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Fiscal Decentralization and Socioeconomic Implications in Pakistan: Focus on Pre & Post 7th NFC Award

Nadia Farooq

Asian Development Bank, Islamabad, Pakistan
Email: nadiafarooq222@gmail.com

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Abstract

This paper investigates the socioeconomic impact of fiscal decentralization in Pakistan. The time-series sample during 1982-2018 is divided between pre and post-periods of the 7th National Finance Commission (NFC) Award of 2009. The socioeconomic impacts were separated into growth, education, and health. Results found that there is a positive long-run relationship across the variables. At the same time, the total effect from composite decentralization has positively impacted economic growth and education but none to the health sector after the 7th NFC award. The outcomes have been elaborated with socioeconomic analysis. The study also provides policy recommendations based on empirical outcomes.

Keywords

Fiscal Decentralization, Fiscal Management, Public Policy, Health & Education Services, Economic Growth

1. Introduction

Federalism is an association among diverse layers of a government. It is a political organization that connects and separates states or other polities within an overarching political system. Fiscal decentralization's main function is transferring authority and responsibilities from the central government to the sub-national or local governments. It is argued that federalism and decentralization can be used alternatively, but the difference must be highlighted before.

Literature shows that federalism is a constitutional institution at the same time as decentralization is a policy desire. These have to be systematically outstanding because decentralization can occur in non-federally established states.

It similarly urged that institutional information is critical concerning federalism.

In this research, we analyze the economic impact of fiscal decentralization, especially the 7th National Financial Commission (NFC) award in Pakistan during 1982-2018, including the health sector, education sector, and economic growth. The government structure in Pakistan has three levels; federal, provincial, and local. The federalism in Pakistan consists of four provinces (federating units), i.e., Punjab, Sindh, Khyber Pakhtunkhwa (KP), and Balochistan. In Article 160 of the constitution of Pakistan, National Finance Commission (NFC) is said to be constituted by the President and to make proposals for distribution to the federating units. The 18th Amendment in 2009, declared the local governments to be the third tier while also added in Article: 140-A, stating:

> "Each province shall, by law, establish a local government system and devolve political, administrative, and financial responsibility and authority to the elected representatives of the local governments".

The changes like fiscal decentralization due to 7th NFC award under the 18th Amendment have been expected to have its socio-economic impact in Pakistan. This analysis aims to investigate the economic impact of the 7th NFC award in Pakistan during 1982-2018. This study has used economic growth (GDP), education (secondary enrollment), and health (life expectancy) as dependent variables while on independent side the fiscal decentralization, as well as slope dummy of fiscal decentralization under the 7th NFC award, has been introduced. For fiscal decentralization, three measures have been used i.e., expenditure decentralization, revenue decentralization, and composite decentralization. The fiscal decentralization measures are calculated by following Iqbal et al. (2012).

There is a unit root in the time-series data, so this study has applied the Augmented Dicky fuller test to find the order of integration. The variables are integrated at different levels (i.e., I(0) and I(1)); thus this study tests the long-run cointegration by the ARDL bounds test approach. The indicators of development are assumed to have interdependence among each other (Yasmin et al., 2006). Moreover, the focused analysis of the study has also reverse causality as indicated by Iimi (2005) and Iqbal et al. (2012). Thus, this simultaneity among the focused variables requires a system of equations model and its estimation should be in a way that the analysis gives the best possible results. For this we have used three-stage least squares regression, in which our equations will be estimated under the given endogenous and exogenous variables.

In the remaining sections of this study, a literature review is provided in section 2, data and variables are provided in Section 3, an estimation technique and methodology are provided in Section 4, results and discussions are presented in Section 5, and policy recommendations are made in Section 6.

2. Literature Review

Literature has covered different dimensions of fiscal federalism in Pakistan. According to Qian and Roland (1998), federalism has two effects: the competition

effect and the checks and balance effect. The former claim is that fiscal competition in local government under factor movements enhances the opportunity costs of bailouts and acts as a commitment device. The latter claim is that monetary centralization and fiscal decentralization cause conflicts of interest, thus tightening budget constraints and reducing inflation.

Improved accountability and attainment of diverse individual preferences can be achieved through decentralized supply of public goods (Tiebout, 1996). Oates (1993) presented a theory of fiscal federalism that elaborates the correlation between decentralization and economy, welfare of society, and public services. The focus of this theory revolves around the idea that assigning the local governments in fiscal decentralization with authority can encourage economic growth, as well as increase the welfare of local communities (Farida et al., 2021). Theoretically, decentralizing health care has a high potential for advanced service quality and coverage. Due to numerous theoretical advantages, health sector decentralization is constantly gaining more attention. These benefits include the capacity of upgrading to a unified and more rational health service that can deal with local preferences. The implementation of health programs can be enhanced. The inequalities among urban and rural areas can be minimized, and cost containment would be achieved through transferring to streamlined targeted programs. Moreover, the incorporation of different activities of private and public agencies will elevate, and the intersectoral coordination, especially in rural, local government, and development activities, will be improved (Faguet & Sánchez, 2009).

The idea of decentralization theory in public services was commenced by Oates (1972) and Rondinelli (1981). Oates (1972) stated in his seminal work, Fiscal Federalism, that local communities can gain more benefit from decentralization in decision making by permitting heterogeneous responses to the demands. The Decentralization theorem by Oates (1972) argues that the advantages led by decentralizing health services have the potential to boost health in individuals if such decentralization promotes health input quality and the health inputs fulfill the demands of local residents.

