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Abstract

The present study attempts to assess the potential determinants of economic growth at the state-level for 27 Indian states for the period 2000-01 to 2021-22. We also incorporate a quantitative variable, *unspent funds as a proportion of total budgeted expenditure*, to control for the quality of governance, along with other macroeconomic and structural factors. The paper finds a negative and statistically significant impact of *unspent funds* on the per capita GSVA growth of the states under study at the aggregate level. In addition, we also evaluate the unique growth experiences of different states separately without assuming a homogeneous response of the explanatory variables on the growth processes of all states which might assist the policymakers in offering explanations for the better or worse performing states with respect to the same macroeconomic variable.

JEL Classification: C23, O10, O11, O14, O40, L80

Keywords: GSVA Growth, Unspent Funds, Feasible Generalised Least Squares, Industry, India

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1. Introduction

Following the standard and endogenous growth theory, a considerable section of the literature has evaluated the contribution of an array of variables in influencing the economic growth of a particular region such as sectoral composition, human capital, investment on infrastructure, technological development etc. In recent times, however, the quality of institutions has received a renewed attention as an important determinant of per capita growth and, in turn, has been an upcoming area of research in the growth theory literature. It, therefore, becomes imperative that we explore the role of institutions in influencing economic growth, in the Indian context.

Since the neoclassical growth theory, the empirical literature on an economy's determinants of economic growth has grown manifold. With the focus shifting from the capital-based theories of growth (Solow, 1956), the proponents of the endogenous growth theory filled the perceived gap in the literature by focusing on the accumulation of human capital (Uzawa, 1965; Nordhaus, 1969; Romer, 1990)[2]. The inability of the Solow model to explain the cross-country evidence of income differences led the endogenous growth theorists to model the evolution of technology or ideas by incorporating a production function that exhibits increasing returns to scale in all the inputs (Romer, 1986, 1990). The role played by geographical variations along with spatial differences in driving differences in economic growth across countries has also attracted the attention of several studies where they evaluate the role of natural resources, distance from coastal regions, share of primary exports, urbanization rate, mining etc. (Gallup et al., 1999; Sachs et al., 2002; Gylfason and Zoega, 2006) to evaluate the extent to which differences in geography can explain income differences across economies. Based on the seminal works of Acemoglu et al. (2001, 2005) and Glaeser et al. (2004), amongst others, a growing literature has also pointed the link between economic growth and institutional quality in an economy.

A substantial section of the growth theory literature has explored the role of social, economic and political institutions as a determinant of economic growth in the

[2] See Doré and Teixeira (2023) for a comprehensive review of growth literature.

context of developing nations (Saha and Gounder, 2013; Mullings, 2018; Saha and Sen, 2021). By using a sample of 100 countries for the period 1984-2016 and various indices for corruption and democracy, Saha and Sen (2021) examine the effects of corruption on economic growth through the lens of the prevailing political regime. The authors find a negative and statistically significant impact of corruption along with a positive impact of democracy on per capita growth of the countries. However, higher levels of corruption entail a negative impact on growth even in the presence of a democratic government. Also, there exists the phenomenon of the East Asian paradox, whereby certain East Asian nations display high growth despite corruption and restricted democracy. Taking a step further, Saha and Gounder (2013) detect a non-linear relationship between corruption and the level of growth in a panel of 100 countries. The authors find a concave relationship because corruption increases at lower levels of income per capita till a threshold level of per capita income is reached and starts to fall once the turning point is crossed, especially in the case of low-income countries (LICs). Once the LICs cross a threshold income level of USD 1211.9, the persistence of corruption in the LICs begins to decline on the back of higher remuneration to the officials, regulatory enforcement and prevalence of law and order. In a seminal paper written in recent times, Rodrik (2000) discussed the importance of institutions and evaluated the role of several institutions (property rights, regulatory institutions, macroeconomic stabilization etc.) in driving economic growth. Using a sample of 93 countries and dividing them based on democracy, he reported large fluctuations in long-term growth that can be seen in the case of 'more restrictive democracies' as against 'more liberal democracies. In addition to the impact on economic growth, the literature has also looked at the influence of institutions on profitability of firms (Sharma and Mitra, 2015), renewable energy consumption and emission of CO2 (Danish and Ulucak, 2020, trade flows (Francois and Manchin, 2013), trade costs (Hou et al., 2021) and foreign aid (Dollar and Levin, 2006), amongst others.

A strand of literature has evaluated the role of government in driving economic growth from the lens of government size, mainly for advanced economies

(Dar and Amirkhalkhali, 2002; Bergh and Henrekson, 2011; Kim et al., 2018. There seems to be no consensus on the role of the government's size (as proxied by tax revenue, government's consumption, government's expenditure etc.) in spurring economic growth (Plosser, 1992; Fölster and Henrekson, 2001; Bergh and Karlsson, 2010). While a positive association can stem from the government's role in the protection of property rights and ensuring the rule of law, a negative relationship can be a result of taxes, which drive a wedge between prices and suppress economic activity, thus dampening economic growth. However, most studies in the literature have mostly focused on the set of advanced or developed countries as a sub-group, with scarce attention being paid to the group of developing economies.

In the Indian context, a number of authors have analysed the determinants of economic performance (Nagaraj et al., 2000; Sastry et al., 2003; Cortuk and Singh, 2015; Soni and Subrahmanya, 2020; Sanyal and Singh, 2021; Panda and Sahay, 2022; Ghosh and Kaustabh, 2024, among others). Much of this research has majorly evaluated the impact of physical determinants of growth which includes variables such as urbanisation, extent of structural transformation, financial development indicators *such as* growth in bank deposits and bank branches etc. with limited emphasis being laid on institutions as a '*fundamental*' cause of growth (Rodrik, 2002).

The aforementioned studies, however, did not assign an important role to the quality of governance or institutions at the sub-national level[3]. One study which comes close is carried out by Nirola and Sahu (2019) who examined the impact of government size (as measured by state-level government expenditure as a share of SGDP) in influencing the per capita GSDP of 23 states, for the period 2005-2014. By using a static as well as dynamic econometric framework, the authors establish a negative and statistically significant impact of the size of the government on GDP per capita growth. Further, the authors use the Social Progress Index as an indicator of the quality of institutions at the state-level and arrive at the conclusion that

[3] One notable exception to this is the launch of the Good Governance Index in 2019, initiated by the Union government, which ranks the various states by comprehensively assessing their performance in 10 sectors, including governance. The bi-annual nature of the exercise, however, limits its usage.

institutional quality does not have a statistically significant impact on per capita economic growth, per se. However, the negative impact of government's size on economic growth is attenuated by higher institutional quality. The presence of underdeveloped and incomplete markets, especially in a developing economy such as India assigns a distinctive role to the state governments with respect to the formulation of budgets as well as its effective utilisation and monitoring as a way to ensure efficient outcomes. Non-spending of funds by governments is not only synonymous with absence of decision making but also signals fault lines in the prevailing institutional setup (Desai and Randeria, 2020). For instance, the CAG of India reported in its Performance Audit of National Health Mission (NHM) for the period 2011-12 to 2015-16, that certain states, as a result of remaining unspent balances, diverted the funds to other schemes[4]. During 2016-17, the total expenditure under NHM (including the allocated budget as well as previous unspent balances) was just 57%. In certain cases (such as MGNREGS), the budgeted funds might also be borrowed from the markets by the government which also imposes an additional burden of debt servicing (Bhanumurthy et al., 2014). A sustained trend of funds going unspent can also lead to reluctance on the part of the policymakers to reduce the allocation since a delay in the scheme's implementation can give an idea that additional funds for a scheme are not necessary (Bhanumurthy et al., 2014; Pernechele et al., 2021). Additionally, unspent funds can also imply difficulties in the implementation of a social schemes that should be addressed. With a special focus on the MGNREGS scheme, Bhanumurthy et al. (2014) attribute a higher proportion of unspent balances to poor projections of work demand at the state-level, inefficiencies in local capacities, lopsided release of funds etc.

