

Moderation Effect of Digitalization and Governance Quality on Tourism Development

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Discipline: Tourism management and information systems

Keywords: Digitalization, Governance Quality, Tourism, Moderation effect

Research methodology: Cross-sectional panel data model analysis

Abstract:

This study explores the moderation effect of digitalization and governance quality on tourism development using cross sectional panel data for over 150 countries during the period 1995–2018. Employing governance quality as a moderator variable, the evidence argues that digitalization can lead to tourism development along with an increase of control variables like GDP per capita, price index, cultural and political stability etc. Even so, the primary estimation reveals a significant positive effect on tourism development in the presence of both composite and individual level of governance. In addition, marginal impact of digital adaptation is also found more vigorous impact with higher level of governance on international tourism.

Keywords: Digitalization, Governance Quality, Tourism, Moderation effect

1.0 Introduction:

Travel and tourism sector is considered as the key driver of economic and sustainable development for its social and economic potentials for both developed and developing countries. A vast range of literature have highlighted the impact of tourism on economic growth through reduction in poverty, creation of employment opportunities, and promotion of investments in both the physical and human capital etc. Subsequently, international tourism plays a vital role in cultural preservation, promotion of peace and security, tax revenue generation and export earnings throughout the world (Thommandru *et al.*, 2021). But the dominant research approach has been to investigate the demand side factors like national income, travel cost, relative price, historical and natural heritage etc. (Crouch, 1994; Lim, 1999) whether a few emphasises on supply side factors like infrastructure, technology, government and political stability and travel risk etc.

Digitalization has changed tourism in very fundamental way. It conform the transparency and minimizes the degree of information asymmetry (Guo, 2010; Puciato, Łoś and Mrozowicz, 2013; Asongu and Nwachukwu, 2016), thereby mitigating travel risk. It also transform the structure of the industry to identify, customize and purchase tourism products and support the globalization (Dredge, D., Phi, G., Mahadevan, R., Meehan, 2018). Technological advancement deliberately and strategically played its crucial role to keep the tourism in competition and survive over the pandemic period of Covid-19. For example: artificial intelligence is used to screen, detect, track and predict and to run surveillance tools for contact-tracing apps. ICT tools are the only support to circulate and update the every day's changing of travel regulations and restrictions all over the world. Hereby, ICT applications blur the borders between consumer and citizen that ultimately effect on governance, and the respective responsibilities and roles of the individual, businesses, and government in travel and tourism sector (Darusalram *et al.*, 2021). Such outcome with proper accountability, transparency, responsiveness requires strong institutional backbone where Institutional quality demonstrates a significant role to execute the economic activities smoothly.

Also, institutional quality is claimed as a soft infrastructure of any particular economy plays a strong and positive role on the tourist inflows of the countries. So, travel and tourism industry is also very responsive to it like other business activity because internal and external conflict, corruption, political instability, lack of proper rules of law, low governance quality adversely impact on the tourist flows of any country by increasing the risk and uncertainty (Adedoyin, Erum and Bekun, 2021; Khan, Ahmad and Haleem, 2021). Therefore, Low quality of institutions creates uncertainty and increases transaction costs for both national and international suppliers of tourists' services and tourists (Kim *et al.*, 2018). Consequently it affects the branding of locations as international tourism destinations.

Though for economic development the mediating role of both ICT and institutional quality has been well accepted, neglected in tourism research. A very few studies can be found focusing on the nexus between tourism and digitalization as well as institutional quality and tourism development from specific some country perspective like: India, Latin America, China etc. (Li *et al.*, 2017; Laddha, Koli and Jawandhiya, 2018; Dossou *et al.*, 2021; Mushtaq, Thoker and Bhat, 2021). On the other hand, digital opportunities not only combat the corruptions through the accountability and transparency but also promote easy access and delivery of services for its stakeholders (Asongu and Biekpe, 2017; Asongu and Nwachukwu, 2019). But still the joint contribution of digitalization and institutional quality on tourism development is still remaining unrevealed. So this study is aiming to explore that:

'Does joint effect of digitalization and institutional quality influence inbound tourism in panel data setting over 150 countries during the period 1995–2018?' More specifically, if the impact of digitalisation on inbound tourism gets e stronger with a strong governance quality?

