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MỐI TƯƠNG QUAN GIỮA CHÍNH PHỦ ĐIỆN TỬ VÀ CHẤT LƯỢNG QUẢN TRỊ TRÊN THẾ GIỚI

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Tóm tắt

Bài viết xem xét mối tương quan giữa Chính phủ điện tử và quản trị tốt, sử dụng dữ liệu từ Chỉ số Phát triển Chính phủ Điện tử của Liên hợp quốc (EDGI) và Chỉ số Quản trị Toàn cầu của Ngân hàng Thế giới (WGI) cho 193 quốc gia từ năm 2012 đến năm 2022. Nhóm nghiên cứu sử dụng kiểm nghiệm nhân quả Granger và mô hình hồi quy dữ liệu bảng để phân tích mối quan hệ giữa hai biến kể trên và các khía cạnh của chúng. Kết quả cho thấy Chính phủ điện tử có tác động tích cực nhưng tương đối nhỏ đến quản trị tốt. Bài viết cũng thảo luận về ý nghĩa của những phát hiện này đối với chính sách trên thực tiễn, cũng như những hạn chế và hướng nghiên cứu trong tương lai.

Từ khóa: chính phủ điện tử, quản trị, EDGI, WGI, ICT, sự tương quan

ON THE CORRELATION OF E-GOVERNMENT AND GOOD GOVERNANCE IN THE WORLD

Abstract

The paper examines the correlation between E-government and good governance, using data from the UN E-Government Development Index (EDGI) and the World Bank Worldwide Governance Indicators (WGI) for 193 countries from 2012 to 2022. We employ Granger causality tests and panel data regression models to analyze the relationship between the two concepts and their dimensions. The

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results show that E-government has a positive but relatively small impact on good governance. The paper also discusses the implications of these findings for policy and practice, as well as the limitations and directions for future research.

Keywords: E-Government, governance, EDGI, WGI, ICT, correlation

1. Introduction

In an era marked by remarkable advancement of technology, the integration of electronic government (also called E-government) has emerged as a transformative force, undoubtedly reshaping the landscape of public administration and governance worldwide. The concept of electronic government has significantly altered the landscape of transparency regulations and the broader spectrum of global governance. This paradigm shift reflects a force that has not only redefined the dynamics of government operations but has also ushered in a new era wherein technological advancements play a central role in shaping the principles and practices of transparency laws and the framework of global governance (Relly & Sabharwal, 2009). By 2011, almost every country in the United Nations (UN) had started implementing e-government programs at different levels of progress. E-government rankings, similar to well-known indices like the Human Development Index (HDI) and the Gini coefficient, play a role in describing the conditions within a country.

The relationship between E-government and governance has been carefully investigated for a long time. Governance includes principles advocating for accountability, transparency, participation, and adherence to the rule of law in the operations of governmental institutions (Elahi, 2009). E-government, therefore, is seen as a tool to improve productivity and efficiency in internal administration and to increase responsiveness to the public. The goal of E-government, which is unanimously agreed upon, is to attain better transparency and eventually achieve good governance.

E-Government Development Index (EDGI) and the Worldwide Governance Indicators (WGI) are integral components of the discourse surrounding the evaluation of administrative and governance frameworks within a nation-state. These metrics serve as quantifiable benchmarks for assessing the efficacy of e-government implementations and the overall quality of governance practices, respectively. In the context of this study, we aim to evaluate the complex relationship between E-Government and Good Governance by using data gathered from many countries from within 5 recent years from 2012 to 2022 to build a model which takes into account certain factors and tests them.

The paper is organized as follows. The following section offers a literature review on the identified problem. Following this, the methodology and framework section will outline our research model, hypothesize the tests to be conducted. Subsequently, we will analyze the findings, and the concluding section will discuss both the results and their policy implications.

