Investigating the Determinants of E-Government and its Impact on Corruption and Accountability

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A thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in Management with specialization in Technology Management at the Faculty of Management Sciences,
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Dedication

To my parents, for their eternal support

(Acceptance by the Viva Voice Committee)

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Abstract

In this technological era, Governments across the globe are delivering public services to their citizens in an efficient and effective manner through E-Government (E-Govt) system. However, the development of E-Govt is not without challenges. Its development is surrounded by a number of factors, amongst those technological and governance structure have to be focused more in order to facilitate E-Govt implementation. Conversely, once developed, E-Govt brought forward more transparency, reduces corruption to a greater extent and makes public officials highly accountable to citizens.

In terms of prior research, most of the literature either focused on the implementation challenges or the adoption factors, no research studies were found that took holistic view of both determinants and outcomes of E-Govt. So this research aimed to investigate the determinants and impacts of E-Govt by integrating both determinants and outcomes of E-Govt cohesively in a unified framework. The study incorporated Technological Sophistication, Regulatory Quality, Rule of Law, Political Stability and Government Effectiveness as critical enabling factors that may influence E-Govt development. On the other hand the impacts of E-Govt on Control of Corruption and Voice and Accountability were also investigated. This study also posited that the relationship between E-Govt and Control Corruption and between E-Govt and Voice and Accountability further strengthens with the inclusion of Right to Information laws. Based on quantitative research method, country level secondary data was collected from international agencies (i.e. World Economic Forum, Center for Law and Democracy, United Nations and World Bank) to operationalize research variables. The results suggested that Technological Sophistication, Regulatory Quality and Government Effectiveness have significant positive association with E-Govt while Political Stability has significant but negative effects on E-Govt. Further the relationship between Rule of Law and E-Govt was statistically insignificant. Likewise, on the outcome side, E-Govt has strong impact on Control of Corruption but no impact on Voice and Accountability. In addition, Right to Information laws have moderating effects on the relationship between E-Govt and Control of Corruption and also on the relationship between E-Govt and Voice and Accountability. The research implications and limitations with future research directions are also discussed.

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DECLARATION

I hereby declare that this thesis, neither as a whole nor as a part thereof, has been copied out from any source. It is further declared that I have prepared this thesis entirely on the basis of my personal effort made under the sincere guidance of my supervisor and colleagues. No portion of work, presented in this thesis has been submitted in support of any application for any degree or qualification of this or any other university or institute of learning.

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FORWARDING SHEET

The thesis entitled "Investigating the Determinants of E-Government and its Impact on Corruption and Accountability" submitted by **Mr. Yassir Mahmood** as partial fulfillment of PhD degree in Management Sciences with specialization in Technology Management, has completed under my guidance and supervision. The changes advised by the external and the internal examiners have also been incorporated. I am satisfied with the quality of student's research work and allow him to submit this thesis for further process as per IIU rules and regulations.

Date:_____ Signature : _____

Name : _____

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Chapter 1

Introduction

Rapid technological advancements especially in Information and Communication Technologies (ICTs) have considerably influenced the Governments (Govts), businesses and individual's lifestyles. It has been observed that ICTs are not only improving the business processes, but also help the Govt agencies in providing effective services to their citizens. Therefore, by utilizing ICTs, Govts across the globe are delivering public services to their citizens in an efficient and effective manner. More specifically, such usage of ICTs to provide Governmental information and public services has been referred as E-Government (hereafter E-Govt) in academic literature. In its simplest form, in E-Govt the Govt's agencies (whether local, state or the federal) use web-based technologies particularly the internet to support Govt's operations (Palvia & Sharma 2007). In addition to this, it is the provision of different online services through Governmental websites.

These kinds of websites act as a source of information dissemination and a two-way interaction between Govts and their citizens. The Govts reach citizens in realizing their wide range of requirements through electronic services like: online payments mechanism, vote registration, seeking permits, customer services, licenses renewal, interaction with business and industry etc (IBRD 2019; Brimkulov & Baryktabasov 2014). As a result, many benefits can be achieved like the reduced costs, increased revenue, empowered citizens, lowered corruption, enhanced accountability of public officials, improve network infrastructure of Govts, soar up

economic growths and ascend sustainable developments (Lupu & Lazar 2015; UNDESA 2018; Hacker et al., 2009; Srivastava & Teo 2010a; Lee 2017).

E-Govt presents a tremendous impetus to get forward by delivering Govt's services in an effective and convenient manner (Bhatnagar, 2009). It helps Govts in achieving greater efficiency by eliminating bottlenecks and red tapes in the service delivery process (Mutula, 2008). Unlike traditional approach, an individual can avail any Govt service 24/7 without interruption. The 24/7 implies that a citizen can transact with Govt 24 hours a day 7 days a week from any location. On the contrary, the traditional Motor and Brick approach by Govt involves manual filing, wastage of papers and other resources and above all accessing, storing and managing of such data is laborious (Mutula, 2008). E-Govt controls corruption which leads to improve transparency and accountability (Ojha et al., 2011; Bertot et al., 2010; Meijer, 2007). It provides citizens a platform for active participation, which increases democratization (Katchanovski & La-Porte, 2005; Ifinedo, 2011) and helps in improving good governance (Ciborra, 2005; Krishnan & Teo, 2012).

However, the development of E-Govt is not without challenges. For successful implementation and quick delivery of e-services, it requires more comprehensive and coordinated efforts of the Govts. Govts around the world have made massive financial and political commitments to establish E-Govt (Accenture, 2004), nevertheless only few nations have developed it to the optimum level while many are still in the early stages of E-Govt. This slow progress has been highly influenced by the existence of technological and non-technological issues. Based on this presumption, research has explored the factors that increase the chances of E-Govt stability. Understanding E-Govt developments, require investigation of its determinants (Tan et al., 2010; Das et al., 2011; Ifinedo, 2012) and an evaluation of the

facilitating factors (Krishnan & Teo, 2011) that affect its progress. A meta-analysis conducted by Rana et al. (2011) highlighted the most frequently used different demographic (age, educational level, gender), behavioral (trust, attitude, satisfaction, behavioral intention, perceived behavioral control, self- efficacy) and organizational (social influence, perceived benefits, leadership triad, etc.) factors, which influence E-Govt adoption, diffusion and usage. According to Rana et al. (2011), most of the studies focused behavioral aspects of employees and citizens. They also argued that much of the prior research had considered independent and dependent constructs at individual level, only a few of them were in the context of organization. In a similar vein the literature review undertaken by Nkohkwo and Islam (2013) highlighted a number of challenges (like: Infrastructural, political, human, financial, organizational and socio-economic) that come underway during the development of E-Govt initiatives. While Abu-Shanab et al. (2010) concluded that social and Governmental factors needed special attention to implement successfully E-Govt projects. E-Govt proved to be an integral component of digital technologies which is immensely helpful in governing a country. It is anticipated that a nation's highness in E-Govt areas reflects how properly a country is governed (Huang, 2007). Apostolov (2008) stated

"If by governance we mean the relationship between those who govern a country, an institution, a society or a broader entity and those who are governed, then good governance is the exercise of power that is efficient, free of abuse and corruption, transparent, accountable, equitable, and providing for broad public participation. In this sense, e-governance should be seen just as a tool of governance, which should, ideally, be good".

Therefore many of the features of good governance are expressed in the roles of E-Govt (Lupu & Lazar, 2015). Like E-Govt fights against corruption, increases openness, encourages

citizen participation, brings higher effectiveness and efficiency and enhances accountability of public officials.

In the recent past, (Garcia-Murillo 2010: 2013; Miyata, 2011) attention has been drawn to issues such as good governance and there has been an ever-growing interest as how E-Govt tools can be deployed to improve governance functions in a country. Governance as defined by Kaufmann et al. (1999) is the traditions and institutions by which authority in a country is exercised. Governance has numerous dimensions. The casual observation suggests that a country may outperform in some governance areas while lag behind in others. The World Bank's Worldwide Governance Indicators (WGI)[1] are popular set of governance measures. These indicators are widely used for an indication of good governance in a country[2] (Givens, 2013). Krishnan et al. (2012) and Singh et al. (2007) stressed that governance facilitates E-Govt developments. Thus, this study contends that E-Govt and good governance go side by side.

[1] The WGI categories are: Regulatory Quality, Rule of Law, Political Stability, Government Effectiveness, Control of Corruption and Voice and Accountability.

[2] In recent times the WGI have gained tremendous popularity among research scholars and policy makers. These are widely used as a measure to evaluate governance in cross-country growth studies (Williams, 2015; Gaygısız, 2013). The download statistics recorded by SSRN depicts the popularity story. The researchers have diverted ample attention to WGI as the article "The Worldwide Governance Indicators: Methodology and Analytical Issues" detailing WGI has been regarded the 4th most downloaded article in SSRN's list of top 10,000 articles for the 12 months prior to April 29, 2012 (Givens 2013). The policymakers have also recognized the importance of WGI, for instance, the U.S. Millennium Challenge Corporation mainly uses the WGI as the basic criterion for donating billions of dollars in form of foreign aid.

1.1 Research Gap

E-Govt service delivery greatly depends upon the quality of underlying technologies in a country. Technologies in general and ICTs in particular can augment the development of E-Govt systems as rendering online public services requires the availability of an effective technological infrastructure (Krishnan et al., 2012). Such availability of reliable and subtle Technological Infrastructure may facilitate the development of E-Govt system. It is however important to note that a country's governing status and technological infrastructure are well connected with each other. As in case of E-Govt development, even if a sophisticated technological infrastructure exists, still Govts need human contribution (in the form of governance) to boost E-Govt implementation. Although E-Govt literature highly regarded the need of technological infrastructural arrangements, these are not the sole challenges faced by the E-Govt planners (Abu-Shanab et al., 2010; Sabri et al., 2012). Rather than E-Govt service delivery also depends on governance structure in an economy. In a country, good governance deals in the quality of Govt infrastructure such as effective implementation of Govt rules and regulations, law and order situation, political stability and efficient civil bureaucracy (Transparency International, 2016; Kaufmann et al., 2011). All such factors are the critical elements of governance. As governance is the collection of institutions and processes which creates the conditions for standing rules and actions (Kazancigil, 1998; Jessop, 1998). The extant literature though strongly advocates the importance of all these parameters for the developments of E-Govt, still no empirical study has been found, exploring the impact of all these parameters. The model developed in this study highlights the important role that Govt and public institutions have to play in the development of E-Govt systems. The forces (technological infrastructure and good governance) that promote and sustain E-Govt require to be analyzed in this regard. Though the importance of factors such as

good governance have been recognized by researchers (Singh et al., 2007; Krishnan & Teo 2012), it is surprising that little attention has been paid so far to explore its relationship with E-Govt developments. This study by addressing this sizable gap, incorporated four of the good governance indicators i.e. regulatory quality, rule of law, political stability and Govt effectiveness as important determinants of E-Govt development. As this study postulates that all these indicators greatly facilitate E-Govt development. Apart from the good governance indicators, this research also considered Technological Sophistication as a critical enabling factor that may influence E-Govt development.

A study by Krishnan et al. (2012) deeply investigated some of the determinants of E-Govt system suggesting the future research should also investigate some other determinants along with consequences (i.e. payoffs) of E-Govt developments. In line with their suggestions and limitations of current E-Govt literature, this research integrated both determinants and outcomes of E-Govt cohesively in a unified framework.

The impact of E-Govt development on control of corruption and voice and accountability (remaining two dimensions of good governance) are also under investigation in this research. As it is emphasized in the previous literature that E-Govt brought forward more transparency, reduces corruption to a greater extent and make public officials highly accountable to their citizens (Heeks, 2006; Saghafi et al., 2011; Bertot et al., 2010). This study also posits that the relationship between E-Govt and corruption and voice and accountability further strengthens with the inclusion of Right to Information (RTI) laws. So this study proposed that in countries where laws such as RTI exist the transparency and accountability levels are much higher than the countries where such laws are lacking (Relly & Sabharwal, 2009).

Adopting the laws relating to RTI legislation is becoming increasingly popular among the nations in the past two decades. Their speedy adoption reflects the keen interest of citizens pertaining to Governmental information like: what Govts do? how Govts work? And why decisions have been taken? RTI enables the information seekers to access any sort of public information to put pressure on Govt authorities for preventing corruption. Also, the RTI's role is vital to improve Governmental accountability (Trapnell & Lemieux, 2014; Calland & Bentley, 2013). It provides the means for citizens to request for information from the Governmental authorities. This mechanism reduces information asymmetry which results in increased transparency and accountability of public officials. Some fruitful outcomes of the RTI laws are: informed citizenry for participation in Government decision making process, greater transparency, improved accountability and reduction in corruption (Ansari, 2008). Although, there are perceptible linkages between E-Govt and corruption and accountability in literature, it is surprising that in earlier research only limited studies (Oberoi, 2013) have included RTI laws into this umbrella. This gap in literature acted the main source of motivation to investigate the role of RTI laws as a moderator between i) E-Govt and control of corruption and ii) E-Govt and voice and accountability.

1.2 Purpose of the Study

The aim of the current research is to study the determinants and outcomes of E-Govt developments at the country level. This aim leads to the formulation of a conceptual framework that identifies some critical factors that determines E-Govt developments across the globe. On the other hand, the conceptual framework also integrated fruitful outcomes of E-Govt i.e. controlled corruption and enhanced accountability. This would provide helping hand to the policy makers in a country in understanding the requirements needed for E-Govt developments.

The framework might also facilitate Govt institutions to take appropriate decisions in controlling corruption and enhancing the accountability of public officials. The research is based on applying quantitative approach using secondary data to meet the study's objectives and answer the posed question as quantitative empirical studies at macro level are nascent in E-Govt literature. The research contributed to the literature of E-Govt by providing theoretical implications for E-Govt developments and country general characteristics (i.e. governance factors). The findings might be helpful to policy makers and Govt authorities regarding E-Govt development strategies.

1.3 Structure of Research

The structure of this research report is as follow: the next section explains remaining parts of the Introductory chapter i.e. problem statement, research questions and objectives of the study. Chapter 2 incorporates characteristics of E-Govt like short history about the emergence of E-Govt followed by E-Govt's definitions, domains and maturity models. In last of chapter 2 some key benefits of E-Govt and current status of E-Govt services are discussed. In chapter 3, first a brief literature review is presented followed by a detailed theoretical framework in which variables and their relationships are explained for hypotheses development and then proposed research model is included. Chapter 4 is equipped with the research method of the study which comprises; nature and sources of data, data scores, analyses techniques and the statistical tools used for such techniques. The results are drawn in chapter 5. The result's chapter is sectioned into three portions i.e. descriptive statistics, graphical representation and hypotheses testing. While chapter 6 is composed of concluding remarks, implications of the research along with limitations of the study and recommendations for future research.

1.4 Problem Statement

In today's Governmental practices E-Govt can be widely seen across the globe, still a number of challenges inhibits its development. There are different factors, which influence the progress of E-Govt developments such as technological sophistication, regulatory quality, rule of law, political stability and Govt effectiveness. Such determinants were least focused in prior research studies. Therefore, it is badly needed to develop a framework that enlightens the specific requirements of E-Govt developments across the globe. On the other hand, the previous research mainly focused the cost savings impacts of E-Govt system. This limitation is also covered by current research by studying the impacts like control of corruption and voice and accountability of E-Govt system as these are the critical hindering factors in rendering the affective public services. Such problems are faced by many countries across the globe (Garcia-Murillo, 2013). E-Govt system has the potential to minimize corruption and enhance voice and accountability. Hence this study intends to investigate some of determinants as well as some outcomes of E-Govt. Also, for all countries across the globe, the impact of E-Govt on controlling corruption and enhancing accountability are examined in the presence of RTI laws.

1.5 Research Questions

This study addressed the following research questions:

- What is the relative importance of Technological Sophistication in the development of E-Govt in countries across the globe?
- What are the main factors regarding Good Governance (Regulatory Quality, Rule of Law, Political Stability and Govt Effectiveness) that might drive E-Govt developments?

- How E-Govt helps in Controlling Corruption and enhancing Voice and Accountability?
- What role Right to Information Law plays in moderating the relationships between E-Govt and Control of Corruption and between E-Govt and Voice and Accountability?

1.6 Objectives of the Study

The prime objective of the research is to investigate the impact of Good Governance Indicators on development of E-Govt and to study the role of E-Govt development in controlling corruption and enhancing accountability in the presence of RTI laws. Some of the secondary objectives of current research are:

- To investigate the importance of Technological Sophistication in the Development of E-Govt.
- To examine the key Governance indicators (Regulatory Quality, Rule of Law, Political Stability, Govt Effectiveness) as critical determinants of E-Govt Development.
- To inquire the effects of E-Govt Development on Control of Corruption and Voice and Accountability.
- To determine the moderating role of Right to Information Laws on the relationship between:

i. E-Govt Development and Control of Corruption.
ii. E-Govt Development and Voice and Accountability.

1.7 Significance of the Study

The study is significant from both theoretical as well as practical perspectives. As far as practical applications are concerned this research might explore the impact of E-Govt on controlling corruption and enhancing voice and accountability. This study would also shed light on the important factors that facilitate E-Govt developments. The study would provide useful insight about the determinants influencing E-Govt development for policy makers at Govt level.

The study is also significant as it contributed to theoretical knowledge of E-Govt development. It addresses the contribution of factors such as good governance in successful implementation of E-Govt development, which has not yet been explored. The conceptual model proposed in this research would enable E-Govt developers and practitioners to identify the key Governmental issues that can affect its development. In addition to this it would also provide significant insight about the impact of right to information laws – on the effectiveness of E-Govt development in controlling corruption and promoting accountability.

The findings of this study would be useful for policy makers at national level to guide them towards taking correct decisions and prepare the Govt sector for delivery of effective e-services.

1.8 Chapter Summary

In this introductory chapter, the grounds for research investigation are justified. At start, the chapter presented the introduction to the research area. The emphasis on the inquiry of E-Govt determinants and impacts was described in sections research gap and problem statement.

This is followed by research question that has to be answered by current research. The chapter also briefly covered the objectives and significance of research.

Chapter 2

E-Government Characteristics

2.1 Emergence of E-Government

The internet as a Governmental web tool emerged in late 1980's (Ho, 2002). Before its commencement Govts of some developed countries already deployed ICTs to enhance internal communication and improve Governmental operations (Norris & Kraemer, 1996; Brown, 1999). Since the advent of internet people are relying mainly on ICT driven services. This resulted in societies that are more technological oriented. In 1990's the private firms have out-performed in the fields of e-commerce and e-business increasing the pressures on public sectors to embrace the means of electronic channels for delivering Governmental services (United Nations, 2008). Thus Govts were propelled to use World Wide Web (www) and internet for its external relationships with citizens and other stake-holders (Scavo, 2003). With the emergence of E-Govt services in recent past, Govts across the globe are striving to deliver their services more efficiently and effectively (Affisco & Soliman, 2006). In today's era, citizens are more dependent on internet and they are receiving good e-services from private sector. The same good standards they expect from Govt organizations as well. Heeks (2007) concluded that the term 'Electronic Government' was first used in the report 'Re-engineering through Information Technology'. This plan was part of Bill Clinton's National Performance Review program (Lee et al., 2011). Evoked from this report many E-Govt services were initiated by different Govts (especially UK, Taiwan and Australia) to serve their nationals in a better way (Lee et al., 2005).

Contemporary to this age of E-Govt, a number of different E-Govt projects (like: I-voting; citizen shops, e-Ghana, m-pesa) were initiated by Govts to provide seamless information and services to different stake-holders (UNDESA, 2018). Govts using ICTs are attempting to find new ways in providing convenient and efficient services to their citizens and businesses around the clock (Sharma, 2004; Kamal, 2008). Across the globe in different countries different names are used for E-Govt like a) in Hong Kong its name is 'electronic service delivery' b) in Australia it is called 'Government online' and c) in India it is termed as 'electronic Government'. Apart from the different names, its focal purpose is providing seamless information and services through web (Bose, 2004).

2.2 Defining E-Government

E-Govt refers to "*the use by Govt agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of Govt. These technologies can serve a variety of different ends: better delivery of Govt services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient Govt management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions*" (World Bank, 2002).

The concept of E-Govt is new in comparison to e-commerce and e-business. It is still without any universally agreed definition (Al-Sebie & Irani, 2005). Some defined it as the accessibility of Govt to deliver efficient services, others defined it as a goal in itself (Yildiz, 2007) while few viewed it a tool for reforms and Govt process re-engineering. Various research scholars and international agencies have defined and explained the concept of E-Govt differently

(Fang, 2002; UNDESA, 2014). Though the definitions may vary widely, nevertheless, among all definitions some common notions exist like: IT deployment especially the Internet, delivering effective and efficient services, citizen's empowerment, access to information, stabilizing democracy, improving transparency and accountability, citizen's participation and better governance (Oyomno, 2004). In table 1 some of the commonly used definitions of E-Govt are included that are selected from previous literature.

Table 1. Definitions of E-Government

Description	Reference
Definitions Focusing on Use of IT	
"E-Govt can be referred to as the use and application of ITs in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people".	UNDESA (2014)
"E-Govt has been conceptualized as the intensive or generalized use of ITs in Govt for the provision of public services, the improvement of managerial effectiveness and the promotion of democratic values and mechanisms".	Gil-Garcıa and Pardo (2005)
"E-Govt is a way for Govts to use the most innovative ICTs, particularly web-based Internet applications, to provide citizens and businesses with more convenient access to Govt information and services, to improve the quality of the services and to provide greater opportunities to participate in democratic institutions and processes. This includes transactions between Govt and business, Govt and citizen, Govt and employees and among different units and levels of Govt".	Fang (2002) Srivastava and Teo (2008)

"E-Govt encompasses applications of various technologies to provide citizens and organizations with more convenient access to Govt information and services; and to provide delivery of public services to citizens, business partners and suppliers, and those working in the public sector".	Turban et al. (2002)
"Digitization of Govt refers to the use of ICTs by Govt organizations to execute their business and management processes".	Fountain (2001)
Definition Focusing on Process of Transaction and Transformation	
"E-Govt means exploiting the power of information to help transform the accessibility, quality and cost-effectiveness of public services and to help revitalize the relationship between customers and citizens and public bodies who work on their behalf".	Aldrich et al. (2002)
"Anything more than automated service provision that needs to reach far beyond the conduct of routine Govt business to embrace social, economic and political change".	Gottschalk and Solli-Sæther (2009)
"E-Govt is a transformational process that transforms a Govt's internal and external relationships, while maintaining its functions and its responsibility to remain useful, legitimate, transparent and accountable".	UNDESA (2003)
Definitions Focusing on Good Governance	
"E-Govt is defined as the use of ICTs and particularly the Internet, to achieve better Govt".	OECD (2003)
"E-Govt refers to the use of ICT to improve efficiency, effectiveness, transparency, and accountability of Govts".	World Bank (2009)

"The continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet and new media".	Baum and Di-Maio (2000)
Definitions Focusing on Benefits of E-Government	
"E-Govt is defined as the implementation of cost effective models for citizens, industry, federal employees, and other stakeholders to conduct business transactions online. The concept integrates strategy, process, organization and technology".	Whitson and Davis (2001)
"E-Govt involves access to Govt information and services 24 hours a day, 7 days a week, in a way that is focused on the needs of our citizens and businesses. E-Govt relies heavily on agency use of the internet and their emerging technologies to receive and deliver information and services easily, quickly, efficiently and inexpensively".	Ke and Wei (2004)
"E-Govt is simply using IT to deliver Govt services directly to the customer at any time. The customer can be a citizen, a business or even other Govt entity".	Duffy (2000)
Definition Focusing on Citizens	
"An E-Govt is a Govt that makes full use of the potential of technology to help put its citizens at the center of everything it does, and which makes its citizens its purpose".	Waller et al. (2001)
Definition Focusing on the Internet as a Single Point Access	
"E-Govt is usually explained as a way of improving the delivery of Govt services by making them available through a single point of access on the internet, i.e. also called as - one stop shop shopping"	Mitchinson (2001)

Across the countries, different stake-holders at different Govt levels (local, state, or federal level) perceive E-Govt concept differently (Irani et al., 2006) which is the prime reason for having no clear standard definition. Often, the definition's focus is on the objective of activities rather than technology. Al-Sebie and Irani (2005) stated that the reasons for lack of an agreed E-Govt definition are a) E-Govt definitions have different beneficiaries and domains and b) its definitions greatly depend on a society's goals, values and needs.

2.3 Domains of E-Government

E-Govt revolves a number of domains as it primarily focuses on serving different groups of people, citizens, businesses, employees and organizations. It transforms the production process in which Governmental services are produced and rendered, hence transforming the entire range of relationships of Govt with citizens, businesses and other agencies of Govt (Leitner, 2003). Palvia and Sharma (2007) reported that E-Govt emerged having different interactional dimensions like Govt to Govt (G2G), Govt to Business (G2B), Govt to Citizens (G2C) and Govt to Employees (G2E). The aforementioned dimensions are also applicable in reverse direction i.e. in each case a two way interaction is possible (e.g. B2G, C2G and E2G). Furthermore, based on nature of E-Govt inter-relationships, it can be grouped into external and internal form (See figure 1).

The G2G domain lies at the center of E-Govt system and acts like a backbone for E-Govt implementation (Chen et al., 2006; Bonham et al., 2001). Under this domain, Govt aims to provide integrated services through a single portal. G2G domain covers the transaction between local and central Govt, also between other Govt entities at department level and different bureaus attached with Govt (Klamo et al., 2006). Apart from this, G2G domain also covers the

interaction between Govts and can be a source of international relations and diplomacy (Chavan & Rathod, 2009). For an effective G2G interaction the Governmental agencies must share data and information with each other and update their own internal system and procedures before commencing e-transactions with citizens and businesses.

The G2B is another important domain of E-Govt service. This domain supports the services offered to business communities. Due to increased competition each business strives for cost effective practices, for such practices the G2B domain provide better solutions (Seifert, 2003). Through G2B services, the businesses may have direct access to information about a) Governmental rules and regulations for business initiation and b) policies about operating a business. The business can avail the services like downloading forms, registering new businesses, payment of employee insurance, getting permits, renewal of licenses, submission of financial reports and paying taxes. The E-Govt made it possible to avail all such services through a single web-portal. Hence the chances of data redundancy are eliminated as data may only be submitted to a single Governmental agency rather than to multiple agencies. Some prominent examples of B2G include the e-procurement and e-filing of taxes. Both of the applications are immensely cost effective and time saving (Jaeger, 2003)

The G2C domain is designed to facilitate citizens for the e-transactions of public services. Some of the researchers believe that the sole purpose of E-Govt is to serve the citizens of a certain nation (Carter & Belanger, 2005). G2C initiatives enable the citizens to have access to public information and services provided through Governmental websites. The primary focus of E-Govt developers is to serve the citizens from a single platform known as ‘one stop shop’. Through this one stop shop the citizens may get an array of services from a single source rather than to visit multiple Govt departments (Löfstedt, 2008). The online means provide convenient

ways for the citizens to interact with Govt officials hence this increases citizen's participation in decision making process which might be helpful to strengthen democracy in a country ((Lee et al., 2011).

The citizens are less concerned with the layer of bureaucracy involved for their service delivery rather they are keen to have one stop shop for their personalized services like: access to public information, downloading different sort of forms, public policy information, employment and business opportunities, vote registration, filing taxes, license registration or renewal, payment of fines and giving feedback to political leaders. Seifert (2003) reported that G2C interactions result in more informed citizenry, also it improves the quality of services citizens receives from their Govts.

The G2E domain is an extension of G2C. This domain mainly deals in the services developed only for Govt service-men. The services include training and development of Govt employees for the improvement in the bureaucracy's daily operations and their dealings with citizens (Chavan & Rathod, 2009). In line with this the G2E interaction empowers employees and speed-up administrative process. The civil bureaucracy is linked efficiently with other departments resulting in better cross departmental service delivery. The benefits of G2E interaction are empowered employees, team collaboration and high workforce retention as employees feel a sense of highly responsible (Al-Shafi, 2009). The G2E also results in intra-agency information sharing as employees of one department collaborate with other department's employees anytime anywhere.

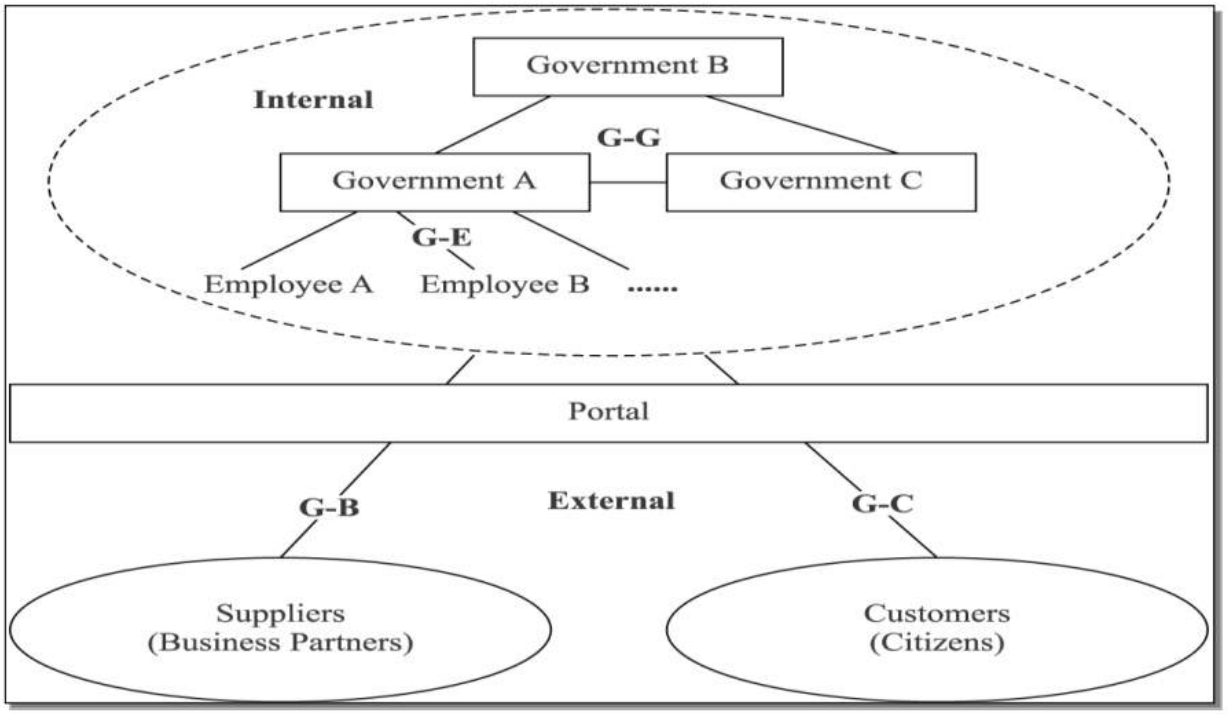

Figure 1. E-Government Interaction Dimensions (Source: Siau & Long, 2005)

2.4 E-Government Maturity Models

As mentioned previously Govts across the globe are keen to develop E-Govt systems. One of the popular approaches to guide and benchmark E-Govt development is E-Govt Maturity Models (E-GMMs) (Karokola, 2012; Layne & Lee, 2001; Karokola & Yngström, 2009). Many researchers, international organizations, consulting firms and academia have tried to understand E-Govt phenomenon by dividing it into several stages or phases (UNDESA, 2014; Layne & Lee, 2001; Siau & Long, 2005; Shahkooh et al., 2008). The researchers are of the view that a stage approach is needed in order to implement and forecast E-Govt system. The terms 'maturity' and 'immaturity' are often used to characterize the state of a given stage in a continuous process. A maturity model has stages starting from publishing information and one way communication and end with fully integrated e-services having transaction capabilities and enriched with digital

democracy (Maumbe et al., 2008). The maturity stage reflects the level of technology complexity, degree of system sophistication and full integration of public administration (Gronlund et al., 2005). The advantage of stage-wise approach is to understand improvements, to measure the progress and to generate momentum that could subsequently be maintained (Lee, 2010; Al-Sebie & Irani, 2005).

The E-Govt literature composed a number of E-GMMs, proposed by different scholars, academia and international agencies. In their review of E-GMMs, Fath-Allah et al. (2014) identified 25 different models. Each E-GMM has several distinct stages. Some of the prominent E-GMMs are: Reddick's two stage model (Reddick, 2004), the three stage models include: Cisco's Model (Davies, 2008) and Howard's Model (Howard, 2001). Some four stage models are: Chandler and Emanuels' Model (Chandler & Emanuels, 2002), UN's Model (UNDESA, 2014), Layne and Lee's Model (Layne & Lee, 2001), Gartner's Model (Baum & Di-Maio, 2000). Five stage models enlist Moon's Model (Moon, 2002), Hiller and Bélanger's Model (2001) and Shahkooh's Model (Shahkooh et al., 2008). While the Deloitte's Model (Deloitte & Touche, 2001), Wescott's Model (Wescott, 2001) and Almazan & Gil-Garcia's Model (Almazan & Gil-Garcia, 2008) consist of six stages.

The number of stages varies in E-GMMs, ranging from as low as two stages (e.g. Reddick's Model) to as high as six stages (e.g. Almazan & Gil-Garcia's Model). Also, the names of the stages differ across many E-GMMS, but their contents are very similar (see table 2.2). For instance the first stage in Gartner's Model is 'web presence' the same in UN's Model is 'emerging' while in Layne and Lee's model it is 'cataloguing'. Across all these three models the purpose of this first stage is same i.e. broadcasting public information through Govt websites. Almost all models have a stage (presence) related to availability of Governmental website, a

stage (interaction) where public can communicate with Govt officials, a stage (transaction) where different stake-holders can transact with Govts and a stage (integration) that has some advance features converging different Govt services at single point.

