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# Decentralizing for Better Governance: How Fiscal Autonomy Shapes Institutional Quality?

**Rafique Ur Rehman Memon[1], Farhan Ahmed[2]**

[1] Federal Board of Revenue, Pakistan; Universidad de Almeria, Spain

Email: rafiquerehman@yahoo.co.uk

ORCID: https://orcid.org/0009-0005-5762-5946

[2] Economics & Management Sciences Department, NED University of Engineering & Technology, Pakistan

Email: fahmed.ned@gmail.com

ORCID: https://orcid.org/0000-0002-1147-8347

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**Corresponding author:**
**Rafique Ur Rehman Memon**
**Email:**
rafiquerehman@yahoo.co.uk

**ABSTRACT**

This study investigates how fiscal decentralization shapes institutional quality in Pakistan, situating the discussion within the broader framework of fiscal federalism, democratic processes, and regional inequality. Using a secondary time series data from 1996 to 2023 with econometric modeling based on the Autoregressive Distributed Lag (ARDL) approach, the study evaluates institutional quality through indicators such as rule of law, political stability, government effectiveness, accountability, and control of corruption. Findings indicate that fiscal decentralization has the potential to enhance institutional quality, but its success depends on complementary conditions, including human capital development, openness to trade, economic growth, and price stability. Conversely, decentralization that is poorly structured or weakly enforced may aggravate corruption, inefficiency, and deficiencies in service delivery. Policy recommendations emphasize expanding fiscal autonomy, reinforcing accountability mechanisms, and addressing regional disparities to promote inclusive growth and stronger institutions.

## Introduction

Institutions play a critical role in promoting economic growth and development. Social institutions protect social values while economic institutions provide the framework of laws, regulations, and policies that encourage entrepreneurship, and innovation, and ensure the efficient allocation of resources (Borrmann, Busse, & Neuhaus, 2006). Moreover, high-quality institutions safeguard a predictable and stable investment climate, by reducing barriers to entry, promoting competition, and protecting intellectual property rights, which create a strong connection between trade and economic growth. Furthermore, high-quality institutions also promote transparency, accountability, and the rule of law, which can reduce corruption and political instability, thereby promoting economic growth. Conclusively, countries with high-quality institutions tend to have more stable and prosperous economies, while those with weak institutions struggle to achieve sustained economic growth. Therefore, it is essential to have strong institutional frameworks in place to promote economic development and improve the welfare of the population (Henisz, 2000). However, poor-quality institutions in developing nations are responsible for corruption, poor law and order condition, government ineffectiveness, and fragile democracy. A strong democracy is recommended to strengthen the law and order situation, control corruption and improve the quality of institutions in developing nations (Knack & Keefer, 1995).

Along with democracy, policymakers highlighted fiscal decentralization as another important determinant of institutional quality. Fiscal decentralization is a process in which, the central government transferred responsibilities and resources to the state, province or municipalities. Fiscal decentralization can have significant impacts on the strength and effectiveness of a country's political and

economic institutions (Enikolopov & Zhuravskaya, 2007). In general, fiscal decentralization authorizes great autonomy and accountability to sub-national government, decentralization may improve institutional quality and lead to more effective and efficient public service delivery. However, in practice, the relationship between fiscal decentralization and institutional quality is not always as simple as stated. For example, if provincial governments are lacking in administrative capacity and resources that are necessary to manage their fiscal responsibilities effectively then decentralization can lead to inefficiencies, corruption, and weak institutional quality. Therefore, the link between fiscal decentralization and institutional quality depends on various factors, such as the clarity of objective, level of administrative and institutional capacity, monitoring and evaluation. Similarly, effective coordination and collaboration between central and provincial governments are necessary for successful fiscal decentralization.

It has been observed that fiscal decentralization significantly affect political institutions and due to decentralization, political parties can better respond to local issues and concern (Enikolopov & Zhuravskaya, 2004). Moreover, to become successful in the next election, each political party encourages economic growth process, government quality and public goods delivery. Consequently, efficient decentralization is possible only when local institutions are held responsible for their actions and decisions and local government is held responsible for public spending, revenue collection and generation. Therefore, theoretical literature explains that accountability ensures transparency, efficiency and effectiveness of local government in carrying out their responsibilities and ultimately, increases public trust and support (Falleti, 2005; Rodden, 2004). Similarly, a few empirical studies investigated the link between decentralization and the quality of intuition and produces mixed results, for instance, Faguet (2004) explained that after decentralization in Bolivia, investment patterns in human capital and social services positively and significantly improved. Bardhan (2002) explained that institutions in developing and transition economies are not capable of effectively carrying out their intended functions and providing necessary services to citizens. Contrary, empirical literature also reported that decentralization can negatively affect institutional quality if decentralization is poorly implemented and it leads to fragmentation of services and lack of coordination between different levels of government (Arzaghi & Henderson, 2005). Moreover, decentralization can lead to greater opportunities for rent-seeking and corruption, particularly if institutions cannot monitor and regulate local governments effectively (Treisman, 2007). In summary, the literature produces mixed results related to the relationship between decentralization and institutional quality, so this study intends to clarify the ambiguity in the empirical literature. Besides, most of the empirical literature utilized corruption and democracy to measure instructional quality (Digdowiseiso, 2022; Sohail, Ullah, & Javid, 2022) while other measurements like law and order, government effectiveness, accountability, political stability and regulatory quality are neglected. Therefore, the objective of this study is to examine the relationship between fiscal decentralization and institutional quality in Pakistan to derive policy implications. Pakistan has undergone several phases of decentralization since its inception; for instance, in 1959, a local government ordinance was issued that divide the Pakistan territory into rural and urban areas and established local councils at both levels, but these councils have little autonomy or decision-making.

In 1979 local government ordinance was revised and created a new more centralized local government system. This local government ordinance of 1979 assigned more power to local councils to manage local affairs. However, this system was abolished in 1983 and was replaced with a 2001 local government ordinance. This ordinance was introduced by General Pervez Musharraf and it was recognized as the most significant decentralization reform in Pakistan's history. 2001 local government ordinance introduced three three-tier systems of local government, with district, tehsil (sub-district), and union councils, this system transferred significant powers and resources to local councils, including responsibility for service delivery, planning, and budgeting. Following the same line, the government of Pakistan Muslim League-Nawaz (PML-N) replaced the 2001 local government ordinance with Local Government Act 2013, this act further devolved power to local councils and introduced new mechanisms for citizen participation and accountability. Despite these decentralization reforms, institutional quality in Pakistan remained questionable, for instance, political interference, corruption, weak institutional capacity, and limited financial resources remain key challenges to Pakistan's development. Therefore, in Pakistan, there are ongoing debates about the appropriate level of decentralization and the balance between local autonomy and national cohesion. Therefore, the main objective of this study is to examine the role of fiscal decentralization on institutional quality while the sub-objective is to investigate other important determinants of institutional quality. In Pakistan, over 94% of total revenue is collected by the federal government, and the allocation of resources primarily on the basis of population has created fiscal disparities, uneven regional growth, and rising provincial grievances (Memon, 2005). Properly implemented, fiscal decentralization can improve the efficiency of resource distribution by aligning public spending with the specific needs and priorities of local communities. However, without robust accountability mechanisms, decentralization may exacerbate regional inequality and weaken the delivery of public services. Thus, promoting transparency and strengthening institutions are essential to ensure the effectiveness of decentralization (Memon, 2017).

The remaining part of the study has been divided into six sections. Section two discusses the theoretical and empirical literature review of the studies, section three provides the descriptive analyses of institutional quality and fiscal decentralization, section four presents methodology and data issues while section five reports a discussion of the results and section six includes the conclusion and the policy implications.

## Review of Literature

In developing nations, especially in Pakistan, where corruption has been embedded in political and administrative culture, corruption and wastage of resources have been considered a major determinants of economic losses and lack of trust in public institutions. Lack of

effective governance and regulation, lack of transparency and accountability in the public institution are the main reasons behind the corruption and wastage of resources. Therefore, to overcome the issues of corruption and wastage of resources, fiscal decentralization is increasingly got popularity in developing nations (Tranchant, 2008). According to Huther and Shah (2005), fiscal decentralization is a measure of good governance, for instance, developed nations achieved good governance through fiscal decentralization. However, some developing nations also realized improved institutional quality, high economic growth, reduced corruption and improved law and order through greater fiscal decentralization (Sepulveda & Martinez-Vazquez, 2011). In the following section, this study developed the theoretical and empirical background of the study.

