

**Impact of Fiscal Decentralization on Institutional Quality:  
Evidence from Developing Countries**

Zaid Shelleh  
(8464324)

Major Paper presented to the  
Department of Economics of the University of Ottawa  
in partial fulfillment of the requirements of the M.A. Degree

Supervisor: Professor Gamal Atallah

ECO 6999

Ottawa, Ontario

April 2017

## **ABSTRACT**

This paper investigates the impact of decentralization on institutional quality. Institutional quality is measured using three indicators i.e. corruption, law and order situation and democratic accountability. While fiscal decentralization is expressed in sub-national forms of revenue and expenditure decentralization. The study uses panel data of 31 developing countries covering the time period of 1984 to 2012 and estimates a fixed effect model with instrumental variable (IV). This paper finds that revenue decentralization deteriorates institutional quality while expenditure decentralization improves it. Furthermore, institutions could be improved in terms of decrease in corruption, improvement in law and order and democratic accountability if developing countries lay more emphasis on trade openness and democracy.

## TABLE OF CONTENTS

<b>1 Introduction .....</b>	<b>1</b>
<b>2 Literature Review.....</b>	<b>3</b>
2.1. Theoretical Studies.....	4
2.2. Empirical Studies .....	5
<b>3 Situation Analysis.....</b>	<b>11</b>
3.1. Intra-Regional Comparison.....	11
3.2. Inter-Regional Comparison.....	24
<b>4 Methodology and Data.....</b>	<b>25</b>
4.1. Methodology.....	25
4.2. Description and Theoretical Justification of the variables.....	26
4.3. Data and Variable Transformation.....	29
4.4. Estimation Technique.....	30
<b>5 Results and Discussion.....</b>	<b>34</b>
5.1. First Stage Results.....	34
5.2. The Results of Instrumental Variable Approach to GMM.....	38
<b>6 Conclusion and Policy Recommendations .....</b>	<b>45</b>
<b>References .....</b>	<b>47</b>

# 1. INTRODUCTION

Institutions are essential for the economic development of any country. Social institutions deal with social protection and economic institutions deal with growth and related issues by settling disputes and by enforcing strong rules and regulations. High quality institutions are aimed to improve productivity and efficiency which play a key role in a better division of labor and strengthen the linkage between trade and growth (Borrmann *et al.*, 2006).

Given the significance of institutional quality for development, it is important to find out the factors that can promote institutional quality. There are many determinants which are evaluated in existing literature for their role in institutional quality. Some of the key determinants of institutional quality are trade openness (Rigobon and Rodrik, 2004), human capital (Khan and Hudson, 2014), inflation (Minea and Villieu, 2009), and economic growth (Eijffinger and Hoeberichts, 2000).

Another important determinant of institutional quality recognized in the literature is democracy. It strengthens law and order situation, particularly in the developing nations which helps to improve the quality of institutions. The deteriorating law and order condition decreases government effectiveness, further weakens institutions and increases corruption (Polterovich and Popov, 2007). Knack and Keefer (1995) further argued that only in the long run democracy decreases the level of corruption. It is also argued that higher levels of political freedom and competitiveness among political parties result in lower level of corruption.

In this context, fiscal decentralization has also received the attention of policy makers and researchers for its potential role for institutional quality. Fiscal decentralization involves shifting responsibilities for expenditures (expenditure decentralization) and revenues (revenue decentralization) to lower levels of government. It may involve autonomy over allocation of

expenditures or shifting the collection and revenue generation responsibilities to the sub-national levels of government. It is argued that different measures of fiscal decentralization may affect various indicators of institutional quality differently. For instance, Fisman and Gatti (2002) argued that in absence of expenditure decentralization, revenue decentralization increases corruption. This increased corruption is explained by high maintenance of local revenue which leads to inter-regional inequality and worsening the delivery of public goods (Mookherjee and Bardhan, 2005), confiscating the rights of the poor (Kyriacou and Sagales, 2009).

Enikolopov and Zhuravskaya (2004) also examined the strength of interaction between fiscal decentralization and government quality and also studied the impact of fiscal decentralization on political institutions. It is argued that strong party systems significantly improve outcomes of fiscal decentralization by encouraging economic growth, government quality and public goods delivery. Consequently, effective decentralization occurs due to the division of local authorities to higher level governments. Similarly, fiscal decentralization occurs through public spending, revenue collection, along with revenue generation from the central government to the local governments (Iqbal *et al.*, 2012). However, the limited literature on the interaction of fiscal decentralization and institutional quality has varying and ambiguous results.

Existing empirical literature contains considerable gap regarding the relationship between fiscal decentralization and institutional quality. Further analysis is required to realize the quality of institutions by using its indicators such as corruption, law and order situation and democratic accountability pertaining to fiscal decentralization. The objective of this study is to examine the relationship between institution quality and fiscal decentralization in developing countries along with other determinants of institution quality in order to derive policy implications.

This study separately analyzes the impact of expenditure and revenue decentralization on institutional quality. We use three indicators of institutional quality (i.e. corruption, law and order and democratic accountability). The empirical investigation is based on the panel data of 31 developing countries over the period of 1984 to 2012.

The study is organized into six sections. Section two provides the theoretical and empirical literature review of the studies; Section three elaborates descriptive analysis of the institutional quality and fiscal decentralization; Section four discusses the methodology and data issues; Section five deals with the discussion of the results obtained from regression; lastly, Section six includes conclusion and the policy implications.

## **2. LITERATURE REVIEW**

Fiscal decentralization has increasingly become important for developing countries given their issues of corruption and wastage of resources (Tranchant, 2008). This is also the reason why Huther and Shah (2005) argued that fiscal decentralization is a measure of good governance. Developed countries have more important outcomes of fiscal decentralization than developing countries. However, some developing countries have also improved their institutions through greater fiscal decentralization, achieved economic growth and development, reduced corruption and improved their law and order as well as their government accountability stances (Martinez-Vazquez, 2011).

The following section focuses on the theoretical and empirical background of the relationship between fiscal decentralization and institutional quality along with some other determinants. The rest of the chapter is divided into two sections. Section 2.1 reviews the theoretical links between

fiscal decentralization and institutional quality; while section 2.2 reviews empirical researches conducted for developing countries.

## **2.1. Theoretical studies**

Fiscal decentralization is a classical concept. Classical economists, such as Tiebout (1956) argued that fiscal decentralization is directly related to the provision of public goods. Good quality government ensures better public good provision which increases public trust along with the development of a country.

Another classical economist, Oates (1972), argued that fiscal decentralization improves the quality of institutions, as fiscally decentralized governments are more informed about the rights of the citizens which helps local governments in understanding the public conditions. However, this relationship is not as straight as it seems. Oates (1999) further argued that low tax revenues are generated when governments are unable to understand their public preferences. In such situation fiscal decentralization will further weaken the institutional quality of any nation.

Likewise, Tiebout (1956) explained the assurance of fiscal decentralization in effective provision of public goods. The view is that fiscal decentralization helps local governments to realize their goals in society. However, Bewley (1981) criticized Tiebout for very restrictive assumptions such as provinces compete with each other to attract citizens to reach an optimal size, while in fact they are more concerned with welfare; similarly if local governments are democratic then Tiebout equilibria may not be Pareto optimal.

An important and opposing argument against fiscal decentralization and provision of public goods is offered by Brennan and Buchanan (1980) using the Leviathan hypothesis. Under this approach, in order to increase the control over economic resources local governments do not act like

monopolists or leviathans. Therefore, sharing the powers of central government into several local governments will not be effective in making a fiscally decentralized system.

Treisman (2006) argued that if local governments are assigned a larger share of revenues then it is expected to promote economic growth and development. Accordingly, it is concluded that the local tax share provides incentive for the local authorities. However, reduction in revenues will have negative effects on economic development.

## **2.2. Empirical Studies**

This section is further divided into two sub-sections. Section 2.3.1 reviews the relationship of fiscal decentralization with institutional quality while section 2.3.2 reviews other determinants of institutional quality.

### **2.2.1. Relationship of Fiscal Decentralization with Institutional Quality**

Most of the empirical studies support the argument that fiscal decentralization has a positive impact on institutional quality. For example, Iqbal *et al.* (2012) conducted a study to investigate the growth effects of fiscal decentralization with democratic institutions in Pakistan. The study applied GMM estimation procedure on annual time series data for the period of 1980-2012 and data was taken from World Development Indicator (WDI) and Pakistan Economic Survey. The study captured the multidimensionality of fiscal decentralization and the findings illustrated the interaction of expenditure decentralization and revenue decentralization with democratic institutions has a positive impact on economic growth. Thus, the study concluded that fiscal decentralization becomes effective in the growth process if it is complemented with good quality institutions.

Machado (2013) observed the link between decentralization and government accountability for developing nations. The study applied OLS estimation technique. Results revealed that higher accountability is associated with decentralization and better public service delivery. The study also revealed that along with accountability, democratic environment is also necessary for a decentralized system.

Similarly, Javid and Arif (2012) examined the effects of fiscal performance across developing Asian countries over the period 1984 to 2010. The aim of their study was to estimate the revenue performance and revenue potential in Asian countries. For that purpose, they used Generalized Method of Moments (GMM) estimation technique. Empirical results indicated that institutional quality, per capita GDP, share of agriculture in GDP and foreign debt are statistically significantly related to the revenue performance in developing Asian countries. However, population growth, trade openness and inflation were negatively related to the revenue performance in developing Asian countries. Thus results concluded that both quality of institutions and good governance increase revenue collection and development.

Faruq and Taylor (2011) conducted a study to examine the relationship between quality of education and institutional quality. The study employed Ordinary Least Square (OLS) estimation technique on the dataset of 71 countries. The objective of their study was to analyze the impact of quality of education and institutions on economic performance. Variables used to measure the quality of education were average real salary of primary school teachers, repetition rates at primary school, and drop-out rates at primary school. Data was taken from International Country Risk Guide (ICRG) and World Development Indicator (WDI). The results suggested that countries can improve economic performance both by improving their education quality and by increasing access to better institutions.

Kyriacou and Sagales (2011) investigated the impact of fiscal and political decentralization on government quality. The study found the determinants of cross-section variation in government quality using a cross-section sample of up to 101 countries and an unbalanced panel of 58 countries over the period 1998–2006. On the basis of fixed-effects panel estimation, they found that fiscal decentralization improves government quality but in the presence of political decentralization it will not have any effect on institutional quality. In particular, they focused on four aspects of government quality: control of corruption, rule of law, regulatory quality, and government effectiveness. Results revealed that fiscal decentralization has a positive and significant impact on government quality but the effect diminishes when it is combined with political decentralization. The policy implication is combining fiscal decentralization and political decentralization will not offer the desired results.

