been limited by the high cost of development and the complexity of tools and software systems for modeling very complex processes (Gaon, 2021).

The early developments of artificial intelligence were driven by the gaming industry, and now it has evolved to be driven by complex systems required to perform our daily lives (Müller & Schaeffer, 2018). Artificial intelligence (AI) is a technology that simulates the workings of the human mind by using a set of algorithms to build computer systems that can perform tasks comparable to those performed by humans. (Bharadiya, 2023), Artificial intelligence is defined as the capability of computer systems to execute and simulate intelligent behavior similar to that of humans, through specific learning, interaction, thinking, understanding, reasoning, as well as providing essential skills for tasks and decision-making. Artificial intelligence is considered a topic of great importance for governments worldwide and the public in general. This is partly due to the ability of artificial intelligence to make significant contributions to problem-solving and improving performance in various industries and sectors (Surya, 2019).

AI is one of the top priorities on public policy agendas in most countries; Many national government initiatives focus on the use of AI applications for development and economic growth, and it is also a top priority on the agendas of international and regional organizations, such as: UNESCO, the Organization for Economic Co-operation and Development (OECD), the World Intellectual Property Organization (WIPO), the European Union, the League of Arab States, the European Union, African, and others. Artificial intelligence heralds a fundamental change in economic and social systems worldwide. It helps a person to predict the future and make better decisions (Inozemtsev et al., 2017).

The industrial revolution represents a radical change in the form of life in terms of production systems, as well as methods of governance and management. It is an opportunity to raise global income levels and improve quality of life for populations all over the world. Where technological innovation, through the use of artificial intelligence and robotics, will lead to long-term gains in efficiency and productivity by reducing transportation and communication costs, global supply chains and logistics will become more efficient, and the cost of trade will decrease, which contributes to opening new markets and driving economic growth (Gutierrez,2020).

Dimensions of Artificial Intelligence

a. Fuzzy Logic System: It is a perception-based technique when using non-fuzzy data to estimate values and simulate the perception of human factors (Al-Qusous, 2021).

b. Expert Systems: The expert system is based on the expert's knowledge of the expert's thinking and perception, or on his way of understanding things. There is a delicate balance between believers in expert system technology and traditionalists who are still skeptical about the advantages of expert systems. As we enter the knowledge era, it has become clear that knowledge organizations, knowledge management, and knowledge technology will depend on expert and knowledge-based systems, and these systems will be an integral part of making global organizations that are competitive and applicable in the international environment. Experts use expert systems in application areas such as diagnosis, visualization, teaching method, learning, playing, programming, pattern proof, and speech recognition. It's pointed out that artificial intelligence and its expert systems have reached a level of maturity, especially in recent years, and have developed to the point that knowledge based on expert systems has reached a level of performance similar to that of a human expert in specialized fields (Al-

Qusous, 2021).

c. Neural Networks: which process information in a manner similar to the human brain, Networks consist of a large number of interconnected processing elements (neurons) that work in parallel to solve a specific problem through the pattern of learning by example, as they cannot be programmed to perform a specific task. Examples of using neural networks include handwriting recognition and facial recognition (Al-Fatlawi & Al-Aasam, 2022).

Economic Growth

Accelerating the process of economic growth, which is a positive change in a country's production level of goods and services in a country, has become an essential function of economists, planners, and politicians in developed, developing and underdeveloped countries during the past five decades because the prevailing belief is that achieving economic growth is the main factor that determines living standards (Weil, 2016).

Human resources, natural resources, technology and infrastructure are the determinants and engines of economic growth for different sectors. The disparity between countries in growth rates is due to the difference in the level of growth engines in them, especially modern technology, which is the most important and fundamental engine in our current era, which contributing to important changes in economic growth rates and causing huge leaps in the economies of many countries, large and small alike (Jedidia & Guerbouj,2020). Information technology, means of communication, software, and all other forms of technology have contributed to accelerating productivity growth in most economic sectors, in varying proportions between countries, depending on the speed of their adoption of modern technology. Moreover, technology has contributed to improving the skill of the workforce, which is a double-edged factor, as the availability of a highly qualified workforce and the presence of advanced technology leads to rapid growth of the economy at high rates. It also leads to increasing and improving the quality of products as well as making them more efficient (Kravchenko, 2019).

There is no doubt that economic policies play an important and prominent role in influencing economic growth rates and are considered a fundamental determinant through taxes, public spending, and controlling the levels of fluctuation and variation in inflation rates (Mazzola et al., 2019). However, technology is currently the main driver of growth, especially since the government's role is currently limited to oversight and guidance. Technology brings us something new every day, beginning with information and communications technology, and today artificial intelligence, which allows machine to simulate the human mind, the topic that occupies the world's attention nowadays with its details, effects and repercussions.

