The Impact of Artificial Intelligence on Unemployment in Egypt

Marwa Mohamed Ibrahim Mansour

Assistant professor of Business Administration

Department of Business Administration, Faculty of Commerce and Business

Administration , Helwan University, Egypt

May Ibrahim Hassan Mohamed

Assistant professor of Economics and Foreign trade

Department of Economics and Foreign Trade, Faculty of Commerce and Business

Administration , Helwan University, Egypt

Abstract:

The rapid evolution and widespread adoption of Artificial intelligence (AI) technologies are transforming the nature of work, presenting both opportunities and challenges in achieving the Sustainable Development Goal of productive and decent employment for all (SDG 8). While AI powered automation and augmentation can enhance efficiency, productivity, and decision making, driving innovation and economic growth, the unprecedented pace of change also raises concerns about job displacement, workforce disruption, and widening socio-economic divides. Navigating this complex landscape requires a multifaceted approach that balances the transformative potential of AI with proactive investment in education, training, and the development of

ethical frameworks, as well as collaborative efforts between stakeholders, to harness the power of AI for positive societal transformation and a future of work that is both technologically advanced and socially responsible. The impact of AI on unemployment is multifaceted and debated. While AI has the potential to automate certain jobs, leading to displacement, it can also create new job opportunities and increase overall productivity. AI can replace repetitive tasks, transform existing jobs, and require new skill sets. The net impact on unemployment depends on the rate of AI implementation, workforce adaptability, and the creation of new jobs. So, the main objective of the study is to analyze the impact of AI technology on the labor market in Egypt and to determine to what extent AI affects unemployment in Egypt. The study used a regression model to test the relation between AI and unemployment in Egypt during the period of 2000 to 2022. The study concluded that There is a positive relationship between the artificial intelligence and unemployment. where the results showed that a 1% increase artificial intelligence will lead to around a 0.001 increase in unemployment. As the implementation of AI can lead to job displacement as automation replaces certain human tasks.

Keywords:

Artificial Intelligence, Unemployment, Automation and Job displacement.

__Introduction:__

Diversification, technological upgrading, and innovation are key drivers in achieving the Sustainable Development Goal of productive and employment for all (SDG 8) (Shen, Y., Zhang, X. (2024). The Fourth Industrial Revolution, which is characterized by the integration of cyber physical systems, automation, data driven decision making, and increased connectivity, is being driven by the pivotal role of Artificial Intelligence (AI). AI powered technologies are transforming work relationships by enabling intelligent automation, fostering humanAI collaboration, personalizing work experiences, and supporting data driven workforce management. This convergence of digital, physical, and biological technologies is ushering in a new era where organizations leverage the synergies between human and machine capabilities to drive innovation and sustained economic growth. (Rickardo, G., & Meiriele, S. 2023).

The rapid evolution and widespread adoption of AI technologies have instigated profound changes in work, presenting both opportunities and challenges. While AI powered automation and augmentation can enhance efficiency, productivity, and decision-making, the unprecedented pace of technological change raises valid concerns about job displacement, workforce disruption, and the potential widening of socio-economic divides. Navigating this complex landscape requires a multifaceted approach that balances

the transformative potential of AI with the need to protect and empower the workforce through proactive investment in education, training, and the development of ethical frameworks and collaborative efforts between stakeholders. By addressing these challenges, we can harness the power of AI to drive positive societal transformation and foster a future of work that is both technologically advanced and socially responsible. (Kumar, S. 2024)

The relationship between unemployment and artificial intelligence (AI) is complex and debated. While AI has the potential to automate certain jobs, leading to job displacement, it can also create new job opportunities and increase productivity. AI can replace repetitive tasks, transform existing jobs, and require specific skill sets. The overall impact on unemployment depends on the rate of AI implementation, workforce adaptability, and the creation of new jobs. Proactive measures such as education, training, and supportive policies can help mitigate negative impacts and maximize the benefits of AI. So, the main objective of this research analyzes the impact of artificial intelligence technology on the labor market and to what extent artificial intelligence affects unemployment in Egypt.