Similarly, Kyriacou and Sagales (2008) identified the importance of fiscal decentralization for government quality. They categorized fiscal decentralization into revenue and expenditure components and used a dataset of 29 developed and developing countries over the period 1984 to 1997. The results based on fixed effect model and two-stage least squares (2SLS) technique showed that, on revenue and expenditure sides, fiscal decentralization has a positive impact on institutional quality of poor nations while a negative impact was observed for rich countries. The study revealed that positive impact of fiscal decentralization along with decision making and electoral decentralization is more pertinent for developed countries. Whereas, fiscal decentralization is observed not to increase institutional quality of underdeveloped or poor countries.

Trenchant (2009) examined the relationship between fiscal decentralization, institutional quality and ethnic conflict using panel data for the period 1985 to 2001. The study focused on fiscal decentralization and its impact on reducing ethnic conflict to improve institutional quality. In this study fiscal decentralization is measured as the share of sub-national revenue while to measure institutions it used two indicators; law and order, and bureaucratic quality. The study employed GMM estimation technique to overcome the endogeneity problem. It found that fiscal decentralization is more effective when the ethnic distance between the group and the rest of the population is largest, and that fiscal decentralization is more effective in richer countries. Contrary to this, fiscal decentralization is not likely to produce any result in countries with low state capacities and weak institutions.

Enikolopov and Zhuravskaya (2004) evaluated the effects of fiscal decentralization on the quality of government, public goods provision and economic growth in developing countries. They applied Two-Stage Least Squares (2SLS) technique using a data sample of 75 developing and transition countries, covering the time period from 1975 to 2000. Empirical results showed that the outcome of fiscal decentralization such as quality of government, economic growth and public goods provision can be improved by a strong party system. However, fiscal decentralization led to effective outcomes by electing politicians rather than appointing local politicians. The author concluded that fiscal decentralization has significant impact on political institutions.

### **2.2.2. Other determinants of Institutional Quality**

Dias and Tebaldi (2012) used panel data covering the time period of 1965 to 2005 in order to analyze the relationship between human capital, institutions, and economic growth. The study applied the Generalized Method of Moments (GMM) estimation technique. Results revealed that human capital significantly affects quality of institutions. Therefore, in the long run, these

institutions expand economic performance and improve creation of knowledge. A policy implication of this study is that growth rates of human capital accelerate improvement in institutions.

Dang (2010) demonstrated the variations in economic institutions across provinces in Vietnam caused by trade liberalization. The study employed Generalized Method of Moments (GMM) with two-stage least squares (2SLS) estimation using data for 63 provinces of Vietnam. The results indicated that trade openness has significant impact on institutions of the north as compared to provinces overall. The study also concluded that trade liberalization works as a catalyst to promote institutional quality.

Garcimartin *et al.* (2009) investigated the determinants of institutional quality. This study applied the Generalized Method of Moments (GMM) estimation technique. Institutional quality was taken as the dependent variable and the independent variables included education, trade openness, per capita income and taxes. The findings concluded that education, trade openness, per capita income and taxes have a positive impact on institutional quality. Findings also revealed that more educated individuals demand more dynamic institutions which further strengthen the institutions.

Minea and Villieu (2009) used data for 83 developing countries to find the relationship between inflation and institutional quality, covering the time period from 1984 to 2005. For this purpose, OLS estimation technique was employed. The findings are that lower inflation provides incentive for the government to increase the quality of institutions. Moreover, higher tax rates and low inflation help governments in improving institutional quality.

Baliamoune-Lutz and Ndikumana (2007) examined the effectiveness of trade openness and the role of institutions on panel data of 39 African countries over the period 1975-2001. They used the

Generalized Method of Moments (GMM) estimation technique. The aim of the study was to determine the limited growth effects of trade openness and weak institutional quality in African countries. The results revealed the positive and significant link between trade liberalization and institutional quality. Thus, the results suggest that trade liberalization plays a crucial role in the institutions growth and development.

Polterovich and Popov (2007) evaluated the fluctuations in the level of democracy for the time span of 1970 to 1990. The study discussed hypothesis for impact of democracy on economic growth under strong institutions as well as under weak institutions. However, the study provided mixed results. It mentioned that the impact of democracy on institutional quality is uncertain. Depending on the strength of previous democracies, the new democracies may have both positive and negative impacts on institutional quality.

Fisman and Gatti (2002) conducted a study to analyze the relationship between decentralization and corruption using a dataset of 59 developed and developing countries over the period of 1980 to 1995. The results based on OLS estimation technique revealed that more decentralized expenditures have a strong significant and negative impact on corruption. Furthermore, results also revealed that corruption can be lowered by focusing on decentralization which improves the government quality.

After reviewing the literature on the topic of interest, existing empirical evidence mostly shows the asymmetric and significant impact of fiscal decentralization on institutional quality and that it works better in developing nations. Furthermore, trade openness, economic growth, human capital accumulation are also expected to have a positive impact of institutional quality. Therefore, this study covers the gap of previous literature by using panel data on developing countries. The panel

data approach provides useful analysis as it considers not only time series dimension but also cross-sections of countries which leads to less collinearity among variables and more efficiency.

### **3. SITUATION ANALYSIS**

This section describes the detailed trend analysis of fiscal decentralization as a measure of revenue and expenditure decentralization along with institutional quality indicators i.e. corruption, law and order and bureaucratic quality. For that purpose, yearly five year averages and standard deviations are calculated for different regions. Data has been accessed from International Country Risk Guide (ICRG) and Government Finance Statistics (GFS) for the time period of 1984-2012. For inter and intra-regional comparisons, all the developing countries listed are divided into their respective geographical regions, each having its descriptive statistics in tabular form.

This chapter is divided into two sections. Section 3.2 includes region-wise comparison between countries while section 3.3 includes comparison between different regions on the whole. The indicators of democracy, government stability and corruption are calculated on a scale from 0 to 6, 0 representing the highest and 6 representing the lowest level of corruption. Fiscal decentralization is expressed in terms of sub-national forms of revenues and expenditures. Moreover, trade openness is total trade as percent of GDP.

#### **3.1. Intra-Regional Comparison**

In this section, different countries have been placed into different regions based on their geographical position. Also, intra-regional comparisons are explained for all three indicators of institutional quality along with revenue and expenditure decentralization in the tables below. Each table is divided into 5 sub-sections (a subsection for each region). These regions include Asia, Europe, Latin America, Africa, Arab states, North America and the Caribbean.

### **3.1.1. Asia**

#### **Trends of Corruption**

For Asia, the yearly averages of corruption for all countries show an increasing trend during 1984 to 2012. Average values showed the lowest level of corruption during 1984 to 1988 having a value of 4. In early 1980s, entry of drug money to Pakistan was the main reason for corruption (Qadir, 2003). Similarly, high level of corruption in Asian countries can be attributed to little or no policy action against corruption.

#### **Trends of law and order**

In Asia, all the countries showed huge improvement in yearly averages of law and order situation during 1984 to 2012 except for Azerbaijan and Thailand that witnessed decline in law and order due to having the highest corruption and instability in the region. In Asia, the highest value of law and order was witnessed in Azerbaijan during 1984 to 1988 having value of 5.6. The weak law and order in Azerbaijan was attributed to weak democratic institutions. In addition, failure to adopt a civil code resulted into bankruptcy among several investors which was particularly disturbing.

#### **Trends of Democratic Accountability**

Democratic accountability is helpful in improving institutional quality. For Asia, yearly averages for all the countries showed increasing trend in democratic accountability. The highest average value of 20.2 was observed in Azerbaijan during 1984-1988. UNDP (United Nations Development Program) emphasized on the development of institutional quality in Azerbaijan. UNDP also established civil service reforms in Azerbaijan and promoted government effectiveness. Most importantly, UNDP supported youth participation for making policies and their implementation to make a strong accountable system.

### **Trends of Expenditure Decentralization**

Contrary to other regions, almost all Asian countries have showed a stagnant average value for expenditure decentralization of 0.1. However, Korea witnessed decreasing trend in the average values of expenditure decentralization in 1984-2012.

### **Trends of Revenue Decentralization**

For Asia, the highest average value for revenue decentralization was observed in Mongolia during 1984-1988 with a value of 0.8. Whereas, yearly averages for India, Iran and Thailand were stagnant during 1984-2012.

### **3.1.2. Europe**

#### **Trends of Corruption**

During 1984 to 2012, the yearly averages for all the countries in Europe showed an increase in corruption. However, statistics showed a reduction of average values for all the countries during 1984 to 1988 that is 4. According to MacDonald and Majeed (2011) the extent of corruption in Europe is less as compared to other developing nations, corruption persists in institutions of European states due to lack of transparency and public spending.

#### **Trends of law and order**

The yearly averages of law and order for Albania, Lithuania and Bulgaria showed a declining trend in law and order throughout the time period. Ullah (2014) explained the decline of law and order in Europe because of the euro crisis in 2007. Resultantly, the European Union had suspended the rule of law and government accountability as it was unable to perform better. The Euro crisis also resulted in debt burden and liquidity problems. However, yearly averages for Belarus and Moldova are 4 while Croatia and Lithuania have a value of 5.

### **Trends of Democratic Accountability**

During 1984-1988 the highest values of democratic accountability were observed for all European countries. However 1989 onwards average values of democratic accountability started to decline until the end of 2012. Ullah (2014) discussed that governments were unable to make policies regarding the issue of bank liquidity caused by the financial crisis of 2007 which affected the whole economic system. Resultantly, it went into collapse and the governments were unable to recover the debt burden.

### **Trends of Expenditure Decentralization**

During 1984-2012, yearly averages of expenditure decentralization for all the European countries have observed a stagnant value that is again 0.1.

### **Trends of Revenue Decentralization**

For Europe, the yearly averages for all the countries showed an increasing trend in revenue decentralization during 1984-2102. The highest value was observed in Moldova during 2009-2012 is 0.5. Moreover, the standard deviation values observed for revenue decentralization showed an increasing trend in all countries and the highest value was observed for Albania and Moldova during 2009-2012, that is 0.2.

### **3.1.3. Latin America**

#### **Trends of Corruption**

For Latin America, the average values for all the countries showed an increase in corruption during 1984 to 2012. This increasing trend is due to higher level civil liberties following democratic freedom in Latin America from 1980 to 2000 (Morris, 2004). The lowest averages were observed during 1984 to 2003, after that values showed an increasing trend in corruption until 2012. Peru

and Paraguay have observed high corruption despite the high foreign investment and economic growth. This was due to low investment in education and human capital (Morris, 2004).

