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The paradox of progress: Unraveling the complex impact of e-government and business ease on economic growth in the Arab world

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ABSTRACT

This research examines how the ease of doing business (EDB) and electronic government (EGOV) collectively influence economic growth in Arab countries. By applying a fixed effects model to panel data from 2004 to 2022, the study encompasses multiple Arab nations to ensure comprehensive and reliable outcomes. The analysis reveals that the combined effect of EDB and EGOV (EGOVEDB) negatively impacts economic growth, where a one percentage point increase in EGOVEDB corresponds to a 3.52 percentage point decrease in GDP. Additionally, the human development index (HDI) shows a minor negative correlation with economic growth, while foreign direct investment (FDI) shows a slight positive relationship with GDP, indicating a limited effect. These findings suggest that instead of solely focusing on implementing e-government initiatives, we should place greater emphasis on attracting investments, enhancing e-government processes (including infrastructure and regulatory frameworks), and improving HDI to promote economic growth in the Arab world.

Contribution/Originality: This study unveils a new interaction term between e-government and ease of doing business, which can negatively affect economic growth in the Arab world. It recommends that new policies harmonize technological and economic strategies to foster sustainable development.

1. INTRODUCTION

The Arab world has a diversified economy, ranging from natural resources such as oil-rich sectors to agriculture and tourism. This unique position provokes analyzing factors that drive economic progress in such a context, suggesting a pivotal importance to test the link between the ease of doing business and electronic government, as these characteristics significantly influence economic development.

There are several studies emphasizing the importance of e-government and the ease of doing business on economic growth, but there is still a lack of understanding regarding the impact of the interaction between e-government and the ease of doing company. However, this article examines the influence of the interplay between the ease of doing business and e-government on economic growth in the Arab World.

The World Bank has created ease of doing business by assessing the regulatory environment's effectiveness in promoting the protection of property rights and facilitating commercial operations. In addition, e-government's implementation results in the improvement of openness and accessibility to public services, hence contributing to economic growth (World Bank, 2020).

669

The adoption of e-government can streamline business operations and enhance economic growth. Integrating e-government with business activities can improve public sector efficiency, thereby increasing economic competitiveness in Arab countries (Almarabeh & AbuAli, 2010). As defined by the World Bank, e-government involves the use of information technologies by government agencies to transform their interactions with citizens, businesses, and other government branches (World Bank, 2011).

Moreover, e-government serves as an interface between governments, individuals, and businesses. The Arab world faces numerous challenges in implementing e-government, particularly in policy areas related to laws and regulations, such as the electronic transactions law of the Sultanate of Oman and other Gulf countries. Infrastructure is not well organized in many Arab countries, especially in sectors catering to the needs of the handicapped. Additionally, there is a lack of human development, attributed to a shortage of trained individuals capable of effectively utilizing new technologies in their respective roles (Omari, 2013).

E-government plays a dynamic role in generating profits for small and medium enterprises by creating new job prospects for local private companies. The electronic government portal (abbreviated as EGP) would enhance the local market for local vendors, hence facilitating long-term growth. Furthermore, improving public finances will promote the nation's progress by reducing reliance on external assistance. E-government enables non-governmental firms to participate in government-to-business (G2B) interactions. Therefore, the businesses view the electronic government portal as a viable solution that employs online platforms and automation to replace paper-based processes, thereby, enhancing collaboration between public and private sectors. In addition, the crucial approach to narrowing the discrepancy between nations and achieving digitalization in developing economies is the implementation of digital government, as highlighted by Soong, Ahmed, and Tan (2020).

In addition, the Arab world region has encountered many challenges in the realm of information and technology, particularly concerning the ease of doing company, which is crucial to shed light on the importance of investing in technology infrastructure and attracting investment in order to increase the ease of doing business that leads to economic growth. The selection of the Arab World illustrates the impact of the interaction between e-government and economic growth. Moreover, e-government is interlinked with the human development index (HDI) and can improve productivity, facilitating the process of establishing a new business, which leads to an increase in income per capita and then economic growth (Abdelhafez & Amer, 2014).