Following the toolkit provided by the *State of Governance Framework* by the Government of India, which ranks bi-annually, the quality of governance in the Indian states based on five dimensions (*namely;* political, legal, administrative, economic and social). The framework employs a total of 123 indicators, which quantitatively or

[4] https://sansad.in/getFile/loksabhaquestions/annex/14/AU2433.pdf?source=pqals

qualitatively measure the above five components of governance. In line with the above framework, as an indicator of administrative efficiency, the present study utilises '*unspent funds as a proportion of total budgeted expenditure (revenue plus capital) on social and economic services'* for the states under study[5]. To the best of our knowledge, our study is one of the first in the literature to model the economic growth of Indian states by incorporating a quantitative variable to control for the quality of governance, along with other macroeconomic and structural factors. *Second*, instead of aggregating the impact of an explanatory variable across all the states, we evaluate the heterogeneous nature of the explanatory variables in influencing the growth performances of different states by using the random coefficient regression framework (Swamy, 1970; Swamy and Arora, 1972). This will assist the policymakers in offering explanations for the better or worse performing states with respect to the same macroeconomic variable. Our study establishes that, at an aggregate level, while *relative share of industry* and *HDI* drive per capita GSVA growth, *relative share of services* and *unspent funds* have a negative impact on per capita growth. Once we account for heterogeneity in the impact of various growth determinants across states, the study finds that unspent funds negatively impact per capita growth in only seven out of 25 states. Additionally, the relative share of industry has a positive impact on per capita growth in only 16 out of 25 states. The present study has been divided into four sections. In the next section, we describe the data and the methodological framework used in the study. In *Section 3*, we discuss the results. *Section 4* concludes.

[5] While ***social services*** comprise education, sports, art and culture, medical and public health, family welfare, water supply and sanitation, housing, urban development, welfare of SCs, STs and OBCs, labour and labour welfare, social security and welfare, nutrition, expenditure on natural calamities and others, ***economic services*** include rural development, food storage and warehousing, special area programmes, Irrigation and flood control, energy, industry and minerals, transport and communications, science, technology and environment and general economic services.

2. Data and Methodology

2.1 Data

For investigating the determinants of per capita economic growth of states, the study employs a panel data set for 27 states for the period 2000-01 to 2021-22. The dependent variable in the analysis is GSVA per capita growth (at 2011-12 prices)) ($grth\_pcgsva$) which was obtained by using the splicing technique for the period before 2011-12. Similarly, the share of the *primary*, *industry* and *tertiary* sectors in GSVA was also obtained for the required years by splicing the sectoral GSVA series. To facilitate a comparison between the respective role of the industrial and the tertiary sector vis-à-vis the primary sector, the analysis uses the ratio of the share of industrial sector to primary sector (ind_prim) and tertiary sector to primary sector ($tert\_prim$) as determinants of GSVA per capita growth. To control for the initial conditions, the study also employs the (logarithm of) initial per capita GSVA (Szirmai, 2012). Following the endogenous growth models, the study also attempts to capture the role of human capital (*in particular*, health and education) in driving GSVA per capita growth at the state-level by employing the non-income components of HDI or, in particular, the geometric mean of health and education index (Romer, 1990). In line with the existing literature, we have also controlled for **forest area (as a share of total geographical area of the state)** to account for the geographical variation across states, in terms of forest areas. High forest covers have a negative connotation for the economic development of a state as they represent foregone economic activities for the states (Droste et al., 2018). Acknowledging these constraints, 12th, 13th and 14th and 15th Finance Commissions also provided additional compensation to states by way of 'Environmental/Ecological Fiscal Transfers' to compensate their cost and efforts of forests conservation and expansion. The data on state-wise forest areas has been collected from the various issues of the *State of the Forest Reports,* released by the Ministry of Environment Forest and Climate Change. Similarly, the analysis also attempts to control for the phenomenon of *the "resource curse,"* by including $mining\ as\ a\ share\ of\ GSVA$, especially for states that are characterised by

large endowments of natural resources (Hota and Behera, 2019). On the other hand, higher endowments of natural resources have also been found to drive economic development in the presence of well-developed institutions (UNCTAD, 2006; Hota and Behera, 2019). As an indicator, to measure the above, we calculate the *share of mining and quarrying in GSVA* for the 27 states in the sample, using the data provided by the CSO.

Following the literature that identifies opposing effects of urbanisation on per capita growth (see Sachs et al., 2002; Calì, 2008, Nguyen and Nguyen, 2018 (for ASEAN)), Panda and Sahay, 2022), the present study attempts to examine the association between urbanisation (as a per cent of total population) and per capita GSVA growth, using the Census data. Additionally, the study controls for the share of inbound tourists (domestic as well as foreign) as a share of total tourists using the data from Ministry of Tourism at the state-level. In a globalised world, the rising share of domestic and foreign tourism (especially medical tourism) in India's GSDP and its resilience has been underscored as an important driver of per capita growth of states. In 2019-20, tourism created almost 80 million jobs, direct as well as indirect, with more than 5 per cent contribution to India's GDP and almost 6 per cent to exports (Ministry of Tourism, 2022, NITI Aayog, 2022). Following the standard growth literature, the study uses capital expenditure of states (as a per cent of GSVA), credit-deposit ratio and agricultural credit (rural plus urban) as a share of primary sector GSVA (Mohan, 2006; Gulati and Juneja, 2019; Narayanan, 2015; Chakraborty and Shukla, 2020). Finally, to measure governance quality, the study takes *unspent funds (Budget Estimates-Actual) as a proportion of total budgeted expenditure (revenue plus capital) on social and economic services* as an indicator of the government's willingness to employ the budgeted expenditure efficiently and channelize them into correct avenues.

2.2 Methodology

In the present study, we have employed the Feasible Generalised Least Squares (FGLS) estimation framework, in a panel data set up to explore the relationship between per capita economic growth and its determinants. In addition to controlling for heteroscedasticity, the FGLS technique also controls for autocorrelation both within and across panels. In terms of efficiency, based on Monte Carlo studies, FGLS outperforms Ordinary Least Squares (OLS) with smaller standard errors (Bai et al., 2020).

Following the growth literature, we can specify **(1)**, which indicates how an economy's per capita growth is associated with its determinants.

$$g_i = \beta x_i + \epsilon_i \quad \textbf{(1)}$$

While $\boldsymbol{g_i}$ is an indicator for per capita growth, $\boldsymbol{x_i}$ is a vector of explanatory variables which have a bearing in the determination of $\boldsymbol{g_i}$ and $\boldsymbol{\beta}$ denotes the coefficient estimates. To shed light on the specific role played by each of the above variables in explaining $\boldsymbol{g_i}$, we estimate the following equation:

$$grth\_pcgsva_{it} = \alpha + x_{it}\beta + (\lambda_t + v_{it}) \quad \textbf{(2)}$$

Where, λ_t denotes the time trend and v_{it}denotes the i.i.d error term, with other variables similar as defined above. Table 1 provides a complete description of the variables employed in the study in addition to the data sources.