**Theoretical Studies**

The concept of fiscal decentralization was first introduced by classical economists, such as Adam Smith and David Ricardo believed that free demand and supply forces lead toward efficient allocation of resources in the market while centralized planning about production and consumption may lead to market inefficiencies, as decision-makers lacked the necessary information to make optimal choices. In other words, Smith believed that in decentralized decision-making, individuals serve their self-interest and lead to better outcomes for society as a whole. Similarly, David Ricardo favoured decentralized decision-making by arguing that free trade and the international division of labour would lead to the most efficient use of resources and the highest levels of economic growth. Richard Musgrave introduced the term "fiscal decentralization' in his seminal work, "The Theory of Public Finance," published in 1959, he established that decentralization of revenue collection and expenditure responsibilities could lead to more efficient and effective use of resources, as local governments would be better positioned to identify and respond to the needs of their communities.

Furthermore, Oates (1972) created the decentralization theorem which states that fiscal decentralization improves the quality of local government institutions that ensure better provision of public goods. Moreover, local officials are more informed about local conditions and can tailor policies and programs to meet the specific need of their communities (Oates, 1972). Additionally, Oates (1999) argued that if an inefficient and uninformed central government failed to collect handsome tax revenue, in such a situation fiscal decentralization helps the government to realize their goals in society. Similarly, Tiebout (1956) argued that in a decentralized system, individuals can vote with their feet means an individual can move to the communities which provide them high level and better quality of public goods and services. Therefore, this competition among communities would lead to an efficient allocation of resources, as local governments would be incentivized to provide public goods and services that are most valued by their residents. Thus, decentralization can promote local autonomy, accountability, and economic growth. However, Bewley (1981) criticized Tiebout's theory for its very restrictive assumption that individuals make preferences to live in a society based on the provision of high-quality public goods. Begley's work suggests that some other factors which are beyond individual control may affect his decision to live in a society, for example, imperfect information about the availability of housing or job opportunities.

Recent scholarship points to the wide-ranging consequences of fiscal decentralization across governance, economic development, environmental sustainability, and innovation. Digdowiseiso (2023) argues that in developing nations, the outcomes of decentralization are closely tied to the strength of institutional frameworks. His findings reveal a nonlinear relationship in which gains in democracy, bureaucratic capacity, and rule of law may paradoxically reduce fiscal autonomy because of underlying structural limitations. Adding another dimension, Song and Zhao (2023) show that competition among local governments within decentralized systems tends to discourage long-term innovation. Their evidence suggests that a one-standard-deviation rise in fiscal competition is linked to a 25% drop in per-capita innovation spending, illustrating the risks of uncoordinated rivalry among jurisdictions. Looking at environmental outcomes, Ding, Tunio & Nabi (2024) study China, India, and Pakistan to explore how decentralization interacts with financial development. They find that while GDP per capita enhances environmental quality, the role of financial growth is complex, yielding both positive and negative effects. Similarly, Mai, Mai, and Chen (2025) investigate China's "Province-Managing-County" reform and conclude that fiscal decentralization worsened pollution, with institutional conditions and regional resources shaping environmental governance more than the political ambitions of officials. By contrast, Ma, Sun, Yan, and Chen (2025) report that decentralization in China helps narrow economic disparities among cities, especially where technological progress and administrative improvements are present. Their study also underscores that the benefits of decentralization are moderated by levels of tax competition. Taken together, these works indicate that fiscal decentralization produces highly context-specific outcomes, shaped by institutional quality, competitive pressures, and supporting governance arrangements.

Contrary to the efficient allocation of resources in fiscal decentralization, Brennan and Buchanan (1980) argued that governments collect taxes and despite utilizing that taxes on their original goals of providing public goods and services, government agencies utilize them to become larger and more bureaucratic. Moreover, Brennan and Buchanan's believed that politicians and bureaucrats have incentives to act in their self-interest, rather than the interest of the public, so the sharing of the powers of central government into several local governments will not be effective in making a fiscally decentralized system. Similarly, Treisman (2006) criticized fiscal decentralization by arguing that fiscal decentralization with high-quality governance is fruitful for economic growth while with low-quality governance (such as those with high levels of corruption and political instability), fiscal decentralization can exacerbate economic problems and result in poorer economic performance.

**Empirical Studies**

This study divides the empirical literature on institutional quality into sections; in the first section, this study presents the empirical literature related to fiscal decentralization and institutional quality while in the section, the study discussed other important determinants of institutional quality.

**Relationship between Fiscal Decentralization and Institutional Quality**

Ample studies have investigated the impact of fiscal decentralization on economic growth and a few studies have investigated the role of fiscal decentralization to promote institutional quality. For instance, Iqbal, Din, and Ghani (2012), investigated the role of fiscal decentralization in economic growth. The study also examined the complementarity of institutional quality with fiscal decentralization to promote economic growth, found that revenue decentralization has a positive effect on economic growth in the presence of democratic institutions. Similarly, Machado (2013) explores that in municipalities, decentralization is not good due to higher income inequality, lower participation in educational and political activities. Therefore, this study also concluded that a healthy democratic environment is a prerequisite for the expected gains from decentralization to materialize. Stoilova and Patonov (2012) examined the impact of fiscal decentralization on economic growth in six EU states and found a positive relationship between the sub-national share of total government expenditure, revenue and economic growth. Javid and Arif (2012) conducted a study on the impact of institutional quality on fiscal performance in Asian developing countries and found that institutional quality positively affects revenue performance while population growth, trade openness, and inflation negatively affect revenue performance.

Faruq and Taylor (2011), conducted a study on the effect of quantity and quality of education on economic performance with the moderating impact of institutional quality and found that quality of education promotes economic performance. Moreover, the study also confirmed that with better law and order conditions, government stability, and an overall good institutional environment, education brings strong results in terms of economic performance. Another study conducted by Escaleras and Chiang (2017), has examined the impact of fiscal decentralization on institutional quality in the business environment and found that fiscal decentralization promotes a business-friendly environment. Moreover, the study found that fiscal decentralization plays a more important role in low-income countries to promote a business-friendly environment. Fisman and Gatti (2002) examined the relationship between decentralization and corruption and found that as expenditure decentralization increases it will cause to decrease in corruption because decentralization improves the quality of government.

**Other Determinants of Institutional Quality**

Dias and Tebaldi (2012) investigated the role of institutions, and human capital in economic growth, found that human capital affects long-run economic growth while political institutions are uncorrelated with productivity and long-run economic growth. Dang (2010) examined the causal relationship between trade liberalization and institutional quality in the context of Vietnam and found unidirectional causality between trade liberalization and institutional quality and trade liberalization brings a strong impact on institutional quality in the Northern Province of Vietnam. Alonso, Garcimartin, and Kvedaras (2020) investigated the determinant of institutional quality and found that trade openness; education and economic growth are important determinants of institutional quality. Similarly, Salahodjaev and Chepel (2014) examined the relationship between institutional quality and inflation and concluded that institutional quality has a significant and sizeable impact on inflation. Minea and Villieu (2009) investigated the relationship between inflation and institutional quality and found that lower inflation and high tax rate promote institutional quality in low-income countries. Another study conducted by Law and Soon (2020) found that inflation increases income inequality but in the presence of institutional quality the size of the impact of inflation on income inequality can be reduced.

Baliamoune-Lutz and Ndikumana (2007) examined the growth impacts of trade openness and the role of institutions and found in the presence of weak institutional quality, the growth effects of trade liberalization are limited; though the study found a positive relationship between trade openness and institutional quality. Busse and Hefeker (2007), examined the role of political stability and institutions in foreign direct investment and found that political risk and weak institutions are a great threat and reduce foreign direct investment.