2. Literature review

Since the 1990s, developed nations such as the United States and Britain have actively endorsed E-government as a crucial approach to enhance national competitiveness and foster government innovation. The term "E-government" was initially introduced by the US in 1993, and during the Clinton administration, there was a focus on leveraging information technology for government reinvention through business process reengineering. Similarly, under Prime Minister Tony Blair, the UK embraced E-government initiatives, emphasizing citizen-centered innovation as part of the broader Modernizing Government agenda (UK Modernising Government White Paper, 1999). Simply put, E-government can be defined as the use of ICTs (information and communication technology) to enhance the efficiency of government service delivery to its people (United Nations, 2005). The main goal of E-government is to modernize traditional government models for the knowledge and information age. It focuses on restructuring government to meet the needs of a modern society, prioritizing citizen services, efficiency, and accountability (Choi and Lee, 2004).

The definitions of governance, however, can significantly differ, particularly when considering perspectives from various international organizations. The OECD, for instance, defines governance as the utilization of political authority and the exertion of control within a society concerning the management of its resources for social and economic development. In 1994, however, World Bank regarded governance as the manner in which power is exercised in a country, managing all the economy and social resources, and this definition has been widely accepted ever since.

Numerous studies have explored the relationship between e-governance and good governance. The authors have examined how these concepts interrelate and influence each other bidirectionally, highlighting contributions and identifying limitations.

According to Suhardi, S., Sofia, A., & Andriyanto, A. (2015), there is a relatively weak correlation between e-government implementation and the attainment of good governance. In the majority of cases examined, there was only a moderate positive correlation, with no significant connection observed. This outcome is likely due to a lack of focus on goal achievement in the assessments. Jameel, A., Asif, M., & Hussain, A. (2019), in their assessment of the effect of E-government on governance in Pakistan, they confirmed the casual relationship between public trust and good governance. Moreover, it showed that e-government serves as a mediator in the connection between good governance and public trust. These findings hold practical significance for both research and policymaking, as they delve into citizens' viewpoints on good governance, public trust, and e-government. In another case, Basyal, D. K., Poudyal, N., & Seo, J. (2018) empirical research using global panel data from 176 countries covering the period from 2003 to 2014 showed strong evidence for the positive impact of E-government on a country's government effectiveness, political stability and economic status. Lastly, Akpan-Obong, P., Trinh, M. P., Ayo, C. K., & Oni, A. A. (2022) research suggests that while ICTs contribute to government objectives, their effectiveness is maximized when integrated with existing governance institutions. This study enhances our comprehension of development and governance by offering real-world insights into the potential and constraints of ICTs in government administration, particularly in geopolitical contexts with resource constraints.

In all the aforementioned research, despite potential variations in end results, a consistent finding emerges – the positive impact of E-government on the quality of governance. The consensus across these studies is that E-government plays a crucial role in positively influencing governance quality, even though nuances exist in their specific findings. While the collective evidence suggests a positive relationship between E-government and governance quality, the specific findings, contexts, and methodologies employed in these studies reveal gaps and nuances that warrant further exploration and consideration in future research.

3. Theoretical framework

3.1. E-Government Development Index (EDGI)

The E-Government Development Index evaluates how UN Member States use information technologies for accessibility and inclusion. It considers provision of online services, telecommunication connectivity and human capacity.