Table 1. Variables description

Short-ID	Description	Source
grth_pcgsva	Growth rate of PCGSVA (in per cent)	MoSPI
lnpcgsvaini	Initial ln (PCGSVA (in INR lakhs))	MoSPI
ind_prim	Ratio of industry to primary sector's share	MoSPI
tert_prim	Ratio of tertiary to primary sector's share	MoSPI
forest area	Forest cover as a per cent of Total Geographical Area	State of Forest Report (Various years)
mining	Share of mining in GSVA (in per cent)	MoSPI
urban	Urban population as a share of total population (in per cent)	Population Projection Report
HDI	Geometric mean of the health and education indicators of the Human Development Index (HDI))	Global Data Lab, Radboud University
tourists	Share of tourists (domestic and foreign) as a per cent of total (all-India) (in per cent)	India Tourism Statistics (Various years)
capex	Total capital disbursements (excl. public accounts) as a share of GSVA (in per cent)	E-STATES Database (RBI)
CD ratio	Credit deposit ratio (in per cent)	RBI
agri credit	Agric. credit (rural plus urban) as a share of agricultural GSVA (in per cent)	EPWRF
unspent funds	Unspent funds (Budget-Actual) as a proportion of total budget on social and economic services to measure budget utilisation for social and economic services.	E-STATES Database (RBI)
t	Time trend	
COVID	Dummy variable (1; 2020-21 and 2021-22 and 0; otherwise)	

While the above estimation technique only sheds light on the generalised results for the Indian economy as a whole, it is imperative to understand the growth experiences of individual states and differential role played by various growth determinants in each state. To further our understanding of state-level experiences, we employ the Swamy (1970) and Swamy and Arora (1972) estimation technique to ascertain the state-specific coefficient estimate of the explanatory variables. We can model the economic growth of state i in the following manner:

$$y_i = \beta_i x_i + u_i \tag{3}$$

Here y_i and x_i denotes the per capita growth of a state and the vector of determinants of y_i, respectively. u_i denotes the i.i.d error term which has zero mean and constant variance. We can represent the state-specific β_i as a sum of a common parameter β and v_i.

$$\beta_i = \beta + v_i \tag{4}$$

Here, v_i denotes the i.i.d. error term with zero mean and zero covariance with u_i (i.e., E $(v_i u_j') = 0$). Swamy (1970) suggests a *random coefficient estimator* which is consistent and asymptotically efficient and allows us to estimate panel specific coefficients, under the assumption of common mean and variance-covariance matrix for the entire data.

3. Results and discussion

Table 2 displays the descriptive statistics (including mean, standard deviation, median, maximum and minimum) for all the variables under study.

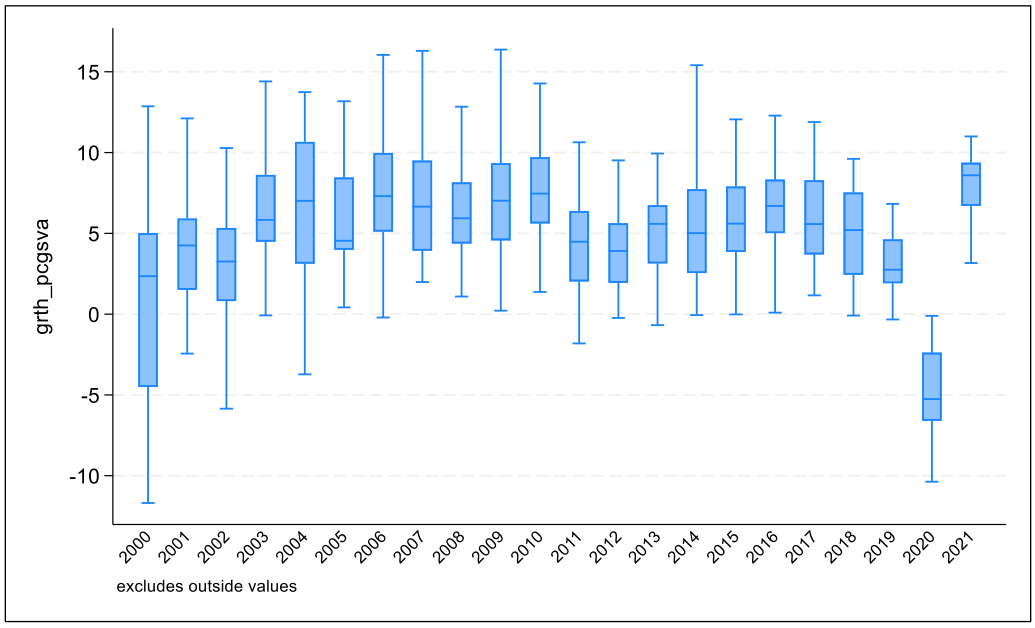
Table 2. Descriptive statistics (2000-01 to 2021-22)

Variable	Mean	Standard Deviation	Median	Maximum	Minimum	N
grth_pcgsva	5.20	6.07	5.29	71.59	-17.27	602
ind_prim	1.53	1.59	1.03	10.54	0.10	602
tert_prim	2.11	1.22	1.70	7.15	0.52	602
forest area	36.15	27.17	9.75	91.26	2.18	600
urban	28.32	12.07	26.47	64.04	9.8	556
HDI	0.62	0.07	0.62	0.79	0.43	602
tourists	3.46	4.94	1.51	21.85	0.001	529
capex	6.01	4.26	4.70	27.442	0	601
CD ratio	50.52	23.75	44	131.5	12.4	599
agri credit	13.59	14.18	8.91	74.56	0.22	574
unspent funds	5.68	14.30	7.09	54.21	-49.60	540

Figure 1A displays the trend in the per capita GSVA growth for all the states combined for the period 2000-01 to 2021-22. The median per capita growth in 2000-01 and 2019-20 was found to be 2.34 per cent and 2.74 per cent, respectively. Resultant of the COVID-19 pandemic, the median per capita growth fell sharply to -5.25 per cent, recovering, thereafter, to 8.59 per cent in the sample of the states under study. An analysis of the real per capita GSVA growth at the state level reveals wide variations in the per capita growth experiences of the states despite similar median per capita growth rates (Figure 1B). While Meghalaya, Assam and Uttar Pradesh are the states with the lowest median growth per capita for the period 2000-01 to 2021-22,