As per Jimenez & Tan (1987), resource usage can be benefitted from decentralized system of administration in education, implementation of fiscal decentralization can help various groups and individuals of society to add supplementary finances for education. As the accountability of administrators is directed towards parents and the community, decentralization can increase the efficiency of schools. According to Oates's (1972) decentralization theory, the three types of decentralization are delegation, decentralization, and devolution. Several scholars, including (Welsh & McGinn, 1999), updated the context of education by bringing in this typology of decentralization. They brought the decentralization motion in education along with administrative autonomy. The first-generation concept of fiscal decentralization supports the idea that the entire regional citizens are the beneficiaries of education, therefore it is way more convenient for local governments to comprehend the local demands, as compared to the central government.

2.1. Empirical Studies of Fiscal Decentralization and Socioeconomic Aspects

Fiscal decentralization depends on the level of fiscal authority and power from the federal government to local governments. Several former studies assess fiscal decentralization with the help of quantifying it and using its proxy as a measure of expenditure and revenue (Kim, Kim, & Park, 2020). The concept of "Pro-poor growth" is partially the basis of inclusive growth. When the system benefits the poor, economic growth elevates. In other words, inequality levels are diminished, as the income growth for the poor increases more than the entire population (Anand, Mishra, & Peiris, 2013). This theory is defined by OECD Report (2014) as a fair division of economic performance across the community, and inclusive growth is defined by the World Economic Forum (WEF) as an improvement in the quality of life for economic actors by minimizing inequality.

According to the recent literature about fiscal decentralization, over the previous decade, the focus on fiscal decentralization and macroeconomic indicators, such as inflation, public debt, budget deficit, and economic growth, has shifted away. The focus of researchers has shifted to analyzing the human face of fiscal decentralization, which includes the outcomes of fiscal decentralization on social indicators like education, health, primary local services, and poverty alleviation (Reayat, Ahmad, Khalil, & Rahim, 2014).

Using the analysis of the influence of fiscal decentralization on facilitating social services delivery, an adequate amount of evidence has been provided by the existing literature regarding the significance and efficacy of fiscal decentralization in the country's development (Ahmed & Lodhi, 2016).

Fiscal decentralization affects every country differently; studies of some countries report a positive impact of fiscal decentralization on poverty, whereas studies of other countries report a negative impact (Khan, Akram, & Farooq, 2021; Mehmood, Sadiq, & Khalid, 2010). A rise in the levels of allocative and technical efficiency can majorly affect fiscal decentralization on health outcomes. Moreover, to maximize health outcomes, a decentralized system is assumed to successfully allot resources that are limited to the alternative interventions (Robalino, Picazo, & Voetberg, 2001). To analyze the decentralization's implications on health policies in the Philippines, Abrigo, Tam, & Ortiz (2017) carried out an organized study of experimental evidence. The relation between decentralization and growing government health expense and health indicators has been proven positive by this study; the improvement is, specifically, more inclined towards nutrition, child mortality rate, neonatal, and the demand for health facilities. The decentralization in the Philippines was constantly associated with the splitting of the state health system.

A sample of 62 countries was examined by Ahmad (2016) to evaluate the impacts of fiscal decentralization on the education sector. As per results, several effects have been observed on the expenditures and quality of the education sector. Increasing funds for education may have a higher possibility when controlled by sub-national governments that are funded through their own revenues; however,

maintaining the teaching quality does not appear to be their priority. This study proves that decentralized structures have the capacity to well-manage local social needs. Therefore, fiscal decentralization acts as a significant policy instrument for attaining social goals.

The influence of decentralization on Swedish school resources was analyzed by Ahlin & Mörk (2008), as the responsibilities in Sweden were decentralized to local government, or municipalities, from the central government. To inspect the school resources, two measures were used, which included the teacher-student ratio and the spending per student. In this panel data study, the crucial decentralization reforms of 1991, 1993, and 1996 were analyzed, which required 277 municipalities that were covering the duration of 1989-2002. Unfortunately, the study failed to conclude with favorable results for decentralization.

By incorporating a panel data model, Kiran (2005) found the benefits of decentralization at national level in India. As suggested by the findings, decentralization proved to be advantageous for the quality of lives of state locals. Kiran (2005) further discusses several social factors, such as money invested in education and health, and evaluated the influence of decentralization on social sector that differs from one state to another.

2.2. Fiscal Decentralization and Socioeconomic Growth of Pakistan

Acting in accordance with the decentralization reforms in 2001, Bossert & Mitchell (2011) reviewed the relationship between local decision-making in Pakistan and health sector decentralization. Their study included 17 districts in Pakistan, and the primary data was collected from local decision-makers and health officials. The major target of the study was the situation that occurred after the establishment of the 2001 Local Government Ordinance. The three main aspects that were emphasized by the authors are institutional capacity, authority (decision space), and the accountability of local officials (to locally elected politicians). The obtained responses were modified into qualitative measures for four distinctive health sector functions which are budgeting, service delivery, strategic and operational planning, and human resource management. Primarily, even though the decentralization policy in different locations of the provinces was the same, the official's actions and efficiency varied across the districts. Therefore, the authors presumed that decentralization is a collective responsibility that requires the decision-makers and facilitators to interact and generate outcomes. The results of decentralization were also dependent on the willingness and involvement of the officials to execute "de jure" decision-making powers. The study did not include the use of an econometric technique and was solely the qualitative analysis of the questionnaire responses. In order to bring advancement in health services, the authors suggest designing decentralization to improve decision-making powers at local levels, secure and toughen institutional capacities, and ensure accountability.

