

# Impact of information and communication technology (ICT) on governance quality

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## Abstract

ICT is an important channel for knowledge, political awareness, making consciousness, understanding and guiding citizens, political and social forces and groups. ICT causes developing of transparency, government accountability and reducing corruption. E-Government uses ICT for the development of more efficient and more economical government. In this context, the main objective of this paper is to examine the impact of ICT on the quality of governance in selected middle-and high-income countries by using the generalized moment's method. Results show that ICT has a significant positive impact on governance quality in selected countries of the period 1996–2010.

**Keywords:** ICT, quality of governance, generalized moments.

## Introduction

Information and Communication Technology (ICT) is known as a new technology to market in the 90s and quickly developed so that in the second half of the twentieth century, it entered in a new era. With the proliferation of information and communication technology, economics and politics were connected with data and information and information served people as a commodity and the world after the ICT revolution changed in all aspects of policy, power, economy and culture. New information and communication technologies underlie a lot of variations. Features of these technologies are

reducing communication costs on one hand and universal access regardless of the traditional rankings on the other hand accelerated development in different societies. Indicators of new information and communications technologies are appropriate tool for measuring the progress of societies, access to technology and taking advantage of them. This technology allows storage and rapid dissemination of information and interaction and cooperation between them and encourage citizens to discuss political issues and familiarity with the political events associated with them. (Tankowski and Van Selm 2000, La portte and *et al*, 2001).

ICT will strengthen political affairs through the direct participation of citizens in government and avoiding mediation and expanding democracy. In recent years the establishment of good governance has been developed through the use of ICT. This is done through the effort required to develop mobile, radio, television, personal computers and the increasing number of global network that enables the interaction between society and the state provides. Satellites and the Internet, with features such as large volume of data transmission political, social, thematic diversity, fast data transmissions and reports and events, can be an important source of information in modern media. Reducing costs to buy satellite dishes and internet connection causes increasing of Internet users and recipients of political and social news and satellites in the future. It has to be said that, in the future this technology can have a substantial impact on the rise of political information. In this context, the main objective of this paper is to examine how the impact of ICT on the quality of governance in selected countries

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(average and high income) for the period 1996 to 2010. In this paper, we test the following hypothesis by dynamic panel data models (DPD).

- ICT has a positive and significant impact on governance quality in selected countries.

In this paper, after studying the theoretical background of the research, the model estimation is introduced and finally, conclusions and policy recommendations are offered.

## Theoretical basics

Good governance is studied as an opportunity to attract domestic and foreign investment, economic growth, and economic security and improve the business environment through six indicators: voice and accountability, political stability and absence of violence, government effectiveness, and regulatory quality, rule of law and control of corruption by the World Bank. In this theory, acknowledging the government logic involvement and its facilitation role are emphasized. In good governance, there is a close relation among three main pillars of government, civil society and the private section for the realization of different dimensions. Several indices of persons and institutions in the field of good governance are offered. The main basis for this paper is the definition and characteristics provided by the World Bank. The World Bank defines good governance as the traditions and institutions by which authority in a country is exercised for the common good which consists of:

- The process by which those in power are selected monitored and replaced
- The government capacity to efficiently manage resources and implement sound policies
- Respect for social and economic interactions between citizens and government institutions that manage them.

The three researchers from the World bank, Daniel Kaufmann, Art Kray and Pablo Zido mixed the findings of various international institutions such as the Economist Intelligence Unit, Regional Risk Guide International, Freedom House and the Heritage Foundation on Economic, political and social world and introduced a general indicators as governance indicators. The researchers began their career with this subject “How customs and institutions exercised in a country, are involved in the country development.” Kaufman and his colleagues called the customs and institutions as gover-

nance and examined its dimensions by introducing the following parameters.

1. **Voice and Accountability (VA)** – capturing 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.

2. **Political Stability and Absence of Violence (PV)** – capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

3. **Government Effectiveness (GE)** – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4. **Regulatory Quality (RQ)** – capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

5. **Rule of Law (RL)** – capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

6. **Control of Corruption (CC)** – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as «capture» of the state by elites and private interests.

