Acta Univ. Sapientiae, Economics and Business, **11** (2023) 258–271

DOI: 10.2478/auseb-2023-0012

Intergovernmental Fiscal Transfers and Tax Collection of Indian States: Estimation from Panel Data Models

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Abstract. This study tries to empirically estimate the effects of the composition of intergovernmental transfers on tax collection across the Indian states by using panel regression model. As intergovernmental transfers constitute almost 47 per cent in total revenue of the states, it could play a vital role in states' own tax collection. The impact of different channels of federal transfers on tax capacities is examined among 25 Indian states over the period from 1991-92 to 2017-18. The study also attempted to capture the asymmetric effect of various forms of transfers, but findings reveal that only state plan grant has a significant effect on its own tax collection. The empirical evidence suggests that the composition of intergovernmental transfers has a dampening effect on states' own tax revenue. Apart from transfers' variables, the study incorporates socio-economic and certain political variables to estimate states' own tax collections.

Keywords: intergovernmental transfers, political factors, state tax collection, Indian states

JEL Classification: H77, P35, P16, H71

1. Introduction

Intergovernmental transfers are considered a key fiscal tool used by the national government to provide more fiscal autonomy across state governments. The fundamental objective of any fiscal transfers is to curb fiscal imbalances by generating equitable transfers that would supplement the slackening of resources at the sub-national governments due to state-specific variations in socio-economic

and political conditions. To address these fiscal gaps among different layers of governments, the constitution has provisioned the institutional transfer mechanism to make decisions about the devolution of revenue resources from the Centre to the states. Therefore, the constitution of India recommends the appointment of finance commission every fifth year to give recommendations on such non-plan transfers. The Finance Commission's transfers have two main components, namely tax-sharing transfers and statutory grants. The former has contributed around 90 per cent to the aggregate transfers made by the agency. The latter part contributed the remaining share, which acts as specific grants to determine whether the states have revenue account imbalance after the devolution of tax revenues (Isaac et al., 2019).

In India, the aggregate federal transfers can be demarcated into two parts: statutory, or general-purpose transfers and discretionary, or specific-purpose transfers. Statutory transfers include two sub-components, that is, central tax devolution and statutory or non-plan grants. On the other hand, the discretionary component of transfers consists of state plan grants, central plan grants, and centrally sponsored schemes (CSS). Alternatively, the total central transfers can also be distinguished as formula-based and discretionary form.

The main economic justifications of such a sizeable devolution of resources are: first, the fiscal gaps existing between the levels of jurisdictions, such as vertical and horizontal fiscal gaps, and second, correcting the regional development gaps across sub-national jurisdictions (Rao, 2005). Intergovernmental transfers may also neutralize the effect of inter-jurisdictional fiscal externalities that occur when fiscal adjustments of one state will affect the fiscal behaviour of others (Dahlby, 1996). However, such a policy of redistributive mechanism would generate a perverse motivation that would lead to a fiscal profligacy problem at the lower level of governments (McCarten, 2001; Rao, 1998, 2005).

Until recently, the main emphasis of empirical studies has been on measuring the impact of intergovernmental transfers on the fiscal outcomes of state governments. In the traditional approach, it was believed that the lump-sum, or general-purpose transfers would lower tax revenue (Bradford and Oates, 1971b). However, empirical evidence suggests that lump-sum transfers from the centre lead to a greater stimulus for public expenditure relative to equivalent cut in taxes. This empirical phenomenon is known as the "flypaper effect" in public finance literature (Gramlich, 1998; Gramlich et al., 1973). However, the central transfers do not always follow the increasing path over time. In this context, state governments could respond differently with the fiscal measures while dealing with a decline in transfers compared to an increase in the same. This concept is known as the "asymmetric hypothesis" in the literature, and it has been empirically examined in many countries (Gramlich, 1987). In analysing the literature on the linkage between central transfers and fiscal outcomes, some of the most relevant studies have conveyed the idea that intergovernmental transfers ease the budgetary constraints

of the states and allow them to create the fungibility of their own resources (Borcherding et al., 1972; McGuire, 1978). Bradford and Oates (1971a–b) argued that due to the fungibility of public incomes, the unconditional fiscal transfers would release additional resources for local authorities to facilitate citizens in the form of tax reduction and therefore crowd-out local revenue efforts. In the same context, in a sample of municipalities in the USA, the study by Buettner and Wildasin (2006) found that intergovernmental transfers provide incentives to tax deductions at the local level.