### **Trends of law and order**

Yearly averages of law and order in Costa Rica showed the steady value of 4. However Brazil showed a declining trend in law and order during 1984-2012. Legarre (2014) demonstrated the disrespect for the laws designed in Latin America is the main reason behind the fall in trends of law and order. Moreover, crime and violence issues lead to deteriorating law and order in the region as half of the crimes are unreported. However, all other countries showed an increasing trend in law and order situation in Latin America. In the 1990s, Latin America began democratizing its governments in collaboration with the international donor community which supported the policy makers and lawyers to improve the law and order situation (Legarre, 2014). In contrast, the standard deviation value for law and order in Paraguay showed the highest value during 1984-1988 that is 1.1.

### **Trends of Democratic Accountability**

Contrary to all the statistics of democratic accountability, Latin America showed an increasing trend in average values during 1984-2012. The highest average value was observed for Nicaragua during 1999-2008 having a value of 6. However, low values for almost all the countries were observed during 1984-1988. On the other hand, values of standard deviation showed decreasing trend for all the countries starting from 1984 until 2012.

### **Trends of Expenditure Decentralization**

In Latin America, between 1984 and 2012, yearly averages of expenditure decentralization for all the countries have observed a stagnant value that is again 0.1.

### **Trends of Revenue Decentralization**

For Latin America, the yearly averages of revenue decentralization for all the countries showed a stagnant average value except in the case of Nicaragua and Panama. Moreover, the standard deviation values observed for revenue decentralization showed no significant change during 1984-2102.

#### **3.1.4. Africa**

##### **Trends of Corruption**

For Africa, for all the countries statistics showed low corruption during 1984-1988, afterwards values increased especially in Zimbabwe. As a result of dictatorship and bad governance, Africa faces high amount of corruption. Similarly, institutions are not very strong in Africa which resulted into high corruption. Bad governance and corruption in Africa are the signs of institutional failure (Owoye and Bissessar, 2012).

##### **Trends of law and order**

For all African countries, yearly averages showed an increasing trend during 1984-2012. The highest values were observed in Ethiopia and Tunisia during 1999-2008 while the lowest values were observed during 1989-1993. In Africa law and order deteriorated because local governments in Africa were weak and corrupt. On the other hand, standard deviation showed a declining trend during 1984-2012.

##### **Trends of Democratic Accountability**

For African countries, the yearly averages for all the countries showed a decreasing trend in democratic accountability except in case of Ethiopia that showed increasing trend in average values during 1984-2012. Democratic accountability deteriorates because central governments

frequently misuse their power to control over local governments resulting in high corruption (Olowu, 2003). The highest average value was witnessed for South Africa during 1984-1988 with a value of 5.

### **Trends of Expenditure Decentralization**

During 1984-2012, yearly averages of expenditure decentralization for all African countries have observed a stagnant value of 0.1 except for Zimbabwe which witnessed an increasing trend in expenditure decentralization. The average values for Zimbabwe started to increase from 1999 until the end of 2012. The standard deviation values measured for African states showed no significant change during the whole period.

### **Trends of Revenue Decentralization**

For the region of Africa, during 2009-2012 the highest average value for revenue decentralization was observed for Zimbabwe, that is 1. Congo has a stagnant average value throughout the period but Ethiopia and South Africa showed a decreasing trend during 1984-2102.

### **3.1.5. Arab States, North America and The Caribbean**

#### **Trends of Corruption**

For the regions of Arab States, North America and The Caribbean, the yearly averages of corruption observed for all the countries show an increasing trend during 1984 to 2012. For all the countries, statistics showed the decline in average values of corruption during 1984 to 1988 that is 4 and afterwards values augmented until the end of 2012. Corruption declined in Arab states due to anti-corruption measures taken by their governments. For example, the government of Jordan took an action in 2011 known as the Business Anti-corruption Portal 2011, which was proposed to reduce corruption (Johnson and Martini, 2012).

### **Trends of law and order**

The yearly averages of law and order observed for Jordan show an improvement in law and order during 1984-2012. Whereas, the highest value was witnessed after 1994 until the end of 2012. USAID program supported Jordan by proper checks and balances to manage and protect citizen's rights. This program was implemented to provide justice and stop criminal activities so that law and order could be maintained along with the accountability of government. However, the regions of North America and the Caribbean observed decreasing average values, which started to decline after the 1990s.

### **Trends of Democratic Accountability**

For Arab countries, North America and The Caribbean, the yearly averages of democratic accountability observed for all the countries show an increase in trend during 1984-2012. For all the countries, statistics showed the highest average values after 1999 until the end of 2012.

### **Trends of Expenditure Decentralization**

For the regions of Arab countries, North America and The Caribbean, the yearly averages of expenditure decentralization observed for all the countries showed a stagnant value of 0.1 during 1984-2012.

### **Trends of Revenue Decentralization**

For the Arab countries, the yearly averages of revenue decentralization observed for Jordan show a decreasing trend during 1984-2014. In North America, the averages were showing an increase in trend while in the Caribbean, the average was stagnant at 0.3.

**Table 1: Trends of Corruption**

Country	AVERAGE						S.D					
	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012
<b>Asia</b>												
Azerbaijan	2.0	2.0	2.0	2.0	1.6	1.5	0.0	0.0	0.0	0.0	0.3	0.0
Iran	4.0	3.0	4.0	3.0	2.0	1.6	0.0	0.0	0.0	0.7	0.0	0.3
Indonesia	4.0	1.6	2.4	1.2	2.2	3.2	0.4	1.1	0.4	0.1	0.8	0.4
India	4.0	2.3	3.0	2.3	2.4	2.4	0.0	0.2	0.0	0.5	0.2	0.1
Korea	4.0	4.1	2.5	1.5	1.0	1.0	0.0	0.6	0.4	0.4	0.0	0.0
Mongolia	4.0	4	4	3.3	2	2.0	0	0	0	0	0	0
Malaysia	4.0	4.0	4.0	3.0	2.5	2.5	0	0	0	0	0	0
Pakistan	4.0	2	2	2.5	1.5	2	0	0	0	0	0	0
Thailand	4.0	3	3	2.5	1.5	2	0	0	0	0	0	0
<b>Europe</b>												
Albania	4	3.9	3.2	2.1	1.5	1.9	0	0.3	0.7	0.1	0.5	0.2
Belarus	1.6	2.6	3.6	2.8	2.0	2.2	0.3	0.3	0.3	0.8	0.0	0.2
Bulgaria	4.0	3.8	4.1	2.7	2.0	2.0	0.0	0.5	0.1	1.0	0.0	0.0
Croatia	4.0	1.0	0.9	2.9	2.6	2.7	0.5	0.5	0.5	0.6	0.3	0.1
Czech Republic	4.0	6.4	4.0	3.4	2.5	2.5	1.2	1.2	0.0	0.4	0.0	0.0
Latvia	4.0	3.1	3.1	2.6	2.0	2.1	0.0	0.0	0.0	0.3	0.0	0.1
Lithuania	4.0	3.1	3.1	3.0	2.2	2.1	0	0	0	0	0.2	0.1
Moldova	4.0	2.1	2.1	2.0	1.5	1.5	0	0	0	0	0	0
<b>Latin America</b>												
Brazil	3.9	4.0	3.0	3.0	2.1	2.9	0.3	0.0	0.0	0.0	0.2	0.1
Costa Rica	4.0	5.0	5.0	4.0	2.0	2.1	0	0.0	0.0	0.7	0.3	0.1
Nicaragua	4.0	5	5	4	2.5	2.5	0	0	0	0	0	0
Peru	4.0	3	3	3	2.5	2.5	0	0	0	0	0	0
Panama	4.0	2	2	2	2	2	0	0	0	0	0	0
Paraguay	4.0	0	2	2	1	1	0	0	0	0	0	0
<b>Africa</b>												
Congo	4.0	3.0	3.2	3.4	2.0	2.9	0.0	0.0	0.2	0.4	0.0	0.7
Ethiopia	4.0	2.5	2.0	2.0	2.0	1.9	0.0	0.3	0.0	0.0	0.0	0.1
South Africa	4.0	5	5	3	2	2.5	0	0	0	0	0	0
Tunisia	4.0	3.0	3.0	3.0	2	2.0	0	0	0	0	0	0
Zimbabwe	4.0	3	4	2	0	0	0	0	0	0	0	0
<b>Arab States</b>												
Jordan	4.0	3.4	4.0	3.0	3.0	2.9	0.0	0.3	0.0	0.1	0.0	0.1
<b>North America</b>												
Mexico	4.0	3.0	3.0	2.0	2	2.3	0	0	0	0	0	0
<b>The Caribbean</b>												
Trinidad Tobago	4.0	3	3	3	2	2	0	0	0	0	0	0

*Source: Data is taken from International Country Risk Guide (ICRG) and averages are calculated by author.*

