

ISSN 0974-763X

UGC-CARE Listed Journal

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Special Issue

Volume 15, Issue No.2



April, 2025

**CHHATRAPATI SHAHU INSTITUTE OF BUSINESS
EDUCATION AND RESEARCH (CSIBER),
KOLHAPUR, MAHARASHTRA, INDIA**

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Published by
CSIBER Press, Central Library Building

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**South Asian Journal of Management Research
(SAJMR)**

Special Issue

Volume 15, Issue No. 2, April 2025

Editor: Dr. Pooja M. Patil

Publisher

CSIBER Press

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Chhatrapati Shahu Institute of
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Editorial Note

South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and disciplines.

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Dr. Pooja M. Patil

Editor

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ISSN: 0974-763X

Price: INR ₹ 1,200/-

Editor: Dr. Pooja M. Patil

Distributed By

CSIBER Press

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Business Education & Research (CSIBER)

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(SAJMR)
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The Socio-Economic Determinants of Service Sector Contribution in India - An Empirical Study Based on Sstate Level Panel Data

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Abstract

In this paper we empirically explore the factors that explain India's service sector share in state level gross value added for the period 1990-2023 on the basis of panel data of 33 states and union territories. The service sector share is explained with the help of socio-economic, governance, infrastructure indicators and urbanisation. Crucial interactive terms among development indicators are used in the panel regression. Our panel data regression results suggest that urbanisation, per capita net state domestic product, infrastructure indicators and social spending have significantly positive influences on state level service sector share in India. However, poverty, agricultural share and poor governance have depressing influences. Factors like labour force participation rate for urban areas and female literacy rate also augment the share of the services. Urbanisation is found to have positive and significant interactions with education, infrastructure and development indicators and these interactive variables have positively influences service sector share. We conclude that in India, share of services may increase further with greater urbanization, higher social sector spending coupled with improved infrastructure and governance.

Keywords: Service Sector, Urbanisation, Infrastructure, Socio-Economic Factors and Panel Data.

JEL classification: O14, O18, C23.

Introduction

The service sector, also known as the tertiary sector, includes a variety of economic activities covering health services, tourism and hospitality, trading, banking and insurance, transportation, education, community and personal services, construction and real estate, security, management and technical consultancy services among many others. Moreover through exports of services the sector also has a major impact on foreign exchange earnings and thus contributes greatly to economic growth and development. India is a labour surplus country and in order to absorb workers in the non-agrarian sector, there is an urgent need to shift to the tertiary sector given that India's manufacturing is not much labour absorbing. This is because employment elasticity with respect to output in manufacturing is low, as a consequence of which labour absorption capacity of modern manufacturing is extremely limited (Bhalotra, 1998).

In recent years, India has experienced a rapid shift towards non-agrarian economic activities with service sector contributing to more than fifty five percent to gross value added at the national level. A comparison of the sectoral shares over time reveals that since the 1990s till date, India's structural shift has gone against agriculture and allied activities. The agricultural activities contributed around 28 percent to gross value added back in 1991-92 but this share is currently just about 16 per cent. Interestingly, manufacturing sector had a share of around 26 percent in 1991-92 and even after three decades this share has roughly remained the same. In contrast, the service sector has been growing both in real value as well as in terms of the share in gross value added and it currently contributes more than fifty percent to gross value added. The Economic Survey 2019-20 (chapter 9, pp.254), shows that share of services exceeded fifty percent of Gross Value Added for 15 of the 33 states and Union Territories of India. For highly urbanized union territories like Delhi and Chandigarh contribution from the service sector is more than 80 percent. The global shift in FDI in favour of the services sector has been recognised by Doytch and Uctum (2011) although the focus of their study is economic growth. According to Gordon and Gupta (2005), a possible explanation behind the rapid growth of this sector is that the demand for service is income elastic as a result of which demand for service rises faster than the demand for goods as income increases.