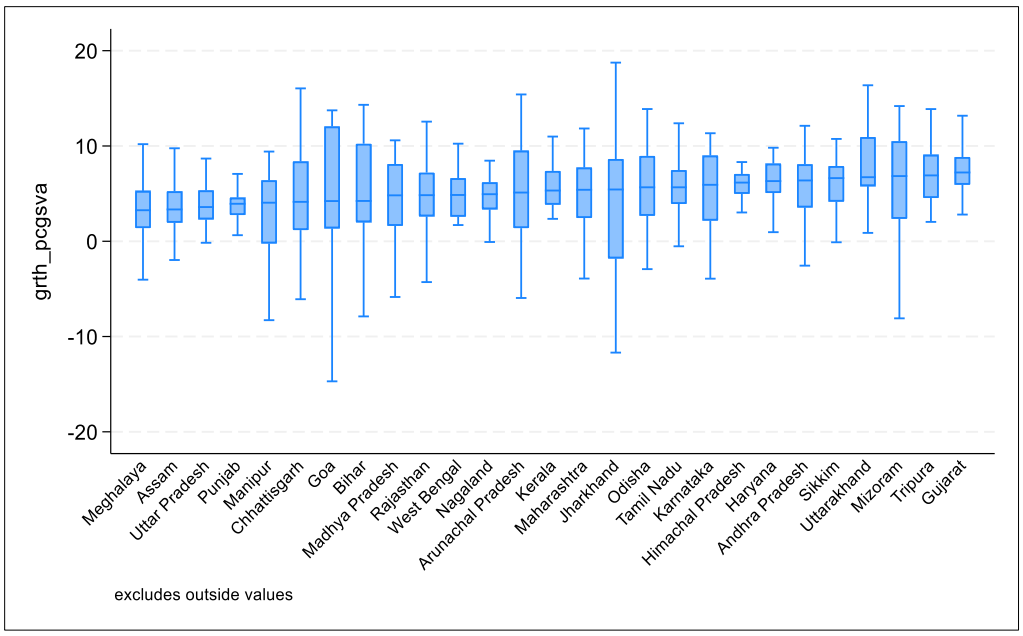
Mizoram, Tripura and Gujarat displayed the highest median per capita growth for the above period.

Figure 1A. Trends in GSVA per capita growth (in per cent) (2000-01 to 2021-22)



Source: Author's calculations

Figure 1B. State-wise progress in GSVA per capita growth (in per cent)



Source: Author's calculations

Next, we present the correlation matrix (Table 3) for all the variables under study. The table indicates a positive correlation between the share of industrial sector (as a ratio of the primary sector) and per capita economic growth (0.12). On the other hand, unspent funds are negatively associated with per capita growth at the state level (-0.18). Following this, we evaluate the trends in the trajectory of unspent budget on social and economic services (as a per cent of total budget on social and economic services) and GSVA per capita growth (in per cent).

Table 3. Pairwise correlation matrix (2000-01 to 2021-22)

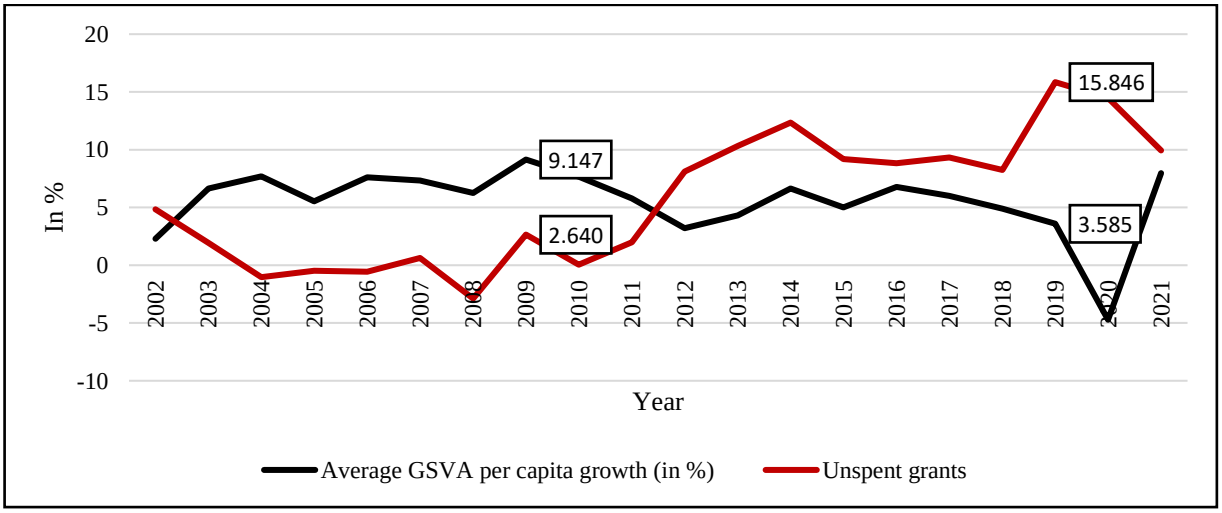
Variable	grth_pc gsva	ind_prim	tert_ prim	forest area	urban	HDI	tourists	capex	CD ratio	agri credit	unspent funds
grth_pcgsva	1										
ind_prim	0.12	1									
tert_prim	0.01	0.65	1								
forest area	0.01	-0.002	0.07	1							
urban	0.002	0.28	0.41	0.02	1						
HDI	0.02	0.45	0.60	0.30	0.41	1					
tourists	-0.02	0.03	0.15	-0.47	0.30	-0.11	1				
capex	0.04	-0.17	-0.10	0.57	-0.18	-0.02	-0.25	1			
CD ratio	-0.003	0.17	0.37	-0.42	0.44	0.13	0.48	-0.35	1		
agri credit	-0.07	0.18	0.48	-0.40	0.20	0.34	0.39	-0.30	0.52	1	
unspent funds	-0.18	0.05	0.07	-0.01	-0.15	0.14	-0.09	-0.26	-0.03	0.12	1

Source: Author's calculations

Figure 2 plots the relationship between average per capita GSVA growth (in per cent) and unspent funds (in per cent) for the period 2002-03 and 2021-22. On average, *unspent funds* were positive for most of the years (except four) during the analysis. In other words, the budget for social and economic services was *overspent* for only four periods, namely 2004-05, 2005-06, 2006-07 and 2008-09. During the period of study, the share of unspent funds peaked in the year 2019-20 (15.84%) followed by the second-highest ratio of 14.47% in the year 2020-21. On average, for the period of study, Assam (24.07%), Meghalaya (21.19%), Chhattisgarh (13.27%), Punjab (13.18%) and Uttarakhand (12.43%) recorded the highest proportion of unspent balances. A disaggregated analysis of the unspent funds on social and economic services (for all states and UTs) into their respective *revenue* and *capital* components has been undertaken in Figure 3. The figure sheds light on the significant unspent

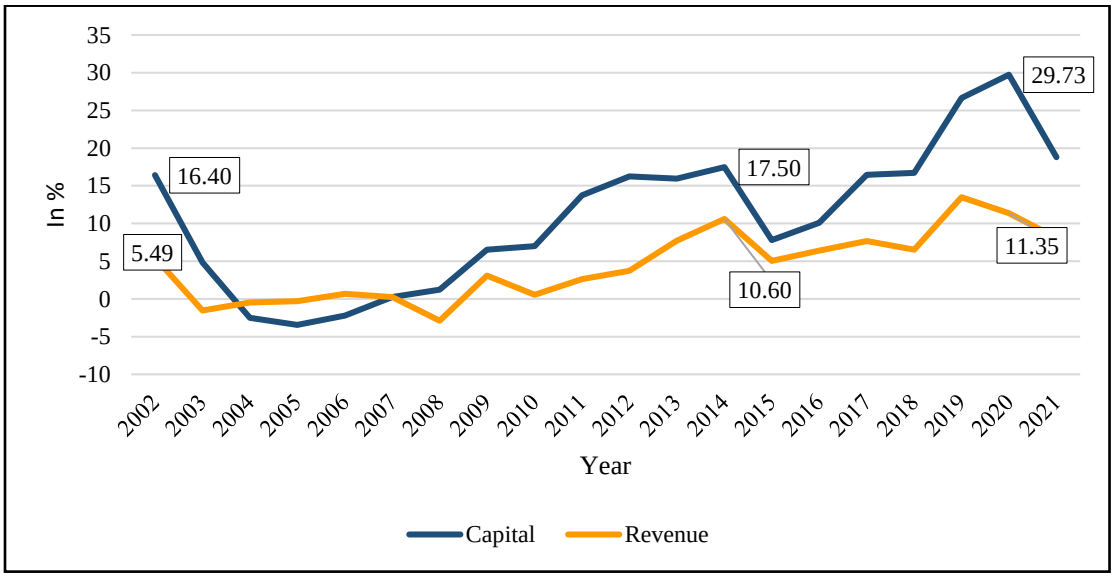
capital outlay on social and economic services which has exhibited a rising trend over the years vis-à-vis the revenue part. Given the committed nature of the revenue expenditure, there is found to be limited deviation between the budgetary resources and actual expenditure of the states. For instance, during the period of study, the average unspent funds with respect to the revenue expenditure of all states was a meagre 4.41 per cent as against 10.88 per cent of capital expenditure. In fact, during 2020-21 and 2021-22, the state governments were able to spend only approximately 70 per cent and 81 per cent of their budgeted expenditures on capital outlay, including both social and economic services, respectively. In contrast, the actual amount of revenue expenditure for the same period was hovering around 89 per cent and 92 per cent respectively.

