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The Crowding in (out) Effect of Intergovernmental Transfers on Local Government Revenue Generation: Evidence from Pakistan*

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Abstract

Literature on the fiscal incentives highlight the importance of how the design of intergovernmental transfer system has momentous implication on the local government's behavior within devolved systems. The pragmatic results on the relationship between IGT and the incentive creation for the local government revenue generation are indecisive and differs across countries. Using a unique data set covering public finance and various socio economic data over the period 1990 to 2015 in Pakistan, this

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The datasets generated and/or analysed during the current study are available publicly in the Pakistan Bureau of statistics and Ministry of Finance Databases from the following links [http://www.pbs.gov.pk/ and http://www.finance.gov.pk/]. In addition, the complete structured dataset used in this study are available from the corresponding author on reasonable request.

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paper contribute to fiscal federalism literature by evaluating the fiscal incentives of unconditional (general purpose) formula defined and conditional (specific purpose) ad hoc based transfers. After endogenity adjustments, our empirical results shows that unconditional formula based intergovernmental transfers/grants improve the mobilization of local government revenues while the conditional, ad hoc based transfers, deteriorate the mobilization of local revenue. However, in Pakistan large part of transfers are unconditional so the results suggest that transfers from the federal government complement local own source revenues generation by encouraging local governments in Pakistan to collect more revenues.

Keywords: Fiscal capacity, Inter-governmental transfers, Local public finance, Devolution, Taxation.

JEL Classification: H29, H71, H79, H30.

1. Introduction

In 2001, Pakistan experimented the decentralization of administrative and fiscal duties to (LGAs) local government authorities. This devolution process assumes the LGAs to raise own source of revenue in order to finance their budgetary needs and basic public goods and service provision to its citizens. However, in most cases there exist an imbalance between expenditure responsibilities and revenue collection capacity of local governments. This vertical fiscal gap is predominantly essential in developing countries, since subnational governments lack the institutional capability to collect taxes and so the subnational governments profoundly rely on transfers/grants from the federal government to keep their governments need afloat (Shah, 2006).

Hypothesized negative relation has been examined between intergovernmental transfer and local government revenue generation via empirical evidence among those countries where well established fiscal institutions exist. However, among most developing and underdeveloped countries, the institutional and administrative capacities of local administrations perform to provide public goods and services. The tax collection is also inadequate, specifically in areas where poverty, geographical vastness and low population density make it difficult for local administrations to accumulate taxes (Fjeldstad *et al.*, 2014). The local revenue generation mainly requires robust monitoring and enforcement system and qualified staff, which are definitely costly to hire and retain (Besley and Persson 2013).

The principal argument of this research is to assess the fiscal capability of local administration along with political cost of implementing the revenue collection which are specifically low. Significantly, these are persistent features of local governments in Pakistan, intergovernmental transfer's helps in the facilitation of the local government revenue generation. However, the federal government transfers alter the behaviour of local government and also the design of these transfers, which are as important as the total amount of transfers (Bird and Smart, 2002). The literature has already highlighted many effects. Among these, the flypaper effect is quite well familiar i.e. an increase in the intergovernmental transfers which results in an increase in the local spending on public rather than increase in the private income of local residents (Hines and Thaler, 1995). Moreover, another effect that is quite pertinent in the literature regarding federal transfers is in the perspective of informational asymmetries which emphasizes on intergovernmental transfers from federal to local government challenges, the

fiscal discipline of subnational governments by raising the problem of a moral hazard (Kornai *et al*., 2003). Local governments perceive these federal transfers as a kind of bonus resource, which reduces the tax collections efforts of the local governments and crowd out the local government own source revenue. Explicatively, federal transfer reliance erodes the local official's accountability process, which is a precondition for an effective process of decentralisation.

Given the hindrance effects of federal transfers/grants on one hand and the vertical fiscal gap on the other, a good deal of work has been devoted to contemplate the nature and structure of intergovernmental transfers in developing and developed countries (Martínez-Vázquez and Searle, 2007; Boadway and Shah, 2007). Based on the literature, we consider two major groups of transfers/grants: general-purpose (unconditional transfers) and selective (conditional transfers), the latter is conditional based on funds being disbursed for specific purposes. Practically, transfers and grant systems vary widely between countries, and comprise of both conditional and unconditional transfers.

Pakistan is an ideal country to be examined empirically, indicating the linkage between intergovernmental transfers/grants and local government revenues generation for various reasons. Specifically, the federal transfers/grants constitute large section of the local government budgets in Pakistan. The federal resource distribution in Pakistan is consist of two major types of transfers to subnational governments. One is unconditional transfers which constitutes NFC transfers and non-developments grants while remnant are development or project specific transfers/grants. The allocation formula of unconditional grants is mainly population, poverty and backwardness specific and local governments having autonomy on the use of these grants while the development grants are allocated for specific projects which have upper sealing which is under the direct control of the federal government. In this regard, it is an ideal setting to investigate whether federal grants/transfers crowd out or crowd in it's own source revenues of local government administrations in Pakistan or not? Keeping this view, the higher local own source revenue collection cost, we first highlight a theoretical uncertainty concerning the incentive and disincentive effect of unconditional and conditional federal transfers/grants on local government own source revenue. Certainly, conditional and unconditional federal transfers/grants crowd out (in) local government own source revenue in case the marginal utility of local public expenditure decreases (increases) in local government own source revenue.

The given theoretical vagueness regarding the effect of conditional and unconditional grants/transfers on local government own source revenue generation is behind our pragmatic analysis. We have focus on Pakistan, which have several administration features, long political history and a recent (2001 devolution) top-down decentralization process. We examine specific conditional and unconditional transfer/grants, where unconditional transfers are the accumulation of divisible pool of taxes. Straight transfers and Non-development grants and conditional grants which comprise of development or project specific grants, depending on population size, poverty, backwardness and population density.

Another issue that obscures the identification of the effect of intergovernmental grants/transfers on local government revenues generation is the amount that the federal government transfers/grants gives to local government which is expected to be endogenous to the local

government fiscal capacity. To alleviate this apprehension, we have used two methods one is used lag values of regressors and other is employing instrumental variable (IV) approach. Various instrumental variables are used for conditional and unconditional transfers.

Empirical analysis shows strong positive evidence regarding the effect of unconditional grants/transfers in the local government revenue expansion. While the conditional grants/ transfers indicate negative relation in the local revenue expansion. These outcomes are imperative and have wide-ranging inferences for fiscal capacity and state building in Pakistan. The literature and conventional wisdom on public finance recommends that dependence on external transfers/grants may weaken the fiscal sovereignty of local administrations. The present analysis examines that the relation between federal grants/transfers and local government revenues generation challenge this expectation in the framework where the prevailing fiscal capability is low or nearly non-existent, like in under develop country Pakistan.

This paper is systematized in the following manner. The next section (Section 2), review the existing literature. Section 3 describes the case of Pakistan Section 4 describes the model, data and the variables used in the study Section 5 presents the main verdicts of my econometric analysis. Section 6 concludes by discussion and the policy implications of the study's central findings.

2. Literature Review

In the past decades many countries have embarked upon the decentralization process and Pakistan is one of them, which have started their local decentralization process in 2001 called as LGAs (local government authorities). During this process many of the responsibilities which were previously under the domain of central government are vested in hands of local government, which now play important role in the provision of public goods and services. These devolution efforts have been encouraged by the fact that local governments are more responsive to the local needs than the federal government because local administrations are in close connect with their citizens, although pragmatic support regarding this line judgment is quite mixed (Brollo *et al*., 2013; Olken, 2007; Reinikka and Svensson, 2005; Crook, 2003; Tendler, 1997).