The process of urbanisation is usually accompanied by a rise in urban incomes which potentially leads to the rising demand for basic urban services like housing and construction, water and energy supplies, transport and communications (including telecom), and most importantly health and educational services. Urbanisation also necessitates demand for financial services such as banking, finance, and insurance, besides a range of utility services that are usually associated with urban living and urban life-styles. During the post-1991 era, the

percentage of urban population of India has increased from 26% in 1991 to 28.53% in 2001 (Census of India, 2001). More recently World Bank data reveals that the percentage of urban population in India has further risen up to 36.36 per cent in 2023-24. It is natural that with rising urbanisation, service industries would respond to meet the ever rising demand for services.

According to the World Bank, in 1991-92 India's employment share in agriculture and allied activities was 63.41 percent which dropped to 40.65 percent in 2019-20. In case of manufacturing industries India's employment share was 14.57 percent in 1991-92, which grew up to 25.25 percent in 2019-20 and further to 26.12 percent in 2022-23, indicating a steady rise in employment share in manufacturing over time. In case of the service sector, the employment share grew from 22.02 percent in 1991-92 to 34.10 percent in 2019-20. Thus in case of India, the decline of agricultural share in total employment has been associated by a rise in employment share both in manufacturing as well as in services.

Table 1. Percentage share of GDP across broad sectors for selected countries							
Regions	Country	1991-92			2019-20		
		AGRI	INDUS	SERVS	AGRI	INDUS	SERVS
SOUTH ASIA	India	27.66	26.44	37.79	16.76	24.59	50.08
	Bangladesh	31.68	21.12	44.36	11.98	32.85	50.85
	Sri Lanka	27.09	25.90	47.02	7.26	29.19	55.75
SOUTH EAST ASIA	Thailand	12.65	38.66	--	8.13	33.59	58.28
	Malaysia	14.36	42.11	44.82	7.24	37.48	54.15
	Korea	6.82	37.15	47.15	1.67	32.68	57.24
	China	24.03	41.49	34.48	7.14	38.59	54.27
	Vietnam	40.49	23.79	35.72	11.78	36.80	42.47
Advanced Industrial	UK	1.23	26.72	68.73	0.60	17.66	71.09
	France	2.61	24.30	62.82	1.52	17.42	70.04
	Australia	3.17	27.65	61.30	1.04	28.80	69.63

Source: Secondary data drawn from the World Bank.

Notes: Construction has been accommodated under services. Figures are in (%).

For most of the OECD countries around the world "services" is the largest component of their economies. Table 1 presents the percentage shares of sectors in respective GDPs for selected countries for two different years - 1991-92 and 2019-20. The figures show that for advanced industrial countries the service sector contributes around 70 percent to GDP, despite being manufacturing giants in absolute terms. Among South Asian countries India's agricultural contribution dropped from around 28 percent in 1991-92 to almost 17 percent in 2019-20. However, the service sector share picked up from 38 percent in 1991-92 to around 50 percent in 2019-20. For Sri Lanka however, agricultural contribution dropped from 27 percent in 1991-92 to just 7.26 percent in 2019-20. Share of services rose up to almost 56 percent in 2019-20 from 47 per cent in 1991-92. Similarly, among Southeast Asian countries, Vietnam's agricultural contribution dropped from 40 percent to almost 12 percent over the past three decades. For China however, the agricultural share was even lower at about 7 percent. India's agricultural share on the other hand, is the highest among the countries considered in table 1. Evidently, India's agricultural share did not decline in line with South Asian, ASEAN, and advanced industrial countries.

A couple of observations are in order. First, India's industrial share in GDP was below 25 percent in 1991-2019 (a drop from 26.44 % in 1991-92 to 24.59 % in 2019-20) while most Southeast Asian countries have had an industrial share of around 35 percent, considerably higher than India's. Second, during the post reforms era, India's structural transformation has been away from agriculture but has not moved significantly in favour of manufacturing industries but has rather moved more in favour of the tertiary or the services sector.