## Data and Methodology

This study utilized time series data from 1996 to 2023. This study utilized institutional quality as the dependent variable and utilized six dimensions of IQ, named violence and accountability, control of corruption and rule of law, political instability, government effectiveness and regulation quality, to measure institutional quality. The data for institutional quality is obtained for the WGI database. Moreover, this study utilized fiscal decentralization as the independent variable and data is obtained from different reports of economic surveys of Pakistan. This study developed three different constructs to measure fiscal decentralization following the study of Iqbal (2013);

First, revenue decentralization is measured as the ratio of the provincial government's revenues (PR) to the total government revenues (FR+PR),

$$RD=PR/FR+PR$$

Second, expenditure revenue is measured by the ratio of provincial government expenditures (PE) to the total government expenditures (TE) (federal plus provincials) excluding the defence expenditures (DE) and interest payments on debt (IE) since these expenditures are mainly considered as part of the non-decentralized government expenditures,

$$ED= PE/PE+FE (DE+IE)$$

Finally, Third composite decentralization is measured by using both RD and ED. The CD captures the information in expenditure and revenue ratios by following Martinez-Vazquez and Timofeev (2010), i.e. CD=RD/1-ED. Moreover, this study utilized some other variables like trade openness, inflation, secondary school enrollment, and gross domestic product as independent variables and data for these variables was obtained from world development indicators (WDI).

This study develops three models and each model contains 3 equations with different measurements of fiscal decentralization. Simple Regression Model in linear form:

**Model 1**

$$COR = \beta_0 + \beta_1 ED + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 1.1}$$

$$COR = \beta_0 + \beta_1 RD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 1.2}$$

$$COR = \beta_0 + \beta_1 CD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon\text{------Eq. 1.3}$$

**Model 2**

$$L\&O = \beta_0 + \beta_1 ED + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 2.1}$$

$$L\&O = \beta_0 + \beta_1 RD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 2.2}$$

$$L\&O = \beta_0 + \beta_1 CD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon\text{------Eq. 2.3}$$

**Model 3**

$$V\&A = \beta_0 + \beta_1 ED + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 3.1}$$

$$V\&A = \beta_0 + \beta_1 RD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon \text{ ------Eq. 3.2}$$

$$V\&A = \beta_0 + \beta_1 CD + \beta_2\ HC + \beta_3\ GDP + \beta_4\ TO + \beta_5\ CPI + \beta_6\ PS + \beta_7\ GE + \varepsilon\text{------Eq. 3.3}$$

All variables are used in natural log except the COR, GE, PS, L&O, and V&A. See the expansion of abbreviation, description of variable and data sources in Table A1 (See appendix)

**Model Specification - ARDL**

To explain the symmetric relationship among the modelled variable, this study utilized the standard method of ARDL

**Model 1**

$$\Delta COR = \beta_0 + \beta_1 COR_{t-1} + \beta_2 ED_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7\ PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 COR_{t-i} + \alpha_1 ED_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6\ PS_{t-i} + \alpha_7\ GE_{t-i} + \varepsilon \text{ ------Eq. 4.1}$$

$$\Delta COR = \beta_0 + \beta_1 COR_{t-1} + \beta_2 RD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7\ PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 COR_{t-i} + \alpha_1 RD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6\ PS_{t-i} + \alpha_7\ GE_{t-i} + \varepsilon \text{ -----Eq. 4.2}$$

$$\Delta COR = \beta_0 + \beta_1 COR_{t-1} + \beta_2 CD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7\ PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 COR_{t-i} + \alpha_1 CD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6\ PS_{t-i} + \alpha_7\ GE_{t-i} + \varepsilon\text{-----Eq. 4.3}$$

**Model 2**

$$\Delta L\&O = \beta_0 + \beta_1 L\&O_{t-1} + \beta_2 ED_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7\ PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 L\&O_{t-i} + \alpha_1 ED_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6\ PS_{t-i} + \alpha_7\ GE_{t-i}\ \varepsilon \text{ ------Eq. 5.1}$$

$$\Delta L\&O = \beta_0 + \beta_1 L\&O_{t-1} + \beta_2 RD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7\ PS_{t-1} + \beta_8\ GE_{t-1} + \alpha_0 L\&O_{t-i} + \alpha_1 RD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6\ PS_{t-i} + \alpha_7\ GE_{t-i} + \varepsilon \text{ ------Eq. 5.2}$$

$$\Delta L\&O = \beta_0 + \beta_1 L\&O_{t-1} + \beta_2 CD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7 PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 L\&O_{t-i} + \alpha_1 CD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6 PS_{t-i} + \alpha_7 GE_{t-i} + \varepsilon$$ ------Eq. 5.3

**Model 3**

$$\Delta V\&A = \beta_0 + \beta_1 V\&A_{t-1} + \beta_2 ED_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7 PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 V\&A_{t-i} + \alpha_1 ED_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6 PS_{t-i} + \alpha_7 GE_{t-i} + \varepsilon$$ ------Eq. 6.1

$$\Delta V\&A = \beta_0 + \beta_1 V\&A_{t-1} + \beta_2 RD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7 PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 V\&A_{t-i} + \alpha_1 RD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6 PS_{t-i} + \alpha_7 GE_{t-i} + \varepsilon$$ ------Eq. 6.2

$$\Delta V\&A = \beta_0 + \beta_1 V\&A_{t-1} + \beta_2 CD_{t-1} + \beta_3 HC_{t-1} + \beta_4 GDP_{t-1} + \beta_5 TO_{t-1} + \beta_6 CPI_{t-1} + \beta_7 PS_{t-1} + \beta_8 GE_{t-1} + \alpha_0 V\&A_{t-i} + \alpha_1 CD_{t-i} + \alpha_2 HC_{t-i} + \alpha_3 GDP_{t-i} + \alpha_4 TO_{t-i} + \alpha_5 CPI_{t-i} + \alpha_6 PS_{t-i} + \alpha_7 GE_{t-i} + \varepsilon$$ ------Eq. 6.3

In Equations 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 6.2, and 6.3, α0, α1, α2, α3, α4, α5, α6, and α7 represents the long-run relationship while β1 to β7 represents short-run dynamics. In the next step, the study follows the Error correction model (ECM) to estimate the short dynamics and ECM can be expressed in the following form:

$$\Delta COR = \alpha_0 \sum_{i=1}^{n} COR_{t-i} + \alpha_1 \sum_{i=0}^{n} ED_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 7.1

$$\Delta COR = \alpha_0 \sum_{i=1}^{n} COR_{t-i} + \alpha_1 \sum_{i=0}^{n} RD_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 7.2

$$\Delta COR = \alpha_0 \sum_{i=1}^{n} COR_{t-i} + \alpha_1 \sum_{i=0}^{n} CD_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 7.3

$$\Delta L\&O = \alpha_0 \sum_{i=1}^{n} L\&O_{t-i} + \alpha_1 \sum_{i=0}^{n} ED_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 8.1

$$\Delta L\&O = \alpha_0 \sum_{i=1}^{n} L\&O_{t-i} + \alpha_1 \sum_{i=0}^{n} RD_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 8.2

$$\Delta L\&O = \alpha_0 \sum_{i=1}^{n} L\&O_{t-i} + \alpha_1 \sum_{i=0}^{n} CD_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 8.3

$$\Delta V\&A = \alpha_0 \sum_{i=1}^{n} V\&A_{t-i} + \alpha_1 \sum_{i=0}^{n} ED_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 9.1

$$\Delta V\&A = \alpha_0 \sum_{i=1}^{n} V\&A_{t-i} + \alpha_1 \sum_{i=0}^{n} RD_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 9.2

$$\Delta V\&A = \alpha_0 \sum_{i=1}^{n} V\&A_{t-i} + \alpha_1 \sum_{i=0}^{n} ED_{t-i} + \alpha_2 \sum_{i=0}^{n} HC_{t-i} + \alpha_3 \sum_{i=0}^{n} GDP_{t-i} + \alpha_4 \sum_{i=0}^{n} TO_{t-i} + \alpha_5 \sum_{i=0}^{n} CPI_{t-i} + \alpha_6 \sum_{i=0}^{n} PS_{t-i} + \alpha_7 \sum_{i=0}^{n} GE_{t-i} + \eta ECT_{t-i} + \varepsilon$$ -----Eq. 9.3

In Equations 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 9.1, 9.2, and 9.3 $ECT_{t-i}$ are the error correction term and η shows the speed of adjustment; for a stable model, the study expects the negative sign with ECM and the value of η is less than one.

## Results and Discussion

This is the section that concludes the manuscript.

