

Does Fiscal Decentralisation Matter for Poverty and Income Inequality in Pakistan?

SEHRISH SHAHZAD and BUSHRA YASMIN

This study endeavours to investigate the impact of fiscal decentralisation on the welfare concerns of poverty, and income inequality in Pakistan for the time period 1972 to 2013. In order to capture the multi-dimensional nature of fiscal decentralisation, three indicators are used namely; revenue decentralisation, expenditure decentralisation and composite decentralisation. Further, the role of institutional quality is also incorporated in apprehending the responsiveness of welfare issues towards the process of fiscal decentralisation. The estimation technique of Generalised Method of Moments (GMM) is employed for estimating the impact of fiscal decentralisation on poverty and income inequality. The empirical findings suggest that fiscal decentralisation has discretely resulted in increasing poverty and income inequality in Pakistan, but the presence of better institutional quality along with fiscal decentralisation can promise to mitigate the negative consequences of fiscal decentralisation for poverty and income inequality in Pakistan. Although, the indirect effect of fiscal decentralisation on welfare concerns, through institutional quality exhibits a fluctuating trend over time, but its average marginal effect is lower than the direct effect of fiscal decentralisation on welfare concerns. Hence, it can be perceived that the long-run welfare issues can be tackled effectively in the presence of institutional quality with a rational level of fiscal decentralisation. Also in order to reap the potential benefits of fiscal decentralisation for poverty and income inequality that has remained a catastrophe in case of Pakistan.

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1. INTRODUCTION

The welfare issues like poverty and income inequality have remained the key objectives of policy makers and it has regained the attention, since the adoption of Millennium Development Goals (MDG) (2000). In order to combat poverty and income inequality, a reasonable progress has been made in devising the development policies. Yet, almost a billion people in the world continue to be in miserable poverty, and are facing severe income disparities. In order to improve the living conditions of the poor, the nature, causes and consequences of poverty and income inequality has become an overwhelming matter of concern and a priority research area.

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Poverty and income inequality is considered as complex issues in South Asian countries like Pakistan. Approximately 40 percent of people in Pakistan are living below the poverty line and are facing severe imbalances in income distribution. They are even at the dearth of basic needs like food, clothing, shelter, education and health facilities. Rapid growth of population, high inflation, unemployment and lack of effective labour force has remained the major causes of rising poverty and income inequality in Pakistan [Faridi and Nazar (2013)].

The welfare issues are inherently linked with each other and inclined to the same public policies. Specifically, the poverty ailment in the economy can be improved through equitable distributional policies [Jamal (2006)]. Pertaining to the eradication of poverty and income inequality, the redistribution of revenues and expenditures can be considered as an important policy tool. Fiscal decentralisation has gained momentum as a major contributing factor to deal with these issues and to ensure effective governance through financial autonomy of provincial governments.

According to Rondinelli (1981), fiscal decentralisation is a process through which powers over revenues collection and expenditures are transferred from the national government to the sub-national levels of government. It makes the contribution of the smaller units of federation in economic development possible and provides an opportunity to the central government to accomplish the national level tasks more efficiently. More precisely, the devolution of fiscal responsibilities both in terms of revenues generation and expenditures is expected to enhance the public sector efficiency, through healthy competition across the provinces in the provision of public utilities and by the development of transparency in the institutional mechanism. Henceforth, this can enter into the poverty and income inequality debate through its channel of accountability and transparency and the resource re-allocation among the poor, keeping in view the pro-poor growth aspect.

However, the role of institutional quality matters in regulating this channel. Literature postulates both positive and negative effects of fiscal decentralisation for economic growth, poverty and income inequality with a varied context for developed and developing countries [Prud'homme (1995), Tanzi (1996), Rodríguez-Pose and Gill (2004), Arze, *et al.* (2005), Rodríguez-Pose and Ezcurra (2009), Sepulveda and Martinez-Vazquez (2010) and Tselios, *et al.* (2011)]. The literature on fiscal decentralisation emerged from the traditional 'Theory of Fiscal Federalism' which put forward a normative framework regarding the assignment of responsibilities and functions to the different levels of government. According to Baratheen (2008) and Ezcurra and Pascual (2008), fiscal decentralisation is a success for major welfare measures as it results in human capital development, resource mobilisation and pro-poor service delivery.

Conversely, low institutional quality, poor governance and corrupt policies leads to unfair revenue sharing and reduces the potential of fiscal decentralisation process to combat poverty and income inequality [Bonet (2006) and Dyah (2012)]. The inbuilt supposition behind the optimistic contribution of fiscal decentralisation is inclined with an effective institutional mechanism. Institutional quality promotes the accountability and transparency in the fiscal system and can lower the corruption. This eventually results in proficient distribution of public resources and can reduce poverty and income inequality [Limi (2005) and Neyapti (2006)].

1.1. Objectives of the Study

Keeping in view, the growing stance for fiscal decentralisation with the policy target of tackling socio-economic problems at grass-root level in Pakistan, this study endeavours to work out possible link of fiscal decentralisation with poverty and income inequality, controlling for the institutional quality. This study covers the time period from 1972–2013 that encounters all NFC awards and earlier settlements on the adjustment of federal-provincial resource distribution mechanism.

1.2. Organisation of the Study

The rest of the paper is organised as follows. Second section deals with the literature review. Third part discusses the evolution of fiscal decentralisation in Pakistan. The fourth section discusses methodology and the fifth section reports and interprets the empirical findings. Final section concludes the paper with policy implications.

2. REVIEW OF LITERATURE

Given the lack of consensus on the impact of fiscal decentralisation, a number of studies have empirically examined the impact of fiscal decentralisation on poverty. Many studies, found a positively significant relationship between fiscal decentralisation and poverty [Bossuyt and Gould (2000), Vedeld (2003), Steiner (2007) and Banwo (2012)] with the perception of weak financial and administrative support to the decentralised governments, vulnerable institutions and fiscal indiscipline at sub-national level. However, some other studies found the said relationship to be negative implying reduction in poverty as a result of fiscal decentralisation [Barathen (2008) and Faridi and Nazar (2013)]. Such relationship is mostly justified on the basis of efficient service delivery, increased participation of poor, resource mobilisation and financial transfer to the sub-national governments.

