

## Understanding Service Sector Growth at Disaggregated Level: A Study of North East India

**Panchatapa Deshamukhya**

*Assam University, Cachar, Assam, India*

**Niranjan Roy**

*Assam University, Silchar, Assam, India*

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### Abstract

Dominance of service sector in India's national income is well documented. Presently this sector contributes around fifty percent of India's GDP (Gross Domestic Product). However the dynamics of economic growth within service sector is not uniform in different regions of the nation. The present study tries to understand trend, contribution and structure of sub-categories of the service sector in North East India during 1991 to 2014. The basis of this study is formed by the secondary data gathered from Handbook of Statistics on Indian Economy printed by RBI. The analysis shows a number of interesting facts about service sector in the region. Firstly, service sector growth shows a significant variation across different states of the region with Mizoram being the highest growing state in most of the years. Secondly, within service sector, Nagaland has experienced positive growth for most of the sub-sectors, whereas Arunachal Pradesh has shown negative growth for these sectors. It is observed that Mizoram and Nagaland have experienced relatively balanced contribution from different sub-sectors (of service sector). Thirdly, there is poor contribution of transport, trade and banking for most of the states. Finally, for individual sector, we have observed partial convergence of output among the states in the region. However, in respect of overall service sector structure, most of the states have experienced divergence.

**Keywords:** Sub-sectors of service sector, Convergence, Analysis of Variance, North East India

**JEL Classification:** O14, L70, L80, L90

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### Introduction

At the most aggregate level, the term service sector consists of various activities which include trade, hospitality, transportation, communication, entertainment, health, education, public services and so on. At present the growth of service sector is fastest globally. It becomes the largest sector in the economy and the involvement of service sector to the employment and global output is higher than other two sectors. Services are the largest part of the economy for

most of the countries around the world. There are many reasons behind this excessive growth of service sector, such as, increased urbanisation, privatisation and higher demand for intermediate and final consumer services. For the economic well-being, it is necessary to avail quality services. The impact of service sector on economic growth has become an issue of great importance for an economy. The input of service sector in Gross Domestic Product (GDP) has been rising considerably. A new element to the economy's growth course has been appended due to the higher growth in service sector.

Following this trend of global economy, service sector of Indian economy has become the biggest and fastly emerging sector from the past couple of decades. In fact, the growth of service sector has been higher than the growth of agricultural and manufacturing sector. This sector shows not only rapid growth, but also a higher contribution to GDP (Hansda, 2001). An interesting point to be understood is that the turn down in the agricultural sector have given rise to the growth of service sector but on the other hand the industrial sector showed more or less the same share of growth (Banga, 2005). This feature can be treated as unique in this case since such tendencies are not usually observed in developing countries. This is mainly experienced by high income countries.

The following are broadly different heads under which service sector can be categorised: construction; communication and logistics; trade and hospitality; banking and insurance; real estate, ownership of dwelling and business services; public administration; and other services. In India, all the components of service sector are not growing equally. There are some services whose shares in GDP as well as in trade are very high, for example, software and telecommunication service. Some services are growing fast but in terms of international transaction, the share of these services are low, e.g. health and education service. Further, there are some services which have experienced negative growth. The reason behind this unequal growth of service sector is that in India, at the sectoral level, reforms have not been conducted in a planned way. In India, there is no integrated service policy though there exists overall agricultural and industrial policy. Therefore, across various sectors, there is no uniformity in the impact of reform. Further, most of the services suffer from external and domestic constraints as these services have been in the public domain for a long time. This paper is an attempt to analyse service sector growth in the context of the economy of North East Region. The scheme of the paper is as follows: After the introductory note; section 2 gives a brief description of North East Region (NER); section 3 deals with a short review of empirical literature on the growth of service sector. Section 4 is devoted to the discussion of methodology followed in the present study; section 5 deals with results and discussions. Finally, in section 6, we summarise the study and offer concluding remarks.

