

Digitalization and Economic Growth in Arab Countries Under Good Governance during (2018-2021)¹

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ABSTRACT

This paper explores the relationship between economic growth, the digital economy, and governance in Arab countries, investigating whether effective governance amplifies the positive impact of digitalization on economic expansion. Through a panel data analysis covering 2018-2021, significant and favourable connections between economic growth, the digital economy, and governance quality are revealed. The study highlights digitalization's pivotal role in fostering economic growth and emphasizes the need for investments in digital infrastructure and innovation. Additionally, it underscores the crucial link between economic growth and effective governance, suggesting that transparent decision-making and efficient resource allocation enhance the benefits of digital initiatives for economic development. The findings advocate for policymakers to prioritize enhancing digital readiness and governance frameworks, fostering innovation and equitable access to technology, ultimately paving the way for sustained and inclusive economic growth in Arab countries.

Keywords: digitalization, economic growth, governance, Arab Countries, efficient institutions

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1. Introduction

In an era characterized by rapid technological advancements and interconnected global economies, the digital revolution has emerged as a driving force behind transformative changes in various aspects of society and industry. The Arab countries, situated at the crossroads of tradition and modernity, have witnessed a significant shift towards embracing the opportunities presented by digitalization. This shift has not only revolutionized economic landscapes but has also emphasized the critical importance of effective governance in maximizing the benefits of the digital economy.

The interplay between digitalization, economic growth, and governance is a subject of increasing interest and scrutiny, particularly within the Arab context. As nations in the Arab region endeavour to diversify their economies and accelerate development, the integration of digital technologies has emerged as a pivotal strategy.

At the heart of this transformation lies the question of whether good governance acts as a catalyst that enhances the translation of digitalization's benefits into tangible economic growth. This paper delves into this inquiry, aiming to explore the intricate relationship between economic growth, the digital economy, and governance in Arab countries. By examining the dynamics at play and assessing empirical evidence, this study seeks to provide valuable insights into the mechanisms through which effective governance can amplify the positive impact of digitalization on economic expansion.

The application on Arab countries is of particular significance; Arab nations stand at a crucial crossroads in their digital journey. While significant investments have boosted digitalization efforts, unlocking its full potential for inclusive and sustainable economic growth hinges on bridging the gap between aspirations and outcomes. This study tackles this challenge by investigating how effective governance, encompassing robust institutions, transparent practices, and a secure digital environment, can act as a vital catalyst. By fostering trust, mitigating risks, and aligning digital strategies with concrete economic objectives, good governance can pave the way for Arab countries to translate their

digital potential into tangible economic prosperity, ensuring that the benefits of the digital economy reach all segments of society.

1.1 Research Problem

Therefore, the primary objective of this paper is to investigate the synergy between economic growth, the digital economy, and governance in Arab countries. The paper employs a panel data analysis approach, utilizing a comprehensive dataset spanning the years 2018 to 2021. This timeframe offers a unique vantage point to analyse the interplay between economic growth, digitalization, and good governance in Arab countries. This period not only encompasses the pre-pandemic baseline, but also captures the unprecedented shock of the COVID-19 pandemic and the subsequent reliance on digital tools during lockdown policies. This context adds significant weight to the investigation, allowing us to assess how digitalization acted as a crucial catalyst for economic resilience and adaptation in the face of unprecedented challenges.

1.2 Research Methodology

The paper employs a panel data analysis approach, utilizing a comprehensive dataset spanning the years 2018 to 2021, and applying on a set of Arab countries¹.

1.3 Research Hypothesis

The main hypothesis that the study seeks to examine in the context of Arab countries, can be formulated as follows: **'Good governance is an asset for a flourishing digital economy in developing countries, by establishing an environment that encourages innovation, investment, and digital adoption, both governance and digitalization have the potential to drive economic growth rates in those countries.'** Formulating and examining this hypothesis is one of the main contributions of this study.

¹ Algeria, Bahran, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and United Arab Emirates

1.4 Research Plan

The paper is divided into three sections, in addition to the introduction and the conclusion. Section two introduces the literature, discussing the existing body of knowledge on digitalization, economic growth, and governance. Section three provides a descriptive data analysis on the synergies between the three aspects in a set of Arab countries. The methodology elaborating on the data collection, variables, and analytical techniques employed, together with the findings of the study are all presented and discussed in detail in section four. The paper concludes by offering policy recommendations that can guide Arab countries in leveraging digitalization as a catalyst for robust economic growth, bolstered by effective governance practices.

2. Examining the Literature

2.1 Theoretical Underpinnings

The theoretical literature highlights the pivotal role of good governance in facilitating the positive impact of digitalization on economic growth in Arab countries. Good governance acts as a catalyst by fostering transparency, accountability, and efficient resource allocation in the digital sphere. It guarantees the safeguarding of intellectual property rights, promotes effective regulations, and mitigates corruption, thus establishing an enabling environment for innovation and investment.

Effective governance frameworks also encourage collaboration among stakeholders, leading to holistic and innovative digital strategies that drive economic growth while ensuring inclusivity across society. This synthesis underscores the significance of good governance in driving the growth of the digital economy in developing nations. It delineates several channels or mechanisms in which good governance can bolster economic growth by nurturing the digital economy.

Good effective governance -via those channels- has the potential to:

(Xianbin and Qiong, 2021; Castro and Lopes, 2021; Dhaoui, 2021; Wang et al., 2021; Shenkoya, 2023; Könnölä et al., 2021)

- **Regulatory Framework:** ensure that regulations encourage competition, protect consumers, and foster entrepreneurship, attracting both domestic and foreign investors.