As stated by Ahmed & Lodhi (2016), basic healthcare outcomes can be greatly

boosted by fiscal decentralization. Furthermore, according to various studies and findings, fiscal decentralization has also indicated constructive results in the education sector. The conclusions supported the views that fiscal decentralization has a way stronger impact on education and health outcomes in most of the provinces, except for KPK and Baluchistan. The reason is that Punjab and Sindh have better fiscal space and infrastructure which makes them efficient as long as fiscal decentralization is concerned. A study (Faridi, Karim, & Arif, 2020) conclusively proved the transfer of responsibility of deciding the tax base and collecting the tax revenue by the local government can positively impact society since the local government has adequate information regarding the taxpaying capacity of an individual.

There is evidence in previous literature that decentralization under fiscal federalism in developing countries can be both positive and negative depending on some aspects. Oates (1999) stated that developing countries must focus on some points when bringing fiscal reforms. As stated, here are these points:

> "1) Re-structuring systems of intergovernmental grants, in some instances to reduce the extent of financing that they provide to decentralized levels of government, and, more generally, to remove the perverse incentives that they often embody for fiscal behavior on the part of recipients;
> a) Redesigning revenue systems so as to provide decentralized levels of government a much expanded access to own revenues to finance their budgets and thereby reduce their dependence on transfers from above; and
> b) Reviewing the use and restrictions on debt finance to ensure that debt issues are not a ready way to finance deficits on the current account. All three of these avenues of reform contribute in important ways to the establishment of a hard budget constraint, but one that permits decentralized levels of government to do their job."

There are mixed effects of fiscal decentralization in Pakistan, with respect to the previous literature. Moreover, the previous research analysis shows that there must be some conditions considered for fiscal decentralization in developing countries. In this analysis, both social and economic indicators are used to empirically analyze the impact of the 7th NFC in Pakistan.

3. Data and Variables

The data used in this study is for the time period 1982-2018. The time series data is taken from different sources, i.e., the Ministry of Finance of Pakistan, Pakistan Economic Survey (various issues), Polity IV Data Set (2018), and World Development Indicators (WDI) (2019) (Please see **Appendix 1** for all the details).

For measuring the impact of fiscal decentralization, we follow the measures developed by Iqbal et al. (2012). Two types of fiscal decentralization are commonly used, namely expenditure decentralization and revenue decentralization. Decentralization of expenditures is a measure of how much subnational government expenditures make up total government expenditures (i.e., the sum of

national and subnational government expenditures). Defense expenditures and interest payments are included in non-decentralized government expenditures, so they are subtracted from total government spending (Iqbal et al., 2012).

Expenditure decentralization is represented as follows:

$$ED = \frac{PE}{PE + FE - (DE + IE)}$$

where ED is the expenditure decentralization (i.e., a share of the provincial expenditures to the total government spending), PE is the sum of the provincial expenditures, FE is federal expenditures, DE is the defense expenditures, and IE is the interest payments to the debt.

Figure 1 shows a historic trend of expenditure decentralization. The share of provincial expenditures varies from 36 percent to 70 percent between 1982 and 2018. This share has touched at 70 percent in the years of 2000-2001, but after that it never touched this level. In 2018 expenditure decentralization is around 60 percent, with an increasing trend.

Revenue decentralization is calculated by taking the share of the revenue of the provincial government to the total government revenue, i.e., a sum of the revenues of the federal government and provincial governments. The revenue decentralization can be shown as follows:

$$RD = \frac{PR}{PR + FR}$$

RD is revenue decentralization (share of provincial government revenues in total government revenues), PR is provincial government revenues, and FR is federal government revenues. The trend of revenue decentralization in Pakistan is shown in Figure 2. Revenue decentralization is much lower than expenditure decentralization. The figure ranges from 6 percent to 10 percent between 1982 and 2018. The share is as low as 4 percent between 1988 and 1991, while there are some ups and downs between 2016 and 2018. In 2018, revenue decentralization hit 10.5 percent, which is the highest in the data range.

CD stands for composite decentralization, RD for revenue decentralization, and ED for expenditure decentralization. It is an important variable which captures the impact of both measures of fiscal decentralization. Composite decentralization is calculated as follows:

$$CD = \frac{RD}{1 - ED}$$

Figure 3 presents composite decentralization in Pakistan. The trend shows that it ranges from 7 percent to 26 percent between 1982 and 2018.

Fundamental socioeconomic indicators in this research study include real income, health, and education, which are more than the traditional economic development indicators used previously by Todaro and Smith (2012). Since GDP, secondary school enrollment as education, and life expectancy as health are used as dependent variables, socioeconomic aspects of development are captured.

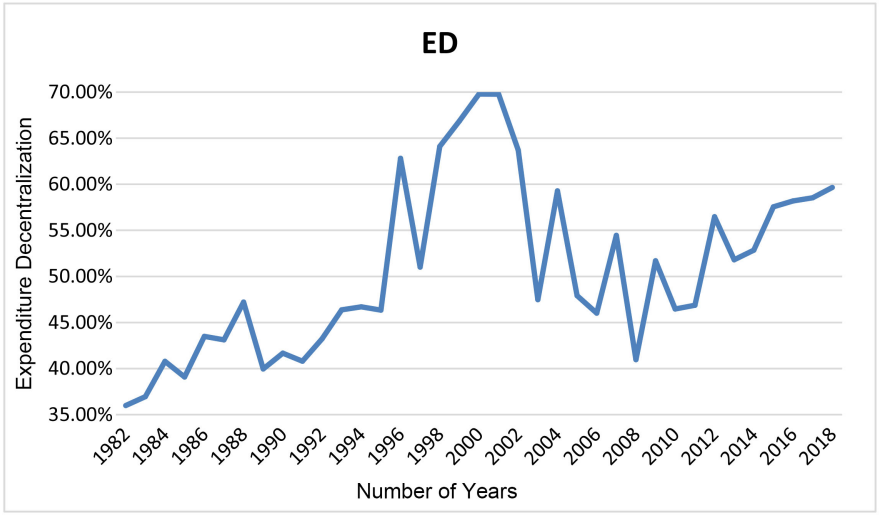

Figure 1. Expenditure decentralization. Source: Authors' own work.