## **Economy of North East Region**

Adorned by the flora and fauna and rich in mineral resources, North Eastern Region can attribute this richness to its proximity with the Himalayan mountain range. The countries that surround the region are Bangladesh, Myanmar, China, Bhutan and Nepal respectively in order of the length of international bordered shared. The region comprises eight states after addition of Sikkim to the region in 2002. The other states of the region listed according to the area, starting from the biggest to the smallest are as follows, Arunachal Pradesh (83,743 sq km), Assam (78,438 sq km), Meghalaya (22,429 sq km), Manipur (22,327 sq km), Mizoram (21,081 sq km), Nagaland (16,579 sq km) and Tripura (10,486 sq km). The 'Siliguri' corridor of West Bengal joins the region with the rest of India. Geography has its influence on the economic, social and cultural life of the north east region. For instance, the Brahmaputra valley was a colourful corridor between the two great civilizations, India and China (Singh, 1987). The total area covered by the region is 2,62,179

sq km which is nearly 7.9 per cent of the entire geographical area of the country. The northern part of the region is surrounded by China and Bhutan, Myanmar shares its borders with the eastern part of the region, Nepal surrounds some parts of the west and the entire southern part shares its borders with Bangladesh, Bangladesh also surrounds some parts of the west. The region is dominated by tribal population and a huge amount of diversity can be noticed even within the states because of the presence of many different tribal groups even within the states. The economy of the North Eastern region is mainly based on agriculture. Jhum cultivation is followed by some of the aboriginal groups of tribes. In this region rapid industrialization is difficult because of limited accessibility of land and internal disturbances. The Central Government of India has been trying to connect the national economy with the economy of North East Region because the north east economy has some special features due to its historical background and geographical location. The composition of Gross State Domestic Product (GSDP) of North East states is characterised by dominance of primary and tertiary sectors while secondary sector specially manufacturing remains subdued. The share of tertiary sector to GSDP has increased from 47.39% in 2004-05 to 53.38% in 2009-10. Over the same period, the share of primary sector to GSDP has declined from 32.37% to 28.48% whereas that of secondary sector has declined from 20.24% to 18.14% (MDoNER). The development strategy followed by the Central Government of India as well as the State governments of the North East Region have followed a totally unbalanced development strategy for the economy of North East India. The states are diverse even in terms of resource bequest, stages of industrialisation and infrastructural amenities. To sum it up, the economies are predominantly agrarian with feebly existing industrial sector and over blown service sector. The initiatives of development taken up mainly by the Planning Commission and also by the North East Council have done miserably in creating any efficient impact on the economic development. As results of such efforts, politically motivated allotment-oriented processes have been crafted. The impact of such processes has led the resources and income budge to the other developed economies. Corruption has also increased due to the extreme reliance of states on central funds for economic development. Thus, the government has created monopoly in employment and as a result the work ethic which is necessary to build a modern economy has been destroyed.

### **Service Sector Growth: Review of literature**

In any economy, the progression of economic development is historically linked to structural changes. Fisher (1935), Clark (1940) and Kuznets (1973), in their ground-breaking studies have pointed out that while economic development takes place, the contribution of agriculture in output and employment was extremely high at nascent phases of development. Industrialization comes into picture after the nascent phases are over and the rise of industrial sector is usually linked to the decline in agricultural sector as has been observed. And finally when industrialization reaches its zenith a gradual fall in the same is witnessed with gradual increase in service sector growth. The outline of structural change as mentioned above is attributed to the income elasticity of demand. When the income level grows, it is observed that the agricultural goods' demand augment at a proportionately lesser rate since agricultural goods' income elasticity of demand is lower than 1. When the economy reaches at the peak of income level, a sharp increase is usually observed in services due to its higher elasticity of demand as compared to industrial goods. The study conducted by Kuznets (1966) observed that the expansion in tertiary sector happens in comparative terms only when secondary sector has become a principal sector equally in terms of work force as well as value added in the swift industrialisation progression. The tertiary sector becomes significant in work force as well as value added composition while there is control of comparative size of industry than that of the other sector.

In the perspective of Indian economy, a great bit of literature documented the service sector growth. In one of the earliest study on the subject, Bhattacharya and Mitra (1990) found that the

pattern of services in India is different from the general pattern. It is experienced and studied that the service sector has become a predominant sector even before the economy was highly industrialised. Though it is true that the percentage distribution of service sector in total national income has been surging high, but looked through the lens of employment, the agricultural and industrial sector is still ahead of service sector by many paces. This may have adverse affect on inflation, balance of payments and income distribution also a mounting shift can be observed among the growth rates of the three sectors. Singh (2006) has conducted a detailed study on India's overall growth experience and examined the contribution of service sector to growth. It has been found that progress of India's manufacturing sector has possibly been hindered in bits and pieces by limitations in prominent service sectors such as electricity and transportation.