Similarly, existing literature on the impact of fiscal decentralisation on income inequality provides mix evidence. Ezcurra and Pascual (2008), and Tselios, *et al.* (2011) provided the evidence for negative association between fiscal decentralisation and income inequality for the developed countries. Notwithstanding, the developed countries have well-established institutional framework and good governance in carrying out such practices. Alternatively, it appears to be reversed for the developing countries, as put forth by Neyapti (2006), Bonet (2006) and Dyah (2012). The factors working behind are low infrastructure investment, lack of adequate redistributive element in national transfer and weak institutional arrangements at sub-national level.

The literature for Pakistan is mostly focused on economic growth, and employment relationship with fiscal decentralisation and portrays a positive association between these variables [Malik, Hassan, and Hussain (2006), Khattak, Ahmad, and Khan (2010), Faridi (2011) and Faridi, Chauhdhry, and Ansari (2012)]. The justification of the findings mostly rely on the ‘theorem of decentralisation’, discussed earlier. Another study by Faridi and Nazar (2013) focused on the relationship between fiscal decentralisation and poverty in Pakistan using Ordinary Least Square (OLS) technique for the time period 1972–2010. Their results reported negative effect of expenditures and revenue decentralisation for poverty. However, the results are to be taken with cautious due to possible endogeneity in

the model, which is not addressed in the respective study. No study is available though, for measuring the direct link between fiscal decentralisation and income inequality for Pakistan. This completes the discussion on existing literature for the implications of fiscal decentralisation. The next section deals with the historical trends in the process of fiscal decentralisation, and welfare indicators in Pakistan from 1972–2013.

3. FISCAL DECENTRALISATION AND WELFARE ISSUES IN PAKISTAN: A HISTORICAL OUTLOOK

3.1. Experience of Resource Distribution Mechanism

In order to strengthen the process of fiscal decentralisation in Pakistan, government has undertaken various measures. Since independence, the transfer of revenues from national to sub-national level has been carried out through the Niemeyer Award 1947, the Raisman Award 1952, the One Unit Scheme 1961 and 1965 and National Finance Commission (NFC) awards.¹ By the time, seven NFC awards have been formulated under the 1973 constitution and only three awards (1974, 1991 and 2010) have made certain advancement in revenue sharing between federation and provinces. The remaining four awards (1979, 1985 1996 and 2000) remained inconclusive due to conflict among the stakeholders of the commission.

The population has remained the sole criteria for resource distribution among provinces in all NFC awards and mostly goes in favour of province Punjab except seventh NFC (2010) that was more comprehensive and taken into account the other indicators as well. The earlier awards depict the lack of policy coordination as Sindh, KPK and Baluchistan always stressed on the equitable and diversified revenue sharing formula, based on the inclusion of other indicators like poverty, revenue collection and inverse population density along with population, but to no avail. Later, the implementation of 7th NFC award brought about improvement in the condition of relatively backward provinces of KPK and Baluchistan as compared to Sindh and Punjab.

Admittedly, the 7th NFC award along with 18th amendment can lead towards the significant transfer of rights and responsibilities to the provincial governments. More recently, the government of Pakistan signed 18th constitutional amendment as a step towards the broader agenda of reforms in establishing multi-order government structure in Pakistan. It is aimed to strengthen the local governments, through uplifting local economies and ensuring social welfare for its local communities. Although, the provinces are able to attain improved fiscal and administrative powers but due to lack of effective local institutions and strong background of central government, the provinces have remained deprived of legitimate autonomy.² The provinces have been demanding higher share from the divisible pool whereas, centre argued for joint sharing of the responsibilities of war against terrorism, natural disasters and the needs of special areas like Azad Jammu and Kashmir, Gilgit Baltistan and the federally administered Tribal areas. Hence, new NFC without any national consensus would be meaningless.

¹National Finance Commission (NFC) is an autonomous body established under Article 160 of Constitution of Pakistan (1973), for the re-distribution of resources from federal government to provincial governments.

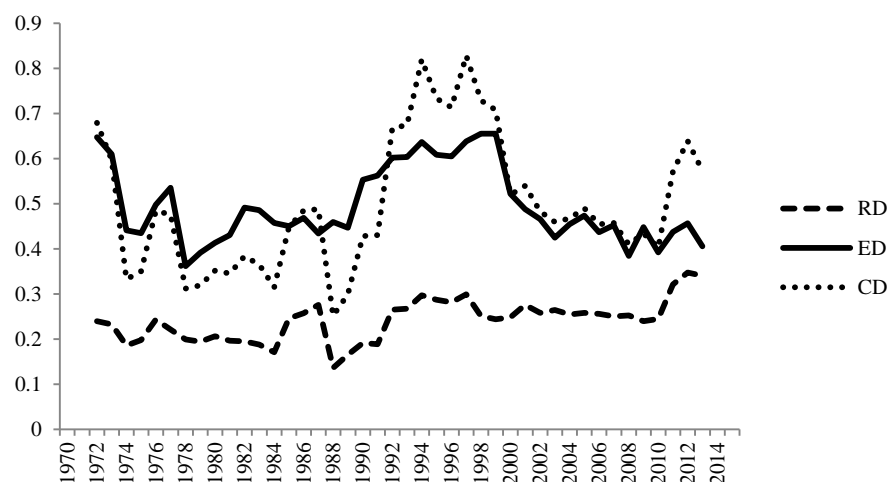
²See for reference, *The Daily Dawn*, May 4, 2015.

Now, we will move to the trend analysis of distribution of resources between federal and provincial governments over the time period 1972–2013.

3.2. Trends in Resources Re-allocation between Federal and Provincial Governments

Three indicators namely revenue decentralisation, expenditure decentralisation and composite decentralisation have been used to measure the level of fiscal decentralisation in Pakistan and are provided as trends in Figure 3.1.³

Fig. 3.1. Revenue, Expenditure and Composite Decentralisation in Pakistan



Source: author's own calculations from Pakistan, Govt. of (various issues).

As depicted by Figure 3.1, trends in revenues and expenditure decentralisation depict the similar fluctuations but with a wide margin. The expenditure decentralisation has remained more than the revenue decentralisation throughout the years. While, the trend in composite decentralisation reflects the combination of the two. Precisely, the share of provincial revenue in total revenue remained between 13 percent to 35 percent during the time period from 1972 to 2013. In 1988, the share of provincial revenues was quite low at 13 percent. However, it tend to be increased later. It remained relatively flat in 2000s with a gradual jump in the year 2013 that observed the revenue decentralisation standing at 35 percent.