Critics argue that transfers/grants from federal to local governments erode the fiscal autonomy of local government because they help as a substitute for the local level tax revenues (Buettner and Wildasin, 2006; Bradford and Oates, 1971a; Bradford and Oates, 1971c; Mogues and Benin, 2012). (Bradford and Oates, 1971c; Bradford and Oates, 1971b) present a formal theory of how transfers/grants may influence the performance of local government fiscal operations. Under this supposition when private and public incomes are interchangeable, the unconditional transfers/grants offer additional resources for local level administrations for providing public service provision to the individual citizens in the form of a reduction in lump-sum tax, therefore crowding out the efforts to accumulate local government revenues.

The empirical support for the crowing-out effect of the federal government transfers have been far away from decisive. More existing studies regarding the crowding out effect

came high income developed economies where there is well established fiscal institutions. Buettner and Wildasin (2006) analyze the US individual municipalities for the time period between 1972 and 1997 and find that increase in the transfers/grants from federal government leads to decrease in local government revenues. Zhuravskaya (2000) observe the similar pattern in Russia, where every unit (monetary) raised in local government own source revenues is offset by 0.9 units reduction in intergovernmental transfers from the upper-tier government, which indicates that local level governments will have practically no motivation to employ efforts for tax generation in case of increase in transfers. Some other studies have focus on the flypaper effect of the intergovernmental transfers i.e. transfers from federal government is likely to be used for public spending in spite for tax reliefs (Rosen, 2004; Hines and Thaler, 1995). For example, an analysis by Dahlberg *et al*. (2008) on Sweden demonstrate that federal transfers increase the public spending instead on reducing local tax revenue. Taiwo (2020) concludes that federal transfers crowd out own source revenues of local administration in Nigeria.

Besides, more current studies (Brun and El Khdari, 2016; Caldeira and Rota-Graziosi, 2014; Zhang, 2013; Skidmore, 1999) observe the ‘‘crowding-in” effects of federal transfers, whereby transfers/grants enlarge the tax revenue of the local government. Caldeira and Rota-Graziosi (2014) observe an increase in the local government own source revenue due to the unconditional revenues from the customs assigned to local administration in Benin. Similar case is analyze by Troland (2016) in the Philippines where the central government transfers overcome the issues of credit constraints and fixed cost link with the revenue collection capacity. Also, on the study by Masaki (2018) concludes central government transfers crowd in local government revenues generation, specifically in rural areas. In short the empirical literature has not grasped any consensus on the relation between transfers/grants and local own revenues generation.

In this research work, we explore the effect of transfers/grants (both unconditional and conditional) on local revenues generation in Pakistan, a region where the fiscal capacity of local government is limited and is determined by the financial support from the federal government. We argue that in regions where present fiscal capacity of local government administrations are weak the political cost associated with tax enforcement are low, intergovernmental transfers from federal to lower government assist in the generation of local revenue instead of decline it.

3. The case of Pakistan

The process of fiscal devolution has gained impetus in Pakistan since the government launched the Local government ordinance (LGO) in the 2001. The 2001 Devolution reforms were third in the devolution process, they were much more ambitious and inclusive in the significant power transfer at the grassroots level. Partly determined by the aggregate demand for more democratic and accountable systems at the lower level, the LGO has delegated many tasks previously consigned in the federal government to LGO and made these local government units the main providers of public service provision.

One of the goals of the LGO has been to give strong financial base and extensive flexible powers to local governments because of limited capacities of local governments to raise revenues (Cochran *et al*., 2009). As a result, the devolution program has extended the amount of federal government transfers/grants distributed to local governments. In Pakistan, revenue is first collected by the federal government and is then reallocated to the local administration (Ehdaie, 1994; Grossman, 1989). Table 1(in appendix) explains the intergovernmental resource transfer mechanism in Pakistan. The key revenue source to the sub national government is intergovernmental transfers. The central government transfers their resources through NFC awards (National Finance Commission) Awards (Table 1 in appendix) to the provincial units, and the provincial administration transfer resources through the PFC (Provincial Finance Commission) through special formula to sub- provisional units.

The resource Distribution formula under PFC (formed in 2001 LGO) is province specific, depending on each provinces under their own political, local and socio-economic needs (Manning *et al*., 2003). The provincial administration also made a direct transfer named as conditional transfers to the local units specifically for social infrastructure needs and are redistributed on an ad-hoc basis on different schemes.

Table 1
FEDERAL RESOURCE DISTRIBUTION BY PROVINCE

Provinces		**1991-1997**	**1998-06**	**2007-09**	**2010-2015**
	Total Transfers	1186604	1401537	591828.3	1679939
Punjab	NFC transfers	95.13	93.45	95.78	98.75
	Total Grants	4.84	6.45	4.2	1.23
	Unconditional transfers	96.83	99.15	99.23	99.52
	Conditional transfers	3.14	0.75	0.75	0.46
	Total Transfers	625637.2	906697.2	367078.3	968624
Sindh	NFC transfers	90.23	88.03	93.37	97.08
	Total Grants	9.6	11.97	6.6	2.91
	Unconditional transfers	92.33	96.95	98.42	99.21
	Conditional transfers	7.5	3.05	1.55	0.78
	Total Transfers	456363.8	495427.4	175702.5	630592.6
Kpk	NFC transfers	91.46	73.02	79.74	91.11
	Total Grants	8.51	26.96	20.23	8.88
	Unconditional transfers	94.3	98.03	99.28	99.36
	Conditional transfers	5.67	1.95	0.69	0.63
	Total Transfers	273514.1	278935.1	134796.4	404064.9
Baluchistan	NFC transfers	85.09	68.75	53.23	86.16
	Total Grants	14.89	31.23	22.42	13.83
	Unconditional transfers	93.38	94.9	40.35	96.9
	Conditional transfers	6.60	5.08	6.39	3.09

As presented in (tables 1 and 2 in appendix), the major criterion of resource distribution for provincial and local units is population. However, the 2010 NFC awards advanced many changes

by indulging multiple criteria mechanism for resource distribution (as shown in table 1 in appendix) and improved the provincial share to nearly 57.7%. The resource distribution criteria include 5% of the revenue generation efforts by the subnational government which is a one step ahead towards increasing the local revenue generation efforts at local level. As mentioned in the 2001 LGO budget rules, the local administration can articulate their budgets and expenditures allocation without provincial government consent. The local government articulates its budget once it is up-to-date by the provincial units and once it has set its budget distribution under the PFC.

In Pakistan, like elsewhere in the region, the collection of local revenues has been particularly challenging. Subnational own sources include indirect, direct and non-tax revenue containing user charges. User charges and Non-tax revenues are imposed by the concern department after the Provincial Chief Minister approval. Direct taxes include transfer of property tax, urban immovable property tax, agriculture tax, capital gain tax, land revenue and tax on trade profession and calling. Indirect taxes consist of stamp duties, provincial excise tax, and tax on motor vehicle, tax on hotels, electricity duties and cotton fees. Almost all subnational government have similar tax collection structure except that of Sindh that include maintenance and development infrastructure that is imposed at ad valorem at the rate of 0.5 percent on imports (except oil) that land at Karachi air/sea ports. Non-tax and user charges revenues charges include revenues from economic services (food and agriculture, industrial, irrigation and mineral resources), social services (health, education, housing and physical planning, manpower management, social welfare and social security), community services (public health, civil works, other community services and public health), income from enterprises and property (interest, profits and dividend), and non-tax revenues from law and order include police, justice, civil defense and jail and general administration. Table 1 and 2 explains the federal resource distribution and federal own source revenue by province.

Table 2
FEDERAL OWN SOURCE REVENUE BY PROVINCE

NFC years	Punjab	Sindh	KPK	Baluchistan
1991-1997	884955.8	452131	291097.4	169857.5
1998-06	1516685	839968.6	461764.6	266231
2007-09	760533.3	418700	182768.9	111959.2
2010-2015	2021082	1060523	652150.9	358341.8

The NFC 2010 have shown some real steps in expanding the revenue source generation of the subnational governments by including revenue generation effort in resource distribution formula. That on one hand increase the transfers to the local government and on other hand encourage the local governments to expend their resource mobilization efforts.