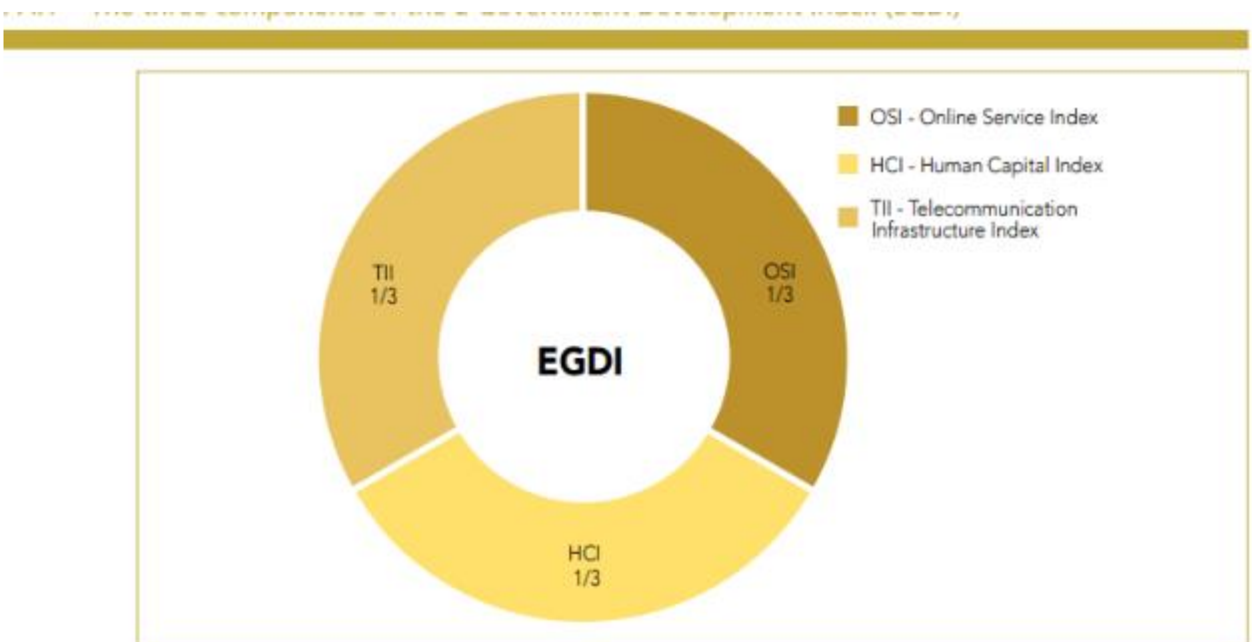

Figure 1: The three components of the E-Government Development Index (EDGI)

Source: UN E-Government Knowledgebase

Mathematically, the EGDI is a weighted average of three normalized scores on three most important dimensions of e-government, namely: (1) scope and quality of online services (Online Service Index, OSI), (2) development status of telecommunication infrastructure (Telecommunication Infrastructure Index, TII), and (3) inherent human capital (Human Capital Index, HCI). Each of these indices is a composite measure that can be extracted and analyzed independently.

EDGI = ⅓ (OSI normalized + HCI normalized + TII normalized)

There are 5 main subindices of OSI or Online Services Index, each is assigned a specific weight as follows:

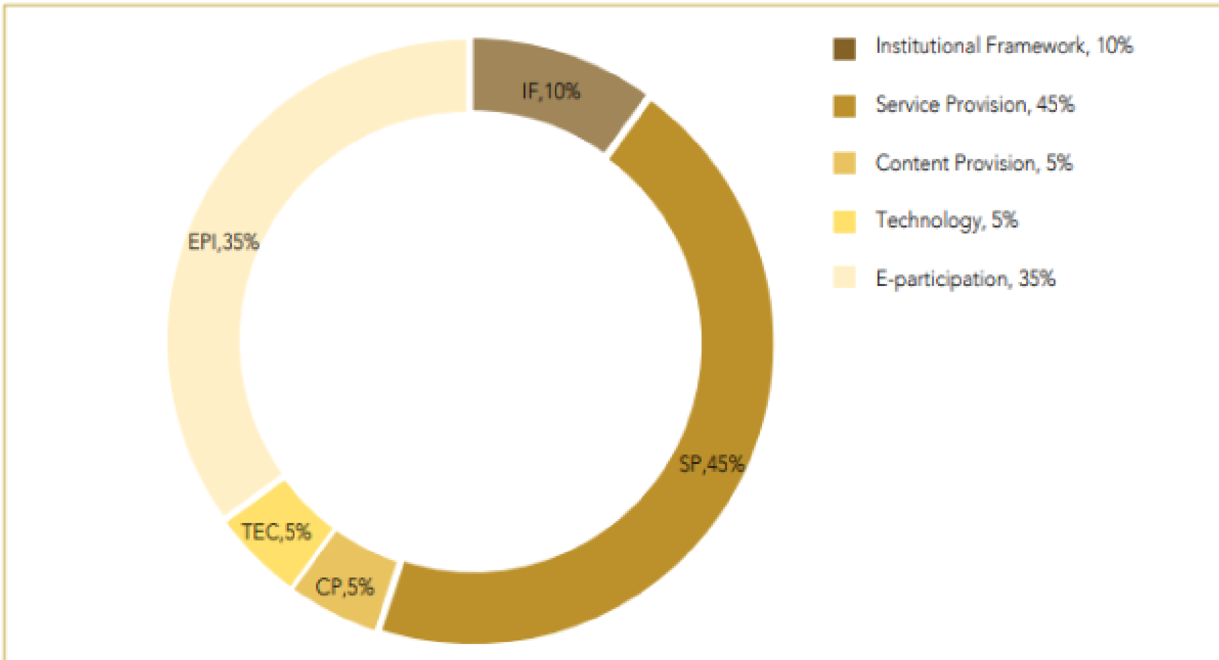

Figure 2: The five subindices of Online Services Index

Source: UN E-Government Knowledgebase

Within 0 to 1 range of EGDI values the countries are then grouped into four levels mathematically defined as follows: very high EGDI values range from 0.75 to 1.00 inclusive, high EGDI group values range from 0.50 to 0.7499 inclusive, middle EGDI values range from 0.25 to 0.4999 inclusive, and low EGDI values range from 0.0 to 0.2499 inclusive.

3.2. Worldwide Governance Indicators (WGI)

The Worldwide Governance Indicators (WGI), on the other hand, serve as a tool for researchers and analysts to evaluate general trends in how governance is perceived in different countries and its evolution over time. The WGI compiles information from over 30 reputable think tanks, international organizations, non-governmental organizations, and private firms globally. The WGI features six aggregate governance indicators for over 200 countries and territories over the period 1996–2022, and as these indicators share a common scale and are gathered collectively, the mean value of the six indicators was computed and employed as a substitute for the overall quality of governance. Each indicator holds equal importance in determining this average value, we can finalize the formula as follows:

$$\mathbf{WGI = \frac{1}{6} (VA + PS + GE + RQ + RL + CC)}$$

In which:

VA: Voice and accountability, which captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

PS: Political Stability and Absence of Violence/Terrorism assesses perceptions regarding the probability of political instability and/or politically motivated violence, including terrorism.

GE: Government effectiveness evaluates perceptions of public service quality, civil service excellence, its independence from political influence, policy formulation and implementation.

RQ: Regulatory quality assesses perceptions of the government's capability to create and enforce effective policies and regulations that encourage private sector development.

RL: Rule of law measures perceptions of individuals' confidence in and adherence to societal rules, particularly focusing on the quality of contract enforcement, property rights, law enforcement, and the judicial system, along with the probability of crime and violence.

CC: Control of corruption evaluates perceptions regarding the degree to which public authority is used for personal benefit, encompassing both minor and major forms of corruption. It also includes the influence of elites and private interests in "capturing" the state.

3.3. Hypotheses

From the theoretical framework, we pose the following hypothesis:

H1: Is there a correlation between the two indicators (EDGI and WGI)? If so, is there a causal relationship between the two indicators as well?

The result of this hypothesis will help us pinpoint the exact type of relationship between the two variables and better interpret the result.

H2: What is the impact of the dimensions of EDGI on WGI and vice versa?

After determining the relationship of the two indicators, we will investigate the impact of the smaller dimensions to better evaluate the effect of individual factors influencing the two major indices.

4. Methodology

4.1. Data and Variable

The data for EDGI indicators is sourced from the United Nations' UN E-Government Survey covering the timeframe from 2012 to 2022. The dataset encompasses information from 193 registered countries globally. However, since data points are available only for even years within this period, namely 2012, 2014, 2016, 2018, 2020, and 2022, we have only chosen these 6 years in our research.

As for the good governance indicators, data is gathered through the World Bank's Worldwide Governance Indicators. To address the time variable gap in the EDGI indicators database, particularly the one-year interval between data points, we have chosen to include only the years 2012, 2014, 2016, 2018, 2020, and 2022 in our database.