The focus of the present paper is entirely on service sector share as because the relative importance of the sector can be more appropriately captured by its share in state level gross value added (GVA). The statistics on service sector shares in GVA across India for 2019-20 (Economic Survey 2019-20, vol. 2, Table 3, pp. 256) reveals some remarkable disparities. For example, Delhi (84.1%), Chandigarh (86.7%), Karnataka (65.4%), Telengana (64.7%), Kerala (62.7%), Maharashtra (57.6%) and West Bengal (57.5%) among few others, have formidable shares of the service sector in state GVA. At the other extreme, states like Uttar Pradesh (48.8%) Jharkhand (44.8%), Odisha (41.8%), Uttarakhand (40.5%), Tripura (39.7%), Chhattisgarh (37.1%), Madhya Pradesh (35.9%) among a few others have service sector shares far below the national average. Two significant exceptions are Gujarat and Bihar. While Bihar, a primarily poor state (26.59% below the poverty line as per head count ratio

in 2011-12¹), had a service sector share of 61.1 percent in 2019-20, Gujarat had a service sector share of just 35.7 percent in the same year. Admittedly, industrial share of Gujarat² was at 44.50 percent, currently amongst the highest for Indian states. Table A1 in Appendix 1, presents the state-wise sectoral shares (%) in state level Gross Value Added (GVA) for India for 1991-92 and 2023-24 where industry has been merged with services. Computations are on the basis of RBI data for sectoral shares in GVA. Although wide inter-state variations exist in the shares for the same year, it is evident that almost all states have a higher service sector share in 2019-20 compared to 1991-92. Moreover agricultural share has dipped for most states with industrial or manufacturing share remaining the same or improving marginally. The objective of the study is presented next.

Research Objectives

The key objective of this paper is to explain state level share of the service sector across Indian states and union territories for the period 1990 to 2023 on the basis of state level socio-economic indicators, governance indicators, infrastructure indicators and the level of urbanisation.

In line with this objective, the fundamental research question that we address in this paper is that, “can we explain service sector share across Indian states on the basis of urbanisation, development, infrastructure and governance indicators?” In view of our exploratory motive, we include urbanisation, infrastructure, governance, female literacy, labour force participation, poverty, access to safe drinking water, health attainments, per-capita income, along with a host of interaction terms under a panel regression framework to explain the share of the service sector across Indian states. This approach to exploring the determinants of service sector share across Indian states is not reported in literature and is thus unique.

This paper is presented in the following sections. After having introduced to the topic in section 1, we present a brief review of relevant literature in section 2 followed by methodological and data related issues in section 3. Empirical results and analysis are presented in Section 4 while section 5 summarizes the entire study and concludes.

Review of Literature

The fact that service sector contributes to economic growth and development is an empirically well observed and has been sufficiently reported. An overview of available literature reveals that the principal focus of most of the studies in this area has been on impact of the service sector (and even service sector trade) on economic growth (e.g., Balakrishnan and Parameswaran 2007, Eichengreen and Gupta 2011, Dash and Parida 2012, Dasgupta and Singh 2005, Verma 2010, Wu 2007, among others). However, just a handful of studies are available on the socio-economic determinants of service sector share especially in the Indian context where rapid urbanisation is a relatively recent phenomenon. Consequently there exists sufficient scope for empirical research in this area. This paper fills this gap by explaining India's state level service sector share in terms of urbanisation along with a host of relevant socio-economic factors.

In the early 1990's an academic debate had emerged that questioned the sustainability of rapid progress of the service sector in India in terms of its size and percentage share in national income. According to Bhattacharya and Mitra (1990), the ever rising trend experienced by the service sector share in India's national income is a matter of debate. The authors investigated the growth patterns of the service sector and its implications for overall growth and inequality in India during 1950-87. The study raised the question whether rapid growth of the service sector in India can be sustained over a long periods of time without serious implications on balance of payments, inflation, and distribution of income.

Gordon and Gupta (2005), analyze the factors that explain the growth of the services sector in India. The authors demonstrate that growth of service throughout the 1990s was mostly due to rapid growth in communications, financial, and IT services. Among other factors the authors identified high income elasticity of service demand, use of services as inputs and the exports of services. Moreover, they observe that there is a substantial scope for further growth of India's tertiary economy given that deregulation of this sector continues. Another key observation is that growth of employment in the Indian service sector has been moderate.