4. Econometric Model

We have used the approach of optimal tax theory. The formulization is specifically based on the counter intuitive outcomes with reference to usual assumptions in the empirical lit-

erature on devolution, keeping in view the situation of Pakistan our novel findings is the 'unconditional transfers/grants increases the local own source revenue while the conditional transfers/grants decreases the local own source revenues'.

The model assumes an economy with the local public goods provision termed as PGY and private good PGX. The illustrative local administration maximize the consumer utility in its vicinity. Public revenue comprise two types of sources, first is local own source revenue presented by $LOSR$ which comes from the local population taxation and another one is transfers/grants that comes from federal government. There are two types of transfers/grants under consideration. One is unconditional transfers/grants presented by $UCTR$ and other one is conditional or project specific grants illustrated as CTR.The budget constraint of local government is $LOSR + UCTR \geq PGY$.

The assumption is that, where all things equal, the collection of local own source revenue is costly. The assumption is specifically pertinent in the countries like Pakistan. Firstly, in spite of trade liberalization, most of the federal government tax in developing countries is collected by customs (Baunsgaard and Keen, 2010; Keen and Mansour, 2010). Tariffs, duties and tax collected at borders is quite easy than local tax collection. Secondly, most successful tax administration innovation in the last years has been establishment of large scale taxpayer units that help large scale economies, focus the nation effort on federal taxes like personal income tax, and value added tax and corporate income tax (Baer *et al.*, 2002). The support and attention which is gained by the design of the central government has not received by the local taxes. As mentioned by (Bird, 2010) property tax is one of missing tax revenue collection in these countries.

Without losing the generality, we have normalise the value to 0 which represents the cost of tax collection sustained by the federal administration. Succeeding the literature review of the (Hamilton, 1986; Aragon, 2009), local tax burden is represented as $g(LOSR)$, which show the payment of tax and the tax collection cost. Where $g(0) = 0, g'(LOSR) > 1$ and $g''(LOSR) > 0$. The model partial equilibrium analysis is that federal governments' transfers/grants are costless for the beneficiary local administration, while the local own source revenue is not.

We have assume the local administration maximize the utility of its citizens, which is given by the utility function $U(PGX, PGY)$ subject to the constraint of individual and local government budget. $PGY = LOSR + UCTR$ and $y = PGX + g(LOSR)$,where y represents the pretax income. $LOSR$ represents the premeditated variable for local government is its own source revenue. Here we don't differentiate between tax instruments i.e. tax base and tax rate. The local own tax revenue in its optimal form is represented as $LOSR^*$ and the solution of maximization function is as follows

$$LOSR^* = arg\ maximum\ Utility\,(y - g(LOSR), UCTR + LOSR).$$

The FOC is presented by

$$-g(LOSR)\,Utility_1(.) + Utility_2(.) = 0. \tag{1}$$

The SOC is presented by

$$\frac{\partial^2 Utility(.)}{\partial LOSR^2} = -g''(LOSR)Utility_1(.) + (g'(LOSR))^2 Utility_{11}(.) - 2g'(LOSR)Utility_{12}(.) + Utility_{22}(.) < 0.$$

Aggregate differentiation of equation (1) with reference to UCTR yields to

$$\frac{\partial LOSR}{\partial U} = -\frac{-g'(LOSR)Utility_{12}(.) + Utility_{22}(.)}{SOC} \lessgtr 0.$$

So we assume the below proposition.

PROPOSITION # 1. Unconditional transfers/grants from federal government crowd out (in) local government own source revenue in case the marginal public good's utility is decreasing (increasing) in local government tax revenue ($\partial Utility_2(.)/\partial LOSR > 0$).

PROPOSITION # 2. Conditional transfers/grants from federal government crowd out (in) local government own source revenue in case the marginal public good's utility is decreasing (increasing) in local government tax revenue.

Deviation in marginal public good's utility with reference to local government own source revenue may be interconnected to scale economies in public goods provision, individual inclinations in consumption of public and efficiencies or in efficiencies of local governments in the collection of tax. A right economic cycle is in effect when federal government transfer/grants enhance the spending of local public, which than expands the voluntary compliance of tax and/ or private income and subsequently the local government own source revenue $\partial LOSR/\partial UCT > 0$. Various examples shows such type of relation.

(1) With the restoration or renovation of local bazaars the activity of market level improves and so is the revenues of the merchant's, which need to be partially funded by the federal transfers/grants. This will encourage merchants regarding their willing to pay fees.

(2) Local collection of waste and other public goods intensify the local policy-makers' accountability by making the linkage among the quality of public services and goods and the related local taxation. This fortification of answerability makes the collection of tax easier.

Opposite to this circle, an increase in grants/transfers from the federal government may let local administrations to decrease the efforts of tax collection, while unchanging the level of local public goods $\partial LOSR/\partial UCT < 0$. Or we can say, federal transfers/grants reduces the efforts of local government tax collection efforts in there vicinities or crowd out the local government own source revenue. Such a disincentive influence of federal government transfers/grants opposes the flypaper effect broadly studied in the literature.

Neither the public good normality nor SOC is an adequate condition to get the intuitive negative relation between federal transfers/grants and local government own source revenue.

Public goods normality is given by

$$\frac{\partial(UCTR + LOSR)}{\partial_y}\frac{\partial LOSR}{\partial UNCR} = \frac{-g(LOSR)Utility_{11}(.) + Utility_{12}(.)}{SOC} > 0. \qquad (2)$$

The symbol of cross derivative of the function of utility ($U_{12}(.)$), which describes the substitutability or complementarity a' la Edgeworth between public and private consumption, isn't constrained. If we assume a function of concave utility with reference to public expenditure ($U_{22}(.)) < 0$ which involve that federal transfers/grants increases the local government own source revenue if the degree of substitutability between private and public goods is adequate. The empirical literature on devolution generally undertakes independence between private and public consumption ($U_{12}(.) = 0$). Merging two previous assumptions ($U_{22}(.)) < 0$ and ($U_{12}(.) = 0$) convinces the crowding-out effect often highlighted in the empirical literature-federal transfers/grants decreases local government own source revenue. Nonetheless, without any further constraints than the normality of local public goods and of the SOC, the Proposition 1 highpoints the theoretical vague relation between unconditional federal transfers/grants and local government own source revenue. The subsequent section is dedicated beyond this theoretical vagueness through an econometric investigation of the effect of an unconditional transfers/grants central grant on local government own source revenue in Pakistan.

To empirically test the relationship between intergovernmental federal transfers and local tax revenues mobilization (the detail of all variables and descriptive statistics are presented in Table 3 and 4 of appendix), we use provincial-level, panel data on local government revenues in Pakistan from 1990-2015[1]. All the fiscal data are derives from PRSP, the Pakistan economic survey (Ministry of Pakistan), the Pakistan Statistical Yearbooks (Pakistan Bureau of Statistics), the State Bank of Pakistan, and the Development statistics of Pakistan. The set of models estimates the impact of intergovernmental transfers on local revenues in the following equation, which is FGLS model akin to the model used in (Lessmann, 2006; Sacchi and Salotti, 2014; Reed and Webb, 2010; Ain *et al*., 2020, 2021).

$$OSR_{i,t} = \alpha_{i,0} + \beta_{i,1}TR_{i,t} + \phi\omega_{i,t} + \delta_t + u_i + \varepsilon_{i,t} \qquad (3)$$

