

Working Paper 506

**Is Public Education
Expenditure Pro-cyclical
in India?**

**Ramanjini
K Gayithri**

Is Public Education Expenditure Pro-cyclical In India?

Ramanjini and K Gayithri

Published and Printed by: Institute for Social and Economic Change
Dr V K R V Rao Road, Nagarabhavi Post,
Bangalore - 560072, Karnataka, India.

ISEC Working Paper No. 506

December 2020

Institute for Social and Economic Change (ISEC) is engaged in interdisciplinary research in analytical and applied areas of the social sciences, encompassing diverse aspects of development. ISEC works with central, state and local governments as well as international agencies by undertaking systematic studies of resource potential, identifying factors influencing growth and examining measures for reducing poverty. The thrust areas of research include state and local economic policies, issues relating to sociological and demographic transition, environmental issues and fiscal, administrative and political decentralization and governance. It pursues fruitful contacts with other institutions and scholars devoted to social science research through collaborative research programmes, seminars, etc.

The Working Paper Series provides an opportunity for ISEC faculty, visiting fellows and PhD scholars to discuss their ideas and research work before publication and to get feedback from their peer group. Papers selected for publication in the series present empirical analyses and generally deal with wider issues of public policy at a sectoral, regional or national level. These working papers undergo external review but typically do not present final research results, and constitute works in progress.

ISEC working papers can be downloaded from the website (www.isec.ac.in).

ISBN 978-81-951228-4-4

© 2020, Copyright Reserved

The Institute for Social and Economic Change,
Bangalore

Working Paper Series Editor: **M Balasubramanian**

IS PUBLIC EDUCATION EXPENDITURE PRO-CYCLICAL IN INDIA?

Ramanjini¹ and K Gayithri²

Abstract

This paper examines the cyclicity of public education expenditure of Indian states using recent data and advanced estimation techniques. The empirical results suggest that public education expenditure is pro-cyclical with respect to states' GDP. Expenditure on higher levels of education shows a relatively higher degree of pro-cyclical than lower levels of education. Economic downturns seem to have hampered public investment on education and more specifically public investment on higher levels of education across Indian states, as pro-cyclical of education expenditure is symmetrical. On the other hand, the fiscal transfers from the Union government are not enabling the state governments to protect the expenditure levels of the education sector during economic downturns. Hence, there is a need for incorporating relevant instruments in the intergovernmental transfer system that enables the states to provide minimum levels of public services such as education and healthcare.

Introduction and Motivation

Introduction

In India, both Union and state governments are responsible for the promotion and development of education, as per the 42nd Constitution (Amendment) Act, 1976. The cost of public education is shared by governments at the Union, state and local levels. Various education commissions and policies such as Education Commission of India (1964-66), New Education Policy (1986) and National Education Policy of India (2020) have recommended the allocation of at least 6 per cent of national income for provision of public education.

The goal of allocating 6 per cent GDP to education remains unfulfilled till date, in spite of assurances made by various successive governments. The country has spent (Union & state governments together) around Rs. 5 lakh crore towards public education, amounting to 2.88 per cent of the country's GDP and around 10 per cent of the total government expenditure for the year 2017-18¹ (Government of India, 2018). In fact, India's public expenditure is evidently lower than other developing and developed countries (Government of India, 2020) despite being known as one of the rapidly growing economies with the second largest education system in terms of enrolment in the world. India ranks at the 62nd position among 63 countries, both in terms of per student public expenditure on education and quality education (IMD, 2019). India's public spending on education is considered not adequate either to attract foreign talent to the country or to tap into indigenous talent (*Ibid*). More importantly, the growth of real public education expenditure in the Indian context has rarely followed a consistent and secular trend over time.

The allocation of resources to public education has been noticeably volatile by nature and is quite often subject to the influence of many factors such as growth of population, urbanisation, output growth, fiscal sustainability², awareness of civil rights, social obligations of governments, etc. Two

¹ Research Scholar, Centre for Economic Studies and Policy (CESP), Institute for Social and Economic Change (ISEC), Bangalore-72, email: ramanjini@isec.ac.in

² Professor, Centre for Economic Studies and Policy (CESP), Institute for Social and Economic Change (ISEC), Bangalore-72, email: gayithri@isec.ac.in

important hypotheses have remarkably contributed to theorising the growth of public expenditure. First, Wagner's principle of increasing state activity that asserts a faster growth of government expenditure than its output³ (Peacock & Wiseman, 1961). Wagner, while emphasising a secular trend in the government expenditure, ignored the other aspects of public expenditure growth such as the time pattern of growth (*Ibid*). Alternatively, Peacock and Wiseman argued that public expenditure would not increase in a smooth manner and that it would rather increase in a shuddering mode due to displacement effect, inspection effect and concentration effect (Peacock & Wiseman, 1961).

While both of these hypotheses recognise the importance of structural elements of society in determining public expenditure growth, the business cycle literature attributes (in particular) the growth of public expenditure to output growth/fluctuations. Much of the scholarly work has generally focused on assessing the degree of response of federal revenues and expenditures to output fluctuations/business cycles (Arena & Revilla, 2009). However, the fiscal policies followed by sub-national governments in a multi-tier system of governance are perhaps more susceptible to output fluctuations. The sub-national governments, often dependent on narrower and sensitive revenue streams with a limited access to credit markets, may find themselves subjected to manoeuvring of intergovernmental transfers. Thus, a combination of all these factors renders fiscal policies followed by sub-national governments inherently and systematically pro-cyclical with respect to output fluctuations (Arena & Revilla, 2009).

Given the context, the present paper aims at examining the association between public education expenditure and output fluctuations at the sub-national level in India. To state otherwise, understanding the behavioural pattern of public education expenditure in relation to output growth of the economy forms the focus of this paper.

Motivation

In the literature, the co-movement of expenditure and output is famously termed as 'expenditure cyclicity'. An analysis of the cyclical behaviour of public education expenditure constitutes the focal point of this paper on three important premises. First, although education figures in the concurrent list in the Indian context, the responsibility of providing adequate educational facilities mainly rests with the state governments (Roy, Kamaiah, & Rao, 2000). In India, persistent disparities existing across the states in respect of various aspects such as the size of population, income, tax base, and mineral and forest resources (Government of India, 2004), have led to inter-state disparities in public education expenditure. Although there is a huge variation across the states when it comes to education expenditure, the rich and middle-income states tend to spend relatively more than poor-income states in per capita terms (Dev & Mooij, 2000). Further, the states lagging behind in terms of per capita expenditure on the social sector (education accounting for a major share), also displays a lower achievement with regard to Human Development Indicators (Kaur, Misra, & Suresh, 2013). Moreover, governments have shown a tendency towards cutting down social sector expenditure during economic slowdowns in India, both at the national and sub-national levels (Mukharjee, 2014), which could be mainly attributed to the economic and fiscal hassles faced by them.

Secondly, there is a strong reason for expecting the expenditure on education to be susceptible to output fluctuations at the sub-national level in India. The sub-national governments normally have access to rather narrower revenue streams with higher expenditure obligations as compared to the Union government. Given the limited scope for revenue mobilisation, along with restrictions on independent borrowings of sub-national governments as part of efforts towards abiding the stability and growth pact (through FRBM), the sub-national governments either have to depend on inter-governmental transfers to maintain the expenditure levels or they have to resort to ad hoc cuts in public expenditure during economic downturns with the social sector often becoming an easy prey. In India, fiscal transfers are designed through the Finance Commission to offset both vertical and horizontal imbalances in the fiscal capacity of states. Especially, the equalisation transfers are designed to overcome the fiscal constraints on the part of state governments in providing a comparable standard of services such as education, health, etc. The Twelfth Finance Commission attempted making equalisation grants to elementary education and health care. However, the commission found it difficult to fully equalise the expenditure levels across the states (Government of India, 2014). Therefore, it is important to understand how far inter-governmental transfers help the states in offsetting the cyclicity of education expenditure.

Finally, the Indian education system can be classified generally into elementary, secondary and higher education. Higher education may be distinguished further by types of education that include general (university and higher education), technical, medical, agricultural, management and legal education (Narayana, 2019). The report of the Central Advisory Board of Education (CABE) committee on 'Financing of Higher and Technical Education' (2005) recommended, if 50 percent of the total education expenditure is allocated to elementary education, the remaining 50 percent of the total education expenditure has to be shared equally between secondary and higher & technical education (i.e. 25 percent to secondary education and 25 percent to higher and technical education put together). Although the state governments are not strictly following the above norm, there are considerable variations observed in the priority accorded to different levels of education when it comes to resource allocation. Thus, the relative priority accorded by the state governments varies across different levels of education. Given the states' priority, it is interesting also to understand whether the output fluctuations do impact the funding of education at different levels in a similar manner.

Given this backdrop, the present paper aims at examining the impact of economic volatility on education expenditure at the sub-national level in India. As part of this endeavour, the present study intends to answer the following questions: Is public education expenditure pro-cyclical, counter-cyclical or acyclical. If it is procyclical, how does public education expenditure respond during output upturns⁴ and downturns⁵? Do various constituent components of public education expenditure (expenditure on different levels of education) show a different or asymmetrical response to output downturn/upturns? And finally, what is the role of states' fiscal health and fiscal transfers in determining the growth of public education expenditure?

The present study contributes to the literature in the following ways: first, it is the first of its kind study in India, that analyses the cyclicity of education expenditure and its constituent components using recent data and an advanced method of estimation- the study makes use of System-

Generalised Method of Movements (Sys-GMM). Second, the study analyses the cyclicity of education expenditure with respect to both output fluctuations and revenue fluctuations. The earlier studies have examined the cyclicity aspect only with respect to output fluctuations. Finally, the cyclical behaviour of education expenditure is compared across the states by dividing 28 states (the state of Telangana has been merged with Andhra Pradesh) into two groups i.e. Non-Special and Special Category states.

