

Journal of Development Policy, Research, & Practice

ISSN (P): [2522-3410](#)

ISSN (E): [2663-3698](#)



Volume 8, 2024

Article History

Submitted:

January 25, 2024

Last Revised:

September 19, 2024

Accepted:

November 29, 2024

Funding

No

Copyright

The Authors

Fiscal Devolution and Corruption in Pakistan: A Non-Linear Analysis

Saira Tufail¹, Bushra Yasmin²

¹Department of Economics, Fatima Jinnah Women University, Rawalpindi, Pakistan

<https://orcid.org/0000-0002-5871-1724>

²Faculty of Arts and Social Sciences, Fatima Jinnah Women University, Rawalpindi, Pakistan

<https://orcid.org/0000-0002-7353-6012>

Correspondence:

Saira Tufail: sairatufail@fjwu.edu.pk

Article Link:

<https://journals.sdpi.org/index.php/JoDPRP/article/view/88>

DOI: <https://doi.org/10.59926/jodprp.vol08/007>

Citation:

Tufail, S. and Yasmin, B. (2024). Fiscal Devolution and Corruption in Pakistan: A Non-Linear Analysis. *Journal of Development Policy, Research & Practice*, vol. 8, pp. 104-127.

Conflict of Interest: Authors declared no Conflict of Interest

Acknowledgment: No administrative and technical support was taken for this research.

Licensing:



licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)



Scan here to read



An official publication of the
Sustainable Development Policy Institute, Islamabad,
Pakistan



Fiscal Devolution and Corruption in Pakistan: A Non-Linear Analysis

*Saira Tufail and Bushra Yasmin**

ABSTRACT

This study analysed the viability of fiscal devolution for controlling state corruption in Pakistan. Specifically, it investigated the role of different types and magnitudes of fiscal decentralisation in controlling corruption after accounting for institutional quality and fiscal reforms. The FMOLS results from 1976–2020 indicated a non-linear relationship between fiscal decentralisation and corruption, implying that decentralisation initially worsened the transparency of state affairs before later improving it. The findings suggested that composite decentralisation should be considered instead of analysing revenue and spending decentralisation separately, and that a minimum of 57% composite decentralisation was necessary for successful corruption control. It was also noted that an institutional structure characterised by low institutional quality and non-transparent fiscal reforms did not substantiate the benefits of fiscal decentralisation for controlling state corruption. The study recommends that fiscal devolution be coordinated with the overall institutional framework of the economy to realise its benefits.

Keywords: Fiscal Decentralisation, Corruption, Pakistan, Institutional Quality, FMOLS

JEL Classification: D73, E6

* **Dr Saira Tufail** is working as Assistant Professor in the Department of Economics, Fatima Jinnah Women University, Rawalpindi, Pakistan. **Prof. Dr Bushra Yasmin** is Professor of Economics at the Faculty of Arts and Social Sciences, Fatima Jinnah Women University, Rawalpindi, Pakistan.

1. INTRODUCTION

Fiscal decentralisation is delegating fiscal and financial responsibilities to sub-national governments and empowering them with independence in planning and decision-making related to financing and management practices. Transferring fiscal autonomy to the sub-national levels of government has been considered an important policy tool for improving allocative efficiency and strengthening good governance which is the core component of decentralisation strategy (Ponce-Rodríguez et al., 2020).

Fiscal decentralisation intends to improve the public sector efficiency by providing public services according to local demand (Guerrero and Castaneda 2021). Oates (2006) asserted that the central government is, by and large, unresponsive towards preference heterogeneity and is only capable of applying uniform policies across the board. From this aspect, fiscal decentralisation is regarded as a beneficial strategy due to the information edge sub-national governments have about the preferences at the local level. Sub-national government can effectively align public services delivery with individuals' needs (Oates 2006; Shah 1998; Enemuo 2000; Rodden and Wibbels 2002). Harmonisation of demand and supply of public services is said to have additional benefits in the form of high tax revenues due to reduced agency cost and information asymmetries and improved trust between taxpayer and service provider (Westergaard and Alam 1995; Livingstone and Charlton 1999).

Transparency is a fundamental tenet of an efficient public services delivery system. Alfano et al., (2019) advocated that an extended degree of discretion of local government on the revenue generation and expenditure decisions imparts stringent responsibility on public officials, mitigation of rent-seeking incentives through direct accountability, and hence higher transparency. From this perspective, fiscal decentralisation can serve as an effective corruption control strategy at the state level attributed to more accountability and transparency in the delivery of public services. Consequently, the taxpayers behave in a responsible manner that helps sub-national governments in effective governing.

Opponents of the decentralisation strategy argue that autonomy at the sub-government level may result in resource exploitation through political lobbying that may hinder the pursuit of transparency and accountability. This may occur in the form of resource exploitation for illicit means and personal benefits and/or inducing unhealthy competition among sub-national governments to reduce tax rates and regulatory standards to attract business in their jurisdiction that can erode revenues and create fiscal imbalance (Prud'homme 1995; Drèze and Sen 2002; Bardhan and Mookherjee, 2006a; 2006b; Weingast 2009). Other negative aspects of decentralisation on the corruption front are duplication of functions, waste of

resources, lack of coordination, and promotion of local interest groups (Ponce-Rodríguez et al., 2020).

A few factors have been discerned from evolving literature and contemporary country experiences that affect the value of fiscal decentralisation in controlling corruption. One such factor is the type or measure of fiscal decentralisation. It has been argued that different measures of decentralisation may affect corruption differently (Alfada 2019). For instance, Fisman and Gatti (2002) argued that in the absence of expenditure decentralisation, revenue decentralisation can increase corruption. This increased corruption is explained by the high maintenance of local revenues which leads to inter-regional inequality and worsens the delivery of public goods leading to confiscating the rights of the poor (Kyriacou and Roca-Sagalés 2011). Another factor is the magnitude of decentralisation itself. Alfano et al., (2019) showed that decentralisation may not help control corruption at all of its levels. Rather, corruption may be non-linearly related to decentralisation.

Given this background, the objectives of the study are manifold. First, the study aims to examine the non-linear relationship between decentralisation and control of corruption. In this regard, the optimal level of decentralisation required for control of corruption is also calculated. Second, the study also examines the potential of disaggregated forms of decentralisation such as expenditure and revenue decentralisation for controlling corruption. Third, the study examines how quality of existing institutional structure affects the relationship between decentralisation and control of corruption. Pertaining to it, the importance of institutional reforms is also examined for possible effects on this relationship.