However, some studies argued that subnational governments may use central resources in order to achieve desired fiscal outcomes (Prud'homme, 1995; Tanzi, 1995). Miyazaki (2016) analysed the impact of fiscal transfers on the fiscal behaviour of Japanese municipalities over the period from 1993 to 2008. By using a panel data model, the study indicates that an increasing proportion of aggregate equalization transfers lead to encouraging local authorities to generate higher revenue collection. Thus, central transfers indeed tended to increase the revenue efforts of local governments in Japan. Furthermore, recent studies by Caldeira and Rota-Graziosi (2014) also examined the "crowd-in" effect of central transfers which induce local tax collection. But the empirical investigations do not validate either argument properly.

In the context of India, the study by Jha et al. (1999) analysed tax efficiency across 15 Indian states from 1980-81 to 1992-93. The authors observed that the problem of moral hazard persists in the design of central transfers, implying that increasing intergovernmental transfers lead to lower tax efforts of state governments. Naganathan and Sivagnanam (2000) also assessed the effect of union fiscal transfers on the tax effort of 14 Indian states from 1970-71 to 1984-85. They found that central resource transfers have a negative and significant effect on the state's tax mobilization. By analysing the impact of sub-central jurisdictions on the tax effort of local jurisdictions, Rajaraman and Vasishtha (2000) examined such relationship in the case of Kerala for the period of 1993–94. They studied that aggregate and untied transfers have a significantly negative effect on the tax effort of local governments. Apart from this, non-plan grant has also adversely affected local tax collection. Further, Panda (2009) investigated the impact of transfers on the state's own revenue collection across 22 Indian states from 1980-81 to 2004-05. By using the fixed-effects regression model, the author found that federal transfers have a negative effect on own tax revenue, own non-tax revenue, and total own revenue of the states. Dash and Raja (2013) empirically examined the impact of conditional and unconditional transfers on the components of tax collection of 14 major Indian states over the period from 1981-82 to 2008-09. They suggested that conditional transfers have a negative effect on direct tax, while unconditional transfers have a negative effect on both tax categories (i.e. direct and indirect tax). Furthermore, the asymmetric variable has been found to be significant in each case,

which implies that the state reacts differently to increase in transfers compared to a loss in transfers. A more recent study by Mohanty et al. (2020) empirically investigated own revenue efforts and the relationship between central transfers and own revenue efforts, using panel regression approaches among 18 Indian states during the period from 2000-01 to 2016-17. Results indicate that among a sample of Indian states, Bihar, Uttar Pradesh, and Madhya Pradesh have emerged on the top. In addition, the study revealed that central tax devolution has a negative effect on own revenue efforts, suggesting that central tax devolution could not provide incentives to the states to raise their own revenue efforts.

Another line of research also deals with political factors along with other key economic and demographic variables affecting the revenue collection of the states. In this context, Arulampalam et al. (2009) used a panel dataset comprising 14 Indian states during the period from 1974-75 to 1996-97. They observed that those states which are both swing and aligned with the ruling party in the central government as per the last state election had managed to receive 16 per cent more federal transfers than those states that are non-aligned and non-swing. A further important study by Dash and Raja (2014) used many political factors such as government fragmentation, the strength of the opposition, ruling government, ideology of government, and the electoral cycle. They confirmed that each state's specific political determinant negatively affected each form of own revenue collection. Debnath and Battacharjee (2019) examined the impact of different channels of intergovernmental transfers on own tax efforts of Indian states over the period from 1990-91 to 2013-14. The empirical findings suggested that total transfers were found to exert a negative pressure on the states' own tax efforts. This might be due to the fact that states were likely to consider central transfers as dependence and are not utilizing these additional funds to finance their developmental activities. At the disaggregated level, conditional transfers were found to be positively associated with own tax effort, whereas unconditional transfers appeared to lower states' tax effort. Apart from this, the study also tested the asymmetric forms of transfers, which were found to alter own revenue efforts among the states. Overall, the study draws some conclusions that the share of conditional transfers could enhance own revenue efforts of state governments by considering some policy measures to make a sophisticated transfer system in the country. Recently, Taiwo (2022) empirically tested the relationship between own revenues and intergovernmental transfers at the sub-national level in Nigeria during the period of 2007–13. The findings reveal the negative relationship between transfers and own revenues of the states due to their dependence on central transfers. Furthermore, election year has been negatively associated with own revenues, whereas education level has influenced positively the own revenues of the states. Also, the study found that states were lagging in generating their revenues due to inefficiencies in their tax administration.