- **Intellectual Property Rights Protection:** safeguard intellectual property rights, incentivizing innovation, and creativity. Such protection encourages companies to invest in research and development, which leads to the creation of new digital products and services.
- **Data Privacy and Security:** robust data protection and cybersecurity regulations. These measures instill trust among consumers and businesses, facilitating the adoption of digital technologies and preserving individuals' rights.
- **E-Government Services:** Governments can promote the digital economy by offering online services. This reduces administrative burdens, cuts transaction costs, and enhances efficiency. Good governance ensures the development and user-friendliness of e-government platforms.
- **Digital Infrastructure Investment:** strategic investments in digital infrastructure, such as broadband networks and data centers. These investments are pivotal for widespread access to the digital economy and streamlined business operations.
- **Innovation Ecosystem:** create an environment conducive to innovation and entrepreneurship by minimizing bureaucratic obstacles, streamlining business registration processes, and enhancing access to financing for digital startups.
- **Cross-Border Trade and E-Commerce:** simplify cross-border trade through standardized regulations, digital customs processes, and uniform electronic payment systems, expanding global markets for digital products and services.
- **Transparency and Anti-Corruption Measures:** Combating corruption and ensuring transparency in digital initiatives fosters investor confidence and prevents resource misallocation.

Given those channels, the main hypothesis that the study seeks to examine in the context of Arab countries, can be formulated as follows: **‘Good governance is an asset for a flourishing digital economy in developing countries, by establishing an environment that encourages innovation, investment, and digital adoption, both governance and digitalization have the potential to drive economic growth rates in those countries.’**

Formulating and examining this hypothesis is one of the main contributions of this study.

This hypothesis could be visualized with the help of figure one.

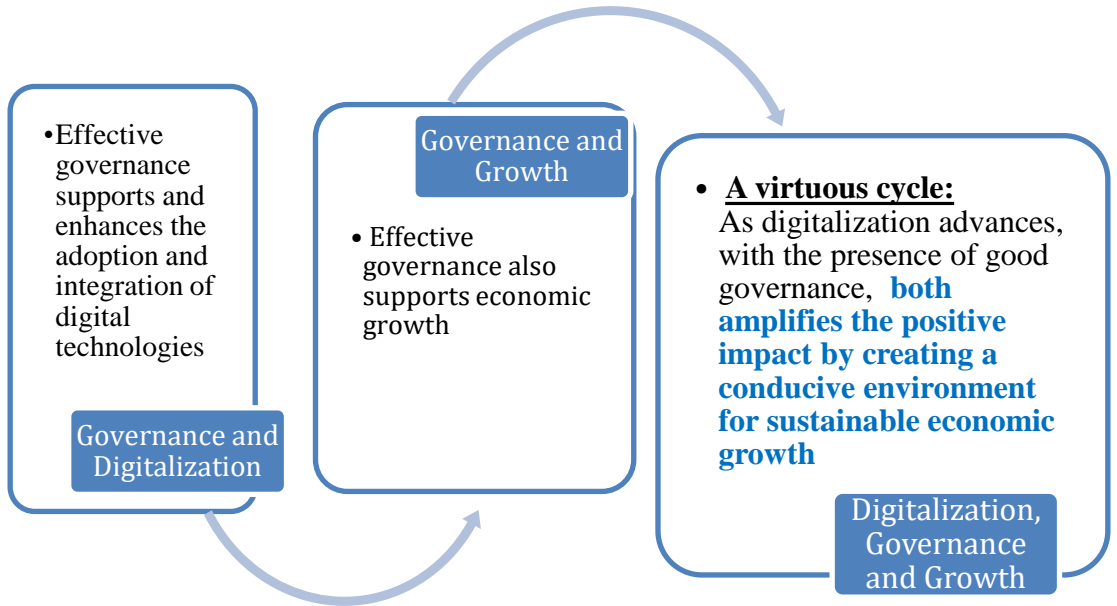


Figure 1: Research Hypothesis

Source: made by the author

2.2 Empirical Literature

The empirical literature that tackled the three aspects together is very limited, with almost none applying on Arab countries. Most studies examined each two variables together, but not the interconnections between the three simultaneously.

Vast number of studies examined the relation between *digitalization and growth*. The majority of which have concluded a positive relation between the two variables (Zhu et al., 2023; Zhang et al., 2022; Mura, 2023; Gomes et al., 2022; Aly, 2020). The concluded positive effect was obtained given that the development of digital economy could improve the efficiency of factors such as capital and labor, thus contributing to economic growth. This is accompanied by positive effects on labour-

saving costs as well as on productivity increases, together with higher efficiency, cost reduction and easier and speedier transactions.

A fewer number of studies found the relation to be negative for different reasons. Aker and Mbiti (2010) found that the cost of ICT development and use is expensive due to the lack of infrastructure, especially for less developed countries. Arsić (2020) found that the net effect of digitalization on employment is negative. Aleksandrova et al. (2022) concluded that the state of the macroenvironment and the readiness of the population for digital transformation do not allow digital technologies to affect the economic growth rate seriously.

Spence (2021) discussed other challenges accompanied with rapid digitalization. The advantages of analysing vast datasets can occasionally encroach upon users' privacy, and the unrestricted movement of data, information, and technologies raises worries about national security. Additionally, significant digital platforms might exploit their substantial market influence to engage in unfair and biased pricing tactics, ultimately harming both consumer benefits and the vigour of innovation.

Those challenges urged the need for the government to supervise the market power of mega-platforms and encourage more innovation, craft an effective institutional and legal framework for the distribution of data property and design an effective tax and incentive system for the digital economy (Spence, 2021).

This particular relation between *digitalization and governance* has been explored by few studies. Nechba et al. (2022) found that good governance is still struggling to find an upward slope in Morocco, despite all the technological advances that have been made. Durkiewicz and Janowski (2018) reached a strong positive correlation between digital indicators and the indicators of Government Effectiveness, Regulatory Quality, and partly Voice and Accountability, by applying on the United Nations member states. Also, Xianbin and Qiong (2021) found that good governance positively impacts long-term sustainability, social reforms, and economic policies of the digital economy by applying on China.

Other group of studies analysed the relation between *governance and growth*, either directly or through adding channels such as democracy, development, exchange rates or wealth inequality, to name just a few (Mahran, 2023; Fayissa and Nisah, 2013; Huang and Ho, 2017; Khan, 2007; Sharma, 2007; Kraipornsak, 2018; Zubair and Khan, 2014; Fraj et al., 2018; McGillivray and Islam, 2020).