Does the interaction between e-government and ease of doing business have a positive impact on economic growth in the Arab world?

2. LITERATURE REVIEW

This article sheds light on the importance of the interaction between ease of doing business and e-government, in order to explain the relationship between these variables and economic growth. It is important to rely on the endogenous growth theory to investigate this relationship. It aims to analyze the effect of this interaction on economic growth, considering factors such as innovation, technological progress, foreign direct investment, human development index, and governance (Samoilikova et al., 2023).

Moreover, it is crucial to elucidate that technical progress is an important factor in improving economic growth, as explained in the growth theory of the mid-20th century (Solow, 1956, 1957).

Based on several empirical studies, neoclassicists were the first to conclusively identify and analyze technological innovations as the primary driver of economic growth. They determined that these alterations were the most crucial factor influencing economic dynamics.

In light of this scenario, some academics have endeavored to include the notion of technological advancements resulting from other processes, such as economic ones, in their analysis.

In the 1980s, theoretical frameworks that challenged the prevalent neoclassical perspective on the sources of technological advancement emerged. The concepts can be categorized into two separate groups related to economic growth, such as the endogenous theory.

Therefore, this article is based on the endogenous growth theory, often referred to as "innovation-based," which encompasses the product-variety model. This model asserts that innovation propels productivity growth by generating new products (Jones, 2019). Therefore, the innovation-based theory encompasses another branch known as the Schumpeterian model, elaborated upon by Aghion and Howitt (2008).

Furthermore, the endogenous growth theory asserts that innovation, knowledge, and technology are fundamental factors in economic growth. Hence, the incorporation of digital technology is a crucial factor that influences economic growth (Chandra, 2022). Multiple studies have demonstrated the impact of technology in various countries, particularly in the Arab world. This is consistent with the significance of technology in growth theory (Chakravorti, Fillpovic, & Chaturvedi, 2019).

Thus, based on Solow's neoclassical growth theory (Solow, 1956, 1957). The function of production, Y = TF (K, L), represents the gross domestic product Y, T represents technology, the physical capital is represented by K, and the labor is represented by L. This concept posits that technological progress is a prerequisite for long-term growth.

Economists increasingly acknowledge that differences in an economy's capacity to innovate are a significant factor in understanding the differing degrees of development among different economies, thanks to the general adoption of endogenous growth theory (Sredojević, Cvetanović, & Bošković, 2016).

In addition, Solow emphasized the significance of physical capital, technological advancement, and human labor in stimulating economic growth (Cvetanović, Mitrović, & Jurakić, 2019).

Therefore, grounded on the economic growth hypothesis, this article sheds light on the relationship between e-government, a type of technological innovation, and economic development. Firstly, e-government is a transformative approach to public sector activity, as it involves an extensive use of ICT as a tool in government agencies' operations. It brings about significant changes in the principles, culture, and business practices of the public sector, profoundly changing the administration and provision of public services. Globally, an increasing number of governments are implementing electronic government systems, sometimes known as e-government.

In addition, the World Bank has developed an Ease of Doing Business (EDB) index to assess countries' business environments, with a primary focus on regulatory variables.

Moreover, researchers have proposed a framework that considers the broader elements of incorporating technology within the organizational environment (Rogge & Archer, 2021).

2.1. Recent Studies

In order to explain the relationship between the macroeconomic variables and economic growth, several studies have examined this relationship.

One study examining the association between economic growth and foreign direct investment in the Romanian economy from 2009 to 2017, using a log-log-linear estimation regression, found that investments in active enterprises, including large, medium, small, and micro companies, had a positive impact on economic growth. Moreover, innovation has a favorable effect on the turnover of enterprises of all sizes, leading to a positive impact on economic growth (Gherghina, Botezatu, Hosszu, & Simionescu, 2020).

Furthermore, a recent study conducted by Dinh, Vo, The Vo, and Nguyen (2019) examined the correlation between foreign direct investment and economic growth in a set of developing countries from 2000 to 2014. Utilizing the panel Vector Error Correction Model (PVECM) and the Fully Modified Ordinary Least Squares (FMOLS) model, the results revealed a negative influence in the short term compared to a positive impact in the

long term. Specifically, the article emphasized the importance of human capital and total domestic investment macroeconomic factors in driving economic growth.

