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Impact of Fiscal Decentralizations on Education and Healthcare Outcomes: Empirical Evidence from Pakistan

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Abstract

This paper aims at investigating the impact of fiscal decentralization on two key social services: education and healthcare outcomes. We use both a simple time series data set and panel data set covering four provinces of Pakistan over the period from 1975 to 2009 to empirically test the impact of fiscal decentralization on infant mortality rate, crude death rate and literacy rate. Besides Ordinary Least Square method we use Generalized Method of Moment econometric technique to obtain robust and consistent results. The empirical findings of this paper indicate that fiscal decentralization is effective in enhancing the delivery and augmenting the quality of education and healthcare services. These findings are important because they suggest, contrary to the traditional public finance theory, that provincial governments can play a far better role in improving the social services delivery like basic education and healthcare compare to federal government.

Keywords: Fiscal Decentralization; Education Outcomes; Healthcare Outcomes; Pakistan

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INTRODUCTION

Fiscal decentralization is broadly defined as the transfer of fiscal decision making the authority of planning and management of public functions from central/federal government to provincial/sub-national governments. Fiscal decentralization gained acceptance as a reform policy in many countries with the realisation that the complex politico-economic social issues may not be handled through central planning, execution implementation (Rondinelli and Cheema, 1983). The decentralization process was further reinforced when local people particularly in developing countries started demanding more political and democratic powers at local level. It is widely believed (Faguet, 2004) that locally elected governments, mandated with the fiscal and administrative authority, are expected to perform far better and with more efficiency in developing, planning and provision of the public services than a remote central government. To support this argument, (Smith, 1985 and Manor, 1999) consider the fiscal decentralization as an effective policy tool that may help in resolving issues such as regional inequity and disparity, poverty reduction and political instability.

However, opponents of fiscal decentralization believe that it causes inefficiency in economics, increases social inequality and distorts social services provision (Samoff, 1990, Tanzi 1995, 2002, Blair, 2000, Katsiaouni, 2003, Samoff, 1990), for example, shows that decentralization as policy tool has been largely failed around the world. Supporting his conclusion, (Slater's, 1989) study on Tanzania illustrates that decentralization was failed to enhance the local capacities in implanting local program. Decentralization distorts the economy of scales, promotes corruption, and encourages elite capture at local level. In case of more fiscal decentralization the provision of health and education will deteriorate.

Nevertheless, proponents of fiscal decentralization argue that it enhances the quality and quantity of social services provision like health and education. Scholars like, (Qian and Weingast, 1997, Litvack et al., 1998 and Oates, 1999) believe that in the absence of significant spillover effect the

provision of key social services like education and health by provincial governments increases the efficiency.

As the literature is divided on the issue of fiscal decentralization impact of social services provision particularly health and education, it is hard to draw a definitive conclusion on the question of fiscal decentralization and education and health services. Hence a systematic research is required to strengthen the existing debate on this issue and provide a robust analysis. This paper aims at providing an empirical analysis on the impact of fiscal decentralization on education and health in Pakistan. As Pakistan is a federation where both education and health are provincial subjects (Pakistan, 1973), it is plausible to see whether or not fiscal decentralization helps improving the quality and quantity of these services.

Second section reviews the existing literature that mainly deals with the question of fiscal decentralization and health and education services. Third section presents the hypothesis, data and methodology for empirical analysis. While Fourth section discusses the empirical results, fifth section gives the conclusion of the paper.

BACKGROUND

Fiscal decentralization and Healthcare

The impact of fiscal decentralization on health sector invites criticism because of many complexities, such as diseconomies of scale, which tend to restraint the local/provincial governments in the provision of costly medical treatments and immunization (Litvak et al, 1998). But many scholars believe that impact of fiscal decentralization of health sector is positive and effective. Because a less unified health service provided by the provincial governments can better tailor to the need of local people. Further, under the local accountability and greater community participation the local governments are more effective in implementing and monitoring health programmes. And decentralization of health is also expected to increase the efficiency through better allocation of resources to the targeted groups, particularly to the poor income groups.

Infant Mortality Rate (IMR) is believed to be a barometer of health status of a society (Kaufmann et al., 2005). And in case fiscal decentralization is successful in reducing IMR, it is evident that it can improve the health condition. (Robalino et al., 2001) conduct a cross-country study to investigate the impact of fiscal decentralization on IMR. Their results show that in countries where the sub-national governments are responsible to manage higher share of total health expenditures tend to have better health indicators including IMR. Their analysis demonstrates that sub-national governments with better administrative capacity are more effective providing better healthcare services. This indicates that for fiscal decentralization to be more useful it needs to be accompanied with administrative decentralization.