In a significant study Chakravarty (2006) examine inter-sectoral state level domestic product data to study the factors explaining the growth of the service sector in India. Adopting a demand-side approach, the analysis

¹ Reserve Bank of India: Handbook of Statistics on Indian Economy, Table 154: Number and Percentage of Population below Poverty Line. (2011-12).

² Directorate of Economics and Statistics of the Respective State/UTs (accessed at www.mospi.gov.in).

considers that the state specific service sector output is dependent on the outputs of its agriculture and industry as well as on the output of the commodity-producing sector. The findings indicate that, a state's own industry is the key determinant of service sector growth. However, the commodity-producing sector outside the state also plays a key role in determining the performance of the service sector at the state level.

Uwitonze and Heshmati (2016) observe that service sector is an appropriate mode of structural transformation as because most less developed countries have a weak industrial base. With the process of structural adjustment and globalization several African nations have shifted more towards the service sector. The study identifies factors that determine the development of the service sector. These factors could be used for framing policies towards rapid development of the service sectors. On somewhat similar lines Iqbal *et al* (2018) carried out a comparative analysis of chosen developed and developing economies to discern key factors influencing service sector growth. Employing both static and dynamic panel data estimation methods, the findings imply that trade openness has a dampening effect on the growth of the service sector. In both types of countries per capita GDP and FDI positively influence service sector growth. However, according to authors, trade openness seems to have a negative influence on the same. For less developed countries, innovations have a positive and significant role in determining service sector growth.

An ARDL approach was adopted by Raboloko (2018) to study the factors influencing the growth of the service sector in Botswana for the period 1980-2015. The findings indicate that positive contributions to the growth of Botswana's services sector originate from gross national expenditure, domestic credit to the private sector, and gross fixed capital formation. However, a negative impact is observed in case of trade openness. Atif and Liu (2018) investigate the factors influencing the expansion of service sector in Pakistan. The study finds that increased per capita income, capital accumulation, and urbanization foster positive growth in the service sector. However, the paper observes an adverse effect of trade liberalization on Pakistan's services growth.

Kolko (2010) is of the view that service sector dominates USA and other advanced economies and the economic future of urban centres depends crucially on the service sector. Focusing on agglomeration of service industries, the study finds that the service sector is relatively more urbanized compared to the manufacturing sector. Using co-integration, error-correction and Granger causality, Hong (2012) finds a long run equilibrium relation between urbanisation and service sector growth in China. In particular, findings suggest that urbanisation Granger-causes service sector growth implying a unidirectional causality. On somewhat similar lines, Cheng (2013) observes a dynamic relationship between urbanisation and service sector growth for China. The study observes that Chinese urbanisation has been responsible for rapid growth of service sector industries. Moreover based on co-integration and causality tests, the findings suggest that Chinese urbanisation and service sector have been closely association over time.

Our line of exploration in this paper is quite new and innovative where focus is on service sector share and its correlates. We take per capita net state domestic product, the degree of urbanization, infrastructure indicators like roads and electricity availability, educational attainments, poverty and other relevant socio-economic indicators as explanatory variables under a panel data set-up in order to investigate the factors influencing the share of the service sector in India. We also incorporate selected governance indicators such police availability per lakh population and transmission and distribution loss in electricity among a few others, and examine how they explain the state-level share of service sector. In line with Daniels (2012), we take urbanisation as a crucial explanatory factor behind contribution of the service sector and allow urbanisation to interact with several key explanatory variables including education and infrastructure in our state level panel regression.

Methodology and Data

Statistical and Econometric Methods

The present paper uses the panel data linear regression model in log-linear form where service sector share at the state level is taken as the dependent variables. Independent variables include macroeconomic variables, infrastructure variables, social sector and governance variables. All variables are appropriately normalized. Moreover variables are in natural logarithm except the linear time trend term which is included in the regression model as because service sector share for India is trended over the study period. Two significant advantages of logarithmic transformation of variables in linear regression are that, (i) the regression coefficients can be interpreted as the elasticities of service sector share with respect to various factors, and (ii) linearization of long-run macroeconomic data which usually is nonlinearly trended. Moreover it may assist in reduction of heteroscedasticity in the errors. Log-transformations can potentially make the data more normal or symmetric. Especially the skewness of a variable may be controlled to a large extent by logarithmic transformation.