Regarding the expenditure decentralisation, measured as the ratio of provincial government expenditure to the total government expenditure; share varying from 35 percent to 65 percent during 1972 to 2013 in Pakistan. The provincial expenditure's share drastically declined from 53 percent to 37 percent over the time period of three years only (1976-1979). However, later it gradually increased and touched its peak in the year 2000. The share of provincial expenditure in total government expenditure remained relatively stable and ranged between 43 percent to 49 percent after year 2000. From 2010 onward,

³The trends are based on author's own calculations, following Iqbal, Din and Ghani (2013) for three fiscal decentralisation formulas.

the provinces are indicating around 44 percent expenditure share in the total government expenditure.

Composite decentralisation index is the combination of both revenue decentralisation and expenditure decentralisation and ranges between 25 percent to 83 percent during 1972-2013. During 1975-1985, the combined provincial share of revenues and expenditures as percentage of total varies between 35 percent to 45 percent. Composite decentralisation index indicated a sharp decline up to 25 percent in the year 1988. Later on, the index rose sharply and reached 82 percent in 1997. From 2002 to 2010, the composite decentralisation index has been following a declining trend and reached 40 percent in 2010 with an upsurge in the year 2012.

3.3. Trends in Poverty and Income Inequality

Figure 3.2 shows the trend in poverty and income inequality in Pakistan from 1972-2013. The head count ratio measuring the poverty in Pakistan ranges from 12 percent to 46 percent, over the time period 1972 to 2013. Overall, the poverty incidence showed a gradually declining path during 1980s. This decreased from 36 percent in 1977 to almost 24 percent in 1984.

Fig. 3.2. Poverty and Income inequality in Pakistan



Source: World Income Inequality Database (2013), Jamal (2006) and Economic Survey of Pakistan (Various Issues).

According to Irfan and Amjad (1984), the reduction in poverty was mainly attributed to the high growth rate of per capita GDP in 1980s that was recorded at 3.8 percent per annum as compared to 1.8 percent in 1970s. However, an increase in poverty is observed from 1997 to 2003, followed by declining trend again. The rise in poverty ratio can be explained by the incidence of low GDP growth rate, lack in employment opportunities and rise in food prices [Miankhail (2009)]. However, the HCR declined to 12.4 percent in 2010. Arif and Farooq (2011) associated this decline with a number of factors including increased allocations to the social safety net programs like Benazir Income Support Program and better support prices of agriculture etc.

The GINI coefficient, measure of income-inequality, ranges from 24 percent to 42 percent for the time period 1972-2013. Initially, income inequality in Pakistan showed an increasing trend from 34.6 percent in 1972 to 37.5 percent in 1980. It further increased and reached at 41.5 percent in 1984. Later, the income inequality attained the highest peak and reached at 42 percent in 1993. According to Haq (1999), rising trend in income inequality is mainly due to high inflation, regressive tax system, high unemployment rate and sticky wages. During 1997-1998, there was a sharp decline in GINI coefficient up to 26 percent. This improvement in income distribution may have been due to increase in wages and employment opportunities in agriculture and manufacturing sectors over the said time period [Kemal (2006)]. The later trend in income inequality is again followed by the sharp fluctuations. This is pertinent to mention that the measure of income-inequality has appeared to be more volatile as compared with poverty.

4. METHODOLOGY AND DATA DESCRIPTION

4.1. Theoretical Framework

‘Theorem of Fiscal Decentralisation’ by Oates (1972) holds importance in explaining the link between fiscal decentralisation and its welfare gains. This theorem strongly justifies the case for fiscal decentralisation and states that the individual as well as regions have different preferences for public goods and services. Sub-national governments take into account the preferences of local communities and work efficiently in providing public goods and services according to the needs of mass.

Secondly, fiscal decentralisation deals with poverty and income inequality through resource mobilisation that can result in the transfer of power over funds to the local government and hence, empowering sub-national governments in decision making process. In this way, resource mobilisation through fiscal decentralisation leads to greater economic efficiency, better distribution of income and welfare gains in the economy [Steiner (2007)]. Moreover, fiscal decentralisation can enhance the competition among jurisdictions for mitigating inefficiency, rent-seeking and corrupt practices as well [Ebel and Yilmaz (2002)].

Relatively, the favourable implications of fiscal decentralisation for poverty and income inequality have been criticised by Prud’homme (1995), Rodríguez-Pose and Gill (2004) and Tanzi (1996). In this context, Prud’homme (1995) put a question on the validity of ‘fiscal decentralisation theorem’ and argued that needs do not differ significantly across the provinces. He suggested that in order to reduce poverty and income inequality, it is better to satisfy the needs instead of focusing on the preferences as the needs are universal and do not vary significantly across regions. Hence, the central government will be more suitable for the provision of these goods as compared to local government. Even if differences in needs are realised across the regions, yet the sub-national governments may not have the power to take into account the needs and preferences of local population, precisely. It is because the local authorities are considered to be weak and inefficient in developing countries and lack relevant expertise to implement the desired policies and strategies for human development [Tanzi (1996)]. The criticism on fiscal decentralisation is also grounded on the quality of institutional factors involved in the process of fiscal decentralisation.

4.2. Model Specification and Data Description

The empirical models to measure the impact of various measures of fiscal decentralisation on poverty in Pakistan over the time span of 1972-2013 are specified as below:⁴

$$LPOV_t = \alpha_0 + \alpha_1 RD_t + \alpha_2 RD_t * INS_t + \alpha_3 LPOV_{t-1} + \alpha_4 LINQ_t + \alpha_5 LPGDP_t + \alpha_6 HK_t + \alpha_7 LCPI_t + \mu_{1t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

$$LPOV_t = \beta_0 + \beta_1 ED_t + \beta_2 ED_t * INS_t + \beta_3 LPOV_{t-1} + \beta_4 LINQ_t + \beta_5 LPGDP_t + \beta_6 HK_t + \beta_7 LCPI_t + \mu_{2t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

$$LPOV_t = \gamma_0 + \gamma_1 CD_t + \gamma_2 CD_t * INS_t + \gamma_3 LPOV_{t-1} + \gamma_4 LINQ_t + \gamma_5 LPGDP_t + \gamma_6 HK_t + \gamma_7 LCPI_t + \mu_{3t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

The above specified equations measure the impact of revenue, expenditures and composite decentralisation, respectively.