Country specific analysis has also been conducted for the assessment of fiscal decentralization on health outcomes. For instance, (Schwartz's, 2002) study on the Philippines suggests a positive correlation between fiscal decentralization and health outcomes. The study compares the level and composition of health expenditure during both pre and post devolution reforms in 1994. Empirical results of study show a comparative increase in per capita health expenditures following the devolution. And the rise on expenditure is more prominent in provincial level compare to municipal ones, which may be because the former are responsible for major health projects and hospitals. Another interesting finding of same study is that after the devolution, the sub-national governments with more unconditional transfers from upper tier of governments tend to have higher allocation for health sector at the expense of other social services. Other studies also show similar results regarding the positive impact of fiscal decentralization on healthcare outcomes. For example, (Arze et al., 2008) show a common trend in Bolivia, Ecuador, El Salvador and Nicaragua where higher health expenditure is followed by fiscal decentralization. (Younger, 1999) finds out that public healthcare service are more pro-poor in Ecuador. Likewise, (Soto et al., 2012) posit that fiscal decentralization has a positive impact in reducing IMR in Colombia.

No matter how much money the sub-national governments spend on healthcare sector, without a stringent accountability system the effect of decentralization in improving health services may be jeopardised. (Khemani, 2001) conducts a research on Nigeria's intergovernmental design and its impact on local accountability. He finds that after decentralization of health sector a widespread disruption and mismanagement in public health services ensued, which ultimately led to further deterioration of already low quality health service in Nigeria. This was not because the sub-national governments lacked sufficient resources, but without systematic and effectual accountability mechanism, the healthcare services deteriorated after decentralization. (Kaufman et al., 2002) study the impact of fiscal decentralization on public services delivery, particularly health and education in Bolivia. The empirical results of their study show that although both central and local governments failed in providing adequate public services to the people overall, but comparatively local governments give better access to citizens, particularly to the poor and disadvantaged than central government. They note that since decentralization is at its early stage in Bolivia positive outcomes of access to social services may be an indication for better health indicators such as IMR and Crude Death Rate (CDR).

However, (Pritchett, 2001) shows that fiscal decentralization fails to improve healthcare outcomes in many countries. For example, in Mexico and Jordan despite differences in public spending on health services IMR remained same. In Haiti and Cote d' Ivoire per capita health expenditure experienced a drastic cut almost with the similar rate. But IMR increased only in Cote d' Ivoire; in Haiti IMR decreased.

As highlighted above, healthcare is a provincial subject in Pakistan. And after the 18th amendment to the Constitution in 2009 health ministry at federal level was abolished. Hence the health service was given entirely to the provincial domain. Fiscal decentralization in Pakistan has had also an increasing trend. Yet, to best of our knowledge, no systematic research does exit looking at the impact of provincial governments on healthcare services after obtaining a better fiscal space through fiscal decentralization.

Fiscal decentralization and Public Education

Like health the debate of the impact of decentralization on education has received much attention for over two decades. Scholars like (Hector, 2006) show a positive correlation between fiscal decentralization and education outcomes. They believe that with more fiscal and administrative power to the sub-national governments the overall performance of education sector, at least to the primary and tertiary level, will be better. Educational decentralization is justified on three broad categories: 1. Redistribution; 2. Effectiveness; and 3. finance (Winker, 1989).The notion of redistributing power in educational decentralization generates from the fact that community participation in schools' affair weakens the influence of strong lobbies such as teachers' union. Better teachers' commitment, citizens' participation and surveillance lead to improve schools' performance. (Fernandez, 2003) argues that decentralization can enhance the basic education outcomes. Because local representatives due to their proximity, and to some extent accountability, to local community, can provide education with improved quality and reduced costs. Further, the decentralised decision making regarding education provides greater voice to the local people that may force the officials and administrators in improving the performance (Thomas and Lawrence, 2000). Winkler and (Gershberg, 2000) argue that for better education outcomes decentralization is effective only in democratic countries. As in nondemocratic countries the local elites inherently influence the decision making process who can hinder the local governments from performing in social services delivery including education.