Another study by Sana, Poddar, and Paul (2020) explored the effect of small and medium enterprises (SMEs) on economic growth in Malaysia from 1964 to 2018. By employing the Autoregressive distributed Lag model (ARDL), the findings of the study showed that the SME sector increases savings, investment, and productivity, thus contributing positively to economic growth.

Furthermore, research by Taqi, e Ali, Parveen, Babar, and Khan (2021) on the Pakistani economy investigating the correlation between the human development index and economic growth from 1980 to 2018 reveals the favorable influence of the human development index on economic development (Taqi et al., 2021).

Furthermore, in accordance with the growth theory, research has underscored the importance of governance in promoting digital innovation and adoption, as a means to reach efficient governance systems. The significance of governance in establishing a beneficial atmosphere for digital innovation is well acknowledged, encompassing criteria elements such as openness, compliance with legal principles, and efficient handling of corrupt practices. Existing literature indicates a dearth of studies on the link between ease of doing business, governance, and digital transformation, particularly in the Arab world, so the objective of this article is to bridge the gap and report this deficiency (Samoilikova et al., 2023).

The endogenous growth theory, from Romer's point of view, emphasizes the role of the state in property rights and free markets. In this context, governance involves the establishment of rules and regulations that shape different parts of society (Schilirò, 2019).

In addition, the relationship between the interaction term, which is composed of e-government and ease of doing business and economic growth is explained by several studies.

Additionally, a study that applied e-government, considering it an application of innovation, and factoring in the ease of doing business across 26 countries from the Association of Southeast Asian Nations (ASEAN) over a 26-year period, through the application of panel co-integration and dynamic ordinary least squares (DOLS), indicates that the ease of doing business contributes to increased foreign direct investment and economic growth. However, this is not the case for e-government.

Moreover, a study investigating the relationship between e-government and economic growth using a panel data analysis for 27 European countries and the United Kingdom over the period 2003-2022 by employing a cluster-robust fixed and random effects model, demonstrates a positive relationship between e-government and economic growth. Furthermore, it indicates that a 10% increase in the number of individuals using e-government services will lead to an increase between 0.4 percentage points and 1.6 percentage points in the gross domestic product (GDP) per capita (Kamal, Youssef, Abuhussein, & Abdel Kader, 2023).

In addition, another study examining the effect of the growth of information and communications technology (ICT) and e-government on economic growth, using the fixed and random effects models, Two Least Squares (2SLS) and Generalized Method of Moments (GMM), this study indicates that an increase of 1 percentage point in e-government will lead to an increase of 3.33 percentage points in GDP, as well as an increase in Information and communication technology (ICT) in 1 percentage point will lead to an increase of 0.24 percentage points in economic growth (Majeed & Khan, 2019).

2.2. Interaction of Ease of Doing Business and E-Government

The term "ease of doing business" encompasses a range of criteria that signify enhanced safeguarding of property rights and more streamlined, advantageous rules for enterprises (Singh, 2015). A high score for ease of doing business shows that the regulatory climate is more advantageous for establishing and running a local business. The index of ease of doing business assesses economies on a scale ranging from 1 to 189, using a predetermined set of characteristics. The index has eleven categories, encompassing launching a business, obtaining

building licenses, acquiring electricity, registering real estate, securing loans, protecting minority investors, submitting taxes, engaging in foreign trade, enforcing contracts, and resolving insolvency. The given figures represent the primary hindrances to business activities, as reported by entrepreneurs from 189 economies. We establish the grade for each economy by calculating the simple average of the percentile rankings for each of the ten index issues (Muli & Aduda, 2017).