The beginning of reliance on artificial intelligence (AI) is the continuous of a long process of automation. Technological progress related to (AI) has led to major transformations in data processing systems carried out by humans (Korinek, A. &

Stiglitz, E. 2018). (AI) is a general term that currently refers to a cluster of technologies and approaches to computing focused on the ability of computers to make flexible rational decisions in response to often unpredictable environment conditions (Tredinnick, L.2017).

Zuniga, H.and et al (2023) provided a broad scientific definition of AI as the tangible real-world capability of non-human machines or artificial entities to perform task, solve, communicate, interact and act logically as it occurs with biological humans. when it is prevalent across many industries, automating tasks that don't require human intervention saves money and time, and can reduce the risk of human error. While Lee, C. & Yan, J. (2024) defined (AI) as a multidisciplinary discipline that utilizes advanced algorithms and data-driven methodologies to create intelligent machines, specifically intelligent computer programs.

Many researchers like Guliyev, H. and et al (2023) pointed out that (AI) and big data technologies can be effectively utilized in administrative and economic processes to reduce unemployment by increasing human capabilities, enhancing productivity, creating new roles, and reassigning tasks, with the necessity of retraining the workforce and developing skills to adapt to the evolving job landscape to reduce the negative effects of (AI) and to achieve balance between harnessing the benefits of (AI) for productivity and economic growth and addressing the potential displacement of jobs.

Gezgin, U. (2023) adds that (AI) and automation will help open up more space for higher cognitive tasks, but taking into account the moral and social dimensions of (AI). Furthermore, Al Hosani, K. & Al Hashmi, S. (2024) presented some of the benefits and challenges that accrue from implementing (AI) in the public sector. The benefits include unlocking potentials and mitigating risks and enhancing administrative efficiency through (AI) governance. On the other hand, the challenges include: the need for capacity building, attracting top talent that creates hurdles for sectors with limited recruiting budgets and the focus on safe guarding privacy rights.

2- Literature review:

The concept of artificial intelligence was originated by the scientist Alan Turning in 1950.The importance of this concept has increased because of the impact of its capabilities on many different sectors. Hence, many countries raced to use its technologies in many industries and the service sector. Researchers view (AI) as a double-edged sword, some may view it positively as an engine of productivity and economic growth, while others view it negatively as it widens the gap between advanced and developing countries and leads to uneven distribution of income, as well as may entail many risks.

According to technological unemployment theory (Keynes, 1930), The theory suggests that technological advancements,

particularly automation and machinery, could lead to job displacement and unemployment as they replace human labor. As technology becomes more capable of performing tasks previously done by humans, there is a concern that jobs in various industries may be eliminated or significantly reduced. This theory highlights the potential impact of automation on the workforce and raises questions about the need for retraining and creating new job opportunities in the face of technological progress. (Rawashdeh, R.2023)

Human capital theory (Psacharopoulos, 1994) emphasizes the importance of intentional investments in education and vocational training to mitigate the negative consequences of job displacements caused by automation. By providing individuals with the necessary skills and knowledge to adapt to evolving job markets, education and vocational training can help workers transition into new roles and industries. This proactive approach aims to equip individuals with the tools they need to remain employable and resilient in the face of automation-driven changes in the labor market. (Nychkalo, N. 2018).

There is a current debate among researchers regarding the nature of the relationship between (AI) and unemployment. Some researchers mention that there is a positive relationship between (AI) and unemployment, including Stiglitz's study (2014), which indicated that (AI) will lead to a decline in employment and a

widespread unemployment rate because of replacement decisions made by capital owners and human resource management. There is another study that found the impact of (AI) on both the labor market wages, and employment constitutes a major threat that (AI) reduces the demand for middle skilled labor, while simultaneously raising the demand for high skilled and low skilled workers, leading to economic inequality in the future (Khurana, R.2016).

Barrick, G. (2017) points out there are some fears of the impact of (AI), as it leads to the emergence of some new industries and job and the extinction of some other jobs. Therefore, the workforce must know the technical skills necessary in the new labor market, enjoy flexibility and adapt to modern changes and developments. In addition to the continuous ability to learn.

Nguyen, Q. & Vo, D. (2022) examined the possible effect of (AI) on unemployment under various inflation levels using a broad database of (AI) related patients in 40 developed and developing markets from 2000-2019. The study depended on a panel smooth transition regression (PSTR) model to analyze the relationship between (AI) and unemployment. The result found that (AI) increases unemployment until a certain inflation threshold is attained, and then the effect reduces afterwards.