Similarly, the empirical models for income inequality are specified as below:⁵

$$LINQ_t = \alpha_0 + \alpha_1 RD_t + \alpha_2 RD_t * INS_t + \alpha_3 LINQ_{t-1} + \alpha_4 LPGDP_t + \alpha_5 SLPGDP_t + \alpha_6 HK_t + \alpha_7 LCPI_t + \mu_{1t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

$$LINQ_t = \beta_0 + \beta_1 ED_t + \beta_2 ED_t * INS_t + \beta_3 LINQ_{t-1} + \beta_4 LPGDP_t + \beta_5 SLPGDP_t + \beta_6 HK_t + \beta_7 LCPI_t + \mu_{2t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

$$LINQ_t = \gamma_0 + \gamma_1 CD_t + \gamma_2 CD_t * INS_t + \gamma_3 LINQ_{t-1} + \gamma_4 LPGDP_t + \gamma_5 SLPGDP_t + \gamma_6 HK_t + \gamma_7 LCPI_t + \mu_{3t} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (6)$$

The variables used in the model are described as below:

Measures for Fiscal Decentralisation

In order to estimate the impact of fiscal decentralisation on poverty and income inequality, the available literature put forward two measures, namely revenue decentralisation and expenditure decentralisation. Woller and Phillips (1998) made some adjustments in these measures to avoid double counting. The factors defense expenditure and interest payment on debt are subtracted from total government expenditure in the measurement of expenditure decentralisation.⁶

In contrast, Martinez-Vazquez and McNab (2003) and Martinez-Vazquez and Timofeev (2010) provided a more comprehensive measure, keeping in view the

⁴It is pertinent to mention that each specified equation is estimated with three alternatives. First, by adding fiscal decentralisation indicator along with other standard variables to poverty. Second, by adding institutional quality (INS) along with the variables used in first equation. In third alternative, an interaction term of institutional quality and fiscal decentralisation measure is included to test the hypothesis of fiscal decentralisation and institutional quality being complementary to reduce poverty, as shown in Equations (1), (2) and (3).

⁵Each equation is estimated with three alternatives like the poverty equations.

⁶This exclusion was justified because the defense expenditures and interest payments are mainly considered as the part of centralised government expenditure.

multidimensional aspect of fiscal decentralisation. They introduced the composite decentralisation index by combining both the expenditure and revenue decentralisation. Later, Iqbal, Din and Ghani (2013) used all three indicators to measure the fiscal decentralisation; expenditure decentralisation, revenue decentralisation and the composite index of decentralisation. The present study also used these measures of fiscal decentralisation as defined below.

Revenue Decentralisation (RD)

Revenue decentralisation (RD) is calculated as the ratio of provincial government revenue less grant in aid to the total government revenue that includes federal government (FR) revenue plus provincial government revenue (PR). The formula for RD is given as below:

$$RD = \frac{PR - \text{Grant in Aid}}{PR + FR}$$

Expenditure Decentralisation (ED)

Expenditure decentralisation (ED) is measured as the ratio of provincial government expenditures (OE) to the total government expenditures less the defense spending (DE) and payment of interest on debt (IE). The formula for ED is given as below:

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

Composite Decentralisation (CD)

Composite decentralisation (CD) is computed using both revenue decentralisation and expenditure decentralisation. The formula for CD is given as below:

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

Table 4.1 displays the description of all variables and their data sources.

4.3. Justification of Variables

The revenue and expenditure decentralisation is expected to have positive/negative effect on poverty and income inequality. Whereas, the impact of composite decentralisation is contingent on the revenue and expenditure decentralisation consequences for poverty and income inequality. Taking into account the role of institutions in determining the welfare measures, it is expected that the impact of institutional quality will be negative implying a decline in poverty and income inequality due to higher institutional quality. The evidence for such outcome of institutional quality has been provided by Barro (1999) and Ismail and Rizvi (2000). Regarding the interaction term of fiscal decentralisation indicators with institutional quality, it is expected that fiscal decentralisation helps in reducing poverty and income inequality when institutional quality is ensured [Lessmann (2011)].

Regarding other control measures, it is expected that lagged poverty and income inequality will have positive association with current level of poverty and income inequality, respectively. This expectation is due to the dynamic nature of the phenomenon and is consistent with the findings of Chaudhry and Imran (2013). The expected

Table 4.1

Variables Description and Data Sources

Variables	Description	Source
LPOV	Natural log of Head Count Ratio (HCR) is used as a measure of poverty. (HCR) is calculated by using a calorie-based approach that takes expenditure as a welfare indicator to estimate the poverty line.	Jamal (2006) and Economic Survey of Pakistan (Various Issues)
LINQ	Natural log of GINI coefficient is used as a measure of income inequality. GINI coefficient is calculated as the mean of difference between every possible pair of individuals, divided by the mean size. It lies between 0 and 100 because the coefficient is usually expressed in percentage.	World Income Inequality Database (2013)
RD	The revenue decentralisation (RD) is calculated as the ratio of the provincial government revenue less grant in aid to the total government revenue.	Author's own calculation from data of Pakistan Statistical Yearbook (Various Issues)
ED	The expenditure decentralisation (ED) is measured as the ratio of provincial government expenditures to the total government expenditures less the defense spending and payment of interest on debt.	Author's own calculation from data of Pakistan Statistical Yearbook (Various Issues)
CD	Composite decentralisation is the combination of both revenue decentralisation and expenditure decentralisation.	Author's own calculation from data of Pakistan Statistical Yearbook (Various Issues)
LPOV_{t-1}	Lag of natural log of Head Count Ratio (HCR).	—
LINQ_{t-1}	Lag of natural log of GINI Coefficient.	—
LPGDP	Natural log of per capita GDP, measured in million Rupees.	Handbook of Statistics on Pakistan Economy (2010).
SLPGDP	Squared per capita GDP in logarithmic form, measured in million rupees.	—
HK	Index of Human Capital, based on years of schooling (Barro/Lee 2012) and returns to education (Psacharopoulos 1994).	Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2013).
LCPI	Inflation measured as natural log of Consumer Price Index.	Handbook of Statistics on Pakistan Economy (2010).
INS	Democracy is used as a proxy for measuring the quality of institutions in Pakistan. The democracy index is measured on an additive eleven point scale ranging from 0 to 10 for Pakistan. As the democratic governments are expected to perform better on the institutional quality front, higher the value of index the higher will be the quality.	Polity IV Dataset [Marshall and Jaggers (2014)].