Rapid and widespread access to affordable and reliable data is a key to establishing good governance. Information and communications technology has affected democracy in the world. This technology allows storage and rapid dissemination of information and interaction and cooperation between them. Nowadays, ICT is known as an engine for growth and energy source to enhance the social and economic power especially in Third World countries. Now, governments give power to groups through ICT. ICT gives better access to information for the people and makes public and the government more accountable to citizens. With the development of technology, the boundaries of the political, social, economic disappear and the governments do not have the ability to control the borders and the main losers are here the authoritarian governments. These technologies are the biggest nightmare for dictators.

New technologies has had a profound effect on people-oriented including the media, which is one of the factors in the collapse of communist regimes in Eastern Europe and the Soviet Union were also the impact of the economic crisis and the crisis of legitimacy cannot be ignored. In fact, these crises have provided fertile ground for attracting media messages related to the so called democracy. One of the aspects of political information of new media (Internet and satellite) is introducing political parties. Political Parties through new media present their views, opinions and engage in their own political activity. Audiences, via satellite and the Internet, obtained information about party ideology, organizations, and agencies and programs of the party for electoral. Information and communication technology (internet and satellite TV), on the one hand, increases political and social awareness and on the other hand, involve the individuals and groups in political and civic affairs.

Internet as a platform for opposition political parties and groups and minorities, could help undermine authoritarian regimes and spread democracy. Political groups and activists, through this technology, highlight the political and economic corruption, discrimination, political oppression, and government ineffectiveness and by showing more obvious weaknesses, create serious challenges for these governments. International non-governmental organizations also through these technologies can mobilize protests against authoritarian rule. (Norris, 2001)

New communication technology can become breeding grounds for social and political participation of individuals and groups. E-democracy, or digital, or a strong democracy in the range of application of these technologies is used in the context of conferences, meetings and electronic communications between individuals, groups and individuals, between groups and between individuals and groups with the government and rise Community participation in local and regional politics real and virtual spaces of the Internet. (Hale, 1999).

Studies show that civic education has an impact on the increasing political and civic information and communication of citizens. Grossman believes that information technology has high capacity to inform the citizens from their rights and his interest in making his contribution (black, 2003). Active citizen should be equipped with the skills and high knowledge of politics and political communication. Lord Guy Black (2012) explains in a

study of revolutions in the Arabic countries of the world the events that occurred in the Middle East and North Africa. These events led to a controversial debate about the role of modern technology and social media on the events. So, the role of social media and digital technology, precision and details were still being debated. Handheld devices and smart phones are rapidly increasing and the number of desktop computers has increased. Candidates, voters, activists, and journalists use these tools for faster access and awareness of community news, grassroots fundraising, stimulate and encourage political ideas, media as a tool to make the government accountable.

Nirmaljiit Singh Kalsi, Ravi Kiran and Vaidya (2008) states in a study entitled ICT and good governance in India that ICT is known as an engine for socio-economic growth and energy source for strength especially in third world countries. Today, governments give power to groups through ICT. This study concludes that new information and communication technologies can contribute to creating a community in order to achieve good governance.

Farid Shirazi, Ojelanki Ngwenyama and Olga (2008) in a study entitled, Development of ICT and the digital dividing in independent democratic countries searched on the impact of ICT education and ICT filtering on democracy and the relationship between ICT and the global expansion of democracy within states. This research studied on statistical data in 133 countries for the period 1995-2003 that in this course, ICT is highly developed. Accordingly center information and communication technologies are to access information and participate in social and political life. This technology allows storage and rapid dissemination of information, balancing groups and provides communication and collaboration. These technologies encourage citizens to discuss political issues and familiarity with political events and ideas related to them.

Nigel Scott, Simon Batchlor, Jonathan Ridley and Britt Jorgensen (2004) in a study in Africa showed that using mobile phones in Africa is very high. Rapidly increasing use of mobile is associated with a regulatory system that is open free to the operator that gives freedom to respond to the requests and needs of customers. Therefore, mobile is important in African countries as an infrastructure service to improve the performance and efficiency of markets, stimulate investment, and the ability to reduce the risk of failure. In the economic sector,

the mobile operators are increasing profits and pay taxes.