As for the relation between *governance, digitalization, and growth*, Labhard and Lehtimäki (2022) studied the effects of digitalisation on economic growth, and how those effects may be impacted by institutions and governance. By applying on EU countries, the study found that better institutions and governance tend to be associated with greater growth-enhancing effects from digital technologies. Nguyen (2021) examined whether governance significantly contributes to the digitalization – economic growth relationship in developing countries. The results indicate that digitalization and governance boost economic growth while their interaction hinders it.

This current study shall add to the existing literature by examining whether good governance could be an asset for a positive relationship between digitalization and economic growth for a set of Arab countries.

3. Digitalization, Governance and Economic Growth in Arab Countries

This section provides data analysis for the stance of digitalization, governance, and economic growth in our sample of Arab countries. Analysing the development of those indicators shall serve the objective of the study by examining the interlinked relationships between them, given the special context of the Arab countries as a developing region.

The percentage change in per capita RGDP is used as a measure for economic growth, The Network Readiness Index is used as a proxy of Digital Economy, and a Composite index of Governance, constructed by the Principal Component Analysis, is used to capture the six dimensions of the World Bank Governance Indicators. The six indicators are also analysed separately to provide comparisons on the different aspects of governance in the set of Arab countries during the period of the study.

The particular rationale for using those exact three indicators as a measure for the three dimensions of the research hypothesis, and the

justification for that, is analysed in some detail in the coming section of data and model.

Figure (2) shows the development of economic growth through the years 2020, 2021, and 2022. As shown from the figure, Egypt was the only Arab state that achieved positive growth rate in 2020. This can be attributed to several factors, including the strong economic and institutional framework of the country, which proved its resilience to the COVID-19 pandemic, and played a good role in its ability to adapt. This was coupled with the government's financial stimulus package, which supported economic activity and mitigated the impact of the crisis. Growth rates continued favourably over the following years.

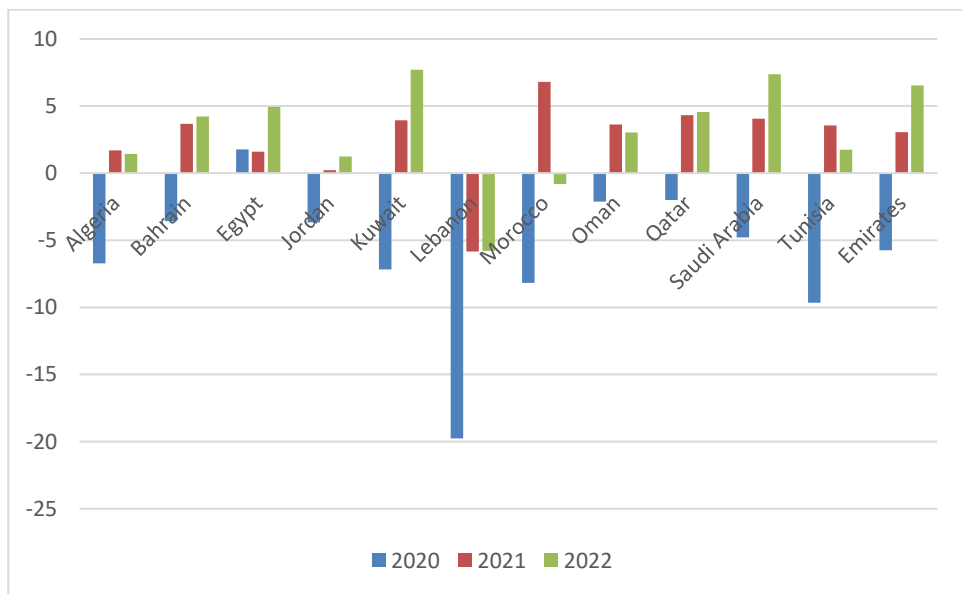


Figure 2: Economic Growth in Selected Arab Countries

Source: made by author based on WDI data set.

Regarding the performance of other Arab countries, most of them began their recovery in 2021, apart from Lebanon, due to its internal disruptions and political conflicts. Generally, Kuwait, Saudi Arabia, and the UAE had the highest economic growth rates, respectively, in the year 2022. The reasons for the growth in these countries can be mainly explained by the increase in oil and gas prices, which constitute a significant source of income for them.

Furthermore, the influx of foreign investments, attracted by the political and economic stability of these countries and their advanced infrastructure, contributed to their growth. Algeria, Jordan, and Tunisia are still struggling behind. Advancements in the digital economy are shown in Figure (3).

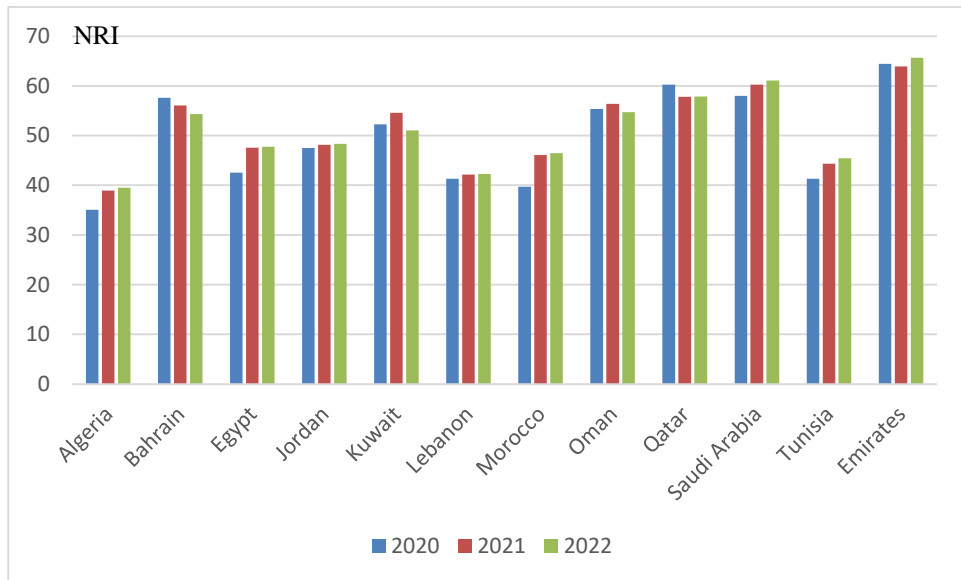


Figure 3: NRI in Selected Arab Countries

Source: made by author based on Portulans Institute Reports.