3. Data and Methodology

3.1. Data

This study is based on the balanced panel dataset, which consists of states' own tax revenues, the central transfers, and other key economic, demographic, and political variables for 25 Indian states during the period from 1991-92 to 2017-18. In this exercise, we seek to explore whether central funding has supplemented the tax revenue of Indian states. To do this, we have classified the central fiscal transfers into several parts: the share of central taxes, plan grants from the centre (i.e. state plan scheme, central plan scheme, centrally sponsored scheme and the northeast special plan schemes), non-plan grants from the centre, which consists of statutory grants, relief on account of natural calamities, and others (De, 2013; Rao and Srivastava, 2014). Since the study investigated the relationship between intergovernmental transfers and own tax collection, transfer-related variables are of interest. Asymmetric forms of transfer variables is also another set of variables to be dealt with. Apart from this, other control variables that cover socio-economic, demographic, fiscal, and political characteristics, i.e. fiscal space, tax complexity, development expenditure, internal debt, per capita income, the share of agriculture to total state domestic product (GSDP), political alignment, state election dummy, and Fiscal Responsibility and Budget Management (FRBM) dummy (this variable is taken to capture the implementation of FRBM legislation at the state level), are also considered. The selection of these variables is based on their usage in the literature (Dash and Raja, 2013; Panda, 2009). To adjust the inflation factor in each dataset, we have deflated all nominal data using state domestic product (SDP) deflator to get constant values.

Definition/Construction of Variables

The study is based on many significant variables such as socio-economic, demographic, fiscal, and political variables to determine the revenue-based fiscal outcome of the states. The detailed measurement of the variables and their respective sources are presented in *Table 1.*

Table 1. *Definition/measurement of variables*

Variables	Data Description	Source
Net State Domestic Product (NSDP)	Per capita income at constant price	*Handbook of statistics on Indian states*, RBI
Own Tax Revenue (SOTR)	States own tax revenue per capita	*State finances: A Study of Budgets*, RBI
Total Transfers (TT)	Total central transfers per capita	*State finances: A Study of Budgets*, RBI
Centre-tax Transfers (CT)	Central tax transfers per capita	*State finances: A Study of Budgets*, RBI

Variables	Data Description	Source
Statutory Grants (SG)	Statutory grants per capita	*State finances: A Study of Budgets*, RBI
Plan Grants (PG)	State plan grants per capita	*State finances: A Study of Budgets*, RBI
Discretionary Grants (DG)	Discretionary grants per capita	*State finances: A Study of Budgets*, RBI
Asymmetric variable (AV)	The asymmetric variables are expressed as $A_{it} = [T_{it} - T_{it-1}]$ if $T_{it} < T_{it-1} = 0$ otherwise. T_{it} stands for different types of transfers for state *i* in period *t*. The negative sign of A_{it} represents a decline in transfers in years and 0 otherwise.	*State finances: A Study of Budgets*, RBI
Fiscal Space (FS)	Ratio of total revenue receipts and the committed primary expenditure on revenue account	*Handbook of statistics on Indian states*, RBI
Own Tax Structure (HHI)	The Herfindahl–Hirschman Index calculates the complexity of the revenue structure.	*Handbook of statistics on Indian states*, RBI
Internal debt (ID)	Internal debt per capita	*Handbook of statistics on Indian states*, RBI
Development Expenditure (DE)	Development expenditure per capita	*Handbook of statistics on Indian states*, RBI
Share of the Agricultural Sector (SAS)	The Proportion of agriculture in SDP	*Handbook of statistics on Indian states*, RBI
Dependency Ratio (DR)	The ratio of people less than 15 years old or over 64 years of age to the working population aged between 15 and 64	*Handbook of statistics on Indian states*, RBI
Political Affiliation (PA)	Political affiliation measured by the number of days in a financial year, which centre and state belongs to one political party or one coalition and divided by 365 as expressed in percentage	*Statistical Reports*, ECI
Election Dummy (ED)	A binary variable that assumes 1 if the i^{th} year is election year	*Statistical Reports*, ECI
(FRBM) Dummy (FD)	A binary variable which equals 1 if the i^{th} year is from 2004 and 0 till 2003	*State finances: A Study of Budgets*, RBI

Source: authors' research

3.2. Methodology

The study has employed linear panel regressions to estimate the behaviour of revenue collection regarding the composition of federal transfers in 25 Indian states over the period from 1991-92 to 2017-18. One of the major advantages of the panel data technique is to capture unobserved heterogeneity existing across

the individual or cross-sectional units and provide an unbiased result with more degrees of freedom. In conducting empirical analysis, we have performed two linear panel regression models (i.e. fixed-effects and random-effects) to estimate the coefficients of variables in the equations. Finally, we have used two-way fixed-effects model, which is the most appropriate technique in the given dataset.