The study conducted by Joshi (2008) shows that during the period 1950-51 to 1999-2000, the trend of service sector growth is uniform unlike manufacturing and agricultural sectors which have shown phases of negative growth, stagnation and positive growth. But the growth of service sector has been less impactful as its percentage distribution in employment has been much smaller than its contribution to GDP. Even inside the service sector, employment growth rate is maximum in finance, insurance and business services; followed by trade and hospitality, logistics etc. The study of Banga (2005) on the performance of services at both aggregated and disaggregated level revealed that service sector growth has been on the slower side. There are sectors which showed growth rate touching double digits where as some showed slower growth rates. Service sector growth can mostly be attributed to the elevated utilisation of growth in manufacturing sector. We can foresee that in future service sector will be capable of creating its own demand because of superior productivity and output growth in manufacturing sector.

The study conducted by Tiwari (2011) attempted to analyse the performance of service sector during reforms. It has been found that during the reform period the service contribution has increased significantly but among the sub-sectors within the service sector, only a few are performing well. These are mainly information technology and communication service. The policy initiatives by the government are major drivers of this shifting growth pattern contributed by service sector. Shingal (2012) investigated the growth of India's service sector at the state level. He conducted standard growth regressions and panel unit root tests to find that per capita services are converging across Indian's states, even as per capita incomes are not. The results of the study show that at the state level also, the service sector has been growing remarkably. The demand for services is more or less uniformly distributed throughout India and per capita services are uniting across time and states which makes this growth both advancing and sustainable politically. Garg and Walia (2013) in a study have found that service sector with all its sub categories has accomplished incredible increase over the year in Indian economy. Their aid in GDP, employment and exports have been growing significantly. The higher growth in service sector has added a new facet to India's development course. They have found that the growth rate of service sector is higher than the growth rate of overall GDP. Also the employment percentage of service sector as well as industrial sector has been rising. Trade and hospitality, and community, social and personal services are the noteworthy producer of employment. Pais (2014) has conducted a study to understand the growth and structure of the service sector in India by analysing the sub sectors of the service sector at a disaggregated level. It has been found that among the sub sectors of service sector, public administration, education and health services are showing an inverse U pattern in the change of their shares in GDP. Their respective shares in services GDP increased till about the 1980s and after that started to decline. On the other hand, hotels and restaurants showed a U shaped pattern with their shares declining till about the late 1980s and then increasing. Finally,

there are two services that stand out predominantly in terms of high growth in recent years. These are business service and private sector communication. Both these services accounted for negligible shares in the 1950s and 1960s, right up to the 1980s. It is only after 1990s, their share started to increase.

## Research Gap

All the studies reviewed above have made useful contribution for understanding service sector growth in the economy. Moreover, there is a considerable gap in the literature since most of the research work looks at the feat of aggregate service sector at the country level. Literature exploring the disaggregated services phenomenon at the state level in India is far and few. In fact the North Eastern Region of India has not received comparable attention. In an effort to fill this gap in the literature, the present study focuses on the service sector growth in the North East India at a disaggregated level.

## Contribution of the Study

The growth of service sector has become an issue of great importance for an economy. The higher growth in service sector has added a dimension to the economy's growth process. The study of service sector at a reasonably disaggregated level is necessary because service sector is highly heterogeneous in nature than the primary and the secondary sectors. From the disaggregated level study we can identify those sub sectors (of service sector) which are playing prominent role in pushing growth of other sectors as well as of the entire economy. Since all the components of service sector are not equally important from employment generation perspective, therefore, sectors which have potential of generating employment need to be nourished. Despite these policy prescription importance, the present study shall also contribute in improving the existent literature on inter sectoral linkage studies.

### Objectives

The study has been carried out keeping in view the following objectives:

- (i) To examine the trend of service sector SDP (State Domestic Product) both at aggregate as well as at disaggregate level for the states of North East Region.
- (ii) To find the contribution of different components of service sector to the growth of aggregate service sector SDP.
- (iii) To examine the trend of divergence in the service sector structure.

### Hypotheses

In order to capture the specific objectives of the study, the following hypotheses have been devised:

- (i) Service sector SDP has been increasing over time.
- (ii) The contribution of different components of service sector to the growth of aggregate service sector SDP is not uniform.
- (iii) There exists divergence in the overall service sector structure.