However, argument in the favour of *centralisation* of education is equally strong. For instance, (Weiler, 1993) is clear when he supports the centralised education on the ground of standardisation, curriculum development and qualification. According to (Wayman, 2003) for standardisation of education and mutual recognition of

qualification (diploma, certificate etc.) in nationwide the centralisation of education is essential. (Carnoy and Hannaway, 1993) argue that decentralization reforms are very unlikely to resolve the problems related to education. These are complex problems therefore a widespread rethinking in policy arena is essential. As the debateof decentralization of education is presented in terms of identifying what functions and responsibilities should be decentralised and what should remain with central government, rather than whether to centralise or decentralise the entire sector, the 'partial decentralization' may fail in encouraging a substantial investment in education sector.
In the 1990s several Latin American countries (Brazil, Bolivia, Chile, Colombia, Costa Rica, Mexico, Nicaragua and Venezuela) embraced decentralization in education sector. Their goal was to enhance the overall quality of education by removing the administrative bottlenecks and inefficient use of resources. Moreover, they embarked decentralization to increase the accessibility for those who hitherto were excluded from education. In Argentina for example all secondary and primary schools have been transferred to the provincial governments and now provincial education department is responsible for planning, financing and management of education (Winkler and Gershberg, 2000). Chile and Colombia are other examples where educational decentralization began in 1980s and 1990s respectively to devolve primary and secondary schools to regional governments and municipalities in order to produce improvements at school level.

However, the evidence on this issue is also mixed. Educational decentralization without proper technical and financial supports from the central government has not been successful in improving the quality of education, particularly for the poor. For instance, Brazil with strong decentralised education system also failed in increasing the per capita education expenditure, reducing regional and income inequalities in access to education. In Chile the condition of poor people not only has not improved after decentralization but has deteriorated further. As a result, the inequalities between the poor and the rich has widen further in post decentralization period in Chile (Carnoy and De Moura, 2000).
As mentioned above, in Pakistan like health education is also a provincial subject. Yet prior to 18th amendment the federal government ran education ministry that made the overall plan for education in Pakistan including curriculum development. Even after the 18th amendment the federal government makes policy planning and coordination of the education sector, albeit implementation, execution and operationalisation of education related policies are conducted by provincial governments. Currently the provincial governments are responsible for planning, monitoring and finance of basic education (Khan and Mira, 2011).
The core reason of giving basic education to subnational governments is to improve the provision and the quality of education. Therefore it is plausible to assume that with more fiscal decentralization, the provision of education may increase. Nevertheless to the best of our knowledge, this relationship has not been empirically tested.

HYPOTHESIS

As demonstrated earlier, provincial governments with more fiscal autonomy would increase expenditures on social services, including education and health. (Enikolopov and Zhuravskaya, 2007) suggest that fiscal decentralization renders into improved basic healthcare facilities to local communities. Better healthcare services that result into a healthy workforce plays a key role in increasing productivity and economic growth in one hand, and save the poor and low income groups from spending a big share of their already meager earnings on private hospitals/clinics and medicines on the other. Particularly, in Pakistan where the health sector constitutionally is a provincial subject (Pakistan, 1973). With fiscal decentralization provincial governments therefore receive more resources and, hence can allocate more resources to health sector. Given this, we hypothetically suggest that:

Hypothesis 1: Bigger the ratio of the share of provincial expenditure to total national

expenditure (fiscal decentralization), *Ceteris paribus,* lesser will be the CMR and the CDR (improved healthcare) that indicate overall better healthcare services.

Education is recognized by many including (Winkler, 1989), (Carnoy and Hannaway, 1993), (Florestal and Cooper, 1997), and (Winkler and Gershberg, 2000) as a main driving force for human resource development and employment generation. In order to support this argument, this paper postulates that fiscal decentralization may be instrumental in increasing the resources to education.

Hypothesis 2: Provincial governments' fiscal autonomy (fiscal decentralization) leads to more expenditure/investment on basic education that enhances the literacy rate in Pakistan.

METHODOLOGY

(Following Ravallion and Chen, 1997, Xie et al., 1999, Deaton and Paxson, 2001, Dollar and Kraay, 2002, Fisman and Gatti, 2002, and Schaltegger and Feld, 2009) we built our econometric models to investigate the impact of fiscal decentralization on healthcare services. While it is true that none of the studies mentioned above has empirically investigated a link between fiscal decentralization and healthcare outcomes *per se* they incorporate certain other factors which potentially affect healthcare. Thus, their models provide a use insight to this paper.