**Table 1. Descriptive Statistics**

| Variables | Mean | Median | Maximum | Minimum | Std. Dev. | Skewness | Kurtosis | Jarque-Bera | Probability |
|---|---|---|---|---|---|---|---|---|---|
| CD | 24.77 | 26.02 | 27.69 | 4.77 | 5.42 | -3.41 | 13.16 | 2.925 | 0.310 |
| ED | 26.76 | 28.11 | 28.88 | 8.06 | 5.03 | -3.51 | 13.58 | 7.373 | 0.400 |
| GDP | 1.40 | 1.52 | 2.02 | 0.47 | 0.42 | -0.58 | 2.50 | 1.056 | 0.590 |
| CPI | 4.54 | 4.66 | 5.21 | 3.83 | 0.48 | -0.25 | 1.51 | 1.639 | 0.441 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| HC | 3.48 | 3.51 | 3.80 | 2.97 | 0.23 | -0.74 | 2.66 | 1.545 | 0.462 |
| RD | 26.92 | 28.24 | 29.14 | 8.10 | 5.06 | -3.51 | 13.58 | 0.423 | 0.751 |
| COR | -0.94 | -0.91 | -0.78 | -1.18 | 0.13 | -0.30 | 1.58 | 1.589 | 0.452 |
| PS1 | -2.28 | -2.42 | -1.55 | -2.81 | 0.43 | 0.66 | 1.96 | 1.881 | 0.390 |
| L& O | -0.84 | -0.86 | -0.67 | -0.99 | 0.09 | 0.25 | 2.15 | 0.642 | 0.725 |
| V&A | -0.88 | -0.85 | -0.69 | -1.17 | 0.15 | -0.67 | 2.34 | 1.471 | 0.479 |
| GE | -0.65 | -0.66 | -0.38 | -0.83 | 0.14 | 0.33 | 1.95 | 1.023 | 0.600 |

Note: This table shows the descriptive statistics of all the variables showing the behaviour of the data.

Table 1 shows the summary of statistics for all variables. The results indicate a positive mean for all variables except COR, PS, L& O, V &A, and GE. Moreover, the results indicate that the skewness value of all variables is negative except PS and L& O. The value of skewness can be zero, positive or negative. It gives information about the shape of the data. Our variables LNCD, LNED, LNGDP, LNCPI, LNHC, LNRD, COR, V&A, and GE have positive skewness values, which indicate that data are asymmetrically distributed with a long tail to the right while negative values for PS and L& O indicate that data are asymmetrical with a long tail to the left. Moreover, kurtosis values are positive for all variables which indicates that the distribution of data is more peaked than a Gaussian distribution. To check the null hypothesis of normality, the study used Jarque and Bera (1980) test and found that all variables have positive value for Jarque and Bera and are insignificant at 5%, which indicate that we accept the null hypothesis that the series is following a normal distribution.

**Unit Root Test**

To understand and forecast the relationship of macroeconomic time series, one major problem that central group economists face is that these series are often non-stationary and non-stationary series produce misleading parameters of the relationship between variables (Mahadeva & Robinson, 2004). Therefore, it is common to employ a unit root test to check stationarity, to avoid the problem of spurious relationships among variables of interest. Moreover, stationary time series play an important L& Oe in forecasting and help the researcher to choose appropriate models to make accurate predictions (Diebold & Kilian, 2000). The empirical literature recommends that checking of unit root test is mandatory before accepting a model. This study examined the stationary properties of the series by using Augmented Dickey-Fuller test unit root tests. The Augmented Dickey-Fuller (ADF) test is a statistical test used to determine if a time series is stationary or non-stationary. Stationary time series has a constant mean, variance, and autocorrelation over time, while non-stationary time series have one or more of these properties that change over time. The ADF test is an extension of the Dickey-Fuller test, which is used for testing the stationarity of a time series. The ADF test accounts for serial correlation and allows for the presence of a trend in the data, making it more appropriate for real-world applications.

The ADF test works by estimating the coefficient of an autoregressive model and comparing it to a critical value. If the coefficient is larger than the critical value, the null hypothesis of non-stationarity is rejected, indicating that the time series is stationary. If the coefficient is smaller than the critical value, the null hypothesis cannot be rejected, indicating that the time series is non-stationary. The ADF test is commonly used in econometrics and finance to test the stationarity of financial time series, such as stock prices or exchange rates. It is also used in other fields, such as meteoL& Oogy, to test the stationarity of climate data. The results of the ADF unit root test are reported in Table 2. Results indicate that all variables are stationary at first difference except GDP and HC which are stationary at level.

**Table 2. Augmented Dickey-Fuller Unit Root**

| Series | At level | At First Difference |
|---|---|---|
| DC | -1.983014 | -3.251337* |
| ED | -1.765154 | -4.919624* |
| RD | -1.704395 | -4.984242 |
| GDP | -3.667572* | -1.187169 |
| HC | -5.863316* | -2.206703 |
| TO | -2.317484 | -5.050910* |
| CPI | 0.069794 | -4.485480* |
| COR | -2.326305 | -4.774695* |
| GE | -1.740506 | -2.922408* |
| PS | -1.932232 | -2.949927* |
| V&A | -1.850466 | -3.946948* |
| L&O | 1.579505 | -5.964846* |

**Multicolinearity**

Multicollinearity, a high correlation among independent variables, biases the estimated results and has damaging effects on multiple regressions. A multi-collinearity problem exists when the correlation coefficients in the correlation matrix are greater than 0.80 (Cooper et al., 2003). This study employed correlation analysis to diagnose the problem of multicollinearity among independent variables. Results are reported in Table 3 and results indicate that correlation values for all variables are less than 0.7 except CD, RD and ED. Results indicate that there is high multicollinearity among CD, ED and RD, so this study utilizes these three measurements of fiscal decentralization into three different equations to contL& O multicollinearity among these variables and to obtain reliable regression estimates.

**Table 3. Correlation Analysis**

| | **LNCD1** | **LNED** | **LNGDP** | **LNCPI1** | **LNHC1** | **LNRD** | **COR** | **PS1** | **L& O** | **V_A** | **GE** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CD | 1 | | | | | | | | | | |
| ED | 0.61 | 1 | | | | | | | | | |
| GDP | 0.19 | 0.23 | 1 | | | | | | | | |
| CPI | -0.23 | 0.29 | -0.04 | 1.00 | | | | | | | |
| HC | -0.09 | 0.57 | 0.08 | 0.88 | 1.00 | | | | | | |
| RD | 0.74 | 0.85 | 0.08 | 0.12 | 0.40 | 1.00 | | | | | |
| COR | -0.15 | 0.05 | 0.28 | 0.32 | 0.35 | -0.10 | 1.00 | | | | |
| PS1 | -0.14 | -0.61 | 0.26 | -0.57 | -0.36 | -0.53 | -0.07 | 1.00 | | | |
| L& O | -0.42 | -0.03 | -0.07 | 0.31 | 0.52 | -0.24 | 0.37 | -0.36 | 1.00 | | |
| V_A | 0.03 | 0.06 | -0.26 | 0.57 | 0.34 | 0.01 | 0.07 | -0.47 | 0.68 | 1.00 | |
| GE | -0.01 | -0.31 | 0.47 | -0.64 | -0.52 | -0.28 | 0.22 | 0.24 | -0.23 | -0.35 | 1.00 |

**Bound Test**

F-statistics are used to test long-run co-integration among variables. The null and alternate hypotheses of cointegration among the variables are as follows:

$$H0: \ \gamma 1 = \gamma 2 = \gamma 3 = \gamma 4 = \gamma 5 = 0$$

$$H1: \ \gamma 1 \neq \gamma 2 \neq \gamma 3 \neq \gamma 4 \neq \gamma 5 \neq 0$$

There are two sets of critical values given by (Pesaran, Shin, & Smith, 2001). One set of values is known as the upper bound and the second one is called the lower bound. In the lower bound case all the variables are integrated at the level I(0) and in the upper bound situation, all the variables are integrated at first order I(1). The calculated F value is compared with critical bound values at a different level of significance such as 1%, 5% and 10%. If the calculated F-statistic value is less than the lower bound value then it shows no co-integration among variables and if the computed F value is more than the upper bound value then, there is co-integration among variables t some specific level of significance. It may also be possible that if the F value lies between upper and lower bounds then in this case test will be inconclusive. This study used ARDL bound test to find the long-run cointegration among modelled variables and results are reported in Table 4. Results indicate that all computed F. statistics values are greater than upper and lower bound values in all three models for all three equations in each model which indicate that long-run cointegration in all three models exists.