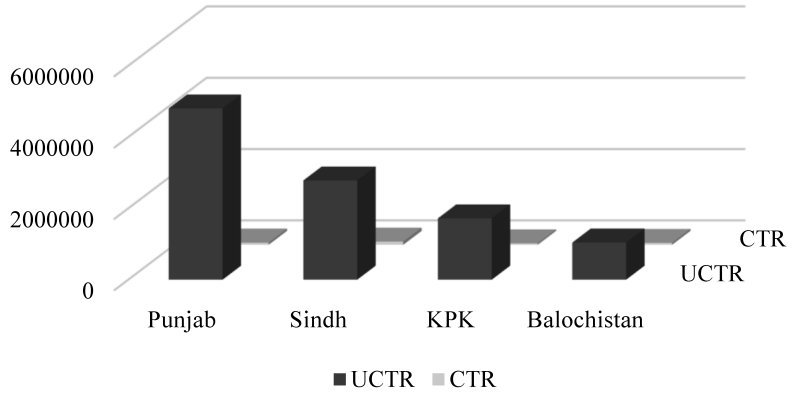
$$OSR_{i,t} = \alpha_{i,0} + \beta_{i,1}UCTR_{i,t} + \phi\omega_{i,t} + \delta_t + u_i + \varepsilon_{i,t} \qquad (3A)$$

$$OSR_{i,t} = \alpha_{i,0} + \beta_{i,1}CTR_{i,t} + \phi\omega_{i,t} + \delta_t + u_i + \varepsilon_{i,t} \qquad (3B)$$

Where t and i index year t and province i, respectively; OSR refers to the volume of local revenues per capita, TR in (equation 3) symbolizes the total intergovernmental transfers per capita in Pakistan. Total transfers is divided between unconditional and conditional transfers as shown in (Figure 1 and 2). Where unconditional transfers ($UCTR$) in the (equation 3A) include divisible pool of taxes (DPT), straight transfers (ST) and Non-development grants (NDG). In unconditional transfers provinces have full autonomy to use these funds and these is no ceil-

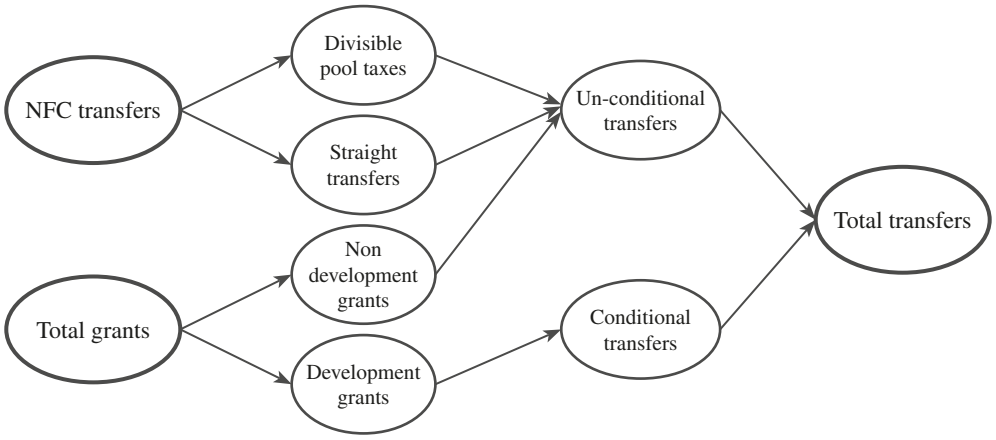
ing attached to these funds. Conditional grants(CTR) in (equation 3B) on other hand include development grants (DG) that are provided to the provincial government annually from the federal government consolidated funds for the financing of specific development projects, performing agency functions or special purpose projects.These grants are conditional as there is no specific rule attached for it disbursement from the central development grant to provinces, and the federal government provides it to finance specific programs and projects. The other categorization include NFC transfers which is part of unconditional transfers and total grants (TG) include development grants (DG) and part of non-development grants (NDG) which are categorized as conditional grants (Figure 2). $\omega_{i,t}$ includes all observable controls; and δ_t and u_i are province-fixed and year-fixed effects.

Figure 1
DIVISION OF UNCONDITIONAL AND CONDITIONAL TRANSFERS IN EACH PROVINCE



Author's construction based on Ministry of Finance, (Statistical supplement), Pakistan financial data.

Figure 2
THE FLOW OF DIFFERENT TYPES OF TRANSFERS/GRANTS FROM FEDERAL TO PROVINCIAL GOVERNMENT



Other control variables are incorporated to alleviate the bias of omitted variable. (a) PC GDP stands for per capita real GDP; (b) PC DPPSQ refers to density per person per square km (c) Pop is the provincial population; (d) URBANIZATION is the share of the urban population in total population;(e) Per capita EDEXP shows education expenditure on per capita; (f) Gini index is used to shows income inequality and is based on the household consumption data where the value of the Gini coefficient lies between hundred and zero. Hundred shows perfect inequality, and zero reveals perfect equality; (g) PC rural development shows per capita expenditure on rural development.

5. Estimation Results

Table 3 presents the main results using feasible generalized least square. We have found that unconditional transfers/grants increases revenue mobilization in local government while the conditional transfers/grants decreases the local government revenue mobilization. Table 3 shows the stimulatory effect of unconditional transfers/grants on the local revenue generation. A one rupee increase in unconditional transfers amplified local revenue by 60 paisas[2] showing an increase in local revenue with 1% significance level. This finding verify the earlier results (Masaki, 2018) that validate that unconditional transfers are spend on revenue mobilization at local level. These unconditional federal transfers encourage local own source revenue generation. It is because local governments know the almost exact amount will they receive, as the federal government NFC awards formula in Pakistan for these transfers, so theses transfers remain anticipated and signifies a stable revenue source. Furthermore, the federal government uses this type of transfers to give local government incentives to increase the level of revenue mobilization by containing a tax effort proxy and by proclaiming that the more transfers will be provided to those subnational localities where there more tax efforts. These results confirm our first proposition that federal government grants and transfers increases local revenue generation. Further Transfers do not have a discouragement influence on own source revenue mobilization by districts, rather, they enhance the local government tax base as illustrated in the literature (Boadway and Shah, 2007; Hindriks *et al.*, 2008). While a rupee increase in conditional transfer's decreases local revenue by 1.18 paisa's. This outcome is not startling as conditional federal transfers are exactly piercing in time and not recurring, reallocated for definite investment needs. Therefore, local administrations know they can't depend on this type of grants to finance their long-term plans unless they match the federal government plans.

To explore further the causal channels through which grants/transfers may affect local revenue generation, considering the intergovernmental system of Pakistan and for the purpose of analysis the total transfers has divided into two broad categories i. e. "NFC transfers", which include DPT and ST on the foundation that this category of transfers are unconditional in nature and provinces enjoy full expenditure sovereignty. The other category is "Total grants" which include DG and NDG and it is calculated by adding remaining grants/transfers. Further we decompose the total transfers as unconditional as provinces enjoy full discretion on the use of these transfers. This category of transfers include NFC transfers and part of

NDG. The DG is conditional is nature as these grants are for specific program and purpose and impose obligation on the provinces and state to spend on specific projects and activities.

Expected local government revenue response present some indication whether federal transfer to receipt governments are utilize in the local government revenue mobilization efforts or are used by the provincial governments to consider these as an alternative revenue source. The results of both these possibilities is evident in the assessed own source revenue equation in Table 3. In the case of a one Rupee increase in NFC transfers raises own source revenue by 0.55 paisa. Coming to one rupee increase in TG transfers, own source revenue decreases around 0.59 paisa. These findings are consistent with those of (Masaki, 2018; Caldeira and Rota-Graziosi, 2014) who report a positive effect of federal transfers on Benin's communes' own revenue generation, but contradict those of (Taiwo, 2020) and (Mogues and Benin, 2012), who find that transfers to district governments discourage local own source revenue generation.