The paper is organised in five sections. The first section provides the introduction and motivation of the study. A review of theoretical and empirical literature is carried out in the second section and an outline of empirical strategy in the third section. The fourth section examines the cyclicity of education expenditure, followed by conclusions in the last section.

Review of Literature

Theoretical Perspectives

The cyclical behaviour of fiscal policy refers to the way government expenditure and revenue policy responds to the changes in Gross Domestic Product (GDP). A fiscal policy is said to be 'pro-cyclical' if it is expansionary in economic booms or good times and contractionary during economic recessions or bad times. Opposite is the case of 'counter-cyclical' fiscal policy (Mukharjee, 2014). Pro-cyclical fiscal policy implies an increase in both the revenue and expenditure of the government at a faster rate than the GDP during good times and a decrease at a faster rate in bad times. A counter-cyclical fiscal policy indicates an inverse relationship between government's revenue and expenditure and GDP. On the other hand, a fiscal policy is called 'acyclical' if it illustrates no association with output fluctuations (good or bad times) (Abbott & Jones, 2013).

The 'Tax Smoothing Hypothesis' proposed by Barro (1979) is considered the most well-known theoretical statement with regard to fiscal cyclicity. It suggests, for a given path of government spending, tax rates should be held constant over the business cycle and the budget surplus should move in a pro-cyclical fashion (Lane, 2003). Our focus is on the government spending on education rather than its source of financing. Therefore, we present a review of economic arguments that are exclusively related to expenditure cyclicity.

The literature suggests that theoretical conjectures of neoclassical framework make weak predictions (less prescriptive) related to the cyclical behaviour of government expenditure (Lane, 2003). The neoclassical Ricardian equivalence theory tends to disbelieve/doubt the influence of inter-temporal income transfer effect of a tax change (increase or decrease in the current tax rates) on the current consumption pattern (Wren-Lewis, 2010). The theory believes that the temporary debt-financed government expenditure may fail to generate any additional multiplier effect, but has not categorically rejected the role of debt-financed fiscal policy in altering aggregate demand. Apparently, on the other side, it does not support unequivocally the role of fiscal policy, especially government spending on macroeconomic stabilisation, unlike the Keynesian school of thought. Therefore, the neoclassical framework is less assertive when it comes to providing an unambiguous prescription for public expenditure during economic/output fluctuations. On the contrary, the Keynesian framework believes (undoubtedly) in the stabilisation function of public expenditure and its role in augmenting aggregate demand and economic growth. Therefore, the Keynesian framework generally supports counter-cyclical

public expenditure (i.e. increase in the expenditure during economic downturns) and also counter-cyclicality of public investment based on the demand management principle (Lane, 2003; Mukharjee, 2014).

The prevalence of a pro-cyclical expenditure policy in developing countries has been attributed to a range of factors in theoretical literature. In this regard, the available literature offers two major arguments that explain the causes and consequences of a pro-cyclical expenditure policy: (i) the financial channel argument; and (ii) political economy argument. The former argument expounds its perspective exclusively based on economic logic, while the latter argument presents its observations from the standpoint of political economy considerations.

Financial channel argument: Although most of the economists would prefer the normative prescription of a counter-cyclical public expenditure, many countries tend to follow a pro-cyclical expenditure policy in reality (Gavin & Perotti, 1997; Talvi & Vegh, 2005; Woo, 2009). The financial channel argument believes the reason for this kind of a seemingly sub-optimal fiscal policy⁶ lying in the borrowing constraints of governments (Alesina & Tabellini, 2005; Gavin & Perotti, 1997). Borrowing constraints, especially in the context of developing countries, tend to intensify during economic downturns, reinforcing a pro-cyclical public spending. In other words, developing countries either encounter difficulties in accessing borrowings in credit markets or they are forced to borrow at higher interest rates during economic downturns. During economic upturns, they can borrow more, as they generally do not face credit constraints in principle. As a result, governments cannot implement more counter-cyclical expenditure policies during bad times, although they like to do so (Gavin & Perotti, 1997).

Political economy argument: The proponents of the second argument view the fiscal process as an important arena wherein powerful groups interact for fiscal redistribution in a society characterised by a weak legal and institutional set-up (for example, Tornell & Lane, 1996, 1999; Lane & Tornell, 1996; Talvi & Vegh, 2005; Alesina & Tabellini, 2005). Lane & Tornell (1996, 1998). The framework developed by Tornell & Lane (1996, 1999) believes that multiple power groups/stakeholders compete for a share in the fiscal resources. These multiple stakeholder groups can refer to different branches of government; individual parties within a coalition; individual ministers within the government; state and provincial governments within a federal system; labour unions and employers' confederation in a corporatist system, etc (Lane, 2003). In the context of the 'fiscal commons problem', these groups compete voraciously for a share in the fiscal resources, with each group unwilling to come down on its claim when there is a surge in the fiscal revenue. This interaction is termed as the 'voracity effect'.

The 'voracity effect' approach presents two basic and important predictions. First, the intensity of fiscal competition will increase, especially during economic upturns. An initial fiscal surplus gives a free rein to an ardent lobbying for a higher public spending during an economic boom (Talvi & Vegh, 2000). This kind of severe competition can lead expenditure to grow more than proportionately relative to an increase in income. Hence, high output volatility is the environment most conducive to generating pro-cyclical behaviour. Second, the political system which harbours more number of power groups and

with a weak legal and institutional set-up will witness a higher degree of fiscal pro-cyclicality relative to a unitary system (Lane, 2003).

On the other hand, Alesina and Tabellini (2005) tried explaining the basis of a pro-cyclical expenditure policy with a dynamic political economy model that resembles 'Starve the Leviathan' argument. They argue that a pro-cyclical and myopic fiscal policy crops up in the presence of the political agency problem. Voters face corrupt governments and intend to squeeze the part of the tax revenue that can be appropriated by the governments for unproductive public consumption (e.g. political rent). In this endeavour, voters observe the state of the economy but not the government borrowings due to imperfect information (they cannot observe the government borrowings, at least at the margin due to lack of information). Consequently, when they see the economy booming, they demand a higher fiscal utility either in the form of tax cuts or in the form of an enhanced provision of public goods. Hence, this act of voters will force the government to impart a pro-cyclical bias to fiscal policy during economic booms (Alesina & Guido, 2005) .

Empirical Literature

The empirical literature points to pro-cyclical spending first in the case of Latin America (Gavin et.al, 1997) and then in the context of other developing countries (for example, Talvi and Vegh, 2005; Woo, 2009) and in OECD countries too (Lane, 2003). The empirical studies also have proved pro-cyclical spending in respect of different items of budget. For example, Lane (2003) observed pro-cyclical spending with respect to expenditure on capital accounts and spending on public sector wages. Lamo et al (2007) observed pro-cyclicality with respect to government consumption spending. Darby & Melitz (2008), Abbott & Jones (2013); Effiom (2019) examined the cyclicity of expenditure on functional categories such as education and healthcare. Arena & Revilla (2009) focused on the cyclical behaviour of expenditure at sub-central government levels of Brazil.

Cyclicality of fiscal policy has been well researched and studied in the international context, though most of the studies have focused on the cyclical behaviour of fiscal policy at the Central/Union/Federal government levels. In the Indian context, there are only a handful of studies that have addressed this pertinent issue. A study conducted by Wibbels & Rodden (2009) is the first-of-this-kind to the best of our understanding. This study analysed the sensitivity of provincial government finances with respect to regional business cycles across eight major federal republics, including India. Later, Shah & Patnaik (2010) observed the pro-cyclical behaviour of both revenue and capital expenditure of the Union government in the short-run. Further, two studies examined the cyclical behaviour of social sector expenditure at the sub-national level in India, controlling for the effect of fiscal deficit and fiscal transfers (Kaur, Misra & Suresh, 2013; Behera, Mohanty, & Dash, 2019). Both the studies were extended to understanding the cyclical behaviour of social sector expenditure during periods of economic downturn and upturn. The latter study exclusively examined the cyclical behaviour of public health expenditure. Although Kaur, Misra & Suresh (2013) unveiled the cyclical nature of education expenditure in India, an examination of the role of economic cycles in the expenditure at different levels of education has remained untapped till date. The present study tries to bridge this gap.

Data and Methodology

Empirical Strategy

The empirical studies mostly adopt three major approaches to measuring the cyclical nature of public spending: a correlation based approach, an elasticity based approach and error correction approach (Effiom, 2019). We have adopted the elasticity based approach to examine the cyclical nature of education expenditure and drawn inspiration from many empirical studies for outlining the empirical strategy of the study (for eg. Gavin & Perotti (1997); Lane (2003); Talvi & Vegh (2005); Darby & Melitz (2008); Arena & Revilla (2009); Granado, Gupta & Hajdenberg (2010); Effiom (2019); Behera, Mohanty, & Dash (2019)).

We have examined the cyclical behaviour of the following public expenditure variables separately: real expenditure on elementary, secondary, university & higher education (hereafter referred to as general higher education) and technical education. For this purpose, we have performed a panel regression estimation for each of the expenditure categories separately with the same model specifications. The panel regression consists of 28 states for 17 years (2000-01 to 2016-17). Data on these variables consists of expenditure on both revenue and capital accounts and have been drawn from state finance accounts published by the Comptroller and Auditor General (CAG) of India. We have studied the cyclical behaviour of the above mentioned expenditure variables (commonly denoted as public education expenditure ($\ln PEE_{it}$)) in relation to real Gross State Domestic Product ($\ln GSDP_{it}$) and states' real Own Revenue ($\ln REVENUE_{it}$), as these two variables play a vital role in determining the fiscal space of the state governments. Hence, states' GSDP and Own Revenue are the two main explanatory variables of our empirical models that determine the extent of cyclical nature of education expenditure. States' GSDP is at factor cost and states' Own Revenue consists of states' Own Tax Revenue⁷ and states' Non-Tax Revenue⁸. We have also used two control variables i.e., Union government's real gross Fiscal Transfers ($\ln TRANSFERS_{it}$) to state governments (that include both tax devolution and grants) and lagged real Fiscal Deficit of the state governments (FD_{it-1}). Data related to all these explanatory variables has been sourced from the Reserve Bank of India (RBI) and deflated at 2011-12 prices, using the GSDP deflators of respective states. Both dependent and independent variables, excepting lagged real fiscal deficit of states (FD_{it-1}), have been converted into natural logarithmic forms.