Furthermore, study by Abu Rayhan & Rayhan.S. (2023) conducted surveys and interviews with employees, employers, and industry experts across diverse sectors to identify the socioeconomic impact of (AI) on employment. The surveys explored the (AI) has a great impact on job satisfaction, job displacement and the emergence of new opportunities, and the potential for unskilling and reskilling. The study proved also that implementing (AI) requires reconsidering the organizational culture, and traditional structure in the workplace to simplify operations and achieving flexibility in decision-making and creating flat hierarchy which enables organizations to adapt to surrounding changes and adopt a culture of continuous improvement.

While some others found that there is a negative relationship between artificial intelligence and unemployment, including study of Collins, J. and et al (2014) which believe that implementing (AI) contributes to raise the productivity of companies, developing their human capital, creating new job opportunities, increasing growth rates, and changing economic and social conditions.

Acemoglu, D. & Restrepo, P. (2018) pointed out that implementing (AI) leads to efficient production, stimulates demand on workers in the field of information technology and starts the chain of innovations which means restructuring the labor market and shifting from work that depends on labor-intensive and time-wasting to machines equipped with (AI) that contribute to the growth of innovative labor.

Many researchers like Ernst, E. and et al (2019) also found that there is a positive relationship between (AI) and achieving inclusive growth, as new digital technologies based on (AI) allow for improving productivity in the labor market and access to professions with better salaries but considering setting specific policies that support the necessary shift in professional demand and maintain a competitive environment to ensure the spread of innovation. As Stevenson, B. (2019) emphasized on (AI) has a positive impact on economic growth by improving productivity and raising the level of income in the future. This positive effect is valid if the benefits generated by (AI) can compensate the workers negatively impacted by their lost wages.

Furthermore (AI) has the potential to reshape skill demands, career opportunities and the distribution of workers among industries and occupations in all the world countries. (AI) is designed to perform a specific workplace skill that influence on career mobility, occupational skill requirements, and society wellbeing with impacts to workers' social identity (Moro, E. 2019).

Lasheen, R. (2023) pointed out in one of the theoretical studies that (AI) had a significant impact on improving the efficiency of the production process and improving the quality of capital, the labor market, raw materials, transportation, and the energy sector in Egypt.

Mutascu, M. (2023) found in her study in the most high-tech and developed countries, using a theoretical and empirical model that (AI) has a nonlinear impact on unemployment. (AI) facilitates the reduction of unemployment but only at low inflation rates without a "switch effect" between "the displacement effect" and "the replacement effect". In addition, these developed countries need to develop policies that support the use of (AI) in their administrative and economic process to reduce unemployment and control wages through economic growth and new jobs, but on the condition that inflation decreases.

Finally, some other researchers have sparked controversy about the relationship between AI and unemployment, as Autor, D. (2015) has offered contrasting perspectives on the longterm implication of (AI) on employment and wage inequality, while some argue that (AI) will lead to job polarization, others contend that technological progress will ultimately create new, more specialized job roles. The examination of workforce dynamics confirmed the necessity for ethical considerations and proactive policy measures to ensure a responsible integration of (AI).

Arntz, M. and et al (2017) provided comprehensive insights into the extent of job vulnerability based on the task performed within occupations. They emphasized that despite the automation of some routine, repetitive tasks, (AI) might also create new opportunities by augmenting human capabilities.

Although (AI) makes human work more efficient, it may have harmful effects in the field of employment, as it leads to widespread technological unemployment that is considered one of the most problematic societal implications of technological progress new technology often implies that old jobs are destroyed, and workers need to find new jobs. The emergence of technological unemployment is due to two main reasons: first, because wages don't adjust for some structural reason, and second as a transition phenomenon (Korinek.A. & Stiglitz, E. 2018)

In addition to, (AI) has created a huge deal of controversy surrounding the increased efficiency of the labor force and unemployment generated. Although it plays a role in unemployment, it has created new jobs. It resulted in the shifting of the job paradigm which created a rift between developing and developed countries (Maity, S. 2022).