## Methodology

### Type of Study

The present study is empirical and consists of three phases. The first phase consisted of identifying the key variables which are required to be used to achieve the goal of the study. This identification of variables largely depends on review of previous study on the topic. Second phase is related to collection and filtering of data. The third phase is of analysis of the data using scientific techniques.

### Data Source

Data used in this paper are collected from Handbook of Statistics on Indian Economy published by Reserve Bank of India (RBI, 2015). All the data are annual figures covering the period 1990-91 to 2013-14 and the variables that are measured are at constant 2004-05 prices. All the eight states of the North East Region have been selected for the study.

### Variables Studied and their definitions

The service sector has been classified into the following sub-sectors: construction; transport, storage and communication; trade, hotels and restaurants; banking and insurance; real estate, ownership of dwelling and business services; public administration and other services. Construction is the action of building something or the creation of an abstract entity. Transport sector includes roads, railways, water and air transport. Agricultural storage contains agri produce, food grains, fertilisers, manure etc. Industrial storage consists of industrial goods and special warehouses for cold and temperature controlled storage. Communication includes postal, telephones and overseas communication services. Trade includes wholesale and retail trade in all commodities both produced at home and imported. Hotel and restaurant are important components of tourism. Services rendered by hotels and other lodging places, restaurants etc contribute to the overall tourism experience through the standard of facilities. Banking and insurance sector provides financial services to commercial and retail customers. All other sub components of service sector are included in other services.

### Methods

To examine the trend of service sector SDP both at aggregate level as well as at disaggregate level the following regression model has been constructed for each state:

$$Y_{it} = a + bT + u_{it} \dots \dots \dots (1)$$

Where,  $Y_{it}$  stands for log of service sector SDP or ith component of service sector SDP in time period t, T represents time trend, for instance, 1990= 1, 1991= 2, ....., 2014= 24 and  $u_{it}$  is the normally distributed error term for service sector SDP or ith component of service sector SDP in year t.

In this model if the value of estimated b is found to be statistically significant, then it would indicate that there is a presence of trend in service sector SDP or in ith component of service sector SDP. On the other hand, if b is found to be statistically insignificant, this would indicate that the values of those variables has remained either stable over time or has increasing or decreasing movement of similar magnitude. However the statistical significance of the parameter will tell

about the presence or absence of trend, not the direction of trend. The direction of trend will be reflected by the algebraic sign of the estimated parameter b.

In order to find the contribution of services sub-sectors to the growth of aggregate service sector, we have used a method which is largely influenced by Balakrishnan and Parameswaran(2007):

$$\frac{\sum_{i=1}^n w_{it}g_{it+1} - w_{it-1}G_{it}}{G_{t+1} - G_t} \dots \dots (2)$$

Where,  $W_{it}$  is the share of  $i$ th sector in time period  $t$

$W_{it-1}$  is the share of  $i$ th sector in time period  $t -1$

$G_{it+1}$  is growth rate of  $i$ th sector in time period  $t+1$

$G_t$  is growth rate of total service sector SDP in time period  $t$

$G_{t+1}$  is growth rate of total service sector SDP in time period  $t+1$ .

To examine the trend of divergence in the service sector structure, two steps have been followed. In the first step, the value of overall divergence has been computed using the following formula:

$$D_{it} = \sum_{in} =1 (S_{it} -Z_{it})^2 \dots \dots \dots (3)$$

Where,  $D_{it}$  represents the divergence in  $i$ th sector in time period  $t$

$S_{it}$  is the share of  $i$ th sector product in service sector SDP in period  $t$  for a particular state

$Z_{it}$  is the share of  $i$ th sector product in service sector SDP in period  $t$  for the rest of the region.

In the second step, the following simple linear regression model has been estimated to examine the trend of divergence:

$$D_{it} = \alpha + \beta T + u_{it} \dots \dots (4)$$

Where,  $D_{it}$  stands for divergence in  $i$ th sector in year  $t$  (= 1990-91, 1991-92,....., 2013-14),  $T$  is the time trend and  $u_{it}$  stands for random disturbance term for  $i$ th sector in year  $t$ .  $\alpha$  and  $\beta$  are the coefficients of the model. Here, a significant positive value of  $\beta$  would indicate divergence in  $i$ th sector. Conversely, a significant negative value of  $\beta$  would indicate that there is convergence in the  $i$ th sector.