relationship between income inequality and poverty is positive. The higher the level of income inequality, the fewer will be the gains from growth shared by the poor and the poverty will likely to be increased [Ali and Tahir (1999) and Jamal (2009)]. GDP per capita is an essential measure for poverty reduction and is expected to have negative effect on the poverty [Cheema and Sial (2012)]. However, the expected relationship between GDP per capita and income inequality is positive. It is because with the economic development, there is a prospect shift from primary (agriculture) to secondary (industry and services) sectors of the economy along with the adoption of new technologies. Such development initially benefits the capitalist class only and tends to generate gaps in income distribution. However, with the passage of time the benefits of technological improvements are expected to be shared among all economic agents and higher per capita GDP tends to reduce inequality [Barro (1999)]. Conclusively, a negative relationship is expected between squared GDP per capita and income inequality as proposed by Kuznet's Hypothesis. Human capital is expected to be negatively associated with poverty and income inequality, as the educational attainment is expected to imply better employment opportunities and improvement in living standard [Shirazi (1995)]. Inflation is expected to increase poverty and income inequality. It is because the low income households are observed to be relatively more vulnerable to inflation as compared with high income households [Pervez and Rizvi (2014)].

4.4. Estimation Technique: Generalised Method of Moments (GMM)

The current study employs first the 'Dickey fuller (min-t) break-point' unit root test to check the order of integration. The basic insight of Dickey Fuller (min-t) test is that it is adjusted for the structural breaks in the model. Later, the Generalised Method of Moments (GMM) estimation technique will be applied in order to measure the impact of fiscal decentralisation on poverty and income inequality in Pakistan over the time period 1972 to 2013.

Generalised Method of Moments (GMM), formalised by Hansen (1982) and further developed by Arellano and bond (1991), take into account the endogeneity problem between explanatory variables and the instruments [Vdovichenko and Voronina (2006)]. GMM estimation is based on the assumption of no correlation between the disturbances with the set of instrumental variables in the model and provides more consistent and efficient estimates in presence of endogeneity in the model. The J-test serves to check whether over identifying restrictions are satisfied. In order to test the validity of instruments used in GMM estimation, instrument Orthogonality (C) test will be applied.

5. RESULTS AND DISCUSSION

This section deals with the results and discussion of the estimated models.

5.1. Stationarity Test Results

The results for Dickey-Fuller (min-t) unit root test are reported in Table 5.1. The results suggest that per capita GDP and squared per capita GDP are stationary at level, whereas, all the other variables are non-stationary at level but they become stationary at their first difference.

Overall, the diagnostic tests under GMM technique indicate that the models are well specified. The J-test and C-test indicates that the over-identified restriction is satisfied and the selected instruments fulfil the orthogonality condition, respectively.⁷ This implies that the results obtained from Generalised Method of Moments (GMM) technique are robust to the model choice as checked from the instrumental's validity test.⁸

Table 5.1

Unit Root Test with Innovative Outlier

Variables	Level		Difference		Decision
	Rho	Break (Year)	Rho	Break (Year)	
LPOV	-3.84	2003	-8.88**	2004	I(1)
LINQ	-4.02	2000	-7.41**	1997	I(1)
RD	-4.14	1991	-8.46**	1988	I(1)
ED	-3.18	1999	-7.02**	2000	I(1)
CD	-3.57	1991	-6.68**	1988	I(1)
LPGDP	-34.29**	1999	-8.85**	2000	I(0)
SLPGDP	-34.05**	1999	-10.17**	2000	I(0)
LCPI	-2.66	2004	-4.83**	1997	I(1)
HK	-2.17	2012	-4.67**	2002	I(1)
INS	-2.34	1987	-7.27**	1988	I(1)

Note: 1. Critical value at 5 percent level of significance is -4.44.

2. ** denotes rejection of stationarity at 5 percent level of significance.

The results for instrument orthogonality C-test are reported in Table 5.2. The p-values of C-test indicate that the over-identifying restriction/orthogonality condition is valid at 5 percent level of significance.

Table 5.2

Instruments Orthogonality C-test

Ho: The specified variable is a proper instrument.								
RD			ED			CD		
Instrument	Difference in J-stats		Instrument	Difference in J-stats		Instrument	Difference in J-stats	
	Value	p-value		value	p-value		Value	p-value
RD(-1)	0.349	0.554	ED(-1)	0.037	0.846	CD(-1)	0.505	0.477
RD(-2)	0.693	0.405	ED(-2)	0.080	0.776	CD(-2)	0.270	0.603
HK(-1)	0.999	0.317	HK(-1)	1.087	0.297	CD(-3)	0.395	0.529
HK(-2)	0.857	0.354	HK(-2)	1.215	0.270	HK(-1)	0.767	0.381
LINQ(-1)	0.913	0.339	LINQ(-1)	1.227	0.267	HK(-2)	0.671	0.412
LINQ(-2)	0.062	0.803	LINQ(-2)	0.910	0.339	HK(-3)	0.593	0.441
LINQ(-3)	0.249	0.617	LINQ(-3)	0.002	0.960	LINQ(-2)	0.639	0.423
LCPI(-3)	1.046	0.306	LCPI(-3)	0.965	0.325	LINQ(-3)	0.141	0.706
FDI	0.803	0.370	FDI	0.373	0.541	LPGDP(-1)	0.342	0.558
						FDI	0.001	0.982

Note: P-values indicate the non-rejection of null hypothesis at 5 percent level of significance.

⁷Eichenbaum, *et al.* (1988) named the “difference in Sargan” test as C-test.

⁸The underlying instruments for measuring the impact of revenue decentralisation on poverty include RD (-1 to -2), HK (-1 to -2), LINQ (-1 to -3), LCPI (-3) and FDI. Whereas, ED (-1 to -2), HK (-1 to -2), LINQ (-1 to -3), LCPI (-3) and FDI are employed as instruments for expenditure decentralization's poverty equation. For composite decentralization's poverty equation the instruments are CD (-1 to -3), HK (-1 to -3), LINQ (-2 to -3), LPGDP (-1) and FDI.

5.2. Results for Fiscal Decentralisation and Poverty

The results for measuring the impact of fiscal decentralisation on poverty are reported in Table 5.3. The results for the impact of revenue decentralisation, expenditure decentralisation and the composite decentralisation index on poverty are reported in column (2), (3) and (4), respectively.