2.0 Theoretical background:

Digitalization affects economic activities from both supply and demand sides. In the demand side, the consumer's economic behaviour through utility function and in the supply side on the producer's behaviour through productive function will be affected. Even in the case of external shock and disaster to the economies, the role of ICT in controlling the situations and survival is of paramount importance. For instance, in the case of pandemic Novel Coronavirus (COVID_19) outbreak, countries with better ICT infrastructure could be able to minimize the potential effect of the virus on their economic activities via working at home, teaching and learning online and online service delivery compared to countries without enough ICT infrastructures (Entele, 2021).

As a strategic tool, technology serves the information intensive and growing sector like tourism from a long way. Digitalization redesigned the tourism industry's business process and transformed it into the global market through wide access to digital applications of real time data processing systems via integrated package of business management, information systems and management, and tourism. For example, application of ICT transforms the airline industry and hotel market into a hospitality sector, just altering the value creation process (Khan & Hossain, 2018). Tourism sector has broadly applied ICTs to cut costs, save on labour, increase operational efficiency, and most critically improve service quality and customer experience (Law et al. 2009). ICTs utilized for or through travel have become much faster, smaller, more intelligent, and more embedded in a user's situation. Hence, the creation, gathering, storage, retrieval, and transfer functions of digitalization remain as vital applications of all tourism companies (Januszewska et al. 2015, Lee *et al.*, 2021).

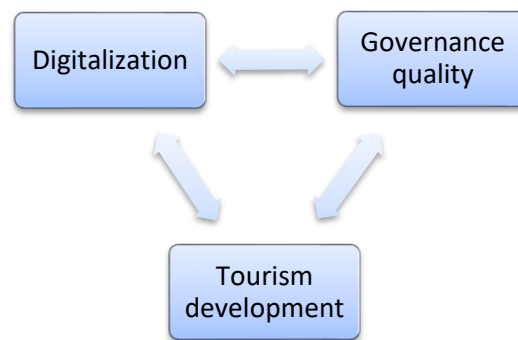
There are numerous studies argues about the impacts of ICTs on tourism fields from different dimension. For example, Mavri and Angelies (2009) found a salient positive relation between traveller arrivals and Internet usage in EU Mediterranean counties whether Ramos and Rodrigues (2013) explored a positive association between online reservations and ICT. Kumar et al. (2019) noted mobile subscriptions can be utilized to increase tourism markets and visitor arrivals. Adeola and Evans (2020) employed both the number of mobile cellular subscriptions and Internet users and explored positively and noteworthy influence on traveller arrivals in African nations. Kumar and Kumar (2020) argued about a unidirectional causality from fixed broadband and mobile subscriptions to both the destination nation's revenue and tourism demand.

Unlike digitalization, relationship between governance quality and tourism development is under explored issue in tourism research. A strand of academic literature has focussed on the impact of institutional quality on international tourism demand. Dossou *et al.*,(2021); Mushtaq, Thoker and Bhat, (2021), Ghalia et al. (2019), Kim et al. (2018), Balli et al. (2016), Manuela and Vera (2015), Yap and Saha (2013), Roxas and Chadee (2013), and Neumayer (2004) highlighted that development of travel and tourism industry in a country depends on the prevailing political conditions, level of corruption in public offices, implementation of rule of law, terrorist activities and regulatory quality to a large extent. Zhao (2020) examined the moderating effect of institutional quality on the influence

of tourism development on poverty reduction in China. Siakwah et al. (2020) and Zhao and Xia (2020) noted that improving tourism governance can contribute to socio-economic development and reduce poverty, which can help to achieve SDGs. Following the same vain, Kim et al. (2018) advocated that stable law and order practices reduce the travel risk and transaction costs and, establish an effective mechanism to resolve disputes and thereby help to attract the tourists across the world.

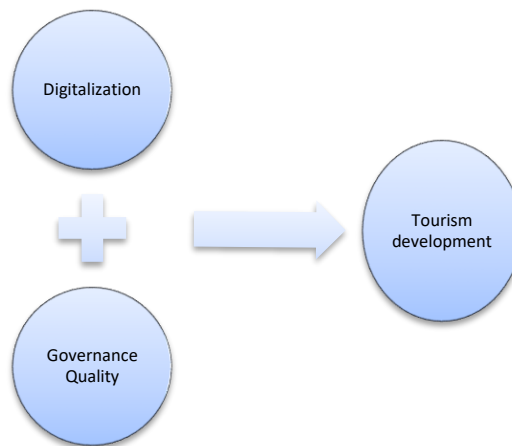
A few empirical studies observe a positive association between practical usage of ICT and IQ in many countries (Saxena, 2018; Singh and Sahu, 2008; Sohag *et al.*, 2021). Popelyshyn et al. (2019) found that the open data system in the government sector makes their activities more transparent, which ultimately improves government performance.