Technological advancement, especially artificial intelligence, is a significant technological field that offers substantial opportunities for enhancement and advancement across various economic sectors; supply chain management and manufacturing, public safety and health, the agricultural sector and the financial and banking sector, ultimately leading to economic growth

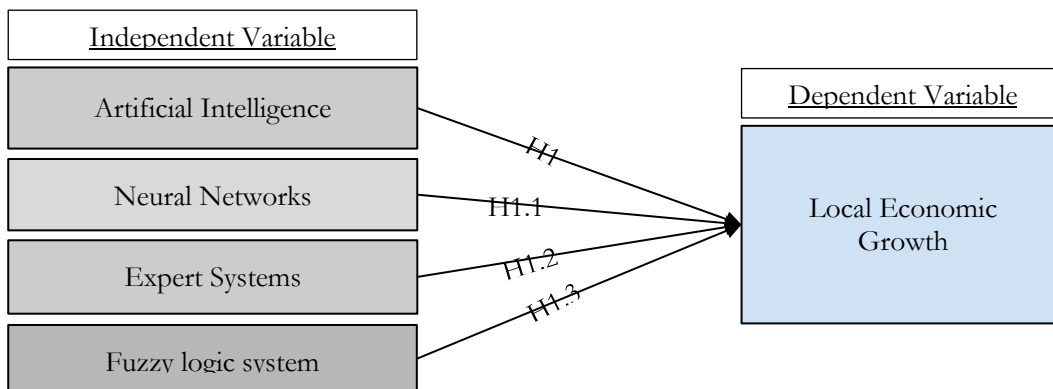
Hypothesis Development

Artificial Intelligence Towards Economic Growth

The results of a study by Makridis & Mishra (2022) showed that cities with higher growth in AI jobs experienced higher economic growth. In addition, the relationship between AI jobs growth and economic growth is driven by cities having a higher concentration of modern (or

professional) services. The growth of AI jobs also leads to an increase in the welfare state. The channel of AI job growth to increased personal well-being is explained by the positive relationship between AI jobs and economic growth. Moreover, the results of the Abdulou's study (2020) showed that introducing strategic planning based on artificial intelligence into the national economic system would build a model for expanded reproduction, without distortions between the different sectors of the economy and thus implement a model of crisis sustainability that leads to free growth. Zhao et al. (2022) showed through the results obtained that artificial intelligence has a significant U-shaped effect on total worker productivity, which was estimated using a non-linear dynamic regression model. Regional heterogeneity analysis shows that improving AI in resource-rich regions can boost economic growth. Furthermore, the results of a study by Lu (2021) showed that the development of artificial intelligence can lead to an increase in economic growth along the path of transitional dynamics. It can also benefit families in the short term if the increase in the accumulation of artificial intelligence is due to rising in productivity in the commodity sector or artificial intelligence. However, artificial intelligence could affect utility if companies use more artificial intelligence to replace human labor. Based on the above, the following hypotheses can be reached:

H1: *There is a statistically significant effect at the level ($\alpha \geq 0.05$) in the effect of using artificial intelligence on economic growth.*



Study Model: Source (Al-Fatlawi & Al-Aasam, 2022; Al-Qusous, 2021; Idrees,2021; Shaheen,2021).

Neural Networks Towards Economic Growth

The results of a study by Tawfiq & Khalawi (2021) showed that using artificial neural networks has an impact on estimating the financial deficit in Iraq through advance planning and developing appropriate solutions. The use of artificial neural networks also leads to reducing the gap in financial expectations for the coming years as well as confronting financial crises. Al-Mahdi et al., (2023) also showed that integrating artificial intelligence techniques into economic and financial sciences is one of the aspects of the knowledge economy, which is characterized by providing statistical and measurement methods that achieve more efficient and accurate results compared to traditional statistical models. The accuracy of the neural network reached (96.3%) by estimating the average percentage of error between the estimated and actual values. Based on the above, the following hypothesis can be reached:

H1.1: *There is a statistically significant effect at the level ($\alpha \geq 0.05$) in the effect of using neural networks on economic growth.*

Expert Systems Towards Economic Growth

The results of a study by Al-Shenhabi (2023) showed that expert systems are a powerful tool for improving the quality of electronic services and providing a better and more satisfied user experience. Although it requires great efforts in development and improvement, it is worth investing in due to its many benefits to economic growth. The results of a study by Ana (2020) also showed that artificial intelligence expert systems have a significant and effective role in economic growth by identifying the development of an expert program in an attempt to enhance practical learning using e-learning during the outbreak of the Covid-19 pandemic. Based on the above, the following hypothesis can be reached:

H1.2: *There is a statistically significant effect at the level ($\alpha \geq 0.05$) in the effect of using expert systems on economic growth.*

Fuzzy Logic System Towards Economic Growth

The results of a study by Jafari et al., (2020), showed that the effective use of artificial intelligence methods, namely artificial neural network, fuzzy logic, and neuro-fuzzy in various applications such as business, marketing, control generation, health care, and social services, has a positive impact on a country's economic growth. The study of Zhang et al., (2020) also showed the positive impact of optimal design of the built environment using a hybrid genetic algorithm, an artificial neural network, multivariate regression analysis, and a fuzzy logic controller for artificial intelligence, and its impact on economic growth. Based on the above, the following hypothesis can be reached:

H1.3: *There is a statistically significant effect at the level ($\alpha \geq 0.05$) in the effect of using fuzzy logic system on economic growth.*

Study Methodology

This study relied on the descriptive statistical approach and the multivariate approach. Its sample consisted of (200) employees selected randomly and distributed across various sectors of the state and selected randomly. After referring to previous studies and literature, the questionnaire tool was designed and distributed electronically to collect data from the study's participants included in the sample. The data collected was analyzed using the statistical package (SPSS), version 26. The data was also analyzed descriptively for all the study variables. The study consisted of the independent variable (artificial intelligence) with its dimensions (neural networks, expert systems, fuzzy logic system) and its impact on the dependent variable (economic growth), and was tested through several statistical measures. The study used descriptive factors such as the reliability (Cronbach's Alpha), frequencies and percentages of basic data for the study sample, means and standard deviation for study domains and items, the matrix correlation, the (Multiple Regressions) analysis and the (Linear Regressions) analysis.

Descriptive Analysis of the Study Variables

This part of the chapter reviews the most important descriptive statistics of the study variables, such as the arithmetic mean and standard deviations. Table number (1) displays means and standard deviation for "neural networks" item and total means of them.

Table (1): Means and Standard Deviation for Each Items of "Neural Networks" and Total Means of Them (N= 200).

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Neural networks reflect the behavior of the human mind related to the field of education.	3.77	1.13	4	High
2	Neural networks are keen to learn from previous experiences.	3.34	1.23	5	Medium
3	Neural networks simulate the intelligent behavior of the decision maker.	3.97	1.10	2	High
4	Neural networks contribute to achieving expertise and knowledge through training, education and practice.	3.95	1.08	3	High
5	Neural networks classify data according to the importance of the variable required for decision making.	3.99	1.03	1	High
Total Means		3.80	0.88	-	High

Table (1) shows that the highest means reached (3.99) out of (5) for item (5) "Neural networks classify data according to the importance of the variable required for decision making" by high agreement degree, then for item (3) "neural networks simulate the intelligent behavior of the decision maker" (means 3.97) by high agreement degree, and the lowest means was (3.34) for item (2) "Neural networks are keen to learn from previous experiences" by medium agreement degree. The total means for "neural networks" reached (3.80) by high agreement degree.

Table (2): Means and Standard Deviation for Each Items of "Expert Systems" and Total Means of Them (N= 200)

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Expert systems mimic the performance of a human expert.	3.83	0.77	2	Medium
2	Expert systems are of high performance compared to traditional applications.	3.62	0.78	5	Medium
3	Expert systems have more ability to solve problems than a human expert.	3.71	0.75	4	High
4	Expert systems increase the ability to make decisions under conditions of uncertainty.	3.85	0.81	1	High
5	Expert systems are easy to use, whether for the average user or the specialist.	3.76	0.81	3	High
Total Means		3.75	0.60	-	High

Table (2) shows that the highest means reached (3.85) out of (5) for item (4) "Expert systems increase the ability to make decisions under conditions of uncertainty" by high agreement degree, then for item (1) " Expert systems mimic the performance of a human expert " (means 3.83) by high agreement degree, and the lowest means was (3.62) for item (2) " Expert systems are of high performance compared to traditional applications " by medium agreement degree. The total means for "Expert Systems" reached (3.75) by high agreement degree.

Table (3): Means and Standard Deviation for Each Items of "Fuzzy Logic System " and Total Means of Them (N= 200).