**Table 2: Trends of law and order**

Country	AVERAGE						S.D					
	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012
<b>Asia</b>												
Azerbaijan	5.6	4.9	4.6	4.1	4.0	3.5	0.2	0.2	0.2	0.0	0.2	0.0
Iran	1.7	1.0	5.0	5.0	4.0	4.0	0.4	1.4	0.0	0.5	0.0	0.0
Indonesia	1.5	2.0	4.0	2.0	2.7	3.0	0.2	0.9	0.9	0.0	0.1	0.0
India	2.2	2.0	4.0	4.0	4.0	4.0	0.4	1.0	0.0	0.0	0.0	0.0
Korea	3.0	2.0	3.1	5.0	5.0	5.0	0.5	0.3	0.8	0.0	0.0	0.0
Mongolia	1.0	1.0	4.0	4.0	4.0	4.0	0.0	1.0	0.0	0.0	0.0	0.0
Malaysia	4.7	3.0	5.0	3.3	3.7	4.0	0.4	0.4	0.0	0.1	0.1	0.0
Pakistan	2.0	2.0	2.9	3.0	3.0	3.0	0.0	0.5	0.4	0.0	0.0	0.2
Thailand	3.0	4.0	5.0	5.0	2.5	2.5	0.3	0.4	0.0	0.9	0.0	0.0
<b>Europe</b>												
Albania	4.7	4.0	4.7	2.4	2.0	2.5	0.3	0.8	0.9	0.2	0.2	0.0
Belarus	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.2
Bulgaria	5.0	5.0	5.0	4.0	4.0	2.5	0.0	0.0	0.6	0.0	0.8	0.0
Croatia	5.0	5.0	5.0	5.0	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
Czech Republic	2.8	1.6	5.8	5.0	5.0	5.0	1.4	1.4	0.4	0.0	0.0	0.0
Latvia	10.0	5.3	0.5	4.3	5.0	5.0	1.5	1.5	1.5	0.3	0.0	0.0
Lithuania	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Moldova	5.0	5.0	5.0	5.0	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
<b>Latin America</b>												
Brazil	3.6	4.0	3.0	2.0	2.1	2.0	0.2	0.1	0.4	0.2	0.3	0.0
Costa Rica	4.0	4.0	4.0	4.0	4.0	3.5	0.0	0.0	0.0	0.0	0.2	0.3
Nicaragua	1.0	2.0	3.0	4.0	4.0	4.0	0.4	0.4	0.4	0.0	0.0	0.3
Peru	1.0	1.4	3.0	3.0	3.0	3.4	0.0	0.6	0.0	0.0	0.0	0.2
Panama	2.0	2.0	3.0	3.0	3.0	3.0	0.0	0.3	0.0	0.0	0.0	0.0
Paraguay	2.0	2.8	4.0	3.1	2.0	2.0	0.0	1.1	0.0	0.5	0.0	0.0
<b>Africa</b>												
Congo	2.0	2.0	2.4	1.0	2.0	2.0	0.0	0.0	0.8	0.4	0.0	0.0
Ethiopia	3.0	2.9	3.8	5.0	5.0	4.5	0.0	1.1	0.5	0.0	0.2	0.0
South Africa	3.0	1.8	3.5	2.3	2.5	2.5	0.4	0.6	0.6	0.3	0.0	0.0
Tunisia	2.0	2.0	4.0	5.0	5.0	5.0	0.1	1.1	0.4	0.0	0.0	0.2
Zimbabwe	1.0	2.0	4.0	4.0	1.3	3.0	0.4	0.8	0.0	1.5	0.7	0.0
<b>Arab States</b>												
Jordan	2.0	2.0	5.0	4.0	4.0	4.0	0.0	1.0	0.5	0.0	0.0	0.0
<b>North America</b>												
Mexico	4.0	3.0	3.0	2.0	2.9	2.0	0.4	0.0	0.3	0.0	0.0	0.2
<b>The Caribbean</b>												
Trinidad Tobago	4.0	4.0	4.0	4.0	2.0	2.5	0.0	0.0	0.0	0.6	0.2	0.0

Source: Data is taken from International Country Risk Guide (ICRG) and averages are calculated by author.

**Table 3: Trends of Democratic Accountability**

Country	AVERAGE						S.D					
	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012
<b>Asia</b>												
Azerbaijan	20.2	9.8	5.4	2.0	1.5	1.5	2.3	2.3	2.3	0.4	0.0	0.0
Iran	1.6	2.3	4.0	4.0	3.0	4.5	0.5	1.0	0.6	0.4	0.7	0.8
Indonesia	3.0	3.0	3.0	2.6	4.8	5.0	0.0	0.0	0.9	0.6	0.1	0.0
India	3.8	4.0	4.5	5.3	6.0	6.0	0.4	0.8	0.2	0.3	0.0	0.0
Korea	5.0	3.0	2.0	0.0	0.0	0.0	0.7	0.5	0.9	0.2	0.0	0.0
Mongolia	2.0	2.0	2.0	6.0	4.0	4.0	0.0	0.0	1.9	0.9	0.0	0.0
Malaysia	5.0	5.0	4.0	3.0	3.9	4.5	0.0	0.2	0.4	0.4	0.3	0.2
Pakistan	1.0	2.0	3.5	2.8	1.0	1.9	0.5	0.0	0.8	1.1	0.2	0.5
Thailand	3.0	2.1	3.0	4.0	4.4	4.5	0.5	0.4	0.9	0.0	0.2	0.0
<b>Europe</b>												
Albania	4.0	4.0	3.0	5.0	4.0	5.0	0.0	0.5	0.9	0.5	0.4	0.0
Belarus	6.9	5.5	4.1	2.6	1.8	1.5	0.4	0.4	0.4	0.7	0.4	0.2
Bulgaria	5.0	4.9	4.0	5.0	5.0	5.5	0.0	0.7	0.8	0.0	0.2	0.0
Croatia	35.0	22.4	9.7	3.0	5.1	5.5	4.0	4.0	4.0	0.9	0.2	0.0
Czech Republic	4.7	4.9	5.0	5.0	5.3	5.5	0.1	0.1	0.5	0.0	0.1	0.0
Latvia	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	5.2	5.1	5.1	5.0	5.5	5.5	0.0	0.0	0.0	0.2	0.0	0.0
Moldova	16.4	12.9	8.9	5.0	5.0	4.0	1.2	1.2	1.2	0.4	0.4	0.0
<b>Latin America</b>												
Brazil	3.6	3.8	3.0	4.0	5.0	5.0	0.2	0.4	0.5	0.4	0.0	0.0
Costa Rica	5.0	5.0	5.0	5.0	5.5	5.5	0.0	0.0	0.0	0.3	0.0	0.0
Nicaragua	1.7	3.0	3.0	6.0	6.0	4.4	0.6	0.0	1.3	0.0	0.1	0.5
Peru	3.7	2.7	2.0	2.0	5.0	5.0	0.3	0.5	0.0	1.5	0.0	0.0
Panama	2.2	2.0	3.0	6.0	6.0	6.0	0.3	0.4	1.3	0.0	0.0	0.0
Paraguay	1.0	2.0	4.0	2.4	2.0	2.0	0.0	1.2	0.1	0.2	0.0	0.0
<b>Africa</b>												
Congo	4.0	4.0	3.0	1.0	3.0	3.0	0.0	0.4	1.2	1.0	0.0	0.0
Ethiopia	1.0	1.1	3.0	4.0	4.0	3.5	0.0	0.7	0.4	0.0	0.2	0.4
South Africa	5.0	4.4	4.6	4.0	4.9	5.0	0.0	0.5	0.4	0.2	0.0	0.0
Tunisia	2.5	3.8	3.0	1.2	2.0	2.0	0.2	0.5	0.9	0.4	0.0	0.0
Zimbabwe	3.0	4.0	3.0	2.0	1.0	2.0	0.0	0.9	0.5	0.5	0.4	0.0
<b>Arab States</b>												
Jordan	1.8	2.2	4.0	4.0	4.5	3.0	0.1	0.8	0.0	0.0	0.7	0.0
<b>North America</b>												
Mexico	4.0	3.5	4.3	5.0	6.0	6.0	0.5	0.3	0.3	0.5	0.0	0.0
<b>The Caribbean</b>												
Trinidad and Tobago	2.0	2.0	3.0	5.0	4.0	4.0	0.0	0.5	0.9	0.5	0.0	0.0

Source: Data is taken from International Country Risk Guide (ICRG) and averages are calculated by author.

**Table 4: Trends of Expenditure Decentralization**

Country	Averages						S.D					
	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012
<b>Asia</b>												
Azerbaijan	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
India	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Indonesia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Iran	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Korea	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Mongolia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pakistan	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>Europe</b>												
Albania	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Bulgaria	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Belarus	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Croatia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Czech Republic	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Latvia	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Moldova	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>Latin America</b>												
Brazil	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Costa Rica	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Nicaragua	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Panama	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Paraguay					0.1	0.1					0.0	0.0
Peru	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>Africa</b>												
Congo	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Ethiopia	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
South Africa	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Tunisia	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Zimbabwe	0.0	0.1	0.1	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<b>Arab States</b>												
Jordan	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>North America</b>												
Mexico	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
<b>The Caribbean</b>												
Trinidad and Tobago	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

Source: Data is taken from Government Finance Statistics (GFS) and averages are calculated by author.

**Table 5: Trends of Revenue Decentralization**

Country	Averages						S.D					
	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012	1984-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2012
<b>Asia</b>												
Azerbaijan	0.5	0.4	0.4	0.4	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.1
India	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Indonesia	0.3	0.3	0.3	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Iran	0.3	0.3	0.3	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Korea	0.3	0.3	0.3	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Mongolia	0.8	0.5	0.4	0.4	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0
Malaysia	0.3	0.3	0.4	0.4	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.2
Pakistan	0.4	0.3	0.4	0.3	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1
<b>Europe</b>												
Albania	0.1	0.2	0.4	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.2
Bulgaria	0.3	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Belarus	0.5	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Croatia	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Czech Republic	0.3	0.3	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.1
Latvia	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Moldova	0.1	0.3	0.4	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.2
<b>Latin America</b>												
Brazil	0.4	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Costa Rica	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Nicaragua	0.3	0.3	0.4	0.4	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Panama	0.3	0.3	0.4	0.4	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Paraguay	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Peru	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<b>Africa</b>												
Congo	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Ethiopia	0.5	0.5	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
South Africa	0.4	0.4	0.4	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Tunisia	0.2	0.2	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Zimbabwe	0.3	0.4	0.5	0.7	0.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Arab States</b>												
Jordan	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
<b>North America</b>												
Mexico	0.3	0.3	0.3	0.4	0.5	0.6	0.0	0.0	0.0	0.1	0.0	0.3
<b>The Caribbean</b>												
Trinidad and Tobago	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1

*Source: Data is taken from Government Finance Statistics (GFS) and averages are calculated by author.*

### **3.2. The Inter-Regional Comparison**

To see the inter-regional comparison for corruption, averages for seven different regions were calculated for the period of 1984-2012. Average values indicate that Latin America is amongst the highly corrupt regions, with an average value of 1.2, followed by Europe, Asia and Africa having average value of 1.8 each (Corruption is measured on the scale of 0-6; 0 representing the highest and 6 representing the lowest level of corruption). However, the regions where corruption is lowest include Africa and Latin America with same average value of 3.9 followed by Arab states with value of 3.8.

In a similar way, averages for seven regions are calculated to determine the law and order situation during the period of 1984-2012. The law and order situation was found best in Europe having average value of 4.9 in Croatia and Moldova followed by Asia having average value of 4 in Korea and Azerbaijan. However, the lowest value for law and order situation was observed in Africa that has an average of 2.

The average democratic accountability during the period of 1984-2012 in different regions revealed that democratic accountability was found to be highest in Europe, while within Europe the highest average value is 13.4 in case of Croatia. The region where there is weak democratic accountability includes Asia with lowest average values of 1.67 and 2 in case of Korea and Pakistan respectively.

During the period of 1984-2012, the regions that have strong revenue decentralization include Africa and Asia with values of 0.6 and 0.4 respectively, while Europe was found to have weak revenue decentralization.

Similarly, inter-regional comparison of expenditure decentralization for the period of 1984-2012 shows highest average value for expenditure decentralization in Asia, with value of 0.2 in Korea.