In some meta-synthesis of E-GMMs, researchers (Fath-Allah et al., 2014; Almuftah et al., 2016) concluded that majority of E-GMMs have some common features and similar stages. Some of the common features covered by most of the E-GMMs are: customer centricity, interoperability, personalization, online payments, one stop shop and e-participation. The similar stages in E-GMMs can be categorized into initial, middle and higher stages (see table 2.2). The initial stages ensure the presence of Govts on web through online portals. These portals act as a source of information dissemination on Govt procedures and institutions. The middle stages allow citizens to interact (e.g. two way communication) with Govts and they can carry out simple transaction (e.g. online payments of taxes). As Govts encourage citizen's discussions on policies to gather feedback electronically. Such engagement improves support and services to citizens, promotes innovation from citizens and provides the foundation for Govt reforms (Chen, 2002). The higher stages mostly deal in integrated services where different Govt bodies are inter-connected to provide services from a common platform. At these stages more advanced online services are provisioned like: digital signatures, full support for online payments, access for the disabled, access from non-PC devices (such as personal digital assistants), support for non-native languages or foreign language translation, etc. At highest stage, Govt services are reorganized and integrated to fit a more citizen-centric orientation. Such reorganization might allow a business to apply for all of its licenses (e.g. health, customs, import, export) on a single portal, rather than having to visit the separate websites of multiple agencies.

The increased numbers of E-GMMs suggest the lack of a universally agreed framework for E-Govt development (Chaushi et al., 2015; Almuftah et al., 2016). Fath-Allah (2014) concluded E-Govt literature is short of a holistic model that may have best practices from all of the e-portals. Also among E-GMMs there is no mutual conformity on the number of stages. Some models suggest E-Govt should pass through all of the preceding stages before moving to the next stage. While some suggest that a certain stage can be skipped for moving on to a higher stage (Lee, 2010). But all agreed upon the fact that at higher stage more complex technology is deployed (for instance see Layne and Lee Model in figure 2) (Claver-Corts et al., 2008; UNDESA, 2014).

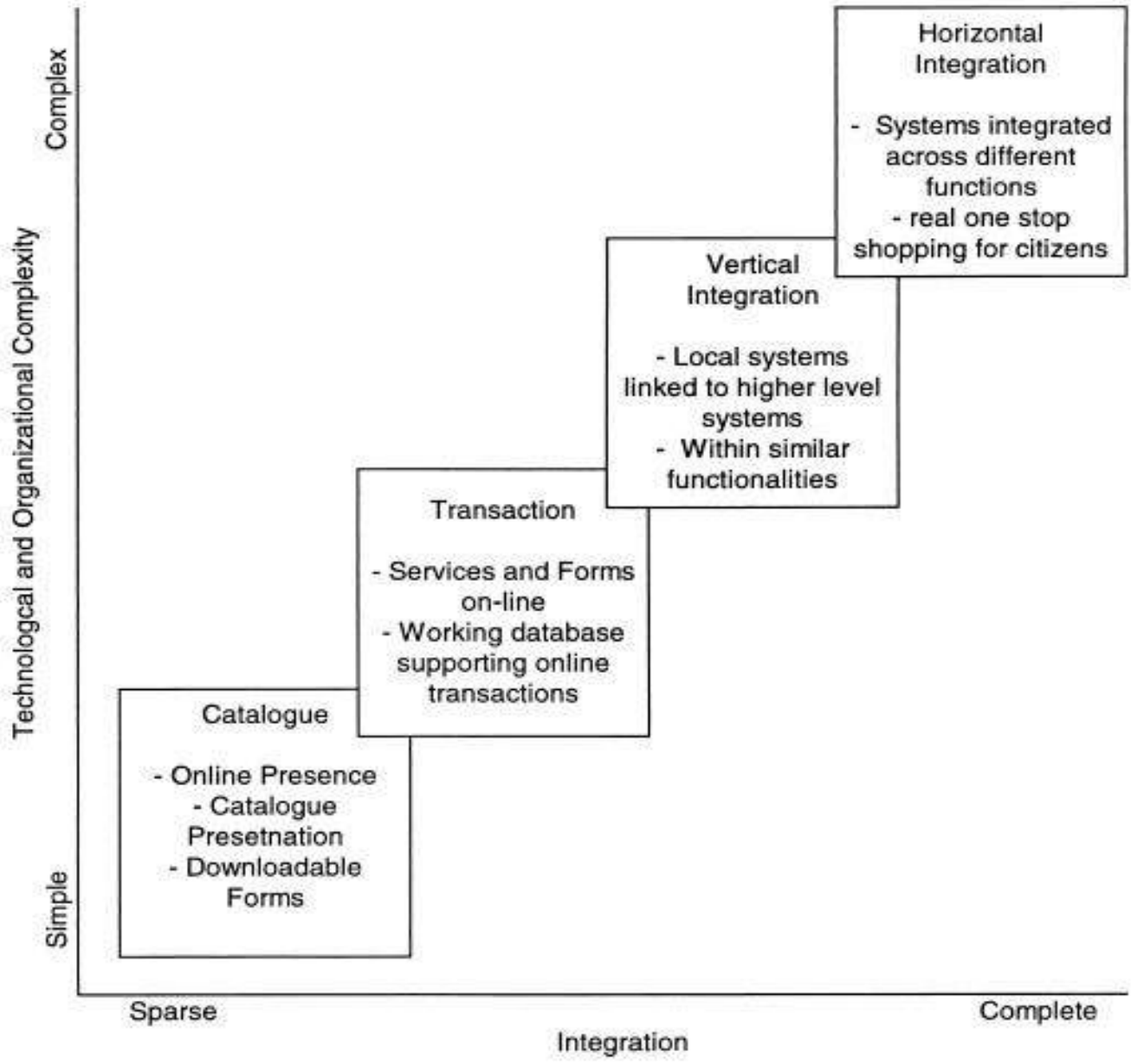

Figure 2. Layne and Lee E-Government Maturity Model (Source: Layne & Lee, 2001)

Table 2. E-Government Maturity Models

Web-Presence Stage	Interaction Stage	Full Integration Stage	Reference
Reddick Two Stage Model			
1. Cataloguing	2. Transactions		Reddick (2004)
Howard Three-Stage Model			
1. Publish	2. Interact 3. Transact		Howard (2001)
Cisco Three-Stage Model			
1. Information	2. Transaction	3. Transformation	Cisco (2007)
World Bank Three Stage Model			
1. Publish	2. Interact 3. Transact		World Bank (2003)
Chandler and Emanuel's Four Stage Model			
1. Information	2. Interaction 3. Transaction	4. Integration	Chandler and Emanuels (2002)
United Nation Four Stage Model			
1. Emerging	2. Enhanced 3. Transactional	4. Connected	UNDESA (2014)
Layne and Lee's Four Stage Model			
1. Cataloguing	2. Transaction	3. Vertical Integration 4. Horizontal Integration	Layne and Lee (2001)

West Four Stage Model 2004			
1. Bill-Board	2. Partial Service Delivery 3. Portal	4. Interactive Democracy	West (2004)
Gartner's Four Stage Model			
1. Web Presence	2. Interaction 3. Transaction	4.Transformation	Baum and Di-Maio (2000)
Moon's Five Stage Model			
1. One-Way Communication	2. Two-Way Communication 3. Transaction	4. Integration 5. Political Participation	Moon (2002)
Hiller and Bélanger Five-Stage Model			
1. Information	2. Two way communication 3. Transactions	4. Integration 5. Participation	Hiller and Bélanger (2001)
Shahkooh, Saghafi, and Abdollahi, Five Stage Model			
1. Online Presence	2. Interaction 3. Transaction	4. Fully Integrated and Transformed E-Govt 5. Digital Democracy	Shahkooh et al. (2008)
Siau and Long Five Stage Model			
1.Web Presence	2.Interaction 3.Transaction	4.Transformation 5.E-Democracy	Siau and Long (2005)

Deloitte's and Touche Six-Stage Model			
1. Information Publishing	2. Official Two-Way Transaction 3. Multi-Purpose Portals 4. Portal Personalization	5. Clustering of Common Services 6. Full Integration / Enterprise Transaction	Deloitte and Touche (2001)
Almazan and Gil-Garcia Six Stage Model			
1. Presence 2. Information	3. Interaction 4. Transaction	5.Integration 6. Participation	Almazan and Gil-Garcia (2008)
Wescott Six Stage Model			
1. Setting-up an email System and Internal Network 2. Enabling Inter Organizational and Public Access to Information	3. Allowing Two-way Communication	4. Exchange of values 5. Digital democracy 6. Joined up Govt	Wescott (2001)

2.4.1 United Nation's Model

The literature indicates that different E-Govt research bodies have proposed E-GMMs, United Nation (UN) is one of them. At first, UN model was composed of five stages proposed in 2001, while the most recent maturity model proposed in 2014 contained four stages. The description of model stages are: emerging information services, enhanced information services, transactional services and connected services (see table 2.3). The UN's model presents true

sketch of E-Govt maturity (Almuftah et al., 2016). It greatly focuses on web-based technologies and their functionality, it also addresses managerial issues (Karokola & Yngström, 2009). The model is characterized after an intense survey of all 193 UN member states. The model foresees the post observation practices as it profiles countries based on the four stages of maturity model: emerging, enhanced, transactional and connected.

Table 3. Four Stages of UN Model (Source: United Nation, 2016)

"Stage 1: Emerging Information Services
Govt websites provide information on public policy, governance, laws, regulations, relevant documentation and types of Govt services provided. They have links to ministries, departments and other branches of Govt. Citizens are easily able to obtain information on what is new in the national Govt and ministries and can follow links to archived information.
Stage 2: Enhanced Information Services
Govt websites deliver enhanced one-way or simple two-way e-communication between Govt and citizen, such as downloadable forms for Govt services and applications. The sites have audio and video capabilities and are multi-lingual, among others.
Stage 3: Transactional Services
Govt websites engage in two-way communication with their citizens, including requesting and receiving inputs on Govt policies, programs, regulations, etc. Some form of electronic authentication of the citizen's identity is required to successfully complete the exchange. Govt websites process non-financial transactions, e.g. e-voting, downloading and uploading forms, filing taxes online or applying for certificates, licenses and permits. They also handle financial transactions, i.e. where money is transferred on a secure network to Govt.

Stage 4: Connected Services
Govt websites have changed the way Govts communicate with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. E-services and e-solutions cut across the departments and ministries in a seamless manner. Information, data and knowledge are transferred from Govt agencies through integrated applications. Govts have moved from a Govt-centric to a citizen-centric approach. Govts create an environment that empowers citizens to be more involved with Govt activities so as to have a voice in decision-making".

This research uses the UN's E-Govt maturity model. The UN's model uses the scores of Online Services Index (OSI) to rank countries. OSI highlights E-Govt sophistication and maturity across the globe. As the other E-Govt assessment models do not provide comparative global empirical data so they were not considered suitable for the purpose of this research. The OSI is widely used construct to measure the countries' achievements in the important E-Govt areas like online services. A country's progress towards the higher maturity stage represents the deployment of more advanced features and online services on their websites (see figure 3).

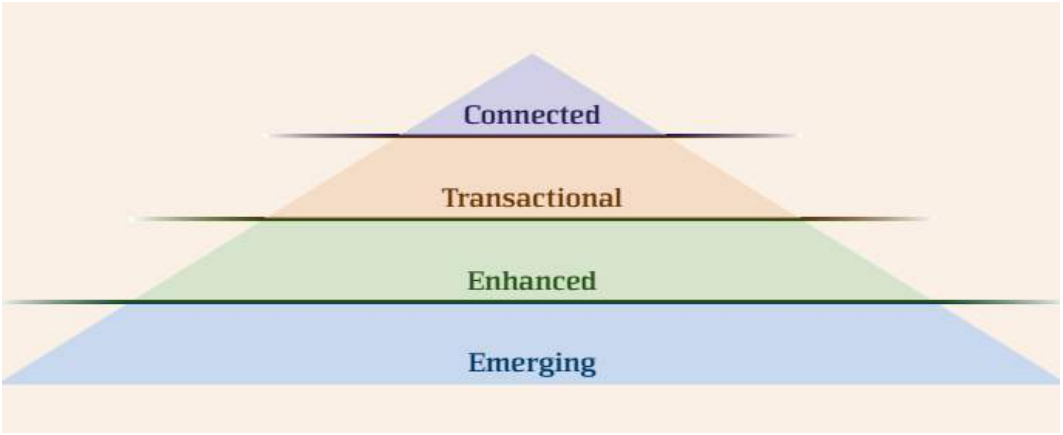

Figure 3. Four Stages of Online Services Index (Source: United Nations, 2014)

2.4.2 Online Services Index

The OSI data-set consist of quantitative measures instead of perceptual measures. Which mainly comprise e-services offered through the Govt's web portals.. This is a positive characteristic of the underlying data since it relies less on the perception of the E-Govt websites design. A detailed note on OSI computation and methodology (UNDESA, 2016) is included in chapter 4.

2.5 E-Government Benefits

The era of internet has already witnessed the importance of E-Govt. It promises ample benefits for the citizens, businesses and Govt agencies (UNDESA, 2018). It improves the interaction between public and Govt which may facilitate the inclusion of public in decision making process. Other positive outcomes can be less corruption, greater transparency, enhanced accountability, revenue growth, cost savings and efficiency gains. Drawing the benefits of E-Govt, Al-Shafi (2009) listed five areas where E-Govt performs well. These are:

i) Efficiency and cost reduction (as it delivers Governmental services conveniently through innovative channels).

ii) Economic development (by improving Govt-business relationships and promoting business friendly climate).

iii) Accessibility and availability (by offering integrated services 24/7 through a single gateway).

iv) Citizen centric (to involve citizens in decision making process and encouraging them for participatory governance).

v) Transparency and accountability (the electronic channels mitigate the chances of corruption and allow citizens to monitor the performance of Govts making them answerable to the public).

Undoubtedly, E-Govt is assumed to be the powerful indicator of development and an exemplar of success for nations. It proved to be an effective tool in delivery public services like education, health, social welfare and finance. It can play an important role in making citizens more vibrant and public organizations more efficient, transparent, and accountable.

2.6 E-Government Around the Globe

Growing benefits of E-Govt have encouraged the developed and developing countries for E-Govt initiatives (Tahrani, 2010). The developing countries lag behind and are still in the initial stages of E-Govt maturity level while the developed countries have out-performed and climbed far up the development ladder. According to UNDESA (2016) report all of the UN member states have an online web-presence. The report shows that 32 (17%) member state have very high OSI scores (0.75 and above), 56 (29%) members with high-OSI values (in range 0.50 to 0.75), while the number of countries that fall in middle (between 0.25 and 0.50) and low (less than 0.25) OSI scores are 52 and 53 respectively, each having weightage of 27% (see figure 4 for more details).

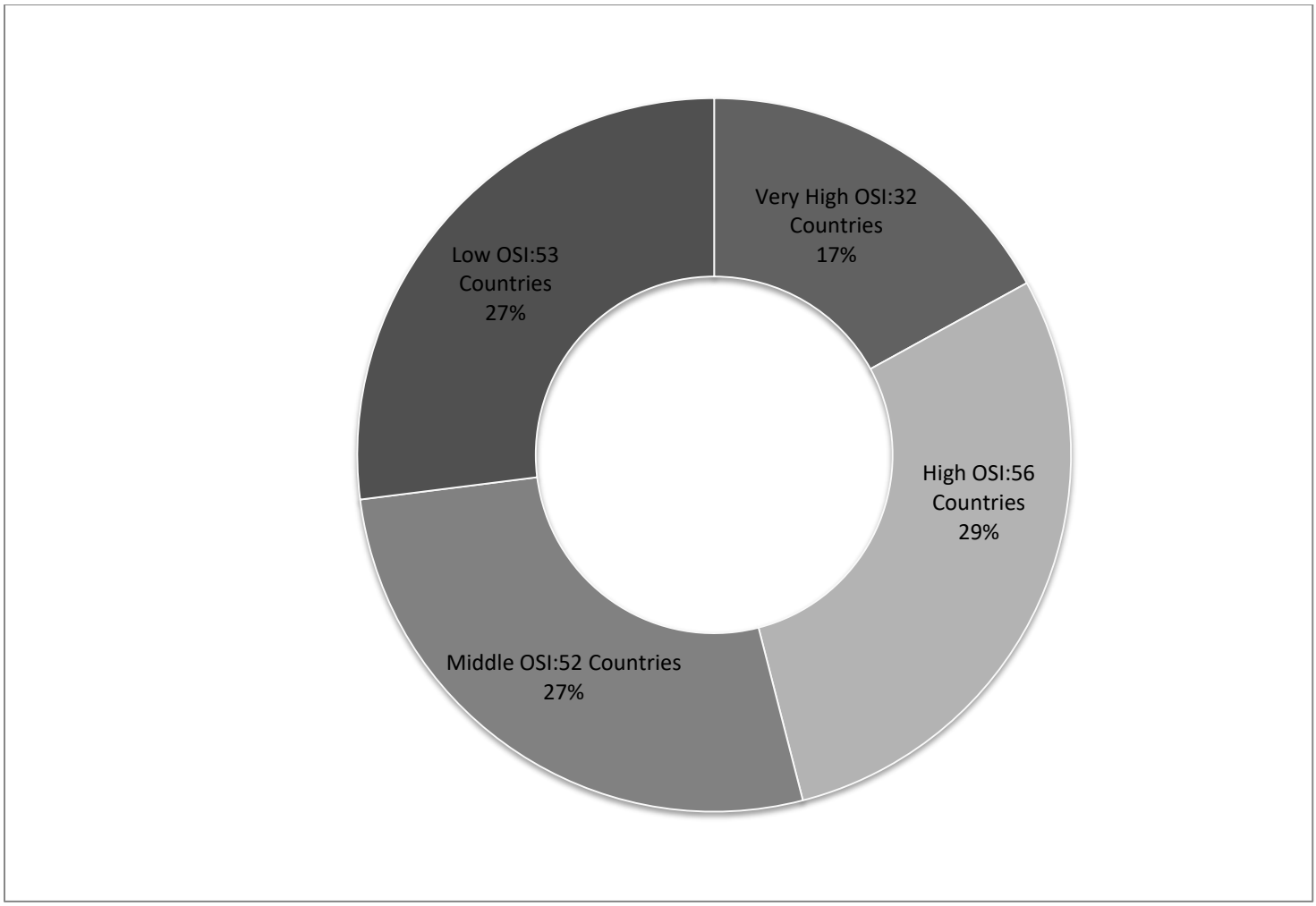

Figure 4. Number of Countries Grouped by OSI level (adopted UNDESA, 2016)

The UNDESA (2016) report further highlighted some facts about the websites of different countries across the globe. Overall, on the web portals of 193 countries: 90 countries have link to one stop shop, 105 countries have advance search option, 71 countries support online tracking system, 101 countries have privacy statement, 141 countries issue digital certificates to ensure secure services and 98 countries provide e-procurement platform. The UNDESA (2016) survey also shows that many countries have initiated advance services through their official web-portals. A number of transactional services were found on different countries portals. Some of the typical transactional services been plotted in figure 5.

Figure 5. Advance Services on Web-Portals (Source: UNDESA, 2016)

2.7 Chapter Summary

This chapter presented a brief history about the emergence of E-Govt system. Afterwards, the diverse range of E-Govt definitions given by international agencies and published in academic literature depicts the multidisciplinary nature of E-Govt. Also it reflects the complexity existing in E-Govt. The chapter also included the different domains and maturity model of E-Govt developments. The investigation of these models highlighted critical factors of development related to technological, governance, regulatory and environmental issues. As the research at hand is based on UN's four stage maturity model which (utilizes OSI to rank

each country across the globe) is also discussed in detail in current chapter. In addition an overview of the countries' general ranking and the number of common services deployed regarding OSI are also examined.

Chapter 3

Literature Review and Theoretical Framework

3.1 Literature Review

A review of literature shows that E-Govt is now generally viewed as an avenue for expanding economic development (Krishnan et al., 2013), improved service delivery (Von-Haldenwang, 2004), administrative process efficiency and business competitiveness (Srivastava & Teo, 2007). It delivers Govt's services in an effective and efficient manner thus increasing transparency and accountability (Ojha et al., 2011) lessening corruption (Bertot et al., 2010), grows revenue and reduces cost (Kim et al., 2007; World Bank, 2014). These advantages are some of the main reasons behind the Govts' keen interest in E-Govt projects. Much of the prior E-Govt research has focused on the technological aspects of E-Govt initiatives without assessing environmental factors of the vast differences in Govt resources. Such a research suffers from fundamental limitations and shortage of cross-national analysis (Boyer-Wright & Kottemann, 2009).

Govts around the world have become well aware of the potential inherent in ITs to simplify, streamline and control the costs of their operations. Many of them have introduced national E-Govt plans detailing their proposed initiatives and the benefits that will accrue from these plans (Singh et al., 2007). Norris and Moon (2005) argued that sophistication of E-Govt systems are greatly depends on the presence of well-developed institutional arrangements. A research undertaken by West (2004) vindicated the importance of institutionalization and the governance mechanism for ensuring E-Govt development. Alike suggestion has also been

proposed by Von-Haldenwang (2004) in his study. Recently, Srivastava and Teo (2010a) found that the quality of public institutions (in association with macro-economic stability) in a country is significantly related to the level of E-Govt development. It also depends upon the presence of good governance (Krishnan & Teo, 2012). As "*good governance has the potential to contribute to the transformation of the public sector, resulting in greater cost savings, enhanced efficiency and the reduced administrative burden*" (United Nations, 2008, p. 8). West (2005) has a similar stance and argued further that E-Govt is essentially the embedding of digital technology in the thoroughly social process of governing a country. His findings suggest that E-Govt developments in a country would depend mainly on how it is being governed.

Several previous studies have stressed to focus extensively the political factors in the development and diffusion of E-Govt efforts (Azad et al., 2010; Chen et al., 2006). Findings of Moon et al. (2005) and UN Public Administration Programme (2010) indicated that poor or wretched technological infrastructure hinders E-Govt diffusion. Moreover, these factors are also congenial because of their vocal importance in prior studies. In the next section of this chapter the theoretical framework and hypotheses are discussed. Afterwards, at the end of this chapter proposed research model of the study is included.

3.2 Theoretical Framework and Hypotheses Development

3.2.1Technological Sophistication and E-Government

Weil and Rosen (1995) stated *"Technological Sophistication (TS) is assessed by the function of the availability and utilization of technology"* (p. 4). For example people face a hazardous situation or feel discomfort in countries where technology receives scant attention due

to being unfamiliar to masses on a large scale. On the other hand else-where in the world, technology is widely embraced by the people due to the wide variety of the technologies available in the common market. With the advanced level of technologies especially ICTs, people tend to transfer their matters to online system for quick and accurate dealing. This technological advancement also enabled Govts to take right steps to move their transactions to internet to obtain a wide range publicity besides gaining a firm foot hold in the comity of nations. In the course of time, it is believed that this change in the composition of interactions, would really invite further development in E-Govt (Singh, 2007).

Technological development and its availability is the life blood to ensure the speedy growth of the E-Govt and the extent of Internet usage to sustain an unshakable existence in all odds. The more we harness our living standard, working out the use of internet and a free approach to use web, the more our masses would gain a dominant position resulting in improved Govt–citizen relationship (Tolbert et al., 2008). Similarly, the greater the TS, the greater the penetration of E-Govt is expected in a country. In other words, the quality of the infrastructure also constrains the nature of the applications that can be deployed for E-Govt. For example the, bandwidth available to household Internet users limit the use of rich media (sound and video clips) on Govt's web portals. Similarly, this weaker bandwidth may curtail citizens to use such rich media. The more effective and vibrant is the TS, the more cohesive and healthy would be the cause of E-Govt expansion. And E-Govt is expected to show greater penetration only when supported by vociferous application of technology in vogue.

According to the well-known neoclassical and new growth theories that elucidated technological progress and creativity, is considered second to none in any way (Lucas, 1988; Romer, 1990). In other words, nothing would be remarkable in the annals of human life without

perceiving a Renaissance that happened to appear through technology in world today (Lucas, 1988). Extending this argument in the context of E-Govt, it is thereafter argued that TS can contribute a great deal of strength to E-Govt system as E-Govt development entirely depends upon how to utilize the technology infrastructure to deliver the public services online (Siau & Long, 2009). So also Srivastava and Teo (2010a) emphasized that a Govt and its agencies can do their duties skillfully which pertain to the routine activities of citizens and businesses when ICTs are widely available. Warkentin et al. (2002) quoted that E-Govt is characterized by the comprehensive use of the latest technologies such as ICTs which consequently accelerate E-Govt development. Grant and Chau (2005) accentuated that E-Govt like e-business, would be impossible without a sound technological platform. Furthermore, Heeks (2002) stated a 20-25% failure rate among E-Govt projects in developing countries, the prime reason was the lack of technological infrastructure. In another study conducted by Nkohkwo and Islam (2013) in the least developed region of the globe i.e. Sub-Saharan African countries, technological infrastructure was regarded as the greatest challenge to the successful implementation of E-Govt systems. And to highlight E-Govt more, Moon et al. (2005) contended that the more technologically advanced (i.e. at higher level of TS) a country is, the more likely would be the country to gain a solid ground to boost up its E-Govt projects and agenda. Hence it is predicted that:

H1: Technological Sophistication is positively associated with E-Govt development in a country.

3.2.2 Good Governance and E-Government

Transparency International defines Governance as *"a concept that goes beyond the traditional notion of Govt to focus on the relationships between leaders, public institutions and*

citizens including the processes by which they make and implement decisions" (Transparency International, 2018). Governance means how the supporting columns of a country up hold the running affairs that keep it moving ahead smoothly and efficiently. So Governance indicators relate to the aspects of a country's governance. A report by World Bank (2014) stated Governance is like an umbrella having many supporting units to become a strong stem to up hold the whole system tightly. Governance measures some specific areas of governance, like public service delivery, electoral systems, corruption, accountability, human rights, civil society and gender equality. In recent past, a general consensus has egressed about the 'Good Governance'. The elements of good governance are: transparent and accountable institutions, fair decision making procedures, a competitive democratic and political system, impartial judiciary, economic openness and speedy growing economy, a viable civil society and above all the rule of law (Global Innovation Index, 2013). Likewise Transparency International characterized good governance as *"being participatory, accountable, transparent, efficient, responsive and inclusive, respecting the rule of law and minimizing opportunities for corruption"* (Transparency International, 2018). It is essential for the Govt to have a loyal and a diligent bureaucracy and a fair distribution in employment quota i.e. the right person on the right job to form an active Govt to run the machinery more efficiently as a democratic setup that depends upon the collection of personnel imbued with strong sagacity and selfless designs.

A report by World Bank (1994) embodied some of the important constituents of 'Good Governance' which primarily include (i) credible economic policies (ii) skillful bureaucracy (iii) public official's accountability and (iv) public participation in Govt affairs, all behaving under the rule of law. In line with this explanation, for any country several aggregated indicators are proposed by World Bank to measure governance. These aggregated indicators gathered the

views of respondents including citizens, expert's opinions and individual's in large enterprises from industrialized, developing and least developed countries. The indicators' scores are published annually which covers over two hundred countries and territories (Kaufmann et al., 2011). The general consensus is that countries which run democratic and transparent Govt institutions have the capabilities to promote development and growth, increase the overall living standard of population and mitigate the poverty graph.

The governance indicators provide comprehensive snapshot of a country's degree of governance still a great many problem can be found to put them in order. A couple of researchers have criticized them for several demerits. The prominent critiques include complexity, absence of underlying theory, lack of comparability over time and space, lack of conceptual clarity and hidden biases (Arndt & Oman, 2006; Knack, 2006; Langbein & Knack, 2010; Thomas, 2010). However, in counter reply the developers (i.e. Daniel Kaufmann, Aart Kraay, Pablo Zoido-Lobatón and Massimo Mastruzzi) refuted all of the critiques in various published articles (like: Kaufmann et al., 2009; Kaufmann et al., 2011). Regardless of the critiques and controversial opinions given by the critics against the indicators, the gist of the whole problem may be squeezed out with positive results. As in recent times, majority of the policymakers and academicians agreed upon the usefulness of these indicators as they widely applied these indicators to study the governance structure of any economy (Givens, 2013). The vitality of the aggregate indicators is also evident from the fact that it offers highest coverage for countries across globe which is far greater than any other data source.

E-Govt is a key modernizing mechanism in the contemporary governance. As noted by Meso et al. (2009), the idea of governance is attaining much focus as a national-level construct because of its rapid expanding domain within ICT research. In addition, they further highlighted

that in developing states governance has capability to exert the influence on ITs and the system that are being developed. Earlier studies (Ferreira et al., 2014) in Information Sciences together with some developmental research (Meso et al., 2006;) have colligated technology with governance. Further-more, majority of the studies connecting governance and E-Govt are based on qualitative approach (e.g. Madon, et al., 2007). The present record of those studies brings us close to the conclusion that there is yet another better option in the form of quantitative approach. Comparatively, this research seeks to recognize whether there is quantitative merit in the complementary role of governance framing the E-Govt development.

Consuming the resource complementarity perspective (an extended form of Resource Based View) as our theoretical lens, this study formulates the governance as a national complimentary asset. Such national complimentary assets have a vital role to play to ensure a viable E-Govt (Krishnan & Teo, 2012). Focusing this critical purview of governance yield the probable high level of E-Govt attainment across some countries. As application of the idea of governance as a national complimentary asset epitomizes how a few states before us gained such a high altitude to form E-Govt. Though initially it was preferred to apply resource complementarities concept in the firm settings, currently many studies have approached from several angles and extended its core arguments to different levels e.g. country-level (Krishnan & Teo, 2012) to verify its applicability in various settings. For instance, by extending the resource complementarity perspective, Srivastava and Teo (2008) pointed that E-Govt development in a country is strongly associated with national complementary assets, such as human capital, public institutions and macro-economic conditions. This study is an extension of such research by considering indicators of governance as the national complementary assets that may appear an energetic force to contribute to the transformation of public service delivery ensuring a good deal

of cost saving, minimizing administrative burden and above all stabilizing an all-round efficiency (UNDP,2008).

3.2.3 Regulatory Quality and E-Government

Regulatory Quality (RQ) is *"capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development"* (Kaufmann et al., 2011, p. 223). Concisely RQ is the output of the Govt as how drastically it can formulate and implement policies and terms of its standing rules and regulations in the greater interest of both state and citizens. According to the critical conclusion made by Kaufmann et al. (2007) the regulatory framework are market-unfriendly policies such as price controls, insufficient bank supervision and excessive regulations especially in areas of foreign trade and business development. All such poor regulations demand timely action and needs to be checked at suitable intervals to see its effectiveness.

Nations are ranked differently regarding scope and the degree of depth of E-Govt. Vassilakis et al. (2005) is of the opinion that there are five core potential barriers to the Govt's e-services, amongst which legislative barriers are top ranked. This gives the explanation as to why some countries fall behind the developed countries in the fields of E-Govt. In most of the cases, E-Govt has been imputed to faint or non-existent national governance and institution factors pervading the developing world (Azad et al., 2010; Gebremichael & Jackson, 2006). It has also been observed with concern that some countries stand stagnant to furnish their technological advancement like E-Govt (Azad et al., 2010; Gebremichael & Jackson, 2006). They fail to catch up their rivals. To harness their technological strength in a true sense, they need to improve weak or non-existent national governance institutional factors (Azad et al., 2010). Similarly Neto et al.

(2005) declared that a country having an appropriate legal framework gains a rich ICT progress. In a similar note Guermazi and Satola (2005) stated *"it is critical for countries to adopt effective legal environments that support e-development"* (p. 23). The legal framework and laws provide tangible support to stabilize e-development in a country. As the wide range of civil and the criminal penalties enforce different procedures that are essential to facilitate the E-Govt as per its pre-planned agenda. A longitudinal study undertaken by Dutta and Mia (2010) suggested that legal framework gives ample support to ICT led innovations which might be fruitful for a country in the long run.

The legislative is to chalk out the parameter of judiciary system in the state. It makes laws according to the instructions of the constitution so that justice is given to every citizen in the state through different courts. Regarding E-Govt systems such laws point towards the feasible laws, regulations and directives that are needed for its implementation. The legal frame work is an indispensible set up in E-Govt so that the Govt organization can stabilize distribution of justice to the down-trodden people of every creed and color, also such legal framework has positive effects on IT adoption in public organizations (Gasco, 2005). Boyer-Wright and Kottemann (2009) augmented that E-Govt comes into being through a franchised mandate of legislation. The Govt is however determined to bring forward laws to safeguard privacy in the field of Information System like that of introducing the 'cyber law' in vogue. Implementation of cyber rules would prove an effective deterrent to provide ample protection against the cyber war in the twenty first century. These days adequate law bills have been finalized in the courts to take effects, yet privacy in the public sector is considered a pre-requisite to maintain cooperation between all ranks in the Govt. A viable legal system ensures the safety and privacy oriented matters of citizens and businesses and is also responsible for the success of any E-Govt initiative.

For example, Singapore is credited to be the first country in the world to enact cyber laws. The laws cover digital and electronic signatures, keep track of electronic records and maintain electronic contracts. Further, the laws are fully applicable to all kinds of electronic communications. The presence of these effective cyber laws have earned Singapore name and fame in the E-Govt and has soared up its position in E-Govt rankings as currently it has the supremacy in implementation of E-Govt initiatives (Srivastava & Teo, 2005).

A survey carried out by WEF revealed that success of RQ depends upon applying crucial judgment which ensures investments and ICT led developments in a country (Dutta & Mia, 2010). A report presented at the 'World Summit on the Information Society' Schware (2005) regarding the size and the scope of web applications in a society emphasized that positive steps (like legal framework) based on good will be familiarized throughout the world to counter the damages to the cause of e-commerce and E-Govt. Schware (2005) also highlighted the importance of feasible regulations needed for an environment conducive to ICT progression, such environment may enhance the adoption and use of e-applications. In a similar research, Neto, et al. (2005) added that regulatory reform enables competition trend which encourage ICT investment that press down ICT prices and boost up the approach of developing more advance ICT services. Moreover they vindicated that the differences in the quality of regulations among countries also result in enlarging the technological gaps between them. Hence, it is to note that E-Govt services will expand and flourish enormously provided the charter of regulatory framework is high. In short, the level of E-Govt will rise, show its durability and nurture from basic information publishing to transactional services (United Nations, 2010). These arguments made the grounds for the second hypothesis of the study i.e.

H2: Regulatory quality is positively associated with E-Govt development in a country.