The number of AI patent applications has continuously increased world wide in the last decade as shown in the figure 1:

Figure 1: Number of artificial intelligence patent applicationsworldwide (2013-2022)
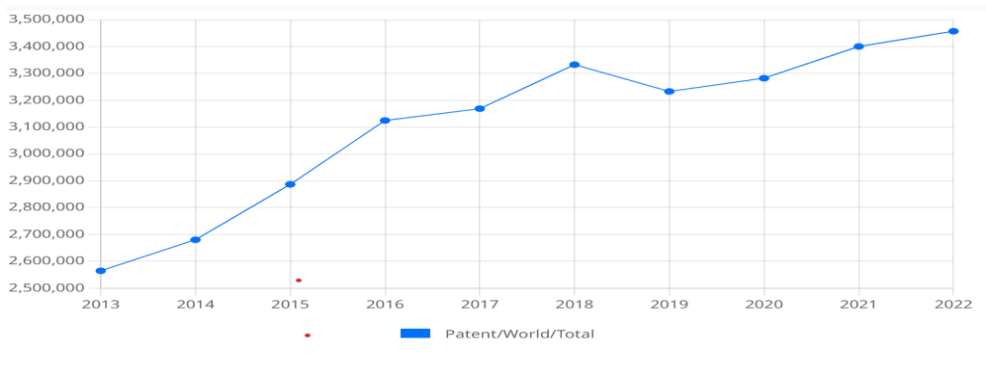
**Source: WIPO statistics database. Last updated: December 2023**

Egypt's Case Study:

The report from the Ministry of Communications and Information Technology indicates that the communications and IT sector in the country experienced robust growth of over 16% in 2020/2021, exceeding the prior year's rate of 15.2%. The ministry is working to complete a major digital transformation initiative by 2022/2023, with the goal of automating 550 government services and making them available through the "Digital Egypt" platform by the end of 2023. This push for digitalization and service automation aligns with the broader objective of achieving sustainable development through the leveraging of modern communications and information

technologies, even in the face of the challenges posed by the COVID-19 pandemic.(MCI, 2023)

Unemployment has been one of the most significant challenges facing the Egyptian state, reflecting an imbalance in the labor market and the broader national economy. However, the International Monetary Fund has praised Egypt's recent decline in unemployment rates, attributing this progress to the continued implementation of strong economic reforms and policies, even amid the negative impacts of the COVID-19 pandemic. Notably, the IMF highlighted Egypt as one of the countries with the highest potential for further improvement in this unemployment indicator, suggesting the government's reform efforts have been effective in addressing this longstanding issue as shown in the figure below.

Figure 2: GDP Growth (annual %)
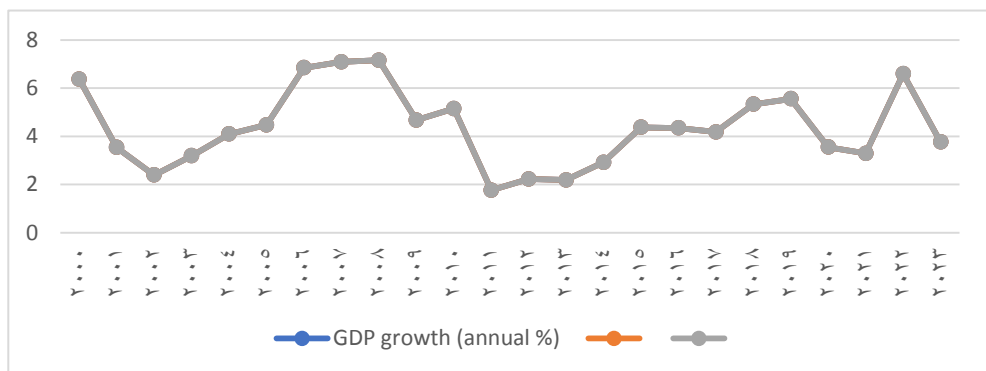
Source: Made by the researcher , Data from the World Bank

