



Fiscal Decentralization and Education Index: Evidence from Punjab, Pakistan

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ABSTRACT

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The study examines how fiscal decentralization affects the education index at the district level in Pakistan's Punjab province, which has five components. Disparities in the distribution of public services have existed throughout Pakistan's history, and current research on regional development emphasizes the importance of evaluating human development phenomena using spatial models like density, locality, and distance. According to the study's findings, the distance between districts and the capital city determines the significant positive effects of fiscal decentralization on the district-level education index; the more "distance from the city" that districts are from the city, the greater the positive effects of fiscal decentralization. Since geography affects the delivery of public services, differences between districts should be addressed by enhancing social and economic institutions and infrastructure in the nation's underdeveloped areas.



Introduction

Decentralization is the transfer of power and responsibility for providing public services from central to subnational governments (Rondinelli, 1999). The World Bank and other international institutions see decentralization as a critical component of developing nations' development and economic strategies (Gopal, 2008). Decentralization may be characterized according to the amount of sovereignty lost and the tasks delegated to lower levels of government. Decentralization is grouped into three types based on the delegated responsibilities: administrative, monetary, and political reorganization (Hutchinson 2004). Four decades ago, many countries were organized into consolidated nation states. The tendency toward decentralization in the United States may be

traced back to Reagan's New Federalism of the 1980s, when states gained more power (Donahue 1997).

Devolution has been a controlling model in Asia during the last 3 decades. Decentralization is now driven by economic and social change, rather than racial, cultural, linguistic, or religious factors (Rodríguez, 2009). Numerous more considerations may explain the growing emphasis on decentralization (Armstrong & Taylor, 2000). The primary rationale is the assumption that decentralization increases efficiency and individuality in an economy, promoting diversity in an increasingly homogenized and globalized society (Keating, 1998; Pike and Tomaney, 2004). The 2nd cause is the adversary to firm consolidated institutions, which has occurred not just in poor nations but furthermore in the affluent world, comprising the European Union. The 3rd explanation is attributable to modifications in the restrain structure of private firms during the last few decades. The fourth refers to a shift in the European Union's existing regional policy. The 4th goal is to improve public engagement in public policy and administration by strengthening consensus.

Fiscal devolution refers to the establishment of multiple levels of governance within a country., each with spending and taxing powers. Redistribution of dominance and possessions is interpreted as a key testament strategy for achieving economic efficiency and effective governance through subnational administration.

Fiscal decentralization helps that smaller federative units participate in the nation's economic growth, bringing them together. According to Bird and Smart (2002), for successful service delivery, beneficiaries of transfers must have clear authority, enough resources, and appropriate decision-making flexibility. Fiscal decentralization, along with subordinate governments, has the potential to improve the central government's efficiency and effectiveness. Fiscal decentralization may result in more effective delivery of local services and public goods, allowing policies to better accord with population desires.

However, there are questions about the equal distribution of gains from fiscal decentralization across all areas. Fiscal decentralization may not benefit all areas, since "poor" regions may lose competitiveness relative to more rich regions, worsening regional inequality. Fiscal decentralization may constitute a danger if not properly planned, enabling subordinate governments to express their budgets to others (Von Hagen et al. 2000; Rodden et al. 2002).

According to different research (e.g., Boldrin & Canova, 2001; Neckerman & Torche, 2007; Wu & Gopinath, 2008; Heidenreich & Wunder, 2008), spatial inequality in public service delivery is still a severe challenge in many industrialized countries, with deeper roots in the developing world. Many studies show that countries with big populations, such as China and India, are similarly influenced by geographical inequality. Historically, identity was used to justify outsourcing activities and resources to lower levels of government., namely the preservation of a unique language, history, culture, or religion within large, varied nations, as studied in several studies (Hechter, 1975; Moreno, 2001).

Contemporary regionalist literature justifies the recent trend of decentralization by claiming that local governments have an enhanced capacity to overcome the shortcomings of the centralized state, as articulated by Bardhan (2002), to achieve superior economic efficiency (Keating, 1998; Morgan, 2002), and to foster economic uniqueness and differentiation in an increasingly globalized and homogenized environment (Pike & Tomaney, 2004).