**Table 4. ARDL Bounds Test**

| **Equations** | **Null Hypothesis: No long-run relationships exist** | | |
|---|---|---|---|
| | Model 1; K=7 | Model 2; K=7 | Model 3; K=7 |
| | Test Statistic: F-statistic Value | Value | |
| Equation 1 | 8.618836 | 12.11641 | 20.86222 |
| Equation 2 | 11.08222 | 21.01178 | 601.6521 |
| Equation 3 | 32.08222 | 10.90755 | 50.577535 |
| Critical Value Bounds | | | |
| Significance | I0 Bound | I1 Bound | |
| 10% | 2.03 | 3.13 | |
| 5% | 2.32 | 3.5 | |
| 2.5% | 2.6 | 3.84 | |
| 1% | 2.96 | 4.26 | |

The ARDL results are reported in Table 5. This study estimated three equations using different measures of fiscal decentralization: expenditure decentralization (ED), revenue decentralization (RD), and composite decentralization (CD). Since these measures are highly

correlated (Table 3), each was used in a separate equation to avoid multicollinearity. Model 1 shows convergence speeds of 10%, 13%, and 25% in equations 1–3, confirming model stability. Model 2 reports speeds of 15%, 8%, and 78%. Model 3 indicates much faster convergence, with rates of 96%, 97%, and 97.6%. Thus, while all models converge toward equilibrium aftershocks, Model 3 demonstrates the highest speed of adjustment compared to Models 1 and 2.

**Table 5. Auto Regressive Distributive Lag Model (ARDL)**

| | **Dependent Variable: COR** | | | **Dependent Variable: L& O** | | | **Dependent Variable: V&A** | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Model 1** | | | **Model 2** | | | **Model 3** | | |
| | **Eq. 1** | **Eq. 2** | **Eq. 3** | **Eq. 1** | **Eq. 2** | **Eq. 3** | **Eq. 1** | **Eq. 2** | **Eq. 3** |
| | **β** | **β** | **β** | **β** | **β** | **β** | **β** | **β** | **β** |
| | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** | **(S.E)** |
| **Variable** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** | **[t-Values]** |
| COR(-1) | -.107 | -0.130 | -0.257 | | | | | | |
| | (0.051) | (0.018) | (0.035) | | | | | | |
| | [-2.09] | [-7.22] | [-7.34] | | | | | | |
| L& O(-1) | | | | -0.151 | -0.779 | -0.783 | | | |
| | | | | (0.03) | (0.073) | (0.078) | | | |
| | | | | [5.03] | [10.61] | [10.61] | | | |
| V&A (-1) | | | | | | | -0.964 | -0.970 | -0.976 |
| | | | | | | | (0.040) | (-0.042) | (0.037) |
| | | | | | | | [24.30] | [22.89] | [26.32] |
| ED | 0.040* | | | 0.050* | | | 0.009* | | |
| | (0.017) | | | (0.014) | | | (0.002) | | |
| | [-2.37] | | | [-3.57] | | | [5.29] | | |
| RD | | -0.017* | | | 0.07* | | | 0.006* | |
| | | (0.007) | | | (0.01) | | | (0.001) | |
| | | [2.32] | | | [7.0] | | | [4.44] | |
| CD | | | -0.031* | | | 0.03* | | | 0.014* |
| | | | (0.012) | | | (0.001) | | | (0.002) |
| | | | [2.54] | | | [30.0] | | | [8.57] |
| HC | -2.512 | -2.153* | -2.125* | 0.773 | 0.210 | 0.128* | 0.009* | 0.033 | 0.015 |
| | (1.627) | (0.575) | (0.564) | (1.257) | (0.145) | (0.046) | (0.002) | (0.050) | (0.036) |
| | [-1.54] | [-3.74] | [-3.76] | [-0.61] | [1.44] | [3.20] | [5.29] | [0.66] | [0.41] |
| HC1(-1) | -0.483 | | | 1.204 | 0.224 | | | | |
| | (0.635) | | | (0.699) | (0.147) | | | | |
| | [-0.76] | | | [1.72] | [1.52] | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| GDP | -0.485* | -0.093 | -0.081 | 0.188* | 0.017 | 0.025 | 0.092* | 0.038* | 0.068* |
| | (0.140) | (0.110) | (0.106) | (0.084) | (0.013) | (0.015) | (0.017) | (0.017) | (0.013) |
| | [-3.44] | [-0.84] | [-0.77] | [2.22] | [1.25] | [1.59] | [5.43] | [2.23] | [5.17] |
| GDP(-1) | | -0.269 | 0.277 | 0.174 | | | 0.100 | 0.047 | 0.068 |
| | | (0.117) | (0.117) | (0.080) | | | (0.016) | (0.017) | (0.013) |
| | | [-2.28] | [2.36] | [2.17] | | | [6.26] | [2.82] | [5.36] |
| LNTO | -0.636 | -0.604 | | 0.397 | 0.076 | 0.086 | 0.162 | 0.278 | 0.325 |
| | (0.092) | (0.084) | | (0.027) | (0.051) | (0.054) | (0.081) | (0.090) | (0.070) |
| | [-6.91] | [-7.19] | | [14.70] | [1.49] | [1.57] | [2.01] | [3.09] | [4.64] |
| LNTO(-1) | 2.412 | | 0.478 | 0.517 | | | -0.112 | -0.235 | -0.273 |
| | (0.752) | | (0.476) | (0.413) | | | (0.085) | (0.094) | (0.073) |
| | [3.20] | | [1.00] | [1.25] | | | [-1.32] | [-2.49] | [-3.73] |
| PS1 | 0.443* | 0.914* | 0.856* | 0.535* | 0.026 | 0.122* | 0.180* | 0.150* | 0.240* |
| | (0.022) | (0.309) | (0.294) | (0.222) | (0.029) | (0.062) | (0.026) | (0.027) | (0.024) |
| | [20.13] | [2.96] | [2.90] | [2.40] | [0.91] | [1.97] | [6.92] | [5.55] | [10.00] |
| GE1 | 0.786 | -0.197 | -0.283 | 1.307* | 0.509* | 0.425* | 0.294* | 0.222* | 0.193* |
| | (0.767) | (0.629) | (0.633) | (0.521) | (0.117) | (0.114) | (0.090) | (0.095) | (0.074) |
| | [1.02] | [-0.31] | [-0.44] | [2.50] | [4.34] | [3.71] | [3.28] | [2.33] | [2.61] |
| GE1(-1) | 3.168 | 0.947 (0.557) | 1.076 | -0.294 | -0.441 | -0.339 | -0.332 | -0.219 | -0.213 |
| | (0.759) | [1.69] | (0.577) | (0.381) | (0.110) | (0.107) | (0.082) | (0.089) | (0.068) |
| | [4.17] | | [1.86] | [-0.77] | [-3.97] | [-3.16] | [-4.05] | [-2.47] | [-3.11] |
| CPI | 0.0008 | -0.002 | 0.001 | -0.003 | -0.003 | -0.002 | -0.003 | -0.002 | -0.004 |
| | (0.0004) | (0.002) | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| | [1.8721 | [-1.174] | [2.973] | [-2.620] | [-2.53] | [-2.47] | [-3.49] | [-2.22] | [-4.99] |
| CPI(-1) | | 0.003 | | 0.001 | -0.002 | -0.001 | -0.003 | -0.002 | -0.004 |
| | | (0.001) | | (0.000) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| | | [1.798] | | [2.973] | [-2.01] | [-1.85] | [-3.54] | [-2.06] | -4.78 |
| C | -40.35 | -8.287 | -7.610 | -10.08 | -0.434 | -0.501 | -0.215 | -0.120 | -0.246 |
| | (10.60) | (2.554) | (2.411) | (6.969) | (0.210) | (0.252) | (0.153) | (0.165) | (0.179) |
| | [-3.80] | [-3.24] | [-3.15] | [-1.44] | [-2.06] | [-1.98] | [-1.41] | [-0.72] | [-1.38] |
| R-squared | 0.941 | 0.816 | 0.817 | 0.932 | 0.909 | 0.907 | 0.981 | 0.979 | 0.987 |
| Adjusted R-squared | 0.763 | 0.510 | 0.512 | 0.729 | 0.892 | 0.892 | 0.977 | 0.975 | 0.984 |
| Durbin-Watson stat | 2.114 | 1.97 | 2.176 | 1.954 | 1.917 | 1.905 | 2.003 | 1.860 | 1.701 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| F-statistic | 5.295 | 2.666 | 5.677 | 4.594 | 3.563 | 5.780 | 1.420 | 3.188 | 3.231 |
| Prob(F-statistic) | 0.060 | 0.121 | 0.120 | 0.077 | 0.127 | 0.0651 | 0.1315 | 0.312 | 0.081 |
| LM Test:F-statistic | 2.014 | 0.553 | 0.455 | 0.007 | 0.020 | 0.063 | 0.79 | 0.49 | 0.03 |
| | (0.09) | (0.57) | (0.63) | (0.99) | (0.97) | (0.93) | (0.45) | (0.61) | (0.97) |
| Heteroskedasticity Test: F-statistic | 0.550 | 0.200 | 0.934 | 0.963 | 1.011 | 1.056 | 0.77 | 0.60 | 0.78 |
| | (0.80) | (0.74) | (0.66) | (0.47) | (0.44) | (0.40) | (0.66) | (0.770 | (0.62) |