4.2. Testing Granger causality

To determine the relationship between EDGI and MWGI, Granger causality was tested. In a bi-variate framework, if the first time series variable X "Granger-causes' ' the second time series variable Y, it means that the past values of X provide statistically significant information about future values of Y, beyond the information contained in past values of Y alone. Granger causality does not imply "true causality", it implies "temporally related". The bivariate linear autoregressive model of two variables:

$$Y_t = \alpha + \sum_{k=1}^{K} \gamma k Y_{t-k} + \sum_{k=1}^{K} \beta k X_{t-k} + \varepsilon_t \quad \text{with } t = 1.., T$$

where et is error term, X and Y are time series variables, t is time and k are the lags order. We assume that both the autoregressive coefficients, denoted as γ,and the regression coefficient slopes, denoted as β, remain constant for all k in the range of $k \epsilon [1;K]$. Additionally, it is assumed that the autoregressive coefficients are the same across all individuals, while the regression coefficient slopes may vary on an individual basis. This forms the fundamental structure for applying Granger causality in the context of panel data.

The flaw of the model is that it can only test whether X affects the future value of Y, but not vice versa. In testing Granger causality, we conducted a test for all combinations of EDGI and MWGI:

(X, Y) = (EDGI, MWGI); (MWGI. EDGI)

From the model above, according to Granger causality, the H0 hypothesis is that X does not have an impact on Y. Therefore, if one or more estimated coefficients of the lagged variable X have a statistically significant impact on Y, we have a basis to reject H0 and conclude that X has a Granger causal effect on Y.

4.3. Regression Model

Following the identification of the correlation between EDGI and WGI, the next step involves assessing and estimating the impact of specific factors on both indices. The pooled ordinary least squares (OLS) regression analysis entails applying a linear regression model using the OLS method to a condensed form of the panel dataset. This model operates under the assumption that there are no individual-specific or time-related effects, implying that all entities within the dataset are presumed to share common underlying characteristics.

$$y_{it} = \alpha + \beta_{0_{x_{it}}} + \dots + \varepsilon_{it}$$

Despite the presence of unobserved heterogeneity, the pooled ordinary least squares (OLS) method is employed for an initial examination of the positive or negative impact between variables. Additionally, this approach serves to test for potential issues of multicollinearity among the variables.

4.4. Linear Panel Data Regression

The utilization of the pooled OLS is insufficient for drawing conclusions regarding unobserved heterogeneity and endogeneity. Additionally, it fails to address concerns related to the interference of time and individual dimensions in econometric results. Therefore, after initiating the analysis with a simpler model, a linear panel data regression model was adopted to evaluate the impact.

The selection of a linear panel data regression model is motivated by its effectiveness in accounting for both individual-specific effects and time-related effects. This choice allows for a more robust assessment of the influence of independent variables on dependent variables compared to a cross-sectional regression analysis. Furthermore, employing a linear panel data regression analysis helps alleviate potential challenges associated with multicollinearity and biases in the estimation process.

$$y_{it} = \alpha + \beta_{0} x_{it} + \ldots + u_i + \varepsilon_{it} \quad i \in N, t \in T$$

In the equation above, y_{it} represents the dependent variable, either the dimensions of governance or the e-governance index. β_{0} is the estimated coefficient and x_{it} represents the independent variable (EGDI or WGI indicators) depending on the dependent variable Additionally, u_i is the unobserved characteristics and ε_{it} is the idiosyncratic error. The regression analysis for panel data offers estimations through Fixed Effects (FE) or Random Effects (RE) models. To determine the preferable model among FE and RE for all instances, the Hausman test is employed. FE is computed using the least squares dummy variable method, while RE is derived through the generalized least squares method, as outlined by Hausman in 1978. Moreover, it is essential to conduct tests and address errors arising from heteroscedasticity and autocorrelation in the linear panel data regression model. The Fixed Effect model (FE) is mainly used for effect estimates in this research as it is more suitable for our model according to the Hausman test. For the test of autocorrelation and heteroskedasticity, the Woolridge test and the Wald test were used, respectively.