Carlos Batsita (2003) in a study entitled ICT and good governance deals with the conditions of use of ICT in five countries in Latin America (Brazil, Uruguay, Peru, Ecuador and Mexico). In this study, numbers of municipalities and many local organizations have been visited. In this study, aspects of decentralization, citizen participation and transparency are considered. This paper tries to use the opportunity to make more efficient use of ICT training programs and thus to measure the development of good governance. Another point to be considered in this study is that if there are Specific factors in the municipalities of Latin America or not? And the presence or absence of these factors could cause the government to be good or not? In this study, 120 municipalities website have been

analyzed. This study sought to describe the relationship between the use of ICT and good governance at the local and municipal regulatory agencies in Latin America. One of the results of this review is that providing Training program for staff, who wants to make use of ICT, causes the development of good governance at the local level. Also today society demands more transparency in the public sector and greater decentralization and more autonomy to the demands and desires.

### Specifying and estimating model

In this paper, regarding the different variables that affect the quality of governance, to assess the impact of information and communications technology governance, Quality Model (1) is used.

In this equation:

$$G_{i,t} = \beta_0 + \beta_1 ICT_{i,t} + \beta_2 HCA_{i,t} + \beta_3 LnGDP_{i,t} + \beta_4 INV_{i,t} + U_i \quad (1)$$

**GG:** represents the simple average of six indicators of good governance (the voice and accountability, political stability and absence of violence, control of corruption, government effectiveness, regulatory quality, rule of law)

**ICT:** the number of mobile users per 100 people as indicator of information technology

**HCA:** gross enrollment rate at the secondary level as an indicator of human capital

**LGDP:** log of GDP in 2000 prices

**INNOV:** Number of articles published in scientific journals as an indicator of innovation

**U:** the error

**i, t:** represents the country and time

Before addressing the model, it is first necessary to examine the model. For this purpose, the boys and Shin unit root test is used. The results of the

tests are shown in Table 1. As shown in Table 1 can be seen, according to statistics, the variables used in this group with a time difference of middle-income countries are static, While in high income countries, the log of GDP in 2000 prices, quality of governance, the gross enrollment rate at the secondary level as an indicator of human capital, the number of articles published in scientific journals as indicators of innovation with a difference the number of mobile phone users per 100 people in the information technology index represents the difference between the two measurements are static. So that the unit roots null hypothesis is rejected. As a result, the stability of the data used in this study is confirmed in prior research model. Convergence test results also indicated that long-run relationship between the variables is used in both groups.

**Table 1. Unit root test results for the group of selected countries.**

Regression type	sala	ICT	LGDP	INNOV	GG
	Average income group				
Levin test ( $P - \nabla$ value)	I <sub>1</sub>	I <sub>2</sub>	I <sub>0</sub>	I <sub>1</sub>	I <sub>1</sub>
	High income group				
	I <sub>1</sub>	I <sub>1</sub>	I <sub>1</sub>	I <sub>1</sub>	I <sub>1</sub>

Source: Calculations of research

In this paper, Sargan tests characterized by excessive restrictions have been used to test the validity of instrumental variables. One of the major applications of the test statistic j

is defined credit limits test. The test is based on the chi-square distribution with degrees of freedom equal to the number of constraints defined (p-k).

So that  $k$  represents the number of estimated coefficients and  $p$  indicates the device rated. If the  $p$ -value is smaller than  $\alpha$ , the use of instrumental variables in the model will be deemed valid. The results of these tests are given at the end of GMM technique results suggest that Instrumental variables used in the model are valid and rejects the null hypothesis that correlated with the residual, there is no communication between components and tools used. Consequently, the validity of the interpretation of the results is confirmed.

GMM estimator to estimate model has many advantages. For example, Beck, Levine and Loayza know using time series variance estimators to resolve very well. GMM estimators assessing unobserved individual specific effects in the model (the dependent variable to insert a pause as explanatory variables in the model), provide better control on explanatory variables. Quality estimation results of the impact of ICT governance using generalized method of moment estimator (GMM) group of selected countries in Table 2 are presented.