In Model 1, results show that expenditure decentralization (ED) increases corruption, while revenue (RD) and composite decentralization (CD) reduce it. A 1% rise in ED raises corruption by 0.4%, supporting Fisman and Gatti (2002) and Shelleh (2017). In developing nations, greater local discretion over resources creates rent-seeking and bribery opportunities. Conversely, a 1% increase in RD lowers corruption by 0.1%, consistent with Fisman and Gatti (2002), as local revenue generation improves efficiency, accountability, and transparency. In Model 2, ED, RD, and CD all positively influence rule of law. As fiscal decentralization rises, law and order improve, consistent with Mauro, Pigliaru, and Carmeci (2018), since stronger local institutions better manage resources and uphold governance. In Model 3, ED, RD, and CD positively affect democratic accountability, showing that greater fiscal decentralization enhances accountability in Pakistan.

Model 1 shows that human capital significantly reduces corruption, consistent with Dridi (2014) and Shelleh (2017). Higher human capital lowers corruption as skilled individuals are more aware of their rights, less likely to engage in corrupt practices, and more accountable for their actions. Models 2 and 3 indicate that human capital positively influences law and order as well as democratic accountability, since educated people are more likely to respect the law and support democracy (Wacziarg, 2001).

ARDL results also show that economic growth (GDP) reduces corruption, supporting Nwankwo (2014). Growth fosters a middle class that demands accountability and transparency, pressuring governments to act in the public interest. In Models 2 and 3, economic growth positively affects law and order and democratic accountability: a 1% increase in growth raises law and order by 0.2% and accountability by 0.9%. These findings align with Nawaz (2015), who noted stronger effects in high-income countries, and with Dellepiane-Avellaneda (2010), who linked growth to stronger institutions, better governance, and improved democratic outcomes.

Model results show that trade openness reduces corruption but strengthens law and order as well as democracy and accountability. This supports Marjit, Mandal, and Roy (2014), who found that trade liberalization increases competition, reduces rent-seeking, and promotes transparency. Trade openness also familiarizes countries with international standards, further curbing corruption. Consistent with Caruso and Schneider (2011), our results show that openness improves law and order, as freer trade enhances business opportunities, prosperity, and lowers crime (Gwartney & Lawson, 2003). Similarly, López-Córdova and Meissner (2005) found that trade openness fosters democracy and accountability by boosting competition, transparency, and governance. Additionally, Model 1 shows that political stability increases corruption: a 1% rise in stability leads to a 44% rise in corruption. Unlike Fredriksson and Svensson (2003), who linked instability with corruption, our findings suggest that in poor countries entrenched elites thrive under stability, controlling resources and manipulating the system to protect corrupt interests.

Results show that political stability positively affects law and order (53%) and democratic accountability (18%). Stability helps devise and implement policies, strengthen institutions, and ensure public participation without fear (Feng, 1997). Government effectiveness (GE) has no significant impact on corruption but strongly improves law and order (53%) and accountability (18%). Effective governments build strong institutions, enforce law and order, and deliver public goods, fostering trust and participatory democracy (Sacks & Levi, 2010). Model 1 also shows inflation increases corruption: a 1% rise in inflation raises corruption by 0.01% (Akça, Ata, & Karaca, 2012). In Models 2 and 3, inflation reduces law and order and accountability by 0.03%. High inflation causes unrest, weakens service delivery, and undermines government credibility, thereby harming democracy (Baloch, Sher, & Zaman, 2013).

This study ensured the reliability and stability of models with several tests, for instance, the value of R2 indicates that in three equations of model 1, 76%, 51.1 %, and 51.2% variations in corruption are explained by independent variables while in the model, in equation 1, 72%, in equation 2, 89% and in equation 3, 89.2% variations in law and order are explained by independent variables. Similarly, in model 3, three equations explain 97%, 97.5%, and 98.4% variation in democratic accountability. Moreover, the value of Durbin Watson test indicates that there is no serial correlation because all values of Durbin Watson are within the range of 1.7 to 2.1 and F. statistic values of the LM test also confirm Durbin Watson results of no serial correlation in all models at 5% level of significance. Moreover, F. statistics of the Heteroskedasticity Test indicate that there is no heteroscedasticity at a 5% level of significance. Similarly, all value of F. statistics are above 3 which indicate that all models are stable, similarly, the results of CUSUM square indicate that all model is stable and presented in Figure 1 (Model 1), Figure 2 (Model 2) and Figure 3 (model 3) below.