Figure 1 Relationship between the primary variables



Apart from above discussion, a triangular relationship can be drawn like figure (1) as evidences proving the positive relationship of ICT and tourism, Governance quality and tourism, as well as ICT and governance quality. Several studies argued about the positive relationship between digitalization and international tourism as well as governance quality and international tourism but no study exists focusing on how both ICT and governance quality jointly effects on accelerating tourism. As ICT, governance quality and inbound tourism are positively related with each other, while ICT and governance quality are serving travel and tourism as determinants. So, this chapter is intended to explore the moderation effect of those two factors on tourism development to create distinction by two following two factors. First, this research is explicitly quantified the joint effects of digitalization and governance quality on tourism; second, it is estimated partial interaction effects to compare the individual effects of digitalization due to the changes of governance quality at different level.

Figure 2 Conceptual model of the study



Moderation effects measure the combined effects of independent variables on a dependent variable. Rather focusing on the effects of a single independent variable, the analysis can combine effects of two or more independent variables (Aiken and West 1991; Halcoussis 2005). When a moderation effect is present, the impact of one variable depends on the level of another variable. While most empirical studies confirm that digitalization and governance quality alone do accelerate tourism demand, there is no cross country study that captures the joint effects of these variables. Moreover, it is of interest to determine how digitalization and governance quality can jointly affect the tourism industry. Investigation of the moderation effect is vital because different countries have various levels of governance quality and ICT adaption. Hence, the main objective of this chapter is to develop a tourism demand model that can capture the impacts of interaction between these two variables on tourism businesses. The model can then generate more accurate estimations of tourism demand for the purposes of forecasting and planning effective crisis recovery strategies. Therefore, the hypothesis can be constructed like

H1: Countries that have higher interaction effect of digitalization and governance quality receive more international tourists and earn higher revenues from them.

3.0 Model specification, data description and methodology:

Pertaining to the literature review, anecdotal evidence and considering the nature of our data, this chapter has applied the following integrated tourism demand model in explaining the joint effect of digitalization and governance quality on tourist inflow. The moderation effect of ICT and state quality on inbound tourism is the main focus which estimates how both factors could simultaneously affect the international tourism of a country. Employing a panel data analysis for more than 150 countries during the period 1995–2018, the base model is structured as:

Equation: 1

$$\log TD_{it} = \beta_0 + \beta_1 DIG_{it} + \beta_2 GQ_{it} + \beta_3 DIG_{it} * GQ_{it} + \beta_4 \log GDP_{it} + \beta_5 \log CPI_{it} + \beta_6 Upg_{it} + \beta_7 PS_{it} + e_{it}$$

Here, TD_{it} = tourism demand in country (tourism demand has been determined by number of tourist arrival (TA) and international tourist receipt (TR) along with per capita); \log = natural logarithm; i = country specific; t = time specific; DIG_{it} = variables of digitalization, GQ_{it} = variables of governance quality, GDP_{it} = GDP per capita based on purchasing power parity (PPP), CPI_{it} = Consumer price index in USD, Upp_{it} = Urban population growth, PS_{it} = Political stability, β_k = estimated coefficients; and e_{it} = error term.

The coefficient β_3 captures the interaction effect of digitalization and governance quality, which is the main focus of this study. Further analysis is to examine marginal impacts of digitalization and governance quality on tourism demand. So, how DIG affects TD at various levels of GQ is estimated by using the marginal effects are estimated as follows:

Equation: 2

$$\frac{\partial \log TD_{it}}{\partial DIG_{it}} = \beta_1 + \beta_3 GQ_{it}$$

Here, if $\beta_3 > 0$, then equation (2) implies that a one unit increase in the digitalization index yields a greater increase in percentage change of tourism demand with a higher level of governance quality.

3.1 Data description:

We examine the impact of digitalization and state quality together on tourism demand by employing a panel data analysis for 167 countries over the period 1995-2018. The panel data models are advantageous because they provide more information, more variability, less collinearity amongst the variables, more degrees of freedom and more efficiency (Baltagi 2008). So, for this study following list of variables are employed on the basis literature review and availability of data.