Though a number of studies have analysed the role of decentralisation for control of corruption, nonetheless, the role of institutional structure and reforms in this regard is scantily investigated. The study contributes to the literature by incorporating this role with the understanding that institutional framework of the country largely affects the significance of decentralisation for the control of corruption. The main manifestation of weak institutional framework is the ability of ruling power elites to usurp public policy for private gains. In the presence of a weak institutional framework, strategies like fiscal decentralisation may be opted for the privatisation of public policies. Alternatively, a well-defined institutional mechanism not only reduces corruption directly by increasing the liability and consequent transparency in the political system (Iqbal 2013) but also makes other related strategies like decentralisation more effective (Enikolopov and Zhuravskaya 2007).

Similarly, another contribution to the literature is to take *de jure* decentralisation in the form of institutional reform in the analysis. It is worth mentioning that there may be a difference

in the degree of fiscal autonomy that sub-national governments are entitled to and the autonomy that they can exercise on both revenue and expenditure fronts. The former is called *de jure* fiscal decentralisation and the latter *de facto* decentralisation. *De jure* decentralisation takes the form of institutional reforms related to fiscal decentralisation. These reforms depict the long-term fiscal stance and, if implemented effectively, can multiply the favourable effects of its *de facto* counterpart along with its direct impact. As institutional reforms are the most effective way of building sound and accountable institutions, hence impact of these reforms also captures the *de jure* component of institutional quality.

All these issues are immensely pertinent to examine in an emerging economy context that is striving to identify policies for controlling corruption not only as an end itself but also as a means for fair distributive and allocative efficiency. In this regard, Pakistan is an important case study due to its endeavour on the decentralisation front. Several studies have focused on assessing the importance of fiscal decentralisation as a growth promoting policy in Pakistan and found mixed results (Iqbal 2013). This study is expected to contribute to the literature by estimating the type and the magnitude of fiscal decentralisation concomitant with the institutional and economic structure of the country. The results are also expected to shed light on the reasons for the inconclusive effects of decentralisation on economic growth.

The rest of the study is organised as follows. Section 2 provides the methodology and 3 reports the empirical findings with conclusions and policy implications in the last part.

2. LITERATURE REVIEW

Literature offers two strands of theoretical and empirical research regarding the link between decentralisation and corruption. According to the first strand, fiscal devolution results in direct accountability by raising competition between sub-jurisdictions and increasing monitoring and timely evaluation of the services provided by local authorities. The centralised government is expected to behave like revenue-maximising monopoly while the decentralised government discourages the rent-seeking behaviour of authorities due to revenue sharing and makes the provisions of public services including health, education, transport and communication, energy and power, municipal services, and law and order more effective (Breton 2002; Shleifer and Vishny 1993; Huther and Shah 1998; Fisman and Gatti 2002; Bardhan and Mookherjee, 2006a, 2006b; Dong and Torgler 2013). Shrestha, Martinez-Vazquez and Hankla (2023) and Ponce-Rodríguez et al., (2020) provided evidence of the favourable impact of decentralisation on the control of corruption.

The other strand postulates negative outcomes of fiscal devolution and provides empirical evidence where fiscal decentralisation ends in the proliferation of local agents and their biased attitude towards pressure groups among local communities due to lack of accountability. Such system weaknesses subdue the positive intentions and fiscal decentralisation spirit and promote rent-seeking practices (Prud'homme 1995; Tanzi 1995; Khattak et al., 2010; Manor 1999). Specifically, low institutional quality, poor governance, and corruption lead to unfair revenue sharing and reduce the potential of the fiscal decentralisation process (Nirola et al., 2022). Therefore, enforcing local government for efficient service delivery, and greater local autonomy in fiscal matters accompanied by strict monitoring is required (Shen and Zou 2015; Vedeld 2003; Bonet 2006; Banwo 2012; Dyah 2012).

Generally, literature has focused on the effects of decentralisation on economic growth, human development, investment, provision of public services, and other macroeconomic indicators, to name a few. While few others investigated the effect of decentralisation on the quality of governance. However, there is a dearth of studies for Pakistan that directly focus on the decentralisation-corruption nexus. In a panel data study, Fiorino et al., (2015) highlighted that more fiscally decentralised economies are characterised by low corruption, and it takes an average of three years to materialise the real effect. In another study, Alfano et al., (2019) worked out non-linearity in the corruption-fiscal decentralisation nexus for the selected panel of countries. Another panel data study by Fisman and Gatti (2002) focused on the corruption and fiscal decentralisation nexus. Both studies came up with negative association of corruption with fiscal decentralisation. However, as these studies did not include Pakistan in their sample, the results may be quite sensitive to the sample selection and hence, cannot be equally applicable to Pakistan. In the pioneer study on fiscal decentralisation, Oates (2006) argued that the case of decentralisation has been treated generally and in an uncritical way with little empirical support. Similarly, Smoke and Lewis (1996) stressed that the experience of decentralisation may vary widely between countries. This invited the authors to investigate country-specific relationship between decentralisation and corruption.

Although, the role of fiscal decentralisation is largely examined for its implication for macroeconomic determinants specifically economic growth, poverty, income inequality, and inflation, to the authors' knowledge no study has been done specifically for Pakistan to investigate the corruption-decentralisation nexus specifically for its non-linearity concern. In a country study, Iqbal (2013) investigated the effect of fiscal devolution on inflation using three measures vis-à-vis revenue, expenditure, and composite decentralisation with and without controlling institutions for 1972-2010 using GMM. The result provided negative effect on inflation with a supporting role of expenditure to revenue

decentralisation. However, the role of the institutions holds significance in materialising the mitigating the effects of decentralisation on inflation in Pakistan. Nevertheless, the non-linearity in corruption-decentralisation nexus is not investigated for Pakistan that can offer a better and clear picture of the phenomenon.

3. MODEL AND DATA DESCRIPTION

Given the theoretical underpinnings of the decentralisation-corruption relationship discussed in the literature review, the analytical model of the study takes the following form:

$$CCorr_t = f(D_t, I_t, X_{jt}) \quad (1)$$

Where $CCorr_t$ is control of corruption, D_t is the vector of decentralisation measure which includes composite, expenditure and revenue decentralisation, I_t is the vector of institution specific variables that includes institutional quality and institutional reforms and X_{jt} are control variables to cater to certain characteristics of the economy. The empirical model used in the study is based on the non-linearity hypothesis of Alfano et al., (2019) that aimed to specify the level of decentralisation effective for the control of corruption. The specific empirical models depicting non-linear relationship between different measures of decentralisation and control of corruption are given as follows:

For general institution quality:

$$CCorr_t = \alpha_0 + \alpha_1 CD_t + \alpha_2 CD_t^2 + \alpha_3 CD_t^3 + \alpha_4 IQ_t + \alpha_5 IQ_t * CD_t + \sum_{j=6}^7 \alpha_j X_{jt} + \mu_t \quad (2)$$

$$CCorr_t = \beta_0 + \beta_1 RD_t + \beta_2 RD_t^2 + \beta_3 RD_t^3 + \beta_4 IQ_t + \beta_5 IQ_t * RD_t + \sum_{j=6}^7 \beta_j X_{jt} + v_t \quad (3)$$

$$CCorr_t = \gamma_0 + \gamma_1 ED_t + \gamma_2 ED_t^2 + \gamma_3 ED_t^3 + \gamma_4 IQ_t + \gamma_5 IQ_t * ED_t + \sum_{j=6}^7 \gamma_j X_{jt} + u_t \quad (4)$$

For specific institutional reforms:

$$CCorr_t = \theta_0 + \theta_1 CD_t + \theta_2 CD_t^2 + \theta_3 CD_t^3 + \theta_4 IR_t + \theta_5 IR_t * CD_t + \sum_{j=6}^7 \theta_j X_{jt} + e_t \quad (5)$$

$$CCorr_t = \delta_0 + \delta_1 RD_t + \delta_2 RD_t^2 + \delta_3 RD_t^3 + \delta_4 IR_t + \delta_5 IR_t * RD_t + \sum_{j=6}^7 \delta_j X_{jt} + \varepsilon_t \quad (6)$$

$$CCorr_t = \varphi_0 + \varphi_1 ED_t + \varphi_2 ED_t^2 + \varphi_3 ED_t^3 + \varphi_4 IR_t + \varphi_5 IR_t * ED_t + \sum_{j=6}^7 \varphi_j X_{jt} + \epsilon_t \quad (7)$$

Equations (2) – (4) are used to determine the type and magnitude of decentralisation for control of corruption with the direct and intermediating role of institutional quality. Types of decentralisation corresponding to composite decentralisation (CD), expenditure decentralisation (ED), and revenue decentralisation (RD) are taken into account. The magnitude of decentralisation effective for control of corruption is incorporated by taking into account the non-linear impact of decentralisation on the control of corruption. In this regard linear, quadratic and cubic terms for decentralisation have been included.

The role of institutional quality (*IQ*) is added as direct and as an interactive variable with fiscal decentralisation consistent with first and second objectives of the study, respectively. The effectiveness of fiscal decentralisation for control of corruption is examined after controlling for economic growth (GDP) and population growth (POP). Equations (4) to (6) are similar to equations (2) to (4) except for institutional reforms (IR) particularly related to fiscal decentralisation.

The study examined the direct and intermediating role of reforms specific to decentralisation on the relationship between control of corruption and fiscal decentralisation. In this regard, the Sixth National Finance Commission (NFC) Award in 1998 marked a major change in the share of provincial governments (from 37.5 to 46.25%). This institutional reform was also found to be structurally significant in the structural break test. It is worth mentioning that the control of corruption also had the highest value at this data point.

The type of fiscal decentralisation was measured through three indicators, namely composite, revenue and expenditure decentralisation. Revenue decentralisation was measured as the ratio of provincial government revenue less grant in aid to the total government revenues. Similarly, expenditure decentralisation, was measured as the ratio of provincial government expenditures to the total government expenditures less defence spending and payment of interest on debt. While, composite decentralisation, included both revenue decentralisation and expenditure decentralisation measured as: $CD = \frac{RD}{1-ED}$. For the given level of revenue decentralisation, the higher the expenditure decentralisation (revenue decentralisation), the higher is the composite ratio, and vice versa (Martinez-Vazquez and Timofeev 2010).

The Corruption Index, *CORR*, is based on data from the International Corruption Risk Guide (ICRG) by Political Risk Service (PRS) group, which define corruption as the ability

of business to influence the political process, frequency of bribes used to transact business and awarding of business due to patronage as opposed to merit. The Corruption Index ranges between 0 (highest risk of corruption) to 6 (lowest risk of corruption). The one year lagged value of corruption was also used as additional deterministic regressor to capture the dynamic structure of the model.

Institutional quality was measured through equal weighted index for six different dimensions of institutional quality. These dimensions were government stability, democratic accountability, bureaucratic quality, law and order, socioeconomic conditions and investment profile. Data was retrieved from Polity IV, Center for Systematic Peace (CSP).

Besides, the traditional role of macroeconomic indicators like GDP growth rate, *GDPG*, and the demographic factor, that is, population growth, *POP*, was controlled for their likely effects on control of corruption. The data on these variables was extracted from World Development Indicators (WDI) by the World Bank.

The square and cubic terms of decentralisation measure the degree of decentralisation or non-linear relationship between control of corruption and fiscal decentralisation. The estimated coefficients in this regard were expected to provide the level of decentralisation for which decentralisation becomes helpful in controlling corruption. This was done by measuring the estimated series of control of corruption from $[\alpha_1 CD_t + \alpha_2 CD_t^2 + \alpha_3 CD_t^3]$ and $[\theta_1 CD_t + \theta_2 CD_t^2 + \theta_3 CD_t^3]$. The fiscal decentralisation index was ordered from minimum (25%) to maximum (88%) and the estimated series of control of corruption is displayed against the ordered series of *CD* (see Figure 2). To examine the type and measure of decentralisation concomitant with institutional framework and institutional reforms related to decentralisation, marginal effects of fiscal decentralisation on control of corruption was calculated for given series of institutional quality and reforms (see Figure 3).

As the related literature identified the possibility of endogeneity and reverse causality between fiscal decentralisation and corruption, investigating the impact of fiscal decentralisation on corruption by applying Ordinary Least Squares (OLS) can result in biased and inconsistent estimates in the presence of endogeneity. Several articles (see for instance, Bui et al., 2023; Nakatani et al., 2022) have used advanced methodologies such as stochastic frontier analysis for Vietnam and Panel Tobit for analysis of the relationship. Nonetheless, examining the stationary properties of the data directed this study to assume a cointegrating long-run relationship among the variables under consideration. Hence, the study used residual-based Fully Modified Ordinary Least Squares (FMOLS) technique that yields unbiased and normally distributed estimates. FMOLS technique is an asymptotically

efficient estimation procedure pioneered by Phillips and Hansen (1990) and modified by Pedroni (2001) and Phillips and Moon (1999). FMOLS uses non-parametric corrections to account for bias, serial correlation, and endogeneity problems in the OLS estimator and is widely accepted for measuring the existence of long-run cointegrating relationships. This is generally applied on small samples and on a series having unit root along with prevalent endogeneity among the regressors (Phillips and Hansen 1990). The cointegration test is based on the Engle-Granger z-statistic which verifies the existence of long-run cointegration at 5 % level of significance.