From the figure above, it is shown that there is a fluctuation in GDP annual growth as During the period from 2000-2010, Egypt experienced gradual improvement in GDP growth, averaging around 5% annually. However, at the start of the 2010s, there was a sharp decline in the GDP growth rate, down to approximately 1.8% in 2011. This was due to the events of the January 2011 revolution and the subsequent political, security, and economic instability that lasted for nearly 3 years. After 2014, the GDP growth rate started rising again, especially following the implementation of a monetary reform program with IMF support at the end of 2016.(Hegazy,M. and et al ,2024)

During the period 2011-2023 period prevented a significant rebound in the GDP growth rate, as this growth due to growth in telecommunication, Suez canal and manufacturing sector which grew 16.3%, 9.8% and 8.5% in 2022.(Ministry of planning and development,2022)

Figure 3: Unemployment rate in Egypt
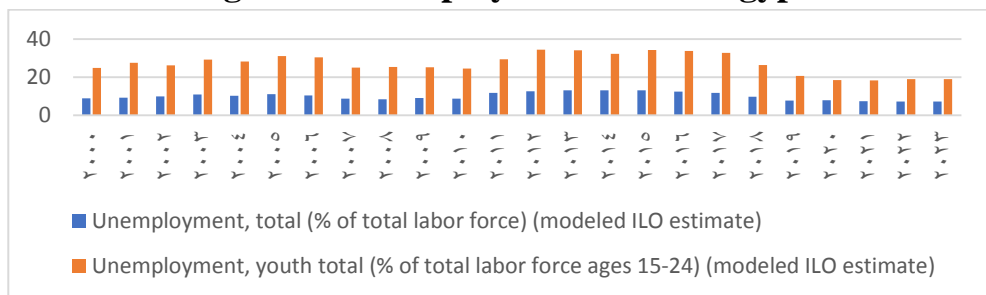
Source: Made by the researcher , Data from the World Bank

From the figure above, Unemployment rates increased from 10.2% in 2002 to around 11.2% in 2005.They then gradually decreased to 8.7% in 2008 before rising again to 9% in 2010.This due to the government's economic reforms and transition to a market economy, which reduced investments and job opportunities. Unemployment rates continued to rise due to political and economic instability, declining investment, and slower economic growth during 2011 and 2013 revolutions as Unemployment peaked at 13.2% in 2013. However, with improved economic conditions and the government's monetary reform program with the IMF, unemployment gradually declined from 12.5% in 2016 to about 7.6% in 2023.

Consequently, it becomes evident that unemployment rates increased during years of slowed economic growth, and vice versa, indicating an inverse relationship between local GDP growth rates and unemployment rates in Egypt. This confirms the potential existence of Okun's Law in the Egyptian economy.(Hegazy,M. and et al ,2024)

Youth unemployment have reached in 2021, 19.7% among youth aged 20-24 which may be due to the challenges of entering the labour market. As many poor people accept any jobs in order to meet their basic needs so they are working under insecure conditions. Also it was clear that youth who have completed their education are more likely to be unemployed.

This due to that they are not satisfied with the available job opportunities and they don't have the return they expected. And that there is a mismatching between the skills provided by the educational system and the skills that are demanded by the various sectors, (Uncief ,2023) this shown in the figure below:

Figure 4: Unemployment with basic Education.
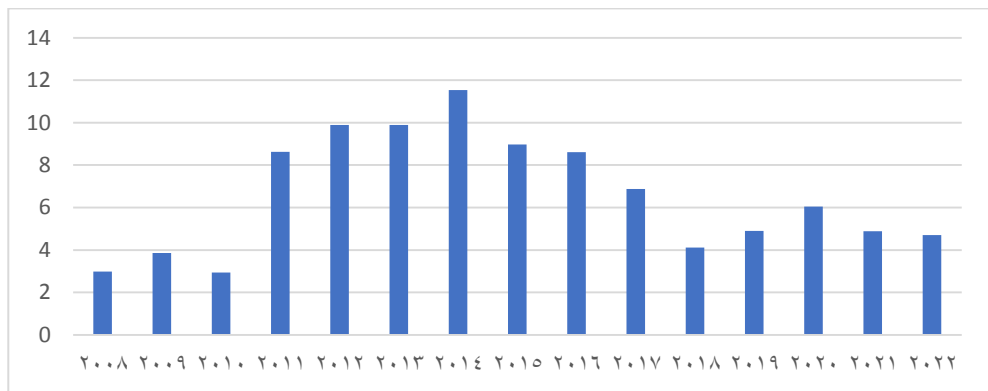
Source: Made by the researcher , Data from the World Bank