Table 5.3
Poverty Equation Estimates

Variable	Dependent Variable: Poverty								
	Revenue Decentralisation			Expenditure Decentralisation			Composite Decentralisation		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
C	1.185* (0.233)	1.186* (0.288)	1.143* (0.424)	1.106* (0.093)	-0.022 (0.593)	0.169 (0.702)	2.268* (0.439)	1.231* (0.349)	1.277* (0.353)
RD	0.883* (0.288)	0.990* (0.282)	0.795*** (0.422)	—	—	—	—	—	—
ED	—	—	—	0.243*** (0.142)	2.367* (0.625)	2.707* (0.798)	—	—	—
CD	—	—	—	—	—	—	0.278* (0.069)	0.284* (0.066)	0.191* (0.048)
INS	—	-0.004** (0.002)	—	—	-0.025* (0.005)	—	—	-0.005* (0.001)	—
RD*INS	—	—	-0.029** (0.014)	—	—	—	—	—	—
ED*INS	—	—	—	—	—	-0.052* (0.013)	—	—	—
CD*INS	—	—	—	—	—	—	—	—	-0.009* (0.002)
$LPOV_{t-1}$	0.897* (0.086)	0.986* (0.055)	1.028* (0.052)	1.029* (0.013)	1.515* (0.104)	1.532* (0.132)	1.011* (0.044)	1.047* (0.022)	1.047* (0.026)
LINQ	0.131*** (0.064)	0.224* (0.055)	0.261* (0.077)	0.211* (0.027)	0.327** (0.152)	0.320*** (0.177)	0.526* (0.124)	0.340* (0.091)	0.311* (0.017)
LPGDP	-0.023** (0.010)	-0.038** (0.016)	-0.040*** (0.022)	-0.052* (0.015)	-0.088** (0.036)	-0.100* (0.030)	-0.023** (0.010)	-0.018** (0.009)	-0.012*** (0.007)
HK	-0.615* (0.207)	-0.882* (0.133)	-0.912* (0.155)	-0.769* (0.108)	-3.872* (0.869)	-3.956* (1.019)	-0.718* (0.199)	-0.484* (0.118)	-0.675* (0.121)
LCPI	0.124** (0.057)	0.147* (0.038)	0.136* (0.040)	0.272* (0.051)	1.314* (0.306)	1.359* (0.347)	0.108** (0.054)	0.143* (0.027)	0.124* (0.037)
Diagnostic Tests									
R^2	0.883	0.875	0.871	0.864	0.652	0.621	0.847	0.858	0.863
J-stat	1.610	1.450	1.856	3.951	1.096	1.250	3.390	1.999	2.176
(p-value)	(0.446)	(0.484)	(0.359)	(0.266)	(0.577)	(0.535)	(0.335)	(0.572)	(0.536)

Note: 1. *, ** and *** represents significance at 1 percent, 5 percent and 10 percent respectively.

2. Standard error in parenthesis of coefficients.

5.2.1. Revenue Decentralisation and Poverty

For the impact of revenue decentralisation on poverty, three equations are estimated under various specifications including institutional quality variable and its interaction with decentralisation, respectively as shown in the alternate equations in Table 5.3.⁹

⁹ As the equation (3) is complete in all aspects so the coefficients for this equation are interpreted.

The coefficient of revenue decentralisation in Equation (3) indicates that one unit increase in revenue decentralisation leads to 0.795 percent increase in poverty. The findings are in line with the criticism on fiscal decentralisation process in Pakistan. This indicates that as a result of revenues transfer to the provincial governments, central government is left with relatively less resources and such resources' shortage at central level put a constraint in financing long term development projects needed for poverty [Bossuyt and Gould (2000)]. Controlling the model for institutional quality, the effect of RD on poverty does not revert and remains positive but the coefficient for institutional quality index appeared itself as negative (−0.004) implying that the increase in transparency and accountability in governance through freedom of press, an indication of good institutional quality, helps in reducing corruption and arbitrary use of power and hence increases the prospective to meet the needs of poor that ultimately addresses the issue of poverty [Ismail and Rizvi (2000)].

Subsequently, the interaction term of revenue decentralisation and institutional quality in Equation (3) indicates the effect of revenue decentralisation through institutional quality on poverty and implies that increase in revenue decentralisation will lead to mitigate the negative impact of decentralisation on poverty. The findings are consistent with that of Boex, *et al.* (2006). On the average value of institutional quality i.e., 3.075 the marginal effect of revenue decentralisation on poverty reduced from 0.795 to 0.676. This implies that better institutional quality can moderate the negative effects of revenue decentralisation on poverty by making the decentralisation process fair. However, it will reverse the negative effects of decentralisation on poverty only after meeting a certain level of, not only, institutional quality but also the decentralisation. This is perceived from the findings that Pakistan is lying below that threshold level where fiscal decentralisation starts to repress the poverty in the economy.

5.2.2. Expenditure Decentralisation and Poverty

Similarly, the impact of expenditure decentralisation on poverty is analysed by estimating three equations as reported in Table 5.3. According to equation (3), one unit increase in expenditure decentralisation leads to increase poverty by 2.707 percent. The coefficient of institutional quality is negative and statistically significant in equation (2) implying one unit increase in institutional quality brings about 0.025 percent reduction in poverty. More specifically, on the average value of institutional quality (3.075) the indirect effect of expenditure decentralisation on poverty, through institutional quality, declined to 2.54 from the direct effect weighing 2.70, as reported in Table 5.3. However, the impact of expenditure decentralisation is still increasing for poverty as was the case for revenue decentralisation.¹⁰ The results are consistent with the findings of Iqbal, Din and Ghani (2013) for economic growth, bearing similar explanation.

5.2.3. Composite Decentralisation and Poverty

The composite decentralisation index has also positive and significant effect on poverty in all specifications, implying 0.191 percent increase in poverty brought about by one unit change in CD according to Equation (3). In contrast, the coefficient for

¹⁰The same justification stands for expenditure decentralization as was for the revenue decentralisation.

institutional quality yields negative effect on poverty (-0.005). This implies that effective institutions lessen the poverty level in Pakistan. The role of institutional quality is constructive here as it tends to mitigate the positive impact of fiscal decentralisation on poverty. The average institutional quality lowers down the said effect by 0.0276 units (the difference between direct and indirect effect of fiscal decentralisation on poverty). Comparatively, the effect of expenditure decentralisation in interaction with institutional quality is statistically significantly higher than the composite decentralisation measure for poverty. While, there is no statistically significant difference across expenditure and revenue decentralisation's impact on poverty as measured by the test of equality.¹¹

5.3. Results for Fiscal Decentralisation and Income Inequality

The results for income-inequality are reported for three indicators of fiscal decentralisation in Table 5.5. The diagnostic test results indicate the goodness of fit of the models and satisfaction of over identified restrictions by J-statistics. Moreover, the result obtained from C-test implies that there is no endogeneity of instruments used in estimation.¹² The results for Instrument orthogonality C-test are reported in Table 5.4.