We have estimated panel regression models choosing specifications of one-step System-GMM model (Sys-GMM) over Ordinary Least Square (OLS) Estimator for the following reasons: (a) the results obtained from OLS remain biased if lagged education expenditure is correlated with unobserved components of individual states. Sys-GMM accounts for this kind of state-specific heterogeneity; (b) Sys-GMM effectively controls for time-varying and state-specific components in the residuals; (c) Sys-GMM is considered efficient in the case where independent variables are correlated with their past values (lagged values) (Mishra & Newhosue, 2009; Behera, Mohanty, & Dash, 2019). The year dummies are included in the model as instrumental variables, along with other external and internal instruments.

The empirical estimation strategy is based on Behera, Mohanty, & Dash (2019) that consists of three different specifications as illustrated below

Univariate Model

Here, we determine the impact of states' output (Y_{it}) and revenue (R_{it}) on public education expenditure (E_{it}) without controlling for any other potential explanatory variables. The coefficient β_1 of equation (1) and (2) measures the degree of cyclicity of public education expenditure with respect to output and revenue.

$$E_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 R_{it} + \beta_3 + \beta_4 + \beta_5 \quad (1)$$

$$E_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 R_{it} + \beta_3 + \beta_4 + \beta_5 \quad (2)$$

Multivariate Model

Under this specification, cyclicity of public education expenditure with respect to output and revenue is determined by controlling for other potential variables (equations (3) and (4)). In other words, equations (3) and (4) measure the cyclical behaviour of public education expenditure (E_{it}) with respect to states output (Y_{it}) and revenue (R_{it}) by controlling for the impact of Union government transfers to states (T_{it}) and lagged states' gross fiscal deficit to GSDP ratio (DF_{it}). Sub-national governments often rely on narrow and sensitive revenue streams and also have a limited access to credit markets (Arena & Revilla, 2009). In India, states are assigned larger expenditure obligations while being allowed to mobilise the required resources through much narrower revenue streams. Hence, state governments in India inevitably rely on Union transfers to accomplish their expenditure commitments. On the other hand, the fiscal deficit indicates the potential impact of borrowing constraints on states' public spending. (Granado, Gupta, & Hajdenberg, 2010). Article 293 of the Indian Constitution stipulates certain restrictions on the power of state governments with regard to borrowing. In India, a rule-based fiscal control has been achieved through the enacting of the Fiscal Responsibility Act (FRA) in respect of most of the states by the fiscal year 2005-06. FRA fixed the permissible level of fiscal deficit at 3 percent of the respective state's GSDP by 2008-09 (Chakraborty & Dash, 2013). There exist significant numbers of studies that assess the impact of Fiscal Responsibility Legislature (FRL) in the Indian context (for example, Misra & Khundarakpam (2008); Simone & Topalova (2009); Buiter & Patel (2010); Chakraborty & Dash (2013); Chakraborty & Dash (2017)). The findings of the above studies generally reveal that the Indian states have been maintaining the deficit targets through the path of spending cuts, especially by reducing the discretionary development expenditure (that includes expenditure on education). However, cuts in the development expenditure have been partially offset by increased Central transfers (Chakraborty & Dash, 2013). Therefore, the above findings imply the inverse association of fiscal deficit and the positive impact of Union transfers on the public expenditure of state governments. Based on these empirical evidences, the present study also expects fiscal transfers to have a positive impact on public education expenditure and fiscal deficit to act exactly the opposite.

$$E_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 R_{it} + \beta_3 T_{it} + \beta_4 DF_{it} + \beta_5 + \beta_6 + \beta_7 \quad (3)$$

$$E_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 R_{it} + \beta_3 T_{it} + \beta_4 DF_{it} + \beta_5 + \beta_6 + \beta_7 \quad (4)$$

Multivariate Model with output/revenue upturns and down turns

Many empirical studies have identified an asymmetrical (dissimilar) the response of public expenditure during good and bad times or output upturns and downturns (Gavin & Perotti, 1997; Granado, Gupta& Hajdenberg, 2010). We examine this hypothesis by estimating equations (5) and (6). This involves the splitting of the entire time period covered by the study into output/revenue upturns and downturns. Output/revenue upturns and downturns are represented by two dummy variables (U_{it} and D_{it} respectively). The upturn dummy (U_{it}) takes the value of 1 (one) if the actual output is greater than the trend/potential output computed using HP filter, otherwise 0 (zero). The opposite is the case with regard to the downturn dummy (D_{it}). Two interaction variables (in both the models) are generated to capture the impact of good and bad times on public education expenditure. The first interaction variables is generated between the real GSDP/revenue and the upturn dummy variable ($RealGSDP_{it}/RealRevenue_{it} \times U_{it}$), and the other between real GSDP/revenue and output downturn dummy variable ($RealGSDP_{it}/RealRevenue_{it} \times D_{it}$).

$$U_{it} = \alpha_0 + \alpha_1 RealGSDP_{it} + \alpha_2 RealRevenue_{it} + \alpha_3 U_{it} + \alpha_4 D_{it} + \alpha_5 (RealGSDP_{it} \times U_{it}) + \alpha_6 (RealRevenue_{it} \times D_{it}) + \alpha_7 + \alpha_8 + \alpha_9 \quad (5)$$

$$D_{it} = \alpha_0 + \alpha_1 RealGSDP_{it} + \alpha_2 RealRevenue_{it} + \alpha_3 U_{it} + \alpha_4 D_{it} + \alpha_5 (RealGSDP_{it} \times U_{it}) + \alpha_6 (RealRevenue_{it} \times D_{it}) + \alpha_7 + \alpha_8 + \alpha_9 \quad (6)$$

In the above empirical models, subscripts i and t denote state and time (year) period respectively. Further, s_i indicates vector of state fixed effects; v_t refers to vector of time (year) dummies; ϵ_{it} is an error term and η_{it} indicates both across and within-state variation.

Results and Discussion

Trends in education expenditure across the states

Here, we present brief trends in public education expenditure before explaining the cyclical nature of educational spending. In the literature, it is suggested that (ideally) the expenditure on education should grow at twice the rate of economic growth in the initial years of educational development. In India, the Education Commission (1964-66) set the target of a modest 10 per cent growth of education expenditure, while expecting the economy to grow at 6 per cent per annum (Tilak , 2006). Although it is difficult to prescribe a definitive level of educational expenditure growth, a consensus is arrived at to retain the growth rate of educational expenditure at higher than the economic growth rate. Annual average growth rate (AAGR) of public education expenditure (in real terms) and other variables has been calculated for the period of 2000-01 to 2016-17 for Indian states and presented in table 1. The findings in this respect reveal that the growth rate of public education expenditure is slightly higher than that of GSDP with the growth rate of technical education registering more than twice the growth rate of the GSDP. The growth rate of public education expenditure related to higher levels of education is much higher than the GSDP, as compared to lower levels of education. However, the public education expenditure seems to have grown at a slower rate in relation to the growth rate of Own Revenue and

the Union government transfers to the states. Overall, the growth of education expenditure is not highly superior (as ideally expected) to GSDP growth across the states excepting in technical education.

Table 1: Average Annual Growth Rate (in Real Terms) of Select Indicators (2000-01 to 2016-17)

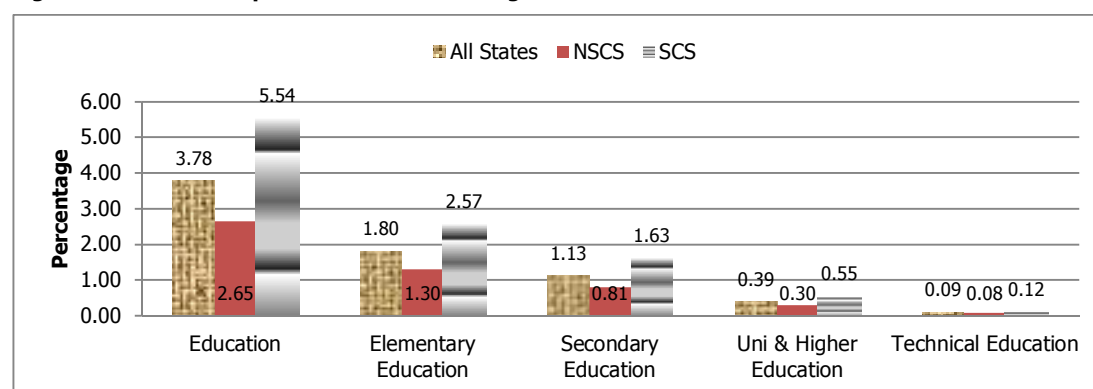
Indicators	All States	NSCS ⁹	SCS ¹⁰
Education, Arts, Sports & Culture	8.80	8.80	8.90
Elementary Education	8.90	8.50	10.00
Secondary Education	9.10	9.70	8.70
University & Higher Education	9.20	9.20	9.80
Technical Education	24.30	17.10	36.00
GSDP (Factor Cost)	7.60	7.70	7.80
States' Own Revenue	9.70	9.00	12.10
Union government Transfers to States	11.00	12.30	9.80

Source: Authors' compilation based on RBI State Finances: Study of State Budgets (various years).

It is a common practice to compare the share of public expenditure on education as a proportion of the GDP of the country, while examining the adequacy of public investment on education. In India, the Education Commission of 1964-66, while carrying out a comprehensive exercise of estimating the proportion of GDP requirement on certain workable assumptions, fixed 6 per cent of the GDP as a norm (Government of India, 1966; Behera, Mohanty & Dash, 2019). The educational policies thereafter have followed the above norm, while making recommendations with respect to the financing of education. Successive governments have also kept on promising to achieve this magical figure quite often. The report of the Central Advisory Board of Education (CABE) committee on 'Financing of Higher and Technical Education' (2005) suggested the allocation of 3 per cent to elementary education, 1.5 per cent to secondary education, 1 per cent to university and higher education and 0.50 per cent to technical education from within the proposed/agreed 6 per cent of GDP to education (Government of India, 2005).