3.2.4 Rule of Law and E-Government

Rule of Law (RL) is *"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"* (Kaufmann et al., 2011, p. 223). While Transparency International explained Rule of Law as " *legal and political systems, structures and practices that condition a Govt's action to protect citizens' rights and liberties, maintain law and order and encourage the effective functioning of the country*" (Transparency International, 2018). In any society RL points towards strong democratic political system, impartial judiciary and a legal system of property rights (Shih et al., 2005). Political institutions and judiciary are the renown setups where an extensive system and supremacy of the rule of law exists. Prevailing directives should be given the chance to prove a strong adhesive against the odd occurrence. RL includes the martial element playing a vital role in contracts made in service structure, the courts and the business based communities to ensure stability in a trouble free set up so that violence and crime factors could be repelled back. Generally, this indicator of good governance is about the success of a nation in promoting an environment that is free from favoritism and where predictable rules form the basis for social interactions.

The law barristers, Jurists, legislators and researchers have explained several aspects of RL. Cervellati et al. (2008) regarded RL as a social contract that guarantee conflict resolution amongst members of society. So the Govts' priority is to guarantee the public aim to enhance civil and the criminal punishments to ensure RL. Similarly according to Donnelly (2006) RL is legitimate reins through which the state protect its citizens. Further Donnelly (2006) explained

*"when citizens can bring disputes concerning rights to court rather than fight in the streets, the rule of law is enhanced" (*p.37). Also it judges how better standards of protecting the public rights have been brought home. In a country if a disorder is reported with greater frequency it's an indication of strong RL, on the contrary if disorder is less frequently reported it indicates weaknesses of institutions with weak RL. Hoff and Stiglitz (2008) have different views about RL who declared it as a resource of political forces whom mostly introduce it as a reform for their personal benefits. The diverse views about RL confirms its complex nature as Meso et al. (2006) observed that RL is a complicated outcome of all the endeavors made by a Govt and it lies at the crux of national development efforts. In short, the role of RL is important in societies as it is held responsible to let its citizens share them in uplift the national cause so as to become an invincible union.

In a country RL is not about the Govt's regulation activities assessment nor it deals in the appropriateness of a specific regulations. In-fact RL is concerned with the implementation and enforcement of regulations. Dynamic Govt institutions play an important role to sustain economic health of any country but this role is hampered in case if RL is less practiced in that country. Re-enforcing the RL reforms push the country to a better position regarding good governance and economic growth. This is also evident from the strong RL practices in the developed countries as they have got a better position from their counterparts (developing and transition economies). The developing countries are however trapped into excessive order or dis-order situations resulting in their institutional weaknesses.

This research mainly focuses on the quality of RL in a country and its impacts on the development of E-govt services. To our knowledge this is a kind of first research that has endeavored to develop a theoretical framework of this relationship. In research literature, a

limited number of studies have explained the relationship between RL and technology adoption. Out of these studies the major portion focused on a specific production sector or industry. Like in their study Lovely and Popp (2008) concluded a positive relationship between regulation and environmental friendly technologies. The World Justice Project accentuated that *"uneven enforcement of regulation, corruption, insecure property rights, unclear laws, and ineffective means to settle disputes undermine legitimate business and drive away meaningful long-term development"* (World Justice Project, 2018). As E-Govt is a long term development, weak RL in a country may inhibit its progress. Infante and Smirnova (2009) developed a model which portrays that strong RL enhances the number of entrepreneurs, whom are highly prone to adopt environmental friendly technologies. Further, through strong RL, Govt services may be served with ease and lesser costs. This is because the minimum intervention from regulators and least resource drainage from rent seeking activities. Also, RL ensure feasible environment for all to live with dignity and obtain equal chances of progress. In such scenario ICT led developments may gear up with much greater speed (Kasigwa et al., 2006). Thus promoting the RL reforms may be helpful in developing an effective E-Govt system. Consequently, the following hypothesis has been formulated:

H3: Rule of law is positively associated with E-Govt development in a country.

3.2.5 Political Stability and E-Government

Political Stability and Absence of Violence (PS) is *"capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism"* (Kaufmann et al., 2011, p. 223). In short, it is the degree of turbulence in a country (Meso et al., 2006). Political stability is like

the life-saving drugs which keep the living beings survive and regain stability to continue longer. It proclaims tranquility, peace and progress in the human society which is directly needed to prevail constantly to keep us moving about. Lack of the political stability on the other hand would leave us gain nothing in life. It can be quoted consistently that quality political traditions once emerged are awarded public appreciation, being a torch bearer for the nations to have a streamline and adhere to it. Politics have ushered the human society to the dreams of new vistas to perceive how to command over the rude side of un-subdued natural phenomena. Our world is just different from what it had been some decades ago. An achievement was got due to fair democratic practices of age long experience. The democratic rule is therefore much better than many other systems practiced else-where in world.

It is emphasized that the highness of political stability has great impacts on the economic condition of nations. It is also claimed that in a country politically stable environment is conducive for citizens' engagements in fruitful economic activities (Meso et al., 2006). This potential of E-Govt to serve citizens better and include them into the process of administration and policy-making is more likely to be realized in nations with politically stable Govts that enact and enforce quality laws in the public interest. On the contrary, citizens in unstable political environments may retire their fruitful resources or shift them to more stable environments or convert them into assets which might be helpful for them in hazardous political situations, such acts result in economic productivity loss (Cukierman, et al., 1992). Individual's in unstable political environments will therefore be more likely to dump their whole productive resources towards the mass and class of people. Such deprivations are not limited to economic decline but it also affects other interests of societies like ICT-led developments. For example, in their study on ICTs and sustainability in developing countries, Kasigwa et al. (2006) accentuated that

"technological infrastructure and political stability are crucial factors for ICT-led development" (p. 78). It is out of question to assume sustainable E-Govt system anywhere in the world without supremacy given to PS. The ruling political bodies are however, responsible to avoid a misadventure to minimize the public capital possibly during big mobilization, emergency or during the national disaster. As the political Govts are always cautious to protect their citizen's assets against the unfavorable situation.

E-Govt is a major transformational exercise in change management. Strong political potentials, men of sound mindset and politicians having viable vision are pre-requisites to make a combined force in paving way to cherish for such transformation (Sudan, 2005). Politicians are the main actors in decision making regarding the evolution of the public organizations and of course the E-Govt. Greater level of political stability may lead to the advancement of activities related to E-Govt developments because implementation of such system require having the proper support to assign resources given that E-Govt development is an action with detectable effects only in the medium to long term. A research undertaken by Al-Solbi and Al-Harbi (2008) highlighted that political un-rest and a turbulent based situation in some parts of the Middle East escalated E-Govt failures in the region. Further, they argued that such turmoil may not only affect ICT-led investments but will also have also negative impact on the ICT-led developments. It is therefore evident that ICT led developments may go to doldrums in such a scenario. Political stability is the only remedy to help reduce ailment. Due to mal practices and misguiding administrative bodies the ICTs infrastructure comes to decay and finally collapse.

ICT narratives increase the thorough participation of citizens in public matters and bring new promises to ensure improvements in democratic norms and achieving the common goals (Jakob, 2002; Liden & Avdic, 2003). The emergence of Internet and commencement of ICTs

developments are the advents of the great democratic process (Shi & Scavo, 2000). It is pertinent to repeat again that the importance of both the internet technology and the democratic rule have rendered us overcome our long awaited problems. Prior research contains mix results regarding democracy and E-Govt relationship. The findings of Norris (2003) depicted significant positive impact of democracy on E-Govt readiness. Likewise Moon et al. (2005) stated that countries where democratic practices are lacking Govts are least interested in E-Govt projects, as such Govts are not provoked towards transparency and interactive relations with citizens or other agencies. Contrary to these results, the empirical research of La-Porte et al. (2002) demonstrated insignificant relationship between democracy and openness of Govt websites, while a weak relationship reported between democratization and E-Govt by West (2004). His findings suggested that authoritarian and democratic Govts have same rankings for E-Govt readiness. Based on the mixed results of earlier literature it is predicted that:

H4: Political Stability is positively associated with E-Govt development in a country.

3.2.6 Government Effectiveness and E-Government

Govt Effectiveness (GE) is *"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"* (Kaufmann et al., 2011, p. 223). GE is mainly concerned with the effectiveness of civil services and effectiveness of bureaucracy in a country. Effectiveness of a Govt can best be judged by its qualitative measures regarding the structure of the civil services and the degree of its independence from the political forces.

GE has various dimensions to depict ways and means through which the real Govt's efficiency could possibly be achieved. The bureaucracy works as a buffer efficiency between the public and the Govt in such a sophisticated way that the whole thrust of the workload is carried out to a thread bare level. It is doubtlessly clear to note that the bureaucracy is the backbone of the Govt, keeping the Govt machinery operating smoothly and efficiently. Therefore, the stronger and honest the bureaucracy is, a better output of the Govt is expected. The bureaucracy of Govt's department is responsible to clear all the reports and response well in time to avoid lingering in any case on one pretext or the other. The policy mechanism is the next factor together with the implantation of the legal orders that demands an iron land for their execution. The Govt is required to stand firm to its commitments regarding promulgation of the policy structure through the concerned agencies. Therefore the grass root level support and the co-ordination among all the ranks of bureaucracy is the cry of the day to make a strong chain of command and control that leads to furnish E-Govt system.

A Govt in any country has to meet wide range of goals and objectives. Such goals stretch the Govts towards the achievement of multi-dimensional development starting from the economic growth gains down to improving social status of their citizens (Srivastava & Teo, 2007). Under economic objectives the Govts are keen to make the nation competitive, sustain economic growth, maintain price stability and reduce poverty level. On the other hand social objectives are concerned with improving human well-being, enhancing living standards of citizens and getting rid of social inequalities. Achievement of such objectives is only possible when Govts' policies are reduced to strict compliance along with serving businesses effectively (Kaufmann et al., 1999) otherwise chaos and disorder would prevail all around and civil disobedience may take place throughout the state or the whole setup may collapse. In short, the

Govts should be 'effective' and policy making mechanism should be kept aloof from the sectarian pressure which can easily be achieved by delivering public services online. In their study Krishnan and Teo (2012) articulated as *"a Govt will be instrumental in developing E-Govt initiatives and delivering online public services only when its (i) national institutions are effective (ii) resource allocation is efficient (iii) quality of public administration is effectual (iv) civil servants are competent and (v) civil services are independent from political pressures"* (p.1934).

GE may provide relevant drivers in the development of digital Govt. More concretely, GE constitutes main support leading towards the erections of a sound E-Govt system. As any Govt inclined towards raising efficiency and citizen's gratification may be more concerned in developing E-Govt system (Moon & Norris, 2005). Thus we hypothesize as:

H5: Govt Effectiveness is positively associated with E-Govt development in a country.

3.2.7 E-Government and Control of Corruption

Control of Corruption (CC) is "*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"* (Kaufmann et al., 2011, p. 223). While Transparency International (2018) defined corruption as "*the abuse of entrusted power for private gain*". According to Transparency International corruption exists in many forms. The most common of which are grand, petty and political corruption. Each form is practiced in different context and has distinct intensity of loss. Grand corruption occurs at the Govt level when elites of the country distort policies for their personal benefits at the expense of public goods. Petty corruption take place in daily operations carried out by common and lowered public

officials in providing Governmental services to citizens. Political corruption involves illegal allocation of resources to un-authorized personnel. Political decision makers take such actions to sustain their power, status and wealth (Transparency International, 2018). Although instances of corruption have been found in both Govt and private organizations, this study concentrates solely on Govt corruption because of its more generalized and potentially extensive detrimental effects on state policies.

Corruption involves acts in which a public office is used to protect an officer's personal interest in a manner that goes against the rules of the office (Jain, 2001). The solid factor invites corruption to a Govt is either the majority feel frustration to have their dire demands met with or those black sheep especially in the Govt agencies to gain superiority over their rivals by appeasing their lust of power no matter how much unfair means might have been practiced as such. Corruption is therefore a problem that exists in institutes which fail to provide ample perks to their employees. Such low rewards decrease the motivation of Govt officials whom got involve in self-interest activities rather than public welfare. When a country is at high ranks of corruption it is because such mal practices are already institutionalized in Governmental organizations.

The impacts of corruption are felt more profoundly in those countries where resources are scarce (Perry, 1997). In some countries, extensive lucrative activities in kinds of bribe, kickbacks and illegal favor/recommendation etc. are frequently practiced. In such countries bureaucracy breeds some tycoons to spread a secret network to collect wealth for obvious reasons, never caring for deteriorating the home economy. The visible trouble to sort out these men is, very difficult to have a curb on the troublesome diseases. This is the worst ever distort which undermine citizens' trust in the institutions of the country. It is however to remember that most

of the obnoxious happenings emerge in public life mainly because of the corruption in our ranks. Nothing looks as dangerous for destabilizing the human society as does corruption. It is quite evident that bribe giving and taking is not less than a curse yet there is another type of the bribe too, which is very deadly and dangerous to weaken rather collapse the Govt. That is the Govt oriented bribing system. In this regard the bribe transaction is done on the Govt level. Each year hundred billion dollars are lost in bribes across the globe. A critical study by Kaufmann (2005) from the World Bank estimated that approximately US $ 1 trillion were lost in bribes, and for some nations, such as Nigeria and Kenya, bribes equate to 12% of their GDP. This undesirable practice of bribe has almost extended to all the living population in the world without a solution in sight. Therefore, finding ways of reducing or eliminating corruption can prevent these funds from being taken out of a country which is prime cause of loss faced by economies. Corruption also leads to great uncertainty as one may not know how much he has to pay to public officials to avail a Govt service. The investors are also reluctant to invest in uncertain situations, hence investors may not plan to invest in countries where bribing system is dominant (Garcia-Murillo, 2011). Endeavors should therefore be enhanced long before to have avoided such a scenario in the apex house.

Scholars have provided many recommendations for reducing corruption. Regarding governance, VonMuhlenbrock (1996) recommends the use of punishment and other preventive mechanisms to curtail the exercise of discretionary powers. Besides, other academicians and school of thought have suggested to reduce the monopoly powers being exercised by greedy Govt officials by introducing a quick structural change in the Govt. Among these is the unbundling of power and its distribution to more agents, which provides alternatives for citizens (Besley & Coate, 2000). Thus change in the organization process may enable us to overcome our

worries in reducing the complex situations. In addition to these measures, some have suggested greater transparency of rules and procedures while few have proposed accessibility o Govt informational documents be made easy to yield good results (Zemanovicova, 2002). Doubtlessly, all of these measures have contributed positively to the reduction of corruption. However, training, punishing or removing corrupt Govt officials does not eliminate the causes of corruption; rather, a change in the organizational process would make it possible to curtail corruption (Rose-Ackerman, 1978). Due to this fact, this study explored the possibility that E-Govt initiatives can help change governance structures to reduce corruption.

E-Govt technologies can simplify processes by reducing or eliminating the intervention of Govt officials. ICTs, as Strand (2010) observes, can increase the coordination, dissemination and administrative capacity of the public sector. They allow the creation of a digital audit trail that makes bureaucrats (the agent) more accountable. An automated and decentralized system take away control over processes for the provision of public services, thus reducing the potential abuse that an agent can have over certain functions of Govt. Hence implementation of an E-Govt initiative can reduce corruption as processes have to be reviewed and changed to accommodate automation. The premise is that, with the modification of Govt processes, there is a potential to significantly reduce corruption much more rapidly than through attempts by increasing income or changing the social capital of a nation, both of which could take decades. As stated by Bhatnagar (2009), the gains of an E-Govt system are convenience, shorter waiting periods, greater transparency and reduced administrative corruption. A Govt service can be rendered completely online through electronic applications and Internet payments, which eliminates the need for the involvement of Govt officials. These electronically based services can also expedite processes and eliminate the need to pay ‘speed money’ to obtain these services more quickly. An

example comes from a study by Miyata (2011), who found significant improvements in Bhutan's provision of Govt services, in particular vehicle registration, after a computerized system was introduced. Similarly, in a rural community in the Indian state of Tamil Nadu, the Govt chartered a website to allow the citizens to obtain birth certificates and apply for pensions. The website was received quite favorably by residents, who reported that they have saved time, money and efforts, compared to obtaining those services directly from the Govt's main office (Kumar & Best, 2006).

Table 4. Exemplary Cases of E-Govt Initiatives and Transparency

S.No	Description	Reference
1	**Bhoomi Land Record System**	
	In the Indian state of Karnataka the land record was computerized. Before the project commencement, 7 million farmers have to pay a bribe of Rs. 100 (on average) against each transaction. The new electronic system requires a fee of Rs.2. After the project initiation, in its very few years almost Rs. 806 million and 1.32 million working days in waiting were saved.	Bertot et al. (2010)
2	**Vehicle Registration**	
	In Bhutan vehicle registration services were started to be provisioned online. The new system brought significant improvements to the old as it was received favorably by the citizens. The working system improved in terms of efficiency due to speedy delivery of public services. The system proved its worth against corruption and its vital role in raising public staff accountability.	Miyata (2011)
3	**Tax Collection**	

	In Pakistan the procedures of tax collection were revived. The whole process has been put online in order to minimize the direct contact between tax officials and citizens in order to reduce the bribery factor.	Anderson (2009)
4	**ePerolehan**	
	The Malaysian Govt e-procurement system has brought significant improvements in the service performance, efficiency, information quality and transparency. The ePerolehan by providing access to online information has limited the 'power of invitation'. Which public officials normally give to preferred organizations and keep it secret as long as possible. The ePerolehan allow quick access to information has furnished better solutions to make the tender process more transparent. It increased competition among suppliers and created new business opportunities as all business suppliers have equal chances to take part in bidding process. The ePerolehan also resulted in decreasing un-necessary 'red tapes' and enhanced greater transparency.	Kassim and Hussin (2013)
5	**e-procurement System**	
	The cases of Philippine's and Chile's (chilecompra) e-procurement system are prominent in the fight against corruption. Both systems are vibrant to prevent price fixing by corrupt officials and contractors which enhanced public official's accountability and reduced corruption.	Anderson (2009) Heeks (2005)
6	**Monitoring Websites**	
	In USA a number of websites (like www.usaspending.gov and www.it.usaspending.gov) are created to track the Govt's expenditures. Such websites allow citizens to monitor Govt spending for waste and fraud.	Bertot et al. (2010)

ICTs facilitate the information stream with tools like the Internet, which *"enables citizens to demand certain standards, to monitor service quality and to challenge abuses by officials"* (Svensson, 2005, p. 35). By means of web applications, agencies can create an electronic interface between citizens (or companies) and the information/services they need. Thus, clients are empowered to control the process by placing requests and paying for public services, tracking and receiving them, all online. Tax payment, procurement and licensing are some examples of public processes that can be transformed to eliminate human mediation, to make them less fallible and corruptible. An example of such a system comes from the study of Martinez-Vazquez et al. (2007), they explained that a tax administration system relies on tax collectors to audit contributors, the taxpayer may feel compelled to 'please' the tax collector in order to receive a lower penalty. An electronic Govt site for taxation could reduce corruption by eliminating the taxpayer's personal relationship with a Govt official. These electronic records also provide a way to audit past transactions, making fraud more easily detectable. It is already known that few nations have taken advantages of these technologies to root out corruption from their societies. For instance Onunga (2003) stated *"the Govt set up a pilot project in Electronic Graft Management for the purpose to increase public awareness and encourage public participation in fighting corrupt practices"*. Though maintaining the efficiency of the E-Govt has been discussed in these lines, still to curtail corruption on the Govt level is yet to be penned down to complete the story.

Prior research that focused on the outcomes of E-Govt demonstrated that in any country, progression of E-Govt system offers several benefits. E-Govt offers a great potential to control corruption and promote transparency. E-Govt tied more strong relationship between Govts and their citizens. E-Govt not only improves service delivery (Von-Haldenwang, 2004; West, 2004)

but it is also helpful in curbing corruption and raising Govt transparency (Von-Haldenwang, 2004; Wong & Welch, 2004). Several tools of IT, especially internet and mobile devices are great sources available to Govts for transforming relations with citizens and businesses. These tools have also resulted in more empowerment of citizens and enhanced their access to wide range of information. The empowered citizens can directly sight and monitor the activities of public officials (Shim & Eom, 2008) which ultimately reduces corruption and enhances transparency (Meena & Sagar, 2010). Some case studies and research instances have already proven the fact that E-Govt acted a great 'anti-corruption' strategy (Mistry & 2012; Elbahnasawy, 2014). Countries across the globe have successfully launched E-Govt applications to reduce corruption. Among these applications the examples of procurement, tax payments, land records and monitoring websites are prominent examples of public process transformation. These applications have minimized the role of human mediation making less fallible and corruptible (Garcia-Murillo, 2013).

A society having limited economic opportunities is motivated by basic survival. In such society individuals find some ways of gaining resources. Even some of these ways are illegal (Schelling, 1978). The very similar way corruption mechanism works in which individual got involved in activities that benefit them but harm society as a whole. Such activities can take several forms like bribe, abuse of power, theft, extortion and embezzlement, fraud and nepotism (Lio et al., 2011). For Govt officials involving in such activities are because of two main reasons i-e., asymmetric information and discretionary powers. The internet based E-Govt system may provide solution for all such problems using Principal-Agent-Client (P-A-C) model based on agency theory (Krishnan et al., 2013). According to Klitgaard (1988) corruption take place when there is a problem of asymmetric information. The P-A-C model states that principals are the

elected Govt officials whom represent the state and its citizens. The principals hire public servants (agents) to deliver Governmental services to citizens and businesses (clients). The model poses that due to asymmetric information the agents know far more than the clients and principals about the administration and processes. The problem of corruption arises due to asymmetric information as in this case the agents may act opportunistically by engaging into corrupt practices like bribery, embezzlement and fraud (Lio et al., 2011). The model further predicts that the agent exercises rent seeking behavior due to greater monopoly and discretionary powers. The agents take advantage of their power and exploit their position to act more in self-interest through bribery, extortion, fraud, nepotism and embezzlement. Hence to counter corruption it is important to re-structure P-A-C model by reducing the discretionary powers granted to agents (Klitgaard, 1988). Mahmood (2004) suggested that E-Govt through ICTs can be an effective tool to transform P-A-C relationships. As E-Govt automate the procedures, has the capability to access and share information with ease and provide detailed data on transactions. Singh et al. (2010) suggested that E-Govt reduces discretion by removing intermediary services as citizens are allowed to conduct transaction by themselves. In terms of P-A-C model it is taking agent out of the model (Mahmood, 2004) or mitigating his role as now it is the computer programs that follow some specific procedures to process client's requests for service delivery. Further E-Govt keeps the record of full transaction which increases the probability of corrupt acts. Therefore E-Govt may inhibit public official's corrupt behavior.

In literature the relationship between E-Govt and corruption has been overlooked by number of researchers (Anderson, 2009; Shim & Eom, 2008; Mistry & Jalal, 2012). While the results of past literature about the role of E-Govt in controlling corruption are mixed. Some study reported positive impacts while some others are just the opposite. In their study Lio et al. (2011)

found that internet adoption reduces corruption, further they highlighted that causality between these two exists both ways. Goel et al. (2012) stated that greater corruption awareness (measured by internet hits per capita) acted as an impediment of corruption. Anderson (2009) analyzed the changes in corruption data (1996 - 2006) due to ICT enabled E-Govt initiatives and concluded that E-Govt is a useful tool in reducing corruption. Mistry and Jalal (2012) carried out their analysis during 2003-2010 and vindicated that 1% increase in E-Govt index results in 1.17% reduction in corruption. They further found that the impact of E-Govt in reducing corruption is higher in developing countries than in developed countries. Apart from their findings Mistry and Jalal's (2012) study was the first to establish the causality of this relationship. Using panel data (2002 - 2005 and 2008) for 187 countries, García-Murillo and Ortega (2010) concluded that E-Govt have helped countries across the globe in reducing corruption. Shim and Eom (2008) highlighted that E-Govt proved to be a successful solution against corruption and especially the corruption that exists in the areas of taxes and public contracts. In a latest study undertaken by Elbahnasawy (2014) reported that E-Govt is a powerful tool in curbing corruption. They used a large panel dataset for 160 countries for the years 1995-2009. Similarly, Lupu and Lazar (2015) investigated the relationship between E-Govt and corruption. Taking data in three different years (2004 - 2007 and 2012) for EU and non EU countries they reported that 1% increase in E-Govt index resulted in 6.7% decrease in corruption for EU and 6.3% for non EU countries. From the period 1997 to 2002 Anderson and Rand (2006) examined the relationship between ICT supported E-Govt and corruption. Their findings depicted that E-Govt is likely to be an effective tool in the fight against corruption. The findings of extant literature provided ample evidences to believe that E-Govt has the potential to fight against corruption as it can 1) curb the public official's discretionary power 2) solve the problem of asymmetric information 3) make

procedures and rules simpler and more transparent. However, some contradictory results also exist in past study like, investigating five cases of ICTs and corruption, Kim et al. (2009) have accentuated that still doubts exist that ICTs can effectively reduce corruption in reality. Also Heeks (1998) established that ICTs has no effect in mitigating corruption rather it can open new gateways for corruption. In another study Wescott (2001) concluded that ICTs enables the public officials to 'up-skill' corruption. Based on these argumentations and mixed findings, the next hypothesis of the study is proposed as:

H6: E-Govt development is positively associated with control of corruption in a country.

3.2.8 E-Government and Voice and Accountability

Voice and Accountability (VA) is *"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"* (Kaufmann et al., 2011, p. 223). VA is a mechanism which scales the depth qualitatively and quantitatively with regards to measure the extent between the relationship of a country with its country men in the context of how much citizens favor participation in choosing their Govt and to agree upon the code of answerability of the ruling actors. Goetz and Jenkins (2001) noted that in a static model of VA, voice means the combination of formal as well as informal mechanism through which the people desire the expression and opinions democratically while accountability is the relationship between two sides (in our case citizens and Govt bodies). All citizens desire to put forward their views to the Govt during different sessions to reach a decision to materialize them according to its priorities.

The very fundamental view of accountability is, being answerable to someone for an act or performance (Romzek and Ingraham 2000). In addition, public accountability is explained as

"*a social relationship in which an actor feels an obligation to explain and to justify his conduct to some significant other, the actor or accountor can be either an individual or an agency, the significant other named as the principal or the accountee can be a specific person, agency or general public*" (Bovens, 2005, as cited in Meijer, 2007, p. 215). The primary focus of accountability is to assess the acts of accountor by the principal on the basis of defined criteria or specific standards.

Meijer (2007) stipulated two levels of accountability. The first one he called 'agency level' and the second 'political principals level'. He further briefed about the accountability arrangements at both level. At the agency level proper record keeping system exist to warrant accountability. Political accountability is ensured by the political principals. In any country the political principals are the supreme representatives of enactment houses like national assembly, parliament or senate etc. (Bovens, 1998). The political principals ascertain the accountability of executive branch of Govt (political actors) for their acts in-front of general public (Meijer, 2007). Digitization in a country has positive effects on both level of accountability.

E-Govt is supposed to be the embodiment of an efficient setup, bears greater efficiency to serve the under command majority showing its utmost capability through different public assets thus ensure reliable accountability in the public sector (Fountain, 2007). E-Govt does not subside its due responsibilities to function in the best possible manner. Especially it is always cautions to the public requirements as information and services become more responsive to the public demands resulting in increased accountability (Dunleavy et al., 2006). ICTs are extensively efficient in transforming a Govt's internal and external relationships while maintaining its functions and responsibilities. It also helps in making a Govt more accountable (UNDESA, 2010). Since E-Govt increases the visibility of policies and procedures (Michael & Bates, 2005),

Govts across the world are striving for greater credibility and accountability to their citizens and are more likely to undertake E-Govt initiatives. As Dunleavy et al. (2006) noted that Govts all over the globe are keen to invest greater efforts to promote E-Govt systems as its role is robust in reviving the governance environments, particularly accountability and transparency. Hence this study posed to hypothesize as:

H7: E-Govt development is positively associated with voice and accountability in a country.

3.2.9 Moderating Role of Right to Information Laws

Right to Information (RTI) law has been defined as "*a fundamental right to any person to access information held by Govt bodies*" (Banisar, 2011, p. 3). Like way Access to Information (ATI) law is defined as "*the legal right for the public to request and obtain information from the Govt at the national level*" (Relly 2012, p. 338). Another explanation of the subject matter is Freedom of Information (FOI) defined by Ackerman and Sandoval-Ballesteros (2006) as: *"a law that gives citizens, other residents and interested parties the right to access documents held by the Govt without being obliged to demonstrate any legal interest"* (p. 93). Almost having similar definitions and explanations of the terms RTI, ATI and FOI this study used these interchangeably[3].

Throughout the world during the past couple of decades, laws concerning RTI were framed on priority basis. Sweden adopted the first RTI legislation over 200 years ago (in 1776). In recent past China and India have enacted RTI laws to pay a viable attention towards the welfare of their thick population (Banisar, 2006; Holsen, & Pasquier 2012). Along with these

[3] All such enactments are alternatively termed as ATI, FOI or RTI laws. For consistency purpose the term RTI is used in the remainder of this study except the quotation of others' scholar work.

countries, four dozen other nations have adopted a strong RTI legislature to promote transparency, openness of Govt and to deter the colossal size of corruption (Banisar, 2011). In the same way USA and many more post-industrial democracies took high interest in improving the wider diffusion of IT and internet access to put most of the citizens in a position to participate in politics and access to Govt information and services online. The greater potential for online activity gives Govt greater incentives to offer information and services through online means.

The FOI laws enable citizens to access any Govt documents unless exempted by the law itself (Ackerman & Sandoval-Ballesteros, 2006). The laws held by Govt provide individuals the basic right to citizens to demand information from Govt's bodies. Through such laws any individual in the state demands approach to get some information or data for some legal purpose. In doing so, the individual is not necessarily bound to disclose the purpose of interest to the state department. In other words in a country, some vital information is secured by the Govt for a safe custody which is restricted to go towards the public. But in case when the Govt wants to control the publicity of RTI, there always remains the interest of the national stability, to avoid any foreign intervention, to avert vile usage and to keep off internal threats.

The RTI law is the business dealing system comprising of the promulgation of certain rules and regulations. It is just above board and held esteem in the civilized society. RTI law enforces the essential economic growth and the social rights back to feet. It therefore undertake greater responsibility to fight exclusively against eradicating the social evils in society. For instance (1) using ATI laws the civic activists in the Indian state of Rajasthan stopped mal practices of the food distributors and ensured that only deserving poor should get the food (Calland & Tilley, 2002), (2) a Thai national used it to find the reasons of refusal of her deserving kid's admission into a top quality school (Coronel, 2001).

At present, we are witnessing a rapid change in the epoch once called industrial era has now been transformed to 'information society'. The period was termed renaissance that brought a new turn in the human life. It brought the world see a tremendous change to usher the mankind to enjoy facilities like introduction of computer. With this change the world requires to take steps to enact a universal RTI law (Bovens, 2002) to provide enormous protection to citizens' legal interests. Adoption of RTI law is an attempt to modernize information dissemination in a society. RTI reforms are effective to eradicate corruption and unveil various scandals concerning health and environment issues. Also such laws in some specific forms are enacted due to pressure from international financial institutions to raise accountability in the financial terms to keep the people well aware about functioning of Govt (Ackerman & Sandoval-Ballesteros, 2006; Banisar, 2006).

The Governmental transparency has now become a burning issue on the world forum. Worst repercussions are found today because of undesirable moral issues left by corruption. The experts in the social development fields have submitted their deepest concern to pay a heed urgently towards a speedy access to information based laws around the world to let nations seek solutions to their corrupted matters. ATI proved to be an effective deterrent to repulse mismanagement, abuses and corruption (Banisar 2011; Relly & Sabharwal 2009; Mendel 2008). Besides, it is also in the interest of the Govt as the law promotes transparency in the decision-making process. Thus co-existence takes place between the state and the public which enhances citizen's trust in Govt actions.

Around the globe scholars, policy makers and many more experts have linked the RTI laws with transparency (Darch & Underwood, 2005; Feinberg, 2004; Islam, 2006; Banisar, 2011). Eschenfelder (2004) noted that spreading the Govt oriented information on the websites keep informed the citizens about Govt operations, encourages economic growth and increases

Govt's credibility in transparency rankings. A report issued by Transparency International in 2003 named as 'Global Corruption Report' specifically focused on information access and acknowledged its role in eliminating corruption. In the introductory note of the report, Peter Eigen mentioned that *"ATI is perhaps the most important weapon against corruption"* (Transparency International, 2003, p. 5). Governmental bodies have become more transparent due to digitization, also the momentum of transparency is greater in those countries where all sorts of information is available about Govt activities (Meijer, 2007). As Mistry and Jalal (2012) pointed *"an important strategy for dismantling corruption can be the providing of easy access to information for all citizens through the use of E-Govt initiatives"* (p. 153). To cut short, ATI is repeatedly quoted to be a double egged dagger which cuts the roots of corruption that is doubtlessly the cause of spreading all the evils and harmful diseases.

The introduction of the FOI laws have now become very important to play its role against the accountability deficit (Ackerman & Sandoval-Ballesteros, 2006). The Govt infrastructure remains stable if the dependent institutions design to flow information ahead in meaningful manner. As Armstrong (2005) stated that Govt institutes be held responsible to be vigilant to frame ATI legislation to disseminate Govt information and enhance Governmental accountability without such the Govt credibility remains at stake. In such a scenario, the good deeds carried out by the Govt prove trash. In this era, democracies heavily rely on accountability while accountability presumes people should be disclosed information about functioning of the Govt (Scholte, 2004). This concludes that Govt should manage to keep the citizens, donors, investors and other interested parties informed about the decision making process so that they should know the rules of the game (Florin, 1999 ; North,1999).

Bovens (1998) has pointed out three different stages of accountability process. The stages are ordered as information stage, discussion stage and sanction stage. The first stage is about collecting relevant information. The second phase includes discussion on probable actions. While in the third and last stage sanctions are enforced. The information stage is crucial in whole process as Meijer (2007) noted *"The information phase is the central focus since this is the phase where the availability of data is of primary concern. Fact-finding is the goal of this phase. It is assumed that before political principals can discuss or sanction Govt actions, they need to make a reconstruction of what has happened. A reconstruction is adequate when the reconstruction is in agreement with reality"* (p.215). Since information collection is the pre-requisite for accountability process the RTI law provides important guarantee to ensure accountability of any individual.