Table 1 List of variables

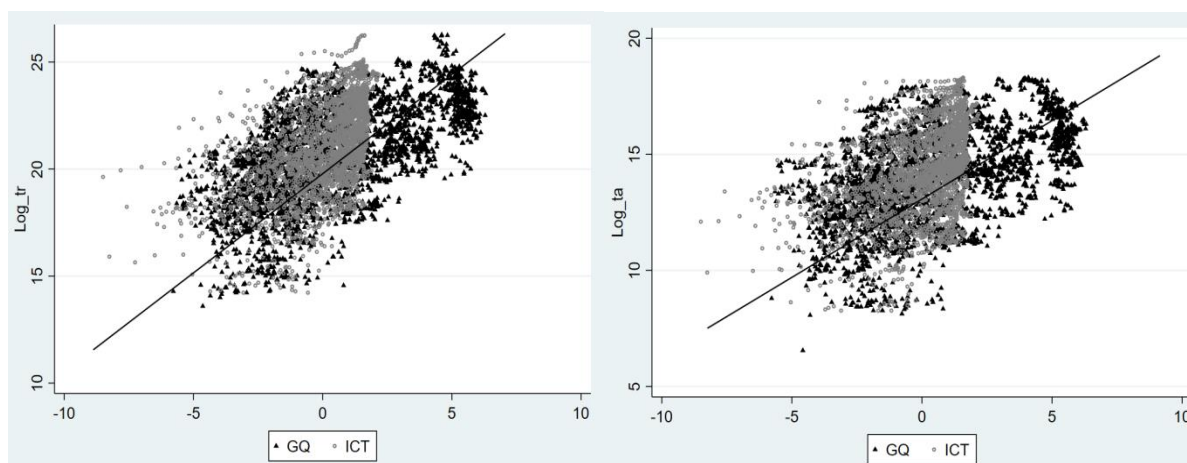
Variable type	Variable name	Label	Measurement and description	Source
Dependent variable	International tourist receipt	TR	Amount of USD received from international travellers	World Bank
	International tourist arrivals	TA	Number of international traveller arrived	World Bank
	International tourist receipt per capita	TRPC	Amount of tourism receipt per capita	World Bank
	International tourist arrivals per capita	TAPC	Per capita international tourist arrived over the period	World Bank
Independent variable	mobile phone subscriptions per 100 people	MS	Percentage of mobile phone subscriber	World Bank
	Fixed broadband subscriptions per 100	FBS	Percentage of broadband subscriber	World Bank
	Individual internet use (IU)	IU	Percentage of internet use by person	World Bank
	Information communication technology index	ICT	Using PCA technique ICT index measured	World Bank
	Government effectiveness	GE	Governance indexing ranging 2.5 to -2.5	World Bank

	Regulatory quality	RQ	Governance indexing ranging 2.5 to -2.5	World Bank
	Rule of law	RL	Governance indexing ranging 2.5 to -2.5	World Bank
	Governance Quality	GQ	Composite Governance indexing ranging 7.5 to -7.5	World Bank
Control variable	GDP per capita PPP	GDP	GDP converted to international dollars using purchasing power parity rates.	World Bank
	Consumer price index	CPI		World Bank
	Urban population growth	UPG	Percentage of population growth in urban area	World Bank
	Political stability	PS	Governance indexing ranging 2.5 to -2.5	World Bank

3.2 Estimations:

Prior to estimation result discussion, the relationship of main focused variables (i.e. tourism demand variables, governance quality and ICT) have been presented by regression fit of the scatter plots. Figure (3) represents the positive upward sloping relationship between international tourism inflows, digitalization and governance index. This suggests that higher digitalization and governance attract more tourists to a country (e.g., US and Australia are prime destinations for international tourists) while low digitalization as well as low institutional quality deter tourists (e.g., Burundi and Sudan receiving very low number of tourists).