4. EMPIRICAL FINDINGS AND DISCUSSION

This section provides the empirical findings based on models (2)-(7). As a prerequisite, the stationarity test results are reported in Table 1. Due to multiple fiscal reforms under various NFC Awards, breakpoint unit root test with innovative outliers was applied. All the variables are integrated of order 1 as can be observed from Table 1:

Table 1: Breakpoint Unit Root Test with Innovative Outlier

Variables	Level		1 st Diff.		Decision
	Rho	Break	Rho	Break	
CCORR	-4.956	2000	-7.564	1997	I (1)
CD	-4.253	2005	-7.535	1997	I (1)
CD ²	-3.169	1999	-7.738	1997	I (1)
CD ³	-3.650	2005	-8.665	1997	I (1)
IQ	-4.47	2001	-5.279	1997	I (1)
GDPPC	-4.227	2011	-9.042	2005	I (1)
POP	-2.695	1998	-9.582	2011	I (1)

Source: Authors' tabulation.

Note: The critical values are -5.347, -4.859 and -4.607 at 1%, 5% and 10% level of significance, respectively.

The results of FMOLS for model 1 for composite decentralisation are provided in Table 2 while for revenue and expenditures decentralisation measures, the results are reported in Table 3. The Engle-Granger diagnostic test for cointegration is reported as z-statistic and the test rejected the null hypothesis of no cointegration among the series. The p-value reported for Andrews-Fair Wald Statistic identifies the year 1998 as break year and fiscal reform or NFC Award of this year has been considered for its direct and intermediating role on control of corruption.

Overall, the results provide positive effect of all measures of fiscal decentralisation on control of corruption and prove the non-linearity of relationship. The linear effect of

decentralisation is negative, the squared and cubic terms positive. This shows that corruption tends to increase at the initial level of fiscal decentralisation, however, medium and high-level decentralisation effectively controls corruption. This implies that a medium to high level of fiscal decentralisation is required for Pakistan to be used as a corruption control/management strategy. Decentralisation, at the early stage, lacks the thrust of responsibilities and consequent accountability on the part of local governments that paves way for rent-seeking behaviour and exploitation of resources with less fear of liability. Besides, partial autonomy in terms of revenue or expenditure prevent local management to proceed with long-term development plans.

The non-linear relationship among variables proved in this study is in line with Alfano et al., (2019) for a panel of 55 countries. Also, the role of decentralisation in combating corruption is supportive of empirical evidence from Fisman and Gatti (2002), and Dong and Torgler (2013).

The results are supported by the findings from revenue and expenditure decentralisation regressions, reported in Table 3. Both equations yield similar coefficient signs for the linear and squared terms except the cubic term which appears negative and significant for both measures. The coefficient size is higher for expenditure decentralisation than revenue decentralisation.

Overall, the results from the fiscal decentralisation measures postulate that composite decentralisation is required to make it an efficient tool for controlling corruption. This is supported by Bardhan and Mookherjee (2006a) and Fisman and Gatti (2000). It is pertinent to mention that average revenue decentralisation in Pakistan over the selected period was 27%, which is lower than the average expenditure decentralisation, 52%. However, mismanagement and lack of technical skills of the personnel involved in the handling of lower tier financial matters hamper potential benefits. This means that combined decentralisation: resource sharing and spending autonomy is recommended for optimum benefits from decentralisation. One support irrespective of the other measure cannot yield significant contribution towards the control of corruption.

Table 2: FMOLS Results for Composite Decentralisation in Pakistan

Dependent Variable: Control of Corruption (CCORR)		
Variables	(1)	(2)
CD	-4.27*** (0.212)	-3.20*** (0.525)
CD ²	2.23*** (0.117)	2.90*** (0.476)

CD ³	3.21*** (0.184)	1.07*** (0.561)
GDPG	-0.12*** (0.003)	-0.04*** (0.010)
POP	0.19*** (0.016)	1.25*** (0.095)
IQ	0.16*** (0.038)	-
IQ*CD	-0.002*** (0.001)	-
IR	-	1.41*** (0.220)
IR*CD	-	-0.01*** (0.003)
Engle-Granger z-Statistic	-36.71***	-30.99**
Andrews-Fair Wald Statistic for Breakpoint Test		0.0001
Difference in J-stats (p-value)	0.087	-
N	31	31

Source: Authors' own tabulation.

Note: *** indicates significance at 1 % level of significance.

Institutional quality indicates a direct significantly positive effect on the control of corruption. 1% increase in institutional quality tends to reduce corruption by 0.16%. The role of institutional quality holds importance in defining the corruption-decentralisation nexus and as pointed out by Khemani et al., (2005), decentralisation is not a zero-sum game which merely re-allocates power among lower tiers of government. Rather, it must be accompanied with strict accountability to actualise its benefits. Results showed that institutional reforms also happen to be very effective for controlling corruption. After the Sixth NFC Award, control of corruption has significantly increased by 1.41%. This relationship can also be observed for revenue and expenditure decentralisation where both institutional quality and reforms are positively related with control of corruption. An interesting finding here is that strong institutional characteristics exert more favourable impact on control of corruption when we control for revenue decentralisation as compared to the case of expenditure decentralisation. Bui et al., (2023) also confirmed these results for Vietnam.

Table 3: FMOLS Results for Revenues and Expenditures Decentralisation in Pakistan

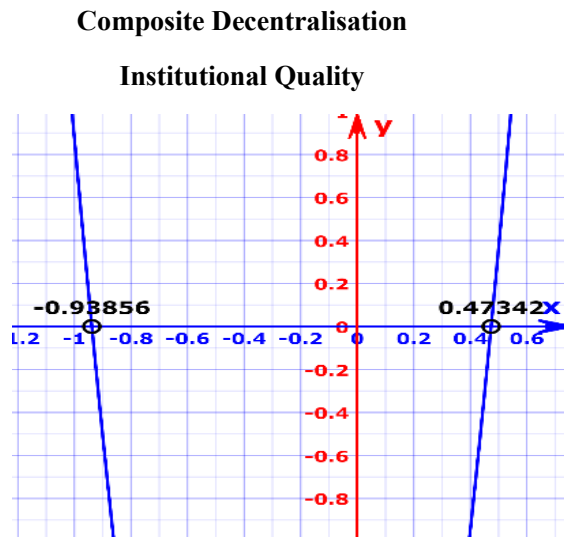
Dependent Variable: Control of Corruption (CCORR)				
Variables	Revenue Decentralisation		Expenditure Decentralisation	
	(1)	(2)	(1)	(2)
RD	-1.42*** (0.172)	-2.28*** (0.284)	-	-
RD ²	0.06*** (0.007)	0.07*** (0.012)	-	-
RD ³	-0.001*** (0.000)	-0.001*** (0.000)	-	-
ED	-	-	-8.01*** (0.467)	-2.04*** (0.515)
ED ²	-	-	0.15*** (0.009)	0.04*** (0.009)
ED ³	-	-	-0.001*** (0.000)	-0.002*** (0.000)
IQ	2.11*** (0.156)	-	-	-
IQ*RD	-0.06*** (0.006)	-	-	-
IR	-	11.14*** (0.902)	-	-
IR*RD	-	-0.39*** (0.034)	-	-
IQ	-	-	2.02*** (0.375)	-