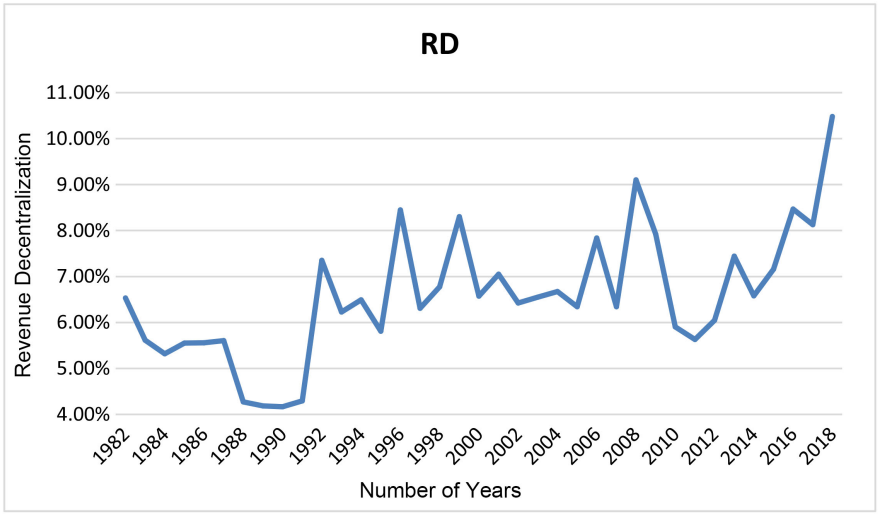

Figure 2. Revenue decentralization. Source: Authors' own work

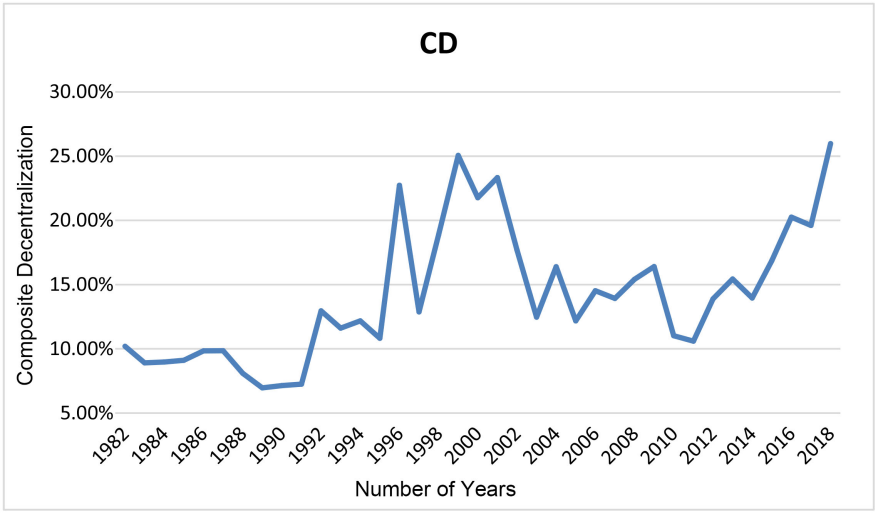

Figure 3. Composite decentralization. Source: Authors' own work

On the independent side, there will be fiscal decentralization and control variables. For fiscal decentralization; three measures, such as expenditure decentralization, revenue decentralization, and composite decentralization have been used. The fiscal decentralization measures are calculated by following Iqbal et al. (2012).

Moreover, for analyzing the post-7th NFC award of fiscal decentralization, an interaction variable of fiscal decentralization and the 7th NFC years' dummy variable have been introduced. The dummy variable for the 7th NFC is generated by giving 1 to 7th NFC award years and otherwise zero. This slope dummy will show how much the effect of fiscal decentralization has increased or decreased after the 7th NFC award.

Table 1 presents the descriptive statistics for all the variables.

4. Empirical Model

The time series data has a unit root, so the Augmented Dicky Fuller test (ADF) changed into implemented to decide the order of integration. The variables are incorporated at special ranges (i.e., I(0) and I(1)) thus, the cointegration via the ARDL bounds check technique has been applied in this study.

The indicators of development are assumed to have interdependence among each other (Yasmin et al., 2006). Moreover, the focused analysis of the study has also reverse causality as indicated by Iimi (2005) and Iqbal et al. (2012). Thus, this simultaneity among the focused variables requires a system of equations model and its estimation should be in a way that the analysis gives best possible results. For this we used Three Stage Least Squares Regression, in which our equations will be estimated under the given endogenous and exogenous variables. The three stage least squares might is more efficient, it is a relative benefit which increases with the interrelations among the error terms (Belsley, 1988). 3SLS estimates are consistent and asymptotically normal, and in some conditions, they are asymptotically efficient than OLS and 2SLS estimates (Zellner, 1962; Theil, 1962). The system of equations of the study is given below:

$$\ln \mathrm{GDP}_t = \pi_0 + \pi_1 \ln \mathrm{L}_t + \pi_2 \ln \mathrm{K}_t + \pi_3 \ln \mathrm{T}_t + \pi_4 \mathrm{FD}_t + \pi_5 \mathrm{Democ}_t + \pi_6 \mathrm{FD} * \mathrm{Dum7NFC}_t + \varepsilon_t \quad (1)$$