As evident from the figure, the index demonstrates an upward trend in several Arab countries, such as Algeria, Lebanon, Morocco, Saudi Arabia, Tunisia, and the UAE. This reflects the increasing efforts adopted by these countries to support and enhance their digital economy, develop communication sectors, and expand their information networks.

Conversely, the index has declined in some other Arab countries like Oman, Bahrain, and Kuwait. This could be attributed to various factors, including the drop in oil prices in spring 2020, which negatively impacted the economies of oil-exporting nations, leading to reduced government spending on information and communication technology, infrastructure, and human capital development. Additionally, global political instability during the same period negatively affected the

information and communication technology sector, making it challenging for companies to invest in the industry's infrastructure and stifling innovation and technological advancement.

Regarding the comparisons within this group of countries, the United Arab Emirates, Qatar, and Saudi Arabia have shown the best performance in the index. These nations have invested significantly in information and communication technology, developed strong sectors, and introduced innovative and intelligent technological services. They are also leading the way in adopting new technologies like Artificial Intelligence and the Internet of Things.

On the other hand, countries with lower index performance include Algeria, Tunisia, and Lebanon. These nations need to increase their investments in information and communication technology infrastructure and human capital.

Overall, despite the improved performance of Arab countries in recent years, there is still ample room for improvement. Arab nations need to continue investing in information and communication technology infrastructure and human capital to keep pace with rapid international developments in this sector and reap the benefits of these successive advancements.

On a complementary stance, figure (4) shows the development of World Bank governance indicators during the years 2019, 2020, and 2021. The indicators reflect a dynamic landscape of governance practices and reforms within the region. These indicators provide valuable insights into the stance of governance in various dimensions, such as voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.

The Governance Indicators (WGI) range from -2.5 to 2.5, with higher values indicating better governance and lower values indicating worse governance. These scores are calculated based on various surveys and expert assessments that capture different aspects of governance in a country.

- 2.5: This represents the highest possible score, indicating exceptional performance in that particular governance indicator. A country with this score would have very strong institutions, effective policies, and a high level of accountability.
- -2.5: This is the lowest possible score, indicating very poor governance performance. A country with this score would have weak institutions, ineffective policies, and a high level of corruption.

The disparities between the countries are clear, with some countries (like United Arab Emirates, Qatar, Oman and Bahrain) preceding the rest as reflected by the positive values of most of the indicators. Despite of the negative values of the other Arab countries; there is still some improvements and yet more room for improvement.

Generally speaking, Arab countries were not immune to the unprecedented global challenges globally brought by the COVID-19 pandemic, and the governance indicators have been impacted in various ways. Governments had to respond rapidly to the health crisis, which have influenced the indicators related to government effectiveness and regulatory quality. Economic strains and the diversion of resources to address the pandemic have also affected indicators of control of corruption and rule of law.

By 2021, some Arab countries have initiated governance reforms in response to the lessons learned from the pandemic and the changing global landscape. These reforms included efforts to strengthen transparency, accountability, and the rule of law. Countries that effectively managed the pandemic's impact on governance have seen improvements in indicators related to government effectiveness and regulatory quality. On the other hand, ongoing conflicts or political transitions continue to affect indicators like voice and accountability, and Rule of Law.