Equations are obvious from the regression results presented in table 3 and hence are avoided. Particularly, in log-linear terms, service sector share (SERVS) at the state level (the dependent variable) is explained by per capita income (PCNSDP), the degree of urbanisation (URBAN, or share of urban population), share of agriculture and allied activities in GVA (i.e., AGRI), industrial or manufacturing sector share in state GVA (INDUS), head count poverty ratio (BPL in percentage), social sector spending (SSS, which is taken as the sum of state level government expenditures on health and education expressed in per capita terms), population density (DENSITY, persons per square kilometer), female literacy rate (FLR), life expectancy at birth (LEB), per capita capital expenditure (CAPEX), labour force participation rate for urban areas (LFPRU), per capita state level electricity availability (ELECT, in MW per capita), highway length per 100 sq.km state area (ROADS). Two governance indicators are taken as explanatory variables. These are transmission and distribution loss (i.e., TDL in percentage) and percentage of population having access to safe drinking water (SDW). TDL represents a leakage from the system and is hence an indicator of poor governance (Dash and Raja, 2009). In addition police availability per lakh population (POLICE) is taken as a crime control instrument at the state level. All variables are appropriately normalized.

In sum, in order to explain service sector share we take development indicators, infrastructure indicators (including infrastructure spending), social-sector spending per capita (SSS) and governance indicators as explanatory variables where urbanisation plays a pivotal role. The uniqueness of our panel regression lies in the inclusion of selected interaction terms with the degree of urbanization in the regression models. Highly correlated variables are avoided in the same regression model in order to tackle collinearity issues and as such three alternative log-linear models are presented where all variables are not included in all models. In order to adjust for serial correlation in the residuals a one period lagged SERVS term is introduced as a regressor which results in a dynamic panel data model. Throughout this paper we take construction as a part of the service sector. Variable definitions and data sources are provided in Appendix 2. FDI at the state level is not considered as it is available only for a handful of states over the study period.

Data

The time period for the present study is 1990 – 2023 (i.e., 33 years) covering 33 Indian states and union territories. The data for the present study is entirely secondary in nature primarily drawn from the RBI: Handbook of statistics on the Indian Economy (various issues), Census of India (1991, 2001, and 2011) and CSO (Ministry of Statistics and Programme Implementation), NHFS (various issues) and NCRB (various issues). To understanding the degree of association between variables a simple correlation analysis is also done as a precursor to panel regression. Also, models with regression coefficients that are statistically insignificant at 10 percent level are not reported. Detailed list of all variables, definitions and data sources are in Appendix 1. A critical econometric issue in our panel regression is whether our key explanatory variables namely, PCNSDP, URBAN and ELECT are exogenous in determining SERVS. In Appendix 2, we present the two stage least squares – instrumental variable (2SLS-IV) results for testing the exogeneity of PCNSDP, URBAN, ELECT and ROADS.

Empirical Results and Analysis

The simple bivariate correlation coefficients across selected pairs of most crucial variables are presented in Table-2. Referring to the SERVS column, service sector share is found to be significantly positively associated with PCNSDP as well as URBAN.

Variable	SERVS	PCNSDP	INDUS	URBAN	AGRI	LEB	BPL	SEX	FLR	ELECT	ROADS
SERVS	1.000										
PCNSDP	0.539 (0.000)	1.000									
INDUS	-0.564 (0.000)	0.199 (0.107)	1.000								
URBAN	0.722 (0.000)	0.742 (0.000)	0.211 (0.051)	1.000							
AGRI	-0.542 (0.000)	-0.771 (0.000)	-0.119 (0.054)	-0.713 (0.000)	1.000						
LEB	0.201 (0.041)	0.499 (0.000)	0.277 (0.049)	0.397 (0.000)	-0.223 (0.058)	1.000					
BPL	-0.094 (0.366)	-0.433 (0.000)	-0.333 (0.022)	-0.332 (0.011)	0.354 (0.013)	-0.298 (0.051)	1.000				
SEX	0.346	0.237	-0.015	0.346	-0.088	0.213	-0.110	1.000			