## **4. METHODOLOGY AND DATA**

This section outlines the methodology used in analyzing the role of expenditure and revenue decentralization in determining institutional quality. The section is organized as follows: section 4.1 presents the methodology; section 4.2 presents the expected relationship of the explanatory variables with the dependent variable based on economic theory; section 4.3 presents the data and transformation of variables; section 4.4 presents the estimation technique.

### **4.1. Methodology**

The quality of institutions is a crucial issue in understanding the effective outcome of fiscal decentralization initiatives. However, there has been very little work done so far, specifically on the subject, except by Kyriacou and Sagales (2011) and Tranchant (2009). According to these studies fiscal decentralization has a positive impact on government quality. To the researcher's limited knowledge there has been less empirical work on the influence of fiscal decentralization on government quality in case of developing nations. Unlike this, the reviewed studies showed the impact of fiscal decentralization and institutional quality with a single dimension of quality for all institutions. Therefore, this study intends to add to the literature by focusing on overall institutional quality. Moreover, the benefits and effectiveness of institutional quality along with fiscal decentralization will also be discussed. For the purposes of analysis, the following benchmark model is adapted from Kyriacou and Sagales (2011) to analyze the impact of fiscal decentralization on institutional quality.

$$(IQ)_{it} = \beta_0 + \beta_1(FD)_{it} + \beta_2(LCPI)_{it} + \beta_3(LGDP)_{it} + \beta_4(TO)_{it} + \beta_5(DEMOC)_{it} + \beta_6(LSSE)_{it} + \beta_7(GS)_{it} + \mu_{it}$$

where,

IQ= Institutional Quality

FD= Fiscal Decentralization

CPI= Consumer Price Index

GDP= Gross Domestic Product

TO = Trade openness

DEMOC= Democracy

LSSE= Log of Secondary School Enrollment

GS= Government Stability

$\mu$  = Error term

$i = 1, 2 \dots 30$

$t = 1, 2 \dots 29$

#### **4.2. Description and Theoretical Justification of the variables**

This section describes the dependent and independent variables along with their expected relationship. In this study Institutional quality is measured using three indicators: corruption, law and order situation and democratic accountability. These indicators are taken from the International Country Risk Guide (ICRG). They are calculated on a scale from 0 to 6, 0 representing the highest and 6 representing the lowest level of corruption. Annual data for

developing countries is used in the form of average annual scores. Democracy and government stability are also taken from ICRG. Fiscal decentralization is expressed in sub-national forms of revenue and expenditure decentralization. The data for revenue and expenditure decentralization is taken from Government Finance Statistics (GFS) expressed as unit of national currency. Moreover, trade openness (percent of GDP), consumer price index (2010=10), secondary school enrollment (percent gross) and economic growth (Constant LCU) are extracted from World Development Indicators (WDI).

The literature on fiscal decentralization and corruption is unable to establish a clear relationship between fiscal decentralization and corruption. On the one hand, fiscal decentralization is expected to have a positive relation with corruption (Arikan, 2004). On the other hand, a very strong and negative association between the two variables has also been found by Fisman and Gatti (2000). Moreover, by bringing the government closer to the people, fiscal decentralization in relatively corrupt countries leads to more responsible fiscal management (i.e. better management of the system and high degree of government accountability and democracy). Furthermore, when citizens become informed of corrupt rulers they would be capable eject those corrupt rulers during elections.

Law and order is another important indicator of institutional quality. Better law and order situation in a country leads to political stability and good governance. Socio-economic conditions also ameliorate due to improvement in law and order condition. In case of poor countries, fiscal decentralization positively and significantly affects law and order (Trenchant, 2009).

Democratic accountability reflects the quality of democratic institutions and practices, which is associated with low country risk. As an important indicator of institutional quality it takes into

account the interests of citizens through its well-functioning accountability mechanisms. According to Khemani (2001), fiscal decentralization is positively related with democratic accountability because fiscal decentralization helps in accountability by bringing government closer to citizens, as citizens have the right to monitor the government by the process of electoral mechanism.

Fiscal decentralization is one of the determinants of institutional quality. A system is fiscally decentralized when revenues and expenditures are transferred from central to local governments. This will help countries to achieve economic stability, democratic accountability and political stability, so that institutional quality will improve (Kyriacou and Roca-Sagales, 2011).

Inflation is another determinant of institutional quality. Low and stable inflation keeps producers and businesses active in the pursuit of profits and therefore is beneficial for the overall health of economy. Thus inflation can play an important role in determining macroeconomic performance and therefore can affect institutional quality (Salahodjaev and Chepel, 2014).

Economic growth is another important determinant of institutional quality. It helps in economic stability and institutional development. With higher income there is a greater demand for better institutions; this is also why richer countries can afford better institutions (Islam and Montenegro, 2002; Alonso and Garcimartin, 2013).

Trade openness is another determinant of institutional quality and the relationship between the two is positive because trade openness brings in more actors that demand better institutions (Levchenko, 2007). Through various channels of international trade and financial cooperation, trade openness has a positive impact on institutional quality (Law, 2009).

Democracy is also an important determinant of institutional quality. High levels of democracy can improve socio-economic conditions of the developing nations. Democracy creates high quality institutions such as public protection of property rights, and also becomes more responsive to fiscal demands. This shows strong link between democracy and institutional quality (Gradstein, 2005). If institutions are not good enough, even resource abundance leads to economic and political instability which distorts institutional quality. Therefore democracy and institutions are interrelated; in most cases, democracy has a positive impact on institutional quality given the development stage of the economy and political environment.

Human capital is another factor considered as determinant of institutional quality. More educated individuals demand efficient institutions to further improve their productivity. Since productivity depends on the accumulation of human capital, economic development is linked to the quality of the institutions (Dias and Tebaldi, 2011).

Government stability is another determinant of institutional quality and it is expected to have a positive impact because government stability tends to form high quality institutions in order to function efficiently and in the interest of the general public. Government stability leads to foreign direct investment in developing countries and to benefit from trade openness as well (Busse and Hefeker, 2007).

### **4.3. Data and Variable Transformation**

This study utilizes panel data on 30 developing countries for the period 1973 to 2010. The analysis is focused on three aspects of institutional quality: corruption, democratic accountability and law and order. Other variables include fiscal decentralization, trade openness, tax revenue, secondary school enrollment, gross domestic product and government stability.

Data on institutional quality is in the form of annual average. For fiscal decentralization data is taken as subnational forms of revenue and fiscal decentralization. Gross domestic product, tax revenue, secondary school enrollment are taken in log form while trade openness and tax revenue are expressed as percentage of GDP. Secondary school enrollment is taken as a gross percentage. The data on institutional variables are taken from International Country Risk Guide (ICRG), for fiscal decentralization data is taken from Government Finance Statistics (GFS) and the data on the other variables are extracted from World Development Indicators (WDI).

#### **4.4. Estimation Technique**

##### **4.4.1. Panel Data**

The model is constructed for the panel data which is based on fixed-effects estimation. Fixed effect estimation is used to explore the relationship between fiscal decentralization and institutional quality. Instrumental variables (IV) estimators in the context of Generalized Method of Moments (GMM) estimation is used. Endogeneity tends to occur in situations in which the independent variable is correlated with the error term. To solve this issue the technique of Instrumental Variable approach is used which explicitly takes this problem into account (Gujarati, 2002).

##### **4.4.2. Instrumental Variable Approach:**

Instrumental Variables (IV) is a method of estimation that is widely used in many economic applications when correlation between the explanatory variables and the error term is suspected. For the purpose of estimation, firstly exogenous variables are determined to predict the endogenous variables present in the model. The equation for instrumental variable is expressed as the number of included endogenous variables exactly equals the number of excluded exogenous variables. One of the prevalent methods to check endogeneity is Generalized Method of Moments (GMM). GMM is the extension of Instrumental Variable (IV) regression.

In this method, a variable  $z$  is introduced that is related with  $x$  but not with the error term. In other words, a variable  $z$  is called an instrument or instrumental variable for the regressor  $x$  in the scalar regression model  $y = \beta x + \mu$  if;

- (1)  $z$  is uncorrelated with the error;
- (2)  $z$  is correlated with the regressor  $x$ .

The first supposition excludes the instrument  $Z$  from being a regressor in the model for  $y$ , since if instead  $y$  depended on both  $x$  and  $z$  and  $y$  is regressed on  $x$  alone then  $z$  is being absorbed into the error so that  $z$  will then be correlated with the error. The second assumption requires some association between the instrument and the variable being instrumented.

As explained by Baum *et al.* (2003) the typical IV estimator is a particular case of a Generalized Method of Moments (GMM) estimator which was first introduced by Hansen (1982). The assumption about the instruments  $Z$  being exogenous can be expressed as  $E(Z_i U_i) = 0$ . The  $L$  instruments give us a set of  $L$  moments,

$$g_i(\hat{\beta}) = Z_i \hat{u}_i = Z_i (y_i - X_i \hat{\beta})$$

where  $g_i$  is  $L \times 1$ . The exogeneity of the instruments shows that there are  $L$  moment conditions, satisfied at the true value of  $\beta$ :

$$E(g_i(\beta)) = 0$$

A sample moment is corresponded by each of the  $L$  moment equations, and hence these  $L$  sample moments are written as:

$$\bar{g}(\hat{\beta}) = \sum_{i=1}^n g_i(\hat{\beta}) = \frac{1}{n} \sum_{i=1}^n \dot{Z}_i (y_i - X_i \hat{\beta}) = \frac{1}{n} \dot{Z}_i \hat{u}$$

The perception behind GMM is to choose such an estimator for  $\beta$  that solves  $\bar{g}(\hat{\beta}) = 0$ .

If the estimated equation is exactly identified, so that  $L = K$ , then we have as many equations (the L moment conditions) as we have unknowns (the K coefficients in  $\hat{\beta}$ ). In this situation it is feasible to get a  $\hat{\beta}$  that solves  $\bar{g}(\hat{\beta}) = 0$ . This GMM estimator is in truth the IV estimator.