Finally, correlation analysis serves as a crucial statistical inference by quantifying the linear relationship or extent of association between two continuous variables. The estimation of correlations between EGDI, WGI, and individual factors was carried out through Pearson correlation analysis at 5% level of significance.

5. Results

5.1. Descriptive statistics

The details about all the variables, including their Obs (number of observations), Mean (average value), Std. Dev. (standard deviation), Min (minimum value), Max (maximum value) is shown in the table below:

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
EDGI	1158	.535	.221	0	.976
EPI	1158	.443	.288	0	1
OSI	1158	.496	.265	0	1
HCI	1158	.678	.2	0	1
TII	1158	.433	.267	0	1
CC	1158	-.074	.997	-1.937	2.403
GE	1158	-.076	.99	-2.439	2.285
PSNV	1158	-.075	.983	-2.996	1.669
RQ	1158	-.086	.984	-2.527	2.226
RL	1158	-.079	.988	-2.418	2.125
VA	1158	-.047	1.001	-2.259	1.775
MWGI	1158	-.073	.908	-2.248	1.867

Source: STATA

5.2. Pearson Correlation

To begin, we used the Pearson correlation analysis to estimate the correlation between the variables.

Table 2: Pearson Correlation result

	EDGI	OSI	HCI	TII	CC	GE	PSNV	RQ	RL	VA	MWGI
EDGI	1.0000										
OSI	0.9007*	1.0000									
HCI	0.8541*	0.6319*	1.0000								
TII	0.9312*	0.7562*	0.7410*	1.0000							

CC	0.6994*	0.5786*	0.6128*	0.6941*	1.0000						
GE	0.8154*	0.7080*	0.7122*	0.7784*	0.9123*	1.0000					
PSNV	0.5226*	0.3302*	0.5890*	0.5175*	0.7580*	0.7176*	1.0000				
RQ	0.8013*	0.7261*	0.6541*	0.7682*	0.8630*	0.9232*	0.6472*	1.0000			
RL	0.7440*	0.6229*	0.6604*	0.7255*	0.9407*	0.9376*	0.7726*	0.9096*	1.0000		
VA	0.5627*	0.4364*	0.5439*	0.5491*	0.7753*	0.7236*	0.7021*	0.7554*	0.8007*	1.0000	
MWGI	0.7532*	0.6182*	0.6854*	0.7327*	0.9541*	0.9475*	0.8352*	0.9264*	0.9743*	0.8651*	1.000

Source: STATA

Note: All the value is adjusted at 5% level of significant

Most of the variables have a very high correlation with each other, notably the correlation between EDGI and MWGI being very high at (0.7532) but does not exhibit the problem of multicollinearity. Pairs of values that have a correlation value > 0.8 are due to them being directly related to each other (i.e a dimension in the indicator).

5.3. Granger Causality

Only when we have established the high correlation between the EDGI and MWGI could we begin to investigate the case of causal relationship between these two variables. For this task, The Granger causality is used.

Table 3: Result of Granger causality Test

	EDGI_X	MWGI_X
EDGI_Y	1.0000	0.0005
MWGI_Y	0.2725	1.0000

Source: STATA

Note: Granger causality was tested at 5% significance level and lag order 3.

Table 2 presents the results of the test of the hypothesis of causality for the relationship between two study variables EDGI and MWGI. The findings strongly support the null hypothesis H0, which posits that MWGI does not Granger-cause EDGI. Conversely, the null hypothesis H0, which states that EDGI does not Granger-cause MWGI, is dismissed.

5.4. Regression Analysis

In the previous section, we established that the causal relationship between EDGI and MWGI is unidirectional. To be more specific, only EDGI Granger-cause MWGI and not the other way around. Therefore, we decided to further investigate the relationship between the dimensions of EDGI and MWGI.