IQ*ED	-	-	-0.03*** (0.006)	-
IR	-	-	-	0.37 (0.418)
IR*ED	-	-	-	-0.01* (0.006)
GDPG	-0.09*** (0.007)	-0.015 (0.014)	-0.13*** (0.010)	-0.15*** (0.01)
POP	0.80*** (0.043)	1.03*** (0.152)	0.96*** (0.076)	0.56*** (0.136)
z-statistic	-36.24***	-39.39***	-27.45***	-44.91***

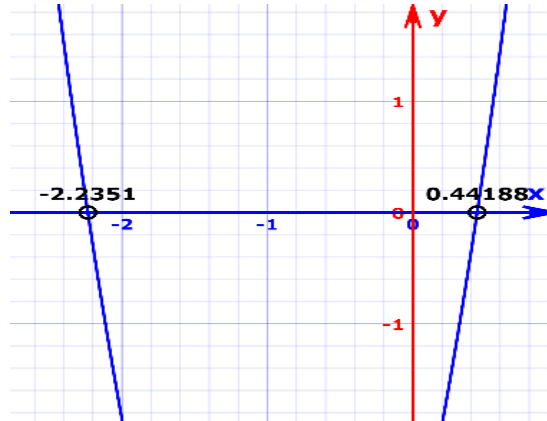
Source: Authors' own tabulation.

Note: *** & ** indicate significance at 1 % and 5 % levels of significance.

Figure 1 : Optimal Level of Decentralisation for Control of Corruption

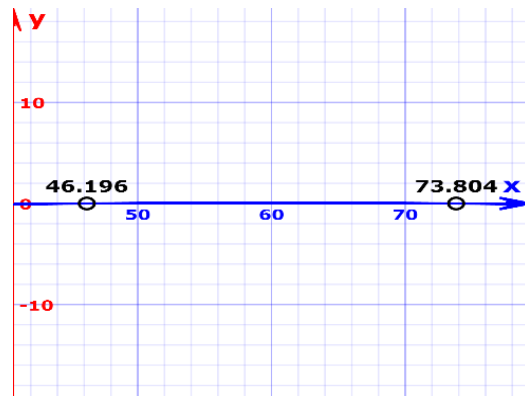


Institutional Reform

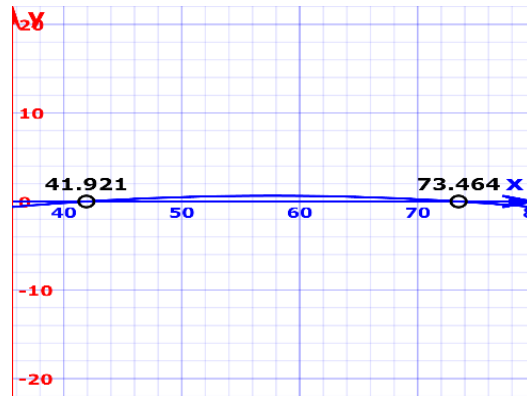


Expenditure Decentralisation

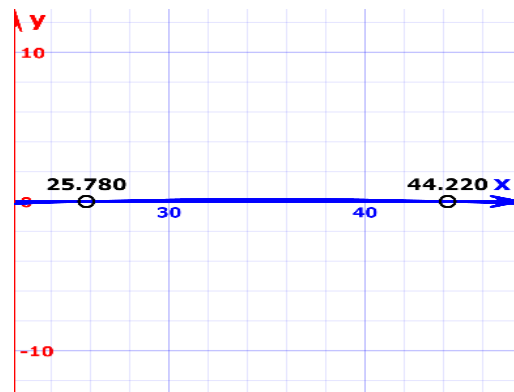
Institutional Quality



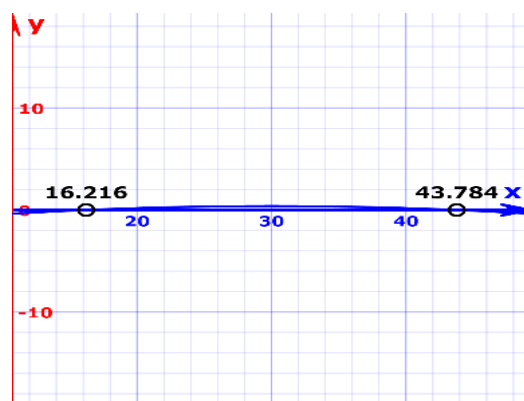
Institutional Reform



Revenue Decentralisation Institutional Quality



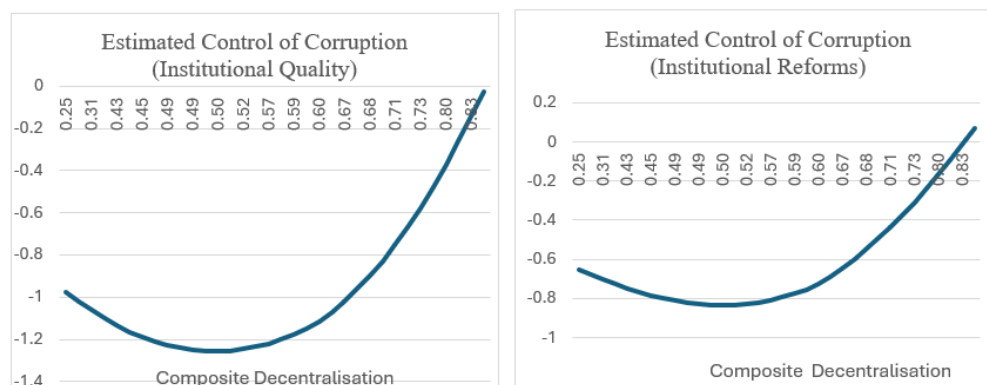
Institutional Reform



Source: Authors' own

The optimal levels of all types of decentralisation are determined and shown in Figure 1 and Figure 2. The findings are further elucidated in Figure 4 which demonstrates the computed index of control of corruption, based on equation $\alpha_1 CD_t + \alpha_2 CD_t^2 + \alpha_3 CD_t^3$ and $\theta_1 CD_t + \theta_2 CD_t^2 + \theta_3 CD_t^3$ from the results of equation 2 and equation 4 in Table 2. A scale of composite decentralisation is constructed from the minimum to maximum value and is displayed on the horizontal axis against the computed series of control of corruption presented on the vertical axis. The polynomial graph shows first a declining and then a rising trend in control of corruption as a result of fiscal decentralisation. This study supports the moderate to high level of decentralisation for achieving optimality. The optimal percentage is about 57% for both equations which implies that corruption reduction demands at least 57% composite decentralisation. It is worth mentioning that the current decentralisation in Pakistan as per the share of provinces in the divisible pool following the Seventh NFC Award is 57.5%.