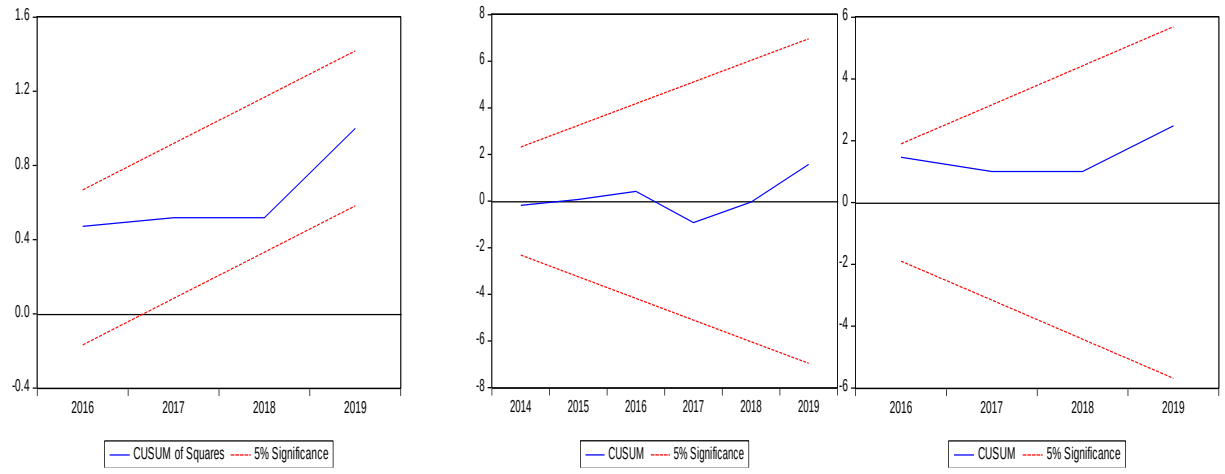



**Figure 1. CUSUM Square of Model – 1 (Source: Generated by Authors)**

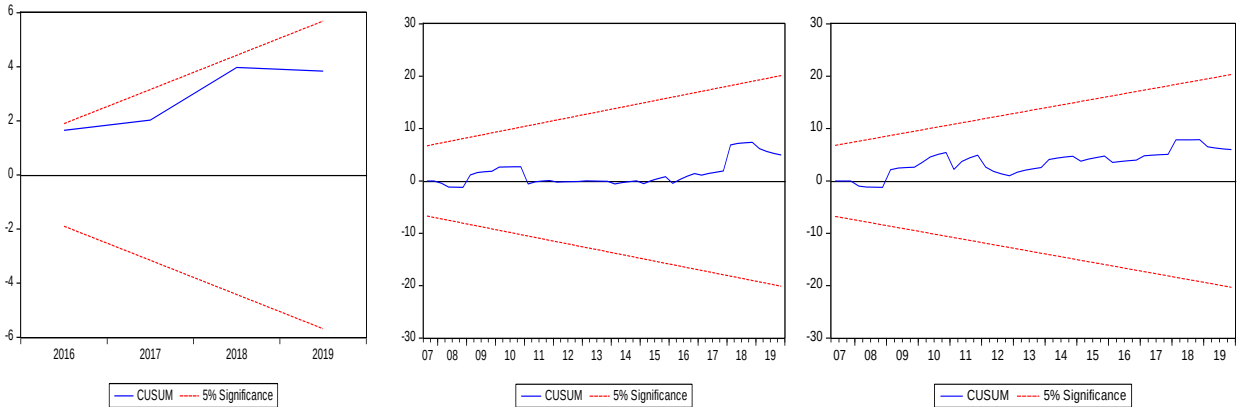



**Figure 2. CUSUM Square of Model – 2 (Source: Generated by Authors)**

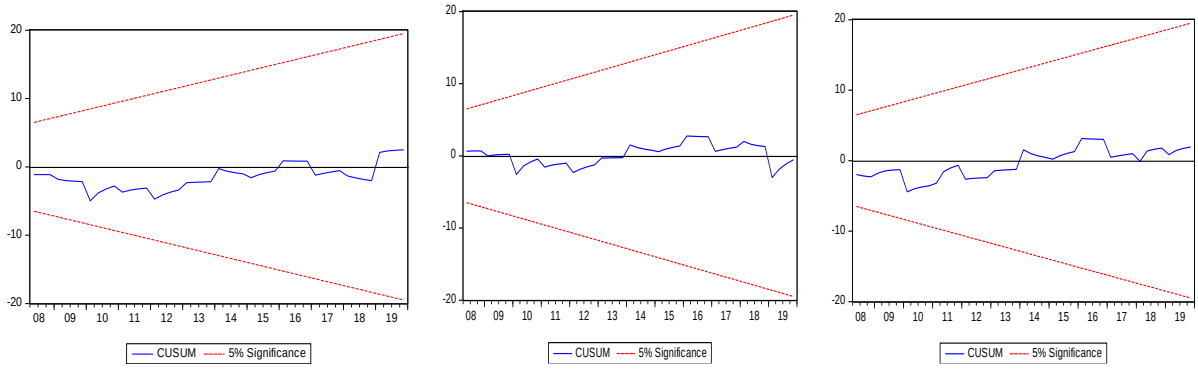



**Figure 3. CUSUM Square of Model – 3 (Source: Generated by Authors)**

## Conclusion

This study aimed to estimate three models. Model 1 examined the impact of fiscal decentralization on corruption; Model 2 examined the impact of fiscal decentralization on law and order while Model 3 examined the impact of fiscal decentralization on democratic accountability. This study utilized three measurements for fiscal decentralization; named expenditure decentralization, revenue decentralization and composite decentralization. All three measurements of fiscal decentralization are highly correlated with each other, so to control the problem of multicollinearity, this study estimated three equations for each model, and each equation entertains one measurement of fiscal decentralization. In equation one, expenditure decentralization is used along with other independent variables to examine the impact of fiscal decentralization on corruption, law and order, and democratic accountability while in equation 2 revenue decentralization is used along with other determinants to assess the impact of fiscal decentralization on corruption, law and order, and

democratic accountability and equation 3 used composite decentralization to analyze the impact of fiscal decentralization on corruption, law and order, and democratic accountability. This study extracted the data from different reports of economic surveys, world development indicators, and world governance indicators for the period of 1996 to 2022. Moreover, this study utilized ARDL bound test to assess the short-run and long-run estimates for the modelled variables. In model 1, the results of equations 1, 2, and 3 indicate that there is a positive and significant association between expenditure decentralization (ED) and corruption, while revenue decentralization (RD) and composite decentralization (CD) negatively and significantly affect corruption. Similarly, human capital, economic growth, trade openness, and government effectiveness are significantly and negatively associated with corruption while political stability and inflation have a positive and significant association with corruption. In model 2, the results of equations 1, 2 and 3 indicate that ED, RD and CD, human capital, economic growth, trade openness, political stability and government effectiveness have a positive and significant association with rule of law while inflation has a negative and significant association with rule of law. In model 3, the results of equations 1, 2 and 3 indicate that ED, RD and CD, human capital, economic growth, trade openness, political stability and government effectiveness have a positive and significant association with democratic accountability while inflation has a negative and significant association with democratic accountability.

Based on the conclusion, study suggests that improving institutional quality requires a comprehensive set of policy actions. Expanding both expenditure and revenue decentralization is important, as greater fiscal autonomy can play a decisive role in institutional strengthening. Alongside this, policymakers should prioritize investment in human capital and ensure steady economic growth, as these elements are fundamental to institutional performance. Opening up the economy through trade liberalization can also provide an enabling environment for stronger institutions. Moreover, keeping inflation under control is essential for maintaining macroeconomic balance, which directly influences institutional stability. Ensuring political stability through well-defined rules and frameworks further enhances institutional resilience. In addition, introducing effective governance mechanisms is necessary to consolidate institutional capacity and guarantee their sustainability in the long run.

## References


1. Akça, H., Ata, A. Y., & Karaca, C. (2012). Inflation and corruption relationship: Evidence from panel data in developed and developing countries. International Journal of Economics and Financial Issues, 2(3), 281-295.
2. Alonso, J. A., Garcimartin, C., & Kvedaras, V. (2020). Determinants of institutional quality: an empirical exploration. Journal of Economic Policy Reform, 23(2), 229-247.
3. Arzaghi, M., & Henderson, J. V. (2005). Why countries are fiscally decentralizing. Journal of public economics, 89(7), 1157-1189.
4. Baliamoune-Lutz, M., & Ndikumana, L. (2007). The growth effects of openness to trade and the role of institutions: New evidence from African countries: working paper.
5. Baloch, Q. B., Sher, M., & Zaman, G. (2013). Dilemma of Inflation in Pakistan. Abasyn Journal of Social Sciences, 3(2).
6. Bardhan, P. (2002). Decentralization of governance and development. Journal of economic perspectives, 16(4), 185-205.
7. Bewley, T. F. (1981). A critique of Tiebout's theory of local public expenditures. Econometrica: journal of the Econometric Society, 713-740.
8. Borrmann, A., Busse, M., & Neuhaus, S. (2006). Institutional quality and the gains from trade. Kyklos, 59(3), 345-368.
9. Brennan, G., & Buchanan, J. M. (1980). The power to tax: Analytic foundations of a fiscal constitution: Cambridge University Press.
10. Busse, M., & Hefeker, C. (2007). Political risk, institutions and foreign direct investment. European Journal of Political Economy, 23(2), 397-415.
11. Caruso, R., & Schneider, F. (2011). The socio-economic determinants of terrorism and political violence in Western Europe (1994–2007). European Journal of Political Economy, 27, S37-S49.
12. Dang, D. A. (2010). Trade liberalization and institutional quality: Evidence from Vietnam.
13. Digdowiseiso, K. (2023). Institutional quality as the driver of fiscal decentralization in developing countries. Cogent Economics & Finance, 11(2), 2234220.
14. Dellepiane-Avellaneda, S. (2010). Good governance, institutions and economic development: Beyond the conventional wisdom. British Journal of Political Science, 40(1), 195-224.

15. Dias, J., & Tebaldi, E. (2012). Institutions, human capital, and growth: The institutional mechanism. Structural change and economic dynamics, 23(3), 300-312.

16. Digdowiseiso, K. (2022). Are fiscal decentralization and institutional quality poverty abating? Empirical evidence from developing countries. Cogent Economics & Finance, 10(1), 2095769.

17. Ding, Y., Tunio, F. H., & Nabi, A. A. (2024). Harmonizing the complexities of financial development and fiscal decentralization in highly populated nations for monitoring environmental quality. Heliyon, 10(21).

18. Dridi, M. (2014). Corruption and education: Empirical evidence. International Journal of Economics and Financial Issues, 4(3), 476-493.

19. Enikolopov, R., & Zhuravskaya, E. (2004). oDecentraliza% tion and Political Institutions, pmimeo. Institute for Advanced Study, Princeton.

20. Enikolopov, R., & Zhuravskaya, E. (2007). Decentralization and political institutions. Journal of public economics, 91(11-12), 2261-2290.