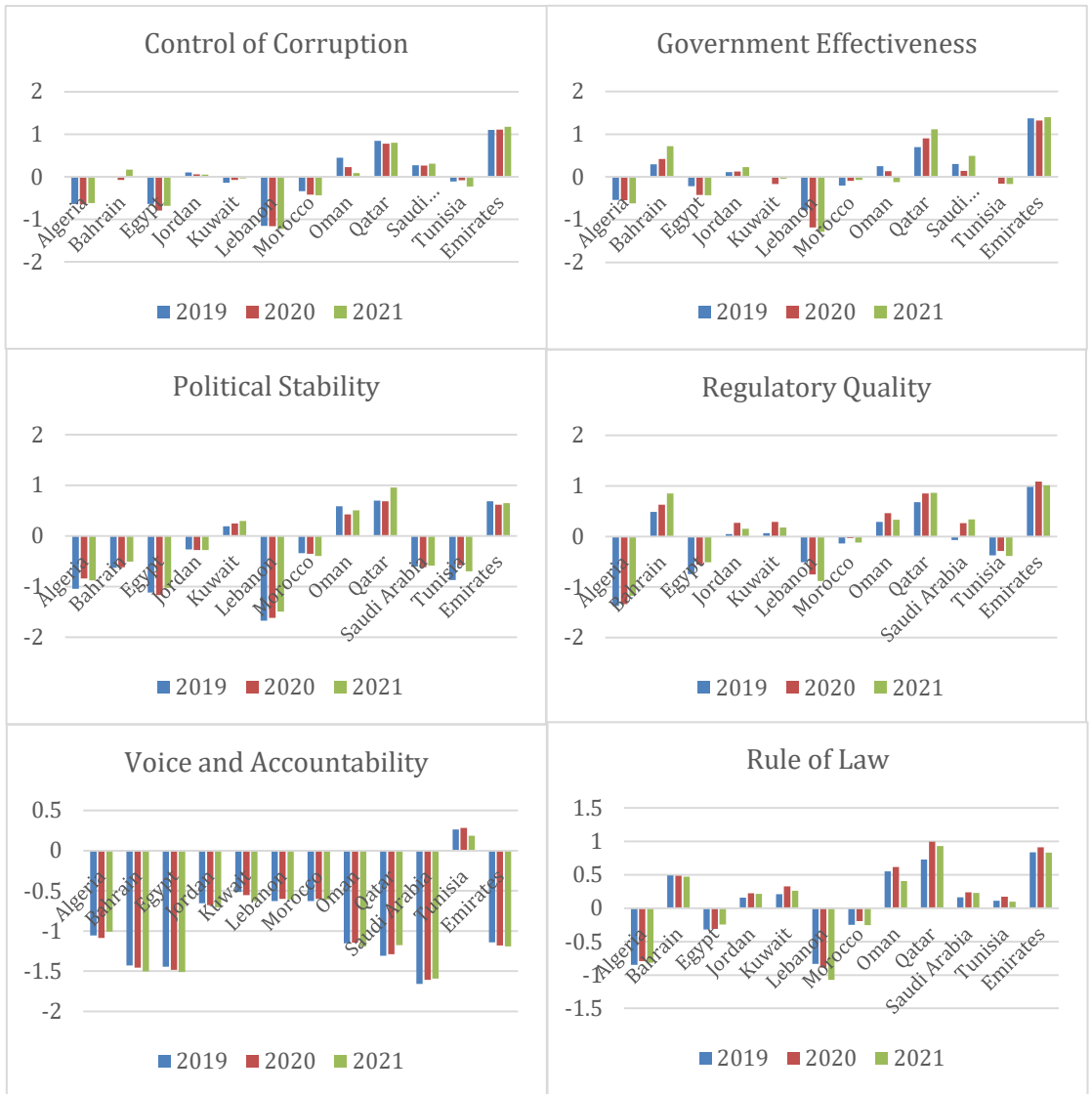


Figure 4: WB Governance Indicators in Selected Arab Countries

Source: made by author based on Portulans Institute reports, WB Governance Indicators dataset, and World Bank Development Indicators datasets

The interlinkages between the three dimensions of the study could be analysed by the help of figure five. The three panels of the figure show an upward trend between the three variables. This suggests an important interconnected dynamic. Good governance can indeed act as a channel to facilitate and enhance the positive impact of digitalization on economic growth.

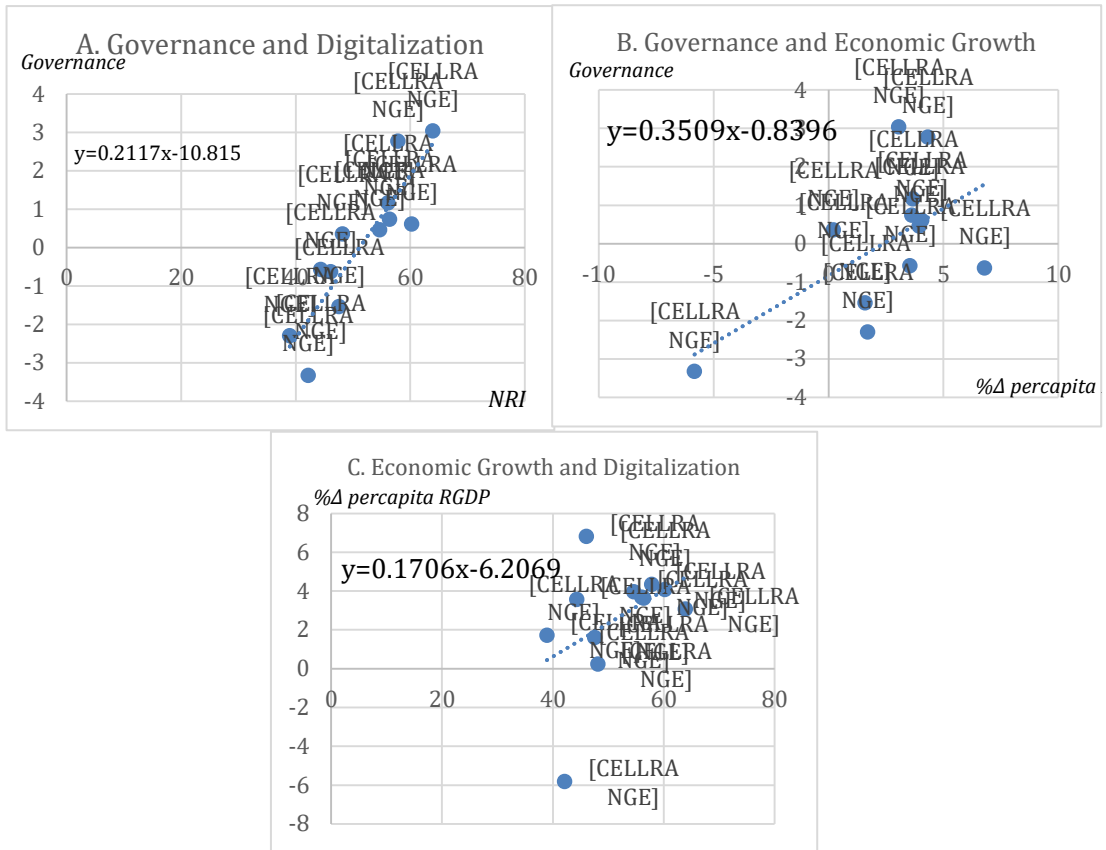


Figure 5: Governance, Economic Growth and Digitalization in Selected Arab Countries in 2021

Source: made by author based on Portulans Institute reports, WB Governance Indicators dataset, and World Bank Development Indicators datasets.

Panel A demonstrates a positive relation between digitalization and governance. This suggests that as digitalization efforts increase within Arab countries, there is a concurrent improvement in governance practices. This alignment implies that countries with more proactive and forward-looking governance structures are better equipped to

embrace and harness the benefits of digitalization. Despite of the low performance of the Arab countries in many aspects of governance, the ongoing reforms and the potential room for improvements carry with it promising gains associated with governed digital structures.

Panel B highlights a crucial dynamic that has far-reaching implications for the region's development. This observation suggests that countries with stronger governance structures are more likely to experience higher levels of economic growth. Transparent, stable governance fosters investor confidence, efficient resource allocation, policy consistency, and regulatory ease, all of which encourage business activity and long-term investment. This correlation features the significance of the ongoing governance reforms in promoting economic growth, encouraging innovation, and ensuring a stable environment for businesses to thrive.