We derived the following regression model between the dimensions of EDGI and MWGI:

$$MWGI = \beta_{0} + \beta_{1}CC + \beta_{2}HCI + \beta_{3}TII + \varepsilon_{it}$$

Table 4: Pooled OLS

Linear regression

MWGI	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
OSI	.341	.101	3.39	.001	.143	.538	***
HCI	1.361	.13	10.50	0	1.107	1.616	***
TII	1.483	.115	12.85	0	1.257	1.709	***
Constant	-1.807	.065	-27.67	0	-1.935	-1.679	***

Mean dependent var	-0.073	SD dependent var	0.908
R-squared	0.586	Number of obs	1158
F-test	544.540	Prob > F	0.000
Akaike crit. (AIC)	2049.631	Bayesian crit. (BIC)	2069.849

**** p<.01, ** p<.05, * p<.1*

Source: STATA

According to the pooled regression analysis, all dimensions of EDGI are statistically significant at 1% level of significance and positively affect MWGI, with the most impactful variable being TII, though the impact is relatively small for all variables. The R-squared value is 0.586, meaning the independent variable can explain 58.6% of the sample variance in the dependent variable. The remaining 41.4% belongs to other factors affecting variables.

We also run the VIF (Variance Inflation Factor) test to test the problem of multicollinearity between the variables:

Table 5: Variance Inflation Factor

	VIF	1/VIF
TII	3.196	.313
OSI	2.4	.417
HCI	2.278	.439
Mean VIF	2.625	.

Source: STATA

The mean VIF value is 2.62, meaning the model has multicollinearity but the problem does not affect the regression analysis.

5.5. Linear Panel Data Regression

To tackle issues associated with endogeneity, unobserved variations, and potential interference from time-related effects in the econometric and statistical analysis, the linear panel data regression was adopted. Furthermore, to ascertain the suitable model specification—whether fixed effects or random effects is more appropriate for evaluating the data—the Hausman test was performed. According to the Hausman test, the fixed effects model is more suitable and is therefore chosen in this research. Fixed-effects models are favored because they offer enhanced control over unobservable factors among individuals, leading to more precise estimates, particularly when individual-specific characteristics are crucial and correlated with the explanatory variables (Wooldridge, 2001)

Panel data poses challenges related to issues like heterogeneous error variances (heteroscedasticity) and temporal dependencies (autocorrelation). Addressing these concerns effectively can be problematic for fixed effects (FE) regression models. To solve this issue, we employed the Wald test to test for heteroskedasticity and the Woolridge test to test for autocorrelation in the model. The result is that our model exhibits both issues. To correct the model, the regression with Driscoll-Kraay standard errors is used.

Table 6: Regression with Driscoll-Kraay standard errors

Method: Pooled OLS	Number of obs = 1158
Group variable (i): Country	Number of groups = 193
Maximum lag: 2	Prob > F = 0.0000
	F(3,5) = 2842.81
	R-squared = 0.5860
	Root MSE = 0.5853

MWGI	Coef.	Drisc/Kraay Std.Err.	t	P>t	[95%Conf.	Interval]
OSI	0.341	0.072	4.730	0.005	0.155	0.526
HCI	1.361	0.278	4.890	0.005	0.646	2.077
TII	1.483	0.325	4.570	0.006	0.649	2.317
_cons	-1.807	0.180	-10.040	0.000	-2.270	-1.344

Source: STATA

Overall, there is no change in the parameter estimates and the value of R-square and a small change in the p-value, although all variables remain statistically significant at significant level of 1%. TII is shown to be the most influential factor and is closely followed by HCI. OSI is shown to be the least influential factor.

6. Discussion

6.1. Results and discussion

H1: Is there a correlation between the two indicators (EDGI and WGI)? If so, is there a causal relationship between the two indicators as well?

In the context of this research, we have found a unidirectional causal relationship between EDGI and MWGI, that being EDGI Granger-cause MWGI. This finding implies that EDGI does have an impact on MWGI. Combining the Granger analysis and result of the Pearson correlation analysis, we conclude that these two indicators are closely linked to each other, and efforts made to improve EDGI can lead to improvements of MWGI.