ATI laws like other arms of Governance yield a great deal of results chiefly include improvements in Governmental transparency and accountability (Piotrowski & Rosenbloom, 2002). A study undertaken by Meijer (2007) indicated that Govt databases improves the transparency of Govt agencies and enhance the accountability of political principals when provided unmediated access to information. The study was a comparative study between USA and Netherlands, In US agencies were found to be consuming digital information to a greater extent than the Dutch agencies. Consequently US agencies were found to be more cautious about accountability than their Dutch counterpart. However, some critics (Grigorescu, 2003; Roberts, 2006) have also panned down their opinions that the installation infrastructure of ATI law is expensive and an uphill experience to control corruption and enhance accountability but once the endeavor is undertaken, the Governmental transparency never fades.

In a society, RTI creates a calm relationship with E-Govt for the people living in its jurisdiction. And if such societies have approved RTI laws, information may widely be available to citizens. The more citizens have access to the sources of information in organizations, the more corruption and other moral mishaps would dispel and public officials could be accounted for their acts. Hence it is hypothesized that:

H8: RTI law will moderate the relationship between E-Govt development and Control of Corruption, in such a way that higher the RTI, higher will be Control of Corruption in a country.

H9: RTI law will moderate the relationship between E-Govt development and Voice and Accountability, in such a way that higher the RTI, higher will be Voice and Accountability in a country.

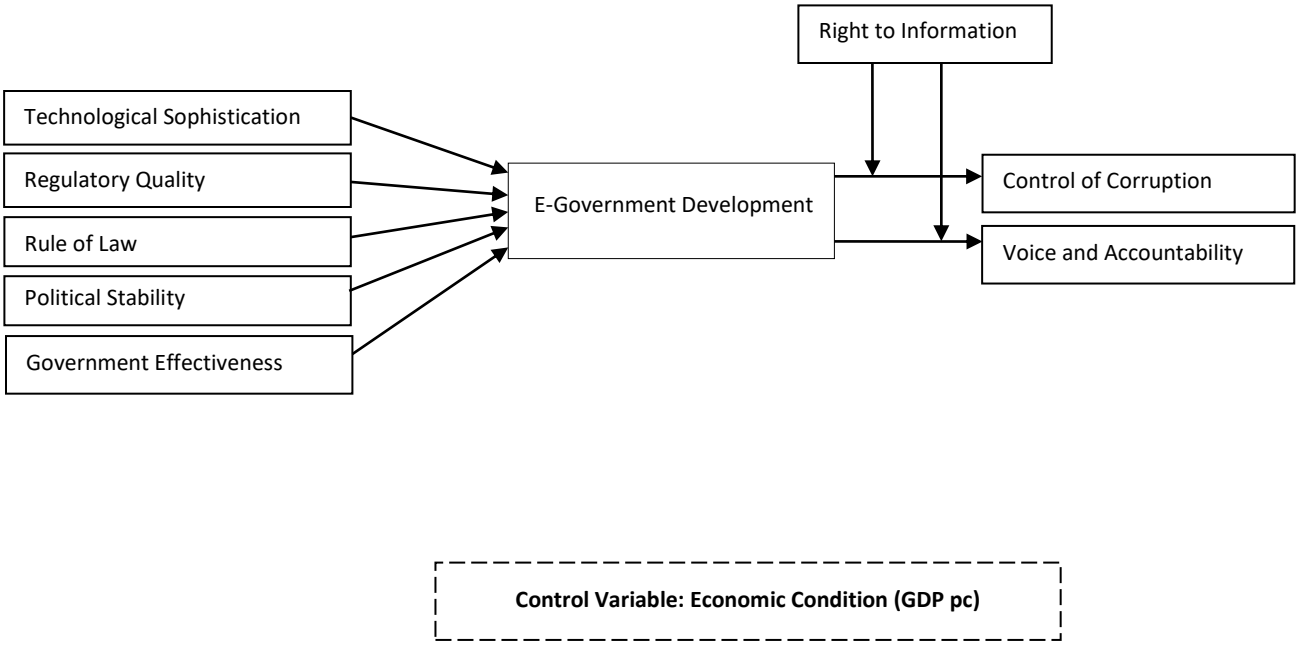

Figure 6. Proposed Research Model

3.3 Chapter Summary

This chapter aimed to focus on the literature review and theoretical underpins of E-Govt developments. Two different perspectives of E-Govt system were addressed in this chapter. First, the challenges surrounding E-Govt from the developments and implementation perspective were discussed. Examples of these factors include technological, governmental effectiveness, political and regulatory. The second perspective focused on the outcomes of E-Govt system. Examples of such factors are controlled corruption in economies and enhanced accountability of public officials. The chapter concluded by offering a conceptual model that mapped facilitating factors (determinants) and outcomes of E-Govt development. This model offered the main frame of reference and potential lines of inquiry for the empirical research that was carried out in this thesis to explore the factors influencing e-government development across the globe. The proposed model is novel because it combined the e-government challenges into taxonomy of technological, governmental, social and political themes that were identified separately in previous studies. The chapter identified the need for studying the factors that are reported for the slow progression of E-Govt across the globe and to focus some of the outcomes of E-Govt system as well.

Chapter 4

Research Methodology

4.1 Research Design

The progression of any research is based upon feasible research philosophies and approaches. A general research onion (figure 7) developed by Saunders et al. (2009) was adopted to determine the effective methodological directions for this research. The research onion has several layers ordered as; research philosophies, approaches, choices, strategies, time horizon and techniques and procedures. Each layer is grounded on the assumptions about nature, sources and development of knowledge.

The outer most layer of research onion comprised of research philosophies. The research philosophies mainly deal in nature of Knowledge and reality, being investigated (Bryman, 2012). Depending on the research goal, the researches may differ each other in terms of philosophies. Using different research philosophies are not necessarily at odds with each other but the relevancy of research philosophy depends the type of knowledge being investigated (May, 2011). Among the different research philosophies (positivism, interpretivism, pragmatism and realism), positivism has the assumption that reality exists independently of the phenomenon being investigated. In other words the meaning of phenomenon remains the same among the subjects (Newman, 1998). Also, positivism creates hypotheses (or research questions) which are tested through quantifiable data by applying some statistical analyses for generating results. The current research takes Positivist perspective as it intended to test some hypothesized relationship along

with underlying theory. The remaining research onion's layers are aligned in accordance with positivist research philosophy and are highlighted in figure 7.

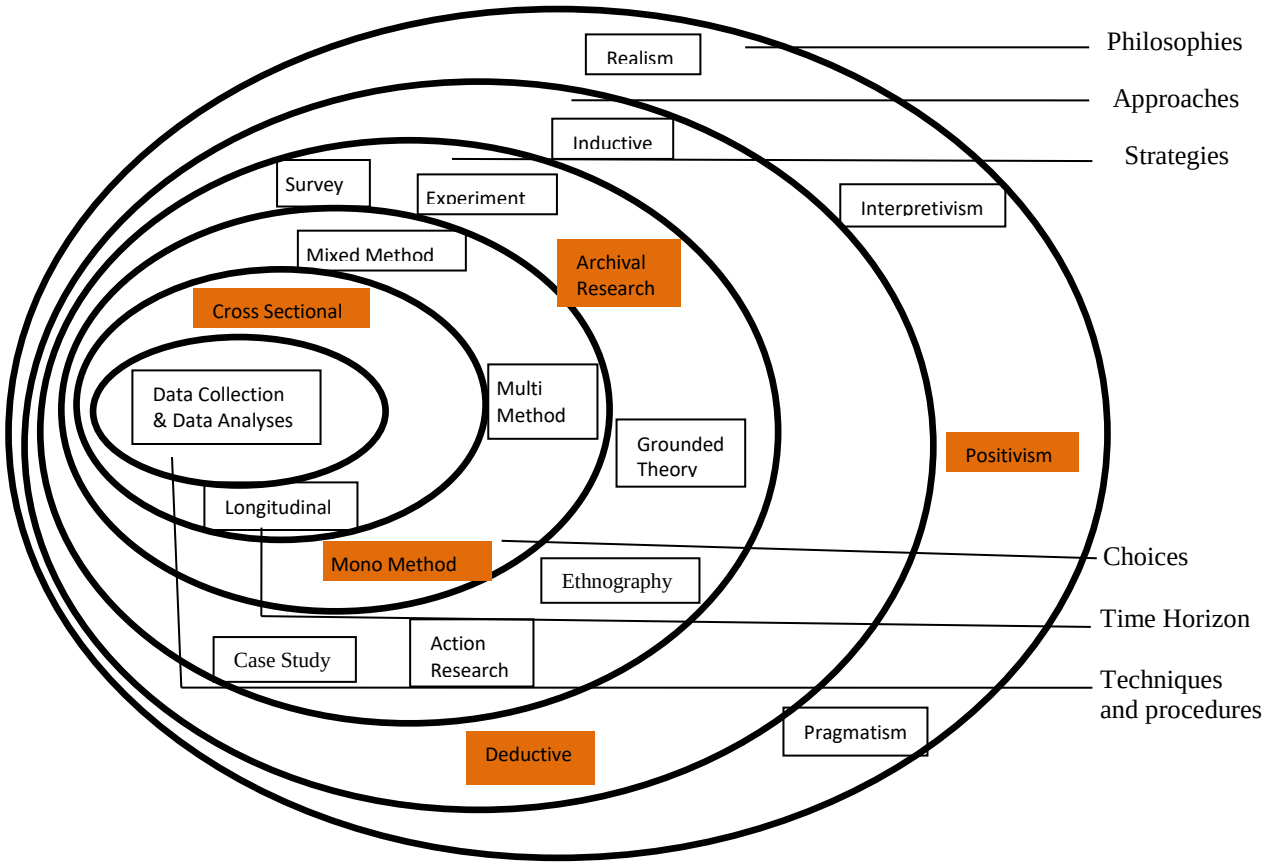

Figure 7. The Research Onion of the Study (Source: Saunders et al., 2009)

4.2 Data

As country form the unit of analysis in current research, so data was needed that being aggregated at the national level. Collecting large-scale primary data for this research (such as opinion and expert surveys, questionnaire and interview) from various countries is constrained by resources and time. Hence, archival data was obtained from reputable international organizations. Recent meta-analyses (Dwivedi et al., 2011; Avison et al., 2008) recognized secondary (archival) data analysis as one of important research methods. Data Collected by international agencies are more comprehensive and likely to be more reliable than self-reported data collected by individual Govts (Nyirenda & Cropf 2010; Ngafeeson & Mehri 2013). International organizations have offices in most of the countries and can collect data with relative ease. Further, these global reports are updated regularly (usually annually or biennially), creating valuable historical data sets. Following the above discussed suggestions, this research utilized four major data sources (World Economic Forum, World Bank, United Nations and Center for Law and Democracy). These secondary data sources have been used in past research studies by many scholars (Gaur & Lu, 2007; Larosiliere & Carter, 2013; Domínguez et al., 2011; Siau & Long, 2009; Ngafeeson & Mehri, 2013; Srivastava & Teo, 2007; Krishnan & Teo, 2012; Raghupathi & Wu, 2011; Relly, 2012; Hogan et al., 2012).

The secondary data used in this research furnished two important advantages - replicability and generalizability. These advantages are also acknowledged by Das et al. (2011). Replicability is ensured as the data is publicly available and is extensively used in E-Govt research (Krishnan & Teo, 2012). On the other hand, generalizability is assured by including maximum number of countries across the globe (Kiecolt & Nathan, 1985).

The analyses carried out in this research are based on data collected over time period of 7 years (2010 - 2016). Thus, this study utilized panel data to capture the developments of E-Govt over time. Panel data offers several advantages, the primary of which includes the prospects for greater variations with respect to changes in variables. Conversely, a single year study (cross-sectional analyses) may not reflect such changes.

4.3 Procedures Followed by International Agencies

The international data collecting agencies (like the UN, WEF and WB) followed stringent processes to assure data validity and reliability. For instance, to compose the OSI, the UN's expert team assessed each member state relevant and official web portals. All countries' officials were contacted for the identification of web portals. And if any country officials failed to respond, internet search engines were browsed for the identification of such web portals. Further the expert team was assisted by translators in case the web portals are developed in unofficial languages of UN. Likewise, the UN expert team was apprised to scrutinize the contents of websites of each member state with intense care. In addition web information management system was deployed for tracking survey results. All the data was then transferred to a secondary group in order to seal high accuracy and further validation.

The WB is also keen to ensure data validity by applying several statistical techniques. The prominent of which is Unobserved Components Methodology (UCM) to aggregate the indicators since several sources were used to collect data. As Kaufmann et al. (2011) indicated that *"Governance Indicators are based on several hundred individual underlying variables, taken from a wide variety of existing data sources. They are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-Governmental organizations,*

commercial business information providers, international organizations, private sector firms and public-sector bodies" (Kaufmann et al., 2011, p. 224).

The WEF with the help of their partner institutes adheres to follow uniform set of guidelines to collect data. Some of such guidelines are; 1) collecting data only from top management of company like CEOs or other same rank officials 2) respondents have the choice of different languages to record their responses, in this regard more than 30 languages were available 3) stratified random technique was applied to have fair representation of spectrum of companies across each surveyed country. A total of 10,993 individuals took part in the survey making an average of 94 respondents across a single country (Srivastava & Teo 2010a). Moreover, Gallup International was consulted for their immense expertise regarding international surveys and all their suggestions were incorporated before undertaking the survey. Also, the data was examined for internal consistency through standard deviation of responses.

4.4 Operationalization of Variables

The United Nations Department of Economic and Social Affairs (UNDESA) conducts E-Govt surveys for the purpose to measure countries achievements regarding important E-Govt areas like online services. The UNDESA survey provides comprehensive and complete assessment of E-Govt development so far (Krishnan & Teo, 2012). It covers almost all of the UN member states for online presence (Ojo et al., 2007; Singh et al., 2007). Data for 193 countries is available for E-Govt development (n=193). The online presence of a country is measured using the Online Services Index (OSI). The Index ranges from zero (low level of E-Govt development) to one (high level of E-Govt development). The UN E-Govt data set is composed of quantitative measures instead of perceptual measures. This includes the assessment of Govt web portals

through counting different features. Furthermore, the portals were also screened for a minimal level of web content accessibility. The questionnaire designed for examining the portals comprised of four sections. Each section reflected the corresponding stage of E-Govt maturity model. The methodology and procedures followed by UN for composing OSI is detailed as:

"To arrive at a set of Online Service Index values, more than 90 researchers- qualified graduate students and volunteers from universities in the field of public administration assessed each country's national website in the native language, including the national portal, e-services portal as well as the websites of the related ministries of education, labor, social services, health, finance and environment as applicable.

The Survey questionnaire is organized in specific thematic sets of questions (subthemes) structured in four patterns corresponding to the four stages of E-Govt development. The patterns have been designed to provide a qualitative assessment within a rigorous quantitative methodology. Each question calls for a binary response. Every positive answer generates a new more in depth question inside and across the patterns.

The outcome is an enhanced quantitative Survey with a wider range of point distributions reflecting differences in levels of E-Govt development among countries. The total number of points scored by each country is normalized to the range of 0 to 1. The online index value for a given country is equal to the actual total score less the lowest total score divided by the range of total score values for all countries. For example, if country x has a score of 114, and the lowest score of any country is 0 and the highest equal to 153, then the online services value for country x would be:

$$\textit{Online Service Index (Country x)} = \frac{(114-0)}{(153-0)} = 0.7451$$

In line with the global trend towards a more citizen-centric approach as driven by the demand for greater efficiency and cost-effectiveness of the public sector, the Survey questionnaire has been designed to reflect this paradigm of E-Govt. As mentioned above, user take-up has been included as one special subject in the Survey, which encourages the Govts to take account not only of the supply side but also the demand side of e-services. Accordingly, the research team was instructed to enforce this approach consistently throughout the whole Survey. If features could not be found easily, quickly and intuitively, then a site would score poorly" (UNDESA, 2016, p.191-192:196).

The measure for variable Technological Sophistication required the creation of a new index and is composed of one component: 'Latest Technology Availability' (earlier, in E-Govt literature Das et al. (2011) have also created a new index to measure ICT infrastructure). This index features broad mix of technologies available within a country to enhance its productivity, with special focus on its capability to fully leverage ICTs (WEF, 2016). The data ("*In your country, to what extent are the latest technologies available?*" 1 = not available at all; 7 = widely available) is taken from the Global Information Technology Report (GITR). The GITR is published annually by the WEF.

The data for variables Regulatory Quality, Rule of Law, Political Stability, Govt Effectiveness, Control of Corruption and Voice and Accountability were obtained from WB's database. The WGI dataset (compiled by Daniel Kaufmann, Aart Kraay and Pablo Zoidan-Lobatón) was used in this regard. WGI possesses several strengths among the other indices.

First, the WGI covers highest number of countries and territories (Williams, 2015) as 214 countries' data was available in the latest edition issued by WB in the year 2016 (see table 5 for details). Second, WGI data sources are far greater than the rest (Rohwer, 2009). For instance in its 2016 edition, WGI used a total of 31 data sources (table 5) (Kaufman et al., 2011). Third, WGI data comes from the survey having diverse range of respondents like: think tanks, non-Governmental organizations, commercial businesses, private sector firms and public-sector bodies. Such diverse communities provide better view on any country's governance status. The strengths and comprehensiveness of WGI provided ample motivation to use it in the current research for the operationalization of governance indicators. The WGI indicators' value range from -2.5 (worst governance) to +2.5 (good governance). For each indicator, the data collected from different sources are aggregated into a single measure by unobserved components model. The indicator is then normalized having mean value of 0 and standard deviation of 1. A country whom score is 0 doesn't mean that the country has no governance, rather it can be stated that the value lies in the middle of the scale and the country should struggle to move it closer to +2.5 which corresponds to much better governance.

Table 5. Coverage and Sources of WGI

S.No	Code	Source	Type	Country Coverage
1	**ADB**	African Development Bank Country Policy and Institutional Assessments	Expert (Gov)	53
2	**AFR**	Afrobarometer.	Survey	19
3	**ASD**	Asian Development Bank Country Policy and Institutional Assessments	Expert (Gov)	29
4	**BPS**	Business Environment and Enterprise Performance Survey	Survey	27
5	**BTI**	Bertelsmann Transformation Index	Expert (NGO)	125
6	**CCR**	Freedom House Countries at the Crossroads	Expert (NGO)	62
7	**DRI**	Global Insight Global Risk Service	Expert (CBIP)	144
8	**EBR**	European Bank for Reconstruction and Development Transition Report	Expert (Gov)	29
9	**EIU**	Economist Intelligence Unit Riskwire and Democracy Index	Expert (CBIP)	181
10	**FRH**	Freedom House.	Expert (NGO)	197
11	**GCB**	Transparency International Global Corruption Barometer	Survey	80
12	**GCS**	World Economic Forum Global Competitiveness Report	Survey	134
13	**GII**	Global Integrity Index	Expert (NGO)	79
14	**GWP**	Gallup World Poll	Survey	130
15	**HER**	Heritage Foundation Index of Economic Freedom	Expert (NGO)	179
16	**HUM**	Cingraneli Richards Human Rights Database and Political Terror Scale	Expert (Gov)	192
17	**IFD**	IFAD Rural Sector Performance Assessments	Expert (Gov)	90
18	**IJET**	IJET Country Security Risk Ratings	Expert (CBIP)	185
19	**IPD**	Institutional Profiles Database	Expert (Gov)	85
20	**IRP**	IREEP African Bectoral Index	Expert (NGO)	53
21	**LBO**	Latinobarometro	Survey	18
22	**MSI**	International Research and Exchanges Board Media Sustainability Index	Expert (NGO)	76
23	**OBI**	International Budget Project Open Budget Index	Expert (NGO)	85
24	**PIA**	World Bank Country Policy and Institutional Assessments	Expert (Gov)	142
25	**PRC**	Political Economic Risk Consultancy Corruption in Asia Survey	Survey	15
26	**PRS**	Political Risk Services International Country Risk Guide	Expert (CBIP)	140
27	**RSF**	Reporters Without Borders Press Freedom Index	Expert (NGO)	170
28	**TPR**	US State Department Trafficking in People Report	Expert (Gov)	153
29	**VAB**	Vanderbilt University Americas Barometer	Survey	23
30	**WCY**	Institute for Management Development World Competitiveness Yearbook	Survey	55
31	**WMO**	Global Insight Business Risk and Conditions	Expert (CBIP)	203

The Center for Law and Democracy (CLD) and Access Info Europe (AIE) rate the RTI laws enacted by any country. These organizations termed this process as 'RTI Rating'. The purpose of RTI rating is to determine the quality of access to information system in a country. The methodology of RTI rating includes the quantitative measure of RTI laws. An ideal legal framework can earn a maximum of 150 points. The rating methodology consists of 61 indicators. Most of the indicators have points having range of 0 to 2. The 61 indicators are broadly grouped in 7 main categories. The scores categorization and details are given in the table 6.

Table 6. Indicators of RTI Ratings

S.No	Category	Max Points
1	Right of Access	6
2	Scope	30
3	Requesting Procedures	30
4	Exceptions and Refusals	30
5	Appeals	30
6	Sanctions and Protections	8
7	Promotional Measures	16
	Total Score	**150**

For the purpose of this research RTI was re-coded. In the proposed model of current research, RTI is acting as moderator variable. For this purpose RTI is measured as dummy variable. The re-scaling of this variable was done on the basis of presence or absence of RTI Laws. In a country, if RTI is absent it is coded as 0 (0 = No sign of a law) and if present it is coded as 1 (1= More or less close to a law).

In addition to the core variables, a control variable was also used in this research. Previous studies indicated that economic conditions might impact E-Govt developments in a country. For this reason GDP per capita was used as a control variable. For which the data was taken from WB's dataset World Development Indicators. Also, it was transformed by taking natural logarithm of it. The transformation was also needed to pull outliers from a positively skewed dispersion nearer to the bulk of the panel data.

Table 7: Summary of Variables and their Sources

Variable	Data Source	Data Collecting Organization	Country Coverage	Literature Reference
E-Government	E-Government Survey	United Nations	193	Boyer-Wright and Kottemann (2015)
Technological Sophistication	Global Information Technology Report	World Economic Forum	148	-Nil-
Regulatory Quality	Worldwide Governance Indicators	World Bank	212	Das et al. (2011)
Rule of Law	Worldwide Governance Indicators	World Bank	214	Ifinedo (2012)
Political Stability	Worldwide Governance Indicators	World Bank	212	Krishnan and Teo (2012)
Government Effectiveness	Worldwide Governance Indicators	World Bank	212	Lupu and Lazar (2015)
Control of Corruption	Worldwide Governance Indicators	World Bank	212	Anderson (2009)
Voice and accountability	Worldwide Governance Indicators	World Bank	214	Garcia-Murillo (2013)
GDP per capita	World Development Indicators	World Bank	215	Mistry and Jalal (2012)
Right to Information Laws	Right to Information Ratings	Center for Law and Democracy	108	Hogan et al. (2012)

4.5 Data Arrangements

The current research utilized multiple data sources so data arrangement was an issue to be addressed. First challenge come across the various datasets is the ‘difference’ of name for a single country. For example in CLD database a country is named as ‘Ivory Coast’ the same country has name ‘Cote d'Ivoire’ in the WB’s database while in UN’s database its name is ‘CÃ´te d'Ivoire’. It was necessary to decide about a single unique name of a certain country. This research set UN database as a benchmark for country naming. A country name is changed according to UN’s database name if found different in other databases. The second issue was regarding the common data points. As each dataset is updated with different periodical frequency i.e. E-Govt survey scores comes after 2 years, TS, WGIs and RTI ratings comes every year. As the selected time period of this study was 2010 to 2016 during which OSI scores were available for the year 2010, 2012, 2014 and 2016. While, TS and WGI scores were available for all the 7 years from 2010 to 2016. In this regard 4 common data points were years 2010, 2012, 2014 and 2016 used. So analyses were done on these 4 common data points for the relationship between (i). TS and E-Govt and (ii). E-Govt and Governance indicators. Further the time lapse of RTI was different i.e. 2011 to 2016 as the CLD started to rate RTI laws in the year 2011. So for RTI moderation relationship 3 common data points (2012, 2014 and 2016) were used. Third, different number of sample was used in testing each hypothesized relationship. This summarizes that the number of countries was different across each relationship in the proposed research model. The number of countries and their data availability varied across each dataset (see table 7 for details) so it was ensured to include maximum number of countries in testing each relationship (which is endorsed by many research studies like: Srivastava & Teo, 2010b). Though in prior research a common country list was derived to investigate the subject matter but this study avoided to

exclude any country to mitigate the problem of selection bias (Kovačić, 2005). For instance in composing a common countries list (in which all variables have data present for all common countries) could result in exclusion of more than 50 countries because almost only 148 countries' data was available for the variable Technological Sophistication as compared to E-Govt variable for which 193 countries data was available.

4.6 Analytical Model

Determinants Equations

$$\text{E-Govt}_{i,t} = \beta_0 + \beta_1 \text{TS}_{i,t} + \beta_2 \text{LnGDP}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 1}$$

$$\text{E-Govt}_{i,t} = \beta_0 + \beta_1 \text{GE}_{i,t} + \beta_2 \text{PS}_{i,t} + \beta_3 \text{RQ}_{i,t} + \beta_4 \text{RL}_{i,t} + \beta_5 \text{LnGDP}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 2}$$

Outcome Equations

$$\text{CC}_{i,t} = \beta_0 + \beta_1 \text{E-Govt}_{i,t} + \beta_2 \text{LnGDP}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 3}$$

$$\text{VA}_{i,t} = \beta_0 + \beta_1 \text{E-Govt}_{i,t} + \beta_2 \text{LnGDP}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 4}$$

Moderation Equations

$$\text{CC}_{i,t} = \beta_0 + \beta_1 \text{E-Govt}_{i,t} + \beta_2 \text{LnGDP}_{i,t} + \beta_3 (\text{E-Govt*RTIA})_{i,t} + \beta_4 \text{RTIA}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 5}$$

$$\text{VA}_{i,t} = \beta_0 + \beta_1 \text{E-Govt}_{i,t} + \beta_2 \text{LnGDP}_{i,t} + \beta_3 (\text{E-Govt*RTIA})_{i,t} + \beta_4 \text{RTIA}_{i,t} + \text{year effect} + \epsilon_{i,t} \quad \text{---------- 6}$$

E-Govt stands for E-Government Development of country i at time t

TS stands for Technological Sophistication of country i at time t

LnGDP stands for log of Gross Domestic Product per Capita of country i at time t

GE stands for Government Effectiveness of country i at time t

PS stands for Political Stability of country i at time t

RQ stands for Regulatory Quality of country i at time t

RL stands for Rule of Law of country i at time t

CC stands for Control of Corruption of country i at time t

VA stands for Voice and Accountability of country i at time t

RTIA Right to Information (present) of country i at time t

4.7 Data Analyses Tools and Techniques

Multiple data analyses techniques were used to address the research questions and test the hypotheses. The tools used to undertake analyses of current research were; i) Statistical Package for Social Science (SPSS) version 20, ii) STATA Standard Edition 12 and iii) Microsoft Excel and E-Views. In data analyses: first, data was arranged for analyses in which all secondary data was collected of all variables from different international data sources. Secondly, international data generally suffers from a high level of missing fields. To alleviate this problem STATA commands were applied, where missing data is generated simultaneously using all the available variables for every observation. Third, descriptive statistics were calculated to provide basic information on the nature of each variable in existing study. Percentage, frequency, means, standard deviations were examined for the variability of the data. Fourth, data normality tests were carried out to verify the normal distribution of data. Fifth, graphical representation of data was performed through scatter plot. Sixth and last, panel data models (OLS, Random Effects) were applied to test the hypothesized relationships.

4.7 Chapter Summary

This chapter presented an overview of the research design and justified the selection of research philosophy, approach, strategy and method based on Saunders et al. (2009) research onion. In order to answer the posed research questions and to test the hypotheses, quantitative research based on positivism philosophical stance was chosen as an appropriate and effective research method as compared to other qualitative research methods. The nature of data and the details of the organizations collecting data are also provided. In addition, the alignment of the secondary data along with appropriate data analyses tools and techniques are also discussed in this chapter.

Chapter 5

Data Analyses and Results

Chapter Overview

This chapter presents the detail of techniques applied on data for analyses and obtaining results. The chapter is divided into four major sections. The first portion is about the descriptive statistics followed by the graphical representations of data in the second portion. In third section, the relationships between different variables are analyzed through different regression techniques i.e. i) Ordinary Least Squares (OLS) and ii) Random Effect Model (REM). The posed hypotheses (of determinants and outcomes) are tested through Random Effect Model as suggested by Hausman model. In last, the section four comprises the moderation analyses of different relationship.

5.1 Descriptive Statistics

Table 8 has the detail of sample, mean, standard deviation, minimum and maximum of variable E-Govt. The detail shows that 192 countries data is available in year 2010. Onwards till 2016 all of 193 UN states have score available for E-Govt. The mean value of E-Govt significantly improved from 0.26 to 0.49 over the period 2010 to 2016 which shows that across the globe Govts are keen to provide online services. The value of E-Govt ranges between 0 and 1. Across all the years the minimum value remained 0 showing still some countries are far way behind in the E-Govt services while the maximum value remained 1 showing the greatest achievements in E-Govt areas by some countries.

Table 8. E-Government Descriptive Statistics

Variable	N	Mean	S.D	Min	Max	25th Percentile	Median	75th Percentile
E-Govt 2010	192	.26	.20	0	1	.11	0.26	.39
E-Govt 2012	193	.42	.23	0	1	.25	0.41	.57
E-Govt 2014	193	.39	.26	0	1	.16	0.35	.59
E-Govt 2016	193	.49	27	0	1	.21	0.46	.68

The descriptive statistics of Technological Sophistication (TS) are drawn in table 9. The results depicted that year 2012 has maximum number of observations i.e. 141 countries' sample was available. On the other hand in 2010 and 2016 only 135 countries' data was reported for TS by World Economic Forum. As the variable ranges between values 1 to 7, the highest mean value was in the year 2010 and lowest in year 2016. For TS lowest minimum value (2.76) was in year 2016 and highest max value (6.84) was in year 2010.

Table 9. Technological Sophistication Descriptive Statistics

Variable	N	Mean	SD	Min	Max	25th Percentile	Median	75th Percentile
TS 2010	135	5.03	.88	3.34	6.84	4.29	4.98	5.62
TS 2012	141	4.98	.89	3.21	6.7	4.31	4.93	5.71
TS 2014	140	4.83	.92	2.77	6.6	4.22	4.75	5.53
TS 2016	135	4.77	.94	2.76	6.6	4.14	4.72	5.43

Table 10 has the descriptive analyses of six good governance indicators. As far as sample is concerned, GE, RQ, RL and CC have the lowest (209) sample in year 2014 and 2016 while highest (212) in year 2012 except RL where the highest figure (214) was recorded as sample in the same year of 2012. PS sample was almost consistent, as 211 was recorded in year 2014 and

2016 while 212 in year 2010 and 2012. Out of the six indicators in the 7 years time period VA showed greater variation regarding number of sample countries as it has lowest sample (204) in year 2014 and 2016 while highest (214) in year 2012. Generally across all six indicators in year 2014 and 2016 samples were relatively low while in year 2012 the sample remained relatively high.

In table 10, next to the sample detail is Mean analyses of all good governance indicators. Close observations of mean values depict that for all indicators the values are near to 0. As the range of indicators lies between positive and negative values (-2.5 to + 2.5). This indicates that generally on all indicators the entire globe has average performance in good governance areas.

Although each indicator's value ranges between -2.5 to + 2.5, but interesting results were drawn from minimum and maximum values of the six indicators. As Kaufmann and Kraay (2008) stated if a country is consistently performing bad on any of the indicator, its score may drop even further from -2.5. Further the units of the WGI are units of a standard normal distribution, this means that most observations will lie between -2.5 and +2.5, but occasionally some may fall outside that range. In the selected time period of 7 years GE, RL, CC and VA have lowest minimum values -2.49, -2.45, -1.84 and -2.24 respectively which lies under the normal range of -2.5. On the other hand PS and RQ have lowest minimum values of -3.10 and -2.53 respectively. Which are beyond the normal range of -2.5. As stated above that some countries are consistently performing badly on these two parameters of good governance. Over the 7 year time period CC, GE, RQ, RL, PS, and VA have highest max values of 2.41, 2.25, 2.23, 2.12, 1.96 and 1.76 respectively.

Table 10. Good Governance Indicators Descriptive Statistics

Variable	N	Mean	SD	Min	Max	25th Percentile	Median	75th Percentile
GE 2010	210	0.000000000124	.99	-2.24	2.25	-.76	-.10	0.75
GE 2012	212	0.000000002082	1	-2.22	2.23	-.78	-.13	0.84
GE 2014	209	-0.000000000892	1	-2.49	2.19	-.68	-.08	0.86
GE 2016	209	0.000000002392	.99	-2.25	2.21	-.69	-.13	0.79
PS 2010	212	0.000000000778	.99	-3.10	1.62	-.66	.08	0.82
PS 2012	212	-0.000000000274	.99	-2.85	1.92	-.66	.11	0.91
PS 2014	211	-0.000000001011	1	-2.76	1.91	-.61	.07	0.82
PS 2016	211	-0.000000002141	1	-2.91	1.96	-.58	.10	0.85
RQ 2010	210	0.000000002785	.99	-2.45	1.91	-.74	-.08	0.73
RQ 2012	212	-0.000000001063	1	-2.53	1.97	-.76	-.08	0.75
RQ 2014	209	-0.000000002155	.99	-2.2	2.23	-.78	-.10	0.77
RQ 2016	209	0.000000000526	.99	-2.33	2.18	-.70	-.12	0.71
RL 2010	212	0.000000000192	1	-2.45	1.98	-.81	-.17	0.86
RL 2012	214	-0.000000002547	1	-2.45	1.96	-.79	-.19	0.89
RL 2014	209	0.000000000062	.99	-2.44	2.12	-.74	-.16	0.64
RL 2016	209	-0.000000002190	.99	-2.37	2.04	-.74	-.12	0.69
CC 2010	211	-0.000000000952	.99	-1.74	2.41	-.74	-.25	0.81
CC 2012	212	0.000000002135	.99	-1.59	2.40	-.75	-.28	0.82
CC 2014	209	0.000000001880	1	-1.84	2.27	-.76	-.26	0.73
CC 2016	209	0.000000002113	1	-1.81	2.29	-.74	-.20	0.69
VA 2010	212	-0.000000003935	1	-2.19	1.64	-.88	.04	0.89
VA 2012	214	-0.000000001038	1	-2.24	1.76	-.81	-.003	0.91
VA 2014	204	0.000000000502	1	-2.22	1.71	-.84	.08	0.96
VA 2016	204	0.000000000037	.99	-2.13	1.58	-.77	.12	0.94

The descriptive statistics of Right to Information (RTI) laws are depicted in Table 11. The Center for Law and Democracy (CLD) records the scores of a country's RTI act. The sample analyses for this variable depicts that from year 2011 to 2016, a gradual increment (86 to108) took place in the number of countries enacting RTI act. Any country if enacted the act can get a minimum score of 0 and max score of 150, so range for this variable is 0 to 150. In this regard the mean statistics show that lowest mean (84.30) was recorded in the year 2010 while highest mean (86.15) in the year 2016. For RTI, the lowest minimum and highest max values were recorded in the same year of 2016, which were 32 and 136 respectively.