Table 3
ESTIMATION METHOD FGLS: DEPENDENT VARIABLE (Own source Revenue)

	NFC per capita (DPT+ST)	TG per capita (NDG+DG)	Unconditional grants	Conditional grants	TT per capita (NFC+TG)
Transfers	.5531***	-.59111 **	0.6093***	-1.1826***	0.5087 ***
	(.05242)	(.11131)	(0.0742)	(.35026)	(0.0794)
Per capita GDP	.03601 ***	.03883**	0.0347***	.06014***	0.0328**
	(.01733)	(.02242)	(0.0166)	(.02213)	(0.0187)
PC DPPSQ	1.3252	-1.6399	2.4244	-10.1184*	2.6594
	(2.5010)	(11.917)	(2.1127)	(5.9995)	(2.3980)
pop	-.00527	.01664	-.00468	.14174*	-0.00684
	(.01365)	(.154682)	(.01046)	(.07866)	(0.00122)
Urbanization	-15.677	.8623	-36.9625	-5928.35	627.667
	(17.0396)	(66.632)	(1662.3)	(4231.6)	(1890.79)
Per capita EDEXP	-.00035	-.002037	.000433	-.001301	0.00082
	(.001051)	(.001249)	(.001187)	(.001444)	(0.00127)
Gini index	-11.115	-17.615	-624.055	-2799.57	-547.81
	(13.691)	(15.942)	(1534.64)	(1875.27)	(1645.48)
PC rural development	2.9546 ***	5.7331 **	4.2195***	7.19716***	4.7956***
	(1.1032)	(1.2375)	(1.2096)	(.1.2369)	(1.2859)
constant	544.478	4350.39***	-867.42	5091.56***	-719.062
	(597.54)	(1202.62)	(658.525)	(1111.11)	(761.01)
Wald chi square	140.53	65.02	115.40	57.89	84.31
Prob chi square	0.000	0.000	0.000	0.000	0.000

We subject our findings to a number of different robustness tests. The first test addresses the issue of endogenity using lag of regressors. Table 4 summarize the results from the FGLS model, which now estimate the effect of the transfers on the local revenue generation.

The lagged effects of transfers are positive and statistically significant in the unconditional transfers while the lagged effects are negative and significant at the conventional level in the subsample of conditional transfers. More substantively, a 1% increase in fiscal transfers is expected to induce a 0.16-0.21 % increase in the total amount of local revenues in case of unconditional transfers (based on column 1 and 3) and a 0.83% decreases in case of conditional grants (based on column 4).

Table 4
ESTIMATION METHOD FGLS: LAG OF REGRESSORS DEPENDENT VARIABLE
(Own source Revenue)

	NFC per capita (DPT+ST)	TG per capita (NDG+DG)	Unconditional grants	Conditional grants	TT per capita (NFC+TG)
Lag transfers	.16390**	-.23233***	.21377***	-.83210***	.15769**
	(.06664)	(.10176)	(.08537)	(.4636)	(.08481)
Lag Per capita GDP	.040856*	.01806	.038282**	.02667	.0390*
	(.02284)	(.02586)	(.02079)	(.0172)	(.02204)
Lag PC DPPSQ	-1.3534	-26.522*	-.02782	-25.743*	.54403
	(3.0045)	(12.133)	(3.2043)	(13.652)	(3.4930)
Lag pop	.00556	.07698	-.00811	.07685	-.00957
	(.02409)	(.07433)	(.01647)	(.07067)	(.01821)
Lag Urbanization	-2206.933	10594.09***	-1405.91	9511.75**	-1523.71
	(2315.62)	(4926.81)	(2093.54)	(5379.70)	(2262.37)
Lag Per capita EDEXP	.001024	.00026	-.000026	.00138	.000856
	(.001428)	(.001413)	(.00135)	(.00178)	(.001437)
Lag Gini index	-151.123	-1322.51	417.341	-2230.04	-30.411
	(1712.36)	(1582.40)	(1715.18)	(1382.2)	(1731.50)
Lag PC rural development	3.6787***	1.95121	5.3089***	1.2512	4.4870***
	(1.3960)	(1.3467)	(1.398)	(1.4861)	(1.4126)
Constant	2064.27***	1277.45	1549.7**	-801.52	1790.50**
	(759.723)	(1201.92)	(828.311)	(1593.11)	(896.002)
Wald chi square	21.05	23.46	40.50	22.61	25.57
Prob chi square	0.007	0.002	0.000	0.003	0.001

As potential threat to the validity of our empirical analysis is endogenity for which we have also used 2SLS. To alleviate this potential bias we assess the effect of transfers (unconditional and conditional) on local own-revenues using fixed-effects two-stage least square (2SLS) approximation approach. This method lets us use external instruments to solve the problem of endogeneity. However, it entails the presence of instruments interrelated with the endogenous variables (conditional /unconditional transfers/grants) but not directly associated with local own source revenues. Therefore, the variables that are most notably correlated with unconditional transfers and uncorrelated with local own source revenue are political indicators. According to the literature on the political determinants of intergovernmental transfers, the instruments for unconditional transfers are a dummy for political dummy that captures

the mechanism through which a fiscal arrangement can affect devolution policy other than through decentralization. The political dummy takes a value of 1 if there is democratic system of government and takes a value of zero if the system is governed under military regimes. (Brun and El Khdari, 2016) shows that the formula doesn't eliminate political motivations and finds that there is a tactical distribution regarding the unconditional transfers. The central government favors more transfers if there is a democratic government because it gives more autonomy to subnational government than the military government. Moreover, (Worthington and Dollery, 1998) debates that the year of federal election have a negative effect on federal transfers. Intergovernmental transfers are less productive in central election comparing to the local election to influence votes and purchase political capital. Another variable include dummy variable for transfers that takes place in 2009. We have taken the value of 1 for the transfer's takes place in 2009 and above and takes the value of 0 before 2009. For the regression with conditional transfers, along with the previous instruments one additional variable is include that we believe indirectly correlated with local own revenues and correlated with conditional transfers are used. While this kind of grant aims to assist local government with high expenditure and investment needs, the instrumental variables are the development revenue grants to local organizations.

The empirical findings using IV instruments reveal that transfers crowd in own revenues in case of unconditional transfers and crowd out own source revenue generation in case of conditional transfers in Pakistan. Hansen J statistic for the over identification test of all instruments indicates that the excluded instruments are correctly excluded with a p-value given in table 5, while the first stage regression are provided in table 6.

Table 5
ESTIMATION METHOD FGLS: 2SLS DEPENDENT VARIABLE (Own source Revenue)

	NFC per capita (DPT+ST)	TG per capita (NDG+DG)	Unconditional grants	Conditional grants	TT per capita (NFC+TG)
Transfers	0.8526***	3.2323**	0.8199***	5.447***	0.729***
	(0.1202)	(1.358)	(0.1100)	(1.722)	(0.1063)
Per capita GDP	0.030094**	0.02798	0.0230**	0.0603***	0.0271**
	(0.01105)	(0.0290)	(0.0108)	(0.0193)	(0.01145)
PC DPPSQ	1.6653	13.218*	4.442**	4.888	4.692**
	(1.467)	(7.712)	(1.606)	(3.584)	(1.760)
pop	-0.00049	-0.0058	-0.00233	-0.0015	-0.00250
	(0.00540)	(0.0146)	(0.0051)	(0.0104)	(0.00558)
Urbanization	-1622.3*	4326.30	-26.438	-1500.63	-146.49
	(881.04)	(3837.37)	(912.63)	(1706.42)	(976.55)
Per capita EDEXP	0.0032	0.0077**	0.00387**	0.00757**	0.00442***
	(0.00137)	(0.00426)	(0.00131)	(0.00318)	(0.0014)
Gini index	2204.02	-8822.42**	296.84	-1716.85	92.434
	(1746.03)	(4888.54)	(1572.99)	(3081.67)	(1688.36)
PC rural development	2.4204***	13.885***	3.746**	10.359***	4.5204***
	(1.514)	(3.919)	(1.3424)	(2.465)	(1.399)

(Continued)

	NFC per capita (DPT+ST)	TG per capita (NDG+DG)	Unconditional grants	Conditional grants	TT per capita (NFC+TG)
constant	-1671.27*** (691.18)	-2679.09 (2332.46)	-2252.37*** (721.36)	-1230.50 (1356.91)	-2225.63** (778.08)
Hansen's J Chi2 (P-value)	0.96	0.65	0.47	0.65	0.32
R-square	0.62	0.63	0.66	0.50	0.61
Wald chi square	174.55	23.46	40.50	22.61	25.57
Prob chi square	0.007	0.002	0.000	0.003	0.001