5.3.1 Revenue Decentralisation and Income Inequality

According to the results reported in Table 5.5, revenue decentralisation appears to be positively significantly associated with income inequality in all specifications. One unit increase in revenue decentralisation worsens the income distribution by 0.651 percent according to equation (3). The justification behind; the sub-national governments are expected to be less efficient in collection of tax as compared to national government in Pakistan and are not capable of providing public goods efficiently [Faridi, Chauhdry, and Ansari (2012)].

Table 5.4

Instrument Orthogonality C-test

Ho: The Specified Variable is a Proper Instrument.								
	RD			ED			CD	
Instrument	Difference in J-stats		Instrument	Difference in J-stats		Instrument	Difference in J-stats	
	Value	p-value		Value	p-value		Value	p-value
RD(-1)	0.748	0.386	ED(-2)	0.026	0.871	CD(-1)	0.854	0.355
RD(-2)	0.733	0.391	ED(-3)	0.001	0.990	CD(-2)	0.495	0.481
RD(-3)	0.671	0.412	HK(-1)	1.396	0.237	CD(-3)	0.059	0.806
HK(-1)	0.135	0.712	HK(-2)	1.401	0.236	HK(-2)	0.200	0.654
HK(-2)	0.195	0.658	HK(-3)	1.397	0.237	HK(-3)	0.407	0.523
HK(-3)	0.278	0.597	LINQ(-2)	1.514	0.218	LINQ(-2)	0.499	0.479
LINQ(-2)	0.739	0.389	LINQ(-3)	1.059	0.303	LINQ(-3)	0.244	0.621
LINQ(-3)	0.685	0.407	LCPI(-2)	0.586	0.443	LCPI(-1)	0.159	0.689
FDI	0.653	0.418	FDI	0.652	0.419	FDI	0.112	0.731

Note: P-values indicate the non-rejection of null hypothesis at 5 percent level of significance.

¹¹The results for test of equality are reported as appendix Table A.1.

¹²The instruments used for measuring the impact of revenue decentralization on income inequality include RD(-1 to -3), HK(-1 to -3), LINQ(-2 to -3) and FDI, while the instruments used for estimating the impact of expenditure decentralization on income inequality are ED(-2 to -3), HK(-1 to -3), LINQ(-2 to -3), LCPI(-2) and FDI. However, the instruments used for evaluating the impact of composite decentralization on income inequality are CD(-1 TO -3), HK(-2 to -3), LINQ(-2 to -3), LCPI(-1) and FDI.

Whereas, a one unit increase in the institutional quality brings about 0.012 percent decline in income inequality. The findings suggest that the mechanism for distribution of income is relatively more equitable once controlled for institutional quality. Successively, the coefficient for the interaction term of revenue decentralisation and institutional quality highlights the mitigating role of institutional quality for the channel under investigation. Precisely, the indirect effect of revenue decentralisation on income inequality through institutional quality yields that a unit increase in expenditure decentralisation brings about 0.598 unit increase in income inequality that is precisely lower than the direct effect of expenditure decentralisation on income distribution (0.651 units) where the institutional quality was not controlled. Albeit, the link established between the income inequality and decentralisation is yet positive.

Table 5.6
Income-Inequality Equation Estimates

Variable	Dependent Variable: Income Inequality								
	Revenue Decentralisation			Expenditure Decentralisation			Composite Decentralisation		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
C	7.208* (0.997)	6.624* (0.845)	6.978* (0.433)	0.870 (0.851)	0.409 (0.553)	0.197 (0.368)	-0.834 (1.683)	-1.836 (1.204)	-1.503 (1.648)
RD	0.364* (0.091)	0.230** (0.098)	0.651** (0.290)	—	—	—	—	—	—
ED	—	—	—	0.946* (0.205)	1.030* (0.194)	1.035* (0.180)	—	—	—
CD	—	—	—	—	—	—	0.652*** (0.376)	0.434* (0.166)	0.571* (0.222)
INS	—	-0.012** (0.006)	—	—	-0.005** (0.002)	—	—	-0.016*** (0.008)	—
RD*INS	—	—	-0.017*** (0.009)	—	—	—	—	—	—
ED*INS	—	—	—	—	—	-0.009* (0.003)	—	—	—
CD*INS	—	—	—	—	—	—	—	—	-0.029* (0.007)
$LINQ_{t-1}$	0.102* (0.033)	0.099* (0.027)	0.067*** (0.035)	0.289* (0.086)	0.389* (0.071)	0.424* (0.062)	0.423** (0.195)	0.478* (0.112)	0.510* (0.118)
LPGDP	0.469* (0.167)	0.419* (0.128)	0.472* (0.078)	0.228*** (0.129)	0.228** (0.095)	0.245* (0.061)	0.642*** (0.335)	0.596** (0.283)	0.527*** (0.284)
SLPGDP	0.033* (0.010)	0.029* (0.008)	0.032* (0.005)	0.012*** (0.007)	0.013* (0.005)	0.014* (0.003)	0.033*** (0.019)	0.040* (0.013)	0.034** (0.017)
HK	-2.059* (0.639)	-2.099* (0.557)	-2.104* (0.395)	-1.011* (0.310)	-1.045* (0.243)	-1.058* (0.199)	-1.827** (0.889)	-2.188* (0.615)	-1.845*** (0.949)
LCPI	0.288*** (0.153)	0.338* (0.113)	0.351* (0.075)	0.372* (0.081)	0.334* (0.071)	0.340* (0.056)	0.704** (0.310)	0.510** (0.248)	0.461*** (0.258)
Diagnostic Tests									
R^2	0.271	0.266	0.233	0.530	0.510	0.521	0.405	0.336	0.412
J-stat	1.177	0.843	0.753	2.567	1.693	1.770	0.831	0.294	0.077
(p-value)	(0.758)	(0.656)	(0.686)	(0.463)	(0.428)	(0.412)	(0.659)	(0.587)	(0.781)

Note: 1. *, ** and *** represents significance at 1 percent, 5 percent and 10 percent respectively.