$$\mathrm{EDU}_t = \beta_0 + \beta_1 \ln \mathrm{GDP}_t + \beta_2 \mathrm{EMP}_t + \beta_3 \mathrm{EE}_t + \beta_4 \mathrm{FD}_t + \beta_5 \mathrm{Democ}_t + \beta_6 \mathrm{FD} * \mathrm{Dum7NFC}_t + \varepsilon_t \quad (2)$$

$$\mathrm{LE}_t = \gamma_0 + \gamma_1 \ln \mathrm{GDP}_t + \gamma_2 \ln \mathrm{HE}_t + \gamma_3 \mathrm{NP}_t + \gamma_4 \mathrm{FD}_t + \gamma_5 \mathrm{Democ}_t + \gamma_6 \mathrm{FD} * \mathrm{Dum7NFC}_t + \varepsilon_t \cdots \quad (3)$$

where GDP = gross domestic product, L = labor force, K = capital, FD = fiscal decentralization, T = trade, EDU = education, EMP = employment rate, EE = education expenditure (% of GDP), LE = life expectancy, HE = health expenditures, NP = the number of physicians, Democ = institutional democracy, and FD*Dum7NFC = interaction term of dummy of 7th NFC years and fiscal decentralization. π, β, and γ are coefficients, and ε is an error term. Subscript *t* is time. The focused coefficients will be π_4, β_4, and γ_4, while interaction term coefficients will also be observed.

Table 1. Descriptive statistics.

Variable	Obs	Mean	Std. Dev	Min	Max
GDP (Billion Rs.)	37	6374	3092	2292	13132.24
Education (Secondary School Enrollment, %)	37	28.5	7.94	17.1	46.0
Life Expectancy at Birth (years)	37	62.6	2.78	57.7	66.9
Expenditure Decentralization (ratio)	37	0.507	0.094	0.360	0.698
Revenue Decentralization (ratio)	37	0.065	0.014	0.042	0.105
Composite Decentralization (ratio)	37	0.142	0.052	0.070	0.260
Total Labor Force (Million)	37	43.5	12.5	26.3	65.5
Gross Fixed Capital Formation (Constant US$ Billion)	37	2.10e+10	6.22e+10	1.08e+10	3.62e+10
Trade to GDP Ratio (%)	37	33.3	3.38	25.3	38.9
[a]Employment Rate (%)	37	93.1	2.68	86.7	97.0
Education Expenditures (% of GDP)	37	2.47	0.35	1.84	3.02
Health Expenditures (Million Rs.)	37	39,515	58,298	291.9	225,331
Number of Physicians (Number)	37	175,141	101,622	30,416	389,485
Institutional Democracy (index)	37	4.27	3.56	0	8

Source: (See **Appendix 1**). [a]The employment rate is high because statistics include seasonal and part-time workers. GDP = gross domestic product; Rs. = the Pakistan rupee.

In Equation (1), in the first model, the Cobb-Douglas production function is applied. Cobb and Douglas (1928) used a particular functional shape of the production function. It is commonly used to represent the technological association among two or extra inputs, especially physical capital, labor, and quantity of output produced by way of those inputs. Trade is also a control variable, as Pakistan has an open economy. It affects the GDP, as stated in previous literature (Sachs et al., 1995).

Fiscal decentralization is included in the model as the focused variable. It has each direct and oblique affects on economic growth. Fiscal decentralization ameliorates the economic growth straight with the aid of growing government spendings (Oates, 1993). Martinez-Vazquez and McNab (2006) stated that fiscal decentralization complements economic growth not directly with the aid of high quality impact on charge stability in developed countries however this effect is much less clean in developing and transitional locations.

Equation (2) is second model, for impact of fiscal decentralization on education. Blöchliger (2013) stated that sub-central autonomy also determines the educational performance and the delegation of power in secondary education that thought to foster the education system. The main control variable included is GDP, as stated by Glewwe and Jacoby (2000) that education increases with higher economic growth. Furthermore, the employment rate and education ex-

penditures are included as control variables, as school characteristics are usually captured by spending (Blöchliger, 2013).

The Equation (3) is the third model regarding the implications of fiscal decentralization on health. Infant mortality and life expectancy are significantly affected by Fiscal Decentralization (Cantarero and Pascual, 2008). We include GDP as a control variable as economic growth benefits the overall country's welfare (Humphries and Van Doorslaer, 2000). Gerdtham and Johannesson (2001) found that medical facilities are important determinants of health conditions, so we included the number of physicians and health spending in the model of health.

5. Results and Interpretations

In this segment, we will look at empirical proofreading regarding the socioeconomic implications of fiscal decentralization. The impact of the three dimensions of fiscal decentralization will be analyzed in each model. The time series data require a stationarity test and confirmation of long-run cointegration before final estimation. Augmented Dickey-Fuller unit root test and an ARDL bound test are used to assess the long-term relationship between the variables. The models will be estimated with Three Stages Least Squares analysis due to the endogeneity of focused association (The GMM results are available in **Tables A1-A3**).

5.1. ADF Test

The stationarity in data has been checked by the implementation of the ADF unit root test. The null hypothesis states that there is no unit root, while the alternative hypothesis shows otherwise. Some variables fail to reject the null hypothesis at the level and reject the null hypothesis at the first difference, so they are integrated at the first difference form. Other variables reject the null hypothesis at the level and accept the null hypothesis at the first difference, so they are integrated at the level. The outcomes are summarized in **Table 2** for the Augmented Dickey-Fuller unit root test.