Table 11. Right to Information Law Descriptive Statistics

Variable	N	Mean	SD	Min	Max	25th Percentile	Median	75th Percentile
RTI 2011	86	84.30	21.90	39	135	68.25	83.5	98
RTI 2012	90	85.37	21.27	39	135	69.25	85	99
RTI 2014	97	85.81	21.16	37	135	70	83	101
RTI 2016	108	86.15	22.44	32	136	69.75	83	102

5.2 Data Normality Assessment

In order to proceed with further analyses of data, it was important to verify the normality of data. As non-normal data may affect the factor structure and results of the study (Hair et al., 2006). Skewness and kurtosis were examined to check the normal distribution of data. Normal distribution of skewness has value of 0 or near to 0. The skewness values in Table 12 for all variables suggest that data is normally skewed. Kurtosis of normal distribution equals to ±2

(Field, 2009; Gravetter & Wallnau 2014). Also in table 12, the kurtosis values of different variables confirm that dataset has normal distribution.

Table 12. Data Normality

Variable	Obs	Skewness	Kurtosis	Prob> Chi^2
E-Govt	760	0.0000	0.0000	0.0000
TS	551	0.4252	0.0000	0.0000
GE	760	0.0000	0.0000	0.0000
PS	760	0.0000	0.9109	0.0000
RQ	760	0.0459	0.0003	0.0005
RL	760	0.0000	0.0000	0.0000
CC	760	0.0000	0.0667	0.0000
VA	760	0.0756	0.0000	0.0000
RTI	294	0.2286	0.0142	0.0285

5.3 Graphical Representation

To identify whether a country's position regarding E-Govt has changed from 2010 to 2016 a scatterplot was designed. Further a 45º line (reference line) is added to the scatterplot which acted as a dividing line between the countries that improved in the area of E-Govt and those that failed to show any progress during the selected time period. Figure 8 depicts that Central African Republic, Eritrea Somalia, North Korea and Djibouti are few of those countries that have lowest E-Govt scores for the year 2010 and have shown no progress till year 2016. Lesotho, Congo Chad and Cameroon are among those nations that have good scores in the year

2010 but their E-Govt progress declined in the year 2016 while Jordan, CÃ´te d'Ivoire, Egypt and Mongolia are such countries those lies beneath 45º line describing their decline in the E-Govt scores with the passage of time. The scatterplot further shows that USA and South Korea have top positions as these countries have highest scores in E-Govt areas, interestingly both countries lies beneath 45º line which indicates that although both countries are market leaders regarding E-Govt functions but over the period from 2010 to 2016 their scores dropped slightly. On the other hand UK, Australia and Singapore are such countries who lie way above the 45º line showing recent significant improvements in their E-Govt scores. On general majority of the countries are above the 45º line which proves that worldwide, countries have improved in the fields of E-Govt. The conclusive evidence from the scatterplot depicted that on large scale countries have improved in the areas of E-Govt during the time period 2010 to 2016.

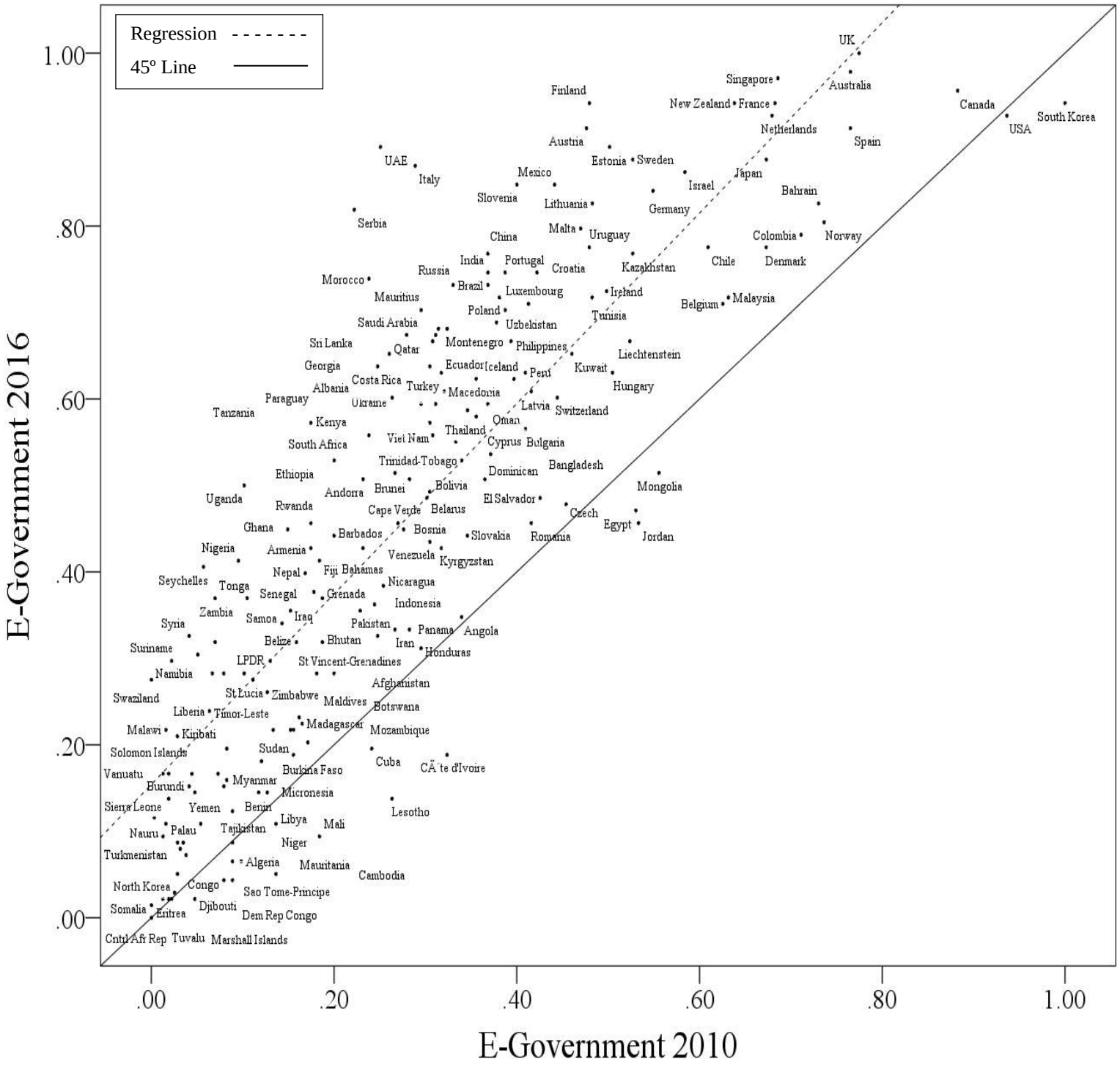

Figure 8. E-Government Worldwide

The status of Technological Sophistication across the globe is drawn in figure 9. Countries in lower left portion of the scatter plot are such countries where latest technologies are scarce. This includes the countries of Chad, Yemen, Sierra Leone, Timor-Leste and Angola. On the other hand Finland, Norway, USA, Japan and Israel are the countries where latest technologies are available up-to the optimum level as all these countries have fairly good scores. Libya, Peru, India and Brazil are way down the 45º line showing their demotion with the passage of time. Further, figure 9 depicts that Guinea, Saudi Arabia, Slovenia and Netherlands are above the 45º line with greater margins, which points their good progress regarding Technological Sophistication from year 2010 to 2016.

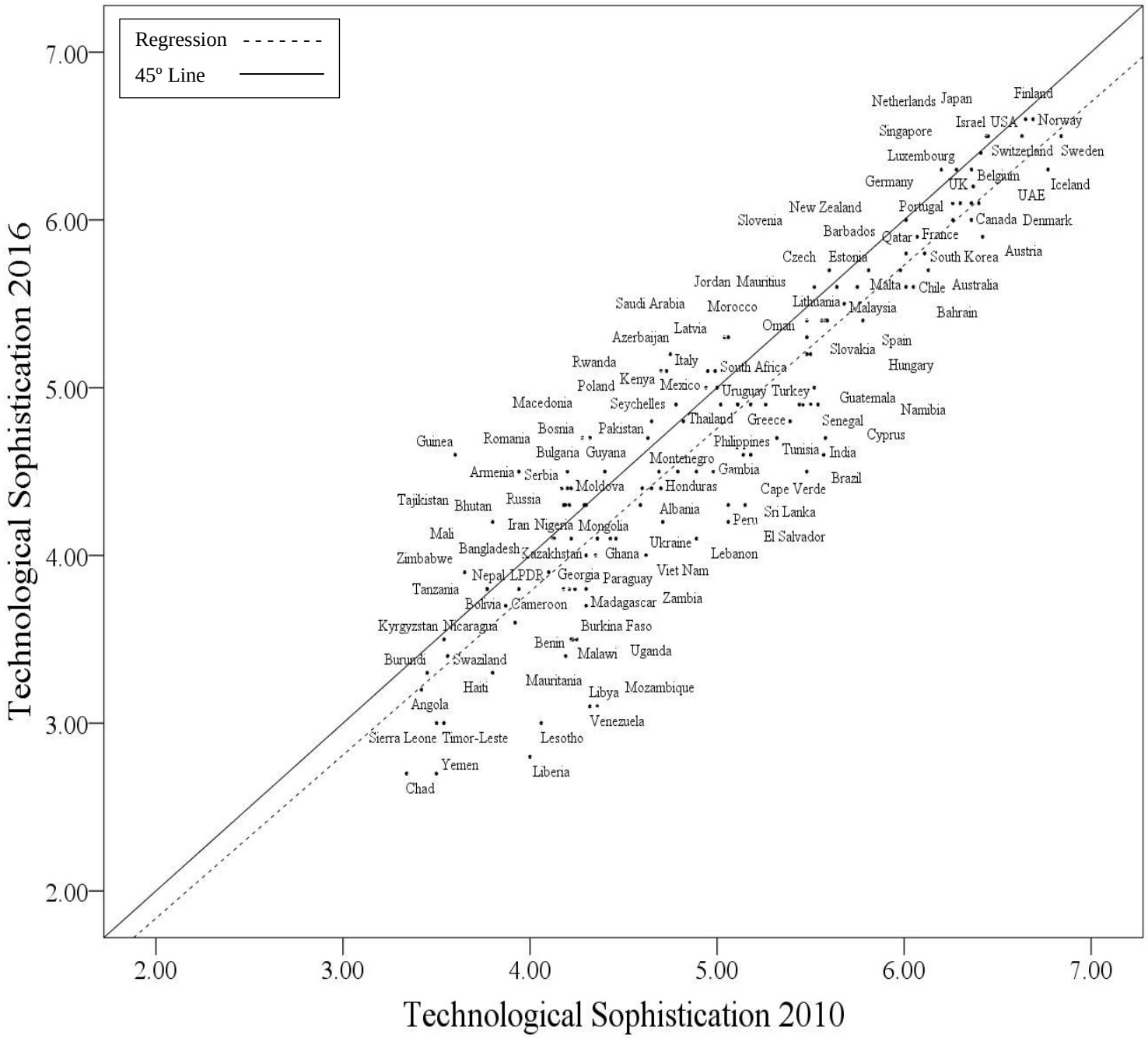

Figure 9. Technological Sophistication in year 2010 and 2016

The scatter plot of the first indicator of Good Governance is drawn in figure 10. Results show that Somalia, Haiti, Central African Republic and Libya have the lowest scores in the area of Govt Effectiveness. On the other hand Singapore, Denmark and Switzerland are countries that are at the top level of Govt Effectiveness scores. In the lower left portion of the scatter plot Vanuatu and St Lucia are two countries lies far below the reference line indicating their performance is below average which got further lowered with passage of time. Finland and Cyprus are though present in the right upper portion of the graph but are some of those advance countries whom still lies below reference line. On the opposite side Azerbaijan, Samoa and UAE lies well above the reference line describing their above average performance.

Among the six indicators of Good Governance, some countries' performance is worst (like lowest minimum values which in some cases got lowered than the normal range of -2.5, see descriptive statistics for details). For this reason the indicator, Political Stability is rescaled from -3.50 to +2.5 in the scatter plot (see figure 11). On the indicator of Political Stability, Afghanistan, Yemen, Pakistan and Sudan are lowest ranked countries. While some developing countries (Botswana, Brunei) along with some small countries (Andorra, Tuvalu) have performed well regarding Political Stability. New Zealand, Singapore and Luxemburg are characterized to be the most stable nations politically. Syria Libya, Ukraine and Mozambique lies far below the 45^0 line indicating their decline in the recent years. In line with this, some of the developed countries like USA, Sweden, Germany and Finland are also below the 45^0 line. Apart from this Guinea, Sri Lanka and Maldives lies way above the 45^0 line indicating the improvements in their political systems over the selected time period of 2010 to 2016.

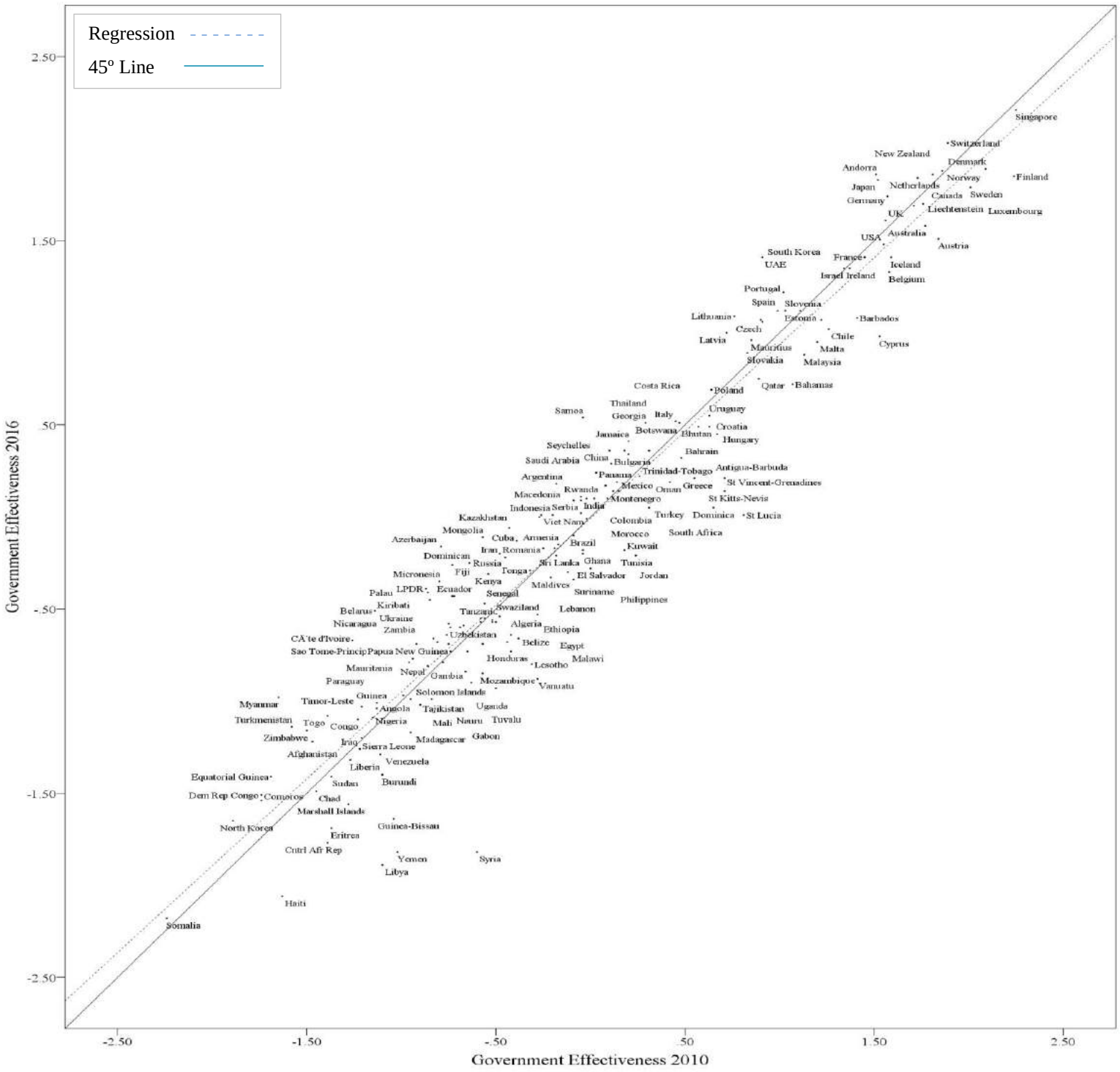

Figure 10. Government Effectiveness in year 2010 and 2016

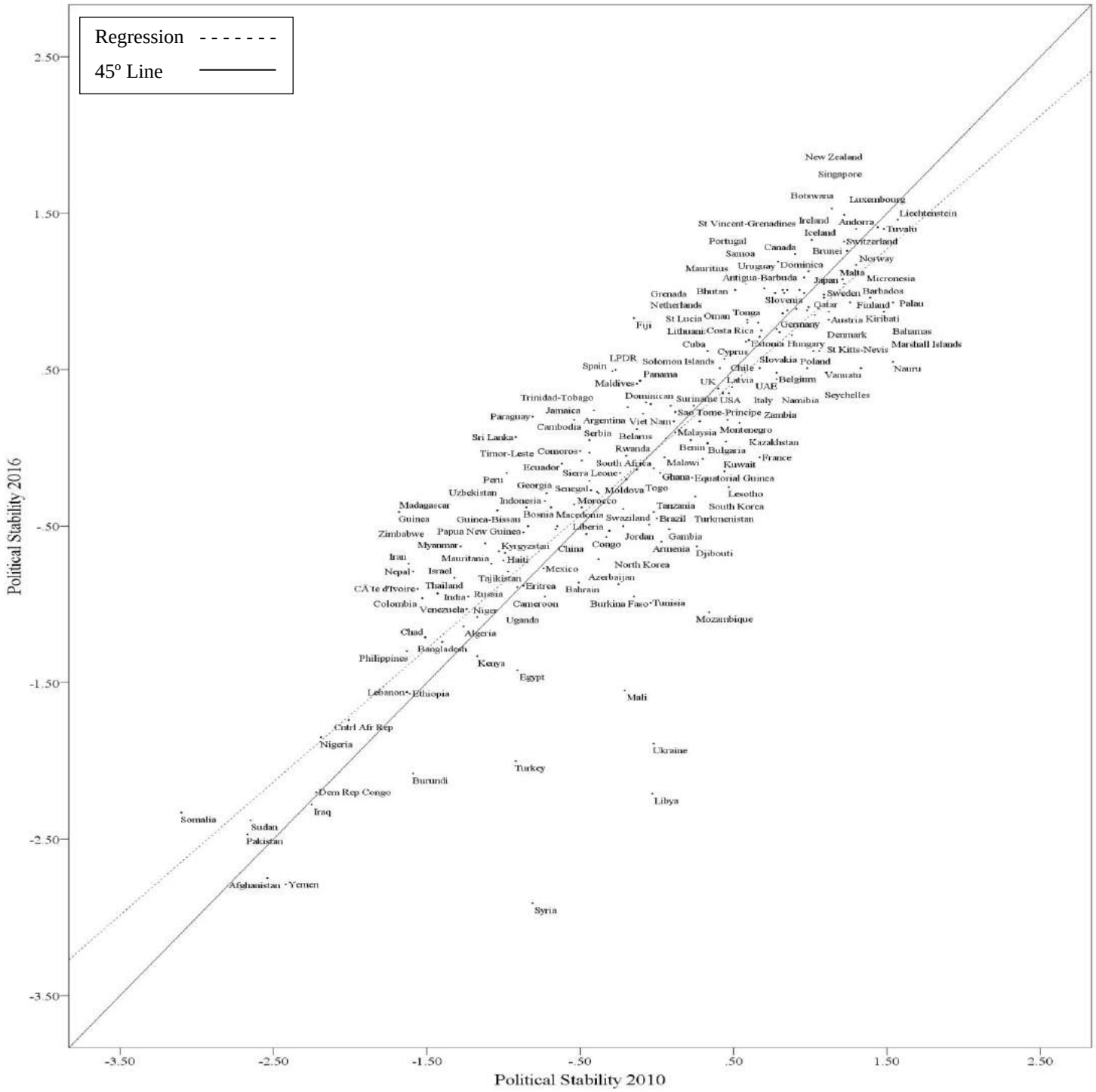

Figure 11. Political Stability in year 2010 and 2016

The regulatory quality graphical representation is delineated in figure 12. Details show that North Korea, Somalia, Eritrea and Turkmenistan are countries with worst regulatory quality while Singapore, Netherlands, Australia and New Zealand are countries with finest regulatory quality scores. Further Libya, Syria, Yemen and Egypt are countries that are way beneath the 45^0 line. Though Brunei, Andorra and Denmark have good scores and are in the right part of the plot but still these countries are far below the 45^0 line indicating their downfall over the period of time. Myanmar the only nation in the graph lying way up the 45^0 line showing its significant improvement from year 2010 to 2016 on the parameter of regulatory quality.

The countries' current position and progress on the Rule of Law indicator are reaped in figure 13. Somalia, Venezuela, Central African Republic and Iraq are among those countries where Rule of Law is minimally exercised. On the opposite side Sweden, Norway, Finland, and Switzerland are at the top of the list regarding Rule of Law practices. Syria and Nauru lies deep below 45^0 line indicating their descent movement while CÃ´te d'Ivoire, Fiji and Vietnam lies far above 45^0 line expressing good progress in terms of Rule of Law practices.

One of the important indicator of Good Governance is Control of Corruption. To clarify a country current position and its progress over the time from 2010 to 2016 a scatter plot is plotted in figure 14. According to plot Equatorial Guinea, Somalia, Yemen, Sudan and Afghanistan are the most corrupted countries across the globe. On other side New Zealand, Denmark, Finland and Sweden are such countries where corruption is highly controlled. Additionally some small islands like Andorra, Barbados, St Lucia and St Vincent-Grenadines and some under-developed countries like Botswana, Qatar and Rwanda have performed well in controlling corruption. On the contrary few developed nations such as South Korea and Malaysia have struggled in controlling corruption.

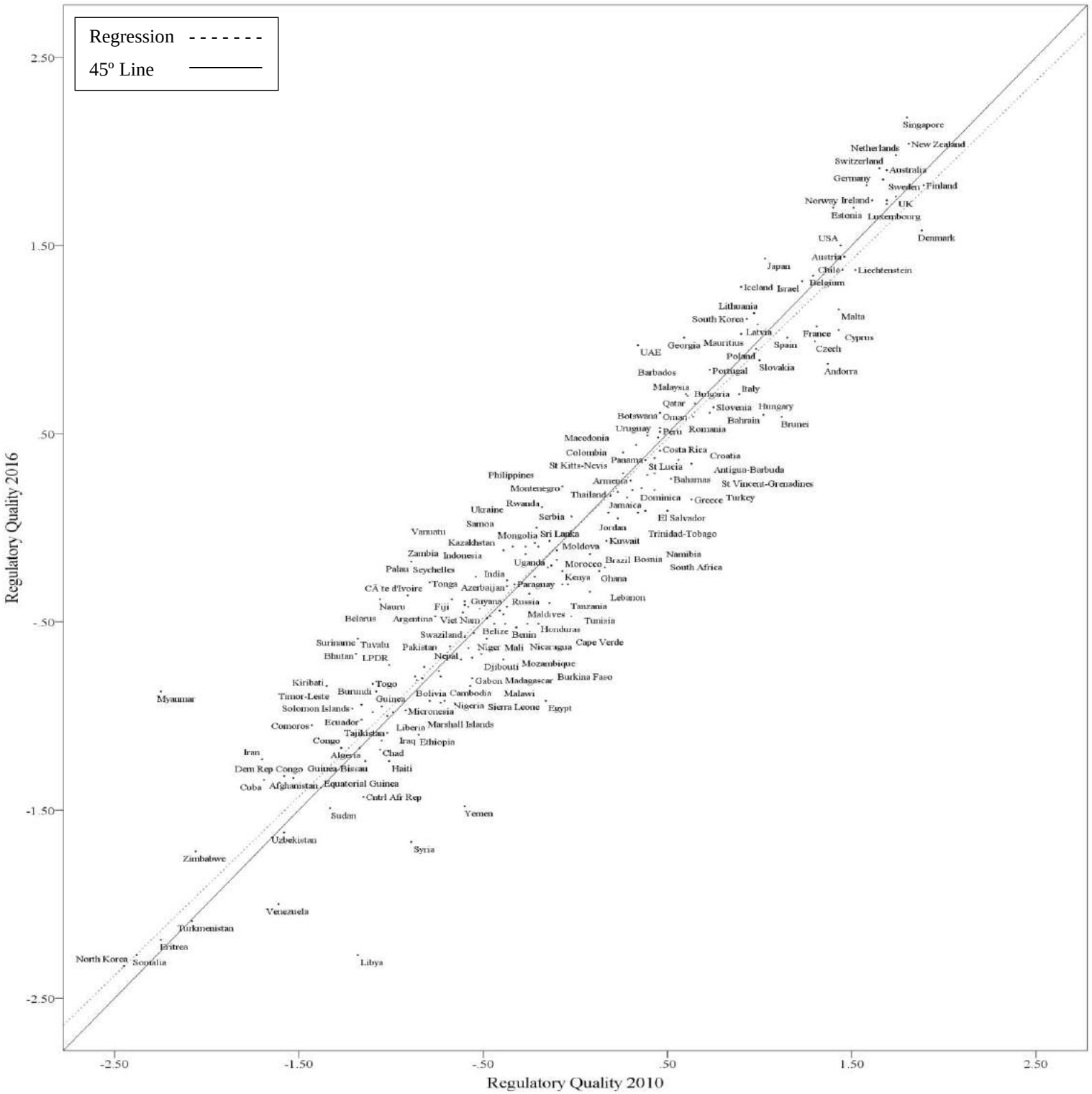

Figure 12. Regulatory Quality in year 2010 and 2016

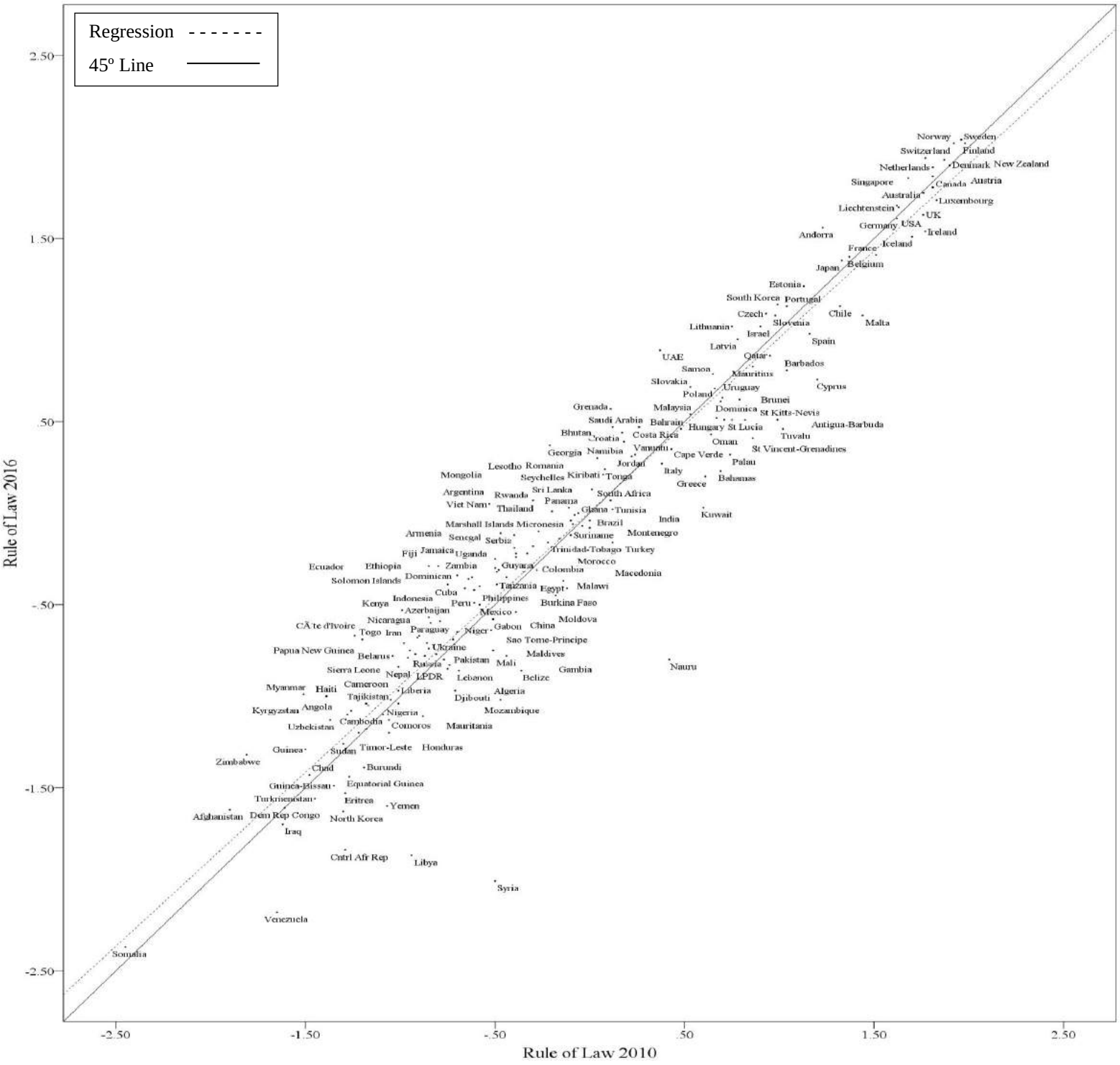

Figure 13. Rule of Law in year 2010 and 2016

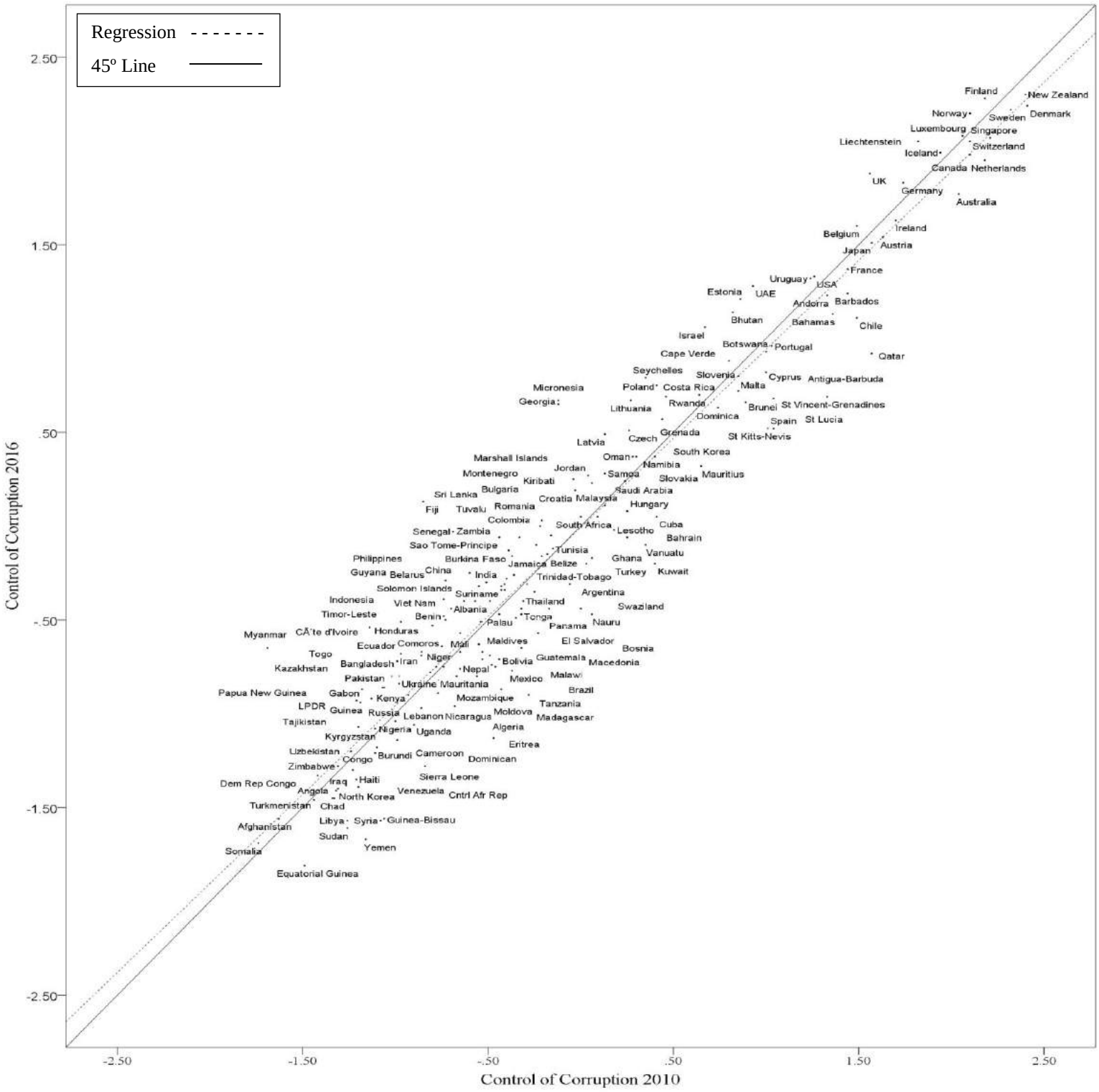

Figure 14. Control of Corruption in year 2010 and 2016

The last indicator of Good Governance is Voice and Accountability, whose graphical representation is carried out in figure 15. Observing the graph closely depicts that Equatorial Guinea, Turkmenistan, North Korea and Uzbekistan are worst ranked countries in terms of Voice and Accountability. On the other hand Norway, Sweden, Netherland and Denmark are such countries whom reside in the top of list regarding Voice and Accountability. Myanmar, Tunisia and Solomon Islands are way above the reference line of 45^0 while Burundi, Thailand, Maldives and Nauru are way below the reference line of 45^0.