Now consider the following ‘structural equation’ (i.e. the regression of interest) with a single endogenous variable:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 W_{1i} + \dots + \beta_{1+r} W_{ri} + \mu_i$$

Where  $Y_i$  is the  $i$ th observation on the dependent variable;  $X_i$  is the  $i$ th observation on the endogenous explanatory variable;  $W_{1i}, \dots, W_{ri}$  are the  $i$ th observations on each of the  $r$  exogenous regressors (i.e. control variables or simply, ‘covariates’); and  $\mu_i$  is the disturbance term. The IV solution relies on other variables, called ‘instruments’ and labeled  $Z_i$  (there must be at least as many instruments as endogenous regressors), to estimate in a two-step procedure the causal impact of  $X_i$  on  $Y_i$ , conditional on the covariates  $W_{1i}, \dots, W_{ri}$ . There are different IV methods but this study employs the two-stage least squares estimation (2SLS), which is the most frequently used IV estimator (Hahn et al., 2004; Murray, 2006). In a first stage (also called as the ‘reduced form equation’), the endogenous regressor is regressed on the instrument(s) and covariate(s). The key idea is that the first stage isolates the variation in  $X_i$  that is not correlated with  $\mu_i$ . The resulting fitted value, denoted  $\hat{X}_i$ , is then used in the second stage (i.e. the structural equation) instead of the endogenous regressor  $X_i$ . Concretely, the first-stage regression is:

$$X_i = \pi_0 + \pi_1 Z_{1i} + \dots + \pi_m Z_{mi} + \pi_{m+1} W_{1i} + \dots + \pi_{m+r} W_{ri} + v_i$$

Then, in the second stage,  $Y_i$  is regressed on the exogenous variables and resulting predicted values,  $\hat{X}_1, \dots, \hat{X}_n$ , such that

$$Y_i = \beta_0 + \beta_1 \hat{X}_i + \beta_2 W_{1i} + \dots + \beta_{1+r} W_{ri} + \mu_i$$

where the resulting coefficients of  $\beta_0, \beta_1, \dots, \beta_{1+r}$  are the 2SLS estimators.

Now instrumental variable technique can be applied with first difference and Fixed Effects Model.

In this study Fixed Effect Model is used.

#### 4.4.3. Fixed Effects Model

A fixed effects model represents the observed quantities in terms of explanatory variables that are treated as if the quantities were non-random. As each cross section has some characteristics so in order to account for the individuality (heterogeneity) of each cross section the fixed effect model is used. To see this we have the model:

$$Y_{it} = \alpha_0 + \alpha_1 X_{it} + \alpha_2 X_{it} + \mu_{it}$$

where  $i = 1, 2 \dots N$  and  $t=1, 2 \dots T$

The subscript  $i$  in the intercept term shows that the intercept of each cross-section is different: the difference may be due to the different characteristics of the cross sectional units. Model 1 is known as fixed effect model, the term fixed effect means although the intercept for each country is different but it is time invariant.

FEM also assumes that the slope coefficient of the independent variable is space and cross-section invariant. Moreover FEM is appropriate to use when cross-section specific error term and independent variables are correlated that is:

$$E(\mu_i X_i) \neq 0$$

## **5. RESULTS AND DISCUSSION**

This chapter discusses the relationship of two forms of fiscal decentralization i.e., revenue and expenditure decentralization with institutional quality. Using the fixed effect instrumental variable regression, this section provides the empirical evidence on the effect of fiscal decentralization along with other control variables on institutional quality of developing countries.

The chapter is organized as follows: Section 5.1 gives the results of first stage regression, while section 5.2 gives results of the instrumental variable approach using 2 steps GMM.

### **5.1. First Stage Results**

The first stage results are illustrated in Table 6. The main purpose is to examine the endogeneity of economic growth as expected in the theory. F-test of first stage result is highly significant showing that economic growth should be treated as endogenous. Given this, we move towards the result of the final model reported in table 5.1.

**Table 6 : Instrumental Variable(IV) Regression, Fixed effect: First-stage regression**

Dependent variables	Corruption			Law and order			Democratic accountability		
	Coefficients	Std. Errors	t-Statistics	Coefficients	Std. Errors	t-Statistics	Coefficients	Std. Errors	t-Statistics
RD	-0.0089	0.0058	-1.55	0.0062	0.0053	-1.98	-0.008	0.005	-1.52
ED	0.0067	0.0030	2.23	-0.106	0.0025	2.51	0.007	0.004	1.68
GS	0.0030	0.0011	2.59	0.0021	0.0010	2.00	0.002	0.001	2.64
DEMOC	0.0007	0.0003	22.11	0.0007	0.0003	2.26	0.0001	0.000	2.13
LSSE	-0.0256	0.0013	-2.25	-0.0060	0.0064	-0.93	0.005	0.005	-1.63
LCPI	0.0052	0.0020	2.49	0.0037	0.0037	1.00	0.001	0.001	2.78
LTO	0.0047	0.1347	0.35	0.3097	0.118	2.62	0.115	0.115	0.51
F-statistic	3668.18		0.000	4644.39		0.000	3568.38		0.000

The R-squared of the model shows that 40 percent of the variation in corruption is being explained by all the independent variables. Likewise, the R-square for law and order and democratic accountability is 0.24 and 0.20 respectively. Whereas, the value of F-statistic shows that the model is significant at 1 percent level of significance.

**Table 7: Instrumental Variable (IV) Regression**

Dependent variables	Corruption	Law and Order	Democratic Accountability
Independent Variables	Coefficient	Coefficient	Coefficient
LGDP	-0.66*** (0.09)	0.21* (0.11)	0.39*** (0.12)
RD	-0.10** (0.05)	0.007 (0.08)	-0.11 (0.10)
ED	0.55*** (0.04)	-0.37*** (0.05)	0.73*** (0.072)
GS	0.02** (0.01)	0.10*** (0.01)	0.01 (0.01)
DEMOC	0.002 (0.002)	0.002 (0.003)	0.009*** (0.002)
LSSE	-0.17** (0.07)	0.38*** (0.07)	0.11 (0.10)
LCPI	-0.13*** (0.02)	-0.18*** (0.03)	0.09*** (0.03)
LTO	-0.27*** (0.08)	0.27* (0.15)	0.63*** (0.14)
F-statistic	72.91	23.82	25.61
R-Squared	0.40	0.24	0.20
Instrumented	LGDP	LGDP	LGDP
Included Instrumented	RD ED GS DEMOC LSSE LCPI LTO	RD ED GS DEMOC LCPI LSSE LTO	LCPI POLITY LTO GS ED RD LSSE
Excluded Instrumented	L.LGDP L.LTO L.LSSE	L.LGDP L.LTO	L.LGDP L2.LCPI
Under identification test	Kleibergen-Paap rk LM statistic:164.522 P-value 0.0000	Kleibergen-Paap rk LM statistic:180.17 P-value 0.0000	
Weak identification test	Cragg-Donald Wald F statistics: 6174.35 Kleibergen-Paap Wald rk F statistics: 3736.42	Cragg-Donald Wald F statistics: 8582.625 Kleibergen-Paap Wald rk F statistics: 4644.389	Cragg-Donald Wald F statistics: 9229.05 Kleibergen-Paap Wald rk F statistics: 5573.18
Stock-Yogo weak ID	Test critical values:  10% maximal IV size 22.30  15% maximal IV size 12.83  20% maximal IV size 9.54  25% maximal IV size 7.80	Test critical values: 7  10% maximal IV size 19.93  15% maximal IV size 11.59  20% maximal IV size 8.75  25% maximal IV size 7.25	Test critical values:  10% maximal IV size 19.93  15% maximal IV size 11.59  20% maximal IV size 8.75  25% maximal IV size 7.25
Hansen J statistic:	Over identification test for all instruments: 0.107 P value: 0.9481	Over identification test for all instruments: 0.103 P value: 0.9097	Over identification test for all instruments: 2.110 P value: 0.1463

\*\*\*' \*\*' \* shows significant at 1%, 5% and 10%

Table 7 shows the tests of both under-identification and weak identification related to instrumental variable technique. The under-identification test is an LM test of whether the equation is identified, i.e., that the excluded instruments are "relevant", meaning correlated with the endogenous regressors. Under the null hypothesis the equation is under identified. The statistic is distributed as chi-squared with degrees of freedom =  $(L1-K1+1)$  where  $L1$ = Number of excluded instruments and  $K1$ =number of endogenous regressors. A rejection of the null indicates that the matrix is full column rank, i.e., the model is identified. The Kleibergen-Paaprk LM statistic is 180.12 for corruption, 164.522 is for law and order and 180.17 is for democratic accountability, while the p-value is zero for all three indicators of institutional quality. Thus results indicate that the model is identified which means that the null hypothesis is rejected.

The values of Cragg-Donald Wald F statistic and Kleibergen-Paaprk Wald F statistic are compared with the values of Stock-Yogo weak ID test statistic. The values of Stock-Yogo weak ID test statistic must be less than that of Cragg-Donald Wald F statistic and Kleibergen-Paaprk Wald F statistic. For corruption, the values of Kleibergen-Paaprk Wald F statistic and Cragg-Donald Wald F statistic are 3736.42 and 6174.35 respectively; which are greater than the Stock-Yogo weak ID test statistic values i.e. 22.30 and 12.83 respectively. Similarly for law and order, the values of Kleibergen-Paaprk Wald F statistic and Cragg-Donald Wald F statistic are 4644.389 and 8582.625 respectively; which are greater than the Stock-Yogo weak ID test statistic values i.e. 19.93 and 11.59 respectively. Lastly for democratic accountability, the values of Kleibergen-Paaprk Wald F statistic and Cragg-Donald Wald F statistic are 9229.05 and 5573.18 respectively; which are greater than the Stock-Yogo weak ID test statistic values (i.e. 22.30 and 12.83), respectively.

The value of Hansen J-statistic is 0.107, 0.103, 2.110 for corruption, law and order and democratic accountability respectively. This shows that the instruments are correlated with the endogenous

variable(s), and orthogonal to the error process. The probability values for these variables are 0.9481, 0.9097 and 0.1463 respectively, which indicates that instruments are valid.

## **5.2. The Results of Instrumental Variable Approach to GMM**

The results show that the coefficient of economic growth is positively related with corruption. According to the corruption index provided by Thomson and Shah (2005), smaller value refers to high corruption and larger value refers to low corruption. In accordance with this criterion, the coefficient of economic growth is negative and significant. Its value is -0.66, implying that 1 percent increase in economic growth leads to 0.66 percent increase in corruption. This relationship is in line with the findings of Chong and Calderon (2000), who suggested that economic growth increases the amount of corruption in developing nations. The reason is, with the increase in economic activities a rise in investment is observed which leads to increase in progressive taxation. Therefore, to decrease the level of progressive taxation corruption tends to increase. Hence, economic growth increases corruption.

Likewise, the coefficient of economic growth shows that it has positive impact on law and order at 10 percent level of significance. One percent increase in economic growth leads to about 0.21 percent increase in law and order. This result is in accordance with the findings of Nawaz (2015) who explained that higher economic growth leads to improved law and order situation. He also observed economic growth has higher impact on law and order situation in high income countries as compared to low income countries. Moreover, better economic system tends to improve political condition of the nations which eventually improves law and order situation in response to stable economic system (Nawaz, 2015).