Fiscal federalism is based on the idea that funding local services through local taxes increases efficiency and accountability. The projected increased economic efficiency of decentralized governments is based on the main principles of fiscal federalism literature. Tiebout (1956) and Oates (1972) argue that delegating responsibility and resources to lower levels of government promotes a twofold gain in efficiency. Decentralization has two key economic benefits. To begin, subnational governments' capacity to match public spending with the diverse preferences of citizens in various locations improves government's allocative efficiency. Furthermore, the capacity to use underutilized assets and promote contest amongst sub-national governments outcomes in the adoption of improved strategies. The full deployment of resources and greater competition across jurisdictions may result in better policy innovation and more efficient delivery of public goods and services, hence boosting the economy's overall productive efficiency (Oates, 1996).

The transference of resources and power from central government to lesser levels may worsen geographical disparities by reducing the federal authority's redistributive ability, resulting in more rich areas outperforming poorer ones in the struggle for fiscal resources. Another reason fiscal decentralization might not follow in regional convergence is the quality of governance at the lower levels. Fiscal decentralization may worsen governmental capacity and corruption, potentially reducing its impact on regional convergence (Prud'homme, 1995; Rodríguez & Ezcurra; Rodríguez & Gill, 2004; Munir et al., 2022; Sibte-Ali et al., 2024; Adeem et al., 2019).

For years, Pakistan's power distribution between the central government and federating units has been a source of contention, as the country grapples with the repercussions of regional inequities at both the province and district level. The country has experienced considerable modifications in the developmental advancement of distinct areas, resulting in inequality both within and across Pakistan's provinces (Jamal and Khan, 2003). Emotions generally have an influence on the problems. Several attempts were made to remedy these concerns; nevertheless, significant progress was accomplished in 2010. Table 1 shows Pakistan's fiscal framework and the history of resource distribution.

Table 1: Distribution of revenues under various NFC Awards

<i>Years</i>	<i>Award Name</i>	<i>Provinces: Federal</i>	<i>Punjab</i>	<i>KPK</i>	<i>Sindh</i>	<i>Baluchistan</i>
1974	1 st NFC award	20%: 80%	60.25%	13.39%	22.50%	3.86%
1979	2 nd NFC award	20%: 80%	57.97%	13.39%	23.34%	5.30%
1984	3 rd NFC award	Interim award				
1991	4 th NFC award	20%:80%	57.87%	13.54%	23.29	5.30%
1997	5 th NFC award	62.5%: 37.5%	57.88%	13.54%	23.28	5.30%
2000	6 th NFC award	Interim award				
2010	7 th NFC award	56%:44%	51.74%	14.62%	24.55	9.09%

Source: Ministry of Finance, Pakistan

The 18th constitutional amendment to Pakistan's 1973 constitution, passed by parliament in April 2010, seeks to expand regional autonomy. The 18th constitutional amendment stressed the importance of decentralization and how it affects geographical imbalances generated by the transfer of power and resources from central to regional administrations.

Objectives of the Research

The major goal of this study is to investigate the impact of decentralization on regional discrepancies in the education index at district-level in Punjab, Pakistan.

Significance of the Study

For many years, scholars throughout the globe have been fascinated by the consequences of fiscal decentralization on geographical imbalances between regions and nations. District-level research provides for a more detailed knowledge of the geographical features of socioeconomic data, as well as a complete investigation of spatial consequences (spatial regimes and regional spillover), as compared to province-level studies. The passage of the 18th constitutional amendment in 2010 was a big step forward for Pakistan's fiscal autonomy. Furthermore, after the 7th National Finance Commission Award, an enhanced flow of funding from the central government to the provinces was enabled; Consequently, provinces now have more say over the delivery of education, healthcare, and physical infrastructure.