In order to examine the intermediating role of the institutional framework on the relationship between fiscal decentralisation and control of corruption, the marginal effects of decentralisation on corruption catering to institutional quality and reforms were calculated. First, the marginal effect was computed for the average level of institutional quality and for the time period when institutional reform under consideration took place, as reported in Table 4.

Figure 2: Corruption Index (Estimated) and Composite Decentralisation Index

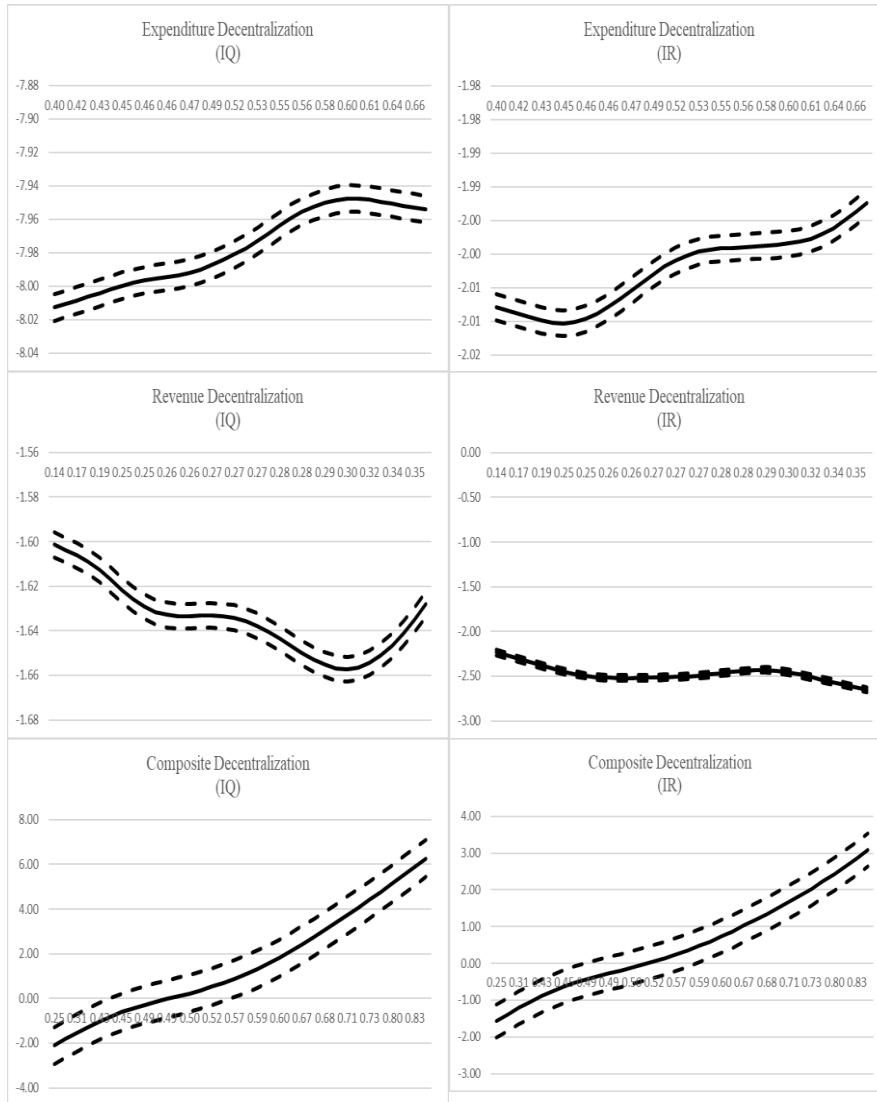
Source: Generated by authors on the basis of estimation results.

Second, the trend in marginal effects for evolution of institutional quality and specific institutional reforms was calculated, shown in Figure 3. The results of the first exercise confirmed the earlier conjecture for Pakistan that only composite decentralisation would be effective for control of corruption at the average level of institutional quality and with specific institutional reforms. Expenditure and revenue decentralisation if pursued separately results in worsening accountability and transparency at the average level of institutional quality in Pakistan. It is worth noting here that expenditure decentralisation leads to a more corrupt system in the country as compared to revenue decentralisation given the prevalent institutional structure.

When we compared the estimates with trends, they demonstrated a similar trajectory. Figure 4 shows that marginal effects of expenditure decentralisation on control of corruption remained negative at all levels of institutional quality. However, this adversity reduces up to 58% of expenditure decentralisation beyond which it starts worsening further. Institutional reforms improve the relationship between expenditure decentralisation and control of corruption. However, it remained negative throughout. Similarly, the marginal effect of revenue decentralisation on control of corruption was negative at the average level of institutional quality. Nevertheless, it was less severe than expenditure decentralisation. The situation becomes hopeful when revenue decentralisation exceeds beyond 32%. Institutional reforms did not improve the situation regarding the worsening effects of revenue decentralisation for control of corruption. When taken together in the form of composite decentralisation, institutional characteristics of the country support fiscal

decentralisation as an effective corruption management strategy particularly for a value greater than 49%.

Figure 3: Marginal Effects of Fiscal Decentralisation on Control of Corruption



Source: Generated by authors using estimation results.

Other variables in the model appeared with the signs and significance as per theoretical expectations. GDP growth showed a negative coefficient throughout the regressions and

this indicates that economic growth leads to lower control of corruption. Dong and Torgler (2013) provided the same evidence for economic growth in China and asserted that the widely positive effect from the world may be temporarily overwhelmed during the transition period. Pakistan's case can be explained on the same ground as Pakistan is in the developing phase and GDP per capita growth might be offsetting efforts in controlling corruption when fiscal decentralisation is controlled. The result is also supported by another context by Chong and Calderon (2003) who suggested that an increase in economic activities due to higher GDP per capita growth tends to increase investment which leads to increased progressive taxation which ultimately invites corruption in the tax avoidance process. The demographic factor 'population' appeared with positive sign which indicates the rising population leads to an increase in control of corruption probably due to a concomitant increase in human capital.

Table 4: Marginal Effects of Decentralisation on Control of Corruption

	Average Institutional Quality (4.2)	Institutional Reform (IR=1)
Average CD (58%)	1.55	0.26
Average ED (52%)	-7.98	-2.04
Average RD (27%)	-1.63	-2.65

Source: Authors' own calculations on the basis of estimation results.