The following basic specification is used to measure the robust coefficients of variables, which have corrected the problem of autocorrelation and heterogeneity in the error term in equations, and the relationship among these variables has also been examined.

$$Y_{it} = \mu + \alpha_i + \beta X_{it} + \lambda_t + v_{it}\ ;\ i = 1, \ldots, N, \text{ and } t = 1, \ldots, T,$$

where subscript *i* refers to the states and *t* denotes the years. Here, μ is a constant term, and α_i captures an individual-specific heterogeneous effect. Y_{it} is the vector of a dependent variable, i.e. states' own tax collection. X is a vector of selected explanatory variables, λ_t is included to capture unobserved time series effects, and v_{it} is the error term in these models. The above equation deals with two-way fixed effects models that allow individual-specific unobserved heterogeneity (α_i) and unobserved time series effects, which are common to all Indian states. Therefore, the main advantage of this technique is permitting a limited form of endogeneity.

4. Empirical Results and Discussion

We have conducted an empirical exercise to see the influence of different forms of transfers on state governments' own tax capacities. At the outset, we performed the endogeneity test among the explanatory variables by estimating the correlation between the explanatory variables and the error term. Due to the absence of the endogeneity problem, we applied static panel regression models to obtain the coefficient values. Before selecting linear panel models, we found that the diagnostic condition of poolability is not present within the dataset. This means that not all states are homogeneous, and unobserved heterogeneity exists in cross-sectional or individual-specific units. Then we have executed two static linear panel regressions, that is, fixed-effects and random-effects. To check which model is most appropriate, we performed the Hausman test in this case. The statistical significance of the statistics of this test assumes that a fixed-effects model is the most suitable technique in each dataset. Finally, we have estimated the most appropriate fixed-effects model to analyse the result of the equation. Further, to tackle the multicollinearity problem among selected explanatory variables, we have performed a correlation analysis. Results show that there is no strong correlation among the variables (see: *Appendix*). Furthermore, we have also corrected the problems of autocorrelation and heteroscedasticity in the residual term and provided robust results in the analysis (*Table 2*).

Table 2 provides the estimates of the coefficients of intergovernmental transfers and their asymmetric effects along with economic and political factors to estimate the tax collection of the states. To do this, we have regressed the own tax revenue per capita with different components of transfers, asymmetric variables, and other key economic, demographic, and political variables (models 1 and 2). The coefficients of all different central transfer variables yielded a negative sign and statistical significance at 1 per cent level. This implies that all components of transfers influenced states' own tax collection negatively. Then we found another set of variables of interest, that is, one asymmetry variable that was statistically significant, which suggests that asymmetric behaviour exists in that component of transfers. The coefficient of asymmetric state plan grant shows a positive sign and is statistically significant at 1 per cent level, which indicates that the decrease in such transfers leads to an increase in own tax collection across the states. Hence, a "fiscal replacement" effect exists in this case. Another significant asymmetric variable, that is, discretionary grant has been found to be positive, but it has been observed to be insignificant, implying that decline in discretionary grant has not exerted any influence on states' own tax collection. Other non-discretionary forms of transfers, such as central tax devolution and statutory grants, are also reported to have negative signs, but they are not statistically significant. Hence, we can observe that decline in the conditional, or specific-purpose grants acts as an incentive for states to increase their own tax efforts to some extent, whereas the decrease in statutory or non-discretionary transfers has no significant effect on states' tax capacities.

Apart from this, we have also found the influence of key fiscal variables on states' own tax effort to be in accordance with their theoretical expectations. The coefficient of fiscal space is negative and statistically significant at the 1 per cent level, implying that it is negatively associated with tax collection. The coefficient of tax complexity measured by the Herfindahl–Hirschman Index (HHI) is also found to be negative and statistically significant at the 1 per cent level, which explains that increase in the complexity of tax structure would lead to decline in own tax collection. Furthermore, the coefficient of internal debt is positive at the 1 per cent significance level, implying that increase in internal debt would lead to an improved tax collection of the states, while the coefficient of development expenditure is also positive and significant at the 1 per cent, implying that it has contributed favourably to the same. Proxies related to tax bases, such as per capita income or the share of the agricultural sector, are found to have a similar sign to what has been expected. Per capita income is positive and statistically significant at the 1 per cent level, whereas the share of the agriculture reported a negative but statistically insignificant effect on states' own tax efforts. Dependency ratio is found to be positive and significant, indicating that it has contributed positively in the model.