The fundamental shift in Pakistan's delegation of power between the federation and the provinces has far-reaching consequences for long-term policy formulation, administration, and execution. As a consequence, more study is required when education, health care, and other social and governmental services are fully delegated to the provinces.

Literature Review

Theoretically, it is uncertain whether over time territorial inequalities rise or decline or regions converge or diverge. In this regard, understanding three theories of economic literature are vital. The Neoclassical Growth Theory by Solow (1956) state that absolute or conditional convergence between regions is predicted if there are similarities in savings, production technology and preferences. On the other side, Endogenous Growth Theory (Romer, 1986; Romer, 1990) predicted a more differentiated result, where regions could converge, diverge or grow parallel. The New Economic Geography (Krugman, 1991) also believes in the possibility of all three development paths.

Empirical research on the link between devolution and territorial inequalities has been undertaken utilizing both offroad and country-precise methodologies (Barrios & Strobl 2009; Bonet 2006; Canaleta et al. 2004; Akai and Sakata 2002; Liu and Lin 2000; Phillips & Woller 1998; Zou 1998). The experimental sources is separated into case studies of specific countries and cross-country research involving both developed and developing economies. The cross-country empirical literature can be separated into readings on developed and growing economies. Numerous studies have investigated the effect of fiscal decentralization on geographical inequality in industrialized countries. Research on industrialized nations, such as Kyriacou et al. (2013), Pascual and Ezcura (2008), Canaleta (2004), and Lessmann (2009) for OECD economies, suggests that decentralization reduces local inequality. Except for one study, most empirical studies in industrialized nations found a positive relationship between fiscal decentralization and geographical disparity.

In developing nations, the majority of empirical investigations have yielded mixed results regarding the relationship between fiscal decentralization and spatial inequality Studies on rising nations include Shah and Shankar (2003), Gill and Rodríguez (2004), and Ezcurra and Rodríguez (2010). The bulk of single-country studies, including those by Qiao et al. (2008) and Zhang and

Kanbor (2005) for China, show a positive association between decentralization and territorial inequalities.

In Pakistan, the majority of study focuses on inequities at the province level. Scarce empirical evidence exists about geographical inequities at the district level, as demonstrated by Munir (2017), Ahmed (2011), Akhtar (2008), and Jamal and Khan (2003). The aforementioned empirical literature indicates that the majority of studies on geographical disparities predominantly rely on GDP per capita as a metric. Recently, some studies have employed development indices to examine the phenomena of club convergence among countries and regions. To my knowledge, no research has yet been undertaken to examine the club hypothesis concerning the broader developmental characteristics of Pakistan at the district level. We establish an augmented development index that encompasses several dimensions of development in quantifiable units, and subsequently, we assess the convergence club hypothesis based on this index.

Methodology

Selection of Model

The research uses a cross-sectional regression framework to show the link between decentralization and the development, education, health, and domestic prosperity indicators. We approximate a regression analysis for 33 Punjab localities from 2008-2009 to 2014-2015. We aim to test the hypothesis that increased fiscal devolution correlates with reduced inequities in the development index across the districts of Punjab, utilizing a cross-sectional regression approach.

The fundamental estimation equation for the cross-sectional analysis is as follows:

$$\mathbf{Disparity} = \beta_0 + \beta_1 \mathbf{FD}_i + \beta_2 \mathbf{Control}_i + \varepsilon_i \quad (1)$$

Disparity is defined as the shifting education Index estimates of regional inequality between 2008-09 and 2014-15. $\mathbf{Control}_i$ is a vector containing certain control elements., such as population concentration and space from centre metropolises. \mathbf{FD} represents household assets and serves as a proxy for decentralization. This research investigates whether increased fiscal decentralization, along with distance from the capital city, may impact district education levels, despite the fact that there is no direct association between fiscal decentralization and development levels. Consequently, we integrate collaboration factor of \mathbf{FD} and \mathbf{Dstcp} flows into Equation 1, yielding Equation 2.