However, the state governments in India do not seem to have followed the above norms while allocating resources to education (figure 1). Educational expenditure in India has never crossed 4 per cent of the GSDP mark over the period from 2000-01 to 2016-17 (for all states). It has not even crossed the 3 per cent mark with respect to Non-Special category states, although it is nearer to the 6 per cent GSDP mark with respect to special category states. However, given the size of special category states' GSDP, the proportion of expenditure on education may not be adequate to meet the expenditure requirement of the education sector.

Figure 1: Education Expenditure as a Percentage of GSDP



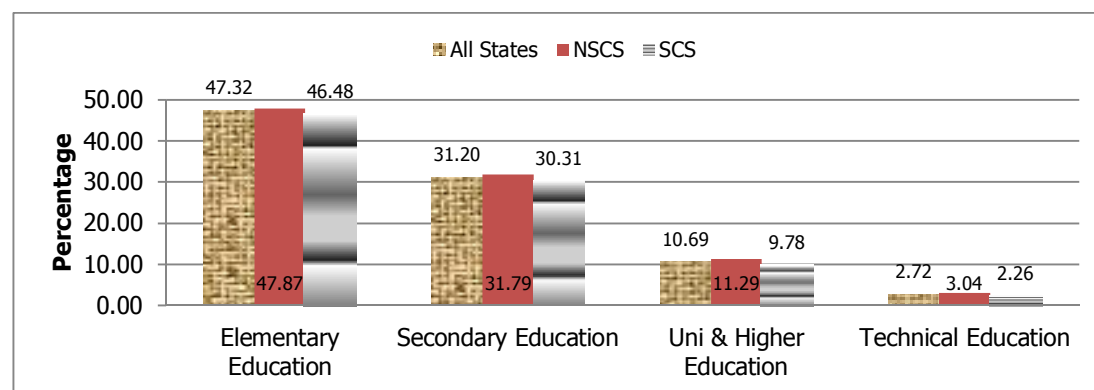
Source: Authors' Compilation based on RBI State Finances: Study of State Budgets (various years)

Note(s): NSCS: Non-Special Category States, SCS: Special Category States

Following the Japanese experience, the Kothari Commission indirectly advocated some kind of sequencing in the pattern of allocation of resources across different levels of education: first primary education, followed by secondary and then higher education (Tilak, 2007). The empirical findings in this respect indicate that more than 75 per cent of the total education expenditure is accounted by elementary and secondary education in the states of India. On the other hand, general higher education (university and higher education) and technical education together share less than 15 per cent of the total education expenditure of the states (figure 3). Although one cannot object to a higher concentration of resources at basic levels of education, prioritising basic levels of education should not occur at the cost of ignoring higher levels of education.

There is also an argument in favour of reallocation of resources (current and future) from lower levels of education to higher levels, if there is a demographically induced decline in the enrolment of basic levels of education¹¹ (Narayana, 2019). The above argument may be considered pragmatic if (and only if) the allocation of resources to basic levels of education is based on the current levels of enrolment and also the allocated resources are sufficient to provide acceptable standards of quality education. If the basic levels of education remain already underfunded, a reduced allocation of public resources due to a decline in the levels of enrolment cannot be justified. Moreover, the above argument also seems to consider public education expenditure as a common pool with different levels of education competing with each other for their portion of resources. However, governments in the developing countries ought to adopt a broader approach towards developing a strong synergy between primary, secondary and tertiary levels of education. They should not get caught in arguments that provoke one level of education against another (Jha, Verma, Venkataraman, & Parvati, 2007).

Figure 2: Inter-Sectoral Allocation of Education Expenditure (%)



Source: Authors' Compilation based on RBI State Finances: Study of State Budgets (various years)

Note(s): NSCS: Non-Special Category States, SCS: Special Category States

Cyclical Behaviour of Education Expenditure

The empirical results of select models using System GMM (one-step) estimation procedure are presented in tables 2, 3, 4, 5 & 6 for Total education, Elementary, Secondary, General higher and Technical education respectively. Robust standard errors are presented in parentheses, Arellano-Bond (AB) test for AR (2) rejects the presence of autocorrelation in all the models estimated (the corresponding p value is less than 0.05 in all the estimated models).

The coefficient value (β_1) of $\Delta \ln E_{it}$ of Univariate model estimated using equation (1) denotes that the spending on total education (Education, Arts, Sports and Culture) is pro-cyclical, while expenditure related to different levels of education shows a similar kind of behaviour and expenditure components of higher levels of education (i.e. General higher and Technical education) are highly (in relative terms) pro-cyclical, as compared to lower levels of education expenditure (i.e. elementary and secondary education). Coefficient values on this account suggest that one per cent increase in real GSDP of states leads to an increase in the expenditure on General higher education to the tune of 0.42 per cent, and Technical education to the extent of 0.78 per cent. The coefficient of $\Delta \ln E_{it}$ of multivariate models (equation 3) that control for the effect of real gross transfers ($\Delta \ln G_{it}$) and real lagged fiscal deficit ($\Delta \ln F_{it}$) mostly/more or less produces a similar kind of explanation.

Table 2: GMM (One Step) Estimates for Total Education (Education, Sports, Arts and Culture)

Variables	Univariate Models		Multivariate Models		Multivariate Models with Economic Cycles	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln PEE_{it-1}$	0.368** (0.111)	0.797** (0.119)	0.188 (0.155)	0.766** (0.110)	0.171 (0.161)	0.329 (0.236)
$\ln GSDP_{it}$	0.476** (0.088)		0.492** (0.089)			
$\ln REVENUE_{it}$		0.184 (0.112)		0.175* (0.089)		
$\ln TRANSFERS_{it}$			0.248** (0.058)	0.053* (0.022)	0.253** (0.060)	0.328** (0.097)
$\ln FDI_{it-1}$			0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)
GSDP UpTurn					0.502** (0.093)	
GSDP DownTurn					0.502** (0.093)	
REVENUE UpTurn						0.314** (0.112)
REVENUE DownTurn						0.316** (0.113)
Observations	447	447	447	447	447	447
States	28	28	28	28	28	28
Time points	17	17	17	17	17	17
Instruments	33	33	35	35	36	36
AB test for AR (2)	0.537	0.609	0.109	0.443	0.107	0.354
Hansen J Statistic	0.922	0.803	0.979	0.846	0.996	1.000

Source: Authors' estimation

* 0.05 level

** 0.01 level

Hence, the analysis based findings of the present study advocate that education expenditure on the part of Indian states is pro-cyclical in nature in relation to states' real GSDP with or without controlling for other potential variables. And there exists a considerable difference between lower and higher levels of education with respect to the extent of prevailing pro-cyclicality.

It is recognised that recurrent expenditure accounts for a larger share in the total education expenditure. And generally recurrent expenditure does not show pro-cyclical behaviour, as it is a prior-committed expenditure on the part of the governments. The governments may not increase or reduce this kind of expenditure based on output fluctuations in the normal course of time. However, the results based findings of our study indicate pro-cyclicality of education expenditure. This, in turn, indirectly indicates the vulnerability of capital expenditure in the education sector to output fluctuations.

Table 3: GMM (One Step) Estimates for Elementary Education

Variables	Univariate Models		Multivariate Models		Multivariate Models with Economic Cycles	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln PEE_{it-1}$	0.681** (0.070)	0.873** (0.082)	0.638** (0.072)	0.841** (0.074)	0.634** (0.073)	0.687** (0.058)
$\ln GSDP_{it}$	0.253** (0.052)		0.187** (0.040)			
$\ln REVENUE_{it}$		0.127 (0.082)		0.102 (0.058)		
$\ln TRANSFERS_{it}$			0.212** (0.053)	0.086* (0.032)	0.214** (0.053)	0.233** (0.045)
$\ln FDI_{it-1}$			-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.000 (0.001)
GSDP UpTurn					0.190** (0.040)	
GSDP DownTurn					0.189** (0.040)	
REVENUE UpTurn						0.125** (0.029)
REVENUE DownTurn						0.126** (0.129)
Observations	444	444	444	444	447	447
States	28	28	28	28	28	28
Time points	17	17	17	17	17	17
Instruments	33	33	35	35	36	36
AB test for AR (2)	0.452	0.481	0.477	0.479	0.478	0.473
Hansen J Statistic	0.874	0.713	0.977	0.971	0.982	0.947

Source: Authors' estimation

* 0.05 level

** 0.01 level

The coefficient value related to $\ln PEE_{it-1}$ of Univariate model estimated using equation (2) indicates that expenditure components of total education and that of lower levels of education are acyclical, as these coefficients are not statistically significant at 5 per cent level of confidence intervals (tables 2, 3 & 4). On the contrary, the expenditure components related to higher levels of education show a pro-cyclical behaviour with respect to states' real Own Revenue (tables 5 & 6). Hence, public expenditure on higher levels of education tends to respond to changes in the states' own revenue. The results of Multivariate models using equation (4) with control variables imply that public expenditure only on total education and technical education will get larger during revenue booms and will apparently shrink in times of revenue shortfalls. From the above findings, it is very clear that the elasticity of GSDP is higher than that of Own Revenue of states with respect to education expenditure. This, in turn, indicates that a change in the GSDP plays a more crucial role in determining the cyclical nature of education expenditure than a change in the own revenue of states.