One aspect that contributes to the ease of doing business is the implementation of electronic government (e-government) and ICT-based solutions. These technologies serve as a means to support small and medium enterprises (SMEs), entrepreneurship, and large businesses by decreasing the expenses associated with administrative and regulatory processes. This article introduces a novel interaction term that connects the ease of doing business (EDB) with e-government (EGOV) to investigate its influence on economic growth in Arab countries. Hence, a panel data analysis of 160 countries reveals a positive relationship between e-government and the ease of doing business. This correlation is particularly evident in the six components of ease of doing business, namely protecting minority investors, starting a business, getting electricity, registering property, trading across borders, and getting credit.

Furthermore, governments worldwide actively promote entrepreneurship, while simultaneously observing a widespread adoption of digital technology that accelerates the growth of new enterprises. A study conducted from 2002 to 2010 across 200 countries using a fixed effects model revealed that an increase in government utilization of online services had a positive impact on the number of procedures required to establish new companies. Das and Das, (2022) achieved this by reducing the cost and the time associated with starting a business.

To explore the relationship between the ease of doing business and economic growth, a study of 15 ECOWAS countries from 2000 to 2019 found a negative and significant relationship between economic growth and ease of doing business indicators, such as the time required to set up a business, registration procedures, and business costs (Raimi & Haini, 2024). In contrast, another study using a sample of 44 African countries and employing the System Generalized Method of Moments (System-GMM) estimation method indicated a positive and significant impact of ease of doing business on economic growth (Bétila, 2022).

3. RESEARCH DESIGN

This article uses a quantitative analysis, where, cross-sectional panel data is employed as secondary, annual, and balanced data, over the period 2004 to 2022 using the statistical software for data analysis "STATA" where the number of years is T=18 and the number of countries is N=13.

3.1. Technique

A panel data analysis is used in this article. This type of analysis aims to study changes within groups, individuals, countries, or entities over a period of time.

The fixed effect model includes a transformation to remove the unobserved effect before estimation, where this unobserved effect is considered correlated with the explanatory variable. This model aims to exclude the unobserved effect, while the random effect model assumes that the unobserved effect is uncorrelated with the explanatory variable (Wooldridge, 2009).

3.2. Data and Variables

The data acquired from the World Bank includes many control variables. The variables utilized in the analysis include the dependent variable Gross Domestic Product (GDP), which is an indicator of Economic Growth. On the other hand, the independent variables such as foreign direct investment (FDI), governance (GOV), technology (TECH), and innovation (INOV). Additionally, we include the interaction term of e-government ease of doing business (EGOV*EDB) in the dataset. The dataset pertains to 13 nations in the Arab World, specifically

Mauritania, Saudi Arabia, Tunisia, Qatar, Egypt, Morocco, Iraq, Kuwait, the United Arab Emirates, Lebanon, Algeria, Oman, and Jordan. The variables are the following:

- *Gross domestic product as a proxy for economic growth*: Considered as the dependent variable, extracted from the World Bank, the Gross domestic product or GDP is the total value added by residents' producers in an economy, it is calculated in US dollars.

- *Foreign direct investment*: Considered as a control variable, extracted from the World Bank, the foreign direct investment, or FDI, net inflow percentage from GDP, is the sum of equity capital, composed of short-term, long-term capital and reinvestment of earnings, as per the balance of payments. This series illustrates net income divided by GDP.

- *Technology*: Considered as a control variable, extracted from the World Bank, abbreviated by TECH, is the import of goods in communication and information technology such as consumer electronic equipment, computers, etc.

- *Easy of Doing Business*: Considered as an interaction term with the e-government and an independent variable, extracted from the World Bank, abbreviated by EDB, the score includes the ease of doing business components such as starting a business, enforcing contracts, construction permits, protecting minority investors, obtaining credit, securing electricity, paying taxes, registering property, resolving insolvency, and trading internationally.

- *E-government*: Considered as an interaction term with the ease of doing business (EGOV*EDB) as an independent variable, extracted from the International Telecommunication Union, is the composite of provision of online services, human capacity, and telecommunication connectivity.

- *Governance*: Considered as a control variable, extracted from the World Bank, abbreviated by GOV, is the average of six components such as regulatory quality, rule of law, corruption control, voice and accountability, government effectiveness, and political stability.

- *Innovation*: Considered as a control variable, extracted from the World Bank, abbreviated by INOV, it is the mean average of researchers in research and development (R&D), patent nonresidents, and residents.