Ordinary Least Square (OLS) and Genralised Methods of Moment (GMM) techniques are used to test the above mentioned hypotheses. Two kinds of datasets, simple time series as well as panel, are used. The panel analysis has the advantage of using both time series and cross-section datasets. Davidson and (MacKinnon, 2004) argue that empirical research based on panel data has the merit to take into account the heterogeneity by allowing for country/region specific effects. It allows for more variability among the variables, restricts multicolinearity and gives more degree of freedom. As a result, it produces more efficient estimators (Baltagi, 2001).

In Pakistan the provinces differ in terms of magnitude of decentralization and the level of education and provision and quality of healthcare services. Looking at only national level based on aggregated data may not help us analysing the impact of decentralization on education and healthcare outcomes. Therefore, a panel dataset of four provinces for a period of 35 five years (1975-2009) is constructed to explore this relationship at provincial level.

To test the first hypothesis the following equations (1 &2) are used to present both a time series and a panel data analysis. Hypothesis 1 suggests that fiscal decentralization affects healthcare outcomes. To test this proposition, we lay down the following models (Eq. 1 and Eq. 2) to provide an overall country level impact of decentralization on healthcare outcomes along with a cross-province analysis by having a panel data approach.

$$HealthOut_t = \alpha + \beta(FD_t) + \beta_2(PPB_t) + \beta_3(FSSER_t) + \beta_4(Lit_t) + \beta_5(\text{Urban Pop}_t) + \beta_6(DRDum_t) + \beta_7(Int1_t) + \beta_8(Int2_t) + \beta_9(Int3_t)\ \mu_t; \quad t = 1, 2, 3, 4, \text{-------}30 \qquad (1)$$

$$HealthOut_{it} = \alpha + \beta(FD_{it}) + \beta_2(PPExp_{it}) + \beta_3(GER_{it}) + + \beta_4(ERDum_{it})\ \beta_5(Int1_{it}) + \beta_6(Int2_{it}) + \mu_{it}; \quad t = 1, 2, 3, 4, \text{--}30; \text{ and } I = 1, 2, 3, \qquad (2)$$

Edu_t = is the education outcomes, proxy by combined literacy rate (male and female both).

FD_t= is the level of fiscal decentralization: 1. the ratio of provincial governments' expenditures to national (federal + provincial governments) expenditures; 2. the ratio of provincial governments' expenditures to total national (federal + provincial governments) expenditures minus debt (re)payments.

$PPExp_t$= is the index of pro-poor social expenditures.

PTR_t= is the pupil-teacher-ratio, which represents the availability of more teachers and resource persons to schools.

GER_{it} = is the primary school gross enrollment rate.

$PCHE_t$= is per capita health expenditures that reflects the quality and quantity of healthcare facilities.

DP Dum_t = is a dummy variable for devolution plan that takes 1 on 2001 and afterward and 0 otherwise.

$Int1_t$= is the interaction term of fiscal decentralization and Corruption Index.

$Int2_t$= is the interaction term between fiscal decentralization and share of urban population to total population.

$Int1_{it}$= is the interaction term between of fiscal decentralization and Punjab-Sind dummy variable.

GDP_{it}= is the per capita GDP growth rate.

Data and Variables

Main data sources are: Pakistan Education Statistics (2008-09), Hand Book of Pakistan Economy, State Bank of Pakistan (2010), SPDC (2010), Economic Survey of Pakistan (various issues), Transparency International and the International Group Risk Guide (2011), Political Risk Group (2010), Bangali and Sadaqat (2000), World Bank (2011), Federal Bureau of Statistics (various Issue), Provincial Governments' Budget Documents (various issues).

Table 1 presents the summary statistics of data. Dependent variables for healthcare outcomes are CDR and IMR. The highest IMR recorded in the country from 1975 to 2009 was 85 per 1000. For the provinces the highest IMR is 155 per 1000 that was recorded in Balochistan province. The minimum IMR with the value of 54.9 was recorded for the Punjab, although very high, but far less than what was found in Balochistan. For education outcomes adult literacy rate is dependent variable. Literacy rate for overall Pakistan in 2009 is 57.5, which is the highest rate since 1975. In provinces 9% lowest literacy rate was recorded, and that was in Balochistan. The ratios of expenditure decentralization (for overall) vary from 0.17 to 0.68, with 0.159 dispersion and 0.35 mean, and 0.19 to 0.7 with 0.165 standard deviation and 0.452 mean, respectively. For panel analysis expenditure decentralization varies from 0.01 to 0.37 with the average value of 0.087 and 0.069 standard deviation, and in measurement the same ratio lies between 0.001 to 0.164 with the standard deviation value of 0.458 and 0.052 mean.