The Right to Information Act (RTI) graph is presented in figure 16. The lower left portion of the graph contains the countries like Austria, Liechtenstein, Jordan and Germany showing that on the RTI parameters these countries have the lowest scores in the year 2010 and no significant improvements shown till the year 2016. The details are full of surprise as Austria and Germany are characterized to be advanced nations, yet they have poor performed in the areas of RTI. On the contrary side i.e. the upper right portion of the graph is occupied by the countries Mexico, Serbia, Slovenia, and India followed closely by Croatia, Liberia and El Salvador providing the evidence that in these countries accessibility to information is far greater and easy than the rest of the world. Sweden, Russia, Panama and Tunisia make the list of countries whose position is far above the 45^0 line. This mean in recent times these countries have performed well in providing greater accessibility to public information. Apart from this some small and less developed countries like Azerbaijan, Macedonia, Antigua-Barbuda and Ethiopia have also encouraged the RTI proceedings. Further examination of figure 16 depicts Tajikistan, Slovakia and Bulgaria are far below the 45^0 line indicating their performance have declined further over the course of time from 2010 to 2016.

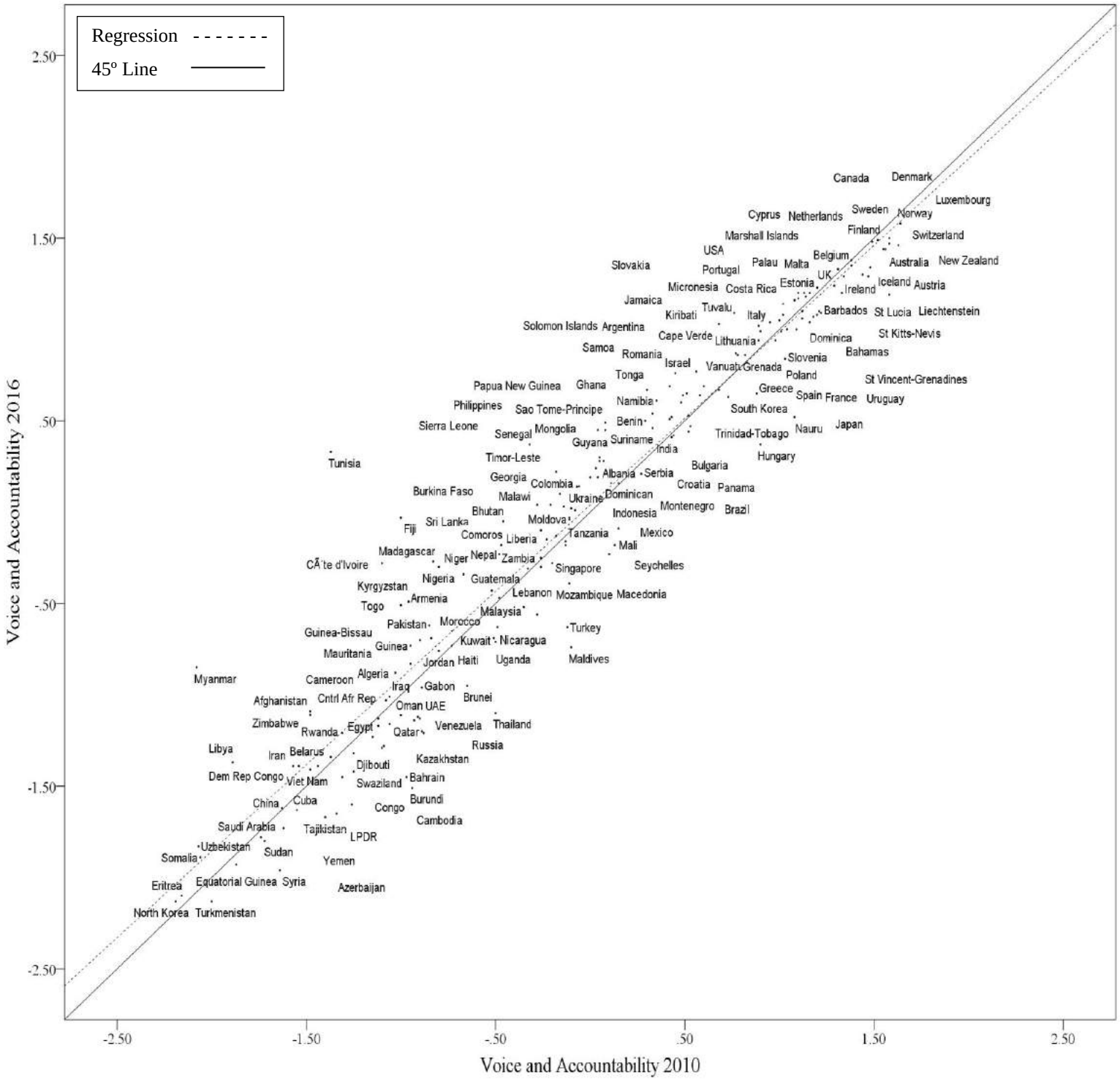

Figure 15. Voice and Accountability in year 2010 and 2016

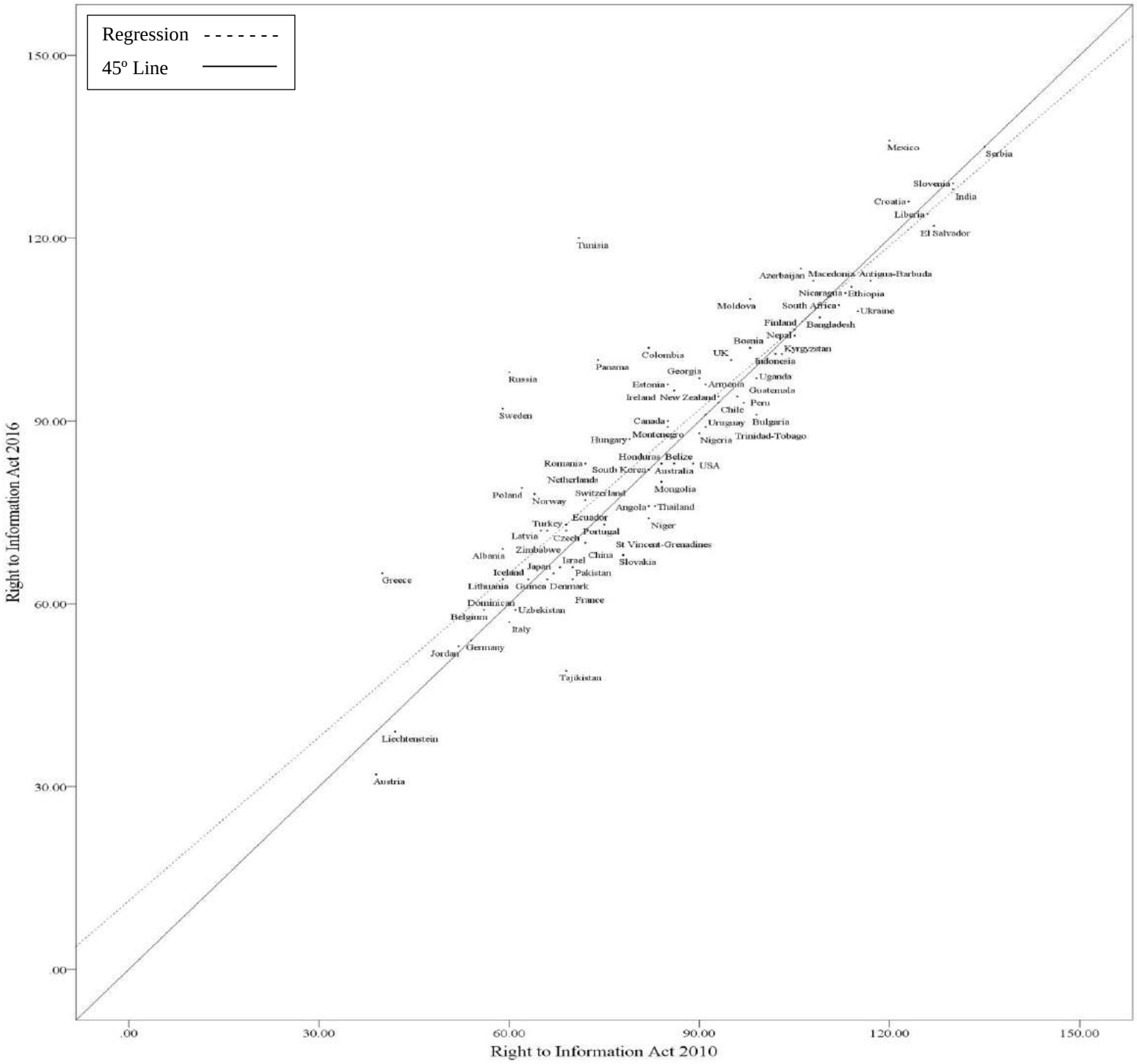

Figure 16. Right to Information Act in year 2010 and 2016

5.4 Hypotheses Testing

In order to investigate the hypothesized relationships among different variables, regressions analyses were carried out to test those hypotheses. It was necessary to detect the heteroskedasticity across the data before applying any panel data model, hence a detection test was applied on data for the identification of heteroskedasticity. The follow up section contains the details of diagnostic test and the selection of appropriate model for the panel data which is to be used in this research.

5.4.1 Regression Analyses of Determinants

Diagnostic Test

Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Heteroskedasticity is the difference of variance of error term across observations. For the detection of heteroskedasticity in the data an appropriate test has to be applied. In case there is no heteroskedasticity where the *p* value is significant and variance of variable is constant (Gujrati, 2007). That is the problem of heteroskedasticity exists if *p* value of chi^2 is significant (less than 0.05). In order to detect the problem of heteroskedasticity in the data, this research conducted Breusch-Pagan / Cook-Weisberg test. As far as the determinant Technological Sophistication is concerned the *p* value of chi^2 is less than 0.05 (i.e. Prob > chi^2 = 0.0108). In case of Good Governance determinants, the test resulted in Prob > chi^2 = 0.0022. So the problem of heteroskedasticity exists in both cases. In order to control this problem, this study used the robust standard errors.

To start with the regressions, the determinants of E-Govt were tested using classical multiple regression model i.e. Ordinary Least Squares (OLS). Table 13 and 14 present the results of OLS regression with robust standard errors. The robust standard errors are used as earlier the presence of heteroskedasticity was diagnosed in the data. Table 13 and Table 14 report the estimated OLS coefficients.

Table 13. OLS Regression of Determinant Technological Sophistication

Variable	**B**	**Robust S.E**	**t-value**	**p > |t|**
TS	.088	.012	7.52	0.000
GDP	.075	.007	11.15	0.000
R^2	0.6370			
F(5, 541)	235.25			
Prob > F	0.0000			
Total panel observations	547			
Year effects	yes			

Dependent Variable E-Govt, TS stands for Technological Sophistication, GDP stands for Gross Domestic Product

Table 14. OLS Regression of Determinants Good Governance

Variable	B	Robust S.E	t-value	p > |t|
GE	.112	.023	4.82	0.000
PS	-.075	.011	-6.95	0.000
RQ	.087	.018	4.95	0.000
RL	-.031	.022	-1.37	0.173
GDP	.059	.007	8.67	0.000
R^2	0.6970			
F(8, 575)	206.85			
Prob > F	0.0000			
Total panel observations	584			
Year effects	yes			

Dependent Variable E-Govt, GE stands for Government Effectiveness, PS stands for Political Stability, RQ stands for Regulatory Quality, RL stands for Rule of Law, GDP stands for Gross Domestic Product

Since among researchers there is no common regression model for the analyses of governance indicators because a substantial theoretical framework is sparse in earlier literature. Although the Random Effect Model (REM) has been frequently applied for the analyses of panel data (Elbahnasawy, 2014; Das et al., 2011). The other option available for such analyses is Fixed Effect Model (FEM). The research at hand avoided the FE techniques as the sample (number of countries) is large. In this case if FE is applied, too many dummies of countries may be created. Additionally, this may also create the problem of multi-collinearity amongst explanatory variables which may result in loss of degree of freedom (Baltagi, 2008; Wooldridge, 2011). Adding to this note, Judge et al. (1985) accentuated that REM is best suited than FEM in cases where sample (n) is large and the number of years (t) is small, assuming other assumptions of

REM hold. The suggested arguments by researchers (Baltagi, 2008; Wooldridge, 2011; Judge et al., 1985; Elbahnasawy, 2014) encouraged us to apply REM to check the effects of determinants (TS, GE, PS, RQ and RL) on E-Govt. In addition, to endorse more about the applicability of appropriate model whether REM or FEM, the current research also applied Hausman test.

Hausman Test

In order to decide about the appropriate model between REM or FEM the current research applied Hausman test. The test assumes that FE should be used if *p* value is significant and if not RE should be applied. In this research case RE model is used as in each determinant case *p* value is not significant (see table A and B in Appendix).

The RE estimate of determinant Technological Sophistication is drawn in Table 15. The results show that Technological Sophistication has significant positive effect on E-Govt (β= .072, *p*= 0.000). The control variable GDP has also significant positive impact on E-Govt (β= .081, *p*= 0.000). The explanatory power (R^2=0.6357) of model is 63.57%, i.e. 63.57 % of the variation in E-Govt is caused by the Technological Sophistication. The value of the F-statistic is significant (Wald $chi^2(5)$= 695.99, sig 0.000) and indicates that the model is fit. Year effect was controlled in the model. This finding of significant relationship between Technological Sophistication and E-Govt enabled us to accept hypothesis 1.

Table 15. REM of Determinant Technological Sophistication (DV: E-Govt)

Variable	B	S.E	Z-Value	p > |z|
TS	.072	.015	4.93	0.000
GDP	.081	.010	8.12	0.000
R^2	0.6357			
Wald chi^2 (5)	695.99			
Prob > chi^2	0.0000			
Number of obs	547 (Groups: 147)			
Year effects	yes			

Dependent Variable E-Govt, TS stands for Technological Sophistication, GDP stands for Gross Domestic Product

The random estimates of determinants GE, PS, RQ and RL are reaped in Table 16. The results show that GE and RQ have significant positive effects on E-Govt (β= .085, *p*= 0.004 and β= .083, *p*= 0.001 respectively). While political stability have significant but negative impact on E-Govt (β= -.052, *p*=0.000). On the other hand the relationship between RL and E-Govt is insignificant (β= -.019, *p*=0.489). GDP which acted as control variable in the model has also significant positive impact on E-Govt (β= .062, *p*=0.000). The explanatory power of model is 69.38% (R^2 = 0.6938) which depicts that GE, PS, RQ, RL and GDP per capita accounted 69.38% variation in E-Govt. Like-way the model overall fitness is also good (Wald chi^2(8) 836.62, sig= 0.000). In model the year effect was controlled. On the basis of these findings hypotheses H2, H4 and H5 have been accepted while hypothesis H3 has been rejected.

Table 16. REM of Determinants Good Governance (DV: E-Govt)

Variable	B	S.E	Z-value	p > |z|
GE	.085	.030	2.86	0.004
PS	-.052	.013	-4.05	0.000
RQ	.083	.024	3.45	0.001
RL	-.019	.029	-0.69	0.489
GDP	.062	.011	5.46	0.000
R^2	0.6938			
Wald chi^2 (8)	836.62			
Prob > chi^2	0.0000			
Total panel observations	736 (Groups: 187)			
Year effects	yes			

Dependent Variable E-Govt, GE stands for Government Effectiveness, PS stands for Political Stability, RQ stands for Regulatory Quality, RL stands for Rule of Law, GDP stands for Gross Domestic Product, TS stands for Technological Sophistication

5.4.2 Regression Analyses of Outcome variables

5.4.3 Control of Corruption

In order to test the relationship between E-Govt and Control of corruption, OLS and RE techniques were applied. But first some necessary diagnostic tests were undertaken. To check the heteroskedasticity in data Breusch-Pagan / Cook-Weisberg test was applied. The test result shows that p value of chi^2 is 0.0000 so the problem of heteroscedasticity exists. In this case robust standard errors are used in OLS regression (Table 17). Here again, Hausman test was applied to decide between the FE and RE models. The Hausman test result shows that p has non-

significant value of 0.201 (see table C in Appendix) so RE model has been selected for the analyses of relationship between E-Govt and Control of Corruption. In the following lines only the REM results are discussed in detail.

Table 17. OLS Regression of Outcome Control of Corruption

Variable	**B**	**Robust S.E**	**t-value**	**p > |t|**
E-Govt	.619	.1504	4.12	0.000
GDP	.444	.025	17.89	0.000
R^2	0.5884			
F(5, 730)	221.06			
Prob > F	0.0000			
Total panel observations	736			
Year effects	yes			

Dependent Variable Control of Corruption, GDP stands for log of Gross Domestic Product

The result of the relationship between E-Govt and first outcome variable i.e. Control of Corruption is gathered in table 17. Details show that E-Govt has significant positive impact on Control of Corruption (β= .179, *p*= 0.020). In model, the other included factor which is GDP per capita has also significant positive effect on Control of Corruption (β= .419, *p*= 0.000). Overall model fitness is good (Wald $chi^2(5)$= 247.12, sig= 0.000) while explanatory power of the model is 58.30% (i.e. R^2= 0.5830). This verifies that 58.30% variation has been delineated by E-Govt in Control of Corruption. The year effect is controlled in the model. Due to significant relationship between E-Govt and Control of Corruption hypothesis H6 has been accepted.

Table 18. REM of Outcome Control of Corruption (IV: E-Govt)

Variable	B	S.E	Z	p > |z|
E-Govt	.179	.077	2.33	0.020
GDP	.419	.029	14.59	0.000
R^2	0.5830			
Wald chi^2 (5)	247.12			
Prob > chi^2	0.0000			
Total panel observations	736 (Groups: 187)			
Year effects	yes			

Dependent Variable Control of Corruption, GDP stands for log of Gross Domestic Product

5.4.4 Voice and Accountability

In case of Voice and Accountability diagnostic test was applied too. Before applying panel data models, data was checked for heteroskedasticity. The result of Breusch-Pagan / Cook-Weisberg test of heteroskedasticity shows that p value of chi^2 is 0.0001 which is less than 0.05 and is significant. So the problem of heteroskedasticity exists. Hence robust standard errors have to be used in OLS regression (see table 19).

Table 19. OLS Regression of Outcome Voice and Accountability

Variable	B	Robust S.E	t-value	p > |t|
E-Govt	.032	.199	0.16	0.871
GDP	.385	.031	12.62	0.000
R^2	0.3349			
F(5, 730)	86.05			
Prob > F	0.0000			
Total panel observations	736			
Year effects	yes			

Dependent Variable Voice and Accountability, GDP stands for Gross Domestic Product

As far as Hausman test score is concerned the result shows that p has value of 0.102 (see table D in Appendix) which is insignificant (as is greater than 0.05) so RE model has been selected for the analyses of relationship between E-Govt and Voice and Accountability. The RE estimates of second outcome variable i.e. Voice and Accountability are drawn in table 20. In-spite of strong theoretical and literature support, result shows that E-Govt has non-significant effect on Voice and Accountability (β= -.018, *p*= 0.800). Though in Model GDP proved to be significant predictor of Voice and Accountability (β= .287, *p*= 0.000). The explanatory power of model is 33.47% while model fitness is good (Wald $chi^2(5)$= 94.97, sig=000). Year effect is controlled in the model. The insignificant relationship between E-Govt and Voice and Accountability resulted in the rejection of hypothesis H7.

Table 20. REM of Outcome Voice and Accountability (IV: E-Govt)

Variable	β	S.E	z-value	p > |z|
E-Govt	-.018	.072	-0.25	0.800
GDP	.287	.032	8.97	0.000
R^2	0.3347			
Wald chi^2 (5)	94.97			
Prob > chi^2	0.000			
Total panel observations	736 (Group 187)			
Year effects	yes			

Dependent Variable Voice and Accountability, GDP stands for Gross Domestic Product

5.4.5 Moderation Analyses

Table 21 shows the effect of E-Govt on Control of Corruption in the presence of RTI law. The result shows the moderating effect of RTI law on the relationship of E-Govt and Control of Corruption. The coefficient of interaction term is .580 (β= 0.580) and is significant (*p*= 0.010). The result portray that E-Govt has 0.580 more effect on Control of Corruption in countries where RTI law is present. This proves the RTI law positive role as moderator on the relationship between E-Govt and Control of Corruption. This result enabled us to accept hypothesis H8.

Table 21. RTI Moderation between E-Govt and Control of Corruption

Variable	B	S.E	Z-value	p > |t|
E-Govt	.578	.221	2.62	0.009
E-Govt*RTI	.580	.224	2.59	0.010
RTI	-.417	.104	-4.03	0.000
GDP	.409	.027	14.95	0.000
R^2	0.5846			
Wald chi^2 (7)	243.40			
Prob > F	0.0000			
No. of observations	630			
Year effects	yes			

Dependent Variable Control of Corruption, RTI stands for Right to Information, GDP stands for Gross Domestic Product

E-Govt	Slope of Omitted Group
E-Govt*RTI	Difference of Coefficients/Slopes of (Controlled Group - Omitted Group)
RTI	Difference of Intercepts of (Controlled Group - Omitted Group)
GDP	Slope of GDP

In the second case of moderation, RTI was tested as moderator between E-Govt and Voice and Accountability. Table 22 has the detailed results of this second moderation case. The coefficient of interaction term is 2.01 (β= 2.01) and is significant (*p= 0.000*). This result can be interpreted as that E-Govt has 2.01 times more effect on Voice and Accountability in countries where RTI laws are present. This also approves the RTI strong positive role as moderator on the

relationship between E-Govt and Voice and Accountability. Hence hypothesis H9 has been accepted.

Table 22. RTI Moderation between E-Govt and Voice and Accountability

Variable	B	S.E	Z-value	p > |t|
E-Govt	-1.39	.304	-4.58	0.000
E-Govt*RTI	2.01	.278	7.20	0.000
RTI	-.542	.126	-4.30	0.000
GDP	.376	.034	11.00	0.000
R^2	0.3586			
Wald chi^2 (7)	111.2			
Prob > F	0.0000			
No. of observations	630			
Year effects	yes			

Dependent Variable Voice and Accountability, RTI stands for Right to Information, GDP stands for Gross Domestic Product

E-Govt	Slope of Omitted Group
E-Govt*RTI	Difference of Coefficients/Slopes of Controlled Group - Omitted Group
RTI	Difference of Intercepts of Controlled Group - Omitted Group
GDP	Slope of GDP

5.5 Response Hypotheses

A total of 9 hypotheses were tested against different relationships in this research. Out of these 9 hypotheses 7 examined whether independent variables explain the dependent variables.

Other two hypotheses were about the moderation. The summarized form of all these hypotheses (whether accepted or rejected) is drawn in table 23.

Table 23. Summary of Results

No.	Hypotheses	Status
H1	Technological Sophistication is positively associated with E-Govt development in a country.	**Accepted**
H2	Regulatory Quality is positively associated with E-Govt development in a country.	**Accepted**
H3	Rule of Law is positively associated with E-Govt development in a country.	**Rejected**
H4	Political Stability is positively associated with E-Govt development in a country.	**Accepted**
H5	Govt Effectiveness is positively associated with E-Govt development in a country.	**Accepted**
H6	E-Govt development is positively associated with Control of Corruption in a country.	**Accepted**
H7	E-Govt development is positively associated with Voice and Accountability in a country.	**Rejected**
H8	RTI law will moderate the relationship between E-Govt development and Control of Corruption, in such a way that higher the RTI, higher will be Control of Corruption in a country.	**Accepted**
H9	RTI law will moderate the relationship between E-Govt development and Voice and Accountability, in such a way that higher the RTI, higher will be Voice and Accountability in a country.	**Accepted**

5.6 Chapter Summary

This chapter summarized the findings of the research. To re-iterate, this study outlined a list of some important determinants and outcomes regarding E-Govt that play key role in the development of any economy. Most importantly, the research findings established a link between Good Governance and E-Govt. Also the findings of the study uncovered the significant role of RTI to Control Corruption in economies and to enhance Voice and Accountability of public officials.

Chapter 6

Discussion and Conclusion

Chapter Overview

The previous chapter provided the detailed description of the quantitative results of this study. This chapter seeks to present the detailed discussion of findings in relation to the relevant literature. In addition, the various contributions of this study towards theory and practice are also discussed. Finally, this thesis concludes by identifying the limitations and proposing future research directions.

6.1 Overview of the Study

It has been described in detail that E-Government helps in enabling its' various stakeholders to access public services in an efficient way without any interruption. However, previous research has reported that E-Government development faces many challenges (Faroqi & Siddiquee, 2011; Nkohkwo & Islam, 2013). The international bodies (e.g. UN, WB and Accenture) accentuated that countries have to cope with the barriers of technology and improve Governance structure for the establishment of stable E-Govt system. Once they succeeded, then with the help of RTI laws, E-Government can contribute in controlling corruption and enhancing voice and accountability. Therefore as described in chapter one, the main research question raised in this study is 'Do good governance indicators and technological sophistication act as the determinants of E-Govt and what role E-Govt plays in controlling corruption and enhancing voice and accountability in the presence of RTI laws?'. This overarching research question is

further divided into four sub questions as (i) What is the relative importance of Technological Sophistication in the development of E-Govt in countries across the globe? (ii) What are the main factors regarding Good Governance (Regulatory Quality, Rule of Law, Political Stability and Govt Effectiveness) that might drive E-Govt developments? (iii) How E-Govt helps in Controlling Corruption and enhancing Voice and Accountability? (iv) What role Right to Information Law plays in moderating the relationships between E-Govt and Control of Corruption and between E-Govt and Voice and Accountability?

Bearing in mind the above described questions, nine hypotheses were proposed to test the relationships of interest among the focal variables (see chapter 3 for detail). In order to investigate the relationships among various variables, these hypotheses were empirically tested to determine significance and direction of relationships. In the following section, all major findings of this research are discussed. In the first phase, general explanation including the discussion about the descriptive statistics is provided, followed by the findings which are organized list wise based on the research questions and associated hypotheses.

6.2 Descriptive Statistics

This section presents a rehash of the descriptive statistics which were undertaken in the previous chapter. In addition, all the variables i.e. including: E-Govt, Technological Sophistication, Regulatory Quality, Political Stability, Govt Effectiveness, Rule of Law, Voice and Accountability, Control of Corruption and Right to Information are discussed for a series of analyses (such as frequency of sample, minimum and maximum values and variation across mean) to find out significant findings and draw potential differences across countries.

6.2.1 Countries Sample

The United Nation (UN) chartered 193 countries to date. All of the chartered members ensured their online presence till the year 2016. Earlier 192 countries data was present regarding the E-Govt parameters in the year 2010. As far as online services are concerned, at least all the countries across the entire globe have some source of E-Govt. In the selected time period just in year 2010 only one country was short of E-Govt system (online services). Onwards from 2010 all the UN member states have some sort of online presence. This is encouraging as far as E-Govt developments are concerned.

As far as the TS sample countries' list is concerned, this research consulted WEF's database. WEF publishes GITR, from which we have taken the data 'latest technology availability' as a proxy for TS. The number of countries having TS data was 135, 141, 140 and 135 in the year 2010, 2012, 2014 and 2016 respectively. Only 135 countries' data was available in the year 2010 which reached a peak level of 141 in the year 2012 then little lowered to 140 in the year 2014 and more lowered to 135 in the year 2016. The data recorded for countries by WEF is low and not satisfactory. The countries as well as the WEF should join their hands against the barriers that come across the data collection. Such barriers should be minimized to increase the number of countries for data gathering.

The Good Governance Indicators (GGI) scores came from the WB's database. WB considers many of the disputed territories and small islands as an independent separate state/country (like Hong Kong, Taiwan, Palestine, Niue, Guam, Cayman Islands). This made the WB's country list way too large than the UN's country list. On total WB records the GGI scores for 214 countries as per 2016 survey reports. For all the indicators, across all the years (i.e. 2010 - 2016) the number of countries ranged from 204 to 214. On general lesser countries data was

available for all the indicators for the year 2016. In the year 2016 GE, PS, RQ, RL, CC and VA have data of 209, 211,, 209, 209, 209 and 204 countries respectively. It is observed that the data availability for countries was dropped during the period 2010 to 2016. Though WB ensured to collect data for all countries, still for all indicators some countries' data is missing. This is worrisome as all countries have to ensure their data availability regarding GGI for better prospects in the future.

The Center for Law and Democracy (CLD) analyzes the country's Right to Information (RTI) act. According to CLD only 86 countries enacted RTI law till the year 2011. The number of countries incremented to 90 and then 97 in the year 2012 and 2014 respectfully. Further increment took place in the year 2016 as 108 countries enacted the RTI law. As of year 2011 till year 2016, 22 more countries have adopted RTI laws, this is satisfactory but still across the globe almost half of the countries are short of RTI laws. The countries without RTI laws have to adopt such laws for informed citizenry. As the world is passing through a stage of information era, for which it is important that the entire population of the world have access to information. For such accessibility all the countries have to work out about the enactment of RTI laws.

6.2.2 Mean Analyses

In this section the mean values of all the variables are discussed. The E-Govt can have a maximum value of 1 and minimum of 0. E-Govt mean value was observed as 0.26 in the year 2010and 0.49 in the year 2016. An 88.46 % increase took place in E-Govt mean value. This is quite good for the progress of E-Govt but still the mean value is below the half line (0.50) and way behind the optimum level (1). Though from year 2010 to 2016 the countries across the globe have outperformed by raising the mean value by 88.46 %, still much work is needed to further

raise the level of E-Govt across the globe. All the Govts have to offer many other online services to their citizens. Some deep insights of countries' E-Govt scores depict that some countries are at the optimum level (having score of 1 or score close to 1), while many other countries have scores less than 0.49 (world average). The UN and the countries' Govts by their own should help themselves to raise E-Govt level by following the strategies of E-Govt leading countries. The experience and roadmap of E-Govt leading countries can act as a role-model for the E-Govt lagger countries. Once an environment of collaboration if created across the globe, the world may see an enhanced level of E-Govt and the entire population of globe may have access to better services in form of online services.

As far as the mean analysis of Technological Sophistication (TS) is concerned, the mean values of TS were 5.03, 4.98, 4.83 and 4.77 in the year 2010, 2012, 2014 and 2016 respectfully. Further analyses suggest that mean of TS has declined over the period 2010 to 2016. A 5.17 % decline took place in TS. Also the ideal mean value should have close to 7 (as TS has maximum value 7 and minimum 1). But in the latest observation of year 2016, mean value of TS was recorded as 4.77 which is just above the mid-point of 3.5. The maximum value of TS can be 7 and minimum 1. Across the 7 year time period not even a single country has achieved the optimum level (7) for TS. The highest recoded value of TS across any year was in the year 2010 which is 6.84. A 5.17 % decline occurred in the mean value of TS from 2010 to 2016. Similarly the minimum value of TS was 3.34 which declined to 2.76 in 2016. The minimum value also declined 17.36 % from 2010 to 2016. The mean value as well as the maximum and minimum values of TS declined over the course of time. This depicts that countries are struggling to deploy latest technologies for their nationals. The Govts across the globe have to work out on plans that accelerate the TS country wide.

The Good Governance Indicators (GGI) have range from -2.5 to +2.5, all the indicators have mean values almost close to 0 across all years. The indicators GE, PS, RQ, RL, CC and VA have mean values 0.000000002392, -0.000000002141, 0.000000000526, -0.000000002190, 0.000000002113 and 0.000000000037 respectively in the year 2016. The low mean scores for all GGI shows that all countries across the globe have poorly performed regarding governance. In order to improve the governance level all Govts around the world have to give some serious attention to governance areas.

The RTI mean values are 84, 85, 85 and 86 in the year 2011, 2012, 2014 and 2016 respectively. RTI having the range of 0 to 150, the mid-point is 75, so the mean values are just above the mid-point of 75. In the year 2016 the mean value recorded was 86. Though from year 2010 to 2016, RTI mean value improved by 2.19 %, but this improvement is too small to be lauded. Access to information is the fundamental right of citizens (Mendel, 2008) in any country. The Govts have to improve their RTI legislation in order to have an improved RTI mean value across the globe.

6.3 Findings from Hypotheses Testing

The aim of this research was providing answers to the posed questions. In this regard, a number of hypotheses were created based on literature review. The analyses and results of all these hypotheses were incorporated in chapter 5. This section is about the findings and the detailed discussion of all those results in relevancy to research questions and associated hypotheses.

Research Question 1: What is the relative importance of Technological Sophistication in the development of E-Govt in countries across the globe?

Research Question 2: What are the main factors regarding Good Governance (Regulatory Quality, Rule of Law, Political Stability and Govt Effectiveness) that might drive E-Govt developments?

H1: Technological Sophistication is positively associated with E-Govt development in a country.

H2: Regulatory Quality is positively associated with E-Govt development in a country.

H3: Rule of Law is positively associated with E-Govt development in a country.

H4: Political Stability is positively associated with E-Govt development in a country.

H5: Govt Effectiveness is positively associated with E-Govt development in a country.

Technological development (more particularly ICTs) and its availability is the life blood to ensure the speedy growth of the E-Govt system. As E-Govt development entirely depends upon how to utilize the technology's infrastructure to deliver the public services online (Siau & Long, 2009). Consistent with previous research this study hypothesized that there would be a positive relationship between Technological Sophistication and E-Govt development.