In addition to the economic and demographic variables, we have incorporated some significant political variables while predicting states' own tax collection. This

means that there will be a decline in their own tax effort by the states due to the same party coordination with that of the centre, as it allows them to substitute such transfers for tax collection. As expected, political alignment has a negative sign, which is statistically significant at 10 per cent level, while election year in states is reported to be positive but insignificant, explaining that it has not contributed to the model. Lastly, Fiscal responsibility and budget management (FRBM) have been found to be positive and statistically significant (at 10 per cent level) but with no significant effect in the second model. This suggests that the implementation of fiscal rules (at the state level) seems to be positively associated with the states' own tax revenue.

Table 2. *Results of panel regression models: Channel-specific as well as aggregate transfers and revenue collection (from 1991-92 to 2017-18)*

	Own Tax Revenue (OTR)	
	Fixed Effect (1)	**Fixed Effect (2)**
Central tax transfers	-0.067*** (0.00)	-
Statutory grants	-0.193*** (0.00)	-
State plan grants	-0.276*** (0.00)	-
Discretionary grants	-0.103** (0.04)	-
Total transfers		-0.140*** (0.00)
Central tax – Asymmetry	-0.022 (0.27)	
Statutory grant – Asymmetry	-0.024 (0.57)	
State plan grant – Asymmetry	0.162*** (0.00)	
Discretionary grants – Asymmetry	0.066 (0.38)	
Total transfers asymmetry		0.004 (0.71)
Fiscal space	-11.61*** (0.00)	-13.53*** (0.00)
HHI – tax complexity	-6265.9*** (0.00)	-7220.5*** (0.00)
Internal debt	0.117*** (0.00)	0.121*** (0.00)

	Own Tax Revenue (OTR)	
	Fixed Effect (1)	**Fixed Effect (2)**
Development expenditure	0.277*** (0.00)	0.258*** (0.00)
Per capita income	0.014*** (0.00)	0.014*** (0.00)
Agriculture sector	-87.08 (0.86)	-787.36 (0.13)
Dependency	3455.1*** (0.00)	3207.8*** (0.00)
Political affiliation	-1.51* (0.06)	-2.65*** (0.00)
Election dummy	87.86 (0.28)	39.35 (0.64)
FRBM dummy	298.61* (0.09)	301.49 (0.11)
Within R^2	0.61	0.56
Hausman test	245.78*** (0.00)	100.61*** (0.00)
F-statistic	53.32*** (0.00)	63.45*** (0.00)
Number of observations	673	673

Source: authors' estimations

Notes: ***, **, and * refer to significance level at 1%, 5%, and 10%, respectively, and p-values are presented in parenthesis.

Apart from this, we have examined the impact of aggregate transfers on states' own tax efforts (Model 2). The coefficient of aggregate transfers is found to be negative and statistically significant at 1 per cent level. This implies that an increase in central transfers tends to lower tax collection in Indian states. Hence, we can observe the existence of "fungibility" of the central funding that permits a lower authority to substitute some proportion of transfers for tax collection. Also, the asymmetric variable is found to be positive but not significant at 5 per cent, implying that decrease in the transfers would not affect states' own tax collection.

When we observed the other economic and political variables in the second specification, we found similar results as with Model 1. Results show that all key fiscal variables, such as fiscal space, tax complexity, internal debt, and development expenditure, are found to be significantly affecting tax revenue. Further, political variables also contributed significantly to states' tax collection. Interestingly, we have also observed that the magnitude of coefficients of all political variables is higher than any other economic variable, indicating that political variables have a larger effect on the tax revenue of the states.