Table 6
ESTIMATION METHOD FGLS: FIRST STAGE REG DEPENDENT VARIABLE
(Own source Revenue)

	NFC per capita (DPT+ST)	TG per capita (NDG+DG)	Unconditional grants	Conditional grants	TT per capita (NFC+TG)
Per capita GDP	0.02924** (0.01421)	0.0048 (0.00646)	0.0344*** (0.0114)	-0.00332 (0.0026)	0.0310** (0.01231)
PC DPPSQ	-7.4766*** (1.657)	-5.300*** (0.7793)	-11.017*** (1.3298)	-1.646*** (0.3230)	-12.639*** (1.436)
pop	0.0105 (0.0067)	0.00379 (0.00318)	0.01239** (0.00543)	0.00137 (0.00132)	0.0137** (0.0058)
Urbanization	-2127.54* (1129.07)	-2208.02*** (534.42)	-3906.68*** (905.72)	-186.74 (221.55)	-4109.19*** (978.12)
Per capita EDEXP	-0.00324* (0.00177)	-0.00225** (0.00087)	-0.00430*** (0.00142)	-0.001410*** (0.00036)	-0.00566*** (0.00153)
Gini index	-2647.94*** ‘(2131.31)	2291.94** (993.360)	-666.31 (1709.70)	97.28 (411.81)	-606.38 (1846.36)
PC rural development	5.1119*** (1.6536)	-2.2008** (0.7856)	3.535*** (1.326)	-.6901** (0.3257)	2.859** (1.432)
dummynfc2009	862.12*** (270.98)	349.442*** (114.351)	1084.01*** (217.37)	198.89*** (47.406)	1292.35*** (234.75)
politics dummy	758.97*** (220.67)		618.011*** (177.02)		609.16*** (191.17)
Development revenue receipts grants		0.0062 (0.01732)		-0.00361 (0.00718)	
constant	4019.92*** (603.074)	1634.03 (250.30)	5157.08*** (483.77)	-801.52 (1593.11)	5884.94** (522.44)
Adj-R square	0.53	0.60	0.74	0.46	0.76

Impending towards another round of robustness that involves an alternate method of finding the results of transfers on own source revenue generation. The study used PCSE

(Blackwell III, 2005)to see the effect of transfers on revenue generation mobilization at local level. PCSE is an alternative to FGLS (feasible generalized least squares) (Beck and Katz, 1995; Wiggins, 2001). PCSE is suitable for linear cross-sectional time-series models in case the disturbances are not expected to be identically and independently distributed (i.i.d) (Beck and Katz, 1995). In the robust analyses (Table 7), the study finds complete specifications that agree with those of table 3. The results validate the stimulatory effect of unconditional federal transfers on the own source revenue and decreases the revenue mobilization in case of conditional transfers. The results further confirm that conditional grants and transfers give more autonomy to the local government and so they are able to mobilize own source revenue while the conditional transfers reduce fiscal efforts of the sub-national government.

Table 7
ESTIMATION METHOD PCSE: DEPENDENT VARIABLE (Own source Revenue)

	NFC per capita (DPT+ST)	**TG per capita (NDG+DG)**	**Unconditional grants**	**Conditional grants**	**TT per capita (NFC+TG)**
transfers	0.553***	-0.584***	0.609***	-1.1826***	0.509 ***
	(0.0747)	(0.1443)	(0.1051)	(0.4100)	(0.1184)
Per capita GDP	0.03601**	0.058413**	0.0347**	0.0601***	0.033**
	(0.018071)	(0.02543)	(0.0164)	(0.02347)	(0.018)
PC DPPSQ	1.3252	-8.9049	2.4244	-10.1184**	2.6594
	(2.5179)	(6.1211)	(2.1913)	(3.9648)	(2.4708)
pop	-0.00527	-0.00363	-0.0047	0.1417***	-0.0068
	(0.01055)	(0.011790)	(0.0082)	(0.0424)	(0.0088)
Urbanization	-1567.72	-3028.27	-36.9625	-5928.35***	627.667
	(1536.96)	(2046.45)	(1489.89)	(2787.089)	(1630.52)
Per capita EDEXP	-0.00035	-0.00203	0.00043	-0.001301	0.0008
	(0.00125)	(0.001453)	(0.00156)	(0.00170)	(0.00175)
Gini index	-1111.58	-1279.37	-624.055	-2799.57	-547.81
	(1506.31)	(1655.55)	(1751.40)	(2094.56)	(1905.36)
PC rural development	2.95468***	5.5041***	4.2195***	7.19716***	4.7956***
	(1.2789)	(1.4015)	(1.5113)	(1.4402)	(1.6702)
constant	544.478	5787.63***	-867.42	5091.56***	-719.062
	(725.947)	(1263.54)	(833.977)	(1103.40)	(970.59)
Wald chi square	80.96	55.09	96.30	50.17	75.78
Prob chi square	0.000	0.000	0.000	0.000	0.000

6. Conclusion

In the past decades many countries have adopted the system of fiscal decentralization in order to curtail the issues related to poverty and poor public service provision in developing countries. Some factual progress have been made in Pakistan with the emergence of 2001 devolution plan which devolved some main responsibilities from federal government (like

collecting taxes and service and goods provision) to subnational government. However many local governments are still administratively and financially weak and they overly depends on support from federal government in order to finance their budgets. Numerous researchers claim that such transfers/grants may preclude the requisite for local government revenue generation and thus weakens the fiscal independence of Local government (e. g., Buettner and Wildasin, 2006; Bradford and Oates, 1971a; Bradford and Oates, 1971c; Zhuravskaya, 2000; Mogues and Benin, 2012). Though, there is an empirical evidence in the support of "crowding out" effect of intergovernmental transfers on local revenue generation, however, prior studies have focused on the study of developed countries where there is an already established fiscal capacity at local level. In fact, few empirical investigations have been demonstrated to analyze the fiscal inference of central transfers in the framework of low-income countries and Pakistan in particular.

We argue that federal transfers play an important role in expediting the local revenue mobilization in Pakistan where the internal capability of the local government regarding raising own source revenue is lacking. Local government administration is financially weak along with lack of the capability to purchase equipment's, hiring competent staff for fees and tax collection. The local government depends on financial grants/transfers from the federal government for provision of public services, which help in the local revenue generation through encouraging compliance of voluntary tax. Using panel FGLS fiscal data on local revenues generation and expenditure within Pakistan, our empirical results exhibit that federal unconditional transfers/grants actually upsurge local revenues. This mechanism directly counters to the hypothesis ''crowding-out" effects of fiscal transfers and conditional transfers/grants that decreases the local government revenue generation.

The fiscal capability issues are mainly overlooked in the current empirical literature on federal government transfers and local government revenue generation. Researchers mostly take for granted the local governments capacity of extracting revenues if they need to do so. In Pakistan, intergovernmental transfers comprise a substantial share of the local government budget, in such case, the functions of the local government tax management also depends on fiscal support from the federal government. Therefore, without fiscal support from federal government, local government administrations cannot improve or maintain their financial/ fiscal systems and so are not capable to enlarge the tax base. While some empirical evidence claim that federal transfers weaken the financial autonomy of the local administrations, it is also emphasized that these grants/transfers may also give strong encouragement to the local government administrations to mobilize greater local revenue, by firming their institutional capability to collect fees/taxes and improving their capacity of public service provision. The negative effect of the conditional transfers is evident from the fact that they are project specific grants /transfers and are not consistent. Moreover, sub national government have partial or no autonomy on the use of these funds.

In Pakistan, a little efforts are assigned to local government for revenue generations and this scenario leads to over-reliance on the federal government. Policy makers and researchers mostly paint austere picture that the federal government (with the help of Local government administration) emerges with the price of replacing their efforts of own source revenue mo-

bilization. In Pakistan, however, local government don't have enough financial capability of effectively raising and mobilizing the own source revenue.Endowing local government capabilities with fiscal and financial abilities to respond to the requirements of their communities is indispensable in improving the accountability of the government as well as establishing the trust of citizens in local administrations. In this regard, federal transfers/grants can play an important role in ameliorating the fiscal capacity of local government administrations.