Figure 3 Regression fit scatter plot among ICT, GQ, TR and TA



(The x-axis measures ICT and governance index and the log of tourism receipts and tourist arrivals are measured on the y-axis)

4.0 Result Discussion:

4.1 Tourism receipt (TR) and tourism receipt per capita (TRPC):

To test our hypothesis more rigorously panel random and fixed effect model are estimated after incorporating control variables for 167 countries over the period 1995–2018. Several estimations are done incorporating the digitalization variables (i.e. log_ms, log_fbs, log_iu and ICT) and governance quality (GQ) to measure the moderation effect. The results of estimations regarding international tourism receipt and international tourism receipt per capita are reported in table (2). In table (2) the entire results are presented on the basis of random effect where all the values especially interactions are positive. Column (1 to 4) report the moderation effect of log_ms, Log_fbs, Log_iu and ICT on tourism revenue increment using moderator variable GQ where all the results are positive. Digitalization measures are all significant along with moderation effect of log_fbs and log-iu. For instance, in column (2), coefficient of fixed broadband (0.096^{***}) and state quality (0.032) along with interaction term are all positive significant 1% level of significance. The positive interaction effect suggests that the effect of digitalisation on tourism receipts enhances as GQ increases.

However, columns 5 to 8 of Table 2 present the results regarding tourism receipt per capita in random effect where all the reported results are found positively related that confirms our hypothesis. Here, all the control variables are found positive and reported in appendix.

Table 2 Result of Estimations regarding Tourism receipt and tourism receipt per capita

	TR				TRPC			
Column no:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log_ms	Log_fbs	Log_iu	lct	Log_ms	Log_fbs	Log_iu	lct
DIG (MS/FBS/IU/ICT)	0.135 ^{**} (0.024)	0.096 ^{**} (0.017)	0.127 ^{***} (0.019)	0.229 ^{**} (0.033)	0.104 ^{**} (0.02)	0.08 ^{***} (0.015)	0.09 ^{***} (0.017)	0.186 ^{**} (0.03)
GQ	0.05 (0.056)	0.032 (0.056)	0.03 (0.052)	0.041 (0.054)	0.05 (0.05)	0.03 (0.048)	0.03 (0.04)	0.03 (0.04)
DIG*GQ	0.00005 (0.0001)	1.48E-09 ^{***} (6.13E-10)	0.0005 [*] (0.0002)	0.004 (0.009)	3.72E-06 (0.0001)	1.20E-09 ^{**} (6.18E-10)	0.0003 (0.0002)	0.002 (0.008)
No of obs	2,879	2,357	2,801	2,275	2,879	2,357	2,801	2,275
Group	155	154	155	154	155	154	155	154
R-sq	0.61	0.58	0.62	0.6	0.58	0.55	0.58	0.56
Wald	587.8	468.87	762.06	509.43	673.67	445.84	896.88	528.32

Note: Figures in parentheses are robust standard errors. ***p < .01, **p < .05, *p < .1.

4.2 Tourist arrival and Tourist arrival per capita:

Table 3 Result of Estimations regarding Tourist arrival and tourist arrival per capita

	TA				TAPC			
Column no:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log_ms	Log_fbs	Log_iu	lct	Log_ms	Log_fbs	Log_iu	lct
DIG(MS/FBS/IU/ICT)	0.08 ^{***} 0.01	0.05 ^{***} 0.01	0.08 ^{***} 0.01	0.12 ^{***} 0.026	0.05 ^{***} 0.01	0.04 ^{***} 0.011	0.046 ^{***} 0.015	0.07 ^{***} 0.02
GQ	0.04 0.03	0.044 0.032	0.028 0.031	0.045 0.033	0.06 ^{**} 0.02	0.05 ^{**} 0.02	0.04 0.02	0.05 ^{**} 0.03
DIG*GQ	-.00007 0.0001	1.22E-09 7.53E-10	0.0001 0.0002	-0.0002 0.005	-0.0001 0.0001	9.71E-10 7.55E-10	0.00005 0.0002	-.0008 0.005

No of obs	2,791	2,302	2,721	2,227	2,791	2,302	2,721	2,227
Group	155	154	155	154	155	154	155	154
R-sq	0.6	0.55	0.6	0.55	0.53	0.48	0.53	0.47
Wald	340.84	370.54	391.1	402.86	291.56	306.44	323.19	323.5

Note: Figures in italic order are robust standard errors. ***p < .01, **p < .05, *p < .1.

Likewise TR and TRPC, this section is to focus on the estimation regarding tourist arrival (TA) and tourist arrival per capita using random effect cross sectional panel data model. Table (3) represents the results of those estimations following the earlier process. Here, results are positive except the interaction term of log_ms*GQ and ICT*GQ. Thus, it reveals that both fixed broadband and internet use complying with governance quality influence international tourist arrival (column 2 and 3).

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