- *Human development index*: Considered as a control variable, extracted from the United Nations Development Program (UNDP), and abbreviated by HDI, it is the average performance in key areas of human development. It is composed of several components, such as long and healthy life, having knowledge, and having a respectable standard of living.

3.3. Specification of the Model

The model states the referral model of Mankiw, Romer, and Weil (1992) where it is based on the equation below:

$$y = f(A, k, n, h) \quad (1)$$

It is explained by the equation below:

$$y_{it} = \beta 0 + \beta 1 A_{it} + \beta 3 k_{it} + \beta 4 n_{it} + \beta 5 h_{it} + \varepsilon_{it} \quad (2)$$

Where y is the real income per capita, A represents the technology, k represents the physical capital, n denotes the labor force, and h indicates the human capital.

Accordingly, the equation in this article is rewritten below, in order to establish the correlation between GDP growth and the indicated variables.

$$GDP_{it} = \alpha + \beta_1 FDI_{it} + \beta_2 EGOV * EDB_{it} + \beta_3 HDI_{it} + \beta_4 TECH_{it} + \beta_5 GOV_{it} + \beta_6 INOV_{it} + \varepsilon_{it} \quad (3)$$

α is an intercept term.

β_1, β_2, β_3, β_4, β_5, and β_6 are the coefficients that are considered as numerical factors for each independent variable

ε_{it} is the error term where the country is i and the time is t.

3.4. Descriptive Statistics

As numerical procedures that are used to describe the variables in a sample, descriptive statistics is a technique used to summarize the variables by describing the mean, median, standard deviation, mode, skewness, and kurtosis that gives a summary of the variables in a study (Fisher & Marshall, 2009).

Table 1. Descriptive statistics.

Variable	Mean	Standard deviation	Min.	Max.
GDP	124	71.44	1	247
FDI	118.66	70.43	1	241
EGOV*EDB	28.22	15.16	1	77.14
HDI	0.735	0.097	0.48	0.92
GOV	51.80	40.40	0	200.32
TECH	91.55	67.72	1	212
INOV	497.50	421.15	47.50	1989.5

The Table 1 presents the descriptive statistics, where the average value of the dependent variable (GDP) is 124 units greater than the standard deviation (71.44), in comparison to the other variables. This indicates that the data is clustered around the average value. Similarly, the average values of the independent variables exceed their respective standard deviations, indicating that the data is concentrated around the mean.

3.5. Correlation Matrix

Senthilnathan (2019) clarifies the use of correlation matrix in studying the relationship between the independent factors and the dependent variable, as well as the interconnection among the independent variable.

Table 2. Correlation matrix.

	Variables	1	2	3	4	5	6	7
1	GDP	1						
2	FDI	0.1358*	1					
3	EGOV*EDB	-0.1696*	-0.1427*	1				
4	HDI	-0.1585*	-0.1075	0.6799*	1			
5	TECH	-0.0320	0.0009	0.1832*	0.4202*	1		
6	GOV	-0.0867	-0.1630*	0.3488*	0.5336*	0.4284*	1	
7	INOV	-0.0712	0.1082	0.5159*	0.2168*	0.0972	-0.1770*	1

Note: * denotes 0.1% respectively

Table 2 indicates that the correlation matrix is statistically significant, positive, and shows a weak association between foreign direct investment (FDI) and Gross Domestic Product (GDP). This means that as FDI increases, GDP tends to decrease. The coefficient of correlation is 0.1358 at a level of significance of 5% (α=0.05). Conversely, there is a feeble and unfavorable correlation between the independent variables, specifically the interaction term of Ease of Doing Business by E-government and the human development index (HDI), and the dependent variable, GDP. The correlation values of -0.1696 and -0.1585, respectively, at a level of significance of 5% (α=0.05) suggest that an increase in the Ease of Doing Business and E-Government (EGOV*EDB) and human development index (HDI) is linked to a reduction in the Gross Domestic Product (GDP). This indicates that in the Arab World, there is a deficiency in the allocation of resources towards developing the skills and knowledge of the workforce, and the relationship between the government's use of technology and the ease of conducting business did not have a beneficial influence on economic growth.