The positive relationship observed in panel C between economic growth and digitalization aligns well with the positive correlations demonstrated in the other scatter plots between digitalization and governance, as well as governance and growth. These interconnected relationships emphasize a reinforcing cycle that can contribute significantly to the region's development, supports the theoretical hypothesis of the study, and aligns well with the limited-empirical studies that examined the hypothesis in a way or another (Labhard and Lehtimäki, 2022; Nguyen, 2021).

In conclusion, descriptive data analysis obtained through the three scatter plots in figure four reveal a positive relationship between digitalization, governance, and economic growth in Arab countries. This primary conclusion highlights the interconnectedness of those three factors in shaping the region's technological and economic trajectory. It emphasizes the potential for effective governance to create an enabling environment for digital innovation, adoption, and growth.

This can in turn provide great opportunities to reap the promised benefits of digitalization in enhancing the economic environment in those countries. Policymakers can draw insights from those relationships to guide strategic decisions that promote both digitalization and governance reforms for a more prosperous future.

The coming section presets the empirical estimation of the study, to further investigate the anticipated relationships using more formal econometric techniques.

4. Data and Model

The objective of this section is to empirically complement the analysis of the relationship between digitalization and economic growth, in the context of governance. A panel data analysis is employed for 12 Arab Countries¹, during the period (2018-2021).

4.1 Data

Given the hypothesis of the study, there was a need to construct a composite index of governance indicators that captures the six dimensions of the World Bank governance indicators², *which are one of the widely agreed upon measures of governance*.

Accordingly, the study employed the Principal Component Analysis (PCA) to construct a single composite measure of governance, instead of using separate ones. This allows for several advantages particularly when incorporating the constructed index into the econometric model (BasuMallick, 2023):

- **Dimension Reduction:** reducing the dimensionality of data from six separate indicators to a single indicator that capture most of the variance in the original data. This reduces multicollinearity in the econometric model that can arise when using highly correlated variables.
- **Simplification:** Working with a smaller number of indicators, that still capture the underlying dimensions of governance, simplifies the interpretation and analysis of the results.

¹ The set of Arab Countries for which the Network Readiness Index is available during the time period are: Algeria, Bahrain, Egypt, Jordan, Oman, Kuwait, Tunisia, Morocco, Saudi Arabia, United Arab Emirates, Lebanon and Qatar.

² The six World Bank Governance indicators are: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

- **Avoiding Weights Selection:** Constructing a composite indicator involves assigning weights to individual indicators. PCA automatically determines the weights based on the variance explained by each principal component. This reduces subjectivity in the weighting process and minimizes the potential for bias.
- **Mitigating Noise:** Sometimes, individual indicators may have noise or measurement errors. PCA can help reduce the impact of noise by focusing on the underlying patterns in the data rather than individual variations.
- **Model Stability:** The composite indicator obtained through PCA is often more stable over time than individual indicators, as it captures the common underlying trends in the data rather than short-term fluctuations.
- **Reducing Overfitting:** In econometric modeling, using a large number of variables can lead to overfitting, where the model performs well on the training data but poorly on new data. Using PCA can help reduce the number of variables while retaining the most relevant information.

Similarly, the choice of the explanatory variable to account for the level of digitalization across the different countries is of utmost importance for the significance and the reliability of the results. The paper chose the Network Readiness Index (NRI) as a measure of the Digital Economy due to its comprehensive and multidimensional approach in assessing digitalization's impact on economies.

Unlike singular indicators that might focus solely on access to technology or internet penetration, the NRI offers a holistic evaluation of a country's readiness to leverage digital technologies for economic growth. It considers factors such as infrastructure, affordability, skills, and usage patterns, providing a more nuanced understanding of a nation's digital capabilities. This multidimensional nature of the NRI allows for a deeper analysis of the various aspects that contribute to a thriving digital economy.

By incorporating a diverse range of indicators, the NRI captures the intricate interplay between technological adoption, human capital development, and policy environment, offering a richer perspective on

a country's digital transformation journey compared to indicators that focus solely on singular aspects of digitalization. This makes the NRI a robust and insightful tool for assessing and comparing the readiness of economies to harness the opportunities presented by the digital age.

Starting from 2028, the methodology of calculating the index and its sub-components changed; therefore, to ensure the reliability of the index and the consistency of measurement, the time period of the study is limited to the period of 2018 to 2021.

Indicators used in the panel data model are summarized by table (1) which presents the rationale behind using the variables, together with summary statistics for each variable:

Table 1: Data Selection and Summary Statistics

Indicator	Rationale for incorporating	Mean	Standard Deviation	Min	Max
Dependent Variable					
% change in per capita RGDP	Measure of Economic Growth (Zhu et al., 2023; Zhang et al., 2022; Gomes et al., 2022; Mura, 2023)	- 0.183 5	5.150	- 19.74 8	7.702
Explanatory Variables					
NRI	Chosen measure of Digital Economy Expected sign: positive	50.46 9	8.645	35.1	65.64
Governance	The constructed composite index from the six WB Governance indicators Expected sign: positive	0.00	1.704	-3.335	3.033
Control Variables					
% change in CPI	Measure of Inflation: to account for the broader economic context: High levels of inflation can distort real economic growth. Inclusion of inflation as a control variable helps ensure that any observed relationship between the digital	11.93 0	34.324	- 2.540 3	171.2

	economy and economic growth is not being driven by changes in general price levels. (Zhang et al., 2022; Mura and Donath, 2023) Expected sign: negative				
Unemployment	To account for its impact on the overall economic situation and labor market stability. It can influence consumption, investment, and economic policies, thereby affecting both the digital economy and economic growth (Zhang et al., 2022) Expected sign: negative	7.662	5.802	-0.095	19.21
Age Dependency Ratio	To account for the demographic impact on the digital economy and resilience. This ratio affects the labor force, consumption, and social policies, influencing the economy's capacity to adapt to digital transformations and economic stability (El Gendy and Hanafy, 2022) Expected sign: negative	43.56 0	14.482	18.71 0	61.218
Population	To account for its impact on market size and demand, its influence on the labor force and innovation, its effect on resource allocation and economic equilibrium, as well as its impact on consumer behavior and government policies, incorporating this variable enhances the explanation of the relationship between the digital economy and economic growth. (Zhang et al., 2022; Mura and Donath, 2023) Expected sign: positive	2.30	2.97	14632 65	111,000, 000

Note: NRI is downloaded from Portulans Institute Reports, Governance is constructed using the WB Governance Indicators dataset, and the control variables are extracted from the World Bank Development Indicators.