Egypt's key economic sectors are being impacted by the Fourth Industrial Revolution (4IR) to varying degrees the transportation and logistics industries have more readily embraced new technologies, while the agriculture and manufacturing sectors have yet to fully harness the potential of tech-based solutions. Across all industries, there is a growing demand for "digitally literate" jobs that involve the use of information and communication technologies, indicative of the broader shift towards a more tech-centric economy in Egypt. (ILO,2021)

(AI) initiative was launched in 2019 in support of Egypt's vision 2030 with the aim of development, structural reform and achieving sustainable development, as well as confronting many of the social, economic and development challenges that Egypt may face in the coming years (National Council for Artificial Intelligence 2019).
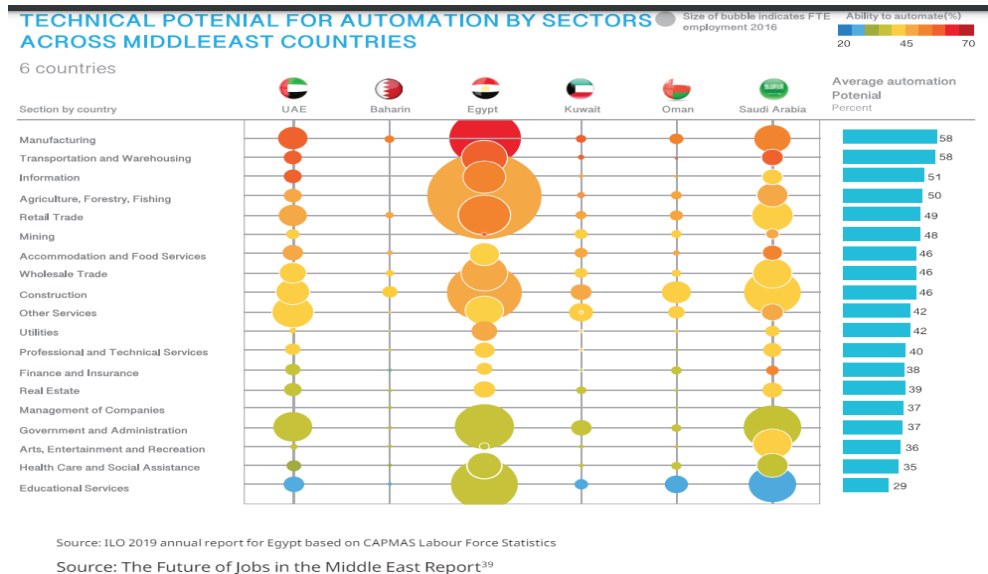
(AI) is poised to revolutionize various industries in Egypt, bringing both challenges and opportunities to the job market. Automation is transforming manufacturing and logistics, reducing demand for manual labor, while the rise of AI powered chatbots is changing customer service roles. However, new opportunities are emerging in data analysis, machine learning, healthcare diagnostics, telemedicine, and cybersecurity as businesses seek to leverage AI to drive efficiency and innovation. As AI continues to advance, the Egyptian workforce will need to adapt by developing skills in managing and improving AI systems, deriving insights from data, and deploying AI powered solutions to meet the evolving needs of the economy.(Ibrahim, S.2023).

Egypt ranked eighth in Africa in applying artificial intelligence in 2019, and by 2022, Egypt advanced to occupy second place after Mauritius (Governmental readiness INDEX of AI 2022)

The impact of AI applications on the Egyptian labor market has been a mixed bag. While AI has created new job

opportunities in sectors like IT, finance, and healthcare, it has also led to job losses in more traditional industries such as manufacturing, agriculture, and transportation. The net effect on unemployment rates depends on the pace and breadth of AI adoption across the Egyptian economy, as well as the types of jobs being affected with manual, routine tasks more vulnerable to automation. Navigating this transition will require careful policy planning, educational reform, and proactive workforce development initiatives to harness the benefits of AI while mitigating potential disruptions to workers and the economy.(Ibrahim, S.2023).