3.6. Diagnostics Tests

The diagnostic testing procedures utilized the following techniques: the first is Wooldridge's examination of serial correlation. It shows a p-value of 0.6446, which exceeds the significance level α=0.05. Thus, we present the null hypothesis, which asserts the absence of autocorrelation (Born & Breitung, 2016). The second is the presence of heteroskedasticity which was evaluated using the Breusch–Pagan Lagrange multiplier test. It yields a p-value of 0.1090. we established the chosen significance level (α) at 0.05. Consequently, the absence of heteroskedasticity leads us to not reject the null hypothesis (Halunga, Orme, & Yamagata, 2017).

Table 3. Panel models- fixed and random effects - dependent variable: GDP.

Variable	Panel fixed effect model		Panel random effect model	
	Coefficient	Probability	Coefficient	Probability
FDI	0.0862	0.431	0.2356	0.002**
EGOV*EDB	-3.5244	0.000***	-2.0247	0.001**
HDI	59.549	0.849	-11.650	0.906
TECH	0.0908	0.471	-0.0179	0.842
GOV	0.6738	0.367	0.1827	0.255
INOV	0.0216	0.376	0.0243	0.124
Constant	115.8	0.615	145.28	0.021*

Note: *,**,*** denotes 5%,1%, and 0.1% respectively

Table 4. Hausman test- dependent variable gross domestic product.

Test	Chi-sq stat.	Probability
Cross-section random	11.98	0.0351

3.7. Estimation of Panel Fixed Model and Random Model

The Table 3 illustrates the estimation of both fixed and random effect models, However, Table 4 represents the Hausman test. This suggests the appropriate choice is the fixed effects model, with a p-value of 0.0351<α=0.05. This suggests that a 1 percentage point increase in the interaction between e-government and ease of doing business (EGOV*EDB) will result in a 3.52 percentage point decrease in gross domestic product (GDP). The findings indicated that e-government efforts have the objective of enhancing the efficiency and openness of public services. Additionally, they can present complications that impede economic expansion.

The effect of e-government on the ease of doing business is substantial. Therefore, the updated model shown in the previously mentioned table illustrates a clear and statistically significant inverse relationship between the interaction of e-government and the convenience of conducting business. We found that other independent variables, including foreign direct investment (FDI), human development index (HDI), import of technology (TECH), governance (GOV), and innovation (INOV), have an insignificant impact on economic growth. This is supported by the p-values for FDI (0.431), HDI (0.849), TECH (0.367), GOV (0.376), and INNOV (0.376), which all have a value greater than the significance level of α=0.05. This suggests that a thorough understanding of the roles of these elements play in economic growth is necessary, as this model may not account for contextual and mediating variables.

4. DISCUSSION

The empirical study, done over 18 years and using data from 13 Arab nations, emphasizes the significance of digital integration and technology in fostering economic progress.

The fixed effect estimation model above reveals that the human development index (HDI), foreign direct investment (FDI), technology (TECH), innovation (INOV), and governance (GOV) have an insignificant impact. However, the interaction term between E-government and ease of doing business has a negative and significant impact, which is not aligned with the hypothesis. It aligns with the study (Raimi & Haini, 2024) demonstrating a

negative relationship between ease of doing business on economic growth, with another study investigating the relationship between E-government and ease of doing business and economic growth, denoting a negative impact of E-government on economic growth in the ASEAN countries (Zulkifli et al., 2020). This suggests a lack of e-government implementation in the Arab world. Furthermore, a lack of a substantial association between technology and economic growth can be attributed to the limited utilization of technology in emerging enterprises. This emphasizes the importance of creating an environment conducive to technology and innovation, which in turn facilitates economic digitalization and fosters economic development.

The economic crisis and political instability in many Arab countries led to foreign direct investment having no effect on economic growth, resulting in a shortage of investment. Conversely, previous studies highlighted a positive relationship between e-government and ease of doing business, which contributed to economic growth. These studies also demonstrated the positive impact of ease of doing business on economic growth (Bétila, 2022) and the positive impact of e-government on economic growth (Das & Das, 2022).