4.2 Model

The methodology employed in this study, is based on the approach outlined in Zhang et al. (2022), which adopts Panel Data Analysis to examine the relationship between economic growth (the rate of change in per-capita real GDP), as a dependent variable, and various control variables including population, inflation, unemployment, and dependency rates. These control variables mainly reflect the demographic characteristics of the country, in addition to the general price level.

Additions of foremost significance are apparent in this current study. This is reflected by: *first*, the usage of the Network Readiness Index as an international measure that enables the comparison of the extent of economic digitization, with its various aspects, across different countries. *Second*, adding the dimension of governance, to examine its effectiveness as a supplementary tool allowing countries to reap the benefits of digitalization, together with constructing the composite governance indicator. *Third*, estimating the relationship by applying on Arab Countries, which has received less attention in the literature compared to other developed and Emerging Countries.

It is worth noting is that the model was also estimated using the rate of change in real GDP as the dependent variable, and the model's results remained unchanged, indicating result stability. Results are reported for per capita RGDP.

4.3 Discussion of Results

The analysis starts with conducting a Hausman Test to select between the Fixed Effects Model and the Random Effects Model based on the data characteristics and the nature of the relationship between the different variables. The test results (the p-value is 0.000) indicate a preference for the Fixed Effects Model.

When the p-value is very small (less than 0.05 at a 95% confidence level), it suggests the necessity of rejecting the null hypothesis (H0), which assumes no association between the unobserved individual

effects and the independent variables (the fundamental assumption of using the Random Effects Model). Thus, the appropriate model becomes the Fixed Effects Model. Table (2) presents the results of the FE model.

Table 2: Results of FE model

Dependent Variable: % change in Per Capita RGDP	
NRI	0.9935
	(0.017)**
Governance	8.822
	(0.083)*
Inflation	0.060
	(0.076)*
Unemployment	-3.961
	(0.000)***
Age Dependency	1.268
	(0.051)**
Population	0.000
	(0.142)
Constant	-35.032
No. of observations	48

Note: P-value between brackets, *, **, *** indicates 90%, 95%, and 99% significance levels respectively.

The model's results indicate a positive relationship between the digital economy index and the economic growth rate (at 95% significance level). This means that as a country's digital economy advances, its economic growth rate increases. A one-point increase in the NRI is linked to an average increase of 0.9935% in Per Capita RGDP growth. These findings align with the study's fundamental hypothesis, which posits that greater digital development in a country leads to increased economic growth rates and aligns well too with the results obtained from the descriptive analysis of the indicators.

This effect is justified by the channels through which the digital economy contributes to boosting a country's economic growth. These channels encompass productivity and economic activities, and effective resource allocation.

The positive relation between economic growth and digitalization is supplemented by the positive contribution of governance to economic growth, as suggested by the positive significant coefficient of governance- the PCA constructed governance indicator (at 90% significance level). On average, a one-unit increase in the composite governance indicator score is associated with an 8.822% increase in the % change of Per Capita RGDP

This result contributes to the main research question of the study, by concluding that governance could indeed be an asset that helps the merits of digitalization to be transmitted to an economic growing country. Good governance serves as a bridge between the potential of digitalization and its realization in terms of economic growth.

Through transparent decision-making, effective regulations, and strengthened institutions, governance enhances the impact of digital initiatives by encouraging trust, innovation, and collaboration. This symbiotic relationship between good governance and digitalization creates a foundation where technological advancements are harnessed to their fullest extent, resulting in higher economic growth rates and a more inclusive digital economy.

The relationship between good governance and the transmission of digitalization benefits to higher economic growth rates holds particular relevance for Arab countries due to several contextual factors. *Firstly*, many Arab countries are in the process of enhancing their digital infrastructure and adopting innovative technologies to diversify their economies and reduce dependence on oil. In this context, effective governance becomes essential to ensure that digital resources are allocated efficiently, regulations are clear, and intellectual property rights are protected, fostering a conducive environment for economic growth driven by digitalization.

Secondly, the region's diverse socio-economic landscapes and varying levels of development highlight the importance of good governance in

ensuring equitable access to the benefits of digitalization. Arab countries often face challenges related to inequality and social exclusion, making it crucial for governance practices to facilitate digital inclusion for marginalized communities. This entails creating policies that bridge the digital divide, providing equal opportunities for all segments of society to participate in the digital economy, thereby contributing to more balanced and sustainable growth.

Lastly, the global nature of the digital economy calls for effective governance frameworks that enable Arab countries to compete and collaborate on an international scale. Building trust and credibility through transparent governance practices can attract foreign investments and partnerships, thereby boosting the integration of Arab economies into the global digital ecosystem. By recognizing and addressing the unique challenges and opportunities in the region, good governance can play a pivotal role in steering Arab countries towards leveraging digitalization for resilient and inclusive economic growth.

Considering the relationship between economic growth and control variables, the relationship with inflation is positive and significant. This relation could be justified by referring to the context of Arab countries given factors such as high energy exports, infrastructure investments, expansionary monetary policies, supply-side constraints, population growth, and imported inflation. Oil revenue fluctuations, government spending on development, and increased demand due to economic expansion can contribute to rising prices. The expansion of the labor force, consumer base, and demand for imports, along with potential challenges in rapidly scaling up production capacities, can further amplify inflationary pressures.