5.2. Long Run Cointegration Test

The different orders of integration show that the long-run cointegration should be checked with ARDL Bound test approach. The ARDL cointegration test was established by Pesaran et al. (2001). The null hypothesis in this test is that there is no cointegration. The null is rejected if the F-statistic value is higher than the upper critical bounds value, it is accepted if the F-statistic value is lower than the lower bounds value, and otherwise, the cointegration test is inconclusive. The results of the ARDL Bound Test are shown in **Tables 3-5** for the main equations.

In **Tables 3-5**, the test results show that all equations with each fiscal decentralization measure confirm the long-run cointegration as the values of the F-statistic are greater than the upper critical bound at each significance level. Thus this study now applies the three-stage least squares technique under the confirmation of long-run relationship after the ARDL Bound test.

Table 2. ADF test results.

Variable	ADF Test at Level	ADF Test at First Difference	Conclusion
GDP (Billion Rs.)	6.18 (1.00)	−4.94 (0.00)	I(1)
Education (Secondary School Enrollment)	0.30 (0.97)	−5.62 (0.00)	I(1)
Life Expectancy at Birth	5.03 (0.99)	−3.53 (0.05)	I(1)
Expenditure Decentralization	−2.21 (0.20)	−10.27 (0.00)	I(1)
Revenue Decentralization	−4.06 (0.01)	-	I(0)
Composite Decentralization	−1.98 (0.28)	−6.82(0.00)	I(1)
Total Labor Force (Million)	7.77 (1.00)	−3.66(0.00)	I(1)
Gross Fixed Capital Formation (Constant US$ Billion)	−3.29 (0.08)		I(0)
Trade to GDP Ratio	−0.44 (0.51)	−7.12 (0.00)	I(1)
Employment Rate	−1.94 (0.30)	−6.33 (0.00)	I(1)
Education Expenditures (% of GDP)	−3.46 (0.01)	-	I(0)
Health Expenditures (MillionRs.)	−1.38 (0.99)	−3.61(0.01)	I(1)
Number of Physicians (Number)	−8.97 (0.00)	-	I(0)

Note: Parentheses have *p*-values.

Table 3. ARDL bound test results for first equation.

Bounds testing to cointegration of Equation (1)	With expenditure decentralization	With revenue decentralization	With composite decentralization
Optimal Lag Length	(3, 3, 2, 1, 4, 3)	(3, 4, 4, 4, 4, 4)	(4, 4, 4, 3, 4, 4)
F-statistics	11.184	74.077	3.005
	Critical values (T = 37)	I(0) Bound	I(1) Bound
10%		2.08	2.9
5%		2.39	3.38
2.5%		2.7	3.73
1%		3.06	4.15

Table 4. ARDL bound test results for second equation.

Bounds testing to cointegration of Equation (2)	With expenditure decentralization	With revenue decentralization	With composite decentralization
Optimal Lag Length	(4, 4, 4, 4, 4, 4)	(4, 3, 3, 4, 4, 4)	(4, 4, 4, 4, 3, 4)
F-statistics	17.55	4.3	21.72
	Critical values (T = 37)	I(0) Bound	I(1) Bound
10%		2.08	3
5%		2.39	3.38
2.5%		2.7	3.73
1%		3.06	4.15

Table 5. ARDL bound test results for third equation.

Bounds testing to cointegration of Equation (3)	With expenditure decentralization	With revenue decentralization	With composite decentralization
Optimal Lag Length	(4, 4, 4, 3, 4, 4)	(4, 1, 4, 4, 4, 3)	(4, 4, 3, 4, 4, 3)
F-statistics	51.84	19.55	8.04
	Critical values (T = 37)	I(0) Bound	I(1) Bound
10%		2.08	3
5%		2.39	3.38
2.5%		2.7	3.73
1%		3.06	4.15

5.3. 3 SLS Results

The 3 SLS results are shown in Tables 6-8 for each dimension of fiscal decentralization. In these tables 2nd, 3rd, and 4th columns have results for equations 1, 2, and 3, respectively.

In Table 6, we observe that expenditure decentralization has a highly significant and positive impact on economic growth and education while insignificant impact on life expectancy. In this analysis, our main focus is on the effect of the 7th NFC award, we observe that in this case, the interactive term of expenditures decentralization and 7th NFC award Years' show a significant and positive impact on all variables except life expectancy. The 0.01 unit increase (or one percent increase) in expenditure decentralization increases the GDP of the country by 0.27 percent at a 1percent significance level, while after the 7th NFC, this effect increases by 0.13 percent, which becomes 0.40 (0.27 + 0.13 = 0.40) percent. The positive impact of decentralization on economic growth is predicted in previous literature Oates (1993) and Iimi (2005).

The effect of expenditure decentralization on education is significant and negative as 0.01 unit increase (or one percent increase) in ED brings 10.12 units to decrease in secondary enrollment at 1 percent significance level. However, the magnitude of this negative effect on education has decreased by 7.93 units after the 7th NFC award and becomes −2.93 (−10.12 + 7.93). The life expectancy increases by 1.11 years when ED increases by 0.01 units (or one percent increase) at 1 percent significance considered. The slope dummy shows that after the 7th NFC award, the effect of expenditure decentralization is positive but insignificant in the health sector. The education results are consistent with Sabir (2010), which concluded based on projected values of education by arguing that this award is a positive move.

The effect of revenue decentralization on three indicators of socioeconomic development has been shown in Table 6. The impact of revenue decentralization on economic growth is insignificant; but after 7th NFC award years, the slope dummy variable is positive and significant. This result is consistent with the results of Iqbal et al. (2012). The impact of revenue decentralization on education is significant and positive, the secondary enrollment increases by 60.24 units with 0.01 unit increase (or one percent increase) in RD at 5 percent significance

level. This effect is also positive after 7th NFC award to 110.02 units (60.24 + 49.78). These results are consistent with Blöchliger (2013), which found that revenue decentralization has a positive and significant impact on education. Furthermore, it also stated that revenue decentralization has a more strong relationship with education.