Figure 2. Relationship between unspent funds (in %) and GSVA per capita growth (in %)



Source: Author's calculations

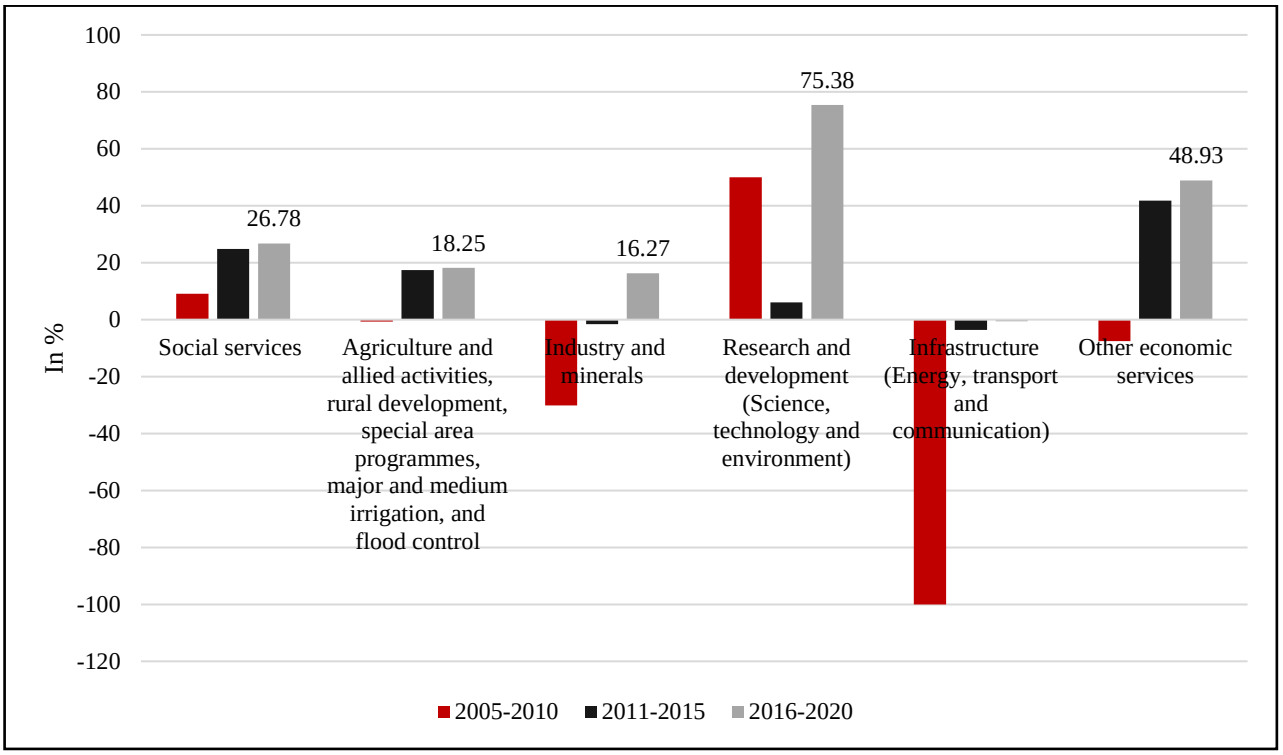
Figure 3. Breakdown of unspent funds (Capital versus Revenue components)



Source: Author's calculations

Further, we disaggregate the capital expenditure in several categories (i.e., social services, agriculture and allied activities, rural development, special area programmes, major and medium irrigation, and flood control, industry and minerals, research and development (science, technology and environment), infrastructure (energy, transport and communication) and other economic services) to analyse the share of unspent funds in each of these categories at the all-India level for the period 2005-10, 2010-15 and 2015-2020. As can be concluded from the figure, unspent funds (as % of total budget) have increased across all the categories over time. Apart from *other economic services*, *social services* and *research and development* reported the highest unspent funds vis-à-vis other categories of capital expenditure to the extent of 26.78 per cent and 75.38 per cent during 2015-20, respectively.

Figure 4. Capital expenditure: Unspent funds (Sectoral view)



Source: Author's calculations

In the following sub-section, we adopt the Feasible Generalised Least Square (FGLS) framework to capture the influence of unspent funds on GSVA per capita growth (along with other explanatory variables). Before we report the regression results, we check for the presence of heteroscedasticity and serial correlation in the continuous variables in the present study. Table 4 reports the results of the likelihood ratio (LR) test for testing heteroscedasticity and the HR test for first-order serial correlation. The null hypothesis for the LR test is that the data is homoscedastic, as against the alternative that there is heteroscedasticity present in the data. In the case of the HR test for serial correlation (Born and Breitung, 2016), the null hypothesis is specified as the absence of first-order serial correlation, with the alternate hypothesis specified as the presence of first-order serial correlation in some variables.

Table 4. Test for heteroscedasticity and serial correlation

Variable	HR-Statistic
$grth\_pcgsva$	-0.42
ind_prim	-2.20**
$tert\_prim$	-2.17**
$forest\ area$	-0.30
$urban$	-2.87***
HDI	-8.49***
$tourists$	.
$capex$	2.13**
$CD\ ratio$	1.66*
$agri\ credit$	-3.79***
$unspent\ funds$	2.85***
LR-χ^2(df)	323.74***

*Source: *** , ** and * denotes statistical significance at 1 per cent, 5 per cent and 10 per cent level of significance. Gaps in data led to no calculation of the HR-statistic for tourists*

With the χ^2 statistic being rejected at 1 per cent level of significance, we can say there is heteroscedasticity present in the dataset. The HR test (Born and Breitung, 2016) for serial correlation also confirms the presence of first-order serial correlation in, ind_prim, $tert\_prim$, $urban$, HDI, $capex$, $CD-ratio$, $agri\ credit$ and $unspent\ funds$. Following the presence of heteroscedasticity and serial correlation in our dataset, we prefer the FGLS estimation framework over other techniques. Table 5 reports the coefficient estimates for the explanatory variables obtained by the FGLS estimation framework. In all the models, the results affirm the positive and statistically significant role played by the share of industry (as a per cent of primary sector). In Model (4), the coefficient estimates suggest that the industrial sector (*as a ratio of primary sector*) (ind_prim), human capital (HDI) and financial inclusion ($CD\ ratio$) have a positive and statistically significant impact on the dependent variable, i.e.,$grth\_pcgsva$.