5. Conclusions and Policy Implications

The present study attempted to empirically examine the effects of intergovernmental transfers at two levels – total and individual – on the states' own tax revenues. To be more precise, we have seen the impact of both increase and decrease in different channels of transfers and total transfers that affect the own tax collection of Indian states. The results of our study indicate that all forms of federal transfers are inversely related to the own tax collection of Indian states. This indicates that the increase in different forms of transfers does not act as an incentive for the states to increase their own tax collection. On the other hand, we have also analysed whether the declining component of transfers or asymmetric variables has influenced states' tax collection. In this context, we found the statistically significant positive sign of a conditional form of transfers that provides a better guidance for states to raise their own tax collection and finance their expenditure responsibilities. Hence, the findings of the study are similar to those of a more recent study by Taiwo (2022) in the sense that transfers exert a negative pressure on state governments, own revenues. However, the study is partially different from, e.g., that of Dash, Raja, Debnath, and Bhattacharjee (2019) in terms of the components of central transfers. Conditional transfers did not affect own tax revenue negatively, but in our study, all components of central transfers were adversely related to states' own tax revenue. Apart from these transfers, other key fiscal variables were also found to be significantly influencing own tax collection based on their theoretical reasoning. Further, it is also found that the political alignment variable has a larger impact on states' tax effort.

Overall, the empirical findings confirmed that intergovernmental transfers, both on the aggregate and the individual level, tend to create fiscal lethargy among the states and do not allow them to utilize their own resources efficiently. Therefore, the mechanism of central transfers should be designed on the principle of equalization so that the recipient states will not substitute the transfers with their own resources.

Conflict of interest

The authors declare that there is no conflict of interest regarding research, authorship, and publication of this article.

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Appendix

Correlation Coefficients of Explanatory Variables

	pctx	*pstg*	*pspg*	*pdg*	*cta*	*sta*	*spa*	*dga*	*hhi*	*pid*	*pde*	*fs*	*pci*	*agr*	*dep*	*ed*	*pa*	*fd*
pctx																		
pstg	0.289***																	
pspg	0.467***	0.521***																
pdg	0.556***	0.566***	0.676***															
cta	0.04	0.008	0.007	0.01														
sta	-0.116**	-0.04	-0.131***	-0.110**	0.311***													
spa	-0.560***	-0.195***	-0.156***	-0.336***	0.265***	0.182***												
dga	-0.177***	-0.164***	-0.175***	-0.100*	0.430***	0.371***	0.303***											
hhi	0.142***	0.068	0.148***	0.094*	0.099*	-0.055	-0.120**	-0.088*										
pid	0.351***	0.306***	0.204***	0.354***	0.090*	0.01	-0.167***	-0.076	0.146***									
pde	0.681***	0.527***	0.713***	0.656***	0.046	-0.096*	-0.324***	-0.176***	0.208***	0.545***								
fs	-0.225***	-0.167***	-0.077	-0.171***	-0.276***	-0.134***	0.031	-0.056	-0.104**	-0.420***	-0.289***							
pci	0.027	-0.168***	-0.007	0.042	-0.037	-0.016	-0.059	-0.011	0.249***	0.213***	0.301***	0.196***						
agr	-0.214***	-0.130***	-0.148***	-0.161***	-0.170***	-0.059	-0.022	-0.087*	-0.07	-0.281***	-0.360***	0.378***	-0.092*					
dep	-0.149***	-0.067	-0.055	-0.124**	-0.079*	-0.042	0.039	0.028	-0.028	-0.383***	-0.339***	0.409***	-0.429***	0.429***				
ed	-0.053	-0.039	0.028	-0.015	-0.084*	0.034	0.032	-0.01	0.002	-0.023	-0.033	-0.005	0	0.046	-0.001			
pa	-0.090*	-0.07	-0.043	-0.099*	0.021	0.059	0.073	0.057	0.124**	0.046	0.075	-0.003	0.202***	-0.109**	-0.101**	-0.034		
fd	0.274***	0.144***	0.111**	0.180***	0.123**	0.048	-0.075	-0.044	0.152***	0.328***	0.358***	-0.662***	-0.052	-0.364***	-0.409***	-0.039	0.124**	

Notes: *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1.

Abbreviations

pctx: tax transfers in per capita
pstg: statutory grants per capita
pspg: state plan grants per capita
pdg: discretionary grants per capita
cta: central tax asymmetry
sta: statutory grant asymmetry
spa: state plan grant asymmetry
dga: discretionary grant asymmetry
hhi: Herfindahl–Herschman Index
pid: internal debt per capita
pde: developmental expenditure per capita
fs: fiscal space
pci: per capita income
agr: share of agriculture
dep: dependency ratio
ed: election dummy
pa: political affiliation
fd: FRBM dummy