The results suggested the importance of technologies for E-Govt development as countries with higher technological amenities have high E-Govt development scores. This is reasonable as E-Govt developments can only thrive in environments where sophisticated technological based platforms are widely available (Azad et al., 2010; Moon et al., 2005; Krishnan et al., 2012). In other words, a country may move up in the traditional E-Govt maturity model by raising investments in ICTs without rebuilding public process. This high investment in ICTs also enhances the quality of online public services. This suggests that improving nation's general technological sophistication improves its E-Govt system. The importance of latest technologies is inevitable for E-Govt and lack of such technologies may constrain the ICTs

infrastructure and E-Govt developments (Singh et al., 2007; Das et al., 2011; Nkohkwo & Islam, 2013). It is also clear that the leading edge technologies require ample financial resources hence those nations benefit E-Govt the most who can afford it. For the better progress of E-Govt systems in any country, the standard technologies should be affordable and commonplace country-wide (Krishnan et al., 2012). The strong association between technological sophistication and E-Govt development is also consistent with the argumentation of Modernization Theory, that countries having sophisticated technological resources engender social change with ease which in our case is E-Govt development (McClelland, 1967; Goldthorpe et al., 1968; Barker, 2005).

A higher level of E-Govt system is strongly associated with Good Governance in a country. The results of the current research also confirmed that many of Governance indicators have impact on E-Govt development while few don't have any influence on E-Govt developments so it is also confirmed that not all of the Governance indicators contribute to the E-Govt developments. The details of the results show that Regularity Quality in a country significantly affects the E-Govt developments and deployment.

The quality of regulations and legal systems play an important role in the development of any economy in general and E-Govt development in particular. This important role regulations is also affirmed in the current study findings. ICTs laws provide support for the penetration of internet and ensure the progress of E-Govt. The citizens and business users of E-Govt system need it to be secure and reliable. Apart from these aspects, privacy is also an important aspect that should be fulfilled by an effective E-Govt system. In countries across the globe, cyber laws are protecting individual's privacy on e-channels and ensure aspects that are indispensible for E-Govt usage (Kottemann & Boyer-Wright, 2010). Like this study, many instances prove that

favorable laws and regulations accelerate E-Govt developments as there is a common trend across the countries regarding feasible legislations to support E-Govt for mandating its progress (Lewis, 2007; Kottemann & Boyer-Wright, 2010). These legislation and rules are very important as many countries (developing countries especially) are short of such rules and policies (Nkohkwo & Islam, 2013). It is vital to place and enact such legislations as they play an important role in implementing the successful E-Govt system.

The quality of Rule of Law has effects on ICTs adoption and E-Govt Development. The data analyses of this study reveal that there is no relationship between Rule of Law and E-Govt Development. A study undertaken by Ifinedo (2012) found negative relationship between Rule of Law and E-Govt maturity. Some nations across the globe are practicing unfavorable Rule of Law, but still they have achieved much better position in the fields of E-Govt. In these countries E-Govt is solely used to control citizens and general propaganda purposes (Schuppan, 2009; Ifinedo, 2012). This unorthodox usage of E-Govt could be the prime reason for insignificant relationship between Rule of Law and E-Govt. The Govt administration in poorer Rule of Law countries may not be interested in providing sophisticated online services to their citizens. As such may empower their citizens which may deemed to engender dissent (Welch & Wong, 2004; Kovačić, 2005; Ifinedo, 2011). Also in many developing countries the Govt officials view E-Govt as a threat to their power and viability. In such scenario they don't promote the true essence of E-Govt (Heeks, 2002; Nkohkwo & Islam 2013), which raises the challenge of smooth development of E-Govt system. The non-significant relationship between Rule of Law and E-Govt does not affirm that Rule of Law has no bearings for E-Govt maturity. This relationship is counterintuitive and needs further inquiry.

Leadership, democratic structure and political stability provide supportive environment for the growth of E-Govt. Though the finding of the current study is contrary to our hypothesized statement of positive links between political stability and E-Govt. The results suggest that a significant relationship exist between Political Stability and E-Govt but negative in nature. It is worth mentioning to note that in some countries where autocratic political styles of leadership exist are leading in the E-Govt's international rankings. Such countries have tremendous gains in providing online services to their citizens and businesses. This can be one of the probable reason of the negative relationship between Political Stability and E-Govt.

Politically stable countries are likely to have stronger E-Govt system, however this is not the finding of this research. Perhaps this is because many countries have different political systems, which make the politics complex, uncongenial and very diverse. Due to such diversity politicians are still short of any international standards. Also across countries institutional differences exist and such differences are more eminent in political systems, in this context ICTs are used differently in different political structures, the resulting effect is the reproduction of differences in political systems (Meijer, 2007). The differentiation in political system and ICTs being differently applied across each political system may not bring positive results. Further e-democracy is extensively influenced by the inner factors of a country and not by the external factors. The politics of any society is dominant by isolation. In other words, the people working in a political system rarely contact and exchange their views with other people whom affiliation is from different political system. In this regard political system will adapt new technologies rather than to adopt. This gives the lead that E-Govt technologies may change across countries having different political systems. Such changes might resulted in the negative relationship between political stability and E-Govt developments. Likewise, in some countries coalition Govt

exists, in such cases the ruling parties may have different preferences for development programs. E-Govt developments may not be on higher priorities in these democracies. This suggests that coalesced political Govts though acknowledge the need for fostering E-Govt but they require ample electoral support to implement it. As countries having feeble political system or unstable political situations, may give priorities to the short term projects having immediate electoral impact. Such projects may be helpful in the re-election of politicians (Roubini & Sach 1989; Domínguez et al., 2011). Though countries who possess coalesced Govts are supposed to be politically stable but may not prefer E-Govt developments. Leadership's will and political situation are the main constituents of E-Govt initiatives. Unfortunately most of the politicians view E-Govt is a threat to their power (Ebrahim & Irani, 2005; Sanchez, 2003; Nkohkwo & Islam, 2013). Also in many African nations, E-Govt projects are partial or complete failure because of political factors (Heeks, 2002). This inhibits the political will of politicians resulting in under-developed E-Govt platforms (Schwester, 2009). This may shed some light on the negative relationship between political stability and E-Govt development.

Employees are the core assets of any organization. In public sector, employees having know-how and relevant competencies form the basis of implicit knowledge that is needed for the functioning of E-Govt system. The findings of this research also asserted significant relationship between the effectiveness of employees and E-Govt technologies (Ahmad, 2014). A well designed technology which in this research case is E-Govt depends greatly upon the effectiveness of civil servants. The quality of bureaucracy facilitates ICT led developments. A competent bureaucracy positively invest their efforts to increase the success chances of E-Govt tools. Technical skills are not the sole requirement of E-Govt developments, so the civil servants have to overcome the view that declares E-Govt development a technical matter which they left

to technical specialists. The bureaucracy must remove red tapes that come underway in the process of technological transformation like E-Govt. Old style and techniques in public organizations must be updated in order to increase Govt efficiency. On the other hand, incompetent bureaucracy may inhibit the development of E-Govt system. Govt employees if found themselves misfit with the new technology, this might arise a sense of insecurity in their minds regarding the employment. The Govt should take care of their future prospect and provide them relevant training and refresher courses through which they can update their skills (Ahmad, 2014). The skills are vital constituent to move employees from the status quo to E-Govt environment. The E-Govt setting demand skills and competencies as employees have to work on electronic oriented system rather than traditional paper based system (Writz & Daiser, 2015). In this regard role of Govt is vital to improve Govt effectiveness for the purpose to gear up E-Govt developments countrywide.

The findings of this research demonstrate that the advancement of technologies in a country is pivotal for E-Govt developments. Governance indicators on the other hand indicate mixed results. Two of the governance indicators i.e. Regulatory Quality and Govt Effectiveness prove to be significant determinants of E-Govt developments while Rule of Law failed to show statistically significant relationship with E-Govt developments. Though Political Stability is significant but has negative impact on E-Govt developments. The results are aligned with the findings of past studies (Singh et al., 2007; Srivastava & Teo, 2010a; Von-Haldenwang, 2004; Krishnan et al., 2012).

Research Question 2: How E-Govt helps in Controlling Corruption and enhancing Voice and Accountability?

H6: E-Govt development is positively associated with Control of Corruption in a country.

H7: E-Govt development is positively associated with Voice and Accountability in a country.

Using the internet based E-Govt system to fight corruption is a new strategy for Govts. The findings of this study provide a strong evidence about corruption reduction if E-Govt initiatives are undertaken successfully. This study developed a model with the assumption that increasing E-Govt services in a country will mitigate corruption has been verified (Garcia-Murillo, 2013; Mistry & Jalal 2012). The findings derived from the sample selected for this research suggest that E-Govt plays a significant role to control corruption. The use of ICT enable online services hold the promise of minimizing corruption (Mistry & Jalal 2012; Lourenço et al., 2013). These findings are vital and twofold. At one end E-Govt saves costs for Govts, the cost saved can then be used to enhance and deploy sophisticated E-Govt services in any country. At the other end E-Govt technologies are robust in controlling corruption.

The theoretical assumption states that in a country, E-Govt system can be a great source of accountability. Using online means to get service enhances the public official's accountability. Interestingly the results of the study proved insignificant relationship between E-Govt developments and Voice and Accountability. This could be due to dual effects that Voice and Accountability possess. There are chances that Voice and Accountability have influence on E-Govt developments rather than E-Govt developments have any impacts on Voice and Accountability. This dual effect is subject to further investigation and analysis.

In any society Voice and Accountability provides the opportunity of greater participation by raising multiple and competing voices. Such voices may endanger freedom and rights hence may challenge the capabilities of national institutions to handle multiple and competing voices. In such a situation institutions become weak, generating the problem of 'inability of institutions'

(Krishnan & Teo, 2012). In such a scenario the potential benefits of Voice and Accountability might lost. Results of some studies suggest that some countries still do not disclose the required data needed for accountability process. Even if such data is disclosed, it will lose the ground due to short of visibility, proper structure and autonomous presentation. Such data may be least useful for stakeholders for further processing as well. Such limitations will result in lesser Voice and Accountability. These multiple reasons could be the probable grounds of the insignificant relationship between E-Govt developments and Voice and Accountability.

Research Question 3: What role Right to Information Law plays in moderating the relationships between E-Govt and Control of Corruption and between E-Govt and Voice and Accountability?

H8: RTI law will moderate the relationship between E-Govt development and Control of Corruption, in such a way that higher the RTI higher will be the Control of Corruption in a country.

H9: RTI law will moderate the relationship between E-Govt development and Voice and Accountability, in such a way that higher the RTI higher will be the Voice and Accountability in a country.

In the first case of moderation, this study verified the positive moderating role of RTI law between E-Govt and control of corruption. E-Govt is a powerful tool to control corruption in economies. The instances of corruption might further get lowered if Govt provide widespread information about its policies and procedures. Such information has the potential to mitigate corruption as public officials may not demand ‘speed money’ in delivering public services. Thus, it is important to provide citizens and other stakeholders the information about public policies and procedures. Empowering individuals with knowledge and information through RTI laws will reduce the discretionary power of public officials and one can get Govt service, permit or license

without any bribe. The RTI laws hence minimize the chances of corruption through the promotion of electronic channels like E-Govt (Garcia-Murillo, 2010). Thus for any country the role of E-Govt is more prominent to control corruption if information is diffused widely in that country.

In the second case of moderation, the study's findings approved RTI to have positive moderating effects upon the relationship between E-Govt and voice and accountability. To foster accountability, the role of web-portals and RTI laws is crucial. The websites are a great source of information dissemination. The information mounts further in the presence of RTI laws. RTI law ensures the information flow between citizens and public institutions. Public officials are well aware that they might be held accountable due to this high information flow as the citizen act as the watch-dog on public officials gestures/behaviors (Lourenço et al., 2013). Such flow of information challenges the information asymmetries thus enhances the responsiveness of public officials towards citizens. The Govts across the globe have to rely on E-Govt system and enact RTI laws to enhance the accountability of public officials.

6.4 Conclusion

The UN E-Govt maturity model though doesn't correspond to the technological sophistication, nonetheless this determinant plays a vital role in the development of E-Govt. In-fact the countries may go up the ladder of E-Govt maturity only if ample attention be given to the technological sophistication. Nations are focusing on improving their technological capabilities in this regard. Legal framework is also an important constituent needed for the E-Govt developments. In some countries due to incompetent bureaucracy, though public services are offered through online means but simultaneously it is still practiced that one has to go physically

to a public office and meet with public officials, in such cases the benefits of E-Govt system are hampered (UNDP, 2006; Elbahnasawy, 2014). Therefore the effectiveness of civil bureaucracy along with the legal framework regulations are needed to be reviewed in order to achieve maximum benefits of E-Govt system. Furthermore, the battery of E-Govt provides ample charge in the fight against corruption. In addition to E-Govt, the Govts can control corruption and enhance the accountability of public officials through information dissemination by enacting RTI laws.

6.5 Implications of Research

This study has contributed to E-Govt research in many ways. This research is distinctive as it examined e-government development at national level and provided holistic approach by examining empirically the technological, governance and governmental issues. To the researcher‘s knowledge, no previous studies exist that have attempted to combine the factors influencing E-Govt development (determinants) with outcomes. The proposed model could be used as a frame of reference by government institutions that seek to develop E-Govt systems. Further, it could serve as a decision-making tool to support government institutions and officials in their efforts to promote transparency and voice and accountability. This model can be used by researchers and scholars in the field of e-government to understand and analyze challenges and factors facing government efforts in terms of system implementation. Also, decision makers can use the conceptual model as a tool to support government institutions and agencies when taking decisions to develop and maintain E-Govt systems.

The study used multiple databases for acquiring secondary data of the focal research variables. The multi data sources contain different number of countries. Hence to test the

hypothesized relationship the sample (number of countries) variate across each relationship. This feature of using different number of countries across each hypothesized relationship make this study unique in E-Govt research. Though only Abu-Shanab and Harb (2013) has used different number of countries for testing their hypotheses.

The study applied mixed effects models i.e. OLS and RE for estimating the E-Govt relationships with determinants and outcomes. The mixed effect model shows E-Govt system extensively depends on the level of technological sophistication, Regulatory Quality and Govt Effectiveness in a country. Similarly E-Govt and RTI role to control corruption is evident for the national policymakers. From the brief conclusion, some implications for policy makers are brought forward. An E-Govt system is in great need of sophisticated technologies to be deployed before implementing it. For E-Govt systems, it is vital to improve internet access and provide feasible technological tools countrywide. Also feasible technological tools should be worked out to help citizens and businesses to perform Governmental transaction with ease. In a country the institutional characteristics of political system changes the form of E-Govt, so at country level the E-Govt developers have to focus the political system in that country before designing strategies for E-Govt development and implementation. Govts need to polish the skills of their civil bureaucracy and promote favorable regulations for the progress of E-Govt system. The Govts have a better and instant remedy in the form of E-Govt to root out corruption from their societies. Also it is important to enact effective RTI laws as only disclosing or providing access to information may merely bring desired results. The Governmental agencies should be more empowered whom then should ensure citizen's access to public and administrative documents. Raising the public access to greater information sources is the only way to make the Govt operations more transparent and public officials highly accountable.

Based on the theoretical findings, a set of deployment strategies were formulated for the Govts to develop E-Govt successfully. Improvements include enhancing the technological infrastructure, political system, regulations and rule of law. Decision makers and researchers can benefit by recognizing the relevance of technology as well as their influence on the development of E-Govt system. The congruence of technologies with the governance factors should exhibit development rates. The current research affirmed the importance of latest technologies needed for the speedy progression of E-Govt development. This finding is a guideline for the policy makers and decision makers to divert more attention towards the technological infrastructure which might accelerate the deployment of E-Govt. Further, E-Govt proved to be a dreadful weapon for corruption. As the findings of the study suggested that once developed E-Govt can fight corruption. Hence the Govts across the globe have to consider the role of E-Govt to eradicate corruption from their economies. In addition, the RTI laws can give policy makers a helping hand in mitigating corruption if used in combination with E-Govt as information dissemination eliminates information asymmetries. The Govts should be encouraged to enact more strong RTI laws to control corruption and enhance voice and accountability.

6.6 Limitations and Future Research Directions

Like any other study, the research at hand has also few limitations. This research clarifies some of the determinants and outcomes of E-Govt developments. The research comprehensively discussed the relationship between antecedents and E-Govt and then E-Govt and its outcomes. Any future research should also investigate how these relationships are affected by some contingency variables? The future research may incorporate the contingency variables like public institutions and macro-economy to check their impacts with the current study hypothesized

relationships. Also, the current research incorporated only technological and governance factors. Other factors relevant to culture and socio-economic should also be considered in future research. On the determinant side, the role of national culture is critical. The difference of national culture across nations might explain greater variance in E-Govt development. On the outcome side of E-Govt development, the applicability of culture is equally important and need to be investigated. Technologies and especially E-Govt can be a deterrent tool to control corruption, however cultural values has to be focused when studying corruption. As countries differ each other due to variation in the corruption level, so the solutions to control corruption might also be different. For instance, Husted (2002) accentuated that cultural context of any country is important while determining its corruption level. Culturally, individualistic societies are more influenced by professionalism and e-participation approaches. On the other hand in collectivist cultures bureaucracy and internal surveillance through e-government can be more successful strategies. Further research should inquire and focus such cultural contexts in cross national analyses. Similarly, any future research should also take into consideration the difference of political systems across different countries. This may yield us the results about why E-Govt takes different forms in different political systems.

The time frame of current study was limited to 7 years period. The panel data used in this research was from 2010 to 2016. Future contribution should consider much longer observation period as more data become available as Dewan et al. (2010) vindicated that at country level analysis, a minimum of 9 years data is required for robust estimation while performing panel data analysis. Besides, panel data have the problems of endogeneity, for which Generalized Method of Moment (GMM) provides better solutions. The future research should also consider this statistical technique when estimating alike model based on panel data.

Many developed countries have already made available a diverse range of sophisticated technologies within their ICTs infrastructure. The direction here for future research is that it should separately analyze different aspects of technological infrastructure to find out which one carries comparatively the heavy weight for E-Govt development. This sort of analysis would usher us the most feasible tools and technologies needed for E-Govt development. Likewise, the future research should also elaborate whether the existing technologies used for E-Govt developments have the greater implementation impacts or the newer technologies like mobiles and wireless phone may be more helpful in developing E-Govt systems. In addition to this, different countries have set different priorities regarding E-Govt development. The three core areas of such development are service delivery, citizen involvement and Govt reforms/integration. Some countries purposely invest more in certain area than others. This might shatter their OSI rankings. This trade-off needed to be further investigated through qualitative techniques like in-depth interviews. Such qualitative should also focus individual country profile through case study research. These qualitative studies would also provide a different perspective into the explanation of how governance factors could affect development of E-Govt system.

6.7 Chapter Summary

This chapter presented a discussion of the key findings of the research. The research questions posed in chapter one are answered in current chapter. The discussion confirms the importance and relevance of the identified factors. The chapter also incorporated major contributions of this research, as well as implications for successful E-Govt deployment are highlighted. The chapter concluded with a discussion of limitations and future research directions.

References

Abu-Shanab, E., Al-Rub, S. A. & Nor, K. M. (2010). Obstacles facing the adoption of E-Government services in Jordan. *Journal of E-Governance,* 33 (1), 35-47.

Abu-Shanab, E. A., & Harb, Y. A. (2013). E-government readiness association with human rights index. *Electronic Government, An International Journal,* 10 (1), 56-67.

Accenture (2004). E-Government Leadership: High Performance, Maximum Value. Retrieved From http://www.accenture.com

Ackerman, J. M., & Sandoval-Ballesteros, I. E. (2006).The Global Explosion of Freedom of Information Laws. *Administrative Law Review*, 58 (1), 84-130.

Affisco, J. F., & Soliman, K. S. (2006). E-government: A strategic operations management framework for service delivery. *Business Process Management Journal,* 12**,** 13-21.

Ahmad, S. (2014). Technology in Organizations. *International Journal of Research in Business Management (IMPACT: IJRBM),* 2 (7), 73-80.

Aldrich, D., Bertot, J. C., & Mcclure, C. R. (2002). E-government: Initiatives, developments, and issues. *Government Information Quarterly,* 19**,** 349-355.

Almazan, R. S., and Gil-Garcia, J. R. (2008). E-Government Portals in Mexico. Retrieved from http://www.igi-global.com/chapter/electronic-government-concepts-methodologies-tools/9818

Almuftah, H., Weerakkody, V. & Sivarajah, U. (2016). Comparing and Contrasting e Government Maturity Models: A Qualitative-Meta Synthesis. *Electronic Government and Electronic Participation H.J. Scholl et al. (Eds.)*

Al-Sebie, M., & Irani, Z. (2005). Technical and organizational challenges facing transactional e-government systems: an empirical study. *International Journal of Electronic Government,* 2 (3), 247-276.

Al-Shafi, H. S. (2009). Factors Affecting E-Government Implementation and Adoption in the State of Qatar, A Thesis Submitted for the Degree of Doctor of Philosophy, Brunel University, West London.

Al-Solbi, A. N. H., & Al-Harbi, S. H. (2008). An exploratory study of factors determining E-Government success in Saudi Arabia. *Communications of the IBIMA*, 4 (25), 188-192.

Anderson, T. B. (2009). E-government as an anti-corruption strategy. *Information Economics and Policy*, 21, 201-210.

Ansari, M. M. (2008). Right to Information and its Relationship to Good Governance and Development. Central Information Commission, New Delhi.

Apostolov, M. (2008). Good Governance and the Concept of Electronic Single Window for International Trade. International Conference on E-GOV, December 1-4, Cairo, Egypt.

Armstrong, E. (2005). Integrity, transparency and accountability in public administration: Recent trends, regional and international developments and emerging issues. Available at http://unpan1.un.org/intradoc/groups/public/documents/un/unpan020955.pdf#search=%22accountability%20public%20administration%22N.

Arndt, C., & Oman, C. (2006). Uses and Abuses of Governance Indicators. OECD Development Center Study.

Avison, D., Dwivedi, Y. K., Fitzgerald, G., and Powell, P. (2008). The beginnings of a new era: Time to reflect on 17 years of the ISJ. *Information Systems Journal*,18 (1), 5–21.

Azad, B., Faraj, S., & Goh J. F. (2010). What Shapes Global Diffusion of E-Government: Comparing the Influence of National Governance Institutions. *Journal of Global Information Management*, 18 (2), 85-104.

Baltagi, B. H. (2008). Econometric analysis of panel data. Wiley, New York, USA.

Banisar, D. (2006). Freedom of information around the world 2006: A global survey of access to government information laws. Privacy International. London

Banisar, D. (2011). The Right to Information and Privacy: Balancing Rights and Managing Conflicts. The International Bank for Reconstruction and Development / The World Bank Washington DC. Working Paper.

Barker, C. (2005). Cultural Studies: Theory and Practice, London, Sage.

Baum, C., & Di Maio, A. (2000). Gartner's four phases of e-government model. Gartner Group.

Bellver, A., & Kaufmann, D. (2005). Transparency, Transparency: Initial Empirics and Policy Applications. Preliminary draft discussion paper presented at the IMF Conference on Transparency and Integrity, June 6–7, Washington, DC: World Bank.

Bertot, J. C., Jaeger, P. T., and Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-Government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*, 27, 264-271.

Besley, T., and Coate, S. (2000). Issue unbundling via citizens' initiatives. *Quarterly Journal of Political Science*, 3 (4), 379-397.

Bhatnagar, S. (2009). Unlocking E-Government Potential Concepts, Cases and Practical Insights. New Delhi, India: Sage Publications.

Bonham, G., Seifert, J., & Thorson, S. (2001). The Transformational Potential of e-Government: The Role Of Political Leadership. The 4th Pan European International Relations Conference of the European Consortium for Political Research. University of Kent, Canterbury, U.K.

Bose, R. (2004). E-government: infrastructure and technologies for education and training. *Electronic Government, an International Journal*, 1**,** 349-361.

Bovens, M. A. P. (1998). The Quest for Responsibility: Accountability and Citizenship in Complex Organizations, Cambridge University Press, Cambridge.

Bovens, M. (2002). Information Rights: Citizenship in the Information Society. *The Journal of Political Philosophy*, 10 (3) 317-341.

Bovens, M. (2005). Publieke verantwoording. Een analysekader (Public Accountability: A Frame for Analysis). In: W. Bakker and K. Yesilkagit (eds.), *Publieke verantwoording*, Boom, Amsterdam, 25-55.

Boyer-Wright, K. M., & Kottemann, J. E. (2009). An empirical assessment of common fundamentals in national e-readiness frameworks. *Journal of Global Information Technology Management*, 12 (3), 55-74.

Boyer-Wright, K. M., & Kottemann, J. E. (2015). E-Government and Related Indices: Telecommunications Infrastructure, Human Capital, Institutional Efficacy, and Online Services. *International Journal of Electronic Government Research*, 11(4), 24-37.

Bryman, A. (2012). Social research methods (5th ed.). Oxford: Oxford University Press.

Brown, D. (1999). Information System for Improved Performance Management: Development Approaches in U.S. Public Agencies. In Reinventing the Government in the Information Age, edited by Richards Heeks, 113-134. New York, Routledge.

Calland, R., & Tilley, A. (2002). The Right to Know, the Right to Live: Access to Information and Socio-economic Justice. Cape Town, South Africa: Open Democracy Advice Centre.

Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal*, 15**,** 5-26.

Cervellati, M., Fortunato, P., & Sunde, U. (2008). Hobbes to Rousseau: Inequality, Institutions and Development. *The Economic Journal*, 118, 1354-1384.

Chaushi, A., Chaushi, B. A., & Ismaili, F. (2015). Measuring e-Government Maturity: A meta-synthesis approach. *SEEU Review*, 11 (2) 53-69.

Chandler, S., & Emanuels, S. (2002). Transformation not automation. In Proceedings of 2nd European Conference on E-government. 91-102.

Chavan, G. R., and Rathod, M. L. (2009). E-Governance and Its Implementation. *SRELS Journal of Information Management*, 46.

Chen, H. (2002). Digital Government: Technologies and Practices. Decision Support Systems. 34 (3), 223-227.

Chen, Y. N., Chen, H. M., Huang, W. & Ching, R. K. H. (2006). E-Government Strategies in Developed and Developing Countries: An Implementation Framework and Case Study. *Journal of Global Information Management*, 14 (1), 23-46.

Ciborra, C. (2005). Interpreting E-Government and development: efficiency, transparency or governance at a distance. *Information Technology and People*, 18 (3), 260-279.

Cisco IBSG. (2007). E-Government Best Practices learning from success, avoiding the pitfalls. Retrieved from

http://siteresources.worldbank.org/EXTEDEVELOPMENT/Resources/20080222_Phil_eGov_workshop.pdf?resourceurlname=20080222_Phil_eGov_workshop.pdf

Claver-Cortés, E., Juana-Espinosa, S., & Tarí, J. J. (2008). E-government maturity at Spanish local levels. *International Journal of Value Chain Management, 2*(1), 4–17.

Coronel, S. S. ed. (2001). The Right to Know: Access to Information in Southeast Asia. Quezon City: Philippine Center for Investigative Journalism.

Cukierman, A., Edwards, S. & Tabellini, G. (1992). Seigniorage and political instability. *American Economic Review*, 82 (3), 537-555.

Darch, C. & Underwood, P. G. (2005). Freedom-of-information legislation, state compliance and the discourse of knowledge: The South African experience. *The International Information and Library Review*, 37, 77-86.

Das, A., Singh, H. & Joseph, D. (2011). A Longitudinal Study of E-Government Maturity. PACIS 2011 Proceedings. Paper 52.

Davies, P. (2008). E-Government Best Practices learning from success, avoiding the pitfalls. Cisco Retrieved From http://siteresources.worldbank.org/EXTEDEVELOPMENT/Resources/20080222_Phil_eGov_workshop.pdf?resourceurlname=20080222_Phil_eGov_workshop.pdf

Deloitte Consulting, and Deloitte & Touche. (2000). At the dawn of e-government: The citizen as customer. New York: Deloitte Research. Retrieved from http://www.egov.vic.gov.au/pdfs/egovernment.pdf

Dewan, S., Ganley, D. & Kraemer, K. L. (2010). Complementarities in the diffusion of personal computers and the Internet: implications for the global digital divide, *Information Systems Research*, 21 (4), 925–940.

Domínguez, L. R., Sánchez, I. M. G. & Álvarez, I. G. (2011). Determining Factors of E-government Development: A Worldwide National Approach. *International Public Management Journal*, 14 (2), 218-248.

Donnelly S. J. (2006). Reflecting on The Rule of Law: its Reciprocal Relations with Rights, Legitimacy, and Other Concepts and Institutions. - *The ANNALS of the American Academy of Political and Social Science*, 603, 37-53.

Duffy, D. (2000) Q and A: Balancing the role of e-Government: Interview with Mike Hernon, vice president of e-government for New York City-based GovWorks. [Online]. Available at: http://www.cnn.com/2000/TECH/computing/11/13/qna.egov.idg/.

Dunleavy, P., Margetts, H., Bastow, S. & Tinkler, J. (2006). Digital Era Governance: IT Corporations, the State, and E-Government. New York: Oxford University Press.

Dutta, S. & Mia, I. (2010). The global information technology report 2010–2011. World Economic Forum, Geneva, Switzerland.

Dwivedi, Y. K., Venkitachalam, K., Sharif, A. M., Al-Karaghouli, W., & Weerakkody, V. (2011). Research Trends in Knowledge Management: Analyzing the Past and Predicting the Future. Information Systems Management, 28 (1), 43-56.

Ebrahim Z. & Irani Z. (2005). E-government adoption: architecture and barriers. *Business process management journal*, 11(5), 589-611.

Elbahnasawy, N. G. (2014). E-Government, Internet Adoption, and Corruption: An Empirical Investigation. *World Development*, 57, 114–126.

Eschenfelder, K. R. (2004). Behind the Web site: An inside look at the production of Web-based textual government information. *Government Information Quarterly*, 21 (3), 337-358.

Fang, Z. (2002). E-Government in digital era: concept, practice, and development. *International Journal of the Computer, the Internet and Management*, 10 (2), 1-22.

Faroqi, Md. G., & Siddiquee, N. A. (2011). Limping into the Information Age: Challenges of e-Government in Bangladesh. *Journal of Comparative Asian Development*, 10(1), 33-61.

Fath-Allah, A., Cheikhi, L., Al-Qutaish, R. E., & Idri, A. (2014). eGovernment Maturity Models: A Comparative Study. *International Journal of Software Engineering and Applications*, 5(3).

Feinberg, L. E. (2004). FOIA, federal information policy, and information availability in a post-9/11 world. *Government Information Quarterly*, 21 (4), 439−460.

Felix, S., Kumar, P. & Vijaykumar, N. (2011). E-governance projects: exploring the way to success. *SETLabs Briefings*, 9 (2), 15-22.

Ferreira, I., Cunha, S., Amaral, L. A., & Camões, P. (2014). ICT for Governance in Combating Corruption: the Case of Public e-Procurement in Portugal, *ICEGOV2014*, October 27 – 30, 2014, Guimaraes, Portugal.

Field, A. (2009). Discovering statistics using SPSS. London: Sage.

Florini, A. M. (1999). Does the invisible hand need a transparent glove? The politics of transparency. Paper prepared for the Annual World Bank Conference on Development Economics, Washington, D.C.

Fountain, J. E. (2001) Building the virtual state: Information technology and institutional change. Brookings Washington, D.C., The Brookings Institution.

Fountain, J. E. (2007). Challenges to organizational change: multi-level integrated information structures (MIIS). In V. Mayer-Schönberger and D. Lazer (Ed.) Governance and Information Technology: From Electronic Government to Information Government. Cambridge, MA: MIT Press.

García-Murillo, M. (2010). The effect of internet access on government corruption. *Electronic Government, an International Journal, 7(1), 22-40.*

Garcia-Murillo, M. (2011). Regulation resources and innovation: The Argentinean telecommunications case. *Journal of Information Policy*, 1, 260–286.

Garcia-Murillo, M. (2013). Does a government web presence reduce perceptions of corruption? *Information Technology for Development*, 19 (2), 151-175.

García-Murillo, M., & Ortega, R., (2010). Do e-government initiatives reduce corruption?, School of Information Studies, Syracuse University, New York.

Gasco, M. (2005). Exploring the E-Government gap in South America. *International Journal of Public Administration*, 28 (1), 15-30.

Gaur, A. S. & Lu, J. (2007). Ownership strategies and subsidiary performance: Impact of institutions and experience. *Journal of Management,* 33 (1), 84-110.

Gaygısız, E. (2013). How are cultural dimensions and governance quality related to socioeconomic development? *The Journal of Socio-Economics,* 47, 170-179.

Gebremichael, M., & Jackson, J. (2006). Bridging the Gap in Sub-Saharan Africa: A Holistic Look at Information Poverty and the Region's Digital Divide. *Government Information Quarterly,* 23 (2), 267-280.

Gil-Garcìa, J. R., & Pardo, T. A. (2005). E-government success factors: Mapping practical tools to theoretical foundations. *Government Information Quarterly,* 22**,** 187-216.

Givens, D. (2013). Defining governance matters: A factor analytic assessment of governance institutions. *Journal of Comparative Economics,* 41 (4), 1026-1053.

Global Innovation Index (2013). The Local Dynamics of Innovation, Cornell University, INSEAD, and WIPO, Geneva, Ithaca, and Fontainebleau.

Goel, R. K., Nelson, M. A., & Naretta, M. A. (2012). The internet as an indicator of corruption awareness. *European Journal of Political Economy,* 28(1), 64–75.

Goetz, A. M., & Jenkins, R. (2001). Hybrid forms of accountability: Citizen engagement in institutions of public-sector oversight. *Public Management Review,* 3 (3), 363-384.

Goldthorpe, J. H., Lockwood, D., Bechhofer, F. & Platt, J. (1968). The Affluent Worker: Industrial Attitudes and Behaviour, Cambridge, the UK, Cambridge University Press.

Gottschalk, P., & Solli-Sæther, H. (2009). E-Government Interoperability and Information Resource Integration: Frameworks for Aligned Development. *Information Science Reference* (an imprint of IGI Global), Yurchak Printing Inc. Hershey.