Table 5. Growth regressions

(Dependent Variable: *GSVA per capita growth (in per cent*)

Variable	Model 1 (Full Sample)	Model 2 (Full Sample)	Model 3 (Full Sample)	Model 4 (Full Sample)	*Special Category States*	*General Category States*
1	*2*	*3*	*4*	*5*	*6*	*7*
lnpcgsvaini	0.12	-0.02	-0.94	-1.55**	0.98	*-1.69**
ind_prim	0.77***	0.85***	0.83***	1.10***	0.86	*1.28***
tert_prim	-0.42**	-0.46**	-0.47*	-0.78***	0.88	*-0.77***
urban		0.01	0.003	-0.01	-0.17*	-0.0007
HDI		-1.13	7.80	15.71***	25.83*	14.03**
forest area			-0.01	-0.01	0.10	-0.03
mining			0.05	0.03	0.33*	0.01
tourists			-0.05	-0.05	0.80	-0.05
capex				0.03	-0.13	0.11
CD ratio				0.023**	-0.05	0.02**
agri credit				-0.004	-0.08	-0.02
unspent funds	-0.05***	-0.05***	-0.06***	-0.04***	-0.08**	-0.03**
t	-0.03	-3.63***	-0.09***	-0.16***	-0.11	-0.09
covid	-3.56***	-3.63***	-3.84***	-9.43***	-7.22***	-10.23***
Constant	5.98	6.58	11.68**	13.17**	-21.20	15.13*
Wald Chi^2	58.44***	119.27***	87.96***	340.96***	60.19***	263.14***

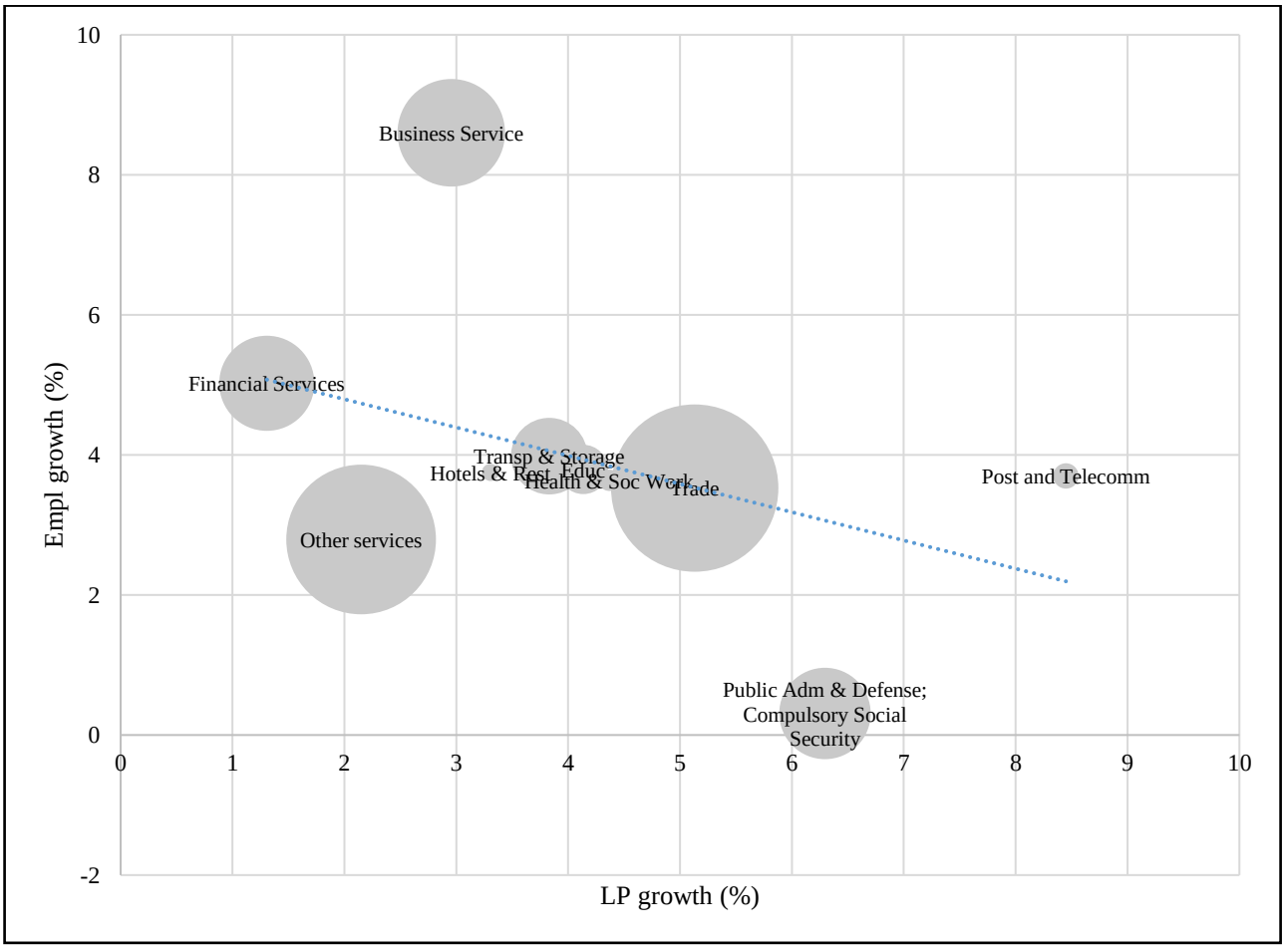
*Notes: ***, ** and * denotes statistical significance at 1%, 5% and 10% level of significance, respectively*

We obtain a negative impact of the initial per capita income ($lnpcgsva\_ini$), service sector ($tert\_prim$), unspent funds as a share of budget estimates ($unspent\ funds$) and the COVID dummy ($COVID$). The negative coefficient of the $lnpcgsvaini$ variable (-1.55) confirms the conditional convergence hypothesis (Nagaraj et al., 2000; Adabar, 2004; Nayak and Sahoo, 2022) which implies that states with initial low per capita incomes have displayed a higher per capita growth rate vis-à-vis states that were initially well-off that have displayed low growth of per capita incomes, on average, once we control for the impact of all other determinants of growth. By using a panel dataset of 17 states for the period 1990–2018, along with a sub-period analysis, Nayak and Sahoo (2022) find support for the hypothesis of absolute as well

as conditional convergence. However, the authors show that there has been a concomitant divergence in the income levels across the states, or in other words, the distribution of income across states has become more unequal over time. Despite the arguments concerning a stagnant manufacturing sector and premature deindustrialisation, the study shows a positive and statistically significant contribution of the industrial sector (as a share of primary sector) in achieving high per capita economic growth, at the state-level. Our findings are in line with the results of Kathuria and Natarajan (2013), who also report, using the data for 15 states for the period 1995 to 2006, the imperative role played by the manufacturing sector in driving per capita NSDP growth. Our study, in fact, finds a negative and statistically significant role played by the tertiary sector (as a share of the primary sector). Despite the significant share of the service sector in the aggregate Indian GDP and its well-documented contribution to aggregate growth, the present study sheds light on the negative contribution of the service sector to the GSVA per capita growth. While the negative sign appears counterintuitive to the traditional growth theory it is important to realise that the composition of service sector in India is dominated mostly by low-productivity or *'traditional'* service industries which are characterised by low labour productivity growth. Though the service sector is playing a prominent role in driving the aggregate GDP growth of the Indian economy, the contribution to GSVA is mostly made by *'low-productivity'* industries (Basole, 2022). The average labour productivity of the service sector (adjusted for labour quality) for the period 2000-01 to 2019-20 was 3.318 vis-à-vis 4.10 for the industrial sector (RBI KLEMS). As can be witnessed from Fig 5, *trade* contributed the maximum value-added (10.55%) but displays an average productivity growth rates of 5.13%, over the period 2000-01 to 2019-20, combined with an employment growth of 3.52%. Similarly, *posts and telecommunications* sector experienced substantial productivity growth rate of 8.45% but contributed only a meagre 1.6% to the value-added of the economy during the same period only witnessing an employment growth of 3.7%. One defining characteristic of the service sector in the Indian economy is that employment growth is concentrated in mostly service industries which are characterised by low rates of

productivity growth and in turn, drive down the overall productivity of the economy (see the literature on *Baumol's cost disease* (Baumol, 1967; Fernandez and Palazuelos, 2012; Basole, 2022)). Business services, for example, attracted the maximum labour force which resulted in an employment growth of 8.6%. This stands in sharp contrast to its productivity growth of around 3% over the period 2000-20.