While the above divergence analysis gives an interesting picture about the nature of convergence or divergence, however, the technique hardly puts any light on individual sector. To meet this deficiency, we have further examined the divergence in each sector separately using the following formula:

$$\frac{\text{per capita output of } i\text{th sector}}{\text{average per capita output of the rest of the region}} \dots \dots (5)$$

This ratio is the relative per capita  $i$ th sector SDP. If this is greater than one, then the  $i$ th state would be an above par state. It means that the per capita output of  $i$ th sector in that particular state is higher than the regional average.

To analyse the performance of a particular sub-sector compared to the rest of the region, following linear regression model has been estimated:

$$Y_{it} = \alpha + \beta T + u_{it} \dots\dots (6)$$

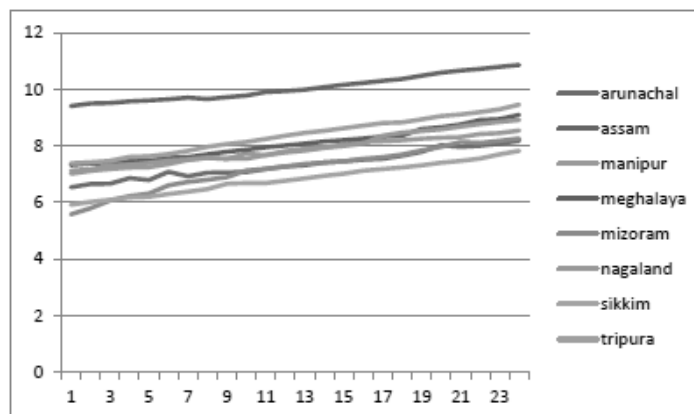
Where,  $Y_{it}$  stands for the relative per capita service sector SDP of  $i$ th sub sector in period  $t$ ,  $T$  stands for time trend and  $u_{it}$  is the error term of  $i$ th sector in period  $t$ .  $\alpha$  and  $\beta$  are the coefficients of the model. A significant positive value of  $\beta$  would indicate the presence of divergence whereas a significant negative value of  $\beta$  would indicate the presence of convergence.

## Results and Discussions

### Trend of service sector SDP

The trend of service sector SDP at aggregate level is graphically shown in figure-1. From figure-1, it is clear that over time the service sector SDP has been showing an increasing trend for each of the states of North East Region. However, an exact measurement of data is not possible graphically. Therefore in order to verify the above finding statistically, the trend of service sector SDP has been estimated at aggregate level by using a simple linear regression model as shown in equation (1) for each of the states of North East Region. The result of this exercise is shown in Table-1. From Table-1 which shows estimated OLS results of service sector SDP trend at aggregate level for the states of North East Region, it has been observed that the coefficient of time trend is positive and significant for each of the North Eastern states along with a high value of adjusted R square. Therefore, it indicates that the service sector SDP has an increasing trend over time for the states of North East Region. If we look at the magnitude of the estimated coefficients of time for these states, we would find that these are almost similar signifying that performance of the sector at the overall level is similar across the states in North East Region.

Figure- 1: Trend of service sector SDP (aggregate)



Source: drawn by authors



Table-1: Trend of aggregate service sector SDP (estimated OLS result)		
States	Coefficient of time trend	Adjusted R square
Arunachal Pradesh	0.06 (31.01)***	0.97
Assam	0.07 (9.64)***	0.99
Manipur	0.06 (38.50)***	0.98
Meghalaya	0.08 (13.71)***	0.99
Mizoram	0.08 (12.24)***	0.99
Nagaland	0.09 (8.72)***	0.99
Sikkim	0.07 (38.87)***	0.99
Tripura	0.09 (54.16)***	0.99

Note: \*\*\* represents 1 percent level of significance

Source: estimated by authors

We have also analysed the trend of service sector SDP at a disaggregate level. Table-2 shows the estimated OLS results of trend of service sector SDP at a disaggregated level for each state of North East Region separately. From the table it is observed that the coefficients of time trend are positive and significant for each component of service sector in all the states except in Manipur. In Manipur, the coefficient of time trend is insignificant for construction though the value of adjusted R square is satisfactory. Thus, it implies that SDP originating from construction sector in Manipur has remained stable over time.