5. CONCLUSION AND POLICY RECOMMENDATIONS

The study was carried out to investigate the non-linear relationship between fiscal decentralisation and control of corruption to conclude the type and extent of decentralisation required for Pakistan to utilise it as an efficient tool for corruption management. The significance of the study lies in examining the role of institutional characteristics to determine the type and degree of decentralisation suitable for Pakistan in controlling corruption. The results show that corruption increases by all measures of decentralisation at the preliminary level when sub-national governments are in the transition phase of building capacities and managerial skills generally. In the initial stages, decentralisation adds to rent-seeking behaviour and leads to a high level of corruption. Nonetheless, a mature and well-established decentralised system is associated with competition among sub-national governments and their constituencies. A higher level of accountability is required to make this competition healthy which can only be promised with strong institutions.

Three policies are recommended based on the study's outcomes. First, in alignment with the institutional characteristics of the economy, composite decentralisation may be adopted as an effective corruption control policy. Second, although institutional quality generally facilitates decentralisation as a corruption control strategy, its current impact is limited. Similarly, while fiscal reforms exert a strong direct influence on controlling corruption, they offer only negligible support in strengthening the relationship between corruption control and decentralisation. Consequently, integrating these factors is recommended to achieve a more effective impact on corruption. It is further concluded that the prevailing institutional framework does not support expenditure and revenue decentralisation in isolation. The research may be extended in several ways. First, the impact of decentralisation on the control of corruption could be examined across different sectors of the economy, which would assist in designing targeted policy interventions. Second, a cross-country analysis could further enhance our understanding of this relationship.

REFERENCES

- Alfada, A. 2019, 'Does Fiscal Decentralisation Encourage Corruption in Local Governments? Evidence from Indonesia', *Journal of Risk and Financial Management*, vol.12, no.3, <<https://doi.org/10.3390/jrfm12030118>>.
- Alfano, R.A., Baraldi, A.L. and Cantabene, C. 2019, 'The Effect of Fiscal Decentralisation on Corruption: A Non-Linear Hypothesis', *German Economic Review*, vol. 20, no.1, pp.105-128, <<https://doi.org/10.1111/geer.12164>>.
- Banwo, M.A. 2012 'Fiscal Decentralisation Policy and Poverty Reduction: Lessons from Nigeria', *IPPR Journal*, vol. 7, no. 1, pp. 1-35.
- Bardhan, P. and Mookherjee, D. 2006a, *Decentralisation and Local Governments in Developing Countries: A Comparative Perspective*, Vol. 1, Cambridge, MA: The MIT Press.
- Bardhan, P. and Mookherjee, D. 2006b, 'Decentralisation and Accountability in Infrastructure Delivery in Developing Countries', *The Economic Journal*, vol. 116, pp.101-127, <<https://doi.org/10.1111/j.1468-0297.2006.01049.x>>.
- Bonet, J. 2006, 'Fiscal Decentralisation and Regional Income Disparities: Evidence from the Colombian Experience', *The Annals of Regional Science*, vol. 40, pp. 661-676, <<https://doi.org/10.1007/s00168-006-0060-z>>.
- Breton, A. 2002, 'An Introduction to Decentralisation Failure', in *Managing Fiscal Decentralisation*, pp.31-45, London: Routledge.

- Bui, M-T., Le, T-H. and Park, D. 2023, 'Impacts of Fiscal Decentralisation on Local Development in Vietnam: A Disaggregated Analysis', *Economics of Transition and Institutional Change*, vol. 31, no. 1, pp. 3-31, <<https://doi.org/10.1111/ecot.12323>>.
- Chong, A. and Calderon, C. 2003, 'Causality and Feedback between Institutional Measures and Economic Growth', *Economics and Politics*, vol. 12, no.1, pp. 69-81, <<https://doi.org/10.1111/1468-0343.00069>>.
- Dong, B. and Torgler, B. 2013, 'Causes of Corruption: Evidence from China', *China Economic Review*, vol. 26, pp. 152-169, <<https://doi.org/10.1016/j.chieco.2012.09.005>>.
- Drèze, J. and Sen, A. 2002, 'Democratic Practice and Social Inequality in India', *Journal of Asian and African Studies*, vol. 37, no. 2, pp. 6-37, <<https://doi.org/10.1177/002190960203700202>>.
- Dyah, S.M. 2012, 'The Impact of Fiscal Decentralisation on Income Inequality in Indonesia', *Journal Borneo Administrator*, vol. 8, no. 3, pp. 293-309.
- Enemuo, F.C. 2000, 'Problems and Prospects of Local Governance', in G. Hyden, D. Olowu and H. Ogendo (eds.), *African Perspectives of Governance*, pp. 181-204, Trenton/Asmara: Africa World Press.
- Enikolopov, R. and Zhuravskaya, E. 2007, 'Decentralisation and Political Institutions', *Journal of Public Economics*, vol. 91, no. 11, pp.2261-2290, <<https://doi.org/10.1016/j.jpubeco.2007.02.006>>.
- Fiorino, N., Galli, E. and Padovano, F. 2015, 'How Long Does It Take for Government Decentralisation to Affect Corruption?', *Economics of Governance*, vol.16, pp. 273-305, <<https://doi.org/10.1007/s10101-015-0156-y>>.
- Fisman, R. and Gatti, R. 2002, 'Decentralisation and Corruption: Evidence across Countries', *Journal of Public Economics*, vol. 83, no. 3, pp. 325-345, <[https://doi.org/10.1016/S0047-2727\(00\)00158-4](https://doi.org/10.1016/S0047-2727(00)00158-4)>.
- Guerrero, O.A. and Castaneda, G. 2021, 'Does Expenditure in Public Governance Guarantee Less Corruption? Non-Linearities and Complementarities of the Rule of Law', *Economics of Governance*, vol. 22, no. 2, pp. 139-164, <<https://doi.org/10.1007/s10101-021-00252-z>>.
- Huther, J. and Shah, A. 1998, 'Applying a Simple Measure of Good Governance to the Debate on Fiscal Decentralisation', Policy Research Working Paper No. 1894,