Fig 5. Average labour productivity growth (%), employment growth (%) and share in value-added (%) (2000-01 to 2019-20)



Source: Author's' calculations using India KLEMS database

In line with the endogenous growth theories, as propounded by Uzawa (1965), Nordhaus (1969) and Romer (1986; 1990), there is a positive and statistically significant impact of (non-income) Human Development Index (HDI) on GSVA per capita growth which reaffirms the imperative role played by better health conditions

and educational outcomes in the overall development of the states (Dholakia, 2003; Bassanini and Scarpetta, 2002; Viswanath et al., 2009; Mukherjee and Chakraborty, 2010). Additionally, credit-deposit ratio (in per cent) ($CD\ ratio$), an indicator of financial development, is also found to have a positive association with per capita GSVA growth, thus, implying that the financial inclusion policies by the government have a positive influence on economic development of the states. A number of the government schemes transfer the monetary or cash benefits directly to the beneficiaries using the DBT system which enables speedy payments with little or no leakages by employing the financial services infrastructure. In terms of magnitude, a 1 unit increase in the credit-deposit ratio will improve per capita GSVA growth by 0.023 per cent, on average. The COVID dummy also reiterates the stark decline in per capita growth, indicating a 9.43 per cent decline in economic growth per capita for the COVID years (2020-21 and 2021-22) (Bertrand et al., 2020). The negative and statistically significant coefficient of $unspent\ funds$ in all the four models above reaffirms the finding that insufficient budget utilisation is hampering the economic growth of states, which, in turn being an indicator of governance implies that governance or institutional quality plays an imperative role in the determination of economic growth of a state. On average, if unspent funds as a share of budget estimates increase by 1 per cent, the average GSVA per capita growth will reduce by 0.04 per cent (Column 5).

To analyse the growth prospects of states with *special category* status (i.e., Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand), we also explore the engines of growth in these 10 states (*Column 6*). In Column (6), we present the results from the FGLS estimation framework for the special category states. As can be glanced from the table, while $unspent\ funds$ and $urban$ have a negative and statistically significant impact on GSVA per capita growth (in %) in the *special category* states, mining as a share of GSVA as well has HDI pulled up per capita GSVA growth (in %). Notably, the negative impact of unspent funds on GSVA growth for the *special category* states exceeds that of the full sample (-0.08% versus -0.04%). Also, human capital plays a

much more significant role in driving growth in *special category* states vis-à-vis the full sample. To ensure the results are not impacted by the splicing of the GSVA series, we also calculated the coherency measure between the GSVA numbers calculated at the current prices and the spliced series. The (squared) coherency between the two series exceeded 0.95 and was statistically significant at 5 per cent level of significance. This implies that the results for the coefficient estimates are not impacted by the splicing of the GSVA numbers[6].

Although the above coefficient estimates assist in understanding the major drivers of growth at an all-India level, they also mask substantial variations in the growth performances of individual states. Table 6 provides the differential in the economic performance of the states in our sample as well as the differentials in other control variables with respect to the sample average. As can be seen from Table 6, states such as Arunachal Pradesh, Assam, Bihar, Jharkhand and Madhya Pradesh etc., display less than average per capita GSVA growth (in per cent) for the entire period of study. On the other hand, Gujarat, Mizoram, Tripura and Uttarakhand witnessed above-average growth rates over the period of study (*5.19 per cent*). Similarly, the (non-income) HDI was found to be above the sample average *(0.62)* for Goa, Kerala, Sikkim, Tamil Nadu etc. For the states of Assam, Meghalaya, Punjab and Uttarakhand etc., the share of unspent funds differential (in per cent) way exceeded the average *(5.68 per cent).*

[6] We also tested for a non-linear relationship by including a squared term for $tert\_prim$. The coefficient estimate was, however, statistically insignificant.

Table 6. Differentials from the average value among all the 27 states (2000-01 to 2021-22)

State	Per capita growth differential (%)	Secondary sector differential (%)	Tertiary sector differential (%)	HDI differential (Index)	Urbanisaton differential (%)	Capex differential (%)	Credit deposit ratio differential (%)	Unspent funds differential (%)
Andhra Pradesh	0.68	-0.80	-0.93	-0.05	1.77	0.45	35.80	5.13
Arunachal Pradesh	-0.11	-1.11	-1.22	-0.01	-4.95	11.98	-19.80	-21.29
Assam	-1.31	-0.85	-0.85	-0.03	-14.34	-2.12	-18.58	18.39
Bihar	-0.66	-0.84	0.08	-0.09	-17.15	-0.05	-15.99	5.43
Chhattisgarh	-0.43	-0.40	-0.98	-0.02	-6.35	-2.00	-2.84	7.59
Goa	0.53	3.42	1.11	0.10	27.18	-1.40	3.11	1.75
Gujarat	1.34	0.37	-0.49	-0.03	11.59	-2.37	-5.86	-9.11
Haryana	0.65	-0.13	-0.17	0.01	3.63	-2.77	9.66	-1.15
Himachal Pradesh	0.41	0.84	-0.01	0.05	-17.87	0.18	-15.79	-8.60
Jharkhand	-1.53	0.03	-0.58	-0.01	-4.94	-0.72	-17.73	2.75
Karnataka	0.32	0.38	2.01	-0.01	8.09	-2.72	38.45	-9.08
Kerala	0.08	0.30	1.88	0.12	4.99	-3.78	11.18	3.05
Madhya Pradesh	-1.07	-0.84	-1.05	-0.08	-0.88	-0.52	7.33	-7.00
Maharashtra	-0.22	0.12	0.75	0.03	15.95	-3.39	33.90	-1.80
Manipur	-2.87	-0.83	0.66	0.07	-0.58	7.35	-9.43	6.03
Meghalaya	-2.07	-0.59	-0.02	-0.02	-8.02	-0.24	-13.02	15.51
Mizoram	1.51	-0.51	0.40	0.04	23.02	5.11	-12.89	-15.77
Nagaland	0.52	-1.16	-0.35	0.02	-6.66	4.74	-19.80	-0.70
Odisha	0.27	-0.52	-0.90	-0.07	-12.11	-1.23	-6.79	2.33
Punjab	-1.32	-0.76	-0.67	0.02	7.90	-2.50	11.72	7.50
Rajasthan	-0.73	-0.76	-0.90	-0.07	-3.97	-1.86	24.37	-4.38
Sikkim	4.02	4.02	1.74	0.02	-11.41	4.28	-13.33	1.44
Tamil Nadu	0.68	1.16	1.55	0.04	19.22	-2.94	37.83	-7.13
Tripura	1.41	-1.10	-0.71	0.01	-7.43	1.96	-17.79	3.93
Uttar Pradesh	-1.45	-0.61	-0.53	-0.08	-6.47	-0.62	-1.74	0.42
Uttarakhand	2.16	1.73	0.41	0.05	-1.67	-2.01	-16.23	6.74
West Bengal	-0.81	-0.53	-0.24	-0.02	1.44	-2.83	-5.73	-1.99
Sample average	5.19	1.53	2.10	0.62	27.91	6.11	49.78	5.68