Table 1: Summary Statistics of Dependent and Independent Variables

Variables	Obs.	Mean	Std. Dev.	Min	Max
Bottom 20% population share in National Income	35	6.916286	0.558696	6.19	7.88
Corruption Index	35	2.383793	0.217031	2.1	2.91
Crude Birth Rate	35	37.33743	4.847015	29.66	43.2
Crude Death Rate	35	9.551714	1.478659	7.11	12.4
Crude Birth Rate	140	8.928571	1.656219	6	12
Crude Death Rate	140	8.928571	1.656219	1.65621	12
Fiscal Decentralisation (1)	35	0.35	0.159023	0.17	0.68
Fiscal Decentralisation (1)	140	0.087414	0.069814	0.01	0.37
Fiscal Decentralisation (2)	35	0.452571	0.165447	0.19	0.7
Fiscal Decentralisation (2)	140	0.113429	0.080417	0.01	0.379
Gross Enrolment (female)	140	41.44143	20.88948	8	95
Gross Enrolment (total)	140	57.65714	18.36304	19.6	100
Infant Mortality Rate	35	41.57143	27.38321	1	85
Infant mortality rate	140	93.6	17.2065	54.9	155
Life expectancy at birth	140	57.48714	5.382945	46.6	71
Literacy Rate	35	38.13429	9.749025	24.2	57.5
Literacy Rate	140	32.99607	13.64027	9	59
Per Capita Education	140	226.866	171.7984	2.08845	757.18
Per capita fertilizer	140	13.30037	7.744769	0.55710	31.306
per capita health	140	121.571	112.9628	10.34	468.6
Pro-poor expenditures	35	61.33229	43.35778	4.59	178.07
Pro-poor expenditures	140	389.4192	355.0672	20.613	1577.8
Pupil Teacher Ratio	140	38.34181	9.206662	23.4	65.2
Pupil-teacher Ratio (male)	35	38.22857	5.770542	30	55
Urban Population (%)	35	31.25714	2.944015	26	37

RESULTS AND DISCUSSION

The Impact of Fiscal decentralization on Healthcare outcomes

Healthcare being an essential social service is expected to receive much better treatment under provincial/local governments than the federal/central government (Khaleghian, 2004, Uchimura and Jutting, 2009, Jimenez-Rubio, 2010). Supporting this argument, we ex-ante believe that fiscal decentralization can improve healthcare services in Pakistan. Fiscal decentralization may help in reducing the inequality within the provinces in terms of healthcare and other social services as provincial governments possess more knowledge of people need. They can focus better on rural and backward areas to bring them at par to rest of the province. More importantly, since healthcare is identified as a crucial predictor of poverty reduction, hence fiscal decentralization is effective in healthcare provision, it inherently helps in reducing poverty.

The empirical results of the relationship between healthcare and fiscal decentralization are reported in Table 2. Healthcare service is proxy by IMR and CDR. A negative relationship between fiscal decentralization and healthcare (IMR and CDR) is expected with a coefficient having a negative sign vis-à-vis the fiscal decentralization. The results show that the elasticity of CRD with respect to fiscal

decentralization is high and statistically significant at 5%. Broadly speaking, other factors remaining the same one unit increase in the share of provincial expenditure to total expenditure leads to a the reduction of CRD and IMR by 5.29 and 13.47 points respectively.

Table 2: The Determinants of Health Outcomes

Model : GMM- IV		
Dependent Variables	**Crude Death**	**Infant Mortality**
Fiscal Decentralisation	-5.293**	-13.47**
	(2.448)	(5.860)
Population Per Bed	0.00322***	0.00942***
	(0.001)	(0.003)
Female Secondary School Enrollment (% Gross)	-0.359***	-0.231
	(0.084)	(0.153)
Adult Literacy Rate	-0.0417	0.221
	(0.084)	(0.142)
Urban Population (%)	0.152*	-1.176***
	(0.085)	(0.161)
Devolution Reform Dummy	-2.177***	-0.530
	(0.626)	(1.361)
Interaction term(Fiscal Decentralisation* Rule of Law)	-1.551	-10.04
	(1.994)	(6.801)
Interaction term(Fiscal Decentralisation*Corruption Index)	-1.540*	1.183
	(0.874)	(1.155)
Interaction term(Fiscal Decentralization*Devolution Reform Dummy)	6.361***	6.626**
	(2.016)	(3.292)
Constant	8.587***	119.0***
	(2.570)	(6.684)
N	34	34
R^2	0.935	0.998
adj. R^2	0.910	0.997