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	The fuzzy logic system focused on the method of perception to estimate the different value associated with the decision.	3.90	0.80	2	High
2	The fuzzy logic system increases the possibility of dealing with imprecise information regarding the alternatives available for a decision.	3.92	0.90	1	High
3	Fuzzy logic enables the system to deal with uncertain conditions in solving problems through logical reasoning.	3.68	0.97	4	High
4	It uses aspects of logic to suggest cases regarding non-ideal reality.	3.69	0.91	3	High
5	It provides the ability to handle the most complex conditions, which has the most logical part.	3.63	0.95	5	Medium
Total Means		3.76	0.71	-	Medium

Table (3) shows that the highest means reached (3.92) out of (5) for item (2) " The fuzzy logic system increases the possibility of dealing with imprecise information regarding the alternatives available for a decision " by high agreement degree, then for item (1) " The fuzzy logic system focused on the method of perception to estimate the different value associated with the decision " (means 3.90) by high agreement degree, and the lowest means was (3.63) for item (5) ". It provides the ability to handle the most complex conditions, which has the most logical part " by medium agreement degree. The total means for "fuzzy logic system" reached (3.76) by high agreement degree.

Table (4): Means and Standard Deviation for Each Items of "Economic Growth " and Total Means of Them (N= 200).

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Artificial intelligence methods and systems are applied to the state's institutions to raise economic growth rates through legislation and regulations that regulate the work of financial institutions.	3.58	0.88	9	Medium
2	Training the employees of administrative institutions in the state's government apparatus, developing their skills in various modern application systems of communications and information systems technology and raising their levels.	3.68	0.86	8	High
3	Strengthening the role of artificial intelligence in the state's economic institutions, in the field of economics and markets.	3.77	0.87	4	High
4	Strengthening the role of artificial intelligence in the state's economic institutions, in the field of energy, especially for the industrial sectors.	3.82	0.92	3	High
5	Enhancing the role of artificial intelligence in the state's economic institutions, in the financial services sector, by spreading awareness among decision-makers and investors.	3.55	0.96	10	Medium
6	Enhancing the role of artificial intelligence in the state's economic institutions, in the agricultural sector, by producing intelligent mechanisms for processing, consumption, and storage, and providing timely data.	3.72	1.21	6	High
7	Strengthening the role of artificial intelligence in the state's economic institutions and in the education sector by developing curricula to adapt to the modern technological changes.	3.74	1.23	5	High
8	Strengthening the role of artificial intelligence in the state's economic institutions, in the health sector, by improving the medical and biological devices.	3.90	0.90	2	High
9	Enhancing the role of artificial intelligence in the state's economic institutions, in the communications sector through the improvement in bandwidth, storage, languages and information systems.	3.91	1.14	1	High
10	Authentication with regional countries to exchange information and artificial intelligence systems.	3.71	1.09	7	High
Total Means		3.73	0.69	-	High

Table (4) shows that the highest means reached (3.91) out of (5) for item (9) " Enhancing the role of artificial intelligence in the state's economic institutions, in the communications sector through improvement in the bandwidth, storage, languages and information systems " by high agreement degree, then for item (8) " Strengthening the role of artificial intelligence in the state's economic institutions, in the health sector, by improving the medical and biological devices " (means 3.90) by high agreement degree, and the lowest means was (3.55) for item (5) " Enhancing the role of artificial intelligence in the state's economic institutions, in the financial

services sector, by spreading awareness among decision-makers and investors " by medium agreement degree. The total means for "economic growth " reached (3.73) by high agreement degree.

Results of the Study Model Analysis

The impact of artificial intelligence in its dimensions (neural networks, expert systems, and fuzzy logic system) on the economic growth of all sectors of the country.

H1: *There is a statistically significant effect at the level ($\alpha \leq 0.05$) in the effect of using artificial intelligence on economic growth.*

In order to test this hypothesis, and detect the effect of using artificial intelligence on economic growth, the (Multiple Regression) analysis was used as table (5) shows.

Table (5): Results of the (Multiple Regression) Analysis of the Effect of Using Artificial Intelligence on Local Economic Growth (N= 200).

Independent variable	"t" value	"t" sig	Beta	R	R ²	"F" value	"F" sig
Neural Networks	2.254	0.025	0.093				
Expert Systems	9.622	0.000	0.593	0.819	0.671	133.45	0.00
Fuzzy logic system	4.160	0.000	0.255				

* Dependent Variable: Economic Growth.

Table (5) shows that there is a statistically significant effect at significant level ($\alpha \leq 0.05$) of using artificial intelligence on economic growth, where "F" value reached (133.45) by statistically significant (0.00). (R) value reached (0.819) and (R²) value reached (0.671); Thus (H1) was accepted

H1.1: *There is a statistically significant effect at the level ($\alpha \leq 0.05$) in the effect of using neural networks on local economic growth.*

In order to test this hypothesis, and detect the effect of using neural networks on economic growth, the (Linear Regression) analysis was used, as table (6) shows.