Appendix

Table 1
REVENUE SHARING FORMULAS UNDER VARIOUS NFC AWARDS

NFC awards	Divisible pool of taxes	Criteria of distribution			
		Population	Revenue Collection	backwardness	Inverse Population density
1990	Total taxes less duties on imports	100	N/A	P 1000/3Y S 700/5Y	N/A
1996	Total taxes	100	N/A	B 4410M K 3380M	N/A
2006	Total taxes	100	N/A	3	N/A
2009	Total taxes	82	5	10.3	2.7

Table 2
FEDERAL TRANSFERS TO PROVINCES UNDER VARIOUS NFC AWARDS

	1991-1997	1998-06	2007-09	2010-2015
Total Transfers	2542119	3082596	1269405	3683220
NFC transfers	92.19	86.34	88.35	95.6
Total Grants	7.8	13.66	11.64	4.37
Unconditional transfers	94.93	97.98	98.41	99.11
Conditional transfers	5.06	2.02	1.58	0.86
Total	100	100	100	100

Table 3
DESCRIPTIVE STATISTICS

Variables	obs	Mean Values	Overall Variance (SD)	Between variance	Within variance	Minimum	Maximum
OSR	104	2864.796	1082.149	648.525	923.332	1274.225	6281.319
NFC	104	3026.514	1245.967	813.725	1025.184	1532.012	8570.379
TG	104	575.209	638.866	523.923	447.526	3.950203	3799.168
UCTR	104	3447.382	1354.886	1193.514	870.05	1645.704	8712.193
CTR	104	154.341	227.034	126.707	198.460	1.5139	1736.423
TT	104	3601.724	1497.245	1318.88	961.501	1668.376	9535.698
GDPPC	104	40276.38	13080.43	8921.416	10527.32	21000	69417
DPSKM	104	240.150	148.8842	158.147	56.802	15.91531	513.010
Pop	104	36479.23	28897.06	31874.73	8102.043	5525.635	105344
Urbanization	104	0.316	0.134	0.1497	0.0304	0.158	0.586
Per capita EDEXP	104	50667.17	75246.45	67213.25	47338.33	371.1435	316486.6
Gini index	104	0.290	0.0619	0.030	0.056	0.104	0.410
PC rural development	104	28.547	57.834	24.350	53.812	0.275	283.691

Table 4
VARIABLES DESCRIPTION AND DATA SOURCES

Variables	Definition	Source
Own source revenue (OSR per capita)	Own-source revenue per capita is constructed by dividing own-source revenue to their provincial population.	*Pakistan Economic Survey* (Ministry of Finance, 1990-2015); *Pakistan statistical yearbooks* (Pakistan Bureau of statistics, 1990-2015).
NFC transfers (DPT+ST per capita)	NFC per capita is measured as a share of the divisible pool transfers plus straight transfers to provincial population.	• Budget Memorandum Volumes (Federal & Provincial Governments). • Annual Budgets Statements (F and P). • Explanatory Memorandum on Federal Receipts.
Total grants transfers (NDG+DG per capita)	TG per capita is measured a share of Non-development and development transfers to provincial population.	• Budget Memorandum Volumes (Federal & Provincial Governments). • Annual Budgets Statements (F and P). • Explanatory Memorandum on Federal Receipts.
Unconditional transfers per capita	UCTR per capita is measured as a share of DPT plus Straight transfers Plus Non-development grants to provincial population.	• Budget Memorandum Volumes (Federal & Provincial Governments). • Annual Budgets Statements (F and P). • Explanatory Memorandum on Federal Receipts.
Conditional transfers per capita	CTR per capita is measured as Share of Development grants to provincial population.	• Budget Memorandum Volumes (Federal & Provincial Governments). • Annual Budgets Statements (F and P). • Explanatory Memorandum on Federal Receipts.
Total Transfers (TT per capita)	TT per capita is measured as a share of DPT plus Straight transfers Plus Non-development grants plus development grants to provincial population.	• Budget Memorandum Volumes (Federal & Provincial Governments). • Annual Budgets Statements (F and P). • Explanatory Memorandum on Federal Receipts.
GDP per capita	Per capita Gross Domestic product.	The data on PGDP has been estimated and disaggregated by (Bengali and Sadaqat, 2005) in the Regional Accounts of Pakistan, Methodology, and Estimates 1973-2001 from 1972 to 2000. Using the same methodology, PGDP was calculated by Shaheen Malik (Research Analyst at unit SASEP) for the World Bank and Regional Accounts of Pakistan, Methodology, and Estimates from 1999 to 2015.
DPPSQ Per capita	DPPSQ refers to Population density per person per square km and is measured by dividing the population to its area.	*Pakistan Economic survey* (Ministry of Finance, 1990-2015).

(Continued)

Variables	Definition	Source
Population	Population is measured in thousands.	*Pakistan statistical yearbooks* (Pakistan Bureau of statistics, 1990-2015).
Urbanization	Urbanization is measured as the share of urban population to the total population.	*Population, Labor force and Employment* (Ministry of Finance, 1990-2015); *Pakistan statistical yearbooks* (Pakistan Bureau of statistics, 1990-2015).
Education Exp (EE per capita)	Education expenditure per capita is taken as a ratio of education expenditure to provincial population	*PRSP* (Ministry of Finance, 1990-2015).
Rural development exp(RDE per capita)	Rural development expenditure per capita is taken as a ratio of rural development expenditure to provincial population	*PRSP* (Ministry of Finance, 1990-2015).
Gini coefficient	Gini coefficient is used to measure household income inequality. Consumption expenditure as a welfare dependence indicator is used in the study (HIES).Where the value of the Gini coefficient lies between 100 and zero. 100 shows perfect inequality and zero reveals perfect equality. Higher Gini coefficient shows greater unequal income distribution and lower Gini shows an equal distribution of income.	*PSLM (Household Integrated Economic Survey) HIES Micro data various years* (Pakistan Bureau of statistics, 1990-2015).

Notes

1. The data are limited between 1990 and 2015. This period is used for two reasons. First, five intergovernmental NFC awards started in 1990, and the last one in 2015 is studied. Secondly, data after 2015 are unavailable. The data are taken from four federation units (named provinces) of Pakistan, while Azad Jammu and Kashmir (AJK) and Gilgit Baltistan are excluded from the study for two reasons: (1) The local governance structure needs to be functional in other areas, and (2) data limitations do not allow us to exceed the federating units.
2. One Pakistani rupee is equal to 100 paisas.

References

Ain, Q.U., Yousaf, T., Jie, Y. and Akhtar, Y. (2020), "The Impact of Devolution on Government Size and Provision of Social Services: Evidence from Pakistan", *Hacienda Pública Española/Review of Public Economics*, 234(3): 105-135.

Ain, Q.U., Jie, Y., Ivaşcu, L., Shah, S. G. M. and Yousaf, T. (2021), "Whether rising tide has lifted all the boats? Effect of inter-governmental transfers on household income inequality in Pakistan", *International Journal of Finance & Economics*.

Aragon, F. M. (2009), "The flypaper effect revisited", *LSE STICERD Research Paper* No. EOPP004.

Baer, K., Benon, O.P. and Toro, R.J. (2002), "Improving Large Taxpayers", *Compliance: A Review of Country Experience', Occasional Paper* (215).

Baunsgaard, T. and Keen, M. (2010), "Tax revenue and (or?) trade liberalization", *Journal of Public Economics,* 94(9-10): 563-577.

Beck, N. and Katz, J.N. (1995), "What to do (and not to do) with time-series cross-section data", *American political science review*, 634-647.

Besley, T. and Persson, T. (2013), "Taxation and development", in *Handbook of public economics*, 51-110, Elsevier.