Table 4: GMM (One Step) Estimates for Secondary Education

Variables	Univariate Models		Multivariate Models		Multivariate Models with Economic Cycles	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln PEE_{it-1}$	0.703** (0.168)	0.806** (0.114)	0.413 (0.560)	0.861** (0.092)	0.548** (0.201)	0.682** (0.188)
$\ln GSDP_{it}$	0.230 (0.132)		0.444** (0.045)			
$\ln REVENUE_{it}$		0.178 (0.109)		0.132 (0.089)		
$\ln TRANSFERS_{it}$			0.023 (0.045)	-0.013 (0.017)	0.027 (0.053)	0.082 (0.051)
$\ln FDI_{it-1}$			0.002 (0.005)	0.002 (0.002)	0.000 (0.002)	0.000 (0.002)
GSDP UpTurn					0.381* (0.173)	
GSDP DownTurn					0.382* (0.174)	
REVENUE UpTurn						0.188 (0.111)
REVENUE DownTurn						0.189 (0.111)
Observations	447	447	446	446	446	446
States	28	28	28	28	28	28
Time points	17	17	17	17	17	17
Instruments	33	33	35	35	37	36
AB test for AR (2)	0.863	0.928	0.983	0.843	0.835	0.927
Hansen J Statistic	0.805	0.608	0.937	0.632	0.966	0.907

Source: Authors' estimation

* 0.05 level

** 0.01 level

When it comes to control variables, the analysis based findings suggest that transfers from the Union government explain, to a large extent, the observed cyclical behaviour of education expenditure occurring due to a change in GSDP (in this case coefficients related to both $\ln PEE_{it-1}$ and $\ln GSDP_{it}$ are positive and statistically significant). However, this pattern is not consistent across different levels of education. The coefficient values of gross Union transfers are positive and significant with reference to Total education, Elementary and General higher education, whereas, the coefficient values of gross transfers related to Secondary and Technical education are not statistically significant. These findings indicate that Union fiscal transfers to state governments do not play any significant role in determining the level of expenditure on Secondary and Technical education. In other words, the state governments manage funds for secondary and technical education on their own without depending on Union government transfers.

In India, fiscal resources are shared between the Union and state governments through fiscal transfers from the Union government to state governments¹². These fiscal transfers are designed to offset vertical¹³ and horizontal¹⁴ imbalances. Fiscal transfers to states from the Union government of India consist of four sources of funds that are mutually different qualitatively. They include, share in central taxes¹⁵, statutory grants (non-plan grants awarded by the Finance Commission), plan grants (state plan schemes and central plan schemes awarded by the Planning Commission of India¹⁶) and

other grants¹⁷ (Rao & Srivastava, 2014). The first two type transfers are considered as 'entitlement transfers' that are non-discretionary in nature, and the latter two are broadly considered as 'discretionary transfers'. Although a part of plan grants is formula based, the weights that is attached to this part is normally viewed as discretionary by nature (*Ibid*).

Table 5: GMM (One Step) Estimates for University and Higher Education

Variables	Univariate Models		Multivariate Models		Multivariate Models with Economic Cycles	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln PEE_{it-1}$	0.470** (0.119)	0.682** (0.132)	0.507** (0.116)	0.974** (0.028)	0.493** (0.119)	0.642** (0.159)
$\ln GSDP_{it}$	0.420** (0.103)		0.320** (0.090)			
$\ln REVENUE_{it}$		0.296* (0.124)		-0.002 (0.023)		
$\ln TRANSFERS_{it}$			0.136* (0.057)	0.014 (0.009)	0.140* (0.059)	0.186** (0.072)
$\ln FDI_{it-1}$			0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.005 (0.003)
GSDP UpTurn					0.330** (0.093)	
GSDP DownTurn					0.330** (0.094)	
REVENUE UpTurn						0.160 (0.085)
REVENUE DownTurn						0.161 (0.086)
Observations	447	447	446	446	446	446
No. of States	28	28	28	28	28	28
Time points	17	17	17	17	17	17
Instruments	33	33	35	36	36	36
AB test for AR (2)	0.126	0.087	0.122	0.304	0.123	0.207
Hansen J Statistic	0.830	0.840	0.848	0.529	0.767	0.995

Source: Authors' estimation

* 0.05 level

** 0.01 level

Under discretionary transfers, the Union government sponsors/provides financial support for central & state plans and centrally-sponsored schemes and these grants sometimes exceed non-plan grants awarded by the Finance Commissions. A close look at these schemes with reference to the education sector indicates that more discretionary grants have been awarded to schemes related to elementary than other levels of education in India. The state governments have implemented many Centrally Sponsored flagship Schemes (CSS) related to elementary education for the study period (for example, Sarva Shiksha Abhiyan (SSA) and Mid Day Meals Scheme (MDMS)). The cost of these schemes is shared between the Union and state governments. Grants provided by the Union government for these schemes account for a significant proportion in the total transfers. Hence, the expenditure on elementary education on the part of states seems to be more sensitive to changes in the federal fiscal transfers.

Real lagged fiscal deficit ($\Delta \text{FISC}_{it-1}$) of the states is another control variable included in the estimation procedure. The coefficient values of fiscal deficit with a one period lag are not at all significant in any of the models estimated. Hence, the findings of this study suggest that the role of states' fiscal deficit in influencing public education expenditure is insignificant.

Table 6: GMM (One Step) Estimates for Technical Education

Variables	Univariate Models		Multivariate Models		Multivariate Models with Economic Cycles	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln \text{PEE}_{it-1}$	0.154** (0.038)	0.145** (0.024)	0.162** (0.034)	0.185** (0.025)	0.158** (0.032)	0.168** (0.024)
$\ln \text{GSDP}_{it}$	0.781** (0.048)		0.875** (0.106)			
$\ln \text{REVENUE}_{it}$		0.897** (0.097)		0.964** (0.190)		
$\ln \text{TRANSFERS}_{it}$			-0.206 (0.145)	-0.220 (0.005)	-0.205 (0.145)	0.066 (0.133)
$\ln \text{FDI}_{it-1}$			-0.002 (0.008)	0.022 (0.005)	0.003 (0.008)	0.002 (0.006)
GSDP UpTurn					0.872** (0.107)	
GSDP DownTurn					0.879** (0.110)	
REVENUE UpTurn						0.664** (0.093)
REVENUE DownTurn						0.666** (0.092)
Observations	448	448	448	448	447	447
States	28	28	28	28	28	28
Time points	17	17	17	17	17	17
Instruments	33	33	35	35	36	36
AB test for AR (2)	0.239	0.304	0.308	0.305	0.306	0.306
Hansen J Statistic	0.190	0.326	0.202	0.681	0.546	0.321

Source: Authors' estimation

* 0.05 level

** 0.01 level

Economic Downturns and Economic Upturns

The present section deals with the question of whether the cyclical nature of education expenditure is symmetrical across good and bad times. In order to find an answer to this question, initially the gap between potential and actual output (otherwise called as output gap) indicated by the ratio of actual to potential output has been computed. The potential output of Indian states has been estimated using the HP filter. Based on the output gap variable, two dummy variables have been generated i.e. UpTurn_{it} and DownTurn_{it} . The former dummy variable (UpTurn_{it}) refers to output upturns, wherein it takes the value '1' if the actual output is higher than the potential output, otherwise, '0'. The opposite is the case with the latter dummy variable (DownTurn_{it}). Further, we have generated two interaction variables: one between real GSDP/Own Revenue ($\ln \text{GSDP}_{it} / \ln \text{REVENUE}_{it}$) and output upturns and the other between real GSDP/Own Revenue and output downturns ($\ln \text{GSDP}_{it} / \ln \text{REVENUE}_{it}$). The

coefficients of these two variables capture the symmetrical nature of the cyclicity of education expenditure (estimated using equations 5 and 6) with respect to GSDP and Own Revenue of the states.

Measurement of symmetric/asymmetric cyclical behaviour is more important from the viewpoint of policy makers (Granado, Gupta, & Hajdenberg, 2010). A pro-cyclical behaviour expenditure only during good times (and acyclical during bad times) indicates that governments invest more on education when there is an economic boom and protect expenditure during recession. Hence, this kind of asymmetric pro-cyclical behaviour is considered as an ideal situation, as it facilitates a consistent increase in investment on education. The findings of this study in this regard are broadly consistent with Gavin & Perotti (1997) and Behera *et al* (2019), but differ from Granado *et al* (2010) and Kaur *et al* (2013). The findings of this study indicate that the education expenditure on the part of Indian states is pro-cyclical in both good and bad times. In other words, the cyclical behaviour of education expenditure is symmetrical in nature. That implies that in India, the pro-cyclicity of education expenditure occurs irrespective of the output gap. Pro-cyclicity is observed during both the positive and negative output gaps. As a result, in India, economic downturns seem to have a profound impact on the financing policies of education as well as the ability to pay for educational services of individuals (if public expenditure operates as a perfect substitute for household expenditure on education). The state governments do increase their allocation to education during good times, but fail to protect the spending during bad times. This, in turn, severely dents the flow of public funds to the educational sector when there is a stern requirement of resources.

The symmetric pro-cyclical behaviour of education expenditure also indicates the absence of the fiscal 'voracity effect' in India. The presence of a fiscal 'voracity effect' implies competition among multiple power groups (it could be the education department in the present case) for a share in the fiscal resources with the intensity of competition increasing, especially during economic upturns. As a result, the expenditure policy tends to be pro-cyclical only during good times. However, the empirical findings of this study suggest that the expenditure policy of education tends to be pro-cyclical during both good and bad times. Since its pro-cyclicity is symmetric across good and bad times, no evidence could be traced for voracious fiscal competition on the part of education departments, along with others for a share in the fiscal resources.

The empirical findings of the study also indicate that the symmetric pro-cyclicity is much stronger with respect to higher levels of education, as compared to lower levels as suggested by their respective coefficients (tables 5 & 6). The coefficient value almost increases as we move from lower levels of education to higher levels. The coefficient value of 0.190/0.189 (for GSDP upturns/downturns) with respect to elementary education is far lower than that of higher (0.330) and technical education (0.872/0.879). Based on this evidence, the study argues that public expenditure on higher levels of education is more sensitive to output fluctuations in India and the state governments in India seem to be indifferent to protect the public expenditure on higher levels of education during economic downturns.