Figure 5: Automation by sectors across countries

Source: ILO 2019 annual report for Egypt based on CAPMAS Labour Force Statistics

Source: The Future of Jobs in the Middle East Report[39]

According to a 2018 report of the World Government Summit and McKinsey & Company, a study was conducted on the automation potential across 6 Middle Eastern countries. In Egypt, it has been found that there is particularly high potential for workforce automation, with 11.9 million out of 20.8 million technically automatable jobs across 6 Middle Eastern countries assessed in the study   a consequence of the country's large workforce in sectors like manufacturing and agriculture that are prone to automation, especially for employees with lower levels of education and experience who make up most of the workforce. So, Egypt faces a significant risk of workforce automation, particularly in industries dominated by routine, manual tasks, and

among its lower-skilled employees. This underscores the need for proactive policies and initiatives to help prepare the Egyptian workforce for the technological changes driven by the Fourth Industrial Revolution.

Data and Methodology:

The research used quantitative methodology in the analysis, where the quantitative data are extracted from the world development indicators of the world bank and some macroeconomic indicators such as Unemployment, GDP, Inflation(cpi), patent that reflect the artificial intelligence, school enrollment and government spending, Moreover, the research estimates the impact of artificial intelligence on unemployment using the statistical program (Eviews13).

The research used a statistical model based on time series data, and this is value added to the analysis where most of the economic research depends on the questionnaire and analytical analysis.

A. The research samples:

The sample used for this research will be applied on Egypt during the period of 2000 to 2022. the data availability for the variables within this research by the World Bank reports issued in 2023.

B. Variables of this study:

The researchers identified the variables studied, analyzed their results, and confirmed the impact of the independent variable on the dependent variable, where the independent variable primary variable was the unemployment rate. The study included other control variables such as artificial intelligence which represented by the total of Patents applications (resident and non-resident), Economic growth was measured by GDP growth (annual %), Gross National Expenditure which is percentage from GDP, Labor Productivity which extracted from the international labor organization (ILO) and can be measured by output per worker (GDP constant 2015) and Inflation, consumer prices (annual %).

C. Measuring the impact of the Artificial Intelligence on the Unemployment:

Ordinary least squares (OLS) regression is the most common method used for time series regression analysis. The software estimates the coefficients of the regression model, which represent the strength and direction of the relationship between the dependent variable and the independent variables.

To ensure the validity of the data, unit root test was conducted to verify the stationarity of the variables, the results are shown in table 1. All variables showed stationarity at 1% significant level

Table 1: Unit Root Test

At First Difference

Variable	GDP growth	Total patents	Gross national expenditure	Inflation CPI	Labor productivity	Unemployment
probability	0.0049	0.0570	0.0006	0.0005	0.0163	0.0420

Source: Calculated by the Authors by using Eviews-13 Sofware

OLS model was selected to test the impact of the Artificial intelligence on unemployment by using the unemployment as the dependent variable and artificial intelligence as the main independent variable; based on this model, all variables are shown in equation 1.

Log Unemp = $\beta 0$ + $\beta 1$GDP growth+ $\beta 2$ Total patent + $\beta 3$ National Expenditure + $\beta 4$ Labor Producitivity+ $\beta 5$ Inflation ……….. 1

the results of estimating the data for using the OLS model is shown in Table 2.

Table 2: OLS Regression

Dependent Variable: unemployment		
Variable	**Coefficient**	**Prob.**
C	24.71728	0.0258
GDP	-0.674599	0.0000
Total patent	0.001185	0.0211
National expen.	-0.186728	0.1141
Labor productivity	-8.76E-05	0.0612
Inflation	0.055878	0.0862
R-squared	94%	
Adjusted R-squared	91%	
Durbin-Watson stat	2.48	
Prob(F-statistic)	0.000000	

Calculated by the Authors by using Eviews-13 Sofware

According to the results of the data estimation, it has been found that:

- There is a positive relationship between the artificial intelligence and unemployment, where the results showed that a 1% increase artificial intelligence will lead to around a 0.001 increase in unemployment. The results match (Saavedra Hoyos, F. and etal. 2024), who shows that the implementation of AI can lead to job displacement as automation replaces certain human tasks. Moreover, AI adoption can raise unemployment rates until new job sectors emerge and the labor market adjusts.