Similarly, economic growth is also observed to be positively related to democratic accountability, which is also significant at 1 percent level. Its coefficient shows that one percent increase in economic growth tends to increase democratic accountability by 0.40 percent. Nawaz (2015) argued that sustainable economic growth allows better democratic accountability and stability. Hence, democracy allows citizens to keep check on corrupt politicians and bureaucrats who intend to harm the economic system. His results also show a positive association among economic growth and democratic accountability.

Former literature showed the positive impact of economic growth on overall institutional quality (Eijffinger and Hoeberichts, 2000). Our results show that economic growth increases the institutional quality by strengthening law and order situation and improving democratic accountability.

The coefficient of democracy shows that it has a negative impact on corruption; however, it is statistically insignificant. A one percent increase in economic growth leads to about 0.002 percent decrease in corruption. This is in line with the study of Hassan et al. (2014) who argued that democratization reduces corruption. Thus our results show that democracy reduces corruption in developing countries.

Similarly, the coefficient of democracy is positive but insignificant in regression with law and order as dependent variable. A one percent increase in democracy leads to about 0.002 percent improvement in law and order condition. This is in agreement with the results of Polterovich and Popov (2007) who argued that democracy strengthens law and order which further improves the quality of political institutions. The reason is that when law and order condition is not strong it will decrease government effectiveness, weaken the quality of institutions and increase corruption.

The coefficient of democracy is also positive and significant for democratic accountability at 1 percent level. A one percent increase in democracy leads to about 0.009 percent increase in democratic accountability. Earlier researches showed both negative and positive impact of democracy on overall institutional quality such as Polterovich and Popov (2007) and Knack and Keefer (1995). Our results reveal that democracy reduces corruption and increases law and order and democratic accountability; however the coefficient values in our case are very small.

Government stability is another determinant of institutional quality. The coefficient of government stability is negative and significant for corruption at 1 percent level. A one percent increase in government stability leads to about 0.02 percent decrease in corruption. Our results are in line with Lederman *et al.* (2001) who also found that government stability reduces corruption.

The coefficient of government stability is positive and significant for law and order. It is statistically significant at 10 percent level of significance. A one percent increase in government stability leads to about 0.10 percent increase in law and order. Busse and Hefeker (2007) also found a positive relationship between government stability and law and order as government stability leads to better law and order situation in the developing nations which makes government more accountable and responsible.

Likewise, the coefficient of government stability is positive but insignificant for democratic accountability.

Earlier researches showed positive impact of government stability on overall institutional quality (Kyriacou and Sagales, 2011). The empirical results of the study showed positive impact of government stability on law and order and democratic accountability but it has negative impact on corruption.

Trade openness may also have a positive impact on institutional quality. Empirical results showed a positive association of trade openness with corruption, law and order and democratic accountability. A one percent increase in trade openness tends to increase corruption by 0.27 percent which is also statistically significant at 1 percent level. Our results are in agreement with the findings of Pham (2013) who concluded that trade openness increases total production of firms which incentivizes them to do more bribery which results in more corruption in the entire economy. However, according to Rigobon and Rodrik (2004) trade openness is positively related to law and order situation as trade openness calls for maintaining international standards and there is more cooperation between institutions of other countries; therefore openness enhances quality of institutions.

Likewise, the coefficient of democratic accountability shows that one percent increase in trade openness tends to increase democratic accountability by 0.63 percent which is also statistically significant at 1 percent level. This means, the more the democratic accountability the better are the chances of trade openness and economic stability. Our results are in agreement with Lee (2004) who argued that openness of trade is responsible for greater cooperation and better international relations. Consequently, government will be more responsible for decision making regarding trade barriers and trade facilitation along with maintaining an environment which is conducive for trade and investment.

Our results also indicate a positive relationship between inflation and corruption which is significant at 1 percent level. A one percent increase in inflation leads to about 0.13 percent increase in corruption. These results are in agreement with Akca *et al.* (2012). Inflation also positively impacts democratic accountability which is significant at 1 percent level. Its coefficient shows that 1 percent increase in inflation leads to about 0.09 percent increase in democratic

accountability. This result is in line with Eijffinger and Hoeberichts (2000). They argued that democratic accountability causes a shift in responsibilities to the government in managing the economy which results in higher government expenditures and therefore higher inflation.

There are also some empirical studies that reported a negative impact of inflation on institutional quality (Minea and Villieu, 2009). However, the empirical results of this study showed a positive impact of inflation on corruption and democratic accountability while a negative impact is observed for law and order. However, the coefficient values are small.

Human capital is measured by secondary school enrollment (LSSE). It is negatively associated with corruption and also significant at 1 percent level. A one percent increase in secondary school enrollment leads to about 0.17 percent decrease in corruption. This result is in accordance with the findings of Dridi (2014) who argued that access to secondary school enrollment reduces corruption.

There is a positive correlation between human capital, democratic accountability and law and order. A one percent increase in human capital leads to about 0.38 percent increase in law and order situation. Khan and Hudson (2014) also found similar results. They argued that human capital is effective in income convergence among countries and decreases inequality within countries. Therefore, it helps not only in attaining higher level of economic growth but also results in better law and order situation.

Secondary school education in case of regression for democratic accountability as dependent variable is not significant. This is mainly due to the reason that accumulation of human capital is a way to establish a relation between the state and its citizens—this process in most of the developing countries is in early stages because of low human capital and various other institutional

constraints. An accountable government and educated individuals lead to economic stability and better institutional quality—however, this link is missing, particularly in case of developing countries, as indicated in our results.

Prior researches showed a positive impact of human capital on overall institutional quality (Khan and Hudson, 2014). In line with that, our empirical results showed a positive impact of human capital for two of the indicators of institutional quality.

Results of equation (3) show that revenue decentralization has a positive impact on corruption which is significant at 1 percent level. A one percent increase in revenue decentralization leads to about 0.10 percent increase in corruption. The increase in corruption because of revenue decentralization is mainly because of existing weak institutions and lacking monitoring and enforcement mechanisms in developing countries. Fisman and Gatti (2002) also found that revenue decentralization in absence of expenditure decentralization leads to increased corruption. High preservation of local revenue leads to inter-regional inequality which worsens the delivery of public goods.

Equations (2) and (3) show that revenue decentralization is positively correlated with law and order and negatively related with democratic accountability. However, the impact of expenditure decentralization on law and order situation and democratic accountability is statistically insignificant.

Expenditure decentralization has a negative impact on corruption and law and order situation which is also significant at 1 percent level. A one percent increase in expenditure decentralization leads to about 0.55 percent decrease in corruption and 0.37 percent decrease in law and order situation. Fisman and Gatti (2000) also found that expenditure decentralization is associated with

lower corruption indicating that countries with high expenditure decentralization tend to have lower corruption ratings.

On the other hand, expenditure decentralization positively impacts democratic accountability at 1 percent level of significance. A one percent increase in expenditure decentralization tends to decrease law and order by 0.73 percent.

Past studies have not discussed the impact of revenue and expenditure decentralization on institutional quality explicitly. Therefore, the significance of this study is to find the relationship between revenue and expenditure decentralization and institutional quality. Our empirical results revealed that revenue decentralization is positively related with corruption, law and order, and democratic accountability. However, coefficient values are very small. The overall effect of revenue decentralization on institutional quality is negative. Similarly, results for expenditure decentralization revealed the positive relationship with democratic accountability whereas it is negatively related with corruption and law and order. However, coefficient values are relatively higher than revenue decentralization.

In conclusion, empirical results revealed that the impact of revenue decentralization on institutional quality is weak in terms of magnitude, whereas expenditure decentralization has relatively more positive effect and higher impact on institutional quality. Hence, empirical inferences illustrate that fiscal decentralization results in enhancement of institutional quality. Moreover, it is also observed that a country can also improve its institutional quality on the basis of increased human capital, democracy, trade openness and government stability.

## **6. CONCLUSION AND POLICY RECOMMENDATIONS**

During the last few decades, the role of fiscal decentralization in evaluating institutional quality remained vibrant. Many studies have been conducted to analyze the impact of fiscal decentralization on institutional quality. This study focuses on the impact of fiscal decentralization on institutional quality. Kyriacou and Sagales (2011) and Enikolopov and Zhuravskaya (2004) highlighted the significance of fiscal decentralization on government quality. According to them strong party systems significantly improve outcomes of fiscal decentralization by encouraging economic growth, government quality and public goods delivery. Consequently, effective decentralization occurs due to the division of local authorities to lower level of governments.

Institutions are the backbone of any economy and play an important role in sustainable economic growth of nations by making proper rule of law and policies for developing countries. However, the literature on revenue and expenditure decentralization on overall institutional quality is scant. Therefore, this study contributes to the literature by incorporating subnational forms of governments including revenue and expenditure decentralization to determine its impact on institutional quality using its three indicators (i.e. corruption, law and order and democratic accountability).

Besides revenue and expenditure decentralization, the other determinants of institutional quality include: trade openness, inflation, government stability, economic growth, human capital and democracy. The study employed panel data of 31 developing countries covering the time period of 1984 to 2012 and estimated the fixed effect model with instrumental variable (IV). In order to remove the problem of endogeneity, GMM estimation technique was used.

The empirical results show mixed evidence regarding corruption. It increases due to high inflation, trade openness, revenue decentralization and economic growth. However, it can be controlled by focusing on expenditure decentralization, democracy, and government stability.

The results also revealed that law and order situation improves due to economic growth, government stability, human capital, trade openness and revenue decentralization. However, it deteriorates due to high inflation and expenditure decentralization in developing countries.

Likewise, results show that democratic accountability increases as a result of high economic growth, expenditure decentralization, democracy, government stability, human capital, inflation and trade openness. Whereas, revenue decentralization decreases democratic accountability, as it becomes challenging to have mechanisms to monitor and enforce rules and regulations at the lower level of governments.

To summarize, the empirical results illustrate that revenue decentralization deteriorates institutional quality while expenditure decentralization improves it. Based on these empirical inferences institutional quality can be improved if governments focus on expenditure decentralization since expenditure decentralization improves institutional quality while revenue decentralization deteriorates it. Furthermore, institutions can be improved if developing countries lay more emphasis on trade openness and democracy.