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The empirical results presented in the Table 2 show that provincial governments gained an increasing role in the allocation of expenditure in healthcare. However, since the expenditure decentralization process in Pakistan is depended upon the transfers from the federal government, the overall decentralization volatility would equally affect the provincial expenditures on healthcare. The negative and statistically significant coefficient of decentralization supports our argument of role of provincial governments in improving healthcare services. Considering that fiscal decentralization is measured as the share of provincial governments' expenditures to national expenditures after subtracting debt servicing from federal government's budget, the coefficient of fiscal decentralization maintains its statistical significance at 5%, though the magnitude of relationship differs.

Panel Regression

In Pakistan the impact of fiscal decentralization on healthcare outcomes varies across provinces and regions. As mentioned earlier fiscal decentralization helped in reducing IMR and CDR in Pakistan but whether this reduction is higher in relatively developed provinces than in poorer provinces. It needs further investigation.

Table 3 reports the panel regression results on four provinces where healthcare is proxy only by IMR, whereas the CDR is not included given the unavailability of data at provincial level. The results show that overall there is a strong and statistically significant positive relationship between decentralization, measures both as the share of provincial government expenditures to total and share of provincial to total expenditures minus debt serving, and the IMR. This relationship is not only in contrast to our earlier analysis in which fiscal decentralization is found to reduce the IMR in overall Pakistan, it also warrants further investigation at provincial level. The provinces of Sind and the Punjab are more developed in terms of all socio-economic indicators in one hand and receive more than two-third of total intergovernmental resource transfers from the federation on the other hand. Equipped with better infrastructure and more financial resources, these provinces may perform better in providing healthcare services than relatively underdeveloped and resource-scared KPK and Balochistan.

For this purpose an interaction term of fiscal decentralization and Punjab-Sind dummy added in the model to assess whether decentralization has different effects on the IMR reduction across provinces or not. As reported in Table 3, the coefficient of the interaction term is significant at 10% and 5% with negative sign suggesting that fiscal decentralization has reduced the IMR in Sind and the Punjab. Thus, in those provinces where infrastructure and administrative machinery is relative developed, decentralization has a strong impact on healthcare services.

This outcome supports our argument that fiscal decentralization improves the allocation efficiency of resources by allowing the sub-national/provincial governments to allocate the funds as per local people basic needs. Therefore, resource allocation efficiency makes the basic healthcare services improved. Oates (1972) in his classic public finance theory posts that such kind of efficiency mainly comes from the heterogeneous nature of localities or regions with different needs for social services. And

Pakistan, because of her multiethnic and diverse historical and cultural background of each region easily fits to such definition of heterogeneity. Income distribution among provinces and regions is extremely unequal, where Provinces like KP and Balochistan show a persistence occurrence and resurgence of chorionic and other terminal diseases. They record the highest incidence of poverty as well. All these socio-economic, cultural, geographic, demographic, political and ethnic differences indicate to some kind of heterogeneity across provinces. Such diversities and heterogeneities support the argument of decentralization as a policy tool in many countries including Pakistan. Our empirical results substantiate this claim.

Table 3: The Determinants of Infant Mortality Rate

Model: GMM - IV				
Dependant Variable	Infant Mortality Rate	Infant Mortality Rate	Infant Mortality Rate	Infant Mortality Rate
	(1)	(2)	(3)	(4)
Fiscal Decentralisation 1	4.036***	2.856***		
	(1.316)	(1.074)		
Fiscal Decentralisation 2			2.878***	2.873***
			(0.860)	(0.868)
Health Expenditure♦	-0.00690	-0.00429	-0.00392	-0.00366
	(0.000)	(0.000)	(0.000)	(0.000)
Gross Enrolment Rate (primary)	-0.00521***	-0.00626***	-0.00535***	-0.00536***
	(0.001)	(0.001)	(0.001)	(0.001)
Devolution Reform Dummy	-0.0384	0.0259	-0.00125	0.00770
	(0.034)	(0.048)	(0.031)	(0.048)
Interaction term(Fiscal Decentralisation*Punjab-Sind Dummy)	-2.068**	-1.366*	-1.453**	-1.452**
	(0.880)	(0.727)	(0.621)	(0.627)
Interaction term(Fiscal Decentralisation*Devolution Reform Dummy)	-1.320***	-0.773**	-0.928***	-0.913***
	(0.409)	(0.325)	(0.262)	(0.257)
Time dummy		Included		Included
Constant	4.670***	4.829***	4.655***	4.656***
	(0.102)	(0.083)	(0.096)	(0.097)
N	136	136	136	136
R^2	0.416	0.553	0.461	0.463
Adj. R^2	0.389	0.484	0.436	0.406