21. Escaleras, M., & Chiang, E. P. (2017). Fiscal decentralization and institutional quality on the business environment. Economics Letters, 159, 161-163.

22. Faguet, J.-P. (2004). Does decentralization increase government responsiveness to local needs?: Evidence from Bolivia. Journal of public economics, 88(3-4), 867-893.

23. Falleti, T. G. (2005). A sequential theory of decentralization: Latin American cases in comparative perspective. American political science review, 99(3), 327-346.

24. Faruq, H. A., & Taylor, A. C. (2011). Quality of education, economic performance and institutional environment. International Advances in economic research, 17, 224-235.

25. Feng, Y. (1997). Democracy, political stability and economic growth. British Journal of Political Science, 27(3), 391-418.

26. Fisman, R., & Gatti, R. (2002). Decentralization and corruption: evidence across countries. Journal of public economics, 83(3), 325-345.

27. Fredriksson, P. G., & Svensson, J. (2003). Political instability, corruption and policy formation: the case of environmental policy. Journal of public economics, 87(7-8), 1383-1405.

28. Gwartney, J., & Lawson, R. (2003). The concept and measurement of economic freedom. European Journal of Political Economy, 19(3), 405-430.

29. Henisz, W. J. (2000). The institutional environment for economic growth. Economics & Politics, 12(1), 1-31.

30. Huther, J., & Shah, A. (2005). A simple measure of good governance. Public services delivery, 39.

31. Iqbal, N. (2013). Fiscal decentralisation, democratic institutions and inflation. The Pakistan Development Review, 207-220.

32. Iqbal, N., Din, M. U., & Ghani, E. (2012). Fiscal decentralisation and economic growth: role of democratic institutions. The Pakistan Development Review, 173-195.

33. Javid, A. Y., & Arif, U. (2012). Analysis of revenue potential and revenue effort in developing Asian countries. The Pakistan Development Review, 365-379.

34. Knack, S., & Keefer, P. (1995). Institutions and economic performance: cross-country tests using alternative institutional measures. Economics & Politics, 7(3), 207-227.

35. Law, C.-H., & Soon, S.-V. (2020). The impact of inflation on income inequality: the role of institutional quality. Applied Economics Letters, 27(21), 1735-1738.

36. López-Córdova, J. E., & Meissner, C. M. (2005). The globalization of trade and democracy, 1870-2000: National Bureau of Economic Research Cambridge, Mass., USA.

37. Machado, F. V. (2013). Decentralization and accountability: The curse of local underdevelopment.

38. Marjit, S., Mandal, B., & Roy, S. (2014). Trade openness, corruption and factor abundance: evidence from a dynamic panel. Review of Development Economics, 18(1), 45-58.

39. Martinez-Vazquez, J., & Timofeev, A. (2010). Decentralization measures revisited. Public Finance and Management, 10(1), 13-47.

40. Mai, W., Mai, L., & Chen, Y. (2025). Assessing the expenditure decentralization in enhancing public service quality: Evidence from 29 province in China. Evaluation and Program Planning, 110, 102551.

41. Ma, L., Sun, M., Yan, H., & Chen, Y. (2025). Chinese economic development difference factors empirical study. PloS one, 20(5), e0319957.

42. Mauro, L., Pigliaru, F., & Carmeci, G. (2018). Decentralization and growth: Do informal institutions and rule of law matter? Journal of policy modeling, 40(5), 873-902.

43. Memon, R. U. R. (2005). Fiscal decentralization and intergovernmental transfers in Pakistan: An analysis of NFC awards (Unpublished master's thesis). University of Manchester.

44. Memon, R. U. R. (2017). Fiscal decentralization in Pakistan: Issues and challenges [Unpublished individual research paper]. National Institute of Public Administration (NIPA), Karachi.

45. Minea, A., & Villieu, P. (2009). Can inflation targeting promote institutional quality in developing countries. Paper presented at the The 26th Symposium on Money, Banking and Finance, University of Orléans.

46. Nawaz, S. (2015). Growth effects of institutions: A disaggregated analysis. Economic Modelling, 45, 118-126.

47. Nwankwo, O. F. (2014). Impact of corruption on economic growth in Nigeria. Mediterranean Journal of Social Sciences, 5(6), 41.

48. Oates, W. E. (1972). Fiscal federalism. Books.

49. Oates, W. E. (1999). Local property taxation: an assessment. Land Lines, 11(3), 1-3.

50. Pesaran, M. H., Shin, Y., & Smith, R. J. J. J. o. a. e. (2001). Bounds testing approaches to the analysis of level relationships. 16(3), 289-326.

51. Rodden, J. (2004). Comparative federalism and decentralization: On meaning and measurement. Comparative politics, 481-500.

52. Sacks, A., & Levi, M. (2010). Measuring government effectiveness and its consequences for social welfare in sub-Saharan African countries. Social Forces, 88(5), 2325-2351.

53. Salahodjaev, R., & Chepel, S. (2014). Institutional quality and inflation.

54. Sepulveda, C. F., & Martinez-Vazquez, J. (2011). The consequences of fiscal decentralization on poverty and income equality. Environment and Planning C: Government and Policy, 29(2), 321-343.

55. Shelleh, Z. (2017). Impact of fiscal decentralization on institutional quality: Evidence from Developing Countries.

56. Sohail, S., Ullah, S., & Javid, A. Y. (2022). Fiscal decentralization, institutional quality, and government size: an asymmetry analysis for Asian economies. Transnational Corporations Review, 14(3), 256-270.

57. Stoilova, D., & Patonov, N. (2012). Fiscal decentralization: Is it a good choice for the small new member states of the EU. Scientific Annals of the Alexandru Ioan Cuza University of Iasi, Economic Sciences Section, 59(1), 125-137.

58. Tiebout, C. M. (1956). A pure theory of local expenditures. Journal of political economy, 64(5), 416-424.

59. Tranchant, J.-P. (2008). Fiscal decentralisation, institutional quality and ethnic conflict: A panel data analysis, 1985–2001. Conflict, Security & Development, 8(4), 491-514.

60. Treisman, D. (2006). Fiscal decentralization, governance, and economic performance: a reconsideration. Economics & Politics, 18(2), 219-235.

61. Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? Annu. Rev. Polit. Sci., 10, 211-244.

62. Wacziarg, R. (2001). Human capital and democracy. Mimeographed document.

63. Wenjuan, S., & Zhao, K. (2023). Balancing fiscal expenditure competition and long-term innovation investment: Exploring trade-offs and policy implications for local governments. Plos one, 18(11), e0293158.

## Appendix

**Table A1. Variable Description and Measurement**

| Abbreviation | Variable name | Variable Description/Measurement | Data source |
|---|---|---|---|
| DE | Defence expenditure | Defense expenditure % of GDP | WDI |
| IE | Interest payments | interest payments (expenditure) in million | WDI |
| HC | Human capital | School enL& Olment, secondary (% gross) | WDI |
| Imp | Imports | Imports of goods and services (% of GDP) | WDI |
| Exp | Exports | Exports of goods and services (% of GDP) | WDI |
| TO | Trade openness | Import +export | |
| FR | Federal revenue | federal govt. revenue (nontax+tax revenue) | ESP |
| FE | Federal Expenditure | federal govt. expenditure | ESP |
| PR | Provincial revenue | provincial govt. revenue | ESP |
| PE | Provincial expenditure | provincial govt. expenditure | ESP |
| RD | Revenue decentralization | PR/FR+PR | |
| ED | Expenditure decentralization | PE/PE+FE (DE+IE), | |
| CD | Composite decentralization | CD=RD/1-ED | |
| COR | ContL& O of corruption | Values range from approximately -2.5 (weak) to 2.5 (strong) contL& O of corruption) | WGI |
| L& O | Rule of law | Values range from approximately -2.5 (weak) to 2.5 (strong) Rule of law | WGI |
| GE | Government effectiveness | Values range from approximately -2.5 (weak) to 2.5 (strong) government effectiveness | WGI |
| V&A | Violence and accountability | Values range from approximately -2.5 (weak) to 2.5 (strong) voice and accountability | WGI |
| PS | Political stability | Values range from approximately -2.5 (weak) to 2.5 (strong) political stability | WGI |

Note: ESP stands for the economic survey of Pakistan

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