## REFERENCES

- Abel, A. B. and Bernanke, B. S. (2001), *Macroeconomics*, Addison, Wesley Longman Inc.
- Akca, H., Ata, A. Y., and Karaca, C. (2012), “Inflation and Corruption Relationship: Evidence from Panel Data in Developed and Developing Countries”, *International Journal of Economics and Financial Issues*, Vol. 2: 281-295.
- Alonso, J. A., and Garcimartín, C. (2013), “The Determinants of Institutional Quality. More on Debate”, *Journal of International Development*, Vol. 25(2): 206-226.
- Arikan, G. (2004), “Fiscal Decentralization: A remedy for corruption?”, *International Tax and Public Finance*, Vol. 11(2): 175-195.
- Baliamoune-Lutz, M., and Ndikumana, L. (2007), *The growth effects of openness to trade and the role of institutions: New evidence from African countries*, Working Paper No. 05, University of Massachusetts, Department of Economics.
- Baum M. F., Schaffer E., and Stillman S. (2003), “Instrumental Variables and GMM: Estimation and Testing”, *Stata Journal*, Vol. 3(1): 1-31.
- Borrmann, A., Busse, M., and Neuhaus, S. (2006), “Institutional Quality and The gains From Trade”, *Kyklos*, Vol. 59(3): 345-368.
- Bewley, T. F. (1981), “A Critique of Tiebout's Theory of Local Public Expenditures”, *Econometrica*, Vol. 49(3): 713-740.
- Brennan, G., and Buchanan, J. M. (1980), *The Power to Tax: Analytic Foundations of A Fiscal Constitution* Cambridge University Press.
- Busse, M., and Hefeker, C. (2007), “Political Risk, Institutions and Foreign Direct Investment”, *European Journal of Political Economy*, Vol. 23(2): 397-415.
- Chong, A., and Calderon, C. (2000), “Causality and Feedback Between Institutional Measures and Economic Growth”, *Economics & Politics*, Vol. 12(1): 69-81.

- Dang, D. A. (2010), “*Trade Liberalization and Institutional Quality: Evidence from Vietnam*”, MPRA Paper No. 26346.
- Dias, J., and Tebaldi, E. (2012), “Institutions, Human Capital and Growth: The institutional Mechanism”, *Structural Change and Economic Dynamics*, Vol. 23(3): 300-312.
- Dias, J., and Tebaldi, E. (2011), *Institutions, Human Capital, and Growth: The Long-run Institutional Mechanism*, Brasilia: Anais do I Circuito de Debates Acadêmicos—Área Temática: Desenvolvimento Econômico.
- Dridi, M. (2014), “Corruption and Education: Empirical Evidence”, *International Journal of Economics and Financial Issues*, Vol. 4(3): 476-493.
- Eijffinger, S. C., and Hoerberichts, M. (2000), *Central Bank Accountability and Transparency: Theory and Some Evidence*, Discussion Paper No. 06, Volkswirtschaftliches Forschungszentrum der Deutschen Bundesbank.
- Enikolopov, R., and Zhuravskaya, E. (2004), *Decentralization and Political Institutions*, Institute for Advanced Study, Princeton.
- Enikolopov, R., and Zhuravskaya, E. (2007), “Decentralization and Political Institutions”, *Journal of Public Economics*, Vol. 91(11): 2261-2290.
- Faruq, H. A., and Taylor, A. C. (2011), “Quality of Education, Economic Performance and Institutional Environment”, *International Advances in Economic Research*, Vol. 17(2): 224-235.
- Fisman, R., and Gatti, R. (2002), “Decentralization and Corruption: Evidence Across Countries”, *Journal of Public Economics*, Vol. 83(3), 325-345.
- Fisman, R., and Gatti, R. (2000), “Decentralization and Corruption: Evidence Across Countries”, *Journal of Public Economics*, Vol. 83: 325-345.
- Gradstein, M. (2005), *Democracy, Property Rights, Redistribution and Economic Growth*, Discussion Paper No. 5130, Centre for Economic Policy Research.
- Gujarati, D. (2002), *Basic Econometrics*, 4<sup>th</sup> ed., McGraw-Hill/Irwin.

- Hahn, J., Hausman, J. and Kuersteiner, G. (2004), "Estimation with Weak Instruments: Accuracy of Higher-Order Bias and MSE Approximations", *Econometrics Journal*, Vol. 7(1): 272-306
- Hansen, L. (1982), "Large Sample Properties of Generalized Method of Moments Estimators", *Econometrica*, Vol. 50(3): 1029-1054.
- Horton, S. (1999), "Law Reform in Azerbaijan: Snapshot in a Time of Transition", Caspian Studies Program Experts Conference Report: 69-70.
- Huther, J., and Shah, A. (2005), "A Simple Measure of Good Governance" in Shah, A. (ed.), *Public Services Delivery*, Washington, DC: The World Bank, 39-61.
- Iqbal, N., Musleh Ud Din, M. U. D., and Ghani, E. (2012), "Fiscal Decentralization and Economic Growth: Role of Democratic Institutions", *The Pakistan Development Review*, Vol. 51(3): 173-195.
- Islam, R., and Montenegro, C. E. (2002), *What Determines the Quality of Institutions?*, Working Paper No. 2764, World Bank Policy Research.
- Javid, A. Y., and Arif, U. (2012), "Analysis of Revenue Potential and Revenue Effort in Developing Asian Countries", *The Pakistan Development Review*, Vol. 51(4): 365-378.
- Johnson, E., and Martini, M. (2012), *Corruption Trends in The Middle East and North Africa Region 2007-2011*, Transparency International.
- Keefer, Philip and Stephen Knack (1995), "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures", *Economics and Politics*, Vol. 3(7): 207-227.
- Khan, F. A., and Hudson, J. (2014), "Initial Human Capital or The Rule of Law: What Matters for The Income Convergence of Poor Countries?", *Applied Economics*, 46(2): 179-189.
- Khemani, S. (2001), *Decentralization and Accountability: Are Voters More Vigilant in Local Than in National Elections?*, Paper No. 2557, The World Bank Publications.

- Knack, S., and Keefer, P. (1995), "Institutions and Economic Performance: Cross-country Tests Using Alternative Institutional Indicators", *Economics and Politics*, Vol. 3(7): 207-228.
- Kyriacou, A. P., and Sagalés, O. R. (2008), "Fiscal Decentralization and The Quality of Government: Evidence from Panel Data", *Hacienda Pública Española*, Vol. 189, 131-155.
- Kyriacou, A. P., and Sagalés, O. R. (2011), "Fiscal and Political Decentralization and Government Quality", *Environment and Planning C: Politics and Space*", Vol. 29(2), 204-223.
- Law, S. H. (2009), "Trade Openness, Capital Flows and Financial Development in Developing Economies", *International Economic Journal*, Vol. 23(3): 409-426.
- Lederman, D., Loayza, N., and Soares, R. R. (2001), *Accountability and Corruption: Political Institutions Matter*, Paper No. 2708, World Bank Publications.
- Lee, J. M. (2004), "Political Accountability and Its Influence on Trade Liberalization", *The Korean Economic Review*, Vol. 20(2): 305-322.
- Legarre, S. (2013), "New Trends in Latin American Constitutionalism: An Overview", *Notre Dame Journal of International Comparative Law*, Vol. 4(1): 34-53.
- Levchenko, A. (2007), "Institutional Quality and International Trade", *The Review of Economic Studies*, Vol. 74(3): 791-819.
- MacDonald, R., and Majeed, M. T. (2011), *Causes of Corruption in European Countries: History, Law, and Political Stability*, University of Glasgow.
- Machado, F. V. (2013), *Decentralization and Accountability: The Curse of Local Underdevelopment*, IDB working paper No. 397.
- Martinez-Vazquez J. (2011), *The Impact of Fiscal Decentralization: Issues in Theory and Challenges in Practice*.
- Minea, A., and Villieu, P. (2009), "Can Inflation Targeting Promote Institutional Quality in Developing Countries?" In *The 26th Symposium on Money, Banking and Finance*, University of Orléans: 25-26.

- Minea, A., and Villieu, P. (2008), “Financial Development, Institutional Quality and Inflation Targeting”, *Economic Modeling*, Vol. 27(1): 324-335.
- Mookherjee, D., and Bardhan, P. (2005), *Decentralization, Corruption and Government Accountability: An Overview*, Working Paper No. 23, Boston University, Department of Economics.
- Morris, S. D. (2004), “Corruption in Latin America: An Empirical Overview”, *Secolas Annals*, Vol. 36: 74-92.
- Murray, M. P. (2006), “Avoiding Invalid Instruments and Coping with Weak Instruments”, *Journal of Economic Perspectives*, Vol. 20(4): 111-32
- Nawaz, S. (2015), “Growth Effects of Institutions: A disaggregated analysis”, *Economic Modeling*, Vol. 45: 118-126.
- Oates, W., (1972), *Fiscal Federalism*, Harcourt, New York.
- Oates, W. E. (1999), “An Essay on Fiscal Federalism”, *Journal of economic literature*, Vol. 37(3): 1120-1149.
- Olowu, D. (2003), “Local Institutional and Political Structures and Processes: Recent Experience in Africa”, *Public Administration and Development*, Vol. 23(1), 41-52.
- Owoye, O., and Bissessar, N. (2012), *Bad Governance and Corruption in Africa: Symptoms of Leadership and Institutional Failure*, Association for Middle Eastern Public Policy and Administration.
- Pham, V. (2013), *Effects of Trade on Corruption In Economies With Heterogeneous Firms*, Working Paper.
- Polterovich, V., Popov, V., and Tonis, A. (2007), “Resource Abundance, Political Corruption, and Instability of Democracy”, NES Working Paper No. WP2007/73.

Qadir, M. (2003), "Report on Present Situation, Problems and Solutions in The Legal System Related to Corruption Control and Corruption Cases in Pakistan", *International Review of Penal Law*, Vol. 74(1): 515-525.

Rigobon, R., and Rodrik, D. (2004), *Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships*, MIT & Kennedy School.

Rodriguez, A., Antonio, J., and Garcimartin, C. (2009), *The Determinants of Institutional Quality*, Working Paper No. 03, Instituto Complutense de Estudios Internacionales (ICEI).

Salahodjaev, R., and Chepel, S. (2014), "Institutional Quality and Inflation" *Modern Economy*, Vol. 5: 219-223

Thompson, T., and Shah, A. (2005), *Transparency international's Corruption Perceptions Index: Whose perceptions are they anyway*, Discussion Draft, March.

Tiebout, C. M. (1956), "A Pure Theory of Local Expenditures", *The Journal of Political Economy*, Vol. 64(5): 416-424.

Tranchant, J. P. (2008), "Fiscal Decentralization, Institutional Quality and Ethnic Conflict: A Panel Data Analysis, 1985–2001", *Conflict, Security and Development*, Vol. 8(4): 491-514.

Treisman, D. (2006), "Fiscal Decentralization, Governance, and Economic Performance: A Reconsideration", *Economics and Politics*, Vol. 18(2): 219-235.

Ullah, G. M. (2014), "A review of European sovereign debt crisis: Causes and consequences", *International Journal of Business and Economics Research*, Vol. 3(2): 66-71.