- These results also match with Rawashdeh (2023) explores the impact of AI in the accounting field, revealing a substantial correlation between AI integration and job displacement. This displacement affects decision-making processes and has broader socio-economic implications, emphasizing the need for policy measures to mitigate negative outcomes, such as upskilling programs and talent retention efforts.

- Also, this match with the Research compiled by the Centre for Economic Policy Research (CEPR) also underscores the displacement effect of AI. Historical data from Acemoglu and Restrepo (2017) show that regions in the U.S. exposed to industrial automation experienced significant negative impacts on employment and wages. This aligns with the predictions of Frey and Osborne (2013), who estimate that nearly half of U.S. jobs are at risk of automation in the coming decade.

- There is a Negative relationship exists between GDP annual growth and unemployment as a 1% increase in GDP will lead to a 0.67%decrease in unemployment. These results match with Okun's law and with the (Abid,M. and et al in 2024)that show that a 10% increase in GDP leads to a 2.38% reduction in total unemployment. This result is statistically significant at the 1% level. When the economic

growth increases by 10%, the unemployment of men with disabilities drops by 2.05%.

- There is a positive relationship between unemployment and inflation and this doesn't match with Philips curve that indicates there is negative relationship between unemployment and inflation but matches with other studies such as (Friedman, M.(1977), (Idenyi,O. and et al (2017) that indicates a positive relation ship between unemployment and inflation.

- Also, this positive relation matches with (Lemaire, T. 2020) by investigating the Egypt's economic condition it was found that there was an absence of the typical negative correlation between unemployment and factors like inflation and real effective exchange rate (REER) .also, the fixed exchange rate regime, disruptions in the productive sector led to a breakdown in the typical inverse relationship between unemployment and both inflation as well as the real effective exchange rate (REER). Specifically, unemployment rose due to the productivity challenges, but inflation remained high, resulting in a real appreciation of the Egyptian pound.

Conclusion and Policy Recommendation:

The rapid evolution and widespread adoption of Artificial intelligence (AI) technologies are transforming the nature of work, The study used a regression model to test the relation

between AI and Unemployment in Egypt. The results indicate a statistically significant positive relationship between the adoption of AI technologies and the unemployment rate. Specifically, the analysis found that a 1% increase in AI implementation was associated with approximately a 0.001 increase in the unemployment level. This finding is consistent with previous research demonstrating that the introduction of AI powered automation can lead to job displacement as certain human tasks become computerized (Saavedra Hoyos et al., 2024).

Conversely, the analysis revealed a robust negative relationship between GDP growth and unemployment. The results showed that a 1% increase in annual GDP was linked to a 0.67% decrease in the unemployment rate. This aligns with Okun's law and the work of Abid et al. (2024), which found that a 10% rise in GDP corresponds to a 2.38% reduction in overall unemployment, including for workers with disabilities (-2.05%). Moreover, the study identified a positive correlation between unemployment and inflation rates. This contrasts with the traditional Phillips curve framework, which posits an inverse relationship between these variables. However, this positive association has been documented in other studies, such as those by Friedman (1977) and Idenyi et al. (2017). Lemaire's (2020) investigation of Egypt's economic conditions further suggests that the typical inverse unemployment-inflation relationship may

have broken down, potentially due to factors like the fixed exchange rate regime and productivity challenges.

As recommendation, The Egyptian government should prioritize the development of human capital skills to mitigate the potential negative impacts of artificial intelligence on unemployment. This can be achieved through several key initiatives including the establishment and enhancement of the country's digital infrastructure to enable widespread access to digital technologies. Adding to this, fostering the digital skills, competencies, and mindsets to be integrated into education curricula at all levels, equipping the future workforce with the necessary capabilities. Also, the government should promote lifelong learning and reskilling programs to ensure the current workforce can adapt to the evolving digital landscape and acquire future-ready skills. Finally, a culture of digital adoption and innovation must be encouraged across both the public and private sectors, fostering an environment conducive to technological advancement and job market transformation. By strategically addressing these areas, Egypt can better position its human capital to thrive in an AI-driven economy and mitigate the potential risks of technological unemployment.

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