Robust Standard Error are in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; ♦ Variable expressed in per capita terms

The empirical findings also point to an important issue. When basic healthcare services are decentralised without substantial intergovernmental transfers, it tends to reinforce the poorer provinces hard to finance it. Consequently, they may even consider slashing down the health expenditures. It happened in Pakistan where the insufficient transfers from the federal government and inadequate local revenue generation create a serious resource constraint that adversely affected KP and Balochistan's social sector. This resulted to the failure of these provinces to reduce the IMR.

Our results also present that primary gross enrollment rate is a powerful predictor of the reduction of the IMR. The coefficient with negative sign is significant at 1% suggesting that holding everything else constant, 1% increase in gross enrollment rate leads to decrease the IMR by 0.52%. This supports the argument of empirical literature (World Bank, 1995 & 1996) that considers more literacy rate is an important determinant to improve social services including healthcare. This conclusion is in line with the previous literature (for example, World Bank, 1995; Younger, 1999; Gupta et al., 2002), which shows that fiscal decentralization enhances expenditures on health and education. These services have strong positive implications on poverty.

The Impact of Fiscal decentralization on Education Outcomes

In the last two decades basic education has been largely funded and monitored by sub-national/local governments in many developing and developed countries including Pakistan. The efficacy of fiscal decentralization on healthcare services has been a debated policy issue among economists and policymakers. The empirical findings of this paper contribute to existing debate by showing a positive and statistically significant relationship between fiscal decentralization and healthcare outcomes in Pakistan. How fiscal decentralization has changed or potentially can change the structure of education may be a valid argument. However, this question comes out of the scope of this paper.

Table 4 presents the regression results of education outcomes, proxy by adult literacy rate and fiscal decentralization along with other control variables. Empirics suggest a statistically significant and positive association between fiscal decentralization and the literacy rate. The results show that transferring expenditure responsibilities to provincial governments can increasing the enrollment rate and augment the quality of schools, due to which pupils tend to retain in schools which results into more literacy rate.

Another variable worth commenting is pro-poor social services expenditures. The variable is strongly significant and positively correlated with the literacy rate: one unit increase in the share of provincial

governments' expenditure share leads to a rise in the literacy rate by 0.4% point in first model (1) and 0.99% in second model (2).

For pupil-teacher ratio variable, smaller ratio is expected to increase the overall education performance that means instructors with less number of pupils in a class are more likely to have a better interaction with them and can increase their learning outcomes.

These results are in coherence with the existing empirical works on this subject. For example, Gupta et al. (2002) and Psacharopoulos (1994) show that more expenditure on social services, such as education, is highly likely to enhance economic growth, decrease income inequality and reduce poverty. Psacharopoulos (1994) illustrates how expenditure on basic education is associated with high social rate of return.

Table 4: The Determinants of Education Outcomes

Model : OLS		
Dependant Variable	Adult Literacy	Adult Literacy
	(1)	(2)
Fiscal Decentralisation1	0.59***	
	(0.012)	
Fiscal Decentralisation2		0.62
		(0.4)
Per capita Pro-poor Expenditure ®	0.4***	0.99***
	(0.4296)	(0.723)
Pupil-Teacher Ratio	-0.017	-0.016
	(0.0419)	(0.0511)
Per Capita Health Expenditure	0.0415***	0.0375***
	(0.0541)	(0.054)
Economic Reform Dummy	2.982***	2.941***
	(1.016)	(1.046)
Interaction term(Fiscal Decentralisation*Corruption Index)	-9.704***	-17.01**
	(3.079)	(7.277)
Interaction term(Fiscal Decentralization*Share of Urban pop to total	21.332**	1.95
	(9.199)	(2.514)
Constant	15.67***	18.86
	(2.613)	2.44
N	35	35
R-squared	0.98	0.98
Adj. R-squared	0.92	0.91

Robust Standard Errors are in parentheses. $p < 0.10$, $p < 0.05$, $p < 0.01$. ®variable

LM test, Breusch-Pagan/cook-weisberg test and Ramsey RESET test are applied and found no evidence of Autocorrelation, Heteroskesdasticity and Omitted Variables

Panel Regression

Basic education performance varies across provinces and regions in Pakistan. For instance, SPDC's (2009-10) estimates show that in 2009 total literacy rate in Punjab was 59%: with 50% female literacy and 69% male. Whereas, in Balochistan total literacy rate was recorded as 45%: with 62% male and only 23% female literacy rate.