$$\mathbf{Disparity} = \beta_0 + \beta_1 \mathbf{FD} + \beta_2 \mathbf{Control}_i + \beta_3 \mathbf{FD} \times \mathbf{Dstcp} + \varepsilon_i \quad (2)$$

Equation 2: β_1 assesses the immediate results of \mathbf{FD} , β_2 inspects the affect of control factors, and β_3 assesses amends in improvement level based on instant \mathbf{FD} and \mathbf{Dstcp} levels. To establish the peripheral impact of \mathbf{FD} on \mathbf{dev} in the context of \mathbf{Dstcp} , we compute \mathbf{dev} 's partial derivative in relation to \mathbf{Dstcp} . The partial derivative gives the following equation.

$$\frac{d(\mathbf{dev})}{d(\mathbf{FD})} = \beta_1 + \beta_4 \mathbf{Dstcp} \quad (3)$$

When both β_1 and β_4 are nonnegative, incremental improvements in \mathbf{FD} and \mathbf{Dstcp} will result in an immediate enhancement of the development level.

Variables Description and Data Source

Dependent Variables

The education indicator acts as the study's dependent variable. The index has five components. The UNDP's Sustainable Development targets (SDGs) include these indicators as significant development targets. PCA is used to divide numerous signs into sub-indices and provide a comprehensive progress index. The appendix contains a list of signs and acronyms for the variables utilized in the template.

Explanatory Variables

Fiscal decentralization

Fiscal decentralization is the delegation of some expenditure and revenue responsibilities to lower levels of government. Fiscal decentralization is split into two types.

- a) Revenue Decentralization
- b) Expenditure Decentralization

Revenue Decentralization

Decentralization of returns denotes to the split of regional government income compared to the overall revenue of the central government.

Expenditure Decentralization

The proportion of provincial government spending compared to central government spending is referred to as expenditure devolution.

Punjab has no data on revenue and spending devolution at the district stage. We utilize household assets as a measure of fiscal decentralization. The literature supports the use of household assets as a proxy for fiscal decentralization, demonstrating a significant correlation between fiscal decentralization and revenue variation, as demonstrated by Sacchi and Salotti (2013) in OECD countries and Shahzad and Yasmin (2016) in Pakistan. As a result, we used household assets to investigate fiscal decentralization at the district level in Punjab, Pakistan.

Data Source

The research employs a range of data sources to identify dependent and explanatory variables. The dependent variables for this study come from the Pakistan Social and Living Standards Measurement Survey (PSLM), which was conducted between 2008 and 2014. Since 2004, the Pakistan Federal Bureau of Statistics (FBS) has released the PSLM on an annual basis.

We use data from the Pakistan Social and Living Standards Measurement (PSLM) from 2008 to 2014. We used household asset data on fiscal decentralization at the district level from Punjab's Multiple Indicator Cluster Surveys (MICS) in 2008 and 2014. The research period is divided into two sections: pre-devolution (2008-09) and post-devolution (2014-15).

Results and Discussion

To study the impacts of fiscal decentralization and control variables on education index, initially we reckon the direct influence of both fiscal devolution and control variables on the education index through cross sectional regression analysis.

Table 1: Fiscal Decentralization and Education level in selected districts of Pakistan (2008-2009)

	Education Index (1)	Education Index (2)
Fiscal Decentralization	-1.833** (0.992)	5.136*** (1.859)
Distance to Capital City	-0.079** (0.025)	1.741*** (0.464)
Population Density	-0.0002 (0.003)	0.020 (0.006)
(Fiscal Decentralization) * (Distance to Capital City)	-	-.0192*** (0.004)
Constant	290.194	-379.195
Observation	33	33
R-Squared	0.448	0.559
F-Stat (P-Value)	18.59	23.61

*Note: All estimates are performed using OLS robust. *, **, and *** represent the consequences at the 10, 5, and 1 percent magnitude levels, respectively. Values in brackets indicate strong standard error.*

Table 2: Fiscal Decentralization and Education in selected districts of Pakistan (2014-2015)

