The Impact of ICT Regulations and Internet Filtering on ICT Diffusion and Quality of Life

ICT has transformed human life in a multitude of ways and continues to do so, by the creation, sharing, communication, storing, and management of information. However, it also opened the door for new cybersecurity risks, and if these privacy and security risks are not adequately addressed, ICT use will be restricted by the users. Thus, this cross-country level study (with 106 countries) aims to identify the relationship between ICT regulations on ICT diffusion and the quality of life of citizens while exploring the moderating effect of the use of internet filtering by the government (Figure 1). ICT diffusion refers to the spread and adoption of ICT by various communities and organisations.

According to the National Cyber Security Alliance (NCSA), USA, 74% of American internet users have reduced their online activities due to privacy concerns. Similar findings are drawn from other studies too [1]. Thus, to improve ICT diffusion, it is important to set up a matured ICT-related regulatory environment (H1). As virtual social networks become increasingly popular, online bullying, hate speech, and the spread of fake news have emerged as major problems. Some of the incidents have led to suicides as well as community-level violence. The platform providers are therefore under pressure to restrict this kind of internet content. For example, in Jan-

uary 2024 at the USA Senate, CEOs of social media companies were urged to draw attention to how they had failed to safeguard children. On the other hand, there is growing concern about the involvement of the government in content filtering and censoring highlighting the fact that it could impact the freedom of speech and be biased. Thus, the relationship between the maturity of ICT regulations and the ICT diffusion is moderated by government intervention in internet filtering. This suggests that where there is widespread government-led inter-

net filtering, the effect of ICT regulations on ICT diffusion is lessened than in instances where there is little to no filtering (H2). ICT has become an integral part of our lives. ICT diffusion within society will improve the quality of life (QoL) of citizens (H3) [2]. ICT, for instance, can improve productivity and make it easier to access medical information, services and educational resources (including both free and paid online courses). Furthermore, real-time communication allows social interaction with others to improve mental well-being.
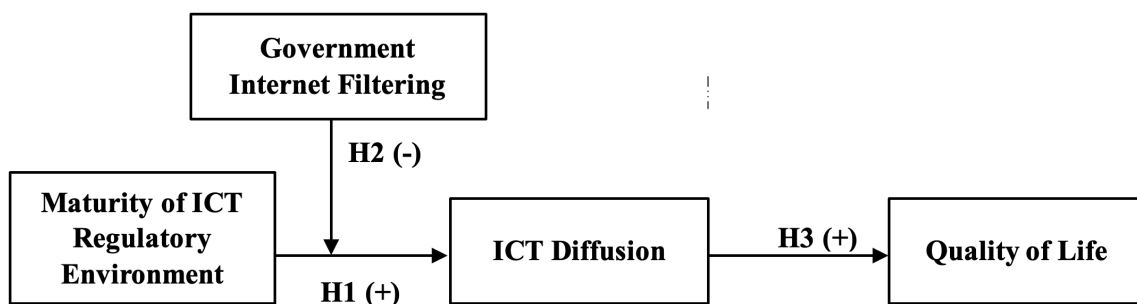

Figure 1. Research Model and Hypotheses

Data

Data from 106 counties were used after excluding missing values to test the hypotheses. Since it is impractical to gather data from over 100 countries, publicly accessible data that is robust against common method bias and easy to reproduce for analysis was utilized to test the hypotheses. Furthermore, these data have been used by many other highly cited publications. The data were collected considering the lag effect between the independent and dependent variables.

The dependent variable, QoL is collected from the Network Readiness Index (NRI) 2023 [3] and the independent variable, the maturity of the ICT regulatory environment for 2018 is obtained from the NRI 2019. The ICT diffusion is represented as a formative construct with the three indicators (internet users, fixed broadband subscriptions and active mobile-broadband subscriptions per 100 people) obtained from World Bank reports for 2020 [4]. The moderating variable, government internet filtering capacity for 2019 is obtained from the Varieties of Democracy database (V-Dem) [5]. Three control

variables were used: (1) log value of population; (2) region classification (e.g., South Asia, Europe and Central Asia, North America) and (3) enrollment % in primary education. All the data for control variables were obtained from the World Bank.

Analysis and Results

The descriptive statistics are indicated in Table 1. To examine whether there is an impact on the estimation of coefficients due to high correlation, variance inflation factor (VIF) analysis was performed. Since all the values were less than 3 (1.01-2.05), there is no impact due to multicollinearity [6].

Hypothesis testing was done using Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM allows simultaneous analysis of all paths and is suitable for exploratory analysis. Also, it makes no assumptions about the distribution and is robust against skewness. The results of path analysis are given in Table 2. The summary of the hypothesis testing is in Table 3.

To explore the mediation effect of ICT diffusion

Table I. Descriptive statistics and correlations

	Mean	SD	ICTReg	DIF	POP	EDU	QoL	REG
ICTReg	80.92	13.66	-					
DIF[a]	-	-	0.505	-				
POP[b]	16.56	1.58	-0.205	-0.301	-			
EDU	78.12	34.78	0.268	0.374	-0.35	-		
QoL	68.71	14.33	0.36	0.847	-0.296	0.387	-	
REG	3.39	2.01	-0.223	-0.679	<u>0.174</u>	-0.291	-0.736	-
FIL	2.01	0.64	-0.207	<u>-0.019</u>	0.277	<u>-0.054</u>	<u>-0.164</u>	0.248

Note: Correlations were significant at p<0.05(2-tailed) except the underlined; SD = standard deviation; ICTReg=ICT regulatory environment; FIL = Government internet filtering; QoL = Quality of Life; REG = Region; EDU = Primary education; DIF = ICT diffusion; a = formative construct; b = natural logarithm value.

Table II. Path Analysis with Standardised Path Coefficients

	ICT Diffusion	Quality of Life
Control variables Log of population Regional difference Primary education		 -0.041 -0.298*** 0.057
Independent variable – ICTReg	0.541***	
Intervening variable - ICT diffusion		0.611***
Moderating variable - FIL	0.088	
Moderation effect – ICTReg * FIL	-0.198*	
Adjusted R^2	0.275	0.762

*Note: *p<0.05**p<0.01***p<0.001(2-tailed); ICTReg=ICT regulatory environment; FIL = Government internet filtering.*

Table III. Results of Hypotheses Testing

Hypothesis	Relationship	Results
H1	ICTReg → DIF	Supported
H2	ICTReg * FIL → DIF	Supported
H3	DIF → QoL	Supported

Note: ICTReg=ICT regulatory environment; FIL = Government internet filtering; QoL = Quality of Life; DIF = ICT diffusion.

(DIF) on the Maturity of ICT regulations (ICTReg) and QoL, the total effect and indirect effect are evaluated. The total effect between ICT regulations and QoL is 0.331*** and the indirect effect (ICTReg ☐ DIF ☐ QoL) is significant as the 95% bootstrap confidence interval does not include zero (0.207, 0.450). Thus, there is a mediation effect.

Conclusion

As indicated by the results it would be useful to introduce regulations and policies to various emerging ICT-based technologies (e.g., AI technologies), thereby, increasing the diffusion of those technologies among the general public. Furthermore, it is important to pay attention to how governments can be involved in safeguarding users without impacting the diffusion of technology.

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