A comparison of Non Special and Special Category States

The empirical analysis was also extended to examining the variations across the states with respect to the cyclicity of public education expenditure. For this purpose, following the approach of Behera *et al* (2019), the states were classified into two categories: Non-Special Category States (NSCS) and Special Category States (SCS). Five separate panel regression models (one each for Total education, Elementary, Secondary, University & Higher and Technical education) based on equation (3) were estimated for each of the categories (total ten models).

Table 7: GMM (One Step) Estimation for Non-Special Category States

Variables	Education	Elementary	Secondary	Higher	Technical
$\ln PEE_{it-1}$	0.296* (0.144)	0.622** (0.135)	1.129** (0.173)	0.326* (0.161)	0.375** (0.132)
$\ln GSDP_{it}$	0.440** (0.073)	0.190* (0.075)	-0.0141 (0.184)	0.409* (0.181)	0.660** (0.145)
$\ln TRANSFERS_{it}$	0.210** (0.069)	0.240* (0.095)	-0.206 (0.145)	0.164* (0.081)	-0.194* (0.091)
$\ln FDI_{it-1}$	0.002 (0.002)	-0.002 (0.001)	-0.008 (0.008)	-0.002 (0.005)	-0.000 (0.006)
Observations	271	269	271	271	271
States	17	17	17	17	17
Time points	17	17	17	17	17
Instruments	35	35	35	35	35
AB test for AR (2)	0.27	0.182	0.917	0.072	0.390
Hansen J Statistic	1.00	1.00	1.00	1.00	1.00

Source: Authors' estimation

Note(s): Education: Education, Arts, Sports & Culture, Elementary: Elementary education, Secondary: Secondary education, Higher: University & Higher education, Technical: Technical education

* 0.05 level

** 0.01 level

The total education expenditure of NSCSs is pro-cyclical; coefficient value (β_1) of $\ln GSDP_{it}$ reveals that one per cent increase in GSDP leads to a 0.44 per cent increase in public expenditure on education in these states (table 7). A decomposition of education expenditure shows that expenditure on higher levels of education (i.e. University & Higher education and Technical education) is more pro-cyclical than elementary education. One per cent increase in GSDP resulting in a 0.40 per cent and 0.66 per cent increase in the expenditure on General and Technical higher education, respectively, which is clearly higher than that of Elementary education. On the other hand, the coefficient value related to secondary education is not significant and hence, highlights the acyclicity of education expenditure. Nevertheless, a higher coefficient value of lagged real expenditure on secondary education ($\ln PEE_{it-1}$) hints at expenditure on this level of education being purely based on its previous year allocation or being incremental in nature. Hence, the NSCSs of India follow the preceding time trend while allocating resources to secondary education and output volatility does not seem to be influencing their decision.

Table 8: GMM (One Step) Estimation for Special Category States

Variables	Education	Elementary	Secondary	Higher	Technical
$\ln PEE_{it-1}$	0.430 (0.224)	0.668** (0.122)	0.683** (0.109)	0.409* (0.167)	0.229** (0.018)
$\ln GDP_{it}$	0.358* (0.143)	0.231* (0.089)	0.270* (0.112)	0.185 (0.137)	0.749 (0.393)
$\ln TRANSFERS_{it}$	0.152 (0.090)	0.079 (0.064)	-0.004 (0.080)	0.528** (0.174)	0.055 (0.556)
$\ln FDI_{it-1}$	0.002 (0.002)	-0.001 (0.002)	0.001 (0.002)	0.010** (0.003)	-0.006 (0.152)
Observations	176	175	175	175	176
States	11	11	11	11	11
Time points	17	17	17	17	17
Instruments	35	35	35	35	35
AB test for AR (2)	0.109	0.317	0.966	0.375	0.276
Hansen J Statistic	1.00	1.00	1.00	1.00	1.00

Source: Authors' estimation

Note(s): Education: Education, Arts, Sports & Culture, Elementary: Elementary education, Secondary: Secondary education, Higher: University & Higher education, Technical: Technical education

* 0.05 level

** 0.01 level

In the case of SCSs (table 8), the total education expenditure and its constituent components related to Elementary and Secondary education are pro-cyclical. Expenditure related to higher education – General higher education and Technical education– is acyclical. The output volatility does not seem to be affecting the funding of General higher education due to the tremendous and positive impact of gross fiscal transfers. The gross fiscal transfers in the case of General higher education seem to act like a shield in terms of offsetting the possible pro-cyclical tendency of expenditure. However, this is not the case with Technical education. Although expenditure on technical education is found acyclical in nature, the extent of acyclicity is not at all explained by the fiscal transfers in the case of SCSs. This, in turn, indicates that the states coming under special category seem to bear the burden of financing technical education on their own.

In India, the dependence of SCSs on Union government transfers is higher than that of NSCSs. The dependency is even higher when compared to low-income Non-Special Category States (Rao & Srivastava, 2014). Given the fact, Union transfers are expected to have a significant impact on educational spending. However, the empirical findings show that the real gross transfers do not appear to be influencing education expenditure, excepting General higher education.

In fact, Government of India has tried to enhance resource allocation to Technical education through Centrally Sponsored Schemes such as Technical Education Quality Improvement Programme-III (TEQUIP-III)¹⁸. Government of India has implemented the third phase of TEQUIP, with the assistance of World Bank, during 2001-2007. This project was directed towards improving the quality of engineering education in Low-Income and Special Category States (SCS). In spite of such concentrated efforts, the gross fiscal transfers have failed to influence the spending on Technical education in SCSs. This could be due to the fact that the project covered a limited number of technical educational institutions with a

smaller resource allocation. Hence, TEQUIP III has not remarkably influenced the funding pattern of Technical education of SCS.

Conclusions

Three major conclusions have emerged from the present analysis. First, education expenditure of Indian states is pro-cyclical in nature in relation to states' real GSDP. Although different components of education expenditure show a similar response to output fluctuations (i.e. pro-cyclical), there exists a considerable difference between lower and higher levels of education with respect to the extent of pro-cyclicality. Expenditure related to higher levels of education shows a higher degree of pro-cyclicality than lower levels of education. Second, pro-cyclicality of education expenditure is symmetrical in nature. This implies that economic downturns seem to be hampering public investment on education and more specifically public investment on higher levels of education across the states in India. The symmetrical pro-cyclicality also indicates the non-existence of a 'fiscal voracity effect'. Third, Union government transfers do not seem to be offsetting the pro-cyclical effect of education expenditure. In other words, the fiscal transfers may not enable the state governments to protect their expenditure levels during economic downturns. Especially, the fiscal transfers have failed to influence the expenditure policy of Special Category States, despite their over dependency on them.

Public expenditure ought to be counter-cyclical, especially during economic downturns in order to ensure an optimum level of public spending on education. However, a mismatch between revenue mobilisation and expenditure commitments is an inherent feature of sub-national governments in federal system of governance like ours. This fiscal mismatch acts as a major obstacle to the provision of meritorious public services such as education and healthcare. And disparity in the provision of public services across states arises from differences existing in terms of the revenue mobilising capacity and the unit cost of providing public services (Rao M. G., 2015). Intergovernmental transfers are expected to soften the budget constraints of state governments, especially during economic downturns. Tax devolution and Grants-in-Aid are the two major instruments of intergovernmental transfers in India. Generally, all the states prefer tax devolution over grants, as the former comes to states as a matter of right (statutory transfers) and states have the prerogative to allocate these resources as per their will (Government of India, 2004). However, tax devolution seems to have failed in offsetting the fiscal imbalance of the poorer and small states because these states quite often end up spending relatively less (compared to rich states) in terms of per capita expenditure despite their higher per capita fiscal transfers (Rao M. G., 2015).

The Twelfth Finance Commission (2005-06 to 2009-10) recognised grants-in-aid, especially conditional grants, as a more effective transfer instrument for state-specific, purpose-specific targeting that helps to achieve a minimum level of public services. Well-designed conditional federal transfers can encourage states and other local bodies to invest in budget items that produce positive externalities, such as education and healthcare (World Bank, 2008). In India, the Finance Commission generally proposes unconditional transfers¹⁹ while conditional fiscal transfers are operated through Centrally Sponsored Schemes (CSS) implemented by various Central ministries/departments. Post the recommendations of the Fourteenth Finance Commission (FFC), the general-purpose transfers have

swelled up significantly at the cost of the reduction in specific-purpose transfers (Chakraborty & Gupta, 2016).

The Committee of Selected Chief Ministers of States has consolidated and rationalised schemes related to specific transfers into three categories: (a) core of the core schemes; (b) core schemes; and (c) optional schemes with a varying degree of matching grants. As per the categorisation, there are six core of the core schemes and surprisingly, no scheme related to the education sector has been enlisted in this category.

While a relative convergence (if not an absolute convergence) of states has been achieved with respect to lower levels of education, there exists a wide disparity across states with respect to the higher education provision. Higher education, especially Technical education facilities, is relatively insufficient in the Special Category States and they have to rely on fiscal transfers to provide an optimal access to higher education. However, our findings suggest that fiscal transfers are not influencing expenditure on Technical education in these states. Insufficient educational facilities plaguing SCSs have created an unwarranted burden on the Technical education system of educationally developed states (particularly southern states). This kind of burden has paved the way for private actors into the education sector and in the context of weak regulations; this sort of commercially motivated privatisation may create educational crises (for eg. crisis of engineering education in southern states). Considering all the points mentioned above, it is the need of the hour to formulate a transfer system that incentivises and ensures an equitable access to educational services across the states in India.