States	Dependent variable	Construction	Transport, storage & communication	Trade, hotels & restaurants	Banking & insurance	Real estate, ownership of dwelling & business services	Public administration	Other services
Arunachal Pradesh	Coefficient of time trend	0.06 (8.76)***	0.10 (20.93)***	0.02 (2.41)**	0.11 (14.58)***	0.04 (7.47)***	0.07 (10.98)***	0.07 (23.94)***
	Adjusted R square	0.89	0.98	0.69	0.98	0.95	0.95	0.96
Assam	Coefficient of time trend	0.05 (6.43)***	0.16 (4.79)***	0.04 (3.21)***	0.12 (13.90)***	0.04 (13.36)***	0.05 (18.41)***	0.07 (11.28)***
	Adjusted R square	0.87	0.97	0.94	0.99	0.98	0.93	0.98
Manipur	Coefficient of time trend	-0.02 (-0.41)	0.09 (16.24)***	0.03 (11.46)***	0.12 (10.19)***	0.03 (6.68)***	0.07 (6.83)***	0.07 (8.84)***
	Adjusted R square	0.93	0.94	0.95	0.97	0.98	0.92	0.95
Meghalaya	Coefficient of time trend	0.11 (18.64)***	0.11 (9.33)***	0.07 (30.95)***	0.11 (17.00)***	0.03 (14.70)***	0.05 (24.81)***	0.12 (5.44)***
	Adjusted R square	0.97	0.98	0.98	0.98	0.97	0.96	0.97
Mizoram	Coefficient of time trend	0.05 (1.95)*	0.11 (18.09)***	0.03 (3.92)***	0.13 (8.26)***	0.11 (3.58)***	0.10 (13.84)***	0.09 (6.90)***
	Adjusted R square	0.97	0.98	0.93	0.98	0.97	0.98	0.97
Nagaland	Coefficient of time trend	0.08 (9.85)***	0.06 (8.51)***	0.07 (13.22)***	0.15 (8.53)***	0.10 (7.13)***	0.06 (5.55)***	0.07 (16.62)***
	Adjusted R square	0.95	0.96	0.98	0.97	0.95	0.98	0.98
Sikkim	Coefficient of time trend	0.11 (7.74)***	0.11 (26.71)***	0.03 (5.18)***	0.16 (42.65)***	0.04 (14.61)***	0.09 (19.93)***	0.05 (4.18)***
	Adjusted R square	0.98	0.98	0.89	0.99	0.98	0.98	0.95
Tripura	Coefficient of time trend	0.13 (4.92)***	0.19 (6.28)***	0.05 (9.86)***	0.13 (11.36)***	0.12 (20.38)***	0.08 (14.42)***	0.08 (42.45)***
	Adjusted R square	0.97	0.99	0.94	0.98	0.98	0.97	0.98

Note:(\*),(\*\*) and (\*\*\*) represent 10 percent, 5 percent and 1 percent level of significance respectively.

Source: Estimated by authors

This is a serious concern because construction sector is an important sector for economic development in any society. This sector is capable of generating employment opportunities especially for low or middle class population. Thus having the construction sector stagnant over the years puts a serious threat on the employment scenario of the state. Besides its direct impact, this sector is also considered driver of growth for other sectors. Since construction is the key to have a sound base of transport and networking, therefore, a stagnant construction sector might have depressed the economic performance of other sectors.

## Growth Pattern of Service Sector SDP

Before analysing the contribution of different sub components of service sector to the growth of aggregate service sector, let us have a broad idea about the growth pattern of service sector both at aggregate level as well as disaggregate for each state of the North East Region. To calculate the growth rate of service sector in different states, the simple one period growth rate formula has been used. The annual average growth rate for the entire period has been calculated by dividing the sum of the annual growth rate by total number of years in the study. The result of this exercise is reported in Table-3. From the data in Table-3, it is observed that the average growth of service sector SDP was 5.16 percent during 1991 to 2001 in Assam which has increased to 7.91 percent during 2001 to 2011. In case of Arunachal Pradesh, it was 7.43 percent during 1991 to 2001 which has remained almost same in the next decade. Manipur has experienced a decline in the average growth of service sector SDP from 6.92 percent during 1991 to 2001 to 6.71 percent in the next