The relationship between fiscal decentralization and literacy rate at provincial level is strongly significant and positive, which suggests that different degrees of fiscal decentralization across provinces do not affect its impact on education outcomes. However, a portrayal of this positive and statistically significant association underlines the fact that poorer provinces like Balochistan and KPK with high illiteracy rate since 1990s have made noticeable improvement in their literacy rate thereafter. Thus, despite fiscal constraints the correlation between decentralization and literacy rate is strongly significant with a positive coefficient across all provinces. Results presented in table 5 indicate that keeping everything else constant, one unit increase in fiscal decentralization (1 and 2) will increase the literacy rate by 0.82, 0.42, 0.92 and 0.8 points respectively in model 1, 2, 3 and 4. Surprisingly, the devolution plan dummy variable registers a negative coefficient though insignificant in model 1 and 3. When an interaction term of the devolution plan and Punjab-Sindh dummy is included the relationship becomes positive. However, its predictor remains insignificant. This indicates that from 2001 to 2009 the literacy rate has not increased substantially.

In nutshell, we may argue that the regression analysis partially confirms our hypothesis (2), that fiscal decentralization leads to increase the basic education services. These findings are in line with many academic studies on this subject. For example, Ranis et al. (2000) argue that fiscal decentralization can enhances education performance that increases the human development, improves productivity, boosts economic growth, reduce income inequality, and reduce poverty. Moreover, basic education is also crucial in reducing gender inequality, improving healthcare, and creating social and political awareness.

Table 5: The Determinants of Literacy Rate

	Model : GMM IV			
	Adult Literacy rate	Adult Literacy rate	Adult Literacy rate	Adult Literacy rate
	(1)	(2)	(3)	(4)
Fiscal Decentralisation1	0.82***	0.42***		
	(0.488)	(0.141)		
Fiscal Decentralisation2			0.92***	0.80***
			(0.084)	(0.770)
Pro-poor Expenditures©	0.0266***	0.0289***	0.0288***	0.0282***
	(0.001)	(0.001)	(0.001)	(0.001)
Pupil-teacher ratio	0.0301	0.0267	0.0315	0.0211
	(0.028)	(0.021)	(0.026)	(0.021)
Gross Enrolment Rate (primary)	0.181***	0.151***	0.181***	0.158***
	(0.012)	(0.021)	(0.012)	(0.020)
GDP Growth©	0.0751***	0.00605***	0.00696***	0.0581***
	(0.00)	(0.00)	(0.00)	(0.00)
Devolution Plan Dummy Variable	-1.379	-2.836**	-1.291	-3.358**
	(0.932)	(1.285)	(0.932)	(1.352)
Interaction term(Punjab Sind dummy variable*Devolution Plan Dummy Variable)	0.398	6.732		
	(5.350)	(5.469)		
Interaction term(Punjab Sind dummy variable*Devolution Plan Dummy Variable)			3.574	13.29***
			(4.107)	(4.362)
Time Dummies		Included		Included
Constant	40.78***	43.48***	40.59***	43.89***
	(1.568)	(2.008)	(1.486)	(2.089)
N	136	136	136	136
R^2	0.856	0.904	0.861	0.902
adj. R^2	0.848	0.864	0.854	0.862

Robust Standard errors are in parentheses Fiscal decentralisation, GDP and Gross Enrollment Rate are instrumented by their first lag; $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$© Variable expressed in per capita term.

CONCLUSION

The results partially substantiate our hypotheses implying that fiscal decentralization may improve basic health care outcomes. For education, overall, our findings support our hypothesis that fiscal decentralization improves education. The results show that the effect of fiscal decentralization on health and education outcomes is weaker for Balochistan and KPK compared to other provinces, which in other words indicates that fiscal decentralization is more effective in terms of education and healthcare facilities in Punjab and Sind because of the latter better fiscal space and improved infrastructure. The findings also suggest that good quality of governance (i.e., using corruption index) has a positive impact on basic health care.

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