End Notes

- ¹ Refers to combined total revenue and capital expenditure
- ² Refers to the capacity of the government to finance its desired expenditure programmes, to service any debt obligations, and to ensure its solvency (Heller, 2005).
- ³ Wagner adduced a number of reasons for the existence of his law, such as government's commitment to protect people from internal and external threats, provision of social services (health, education, etc) and participation in material production.
- ⁴ Refers to the situation where actual output exceeds potential output.
- ⁵ Refers to the situation where actual output falls short of potential output.
- ⁶ The pro-cyclical fiscal policy is considered sub-optimal because it directs the fiscal policy towards an undesirable path; for instance, it suggests a reduction in the government expenditure when it is really needed.
- ⁷ Include taxes on income, taxes on property & capital transactions and taxes on commodities & services.
- ⁸ Include interest receipts, dividends & profits, and receipts from various services such as general, social, fiscal & economic services.
- ⁹ NSCS: Non-Special Category States that include Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.
- ¹⁰ SCS: Special Category States that include Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand.
- ¹¹ Demographically induced decline in enrolment may result in saving of public resources.
- ¹² The President of India constitutes the Finance Commission once in five years under Article 280 of the Constitution to formulate the principles on which the net proceeds of taxes may be distributed between the Union and state governments. Further, the Finance Commission is also mandated to recommend the principles which should govern the grants-in-aid of the revenue to be paid to the states out of Consolidated Fund of India under Article 275 of the Constitution (Government of India, 2014). Apart from the above-mentioned channels, Article 282 of the Constitution also empowers the Union and state governments to make any grants for any

public purpose. Under this provision, the Union government makes grants-in-aid to the states and these are called 'discretionary grants,' the reason being that the discretion to award such grants completely lies with the Union government (Vithal, 1997).

- ¹³ Vertical imbalance arises since more resources have been assigned to the Union government while states have been assigned with larger expenditure obligations (Government of India, 2004).
- ¹⁴ Horizontal imbalance arises due to differentials with respect to revenue mobilisation potential, fiscal needs and cost of providing public services (Government of India, 2004).
- ¹⁵ Consist of states' share in income tax, other taxes on income and expenditure, taxes on wealth and customs, corporation tax, state excise duty, Union excise duties, service tax, and other taxes and duties on commodities and services.
- ¹⁶ At present, there is no distinction between plan and non-plan grants as Government of India abolished the Planning Commission of India in 2014. However, we maintain a distinction between these two types of grants as our study period covered the fiscal awards of both Planning and Finance Commissions of India.
- ¹⁷ Consist of grants towards Centrally Sponsored Schemes (CSS), and the North East special plan schemes.
- ¹⁸ Government of India has implemented the third phase of TEQUIP, with the assistance of World Bank during 2001-2007. This project was directed towards improving the quality of engineering education in Low-Income and Special Category States (SCS).
- ¹⁹ The Fourteenth Finance Commission restrained itself from awarding specific-purpose transfers that required continuous monitoring.

References

- Abbott, A and P Jones (2013). Procyclical Government Spending: A Public Choice Analysis. *Public Choice*, 243-58.
- Alesina, A and Guido, Tabellini (2005). *Why is Fiscal Policy Often Procyclical?* Cambridge MA, Massachusetts, United States of America: National Bureau of Economic Research (NBER).
- Arena, M and J E Revilla (2009). *Pro-Cyclical Fiscal Policy in Brazil*. Washington DC, United States of America: The World Bank.
- Behera, D K, R K Mohanty and U Dash (2019). Cyclicity of Public Health Expenditure in India: Role of Fiscal Transfers and Domestic Revenue Mobilization. *International Review of Economics*.
- Buiter, W H and U R Patel (2010). *Fiscal Rules in India: Are They Effective?* Cambridge MA, Massachusetts, United States of America: National Bureau of Economic Research.
- Chakraborty, P and B B Dash (2013). *Fiscal Reforms, Fiscal Rule and Development Spending: How Indian States Have performed?* New Delhi: National Institute of Public Finance and Policy.
- Chakraborty, P and B B Dash (2017). Fiscal Reforms, Fiscal Rules, and Development Spending: How Indian States Have Performed? *Public Budgeting and Finance*, 111-133.
- Chakraborty, P and M Gupta (2016). Evolving Center-State Financial Relations. *Economic and Political Weekly*.
- Darby, J and J Melitz (2008). Social Spending and Automatic Stabilizers in the OECD. *Economic Policy*, 715-56.
- Dev, S M and J Mooij (2000). Social Sector Expenditures in the 1990s: Analysis of Central and State Budgets. *Economic and Political Weekly*, 853-66.
- Effiom, L (2019). Cyclicity of Social Spending in West African Countries: Evidence from Ghana and Nigeria. *Globa Journal of Social Sciences*, 65-82.
- Gavin, M and R Perotti (1997). Fiscal Policy in Latin America. *NBER Macroeconomic Annual*, 11-61.

- Government of India (1966). *Education and National Development: Report of the Education Commission, 1964-66*. New Delhi: Ministry of Education.
- (2004). *Report of the Twelfth Finance Commission (2005-10)*. New Delhi: Ministry of Economic Affairs.
- (2005). *Report of the CABE Committee on Financing Higher and Technical Education*. New Delhi: National Institute of Educational Planning and Administration.
- (2014). *Report of the Fourteenth Finance Commission*. New Delhi: Ministry of Finance.
- (2018). *Economic Survey 2018-19*. New Delhi: Ministry of Finance.
- (2020). *National Policy on Education 2020*. New Delhi: Ministry of Education, Government of India.
- Granado, J A, S Gupta and A Hajdenberg (2010). *Is Social Spending Procyclical?* Washington DC, Washington, United States of America: International Monetary Fund.
- IMD (2019). *IMD World Talent Ranking 2019*. Lausanne: Institute for Management and Development (IMD).
- Jha, P, N Verma, L N Venkataraman and P Parvati (2007). *Report of the Financing of Elementary Education in India*. New Delhi: Action Aid India.
- Kaur, B, S Misra and A K Suresh (2013). Cyclicity of Social Sector Expenditures: Evidence from Indian States. *Reserve Bank of India Occasional Papers*, 1-36.
- Lamo, A, J J Perez and L Schuknecht (2007). *The Cyclicity of Consumption, Wages and Employment of the Public Sector in the Euro Area*. European Central Bank.
- Lane, P R (2003). The Cyclical Behaviour of Fiscal Policy: Evidence from the OECD. *Journal of Public Economics*, 2661-2675.
- Mishra, P and D Newhosue (2009). Does Health Aid Matter? *Journal of Health Economics*, 855-72.
- Misra, B K (2003). *Social Sector Expenditure and Attainment: An Analysis of Indian States*. Mumbai: Reserve Bank of India.
- Misra, B and J Khundrakpam (2008). Fiscal Consolidation by Central and State Governments: The Medium Term Outlook. *RBI Staff Studies*.
- Mukharjee, A (2014). *Cyclicity of Fiscal Policy in India*.
- Narayana, M R (2019). Fiscal Policy, Demographic Transition and Public Spending on Education: New Macroeconomic Evidence for Higher Education from India. *Journal of Education Finance*, 405-422.
- Peacock, A T and J Wiseman (1961). *The Growth of Public Expenditure in United Kingdom*. Princeton: Princeton University Press.
- Rao, C B and D K Srivastava (2014). *Dependence of States on Central Transfers: State-wise Analysis*. New Delhi, India: National Institute of Public Finance and Policy.
- Rao, M G (2015). *Central Transfers to States in India: Rewarding Performance While Ensuring Equity*. New Delhi: NITI Aayog.
- Rodden, J and E Wibbels (2009). Fiscal Decentralization and the Business Cycle: An Empirical Study of Seven Federations. *Economic & Politics*, 1-31.

- Roy, A, B Kamaiah and M G Rao (2000). Educational Expenditure of Large States: A Normative View. *Economic and Political Weekly*, 1465-69.
- Shah, A and I Patnaik (2010). Stabilizing the Indian Business Cycle. *NIPFP Working Paper 67*, National Institute of Public Finance and Policy
- Sharma, K (2018). India has 10 Lakh Teaching Vacancies: India has 4 Lakh Excess Teachers. Go Figure. Retrieved October 08, 2020, from The Print: <https://theprint.in/India/governance/india-has-10-lakh-teaching-vacancies-india-has-4-lakh-excess-teachers-go-figure/98467/>
- Simone, A S and P Topalava (2009). India's Experience with Fiscal Rules: An Evaluation and the Way Forward. Washington DC, United States of America: International Monetary Fund.
- Talvi, E and C A Vegh (2005). Tax Base Variability and Procyclical Fiscal Policy in Developing Countries. *Journal of Development Economics*, 156-190.
- Tilak, J B (2006). On Allocating 6 Per Cent of GDP to Education. *Economic and Political Weekly*, 613-18.
- (2007). The Kothari Commission and Financing of Education. *Economic and Political Weekly*, 874-82.
- Varma, S (2018). *Over 60 Lakh Government Posts Lying Vacant Under Modi Raj*. Retrieved October 08, 2020, from newsclick.in/60-lakh-government-jobs-posts-lying-vacant-narendra-modi-rule
- Woo, J (2009). Why Do More Polarized Countries Run More Procyclical Fiscal Policy? *The Review of Economics and Statistics*, 850-70.
- World Bank (2008). *Towards a Countercyclical Fiscal Policy Framework*. Washington DC: The World Bank.
- Wren-Lewis, S (2010). Macroeconomic Policy in Light of the Credit Crunch: the Return of Countercyclical Fiscal Policy? *Oxford Review of Economic Policy*, 71-86.