	(0.001)	(0.061)	(0.265)	(0.001)	(0.396)	(0.088)	(0.288)				
FLR	0.514 (0.000)	0.681 (0.000)	0.199 (0.056)	0.609 (0.000)	-0.616 (0.000)	0.012 (0.906)	-0.414 (0.000)	0.331 (0.004)	1.000		
ELECT	0.297 (0.004)	0.787 (0.000)	0.347 (0.031)	0.678 (0.000)	-0.578 (0.000)	0.381 (0.000)	-0.369 (0.000)	0.216 (0.036)	0.436 (0.000)	1.000	
ROADS	0.239 (0.019)	0.394 (0.001)	0.399 (0.019)	0.443 (0.007)	-0.102 (0.093)	0.356 (0.006)	-0.199 (0.054)	0.271 (0.008)	0.158 (0.088)	0.257 (0.052)	1.000

Source: Computed by the researcher based on state level secondary data.

Notes: The bivariate correlations are computed on the basis of panel data for the state level covering 33 states and UTs for the period 1990-91 to 2023-24. Included observations equal 798. Figure in parenthesis are P-values.

Richer and relatively more urbanization states tend to have higher share of the service sector in GVA. However, states that are agriculturally dominant have lower service sector share as is evident from the negative and significant correlation between service sector share and AGRI. Life expectancy at birth (LEB) is significantly positively associated with service sector share meaning that overall health status influences service sector contribution. Higher poverty ratio is a deterrent for the service sector share and this is evident from negative association between BPL and SERVS. Better sex ratio states and states with higher level of female literacy tend to have higher service sector share. Both the physical infrastructure indicators ELECT and ROADS are significantly positively associated with SERVS indicating that physical infrastructure is a vital social overhead requirement or a pre-requisite for a vibrant service sector. A key observation in the first column in Table 2 is the significantly negative association (correlation value being -0.564, significant at 1%) between service sector share (SERVS) and industrial sector share (INDUS). The overall implication is that in India, states with higher service sector share tend to have lower industrial share.

We next turn to our panel regression results. Table 3 presents three alternative log-linear dynamic panel regression models for state level panel data where the service sector share in state level gross value added (SERVS) is explained by a host of explanatory factors. The industrial share in GVA (i.e., INDUS) is kept as a regressor throughout all models in order to control for the influence of industrialization on SERVS.

Table 3. Panel regression of service sector share on state-level factors			
Explanatory Variables	Model 1	Model 2	Model 3
CONSTANT	-0.399 (0.111)	-0.437 (0.091)	-0.479 (0.099)
LOG(SERVS(-1))	0.738**(0.000)	0.739**(0.000)	0.738**(0.000)
LOG(PCNSDP)		0.133**(0.000)	
LOG(URBAN)	0.339**(0.000)		0.337**(0.000)
LOG(URBAN(-1))	0.002 (0.067)	0.011 (0.052)	0.001 (0.068)
LOG(AGRI)		-0.270**(0.000)	
LOG(BPL)	-0.091*(0.033)		-0.089*(0.043)
LOG(INDUS)	-0.131(0.132)	-0.119(0.114)	-0.147(0.213)
LOG(CAPEX)		0.556*(0.042)	
LOG(SSS)	0.009(0.058)	0.010(0.077)	0.017*(0.049)
LOG(ROADS)	0.045*(0.013)		
LOG(ELECT)		0.877*(0.047)	0.623*(0.039)
LOG(FLR)	0.001(0.091)	0.005(0.089)	
LOG(LEB)		0.312(0.059)	0.333(0.060)
LOG(TDL)	-0.141*(0.031)		-0.333*(0.047)
LOG(SDW)	0.017(0.069)	0.002(0.051)	
LOG(POLICE)	0.023(0.089)	0.031(0.097)	0.029(0.095)
LOG(SEX)	0.101(0.099)	0.099(0.101)	0.899(0.097)
LOG(LFPRU)		0.521(0.063)	0.545(0.097)
LOG(DENSITY)	0.013(0.087)	0.020(0.079)	
LOG(URBAN)*LOG(FLR)	0.029(0.066)	0.031(0.055)	0.176*(0.043)
LOG(URBAN)*LOG(ROADS)	0.008*(0.032)		
LOG(URBAN)*LOG(ELECT)		0.034*(0.048)	0.004*(0.033)
LOG(URBAN)*LOG(PCNSDP)		0.717 (0.067)	
LOG(URBAN)*LOG(LFPRU)	0.009*(0.037)		
LOG(URBAN)*LOG(SSS)		0.131 (0.064)	0.129 (0.049)
TIME	0.0006**(0.004)	0.0006**(0.008)	0.0006**(0.006)
Adjusted R-squared	0.811	0.811	0.812