	Education Index (1)	Education Index (2)
Fiscal Decentralization	-2.145*** (0.942)	4.318** (1.905)
Distance to Capital City	-.071** (0.022)	1.594*** (0.507)
Population Density	-0.0008 (0.002)	0.014 (0.005)
(Fiscal Decentralization) * (Distance to Capital City)	-	-0.017*** (0.005)
Constant	326.305	-290.501
Observation	33	33
R-Squared	0.470	0.554
F-Stat (P-Value)	24.59	26.27

*Note: All estimates are performed using OLS robust. *, **, and *** represent the consequences at the 10, 5, and 1 percent magnitude levels, respectively. Values in brackets indicate strong standard error.*

The statistics show how fiscal decentralization and control factors affect the education index both before and after decentralization. The findings show a significant negative association between fiscal decentralization and the district-level education index both before and after devolution. The findings suggest that the severity of this adverse connection has increased in the post-decentralization era.

The study's results revealed that the control variable "distance from capital city" had a significant negative impact on education levels throughout Pakistan's districts. The control variable "distance from capital city" has shown a decline in its coefficient since decentralization. It indicates that "distance from the capital city" has a greater negative effect before to decentralization than after. The control variable "population density" is negligible in both times. Next, we study whether the relationship between fiscal decentralization and the education index depends on interval from the capital city. We utilize the multiplicative label for fiscal federalization and interval from the capital city (FD*dstcp). In tables 1 and 2, the second column indicates the indirect effects of fiscal decentralization and control factors on the education index before and after decentralization. The link between fiscal decentralization and district education level has decreased in the post-decentralization era, from 5.136 to 4.318, but remains favourable and significant (see Tables 1 & 2). The findings show that the good impacts of fiscal devolution in both pre- and post-devolution eras are uncertain on the variable "Distance from the capital city".

Overall, the study discovered that the effects of fiscal decentralization on education levels grow as the distance from the capital city diminishes. Consequently, "distance from the capital city" influences the favourable effects of fiscal decentralization on educational levels.

Conclusions and Recommendations

Conclusion

The study looked at how fiscal decentralization affected the education index in Pakistan's Punjab province. The data show that, although fiscal decentralization may impair or be irrelevant to the education index at the district level, proximity to the capital city may successfully mitigate this effect, changing negative or insignificant effects into positive ones. The closer a district is to the center city; the farther effective fiscal decentralization in promoting education.

Policy Recommendations

The study's findings have significant implications for ongoing initiatives aimed at mitigating spatial inequities at the district level in Pakistan. The significant implications of the study are outlined as follows:

- Decentralization encourages public engagement in decision-making and holds local representatives accountable. As a result, delegating power to subordinate government organizations to engage in public service delivery at the district level is critical for improving efficiency and service supply at that tier.
- The benefits of fiscal decentralization depend on proximity to the capital city. As a result, areas far from capitals must be supplied with improved infrastructure and connected to major cities. The rise of connectivity might surely boost growth and alleviate disparities.
- Capacity building and improving system reliability are essential; else, decentralization may lead to negative outcomes and increased corruption.
- Independent academic research is required to concentrate on region-specific policy. Moreover, considering diversity, it is crucial to account for regional socioeconomic factors when doing such research.
- The absence of credible official statistics results in speculative conjectures and questionable assessments underpinning the argument. Consequently, it is imperative for to create reliable statistics on socioeconomic variables at the district level.

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Appendix

A1: List of Indicators of Education Index

S. No	Education Index
1	Population that has attended school ever
2	Population that has completed primary level or higher
3	Net enrolment rate at the middle level (age 11-13)
4	Net enrolment rate at the Matric level (age 14-15)
5	Adult Literacy level (Population aged 15 years and older)

A2: Abbreviations of the Variables used in the Model

S. No	Variables	Abbreviations
1	fd	Fiscal decentralization
2	dstcp	Distance from capital city
3	popdens	Population density
4	devdfd	Development index divided by Fiscal decentralization
5	edudfd	Education index divided by Fiscal decentralization
6	hhdfd	Household welfare index divided by Fiscal decentralization