**Table 2. Estimated impact of ICT on the quality of governance and the generalized method of moments (GMM) in selected countries for the period 1996-2010**

Dependent variable: governance quality		
Variable	Coefficients in selected group of <b>Average income countries</b> (t-statistics)	Coefficients in selected group of <b>high-income countries</b> (t-statistics)
GG(-1)	0.67128- (410.218-)	0.57065- (281.79- )
HCA	0.014247 (3.595458)	-0.00011 (-0.16602)
LGDP	3.73041 (7.16291)	-3.72243 (-26.5563)
ICT	0.00597 (6.406863)	0.006192 (19.21153)
INV	5.49E-05 (2.725713)	1.17E-05 (8.130138)
J-STATISTIC <sup>1</sup>	20.18348	28.56997

Source: Research Findings

The results of regression estimating (1) in selected countries in the period 1996-2010 show that: (Table2).

- In the group of selected high-income countries, the gross enrollment rate at the secondary level as indicator of human capital has a significant positive effect on the quality of governance. While in the average income in selected countries, enrollment rates in secondary school has not a significant effect on the quality of governance. Education system is one of the agents responsible for the political education. The political education of managerial talent flourished with the political and religious values of his culture in connection with the educational system and the system of po-

litical institutions and many experts considered close links between educational institutions and the power.

- In high-income selected countries, logarithm of real GDP has a positive and significant effect on the quality of governance. Increase in GDP, which is reflected in the increase in national income and access to the media can be used to increase and improve the quality of democracy and governance. Daniel in his studies in six countries, the Middle East (Turkey, Lebanon, Iran, Jordan, Egypt and Syria) published a book called transition from traditional society, modernization in the Middle East. His idea is within the cultural diffusion theory. He believes that in the traditional low-income population, education, degree of urbanization and access to communication media and eventually the weaker and less are not the result of social and political

<sup>1</sup> j-statistic is as Sarjan-statistic that used for testing correlated residuals and instrumental variables. (Newey and West (1987a))



participation. Lipset also expressed the relationship between economic growth and democracy that Welfare and economic development of a country can be considered as an important factor for the development of political democracy. Logarithm of real GDP in selected countries, average income has a significant negative effect on the quality of governance.

- Kaufman and Kray (2003) in his study entitled *Growth without Governance* negative causal relation that the per capita income is the quality of governance. Data from 175 countries in the period 2000 to 2001 have used the results of their study show that data accuracy and integrity of governance and assumptions relating to errors of measurement and per capita income variables omitted material that governance and per capita income in directions opposite direction they can prove negative causal relationship between per capita income and the quality of governance is used during the process.

- In selected countries, ICT has a positive and significant effect on the quality of governance. These technologies increase the knowledge of people involved in the political process and thus cause greater government transparency and accountability. The hypothesis of a positive and significant relationship between ICT and the quality of governance in selected countries cannot be rejected.

- In selected countries, the numbers of articles published in scientific and technical journals have a significant positive impact on the quality of governance. Scientific and technical journal articles are as indicator of innovation and quality factor governance. In this regard, the number of articles published in scientific journals and technical innovation as the index is higher, there is more information and to increase awareness of the quality of governance is enhanced. The government is obliged to respond to such a community.

## Conclusions and recommendations

The main purpose of this paper is to examine how effective rate Quality ICT governance on high income group and middle income countries will be selected. The results of the model in selected countries, high-income and middle-income method of moments extended for the period 1996–2010 shows that in the two groups selected countries, ICT has a positive impact and significantly affect the quality of governance.

The hypothesis that there is a positive and significant relationship between ICT and the quality of governance in selected countries cannot be rejected. According to the results of this paper, to improve governance and enhance the process of achieving a higher level of quality indicators following suggestions are offered:

- Development of information and communication technology, because on one hand it increases political and social awareness, and on the other hand, the individuals and groups involved in political and civic.

- Multiple and varied radio and television networks can facilitate and accelerate the process of achieving good governance. More and more is needed to achieve a quality education. In the political culture of an institution's education system, there is a positive correlation between education and political participation for people. There is nothing much on the political attitudes of education effective. Education is the political education of the people are prosperous and politically of managerial talent, raising awareness of the political education, competent and committed.

- Facilities for researchers and research papers and journals and science and technology play an important role in raising awareness and knowledge of political. This involves engagement of civil, political opinion and feedback. In such a society, the government forced more transparency, accountability and better enforcement of laws and regulations.

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