Nevertheless, the World Bank has observed an upward trend in the ease of doing business indicator in the Arab world.

In terms of governance, the results show that it has no significant influence on economic growth. This finding contradicts the growth theory mentioned earlier, which suggests a positive relationship. This implies that certain countries are not effectively implementing regulatory and legal rules. However, Jordon, for example, has enacted a legal adjustment, defying this situation.

Consequently, foreign direct investment has an insignificant effect that affects the ease of doing business and economic growth. Due to the political instability in the Arab region, foreign direct investment has no significant impact on economic growth.

Therefore, it is important to speed up infrastructure, especially the technological infrastructure, which improves the e-government and increases its use as a collaboration between public and private sectors, followed by enhancing human capital and increasing productivity and economic growth. It is crucial to foster an environment that can increase the development of infrastructure and attract more investment by improving governance, including regulatory reform, of which regulatory law is a part, which can decrease the costs of projects and taxes for businesses and increase economic growth (Alaeddine, 2023).

5. CONCLUSION AND RECOMMENDATIONS

This article presents a novel concept, namely the interaction term between e-government and ease of doing business. It highlights how technologically advanced countries in the Arab world are leveraging technology to significantly influence economic growth.

This study examined the correlation between the ease of doing business (EDB), e-government, and their impact on GDP growth in the Arab world, utilizing a fixed and random model methodology. The investigation revealed a notable negative correlation between E-Government to Ease of Doing Business (EGOV*EDB) rankings and GDP growth. This implies that while introducing e-government to policymaking and practices aims to enhance the effectiveness and openness of public services, they may also bring about process complexities or barriers that impede economic development. Nevertheless, this analysis determined that variables such as Human Development Index (HDI), Foreign Direct Investment (FDI), government effectiveness (Gov), technology adoption (TECH), and innovation (INOV) do not exhibit a significant effect on GDP growth.

Moreover, the lack of significance in innovation necessitates that the Arab world bolster investment in human capital and establish new regulations and a human development index. This would facilitate access to technology and increase the regulatory environment. This study proposes that entrepreneurs and nations that encourage a conducive business environment and streamline company operations should consider creating a novel index to improve the standard and convenience of conducting business in the Arab world.

The research is constrained by the data availability in the Arab world, which is solely derived from the year 2004, when the ease of doing business initiative was introduced.

This article highlights the importance of adopting a well-rounded strategy when implementing e-government to enhance the efficiency of company operations. It emphasizes the vital role of digitization and the use of new technologies across different economic sectors.

This article advocates for the proper deployment of technology and the widespread use of e-government, and new technology in the market, with a particular focus on small and medium firms. This initiative has the potential to create new opportunities and jobs, ultimately contributing to economic growth.

Consequently, it is crucial to impose new and precise strategies in the Arab world, including the amelioration of the infrastructure, management, human development, and law and regulations, encouraging the e-government and the use of new technology that can help in attracting foreign direct investment, enhancing the entrepreneurial activities, and leading to economic growth.

5.1. Implications

In light of the above findings, it is concluded that the interaction between e-government and ease of doing business contributed to a negative relationship with economic growth, which marks the importance of evaluating the regulatory framework and e-government services. The governments in the Arab world should adopt a comprehensive policy strategy that promotes technical progress and fosters economic growth. Furthermore, it is crucial to provide resources for digital infrastructure that improves the functioning of e-government and maximizes advantages for enterprises. Therefore, it is important to share the e-government with companies and start-ups, owing to its benefits for private and public sectors.

5.2. Limitations

The World Bank's implementation of the ease of doing business indicator and the insufficient data availability in certain Arab World countries constrain the data to the year 2004. This restriction limits the dataset to 18 years, resulting in a relatively small sample size.

5.3. Further Research

It is crucial to illuminate the significance of implementing artificial intelligence in startup enterprises, and it is also important to study a new index that can compare the introduction of interaction terms by another index and its impact on economic growth (Al-shehry, 2009).

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