Fiscal Devolution and Corruption in Pakistan: A Non-Linear Analysis

- The World Bank, <<https://documents.worldbank.org/pt/publication/documents-reports/documentdetail/673221468766535925/applying-a-simple-measure-of-good-governance-to-the-debate-on-fiscal-decentralization>>.
- Iqbal, N. 2013, 'Fiscal Decentralisation, Democratic Institutions and Inflation', *The Pakistan Development Review*, vol. 52, no. 3, pp. 207-220, <<https://doi.org/10.30541/v52i3pp.207-220>>.
- Khattak, N.R., Ahmad, I., and Khan, J. 2010, 'Fiscal Decentralisation in Pakistan', *The Pakistan Development Review*, vol. 49, no. 4, pp. 419-436, <<https://doi.org/10.30541/v49i4Ipp.419-436>>.
- Khemani, S., Ahmad, J., Shah, S. and Devarajan, S. 2005, 'Decentralisation and Service Delivery', Policy Research Working Paper No. 3603, The World Bank, <<http://hdl.handle.net/10986/8933>>.
- Kyriacou, A.P. and Roca-Sagalés, O. 2011, 'Fiscal Decentralisation and Government Quality in the OECD', *Economics Letters*, vol. 111, no. 3, pp. 191-193, <<https://doi.org/10.1016/j.econlet.2011.02.019>>.
- Livingstone, I. and Charlton, R. 1999, 'Raising Local Authority District Revenues through Direct Taxation in a Low-Income Developing Country: Evaluating Uganda's GPT', *Public Administration and Development: The International Journal of Management Research and Practice*, vol. 18, no. 5, pp. 499-517, <[https://onlinelibrary.wiley.com/doi/10.1002/\(SICI\)1099-162X\(199812\)18:5%3C499::AID-PAD39%3E3.0.CO;2-M](https://onlinelibrary.wiley.com/doi/10.1002/(SICI)1099-162X(199812)18:5%3C499::AID-PAD39%3E3.0.CO;2-M)>.
- Manor, J. 1999, *The Political Economy of Democratic Decentralization*, Direction in Development, Washington, D.C.: The World Bank, <<https://doi.org/10.1596/0-8213-4470-6>>.
- Martinez-Vazquez, J. and Timofeev, A. 2010, 'Decentralisation Measures Revisited', *Public Finance and Management*, vol. 10, no. 1, pp. 13-47, <<https://doi.org/10.1177/152397211001000102>>.
- Nakatani, R., Zhang, Q. and Valdes, I.G. 2022, 'Fiscal Decentralisation Improves Social Outcomes When Countries Have Good Governance', *IMF Working Papers*, vol. 2022, no. 111, <<https://doi.org/10.5089/9798400211768.001>>.
- Nirola, N., Sahu, S. and Choudhury, A. 2022, 'Fiscal Decentralisation, Regional Disparity, and the Role of Corruption', *The Annals of Regional Science*, vol. 68, no. 3, pp.757-787, <<https://doi.org/10.1007/s00168-021-01102-w>>.

- Oates, W.E. 2006, 'On the Theory and Practice of Fiscal Decentralisation', IFIR Working Paper No. 2006-05, Institute for Federalism and Intergovernmental Relations, <<https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=f226754fba2b1b09c229bf52445f745a462b382d>>.
- Pedroni, P. 2001, 'Fully Modified OLS for Heterogeneous Cointegrated Panels', in *Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Advances in Econometrics, Volume 15*, B.H. Baltagi, T.B. Fomby and R. Carter Hill (eds.), pp. 93-130, Leeds: Emerald Group Publishing Limited, <[https://doi.org/10.1016/S0731-9053\(00\)15004-2](https://doi.org/10.1016/S0731-9053(00)15004-2)>.
- Phillips, P.C.B. and Moon, H.R. 1999, 'Linear Regression Limits Theory for Non-Stationary Panel Data', *Econometrica*, vol. 67, pp.1057-1111, <<http://dx.doi.org/10.1111/1468-0262.00070>>.
- Phillips, P.C.P. and Hansen, B.E. 1990, 'Statistical Inference in Instrumental Variables Regression with $i(1)$ Processes', *The Review of Economic Studies*, vol. 57, no. 1, pp. 99-125, <<https://doi.org/10.2307/2297545>>.
- Ponce-Rodríguez, R.A., Hankla, C.R., Martínez-Vázquez, J. and Heredia-Ortiz, E. 2020, 'The Politics of Fiscal Federalism: Building a Stronger Decentralisation Theorem', *Journal of Theoretical Politics*, vol. 32, no. 4, pp. 605-639, <<https://icepp.gsu.edu/files/2020/04/paper2005.pdf>>.
- Prud'homme, R. 1995, 'The Dangers of Decentralisation', *The World Bank Research Observer*, vol. 10, no. 2, pp. 201-220, <<https://doi.org/10.1093/wbro/10.2.201>>.
- Rodden, J. and Wibbels, E. 2002, 'Beyond the Fiction of Federalism: Macroeconomic Management in Multitiered Systems', *World Politics*, vol. 54, pp. 494-531, <<https://doi.org/10.1353/wp.2002.0016>>.
- Shah, A. 1998, 'Fiscal Federalism and Macroeconomic Governance: For Better or For Worse', Policy Research Working Paper 2005, The World Bank, <<https://documents1.worldbank.org/curated/en/708461468741368927/pdf/multi-page.pdf>>.
- Shen, C. and Zou, H. 2015, 'Fiscal Decentralisation and Public Services Provision in China', *Annals of Economics and Finance*, vol. 16, no. 1, pp. 53-78.
- Shleifer, A. and Vishny, R.W. 1993, 'Corruption', *The Quarterly Journal of Economics*, vol. 108, no. 3, pp. 599-617, <<https://doi.org/10.2307/2118402>>.

Fiscal Devolution and Corruption in Pakistan: A Non-Linear Analysis

- Shrestha, K., Martinez-Vazquez, J. and Hankla, C. 2023, 'Political Decentralisation and Corruption: Exploring the Conditional Role of Parties', *Economics & Politics*, vol. 35, no. 1, pp.411-439, <<https://doi.org/10.1111/ecpo.12222>>.
- Smoke, P. and Lewis, B.D. 1996, 'Fiscal Decentralisation in Indonesia: A New Approach to An Old Idea', *World Development*, vol. 24, no. 8, pp. 1281-1299, <<https://nyuscholars.nyu.edu/en/publications/fiscal-decentralisation-in-indonesia-a-new-approach-to-an-old-idea>>.
- Tanzi, V. 1995, 'Fiscal Federalism and Decentralisation: A Review of Some Efficiency and Macroeconomic Aspects', Annual World Bank Conference on Development Economics, The World Bank, Washington, D.C.
- Vedeld, T. 2003, 'Democratic Decentralisation and Poverty Reduction: Exploring the Linkages', *Forum for Development Studies*, vol. 30, no. 2, pp. 159-204, <<https://doi.org/10.1080/08039410.2003.9666243>>.
- Weingast, B.R. 2009, 'Second Generation Fiscal Federalism: The Implications of Fiscal Incentives', *Journal of Urban Economics*, vol. 65, no. 3, pp. 279-293, <<https://doi.org/10.1016/j.jue.2008.12.005>>.
- Westergaard, K. and Alam, M.M. 1995, 'Local Government in Bangladesh: Past Experiences and Yet Another Try,' *World Development*, vol. 23, no. 4, pp. 679-690, <[https://doi.org/10.1016/0305-750X\(94\)00149-S](https://doi.org/10.1016/0305-750X(94)00149-S)>.