Table 6. 3SLS results with expenditure decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	−7.42***	−72.26**	11.84
Expenditure Decentralization	0.27***	−10.12***	1.11***
Exp Dec*Dum 7th NFC	0.13***	7.93***	0.993
Institutional Democracy	0.004**	0.25**	−0.021*
GDP	-	11.94***	5.82***
Labor	1.07***	-	-
Capital	0.502***	-	-
Trade	−0.008	-	-
Employment Rate	-	−0.065	-
Education Expenditures	-	2.81***	-
Health Expenditures	-	-	0.055*
Number of Physicians	-	-	−4.41
R Squared	0.997	0.942	0.998
No. of Observations	37	37	35

Note: *, **, and *** are 10%, 5%, and 1% significance levels, respectively.

Table 7. 3SLS results with revenue decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	−7.71***	−84.51***	42.34***
Revenue Decentralization	−0.34	60.24**	−6.29***
Rev Dec*Dum 7th NFC	0.59*	49.78***	−17.05
Institutional Democracy	0.004**	0.34***	0.009
GDP	-	10.65***	1.89
Labor	1.11***	-	-
Capital	0.53***	-	-
Trade	−0.12*	-	-
Employment Rate	-	0.13	-
Education Expenditures	-	1.23	-
Health Expenditures	-	-	0.09***
Number of Physicians	-	-	0.00*
R Squared	0.996	0.943	0.993
No. of Observations	37	37	37

Note: *, **, and *** are 10%, 5%, and 1% significance level respectively.

Table 8. 3 SLS results with composite decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	−6.23***	−76.71**	45.24**
Composite Decentralization	0.289***	−8.02	−7.77
Com Dec*Dum 7th NFC	0.248**	26.33***	0.019
Institutional Democracy	0.006***	0.246***	−0.031***
GDP	-	11.46***	1.41
Labor	1.15***	-	-
Capital	0.45***	-	-
Trade	−0.065	-	-
Employment Rate	-	−0.001	-
Education Expenditures	-	2.14***	-
Health Expenditures	-	-	0.106***
Number of Physicians	-	-	0.002
R Squared	0.996	0.939	0.994
No. of Observations	37	37	37

Note: *, **, and *** are 10%, 5%, and 1% significance level respectively.

The effect of revenue decentralization on health is negative and significant, the life expectancy decreases by 6.29 years due to 0.01 unit increase (or one percent increase) in revenue decentralization at a 1 percent significance level. While there is a negative effect of RD after the 7th NFC award, so we can say that revenue decentralization is not beneficial for the health status of the country. The reason might be that collection of revenue by local-level governments in social sectors is exploited by corruption in developing countries, thus the true effects are not transferred.

The results for the effect of composite decentralization on main indicators are shown in Table 8. In composite decentralization, revenue decentralization and expenditure decentralization reinforce each other (Iqbal et al., 2012). The impact of composite decentralization is positive and significant on economic growth as 0.01 unit increase (or one percent increase) in CD brings 0.289 percent increase in the GDP of the country, at 1 percent significance level. The interactive term of the CD and 7th NFC years dummy has a significant coefficient, which shows that the effect is the same either before or after the 7th NFC with a positive magnitude.

The coefficient of composite decentralization is insignificant when observed for education and health. But the slope dummy shows that after 7th NFC award the impact of composite decentralization becomes positive and significant on education but positive and insignificant on health indicators. After 7th NFC award, the secondary enrollment (education) increases by 26.33 units with 0.01

unit increase (or one percent increase) in CD, and insignificance but positive on life expectancy. This shows that 7th NFC has a positive impact on education but none on health.

6. Conclusion and Policy Recommendations

This study presents an analysis of the impact of the 7th NFC and fiscal decentralization on three main economic indicators of Pakistan i.e., economic growth, education, and health. The analysis is done for each fiscal decentralization measure with the slope dummy for 7th NFC years. The study has concluded under the majority rule, the impact of economic indicator under each measure of FD is observed and then concluded that impact where majority goes. The three main conclusions are made as: 1) there is a positive impact of fiscal decentralization on Economic Growth except in one direction, but the effect of 7th NFC is observed positive and significant in all dimensions of FD. Thus 7th NFC has contributed in economic growth; 2) the 7th NFC award has improved education level as there is positive impact for each dimensions of FD; 3) the 7th NFC award has not improved the health level as there is insignificant impact for all dimensions of FD.

The economic growth level of 7th NFC years; show that decentralization has positively contributed in economic growth. This might be due to the reason that Government of Pakistan has done expenditure decentralization largely while revenue decentralization is not done at that level.

Revenue decentralization is negative and insignificant for economic growth but it is positive and significant after 7th NFC. The tax base of Pakistan is quite narrow so revenue decentralization is not significant determinant for health so it might be the reason of insignificant impact. Education have responded positively to the 7th NFC award, thus showing that the main targets of 7th NFC have been fulfilled for education but policy changes are required for the health sector. The summary of results with above conclusions of 7th NFC impact has been shown in below Table 9.

Table 9. Summary of results.