2. Standard error in parenthesis of coefficients.

5.3.2. Expenditure Decentralisation and Income Inequality

Similar to the revenue decentralisation, the impact of expenditure decentralisation on income inequality in Pakistan is provided under different specifications as shown in Table 5.6. Expenditure decentralisation has a statistically positively significant impact on income inequality in all specifications. With one unit increase in expenditure decentralisation, income inequality increases by 1.035 percent according to Equation (3). The findings implied that due to lack of proper institutional framework, the negative distributional effect of fiscal decentralisation results in increasing income inequality [Rodriguez-Pose and Gill (2004)].

Moreover, a one unit increase in institutional quality leads to the reduction in income inequality by 0.005 percent. The result for interaction term is statistically negatively significant implying the mitigating role of institutional quality in addressing income inequality through expenditure decentralisation. The results postulate that the effect of expenditure decentralisation declined to 1.007 from 1.035 units in the presence of institutional quality.

5.3.3. Composite Decentralisation and Income Inequality

The coefficient of composite decentralisation index in Equation (3) implies that one unit increase in composite decentralisation leads to increase income inequality by 0.571 percent. According to Lessmann (2011) and Tselios, *et al.* (2011), fiscal decentralisation is associated with significant rise in income inequality due to weak institutional and redistributive abilities in the developing countries. Notwithstanding, the individual impact of institutional quality in the composite decentralisation model is statistically significantly negative.

The interaction term indicates that on the average value of institutional quality, the effect of fiscal decentralisation on income inequality tends to decline from the direct effect of 0.571 units to 0.481 units. Overall, findings from the composite decentralisation index in interaction with institutional quality appears to be more effective in influencing the income inequality than expenditure decentralisation but no statistically significant difference is observed across the impact of expenditure and revenue decentralisation on income inequality.¹³

5.4. Discussion of other Control Variables

A number of relevant variables were controlled in the specified equations for poverty and income inequality. The lagged poverty and income inequality appears to be positively affecting the current level of poverty and income inequality, respectively, due mainly to its dynamic pull over effects. The income inequality has positively significant impact on poverty as also supported by Ali and Tahir (1999). Similarly, per capita GDP has statistically significantly declining impact on poverty. Comparatively, for income inequality the per capita GDP has increasing effect. These results are consistent with the development theories that while transition from agricultural economy to the industrial economy; increase in per capita income is accompanied by higher inequality [Jamal (2009)]. However, the findings for squared per capita GDP also appeared as positive, not

¹³The results for test of equality are reported in appendix as Table A.2 for parsimony.

negative as expected. This implies that at the later stage of development per capita income yet leads toward the more inequality. According to Khasru and Jalil (2004), the developing economies are unable to curtail income inequality because of their structural deficiencies. And the income inequality is not of transitory nature in Pakistan when encountered with doubled GDP growth rate. The institutional quality along with fiscal decentralisation can perform better in this regard.

The impact of human capital is statistically significantly negative on poverty and income inequality. Improvement in school enrolment ratios and overall literacy rates results in better job opportunities for the masses and can improve income distribution. The findings are consistent with the study by Kemal (2006). Inflation has positive and significant impact on poverty and income inequality, implying that inflation tends to increase both poverty and income inequality as evident by Jamal (2009).

6. CONCLUSIONS AND POLICY IMPLICATIONS

This study attempted to measure the impact of fiscal decentralisation, through revenue decentralisation, expenditure decentralisation and composite decentralisation index, on poverty and income inequality in Pakistan over the time period 1972 to 2013. The estimation technique Generalised Method of Moments (GMM) was employed for estimation.

According to the findings of study, all variables including fiscal decentralisation, lagged poverty, income inequality, per capita GDP, human capital and inflation have significant impact on poverty in Pakistan. The focus variable, fiscal decentralisation appears to be positively significant identifying an increase in poverty due to fiscal decentralisation in Pakistan. It can be perceived that provincial level governments are less efficient in collection of taxes and the resource distribution as compared with the central government. Moreover, re-allocation of resources from federal to provincial level deprives the central government from a marginal share and put a constraint on funding the long term development projects designed for poverty reduction.

Similarly, the results for income inequality equation identify that fiscal decentralisation, lag of income inequality, per capita GDP, squared per capita GDP, human capital and inflation are the significant determinants of income inequality in Pakistan. The indicators for fiscal decentralisation appears to be positively associated with income inequality in the country. The lack of effective institutions, poor governance and weak redistributive abilities results in increasing income inequality due to fiscal decentralisation. As the welfare issues are to be dealt at the national level the promotion of fiscal decentralisation demands fiscal equalisation among the provinces to deal with the welfare issues at sub-national level effectively.

With respect to the role of institutional quality in interaction with fiscal decentralisation process, the results show that better institutional quality mitigates, though remains positive, the negative effect of fiscal decentralisation on poverty and income inequality in Pakistan over the selected time period. The quality institutions increase the efficiency of factors of production by granting proper checks and balance on the fiscal actions. It can reduce the extent of corruption and ensures the accountability and transparency of the government's initiatives. Besides, as the fiscal measures for revenue generation and expenditures are to be initiated by the federal government, its

favourable and equitable consequences can be promised only if fiscal equalisation among the provinces is ensured.

Moreover, the threshold level of fiscal decentralisation is required to be known in order to have long-run favourable effects for the welfare issues. Provincial governments should be given fiscal autonomy to reach the targeted level of fiscal decentralisation on the one hand and standings of all provinces per their preferences must be accredited, on the other. Additionally, in order to curtail poverty and income inequality government's policy should be focused on effective policies to address inflation and development of human capital.

APPENDICES

Table A.1

Test of Equality

Poverty Equation	
ED*INS vs. CD*INS	0.043* (0.013)
ED*INS vs. RD*INS	0.023 (0.019)

Table A.2

Test of Equality

Income Inequality Equation	
CD*INS vs. ED*INS	0.02* (0.007)
ED*INS vs. RD*INS	0.012 (0.011)

Note: 1. * indicates significant difference across the Equations (3) for ED, RD and CD at one percent level of significance.
2. Standard error in parenthesis of coefficients.

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