This finding aligns with previous research that suggests a positive impact of E-government on governance quality. However, it also provides a more nuanced understanding by identifying the specific direction of causality, which contributes to the ongoing discourse in the field. The study's methodology offers a more proper approach to examining the relationship between E-government and good governance, thereby addressing some of the gaps identified in earlier studies. These include:

Direction of Causality: It establishes a unidirectional causal relationship between EDGI and WGI, which was not clearly defined in previous studies.

Methodological Rigor: Utilizing Granger causality tests and panel data regression models adds a level of statistical rigor that enhances the reliability of the findings.

Comprehensive Data: The study's use of data from 193 countries over a 10-year period offers a more comprehensive view than many prior studies.

Specific Dimensions: It examines the impact of individual dimensions of EDGI on WGI, providing a more detailed analysis of how different aspects of E-Government influence governance.

H2: What is the impact of the dimensions of EDGI on MWGI and vice versa?

Due to only having found a unidirectional causal relationship between EDGI and MWGI, this study will only investigate the impacts of the dimensions of EDGI on MWGI. Using Pooled OLS and the corrected Fixed Effects Model, we found the individual dimensions have a positive, but relatively small impact on MWGI. Therefore, to yield the greatest gain for MWGI, countries should focus on developing telecommunication infrastructure (TII) as it has the biggest impact on MWGI according to our results. Alternatively, nations around the world could focus on developing all aspects of EDGI to best improve good governance, should the budget allow it. For instance, countries with well-established telecommunications infrastructure (high TII scores) tend to demonstrate superior governance results, such as enhanced government effectiveness, regulatory excellence, and adherence to the rule of law. Improved connectivity fosters easier access to information, transparency, and citizen involvement, thereby positively influencing governance metrics. In a similar way to TII, an elevated Online Service Index (OSI) simplify administrative procedures, thereby fostering efficiency and accountability. Expanded availability of online information fosters transparency, potentially diminishing corruption and boosting governance metrics, thus increasing the effectiveness of MWGI. In the case of HCI, an high Human Capital Index (HCI) scores indicate improved education, healthcare, and workforce capabilities, and thus are frequently associated with superior governance results. Countries with excellent human capital typically demonstrate heightened government effectiveness, regulatory excellence, and adherence to the rule of law,all of which are dimensions of WGI.

6.2. The state of E-government around the world

As of the year 2022, the United Nations E-Government Data Center has categorized nations around the world into different groups based on their E-Government Development Index (EGDI). This index classifies countries into four main categories: Low E-Government Development Index (LEDGI), Medium E-Government Development Index (MEDGI), High E-Government Development Index (HEDGI), and Very High E-Government Development Index (VHEDGI).

According to the data, there are 7 countries in the Low E-Government Development Index (LEDGI) group, 53 in the Medium E-Government Development Index (MEDGI) group, 73 in the High E-Government Development Index (HEDGI) group, and 60 in the Very High E-Government Development Index (VHEDGI) group. Notably, the majority of countries worldwide fall into three primary categories: MEDGI, HEDGI, and VHEDGI, with the High E-Government Development Index (HEDGI) being the most populous group. This distribution highlights a global trend where nations are placing increasing emphasis on the development of E-government systems. The growing numbers in the HEDGI and VHEDGI categories indicate a widespread recognition of the benefits associated with effective E-government implementation. This shift suggests that countries are actively leveraging digital technologies to enhance governance, public services, and communication between citizens and the government. Our research aims to further explore the advantages of having a good E-government system.

7. Conclusion

The study establishes a positive correlation between E-Government and good governance, with E-Government having a unidirectional causal impact on good governance, suggesting that advancements in E-government can lead to improvements in governance quality. Moreover, the findings have highlighted the importance of telecommunication infrastructure as a key factor in enhancing governance indicators. This helps to understand the important role of E-government in promoting transparency, efficiency, and public participation in governance, thereby contributing to the overall improvement of administrative and governance frameworks within nations. However, there still exist limitations, such as the scope of data and the for more advanced and comprehensive models to fully understand the complex relationship between E-government and governance. We need to acknowledge the limitations of the current research that warrant further research.

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