Table (6): Results of the (Linear Regression) Analysis in the Effect of Using Neural Networks on Economic Growth (N= 200).

Independent variable	"t" value	"t" sig	B	R	R ²	"F" value	"F" sig
Neural Networks	3.044	0.003	0.167	0.211	0.045	9.268	0.003

* Dependent Variable: Economic Growth.

Table (6) shows that a statistically significant effect at significant level ($\alpha \leq 0.05$) of using neural networks on economic growth, where "t" value reached (3.044) by statistically significant (0.003). (R) value reached (0.211) and (R²) value reached (0.045). Accordingly, (H1.1) was accepted.

H1.2: *There is a statistically significant effect at the level ($\alpha \leq 0.05$) in the effect of using expert systems on economic growth.*

To test this hypothesis, and to detect the effect of using expert systems on economic growth, the (Linear Regression) analysis was used, as table (7) shows.

Table (7): Results of the (Linear Regression) Analysis in the Effect of Using Expert Systems on Economic Growth (N= 200).

Independent variable	"t" value	"t" sig	B	R	R ²	"F" value	"F" sig
Expert Systems	342.83	0.00	0.918	0.796	0.634	18.516	0.00

* Dependent Variable: Economic Growth.

Table (7) shows that there is a statistically significant effect at significant level ($\alpha \leq 0.05$) of using expert systems on economic growth, where "t" value reached (18.516) by statistically significant (0.00). (R) value reached (0.796) and (R²) value reached (0.634). Thus (H1.2) was accepted.

H1.3: There is a statistically significant effect at the level ($\alpha \leq 0.05$) in the effect of using fuzzy logic system on economic growth.

To test this hypothesis, and to detect the effect of using fuzzy logic system on economic growth, the (Linear Regression) analysis was used, as table (8) shows.

Table (8): Results of the (Linear Regression) Analysis in the Effect of Using Fuzzy Logic System on Economic Growth (N= 200).

Independent variable	"t" value	"t" sig	B	R	R ²	"F" value	"F" sig
Fuzzy logic system	14.018	0.00	0.685	0.706	0.498	196.5	0.00

* Dependent Variable: Economic Growth

Table (8) shows that there is a statistically significant effect at significant level ($\alpha \leq 0.05$) of using fuzzy logic system on economic growth, where "t" value reached (14.018) by statistically significant (0.00). (R) value reached (0.706) and (R²) value reached (0.498). Therefore (H1.3) was accepted.

Conclusions, Limitations and Recommendations

Conclusions

Based on the results of the previous analysis, the following can be concluded:

1. The first hypothesis (H1) is accepted, which means that there is a significant effect of artificial intelligence on economic growth, where "F" value reached (133.45) by statistically significant (0.00). (R) value reached (0.819) and (R²) value reached (0.671).
2. The first sub-hypothesis (H1.1) is accepted, which means that there is a significant effect of neural networks on economic growth, where "t" value reached (3.044) by statistically significant (0.003). (R) value reached (0.211) and (R²) value reached (0.045).
3. The second sub-hypothesis (H1.2) is accepted, which means that there is a significant effect of expert systems on economic growth, where "t" value reached (18.516) by statistically significant (0.00), (R) value reached (0.796) and (R²) value reached (0.634).
4. The third sub-hypothesis (H1.3) is accepted, which means that there is a significant effect of fuzzy logic system on economic growth, where "t" value reached (14.018) by statistically significant (0.00), (R) value reached (0.706) and (R²) value reached (0.498).

Limitations

The study of the impact of using artificial intelligence on economic growth in Jordan has certain limitations, the main one is the lack of data or studies on artificial intelligence topic, it is a new topic raised at the level of scientific research, so a questionnaire was adopted to collect data. Data collected through the questionnaires may be affected by the extent of the respondents' understanding and interpretation, thus it's possible that the results be biased and inaccurate.

Recommendations

Through the results the statistical analysis, this study reached a set of recommendations, which are as follows:

1. There is a need for various government sectors to adopt artificial intelligence technologies and use them in the accounting and financial decision-making processes.
2. Employees in various government sectors should be trained on artificial intelligence techniques, and provided them with applied and theoretical skills and knowledge on how to use these applications.
3. The necessity of supporting the various government sectors to build a technological infrastructure capable of creating artificial intelligence applications within these sectors.
4. It is essential to appoint and employ engineers and technical staff who are skilled and competent in dealing with artificial intelligence applications in order to confront any technical problems that may arise during the application of these technologies.

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