As for the demographic characteristics, the results indicate a negative relationship between the unemployment rate and the economic growth rate. This suggests that a decrease in the unemployment rate corresponds to an increase in the economic growth rate. This outcome aligns with economic literature, as lower unemployment directly contributes to increased labor force participation, investment, consumption, savings, demand, and expenditure.

Surprisingly, concerning the dependency rate, a significant positive relationship is found. This unexpected result can be explained by examining the demographic and population characteristics of Arab countries. Many Arab nations are currently experiencing a demographic transition characterized by declining birth rates and increased life expectancy. This leads to a temporary rise in the dependency ratio, where a significant portion of the population comprises both young and elderly individuals. As these countries progress through this demographic transition, there might be a period where the working-age population constitutes a smaller proportion of the total population.

This scenario can coincide with economic growth, as the working-age population becomes more productive. Another contributing factor is the substantial reliance on migrant labor in many Arab countries, with these workers often sending remittances back to their home countries. This financial inflow can contribute to economic growth. Therefore, the positive relationship between the dependency rate and economic growth might reflect the impact of remittances from working-age individuals residing abroad.

Considering the relationship between economic growth rate and population, the results indicate a non-significant relationship. This outcome can also be explained by the variation in population counts among the diverse Arab countries included in the sample, ranging from countries with growing populations like Egypt, Algeria, and Morocco, to countries with lower populations like Kuwait, Qatar, and Bahrain. Thus, this population disparity could influence the significance of the relationship.

5. Conclusion and Policy Implications

In conclusion, this paper sets out to investigate the interplay between economic growth, digital economy, and governance within the context of Arab countries, aiming to determine whether good governance acts as an asset that facilitates the translation of digitalization benefits into higher growth rates. Employing a panel data analysis approach on a dataset of Arab countries over the period of 2018-2021, the study's objectives were successfully addressed.

The findings of this study shed light on significant and positive relationships between economic growth and both the digital economy and governance. The positive association between economic growth and the digital economy highlights the pivotal role that digitalization plays in fostering economic expansion within the Arab region. This underscores the importance of investment in digital infrastructure, innovation, and technological advancements to fuel growth.

Moreover, the positive link established between economic growth and governance corroborates the hypothesis that effective governance acts as an enabler, allowing countries to harness the advantages of digitalization for higher growth rates. This reaffirms the role of transparent decision-making, regulatory clarity, and efficient resource allocation in creating an environment that maximizes the impact of digital initiatives on economic development.

The implications of these results extend to policy considerations for Arab countries. Recognizing the positive nexus between economic growth, the digital economy, and governance, policymakers should prioritize initiatives that enhance both digital readiness and governance frameworks. Strategies aimed at fostering innovation, expanding digital infrastructure, and ensuring equitable access to technology can collectively contribute to stronger economic growth.

Furthermore, strengthening governance practices through transparent regulations, effective enforcement of intellectual property rights, and anti-corruption measures will play a vital role in optimizing the benefits of digitalization. By strategically aligning policies that promote digital transformation with effective governance structures, Arab countries can position themselves to seize the full potential of digitalization, promoting sustained and inclusive economic growth in the years ahead.

This study's findings paint a promising picture for Arab countries leveraging digitalization for economic growth. The young and tech-savvy population presents a potent force for innovation, further amplified by existing government initiatives and regional collaboration efforts. Strategic investments in educational programs fostering digital skills and tech entrepreneurship can cultivate this talent pool. Sharing best practices and knowledge exchange amongst Arab nations can

accelerate their digital journey, while regional collaboration in governance development and unified standards can attract foreign investment and create a robust digital ecosystem.

However, navigating the digital transformation path necessitates addressing existing challenges. The persistent digital divide, with disparities in internet access and affordability, risks excluding large segments of the population from the benefits of digitalization. Targeted programs aimed at bridging this gap, through subsidized access initiatives and digital literacy programs, are crucial. Additionally, the limited innovation ecosystem necessitates further investment in research and development, venture capital, and startup incubation programs. Tax incentives and facilitating technology transfer can fuel domestic innovation and ensure access to cutting-edge solutions. Finally, tackling governance concerns like corruption, bureaucratic inefficiencies, and lack of transparency is vital. Implementing anti-corruption measures and enhancing transparency in government processes will foster trust and attract investment. Only by addressing these challenges can Arab countries fully unlock the potential of digitalization for sustainable and inclusive economic growth.

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التحول الرقمي والنمو الاقتصادي في الدول العربية في ظل الحكومة الرشيدة خلال الفترة (2018-2021)

د.هايدي علي فهمي

ملخص البحث باللغة العربية

يدرس هذا البحث العلاقة بين النمو الاقتصادي والاقتصاد الرقمي والحكومة في الدول العربية، ويبحث عما إذا كانت الحكومة الرشيدة تدعم من الأثر الإيجابي للتحول الرقمي على النمو الاقتصادي. من خلال تحليل بيانات زمنية مجمعة للفترة 2018-2021، تكشف الدراسة عن روابط مهمة وإيجابية بين النمو الاقتصادي والاقتصاد الرقمي وجودة الحكومة. ويسلط البحث الضوء على الدور المحوري للتحول الرقمي في تعزيز النمو الاقتصادي ويؤكد على الحاجة إلى الاستثمارات في البنية التحتية الرقمية والابتكار. بالإضافة إلى ذلك، يُشدد على الارتباط الوثيق بين النمو الاقتصادي والحكومة الفعالة، مما يشير إلى أن صنع القرار الشفاف وتخصيص الموارد بكفاءة يعززان من فوائد المبادرات الرقمية للتنمية الاقتصادية. وتوصي النتائج صانعي السياسات بإعطاء الأولوية لتعزيز التحول الرقمي والحكومة الرشيدة، وتعزيز الابتكار والوصول السريع والفعال إلى التكنولوجيا، مما يمهد في النهاية الطريق لتحقيق نمو اقتصادي مستدام وشامل في الدول العربية.

الكلمات الدالة: النمو الاقتصادي – التحول الرقمي – الحكومة الرشيدة – الدول العربية – كفاءة المؤسسات

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