F-statistic	286.62**	268.57**	297.36**
Durbin-Watson statistic	1.899	1.911	1.902
J-statistic (instrument rank)	2.478 (8)	2.586 (8)	2.333 (8)
(p-value)	(0.414)	(0.399)	(0.472)

Source: Estimated by the researcher based on secondary data.

Notes: (1) p-values are in parenthesis. (2) ** implies statistical significance at 1 percent and * implies the same at 5 percent, (3) Here *df* implies degrees of freedom. (4) No. of pooled observations is 1089, included observations equal 956. (5) Results are GMM estimates and are EVIEWS 10 generated.

In model 1, the degree of urbanization has a significant and positive influence on service sector share. Similarly an infrastructure factors like ROADS also has a significant and positive impact on service sector share. State level poverty has a negative and significant influence on service sector share. On the other hand the level of literacy has a positive influence on service sector share. The coefficient of TDL is statistically significant and negative (models 1 and 3) implying that poor governance states have lower service sector share. Both physical infrastructure in the form of ROADS and its interaction with urbanisation are significant and have positive influences on SERVS. Social sector spending (SSS, which covers both health and educational spending per capita) positively and significantly influence service sector share which suggests that service sector share depends crucially on the level of human capital. Sex ratio positively impacts service sector share and this is clear from the coefficient of SEX (insignificant only model 2 but significant at 10% levels in models 1 and 3). Importantly, the urbanisation-literacy interaction term is positive and significant implying that other things controlled, as education rises along with urbanisation, the service sector share rises. This interaction is most likely to act through the availability of skilled workers in the urban formal sector which depends largely upon education, infrastructure and work participation in non-agricultural activities. The URBAN-LFPRU interaction is also significant, indicating that other things unchanged, if work participation rises across similarly urbanized states, service sector share is expected to rise. Also, urbanisation interacts positively with ROADS and FLR (female literacy rate) implying that as infrastructure and educational attainments rise, the degree of urbanisation has an augmenting effect on service sector share.

Coming to model 2, PCNSDP has a positive and significant impact on service sector share. However, agricultural states tend to have lower service sector share, other things remaining constant. Very similar to model 1, poverty as measured by BPL depresses service sector share while both CAPEX and ELECT have significant and positive impacts. Life expectancy at birth, i.e. LEB as a measure of health status has a significantly positive role in explaining service sector share. The labour force participation rate for urban areas (LFPRU) has a positive coefficient that is significant at 10 percent (only in model 2, but insignificant in others) indicating that other things unchanged, LFPRU has a positive influence on service sector share. In both models 1 and 2, population density (DENSITY) is a significant and positive factor behind higher service sector share. This is expected as urbanisation and population density are positively associated (the simple correlation between URBAN and DENSITY is 0.473, statistically significant at 0.1%). The URBAN-FLR interaction is also positive and statistically significant (at 10%) in model 2. In addition, coefficients of URBAN-ELECT and URBAN-PCNSDP are both positive and statistically significant which suggest that among similarly urbanized states, the ones with better infrastructure and higher per capita incomes are expected to have higher service sector share, other things unchanged. The coefficient of SDW is consistently positive across models 1 and 2 indicating that better access to safe drinking water enhances SERVS.