Appendix 1: Descriptive Statistics

Variables	$\ln PEE_{it}$	$\ln GSDP_{it}$	$\ln REVENUE_{it}$	$\ln TRANSFERS_{it}$	$\ln FD_{it}$
Education, Arts, Sports & Culture					
Mean	24.24	27.62	27.16	25.12	22.55
Std. Dev.	1.27	1.61	1.46	1.06	6.35
Minimum	21.25	24.03	23.61	21.94	0.00
Maximum	26.77	30.53	30.10	27.73	26.98
Observations	475	476	475	475	475
Elementary Education					
Mean	23.47	27.62	27.16	25.12	22.55
Std. Dev.	1.37	1.61	1.46	1.06	6.35
Minimum	19.80	24.03	23.61	21.94	0.00
Maximum	26.53	30.53	30.10	27.73	26.98
Observations	472	476	475	475	475
Mean					
Mean	23.02	27.62	27.16	25.12	22.55
Mean	1.36	1.61	1.46	1.06	6.35
Std. Dev.	20.27	24.03	23.61	21.94	0.00
Minimum	25.65	30.53	30.10	27.73	26.98
Maximum	475	476	475	475	475
University and Higher Education					
Mean	21.93	27.62	27.16	25.12	22.55
Std. Dev.	1.39	1.61	1.46	1.06	6.35
Minimum	18.28	24.03	23.61	21.94	0.00
Maximum	24.46	30.53	30.10	27.73	26.98
Observations	475	476	475	475	475
Technical Education					
Mean	20.32	27.62	27.16	25.12	22.55
Std. Dev.	2.22	1.61	1.46	1.06	6.35
Minimum	0.00	24.03	23.61	21.94	0.00
Maximum	23.71	30.53	30.10	27.73	26.98
Observations	476	476	475	475	475

Source: Authors' compilation

Recent Working Papers

- 447 **The Relationship Between Economic Growth and Carbon Emissions in India**
Kaumudi Misra
- 448 **Tax Revenue in India: Trends and Issues**
Pratap Singh
- 449 **Technical Efficiency of Unorganised Food Processing Industry in India: A Stochastic Frontier Analysis**
Padmavathi N
- 450 **Demonetisation 2016 and Its Impact on Indian Economy and Taxation**
Pratap Singh
- 451 **Impact of Perform-Achieve-Trade Policy on the Energy Intensity of Cement and Iron and Steel Industries in India**
Kaumudi Misra
- 452 **Impact of Non-Cognitive Skills on Cognitive Learning Outcomes: A Study of Elementary Education in India**
Indrajit Bairagya and Rohit Mukerji
- 453 **Assessment of Vulnerability to Floods in Coastal Odisha: A District-Level Analysis**
Niranjan Pradhan and S Madheswaran
- 454 **Who Benefits from Higher Education Expenditure? Evidence from Recent Household Survey of India**
Ramanjini and Karnam Gayithri
- 455 **How the Modern Food Retail Chains Emerging as Alternative Channels of Agricultural Marketing? Evidence from Karnataka**
Kedar Vishnu, Parmod Kumar and A V Manjunatha
- 456 **Educational Development, and Household and Public Expenditures on Education in Manipur**
Reimeingam Marchang
- 457 **Social Audit of MGNREGA - A Panacea or a Placebo? Issues and Ways Forward in Karnataka**
Sanjiv Kumar and S Madheswaran
- 458 **State, Religion and Society: Changing Roles of Faith-Based Organisations in Kerala**
Abdul Raoof
- 459 **Single Child Families in Tripura: Evidence from National Family Health Surveys**
N Pautunthang and T S Syamala
- 460 **MGNREGA Ombudsman a Forlorn Scarecrow: Issues and Ways Forward in Karnataka**
Sanjiv Kumar and S Madheswaran
- 461 **Dynamics of Procurement of Modern Food Retail Chains: Evidences from Karnataka**
Kedar Vishnu and Parmod Kumar
- 462 **Determinants of Micro-Level Decisions of Sugarcane Farmers**
Lavanya B T and A V Manjunatha
- 463 **Assessing Quality of Higher Education: An Empirical Study of Commerce Graduates, Kerala State**
Indrajit Bairagya and Bino Joy
- 464 **Farmers' Perception on Risk and Management Strategies in Mahanadi River Basin in Odisha: An Economic Analysis**
Jayanti Mala Nayak and A V Manjunatha
- 465 **An Analysis of Revenue Diversification Across Select Indian States**
J S Darshini and K Gayithri
- 466 **Urban Governance in the Context of Urban 'Primacy': A Comparison of Karnataka and Andhra Pradesh**
Anil Kumar Vaddiraju
- 467 **Urban Financing and Accountability Structures - Case Study of Bruhat Bengaluru Mahanagara Palike**
Shankari Murali and S Manasi
- 468 **Status of Unorganised Food Processing Industry in India - A Study on Key Performance Indicators**
Padmavathi N
- 469 **Sustainability of India's Current Account Deficit: Role of Remittance Inflows and Software Services Exports**
Aneesa Chitgupi
- 470 **BCIM Economic Corridor and North East India**
Reimeingam Marchang
- 471 **The Nation and Its Historical Mediations: Towards Typologies of Regions/States**
Anil Kumar Vaddiraju
- 472 **Structure and Functions of Social-Ecological Systems: A Case Study from Indian Sundarbans**
Sneha Biswas
- 473 **Multiple Vulnerabilities in Utilising Maternal and Child Health Services Across Regions of Uttar Pradesh, India**
Prem Shankar Mishra and T S Syamala
- 474 **Fertility at the Crossroads of Ethnicity and Gender: Understanding Oraon Tribe in Jharkhand, India**
Ujjwala Gupta
- 475 **Complexities of Collaboration, Negotiation and Contestation: Agramee and the State**
Ambuja Kumar Tripathy
- 476 **International Best Practices of Apprenticeship System and Policy Options for India**
K Gayithri, Malini L Tantri and D Rajasekhara
- 477 **Public Healthcare Infrastructure in Tribal India: A Critical Review**
Mohamed Saalim P K
- 478 **Whether Caste Impedes Access to Formal Agricultural Credit in India? Evidence from NSSO Unit Level Data**
Karthick V and S Madheswaran
- 479 **Harmonization of Intellectual Property Rights Across the Globe: Impact on India's Pharmaceutical Exports**
Supriya Bhandarkar
- 480 **Decentralization and People's Participation in Educational Governance: A Review of International Experiences**
Mahima Upadhyay and D Rajasekhara

- 481 **Initiatives in Solid Waste Management: A Case Study of the City of Bengaluru**
Natasha Kalra and S Manasi
- 482 **Agrarian Change in Bihar: A Study of Two Villages**
Prashant Kumar Choudhary
- 483 **Information Asymmetry, Exclusion and Inclusion Errors and Elite Capture of MGNREGA: Critical Examination of IEC Strategies in Karnataka and Ways Forward**
Sanjiv Kumar, S Madheswaran and B P Vani
- 484 **Political Regimes and Religious Minorities in Karnataka: 2008-2018**
Azhar Khan Chikmagalur Akbar
- 485 **Economic Estimation of Health and Productivity Impacts of Traffic Congestion: A Case of Bengaluru City**
Vijayalakshmi S and Krishna Raj
- 486 **Economic Development in the Princely State of Jammu & Kashmir (1846-1947)**
Sardar Babur Hussain
- 487 **Local Government and Decentralized Natural Resource Management**
Mahima Upadhyay
- 488 **Agrarian Distress and Farmer Suicides in Kerala**
Ance Teresa Varghese
- 489 **Ownership of Firms and Their Implication for Productivity: An Empirical Investigation in to Indian Mining Industry**
Meenakshi Parida and S Madheswaran
- 490 **Determinants of Agricultural Credit in Rural India by Social Group**
Karthick V and S Madheswaran
- 491 **Knowledge and Practice of Ethno-Medicine by Jaunsaris in Jaunsar-Bawar Region of Uttarakhand**
Geeta Sahu
- 492 **MGNREGA Quality Monitoring and Multiplier 'Malai' for the Richer States and Regions: Evidence on Elite Capture of Assets in Karnataka and Ways Forward**
Sanjiv Kumar, S Madheswaran and B P Vani
- 493 **Interests and Participation of Elites in MGNREGA: Lessons from Elite Capture in Karnataka**
Sanjiv Kumar, S Madheswaran and B P Vani
- 494 **Values Concerning Children and Fertility Behaviour: Method, Respondents and Preliminary Insights from the Field in Jharkhand, India**
Ujjwala Gupta
- 495 **Preparedness to Monsoon Diseases in Kuttanad (Kerala)**
Bejo Jacob Raju and S Manasi
- 496 **Livelihood and Social Capital in Vulnerable Ecosystems: A Case Study from Indian Sundarbans**
Sneha Biswas and Sunil Nautiyal
- 497 **Eco-Innovations in Waste Management - A Review of High Point Cases**
S Manasi and Harshita Bhat
- 498 **The Impact of Civil Aviation Growth on CO₂ Emissions in India: Evidence from a Time Series Analysis**
Priyanka Saharia and Krishna Raj
- 499 **The Implementation of Domestic Violence Act in India: A State-Level Analysis**
Anamika Das and C M Lakshmana
- 500 **Development Paradox and Economic Development of SCs and STs since India's Independence with Special Reference to Karnataka**
Krishna Raj
- 501 **Emerging Agrarian System and Its Impact on Caste Relations and Local Politics: A Study in the State of Bihar**
Prashant Kumar Choudhary
- 502 **Factors Influencing Urban Residential Water Consumption in Bengaluru**
Kavya Shree K and Krishna Raj
- 503 **COVID-19 Pandemic and Primary Education in India: Does It Cause More Inequality Between Public and Private Schools?**
Indrajit Bairagya, S Manasi and Roshan Thomas
- 504 **Social Capital and Tapping Community-Based Organisation's Convergence Potential with MGNREGA: A Micro Study in Karnataka**
Sanjiv Kumar and S Madheswaran
- 505 **Benchmarking of Bangalore Water Supply and Sewerage Board (BWSSB)**
Kavya Shree K and Krishna Raj

Price: ₹ 30.00

ISBN 978-81-951228-4-4



INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE

(ISEC is an ICSSR Research Institute, Government of India
and the Grant-in-Aid Institute, Government of Karnataka)

Dr V K R V Rao Road, Nagarabhavi P.O., Bangalore - 560 072, India

Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008

E-mail: balasubramanian@isec.ac.in; Web: www.isec.ac.in