Bird, R.M. (2010), *Subnational taxation in developing countries: a review of the literature*, The World Bank.

Bird, R.M. and Smart, M. (2002), "Intergovernmental fiscal transfers: International lessons for developing countries", *World Development*, 30(6): 899-912.

Blackwell III, Lloyd, J. (2005), "Estimation and testing of fixed-effect panel-data systems", *The STATA journal,* 5(2): 202-207.

Boadway, R.W. and Shah, A. (2007), *Intergovernmental fiscal transfers: principles and practices*, World Bank Publications.

Bradford, D.F. and Oates, W.E. (1971a), "The analysis of revenue sharing in a new approach to collective fiscal decisions", *The Quarterly Journal of Economics*, 85(3): 416-439.

Bradford, D.F. and Oates, W.E. (1971b), "Towards a predictive theory of intergovernmental grants", *The American Economic Review*, 61(2): 440-448.

Bradford, D.F. and Oates, W.E. (1971c), "The Analysis of Revenue Sharing in a New Approach to Collective Fiscal Decisions*", *The Quarterly Journal of Economics*, 85(3): 416-439. doi: 10.2307/1885931.

Brollo, F., Nannicini, T., Perotti, R. and Tabellini, G. (2013), "The political resource curse", *American Economic Review*, 103(5): 1759-96.

Brun, J-F., and El Khdari, M. (2016), "The incentive effects of conditional and unconditional transfers on local own revenue generation: Empirical evidence from Moroccan municipalities", *Working Papers* 201606, CERDI

Buettner, T. and Wildasin, D.E. (2006), "The dynamics of municipal fiscal adjustment", *Journal of Public Economics*, 90(6-7): 1115-1132.

Caldeira, E. and Rota-Graziosi, G. (2014), "The crowding-in effect of simple unconditional central grants on local own-source revenue: The case of Benin", *Journal of African Economies*, 23(3): 361-387.

Cochran, T.H., Bond, D.L., Sheppard, B. and Samuels, B. (2009), *Financing Local Infrastructures: Part One Report - The Tanzania Environmental Scan*, Report prepared for the United Nations Capital Development Fund.

Crook, R.C. (2003), "Decentralisation and poverty reduction in Africa: the politics of local–central relations", *Public Administration and Development: The International Journal of Management Research and Practice*, 23(1): 77-88.

Dahlberg, M., Mörk, E., Rattsø , J. and Ågren, H. (2008), "Using a discontinuous grant rule to identify the effect of grants on local taxes and spending", *Journal of Public Economics*, 92(12): 2320-2335.

Ehdaie, J. (1994), *Fiscal decentralization and the size of the government: an extension with evidence from cross-country data*, The World Bank.

Fjeldstad, O-H., Chambas, G. and Brun, J-F. (2014), "Local government taxation in Sub-Saharan Africa: A review and an agenda for research", *CMI Working Paper*.

Grossman, P.J. (1989), "Fiscal decentralization and government size: An extension", *Public Choice*, 62(1): 63-69.

Hamilton, J.H. (1986), "The flypaper effect and the deadweight loss from taxation", *Journal of urban economics*, 19(2): 148-155.

Hindriks, J., Peralta, S. and Weber, S. (2008), "Competing in taxes and investment under fiscal equalization", *Journal of public economics*. 92(12): 2392-2402.

Hines, J.R. and Thaler, R.H. (1995), "The flypaper effect", *Journal of economic perspectives*, 9(4): 217-226.

Keen, M. and Mansour, M. (2010), "Revenue Mobilisation in Sub-Saharan Africa: Challenges from Globalisation I - Trade Reform ", *Development Policy Review*, 28(5): 553-571.

Kornai, J., Maskin, E. and Roland, G. (2003), "Understanding the soft budget constraint", *Journal of Economic Literature*, 41(4): 1095-1136.

Lessmann, C. (2006), "Fiscal decentralization and regional disparity: a panel data approach for OECD countries", *Ifo working paper*.

Manning, N., Porter, D., Charlton, J., Cyan, M. and Hasnain, Z. (2003), "Devolution in Pakistan-preparing for service delivery improvements", Majumdar, R C (1960), *The history and culture of Indian people* 2.

Martínez-Vázquez, J. and Searle, B. (2007), "Challenges in the design of fiscal equalization and intergovernmental transfers", *Fiscal Equalization* (pp. 3-10), Springer, Boston, MA.

Masaki, T. (2018), "The impact of intergovernmental transfers on local revenue generation in Sub-Saharan Africa: Evidence from Tanzania", *World Development*, 106: 173-186.

Mogues, T. and Benin, S. (2012), "Do external grants to district governments discourage own revenue generation? A look at local public finance dynamics in Ghana", *World Development*, 40(5): 1054-1067.

Olken, B.A. (2007), "Monitoring corruption: evidence from a field experiment in Indonesia", *Journal of political Economy*, 115(2): 200-249.

Reed, W.R. and Webb, R. (2010), "The PCSE estimator is good-just not as good as you think", *Journal of Time Series Econometrics*, 2(1).

Reinikka, R. and Svensson, J. (2005), "Fighting corruption to improve schooling: Evidence from a newspaper campaign in Uganda", *Journal of the European economic association*, 3(2-3): 259-267.

Rosen, H.S. (2004), "Public finance", in *The encyclopedia of public choice*, 252-262, Springer.

Sacchi, A. and Salotti, S. (2014), "The effects of fiscal decentralization on household income inequality: some empirical evidence", *Spatial Economic Analysis*, 9(2): 202-222.

Shah, A. (2006), *A practitioner's guide to intergovernmental fiscal transfers*, The World Bank.

Skidmore, M. (1999), "Tax and expenditure limitations and the fiscal relationships between state and local governments", *Public Choice*, 99(1-2): 77-102.

Taiwo, K. (2020), *Intergovernmental Transfers and Own Revenues of Subnational Governments in Nigeria*, University Library of Munich, Germany.

Tendler, J. (1997), *Good government in the tropics*, Johns Hopkins University Press.

Troland, E. (2016), "Can fiscal transfers increase local revenue collection? Evidence from the Philippines", *Evidence from the Philippines* (Jan 15, 2016).

Wiggins, V. (2001), *FAQ: How does xtgls differ from regression clustered with robust standard errors*.

Worthington, A.C. and Dollery, B.E. (1998), "The political determination of intergovernmental grants in Australia", *Public Choice*, 94(3-4): 299-315.

Zhang, G. (2013), "The Impacts of Intergovernmental Transfers on Local Governments' Fiscal Behavior in China: A Cross-County Analysis", *Australian Journal of Public Administration*, 72(3): 264-277.

Zhuravskaya, E.V. (2000), "Incentives to provide local public goods: fiscal federalism, Russian style", *Journal of Public Economics*, 76(3): 337-368.

Resumen

La literatura sobre incentivos fiscales destaca la importancia del diseño del sistema de transferencias intergubernamentales en el comportamiento de los ingresos propios de los gobiernos locales. Los resultados sobre la relación entre el sistema de transferencias intergubernamentales y la creación de incentivos para la generación de ingresos de los gobiernos locales difieren según los países. Este trabajo contribuye a la literatura del federalismo fiscal mediante la evaluación del impacto de las transferencias incondicionales y condicionales en los ingresos locales en Pakistán, para el período 1990-2015. Nuestros resultados muestran que, una vez tenida en cuenta la endogeneidad, las transferencias intergubernamentales incondicionales mejoran la recaudación de los ingresos de los gobiernos locales, mientras

que las transferencias condicionales la deterioran. En Pakistán la mayor parte de las transferencias son de carácter incondicional por lo que los resultados sugieren que las transferencias del gobierno federal complementan la generación de ingresos propios de los gobiernos locales, alentando a los gobiernos locales de Pakistán a recaudar más ingresos.

Palabras clave: capacidad fiscal, transferencias intergubernamentales, finanzas públicas locales, descentralización, fiscalidad.

Clasificación JEL: H29, H71, H79, H30.