Grant, G., & Chau, D. (2005). Developing a generic framework for E-Government. *Journal of Global Information Management,* 13 (1), 1-30.

Gravetter, F., & Wallnau, L. (2014). Essentials of Statistics for the behavioral sciences 8th ed Belmont, CA: Wadsworth.

Grigorescu, A. (2003). International organizations and government transparency: Linking the international development realms. *International Studies Quarterly*, 47 (4), 643-667.

Guermazi, B., & Satola, D. (2005). Creating the "right" enabling environment for ICT. E-development: From excitement to effectiveness (pp. 23–46). Washington, DC: The World Bank Group.

Gronlund, A., & Haron, T. (2005). Introducing e-Gov: History, definitions, and issues. *Communicationsof the AIS.* 15(39), 713–729.

Hacker K. L., Mason S. M. & Morgan E. L. (2009). Digital Disempowerment in a Network Society. *International Journal of E-Government Research,* 5(2), 57-71.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. (2006). Multivariate data analysis (Vol. 6): Pearson Prentice Hall Upper Saddle River, NJ.

Halstuk, M. (2008). Freedom of Information. In W. Donsbach (Ed.) The international encyclopedia of communication (pp. 1889−1892). Malden, MA: Blackwell Publishing.

Heeks, R. (1998). Information Technology and Public Sector Corruption, Information Systems for Public Sector Management Working Paper No. 4, Institute for Development Policy and Management, Manchester, CO, 1998.

Heeks, R. (2002). e-Government in Africa: promise and practice. Institute for Development Policy and Management, Paper No. 13, University of Manchester, the UK.

Heeks, R. (2005). E-government as a carrier of context. *Journal of Public Policy*, 25, 51-74.

Heeks, R. (2006). Implementing and Managing e-Government: An International Text. Thousand Oaks, CA: Sage Publications.

Heeks, R. (2007). Impact assessment of ICT4D projects: a partial review of frameworks. *Manchester: Institute for Development Policy and Management.*

Hiller, J. S., & Belanger, F. (2001). Privacy strategies for electronic government. *E-Government,* 200, 162–198.

Ho, A. (2002) Reinventing local governments and the e-government' initiative. *Public Administration review.,* 62**,** 434-444.

Hoff, K., & Stiglitz, J. E. (2008). Existing a Lawless State. - *The Economic Journal*, 118, 1474-1497.

Hogan. J., Chari, R. & Murphy, G. (2012). Walking in Sunshine, or Away From It? Creating a Unifed Transparency Index. (working paper), Ireland.

Holsen, S., & Pasquier, M. (2012). Insight on oversight: The role of information commissioners in the implementation of access to information policies. *Journal of Information Policy*, 2, 214-241.

Howard, M. (2001). E-government across the globe: how will "e" change government? *Government Finance Review*, 17(4), 6-9.

Husted, B. W. (2002). Culture and International Anti-Corruption Agreements in Latin America. *Journal of Business Ethics*, 37(4), 413–422.

Ifinedo, P. (2011). Factors Influencing E-Government Maturity in Transition Economies and Developing Countries: A Longitudinal Perspective. *The DATA BASE for Advances in Information Systems,* 42 (4), 98-116.

Ifinedo, P. (2012). Drivers of e-government Maturity in two developing regions: focus on Latin America and sub-Saharan Africa. *Journal of Information Systems and Technology Management,* 9 (1), 5-22.

Infante, D., & Smirnova, J. (2009). New technology adoption and the rule of law. Conference: Economies of Central and Eastern Europe: Convergence, Opportunities and Challenges, (14-16 June), Tallinn, Estonia.

Irani, Z., Al-Sebie, M. & Elliman, T. (2006) Transaction Stage of e-Government Systems: Identification of its Location and Importance. Proceedings of the 39th Hawaii International Conference on System Science. Hawaii.

Islam, R. (2006). Does more transparency go along with better governance? *Economics and Politics,* 18 (2), 121-167.

Jaeger, P. T. (2003) The endless wire: e-government as global phenomenon. *Government Information Quarterly*, 20**,** 323-331.

Jain, A. K. (2001). Corruption: A review. *Journal of Economic Surveys,* 5 (1), 71-121.

Jakob, G. (2003). Electronic government: Perspectives and pitfalls of online administrative procedure. Proceedings of the Thirty-Sixth Hawaii International Conference on System Sciences, Big Island, Hawaii.

Jessop, B. (1998). The rise of governance and the risk of failure: The case of economic development. *International Social Science Journal,* 155 (3), 29-45.

Judge, G. G., Hill, R. C., Griffiths, W. E., Lutkepohl, H., and Lee, T. C.(1985). Introduction to the theory and practice of econometrics (2nd ed.). New York: John Wiley and Sons.

Kamal, M. M. (2008) Investigating enterprise application integration adoption in the local government authorities. Department of Information Systems and Computing, Brunel University, London.

Karokola, G. R. (2012). A Framework for Securing e-Government Services: The Case of Tanzania. Doctoral Thesis in Computer and Systems Sciences at Stockholm University, Sweden.

Karokola, G., & Yngström, L. (2009). Discussing e-Government Maturity Models for the Developing World – Security View. Proceedings of the 8th ISSA 2009 conference, Johannesburg, South Africa.

Kasigwa, J., Williams, D. & Baryamureeba, V. (2006). The role of ICTs and their sustainability in developing countries. In V. Baryamureba and W. Ddembe (Ed.) Measuring computing research excellence and vitality (pp. 78–88). Kampala, Uganda: Fountain Publishers.

Kassim, E. S., & Hussin, H., (2013). A Success Model for the Malaysian Government e-Procurement System: The Buyer Perspective. *International Journal of Electronic Government Research,* 9(1), 1-18.

Katchanovski, I. & La-Porte, T. (2005). Cyber democracy or Potemkin e-villages? Electronic governments in OECD and post-communist countries. *International Journal of Public Administration,* 28 (7), 665-681.

Kaufmann, D., Kraay, A. & Zoido-Lobotan, P. (1999). Governance matters (Policy Research Working Paper 2196). Washington, DC: World Bank Development Research Group.

Kaufmann, D. (2005). Myths and Realities of Governance and Corruption. Washington, DC: World Bank.

Kaufmann, D., Kraay, A. & Mastruzzi, M. (2007). The worldwide governance indicators project: answering the critics. Policy Research Working Paper Series: 4149. Washington, DC: World Bank.

Kaufmann, D., & Kraay, A. (2008). Governance Indicators: Where Are We, Where Should We Be Going? *The World Bank Research Observer*, 23 (1), 1-30.

Kaufmann, D., Kraay, A. & Mastruzzi, M. (2008). Governance matters VII: aggregate and individual governance indicators 1996-2007. Policy Research Working Paper Series: 4654. Washington, DC: World Bank.

Kaufmann, D., Kraay, A. & Mastruzzi, M. (2010). Response to 'What do the Worldwide Governance Indicators Measure?'. *European Journal of Development Research* 22, 55-58.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The Worldwide Governance Indicators: Methodology and Analytical Issues. *Hague Journal on the Rule of Law*, 3, 220–246.

Ke, W., & Wei, K. K. (2004). Successful e-government in Singapore. *Communications of the ACM*, 47**,** 95-99.

Klitgaard, R. (1988). Controlling Corruption, University of California Press, Berkeley, CA.

Klamo, L., Huang, W. W., Wang, K. L. & Le, T. (2006). Successfully implementing egovernment: fundamental issues and a case study in the USA. *Electronic Government, an International Journal*, 3, 158-173.

Knack, S. (2006). Measuring Corruption in Eastern Europe and Central Asia: A Critique of the Cross-Country Indicators. World Bank Policy Research Department. Working Paper 3968.

Kotteman, J. E. & Boyer-Wright, K. M. (2010). Socioeconomic foundations enabling e-business and e-government. *Information Technology for Development*, 16 (1), 4-15.

Kovačić, Z. (2005). A Brave New eWorld? An Exploratory Analysis of Worldwide eGovernment Readiness, Level of Democracy, Corruption and Globalization. *International Journal of Electronic Government Research,* 1(3), 15-32.

Kiecolt, K. J., & Nathan, L. E. (1985). Secondary analysis of survey data. Beverly Hills, CA: Sage Publication.

Kim, H. J., Pan., G. & Pan, S. H. (2007). Managing IT-enabled transformation in the public sector: A case study on E-Government in South Korea. *Government Information Quarterly,* 24 (2), 338-352.

Kim, S., Kim, H. J. & Lee, H. (2009). An institutional analysis of an E-Government system for anti-corruption: the case of OPEN. *Government Information Quarterly*, 26 (1), 42-50.

Kottemann, J. E., & Boyer-Wright, K. M. (2010). Socioeconomic Foundations Enabling E-Business and E-Government. *Information Technology for Development*, 16(1), 4–15.

Krishna, S., & Walsham, G. (2005). Implementing public information systems in developing countries: Learning from a success story. *Information Technology for Development,* 11 (2), 123-140.

Krishnan, S., & Teo, T. (2011). E-Government, E-Business and National Environmental Performance. PACIS 2011 Proceedings, Paper 100.

Krishnan, S., & Teo, T. S. H. (2012). Moderating Effects of Governance on Information Infrastructure and E-Government Development. *Journal of the American Society for Information Science and Technology*, 63 (10), 1929-1946.

Krishnan, S., Teo, T. S. H. & Lim, V. K. G. (2012). Contextual Factors, E-Participation, And E-Government Development: Testing A Multiple-Mediation Model. *PACIS 2012 Proceedings.* Paper 113.

Krishnan, S., Teo, T. S. H. & Lim, V. K. G. (2013). Examining the relationships among e-government maturity, corruption, economic prosperity and environmental degradation: A cross-country analysis. Information and Management, 50 (8), 638–649.

Kumar, R., & Best, M. (2006). Impact and sustainability of E-Government services in developing countries: Lessons learned from Tamil Nadu, India. *Information Society,* 22 (1), 1-12.

Langbein, L., & Knack, S. (2010). The worldwide governance indicators: Six, one or none? *Journal of Development Studies,* 46 (2), 350–370.

La-Porte, T. M., Demchak C. C. & DeJong, M. (2002). Democracy and Bureaucracy in the Age of the Web. Empirical Findings and Theoretical Speculations. *Administration and Society*, 34 (4), 411-446.

Larosiliere, G., & Carter, L. (2013). An Empirical Study and the Determinants of E-Government Maturity: A Fit-Viability Perspective. ECIS 2013 Proceedings. Paper 248, Utrecht University, Utrecht, Netherlands.

Layne, K., & Lee, J. W. (2001). Developing Fully Functional E-Government: A Four Stage Model. *Government Information Quarterly,* 18 (2), 122-136.

Lee, C. P., Chang, K. & Berry, F. S. (2011). Testing the Development and Diffusion of E-Government and E-Democracy: A Global Perspective. *Public Administration Review*, 444-454.

Lee, J. (2010). 10 year retrospect on stage models of e-government: A qualitative meta-synthesis. *Government Information Quarterly*, *27*(3), 20–230.

Lee, S. M., Xin, T. & Trimi, S. (2005). Current Practices of Leading E-Government Countries. *Communications of the ACM* 48(10), 99–104.

Lee, Y. B. (2017). Exploring the Relationship between E-Government Development and Environmental Sustainability: A Study of Small Island Developing States. *Sustainability*, 9(732), 1-16.

Leitner, C. (2003). E-Government in Europe: The State of Affairs. Presented at E-Government 2003 Conference, Como, Italy, 7-8 July.

Lewis, J. A. (2007). Government open source policies, Working paper.

Lidén, G., & Avdic, A. (2003). Democracy Functions of Information Technology. Proceedings of the 36th Hawaii International Conference on System Sciences, Big Island, Hawaii.

Lio, M.-C. Liu, M.-C. & Ou, Y.-P. (2011). Can the internet reduce corruption? A cross-country study based on dynamic panel data models. *Government Information Quarterly*, 28 (1), 47–53.

Löfstedt, U. (2008). E-services for and by citizens: towards e-participation and social systems design for development of local public e-services. Departement of Information Technology and Media, Mid Sweden University, Sundsvall.

Lourenço, R. P., Moura-e-Sá, P., Jorge, S. & Pattaro, A. F. (2013). Online Transparency for Accountability: One Assessing Model and two Applications. *Electronic Journal of e-Government,* 11(2), 280-292.

Lovely, M., & Popp. D. (2008). Trade, Technology and the Environment: Why Have Poor Countries Regulated Sooner? NBER Working Papers Series, 14286.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics,* 22 (1), 3-42.

Lupu, D., & Lazăr, C. G. (2015). Influence of e-government on the level of corruption in some EU and non-EU states. *Procedia Economics and Finance,* 20, 365 – 371.

Madon, S., Sahay, S. & Sudan, R. (2007). E-Government policy and health information systems implementation in Andhra Pradesh, India: Need for articulation of linkages between the macro and the micro. Information Systems, 23 (5), 327-344.

Mahmood, R. (2004). Can information and communication technology help reduce corruption? How so and why not: two case studies from South Asia Perspectives on Global Development and Technology 3 (3), 347–373.

Martinez-Vazquez, J., delGranado, J. A. & Boex, J. (2007). Fighting corruption in the public sector. Amsterdam, Netherlands: Elsevier Science.

Maumbe, M. B., Owei, V. & Alexander, H. (2008). Questioning the pace and pathway of egovernment development in Africa: A case study of South Africa's Cape gateway project. *Government Information Quarterly*, 25(4), 757-777.

May, T. (2011). Social research: Issues, methods and research. London: McGraw-Hill International.

McClelland, D. C. (1967). The Achieving Society, New York, van Nostrand Publishers.

Mendel, T. (2008). Freedom of Information: A Comparative Legal Survey. Paris: UNESCO.

Meena, J., & Sagar, N. (2010). E-Governance and good governance. *International Referred Research Journal,* 2(21), 8-10.

Meijer, A. (2007). Digitization and Political Accountability in the USA and the Netherlands: Convergence or Reproduction of Differences? *The Electronic Journal of e-Government,* 5(2), 213 – 224.

Meso, P., Datta, P. & Mbarika, V. (2006). Moderating information and communication technologies' influences on socioeconomic development with good governance: A study of the developing countries. *Journal of the American Society for Information Science and Technology*, 57 (2), 186-197.

Meso, P., Musa, P., Straub, D. & Mbarika, V. (2009). Information infrastructure, governance, and socio-economic development in developing countries. *European Journal of Information Systems,* 18 (1), 52-65.

Michael, B., & Bates, M. (2005). Implementing and Assessing Transparency in Digital Government: Some Issues in Project. In W. Huang, K. Siau, & K. K. Wei (Ed.) Electronic Government Strategies and Implementation, (20-43) USA, Idea Group Publishing.

Mitchinson, T. (2001) A Presentation to Canada's Municipal eGovernment Conference and Exposition. *Available at* http://www.ipc.on.ca/english/Resources/Presentations-andSpeeches/Presentations-and-Speeches-Summary/?id=90.

Mistry, J. J., & Jalal, A. (2012). An empirical analysis of the relationship between e-government and corruption. *The International journal of digital accounting research,* 12(18), 145-176.

Miyata, M. (2011). Measuring impacts of E-Government support in least developed countries: A case study of the vehicle registration service in Bhutan. *Information Technology for Development,* 17 (2), 133-152.

Moon, M. J. (2002). The Evolution of E-Government among Municipalities: Rhetoric or Reality? *Public Administration Review,* 62 (4), 424-433.

Moon, M. J., & Norris, D. F. (2005). Does managerial orientation matter? The adoption of reinventing government and E-Government at the municipal level. *Information Systems Journal,* 15 (1), 43–60.

Moon, M. J., Welch, E. W. & Wong, W. (2005). What Drives Global E-Governance? An Exploratory Study at a Macro level. In Proceedings of the 38th Hawaii International Conference on System Sciences. Big Island, USA.

Morgan, A., & Cong, C. (2003). Integrity, internal control and security in information systems: Connecting governance and technology. *Journal of the American Society for Information Science, and Technology,* 54 (10), 976-977.

Mutula, M. S. (2008). Comparison of sub-Saharan Africa's e-government status with developed and transitional nations. *Information Management and Computer Security,* 16(3), 235-250.

Neto, I., Kenny, C., Janakiram, S. & Watt, C. (2005). Look before you leap: The bumpy road to e-development. In R. Schware (Ed.) E-development: From excitement to effectiveness, (1-22). Washington, DC: World Bank Group.

Newman, I. (1998). Qualitative-quantitative research methodology: Exploring the interactive continuum. Carbondale: Southern Illinois University Press.

Ngafeeson, M. N., & Mehri, M. I. (2013). E-Government Diffusion: Evidence from the Last Decade. *International Journal of Electronic Government Research,* 9 (2), 1-18.

Nkohkwo, Q. N., & Islam, M. S. (2013). Challenges to the Successful Implementation of e-Government Initiatives in Sub-Saharan Africa: A Literature Review**.** *Electronic Journal of e-Government,* 11 (2), 253-267.

Norris, D., & Kraemer, K. (1996). Mainframe and PC Computing in American Cities: Myths and Realities. *Public Administration Review,* 56 (6), 568-576.

Norris, D. F., & Moon, M. J. (2005). Advancing E-Government at the grassroots: Tortoise or hare? *Public Administration Review,* 65 (1), 64-75.

Norris, P. (2003). Deepening democracy via e-governance. World Public Sector Report, United Nations.

North, D. C. (1999). Institutions, institutional change and economic performance. Cambridge, UK: Cambridge University Press.

Nyirenda, J. C. & Cropf, R. A. (2010). The Prospects for E-Government and E-Governance in Sub-saharan Africa: A case Study of Zambia. *International Journal of Electronic Government Research,* 6 (1), 23-45.

Oberoi, R. (2013). Institutionalizing transparency and accountability in Indian governance: understanding the impact of right to information. *IOSR Journal of humanities and social sciences (IOSR-JHSS),* 11(4), 41-53.

OECD (2013). OECD website. Retrieved from http://www.oecd.org/

Ojo, A., Janowski, T. & Estevez, E. (2007). Determining progress towards e-Government – What are the core indicators? Report No. 360, United Nations University, International Institute of Software Technology, Macao.

Ojha, A., Sahu, G. P. & M. P. (2011). Citizens' adoption of pay-to-use E-Government services: An empirical study. *International Journal of Electronic Government Research,* 7 (2), 15-35.

Onunga, J. (2003). Kenya: Busting Corruption Using the Internet, Retrieved from www.cddc.vt.edu/knownet/internetinfo-cases.html.

Oyomno, G. (2004), Towards a framework for assessing the maturity of government capabilities for e-government. *The Southern African Journal of Information and Communication,* 4, 77.

Palvia, S. C., & Sharma, S. K. (2007). E-government and e-governance: definitions/domain framework and status around the world. Paper presented at International Conference on E-Governance, Hyderabad, December 28-30. 1-15.

Perry, P. & Ashgate, A. (1997). Political corruption and political geography. New Zealand Geographer, 54 (1), 59.

Piotrowski, S. J., & Rosenbloom, D. H. (2002). Non-mission based values in results oriented public management: The case of freedom-of-information. *Public Administration Review*, 62 (6), 643-656.

Raghupathi, W., & Wu, S. J. (2011). The Relationship between Information and Communication Technologies and Country Governance: An Exploratory Study, *Communications of the Association for Information Systems*, 28 (1), 181-198.

Rana, N. P., Williams, M. D., Dwivedi, Y. K., & Williams, J. (2011). Reflecting on E-Government research: Towards a Taxonomy of theories and theoretical constructs. *International Journal of Electronic Government Research*, 74 (4), 64-88.

Reddick, C. G. (2004). A two-stage model of e-government growth: Theories and empirical evidence for US cities. *Government Information Quarterly*, 21(1), 51–64.

Relly, J. E. & Sabharwal, M. (2009). Perceptions of transparency of government policymaking: A cross-national study. *Government Information Quarterly*, 26(1), 148-157.

Relly, J. E. (2012). Examining a model of vertical accountability: A cross-national study of the influence of information access on the control of corruption. *Government Information Quarterly*, 29 (3), 335-345.

Roberts, A. (2006). Blacked out: Government secrecy in the information age. New York: Cambridge University Press.

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5), 71-102.

Romzek, B. S., & Ingraham, P. W. (2000). Cross Pressures of Accountability: Initiative, Command, and Failure in the Ron Brown Plane Crash, *Public Administration Review*, 60(3), 240 – 253.

Rose-Ackerman, S. (1978). Corruption: A Study in Political Economy. New York: Academic Press.

Rose-Ackerman, S. (2005). From Elections to Democracy Building Accountable Government in Hungary and Poland. U.K: Cambridge University Press.

Rose-Ackerman, S. (2006). International Handbook on the Economics of Corruption. Cheltenham, U.K: Edward Elgar Publishing Limited.

Roubini, N., & Sachs. J. D. (1989). Political and Economic Determinants of Budget Deficits in the Industrial Democracies. *European Economic Review*, 33, 903–938.

Sabri, A., Sabri, O., & Al-Shargabi, B. (2012). A Cultural E-Government Readiness Model. *Intelligent Information Management*, 4, 212-216.

Saghafi, F., Zarei, B., Abadi, A. K. D. & Shahkooh, K. A. (2011). An Integrated Strategic Framework for E-Government Initiatives. Information *Resources Management Journal*, 24 (2), 1-15.

Sanchez, A. D., Koh, C. E., Kappelman, L. A. & Prybutok, V. R. (2003). The relationship between IT for communication and e-government barriers. In Proceedings of 9th. Americas Conference on Information Systems, August 4 – 6, Tampa, Florida.

Saunders, M., Lewis, P. & Thornhill, A. (2009). Research Methods for Business Students. 5th edition, Pearson Education Limited /Prentice Hall.

Scavo, C. (2003). World Wide Web site design and use in public administration. In G.D. Garson (Ed.), public information Technology: Public and Management Issues. Hershey, PA: Idea Publishing Group.

Schelling, T. C. (1978). Micromotives and Macrobehavior, (Vol. 62). New York, NY: W. W. Norton and Company.

Scholte, J. A. (2004). Civil Society and Democratically Accountable Global Governance. Oxford, UK: Blackwell Publishing.

Schuppan, T. (2009). E-government in Developing Countries: Experiences from Sub-Saharan Africa. *Government Information Quarterly*, 26, 118–127.

Schware, R. (2005). E-development: From excitement to effectiveness. World Summit on the Information Society). Washington, DC: World Bank Group.

Schwester, R. W. (2009). Examining the Barriers to e-Government Adoption. *Electronic Journal of e-Government*, 7(1), 113 – 122.

Seifert, J. W. (2003). A primer on e-government: sectors, stages, opportunities and challenges of online governance. Congressional research service. Retrieved from http://www.fas.org/sgp/crs/rl31057.pdf

Seng, W. M., Jackson, S. & Philip, G. (2011). Cultural issues in developing E-Government in Malaysia. *Behaviour and Information Technology,* 29 (4), 423-432.

Shahkooh, K. A., Saghafi, F. & Abdollahi, A. (2008). A proposed model for e-Government maturity. In Information and Communication Technologies: From Theory to Applications, 2008. ICTTA 2008. 3rd International Conference (pp. 1–5). Retrieved from http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4529948

Sharma, S. K. (2004) Assessing e-government implementations. *Electronic Government, an International Journal,* 1**,** 198-212.

Shi, Y., & Scavo, C. (2000). Citizen participation and direct democracy through computer networking. In G. D. Garson (Ed.) Handbook of public information systems, pp. 247-263. New York: Marcel Dekker.

Shih, C-F., Dedrick, J. and Kraemer, K. L. (2005). Rule of Law and the International Diffusion of E-commerce. Communications of the ACM, 48 (11), 57-62.

Shim, D. C., & Eom, T. H. (2008). E-government and anti-corruption: Empirical analysis of international data. *International Journal of Public Administration,* 31, 298-316.

Singh, G. R., Pathak, R., Naz, R. & Belwal, R. (2010). E-governance for improved public sector service delivery in India, Ethiopia and Fiji. *International Journal of Public Sector Management,* 23(3), 254-275.

Siau, K., & Long, Y. (2005). Synthesizing e-government stage models- a meta-synthesis based on meta-ethnography approach. *Industrial Management and Data Systems,* 105**,** 443-458.

Siau, K., & Long, Y. (2009). Factors impacting E-Government development. *Journal of Computer Information Systems,* 50 (1), 98-107.

Singh, H., Das, A. & Joseph, D. (2007). Country-Level Determinants of E-Government Maturity. *Communications of the Association for Information Systems,* 40, 632-648.

Srivastava, S. C., & Teo, T. S. H. (2005). Electronic Government as a Guided Evolution in Singapore: Vision for the World in the 21st Century. Academy of Management Proceedings, Honolulu, Hawaii.

Srivastava, S. C., & Teo, T. S. H. (2007). E-Government payoffs: Evidence from cross-country data. *Journal of Global Information Management,* 15 (4), 20-40.

Srivastava, S. C., & Teo, T. S. H. (2008). The relationship between E-Government and national competitiveness: The moderating influence of environmental factors. *Communications of the Association for Information Systems,* 23 (2), 73-94.

Srivastava, S. C., & Teo, T. S. H. (2010a). E-Government, e-business, and national economic performance. *Communications of the Association for Information Systems,* 26 (1), 267-286.

Srivastava, S. C., & Teo, T. S. H. (2010b). Development and impact of e-government: the intertwined role of e-commerce from a cross-country stakeholder's perspective. *Electronic Government: An International Journal,* 8(2-3), 144-163.

Strand, C. (2010). Increasing transparency and fighting corruption through ICT: Introduction. [Online] Available at

http://spidercenter.org/polopoly_fs/1.163640.1390315885!/menu/standard/file/Spider%20ICT4D%20series%203%20Increasing%20transparency%20and%20fighting%20corruption%20through%20ICT.pdf

Svensson, J. (2005). Eight questions about corruption. *Journal of Economic Perspectives,* 19 (3), 19 -42.

Sudan, R. (2005). The basic building blocks of E-Government. In R. Schware (Ed.), E-development: From excitement to effectiveness (79-100). Washington, DC: World Bank Group.

Sung, H. E. (2002). A convergence approach to the analysis of political corruption: a cross-national study. *Crime, Law and Social Change,* 38 (2), 137-160.

Tahrani, S. M. (2010). A model of successful factors towards e-government implementation. *Electronic Government, an International Journal,* 7(1), 60-74.

Tan, C. W., Benbasat, I., & Cenfetelli, R. (2010). Understanding the Antecedents and Consequences of E-Government Service Quality: Transactional Frequency as a Moderator of Citizens' Quality Perceptions. ECIS 2010 Proceedings, Paper 115.

Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy,* 15 (6), 285–305.

Thomas, M. (2010). What do the worldwide governance indicators measure? *European Journal of Development Research,* 22, 31–54.

Tolbert, C. J., Mossberger, K. & McNeal, R. (2008). Institutions, Policy Innovation, and E-Government in the American States. *Public Administration Review,* 68 (3), 549-563.

Transparency International. (2003). Global Corruption Report Special Focus: Access to Information London: Profile Books.

Transparency International (2016). Governance, why it matters. Retrieved From https://transparency.hu/en/glossaries/iranyitas-governance/

Transparency International (2018). Anti-Corruption Glossary, Retrieved From https://www.transparency.org/glossary

Turban, E., King, D., Lee, J., Warkentin, M. & Chung, H. (2002). Electronic commerce: A managerial perspective. Upper Saddle River: Prentice Hall.

UNDESA, (2003). United Nations Department of Economic and Social Affairs, World Public Sector Report: E-Government at the Crossroads. New York, Printed at the United Nations.

UNDESA, (2008). United Nations UN e-Government Survey 2008. From e-Government to Connected Governance. New York: UNPAN. Retrieved from https://publicadministration.un.org/egovkb/portals/egovkb/Documents/un/2008-Survey/unpan028607.pdf

UNDESA, (2010). United Nations e-Government Survey 2010. Leveraging E-government at a Time of Financial and Economic Crisis. New York: UNPAN. Retrieved from https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2010-Survey/Complete-survey.pdf

UNDESA, (2012). United Nations e-Government Survey 2012. E-Government for the People. New York: UNPAN. Retrieved from https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2012-Survey/Complete-Survey.pdf

UNDESA, (2014). United Nations e-Government Survey 2014. E-Government for the Future We Want. New York: UNPAN. Retrieved from https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/E-Gov_Complete_Survey-2014.pdf

UNDESA, (2016). United Nations e-Government Survey 2016. E-Government in Support of Sustainable Development. New York: UNPAN. Retrieved from http://workspace.unpan.org/sites/Internet/Documents/UNPAN97453.pdf

UNDESA, (2018). United Nations e-Government Survey 2018. Gearing E-Government to support transformation towards sustainable and resilient societies. New York: UNPAN. Retrieved from https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_FINAL%20for%20web.pdf

UNDP, (2006). United Nations Development Program. Fighting corruption with egovernment applications. APDIP e-note 8. Retrieved from http://www.unapcict.org/ecohub/resources/apdip-e-note-8-fighting-corruptionwith-e.

UNDP, (2008). United Nations Development Programme. Tackling corruption, transforming lives: Accelerating human development in Asia and the Pacific. New Delhi, India: Macmillan Publishers.

Vassilakis, C., Lepouras, G., Fraser, J., Haston, S. & Georgiadis, P. (2005). Barriers to electronic service development. *E-Service Journal*, 4(1), 41–65.

Vleugels, R. (2012). Overview of All FOIA Laws. Retrieved from http://freedominfo.org/documents/Fringe%20Special%20-%20Vleugels2012oct.pdf

Von-Haldenwang, C. (2004). Electronic government (E-Government) and development. *The European Journal of Development Research*, 16 (2), 417-432.

VonMuhlenbrock, G. (1996). Discretion and corruption: The Chilean judiciary. *Crime Law and Social Change,* 25 (4), 335 -351.

Warkentin, M., Gefen, D., Pavlou, P.A. & Rose, G. M. (2002). Encouraging citizen adoption of e-government by building trust. *Electronic Markets,* 12(3), 157-162.

Waller, P., Livesey, P. & Edin, K. (2001). e-Government in the Service of Democracy. *ICA Information,* 74.

Weil, M. M., & Rosen, L. D. (1995). The Psychological Impact of Technology from a Global Perspective: A Study of Technological Sophistication and Technophobia in University Students from Twenty-Three Countries. *Computers in Human Behavior,* 11 (1), 95-133.

Wescott, C. G. (2001). E-Government in the Asia-pacific region. *Asian Journal of Political Science,* 9(2), 1–24.

West, D. M. (2004). E-Government and the transformation of service delivery and citizen attitudes. *Public Administration Review,* 64 (1), 15-27.

West, D. M. (2005). Digital government: Technology and public sector performance. New Jersey, Princeton University Press.

Whitson, T. L. & Davis, L. (2001) Best practices in electronic government: Comprehensive electronic information dissemination for science and technology. *Government Information Quarterly*, 18**,** 79-91.

Writz, B. W. & Daiser, P. (2015). E-Government Strategy Process Instruments. German University of Administrative Sciences, Speyer.

Williams, A. (2015). A global index of information transparency and accountability. *Journal of Comparative Economics,* 43, 804–824.

Wooldridge, J. M. (2011). Econometric analysis of cross section and panel data (2nd ed.). MIT Press.

Wong, W. & Welch, E. (2004). Does E-Government Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability. *Governance: An International Journal of Policy, Administration, and Institutions,* 17 (2), 275-297.

World Bank, (1994). Governance: The World Bank's experience. Washington, DC: World Bank.

World Bank, (2002). E-government: A definition of e-government. The World Bank Group. Retrieved from http://www.worldbank.org/publicsector/egov/definition.htm

World Bank (2003): Building blocks of e-government: lessons from developing countries, Retrieved from http://www1.worldbank.org/prem/PREMNotes/premnote91.pdf

World Bank, (2012). Worldwide Governance Indicators. Retrieved from http://info.worldbank.org/governance/wgi/index.asp.

World Bank, (2014). Definition of E-Government. Retrieved from http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/EXTEGOVERNMENT/0,,contentMDK:20507153~menuPK:702592~pagePK:148956~piPK:216618~theSitePK:702586,00.html

World Economic Forum (2007). Effective Governance, World Economic Forum Annual Meeting, Price water house Coopers.

World Economic Forum. (2013). Global Competitiveness Report, Geneva.

World Economic Forum. (2013). Global Information Technology Report, Growth and Jobs in a Hyper-connected World. Geneva.

World Justice Project (2018). Science and Technology. Retrieved from

https://worldjusticeproject.org/resource-hub/science-and-technology

Yildiz, M. (2007). E-government research: Reviewing the literature, limitations, and ways forward. *Government Information Quarterly,* 24 (3), 646-665.

Zemanovicova, D. (2002). Economic aspects of corruption. *EkonomickyCasopis,* 50(2), 182-196.

Appendices

Appendix A

Table A. Determinant TS Hausman Test

Variable	Coefficients		Difference (b - B)	S.E
	Fixed (b)	Random (B)		
TS	.033	.072	-.039	.015
LnGDP	.027	.081	-.055	.038
$chi^2(5)$	6.29			
Prob> chi^2	0.2787			

Appendix B

Table B. Determinants Good Governance Hausman Test

Variable	Coefficients		Difference (b - B)	S.E
	Fixed (b)	Random (B)		
GE	.039	.085	-.045	.026
PS	-.012	-.052	.039	.013
RQ	.060	.083	-.022	.030
RL	-.019	-.019	.001	.034
LnGDP	.003	.061	-.058	.036
$chi^2(8)$	12.41			
Prob> chi^2	0.1338			

Appendix C

Table C. Outcome Control of Corruption Hausman Test

Variable	Coefficients		Difference	S.E
	Fixed (b)	Random (B)	(b - B)	
E-Govt	.077	.179	-.102	.020
LnGDP	.201	.419	-.218	.047
$chi^2(5)$	7.289			
Prob> chi^2	0.201			

Appendix D

Table D. Outcome Voice and Accountability Hausman Test

Variable	Coefficients		Difference	S.E
	Fixed (b)	Random (B)	(b - B)	
E-Govt	-.041	.018	-.058	.011
LnGDP	.104	.289	-.185	.042
$chi^2(5)$	9.236			
Prob> chi^2	0.102			