Variables	Economic Growth	Education	Health
Expenditure Decentralization	Positive (before 7th NFC) Positive (after 7th NFC)	Negative (before 7th NFC) Positive (After 7th NFC)	Positive (before 7th NFC) Positive (after 7th NFC)
Revenue Decentralization	None (before 7th NFC) Positive (after 7th NFC)	Positive (before 7th NFC) Positive (after 7th NFC)	Negative (before 7th NFC) None (after 7th NFC)
Composite Decentralization	Positive (before 7th NFC) Positive (after 7th NFC)	Positive (before 7th NFC) Positive (after 7th NFC)	None (before 7th NFC) None (after 7th NFC)
CONCLUSION	Positive impact of fiscal decentralization on Economic Growth in two dimensions, while effect of 7th NFC observed positive in all dimensions of FD.	7th NFC award improved education level as there is positive impact for each dimension of FD.	7th NFC award improved health level in only one dimension but there is no impact for two dimensions of FD.

By taking the stock of analysis of results and the conclusion, this study is able to give some policy recommendations.

• The revenue or tax decentralization should be implemented because the revenue collection at provincial level can generate more revenue and thus it can boost the chances of spending on local level.

• The decentralized decision-making should be encouraged but under the coordination of the federal authorities and federating units. The Federal authorities should try to coordinate local tax and expenditure rules. It is able to be executed through revenue sharing and matching grants. For this reason, preserving decentralized decision-making and decreasing the cost arising from the lack of coordination.

• The revenue decentralization should be implemented in education sector specifically as it has high positive response to it. It is not suggested to be happened in health sector as this sector does not respond positively to revenue decentralization.

• Health variable shows a positive response to the expenditure decentralization so there is a need to spend more in this sector with the value of efficiency.

• The results also indicate that specific decentralization should be carried out by Government in each sector of the economy.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix 1. Variable Definitions and Data Sources

Variable	Unit	Form	Source
GDP	Factors Prices (Rs Billion)	Logarithmic	Pakistan ECO survey (Various Issues)
Education (Secondary School Enrollment)	Percentage Gross	Simple	Pakistan ECO survey (Various Issues)
Life Expectancy at Birth	Years	Simple	World Development Indicators (2019)
Expenditure Decentralization	Ratio	Simple	Calculated from Provincial and Federal Expenditure data taken from Pakistan ECO survey (Various Issues)
Revenue Decentralization	Ratio	Simple	Calculated from Provincial and Federal Revenue data taken from Pakistan ECO survey (Various Issues)
Composite Decentralization	Ratio	Simple	Calculated from Provincial and Federal Expenditure and Revenue data taken from Pakistan ECO survey (Various Issues)
Total Labor Force	Number (Million)	Logarithmic	Pakistan ECO survey (Various Issues)
Gross Fixed Capital Formation	Constant US$ (Billion)	Logarithmic	World Development Indicators (2019)
Trade to GDP Ratio	Ratio	Logarithmic	World Development Indicators (2019)
Employment Rate	Ratio	Simple	Calculated from Employed Labor Force and Total Labor Force Data taken from Pakistan Economic Survey (Various Issues)
Education Expenditures	Percentage of GDP	Simple	World Development Indicators (2019)
Health Expenditures	Rs. Million	Logarithmic	Pakistan Economic survey (Various Issues)
Number of Physicians	Number	Logarithmic	Calculated by adding number of Doctors, Nurses, Midwives, and Lady Health Visitors Data taken from Pakistan Economic survey (Various Issues)
Institutional democracy	Index	Simple	Polity IV dataset

Appendix 2. Results of GMM

Table A1. Results with expenditure decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	−12.9***	253.98*	20.19***
Expenditure Decentralization	0.65**	−9.68	0.28
Exp Dec*Dum 7th NFC	0.57*	38.70***	1.64***
Institutional Democracy	−0.01	−0.044	−0.05***
GDP	-	−6.33	2.15*
Labor	0.74***	-	-
Capital	0.65***	-	-
Trade	0.86	-	-
Employment Rate	-	−2.20**	-
Education Expenditures	-	6.57*	-
Health Expenditures	-	-	0.08***
Number of Physicians	-	-	1.91***
R Squared	0.980	0.629	0.995
No. of Observations	37	37	37
J-STAT, Probability for GMM	0.006	0.007	0.006

Note: *, **, and *** are 10%, 5%, and 1% significance level respectively.

Table A2. Results with revenue decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	−71.30	301.30*	22.13***
Revenue Decentralization	−10.46	−18.20	5.93
Rev Dec*Dum 7th NFC	29.87	412.64***	19.91***
Institutional Democracy	−0.14	−0.06	−0.06***
GDP	-	−9.82	0.90
Labor	−2.17	-	-
Capital	3.13	-	-
Trade	4.16	-	-
Employment Rate	-	−2.26*	-
Education Expenditures	-	7.08*	-
Health Expenditures	-	-	0.11*
Number of Physicians	-	-	2.61***
R Squared	0.171	0.502	0.990
No. of Observations	37	37	37
J-STAT, Probability for GMM	0.010	0.007	0.006

Note: *, **, and *** are 10%, 5%, and 1% significance level respectively.

Table A3. Results with composite decentralization.

Variables	Equation (1) GDP	Equation (2) Education	Equation (3) Life Expectancy
Constant	24.73	80.07	24.46***
Composite Decentralization	2.69	−46.58*	−2.20
Com Dec*Dum 7th NFC	9.61	46.23*	5.65**
Institutional Democracy	−0.14	0.21	−0.07***
GDP	-	4.44	−0.19
Labor	3.46	-	-
Capital	−3.0	-	-
Trade	11.93	-	-
Employment Rate	-	−0.93*	-
Education Expenditures	-	−0.23	-
Health Expenditures	-	-	0.40*
Number of Physicians	-	-	3.03*
R Squared	−2.69	0.636	0.978
No. of Observations	37	37	37
J-STAT, Probability for GMM	0.009	0.007	0.008

Note: *, **, and *** are 10%, 5%, and 1% significance level respectively.