Source: Author's calculations

The above differentials necessitate the evaluation of the unique growth experiences of different states separately without assuming a homogeneous response of the explanatory variables on the growth processes of all states. By employing the random coefficient framework as propounded by Swamy (1970) and Swamy and Arora (1972), we avoid the unrealistic assumption of a constant slope for each explanatory variable across all the states under study (say, the coefficient on HDI is the same for Andhra Pradesh and Kerala). The Wald test also rejected the null hypothesis of parameter constancy as against that of parameter heterogeneity, thus, validating that the assumption of a common parameter estimates across cross-sections is not tenable. Table 7 reports the state-wise coefficient estimates of the parameters of the growth equation by using the Swamy (1970) and Swamy and Arora (1972) random coefficient estimation technique for 25 states[7]. As can be witnessed from the table, the pandemic had a unanimous negative and statistically significant impact on per capita GSVA growth of all the states (with a few exceptions such as Assam, Tamil Nadu, Meghalaya, Chhattisgarh and Uttarakhand). Similarly, the share of industry (as a ratio of primary sector) has a positive and statistically significant impact on the growth experience for 16 out of 25 states. The service sector share has a negative impact on the per capita GSVA growth experiences of 12 states (with an exception of Sikkim where manufacturing and services both drive GSVA per capita growth). Though the share of Madhya Pradesh in area under dense forest cover is among the highest in India, Table 7 shows that there is no significant negative impact on the state's per capita growth[8]. In the case of Arunachal Pradesh and Chhattisgarh, which also have a significant share of geographical area under dense forests, there appears to be a significant negative association between state's growth and forest cover. While Table 5 suggests that, on an average, human capital drives economic growth, it can be seen from Table 7 that HDI has a positive and statistically significant impact on per

[7] Due to insufficient data points, the coefficient estimates for Goa and Manipur cannot be calculated.
[8] https://fincomindia.nic.in/archive/writereaddata/html_en_files/fincom15/StudyReports/Forest%20Conservation%20through%20fiscal%20federalism.pdf

capita growth in only six out of 25 states in our sample (*Madhya Pradesh, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal*). This warrants the need to pay attention, at the state-level, to the returns on education for different levels (say, *primary, secondary and tertiary education*) along with the employability of the labour force in line with their level of education.

The variable of interest i.e., *unspent funds* negatively impact the GSVA per capita growth in all different specifications of the model in Table 5. In the case of random coefficient regression results (Table 7), however, unspent funds has a negative and significant impact only in the case of seven states (i.e., Andhra Pradesh, Assam, Bihar, Chhattisgarh, Meghalaya, Sikkim and Tamil Nadu).

Table 7. State-level panel Random Coefficient Regression results
(*Dependent Variable: GSVA per capita growth)*

S. No.	State	*covid*	*ind_prim*	*tert_prim*	*forest area*	*mining*	*urban*	*HDI*	*capex*	*CD ratio*	*agri credit*	*unspent funds*
1	Andhra Pradesh	(-)										(-)
2	Arunachal Pradesh	(-)	+		(-)	(-)			(-)			
3	Assam		+		(-)							(-)
4	Bihar	(-)	+	(-)								(-)
5	Chhattisgarh		+	(-)	(-)	(-)	(-)					(-)
6	Gujarat	(-)	+	(-)								
7	Haryana	(-)	+	(-)					+			
8	Himachal Pradesh	(-)	+	(-)	(-)							
9	Jharkhand	(-)										
10	Karnataka	(-)										
11	Kerala	(-)										
12	Madhya Pradesh	(-)	+	(-)			(-)	+				
13	Maharashtra	(-)	+	(-)	(-)							
14	Meghalaya											(-)
15	Mizoram	(-)										
16	Nagaland	(-)										
17	Odisha	(-)	+	(-)					+			
18	Punjab	(-)										
19	Rajasthan	(-)		(-)								
20	Sikkim	(-)	+	+		+						(-)
21	Tamil Nadu		+	(-)		(-)	(-)	+			(-)	(-)
22	Tripura	(-)	+					+			(-)	
23	Uttar Pradesh	(-)	+	(-)	(-)			+		(-)		
24	Uttarakhand		+					+		(-)		
25	West Bengal	(-)	+	(-)				+				

*Source: *, ** and *** denotes statistical significance at 10%, 5% and 1% levels of significance, respectively*

4. Conclusion

The study aimed to uncover the age old question of the important drivers of economic growth with a lens on the quality of governance at the state-level. Using a panel dataset of 27 states for the period 2000-01 to 2021-22, the study investigates what drives per capita GSVA growth at the state-level, using several variables such as shares of industrial and tertiary sector, domestic and foreign tourist inflow, (non-income) HDI, along with several geographical and financial variables, by employing the FGLS technique. Using *utilisation of budget for social and economic services* as an indicator of governance quality, we find a negative and statistically significant relationship between GSVA per capita growth and unspent budget on social and economic services, which highlights the detrimental impact of administrative inefficiencies, delay in release of funds, poor projections of work demand etc. on economic growth at the state-level. Given the meagre expenditure on health and education by the state as well as the central government, the rising trend of unspent budgets on social and economic services does not augur well for the country since a significant proportion of the population benefits from public expenditure on these heads as against private expenditure. The results for both general category as well as special category states demonstrate a negative influence of unspent funds on GSVA per capita growth, at an aggregate level. The study also finds a negative association between per capita GSVA growth and service sector's share (as a ratio of primary sector's share). While the results sound counterintuitive given the prominence of the service sector in India's present growth story, the results are in line with the dominance of the low-productivity service industries in the service sector which might drive down aggregate productivity growth.

To account for heterogeneity among states, the study also goes ahead and estimates the parameter estimates for various control variables for each state separately. In particular, only seven out of 25 states (including both special and general category states) report a negative association between unspent funds and GSVA per capita growth. Similarly, while HDI is seen to have a positive impact on growth in both special and general category states in the aggregate equation, a state-

wise analysis reveals a positive impact of HDI for only six states out of 25 states under study. It is, therefore, imperative to account for the heterogeneous impact of various explanatory variables on the growth processes of various states. By allowing the coefficient estimates to differ across states, the study attempted to examine the differential impact of the growth determinants, including governance quality, instead of imposing the assumption of equality of coefficient estimates which might turn out to be inappropriate given the differences in the structures of states in comparison to each other.

The present study, however, only employs one single indicator of governance quality as a determinant of the growth process. Future researchers might employ several other indicators such as accessibility to health services (PHCs), Public Distribution Services, water and sanitation etc. to gauge the overall influence of institutional quality on growth. Future studies can also attempt to employ state-wise data for high frequency indicators of growth such as automobile sales, GST collections, night time lights data etc. to understand the differences in growth procedures across the states over a longer time period.

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