Model 3 uses a slightly different combination of variables but findings are similar to those of models 1 and 2. In model 3, the URBAN-ELECT interaction is significant suggesting that is consistent with model 2 findings. All throughout, the coefficient of POLICE turns out to be consistently significant at 10 percent implying that availability of crime control instruments or the law and order infrastructure is a contributing factor behind the service sector share at the state level. The URBAN-SSS interaction term is positive and significant in models 2 and 3 (at 10% and 5% respectively) implying that social sector spending coupled with urbanization enhances the service sector share in GVA. The one period lagged urbanization variable, i.e., URBAN(-1) has a positive coefficient (significant at 10%) in all three models thereby indicating that lagged or past levels of urbanisation have an influence on service sector share at present, or else, urbanisation has a lagged effect on service sector share. This is consistent with the findings of Hong (2012) and Cheng (2013) for the Chinese economy who demonstrate that urbanisation is a key driving force behind growth of service sector.

Throughout all models a one period lagged dependent variable in the form of SERVS(-1) is included as a regressor to adjust for serial correlations in the residuals. The resulting Durbin–Watson statistics are satisfactorily close to 2.0, thereby suggesting the absence of serial correlation in the residuals. The coefficient of time is highly significant throughout and is positive implying that over the study period service sector share in India has a rising

trend. Throughout all models, industrial or manufacturing sector share (INDUS) is kept as a control factor although its coefficient is statistically insignificant.

On the whole, macroeconomic factors like the extent of urbanisation, per capita NSDP and infrastructure (social overhead) have positive impacts on service sector share at the state level. States with higher social overhead capital expenditures are able to sustain a higher service sector share in respective state domestic products. Social factors like female literacy rate, life expectancy at birth, access to safe drinking water and sex ratio have positive influences on service sector share. A unique finding in this paper is that urbanisation has a synergistic relationship with several development and macroeconomic indicators like education, infrastructure, and labour force participation and this synergy drives up the service sector share. Also, combined expenditure on education and health is a significant factor that augments the service sector at state level. In contrast, poverty, agricultural share and poor governance have depressing influences on the service share. Finally good governance in the presence of crime control instruments has a significant and positive role to play in shaping the service sector. The Sargan J-statistic is insignificant in each case which implies acceptance of the null hypothesis of zero covariance of the instruments with the error. This is also an adequate test for over-identifying restrictions in a regression model. We summarize our study and conclude in the following section.

Summary and Conclusions

India has shifted significantly in favour of the service sector and away from agriculture and allied activities ever since the onset of the economic reforms of 1991. With rapid urbanisation since the 1990s, the tertiary sector has emerged as the growth engine of the Indian economy especially in the new millennia with more than fifty five percent of gross value added accruing on account of the service sector including construction. In fact, urbanized states with developed infrastructure, and higher per capita incomes have a formidable share of the service sector, contributing about sixty percent to their respective state domestic products. Our findings in this paper suggest that there is a clear spatial pattern to India's service sector contribution. Poverty, infrastructure bottlenecks, educational backwardness, and poor governance have depressing influences on the state level service sector share. Arguably, agrarian states with higher poverty rates, lower educational attainments, coupled with limited urbanisation and backward infrastructure, find it difficult to create a vibrant services or tertiary sector. At the other extreme, highly urbanized cosmopolitan cities like Delhi –NCR and the union territory of Chandigarh are almost entirely dependent on services for their economic growth and development and thus contribute more than eighty percent of state level gross value added from services. In sum, socio-economic and development indicators like urbanisation, per capita NSDP, social sector spending, state level capital expenditure have significant and positive influences on service sector share. In addition, better governance along with law and order infrastructure also have augmenting effects on the service sector. Finally, a very unique finding is that urbanisation in conjunction with education, infrastructure, social sector spending and labour force participation act as catalysts for the expansion of the service sector.

In conclusion, the process of urbanisation necessitates both demand as well as supply of a wide range of essential services including construction. As the urban formal sector steps up supply to meet the emerging services needs of the urban population, sizable amounts of employment opportunities are created. Arguably, this results in an in-migration of work force into the urban centres which further enhances the pace of urbanisation and continues to trigger the demand for services. In future research, the socio-economic determinants of the service sector size and contribution needs to be studied on the basis of international evidence where the role of urbanisation in determining the service sector size and contribution to GDP could be investigated.

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