decade, that is, from 2001 to 2011. For Meghalaya, it was 6.53 percent during 1991 to 2011 which has increased to 8.56 percent in 2001 to 2011. Mizoram experienced the highest average growth of service sector GDP during 1991 to 2001 which was 17.84 percent. But this has declined to 10 percent in the next decade. In case of Nagaland, the growth was 5.81 percent during 1991 which has significantly increased to 10.79 during 2001 to 2011. The reason for this exceptionally high growth in the service sector of Nagaland is that except for construction, all other components of service sector have been growing at a significantly high rate. Sikkim and Tripura have experienced almost stable growth during the two decades. For Sikkim the growth was 8.15 percent in the first decade and 8.12 percent in the second decade whereas for Tripura it was 9.24 percent in 1991 to 2001 and 9.06 percent in 2001 to 2011. Thus, during 1991 to 2001, Mizoram experienced the highest average growth whereas Assam experienced the lowest average growth in terms of service sector GDP. On the other hand, during 2001 to 2011, the average growth of service sector GDP was highest in Nagaland and lowest in Manipur. It is also observed that Assam, Meghalaya and Nagaland have experienced acceleration in the growth of service sector whereas Mizoram has experienced deceleration in the growth of service sector.

States	1991 to 2001	2001 to 2011	1991 to 2011
1	2	3	4
Assam	5.16	7.91	6.34
Arunachal Pradesh	7.43	7.82	7.77
Manipur	6.92	6.71	6.59
Meghalaya	6.53	8.56	7.42
Mizoram	17.84	10	12.28
Nagaland	5.81	10.79	7.68
Sikkim	8.15	8.12	8.62
Tripura	9.24	9.06	8.42
NER	6.72	6.9	6.49

*Source: Calculated by authors*

The data in the Table-4 shows the average growth trends of different components of service sector for each state of North East Region during 1991-2011. It is observed that the average growth of construction sector is highest in Mizoram and lowest in Assam among all the states of north east during the study period. For transport, storage and communication, Tripura has experienced the highest average growth whereas the growth of this sub sector is lowest in Nagaland. The average growth of trade, hotels and restaurants is highest in Meghalaya and lowest in Assam. Sikkim has experienced highest average growth in terms of banking and insurance whereas the average growth of this sector is lowest in Arunachal Pradesh. For real estate, ownership of dwelling and business services, Mizoram shows the highest average growth whereas the growth of this sector is lowest in Assam. Again, growth of public administration is highest in Mizoram and lowest in Nagaland. Arunachal Pradesh has experienced highest average growth for other services whereas Nagaland has experienced lowest average growth for other services. Finally for the entire North East Region, it is observed that the average growth of transport, storage and communication is highest, followed by banking and insurance; and construction service. On the other hand, the average growth is lowest for trade, hotels and restaurants in the North East Region.

**Table- 4: Growth Pattern of different components of service sector (in percentage), 1991 to 2011**

States Sectors	Assam	Arunachal Pradesh	Manipur	Mizoram	Meghalaya	Nagaland	Sikkim	Tripura	NER
1	2	3	4	5	6	7	8	9	10
Construction	6.7	9.01	7.32	14.18	13.63	10.53	9.94	13.92	10.65
Transport, storage & communication	12.88	14.96	9.00	13.73	12.18	8.56	14.16	15.46	12.61
Trade, hotels & restaurants	4.46	5.77	4.23	9.15	9.37	6.37	8.36	4.63	6.54
Banking & insurance	11.92	4.64	10.15	15.41	10.3	12.88	16.66	9.15	11.38
Real Estate, ownership of dwelling & business services	4.12	5.31	4.62	17.2	3.43	10.68	5.98	8.91	7.53
Public Administration	6.84	9.32	9.29	14.22	6.18	6.08	10.98	10.94	9.23
Other services	7.82	11.49	8.12	13.76	9.66	7.63	8.09	10.09	9.58

Source: Calculated by authors

### Contribution of different components of service sector to the growth of aggregate service sector SDP

**Table – 5: Contribution of components of service sector to the growth of aggregate service sector**

States Sectors	Assam	Arunachal Pradesh	Manipur	Mizoram	Meghalaya	Nagaland	Sikkim	Tripura	NER
1	2	3	4	5	6	7	8	9	10
Construction	0.68	0.75	1.12	0.49	0.78	-0.27	1.11	0.35	5.27
Transport, storage & communication	-0.23	-0.09	0.03	-0.18	-2.13	0.60	0.20	-0.58	-2.21
Trade, hotels & restaurants	1.14	-0.47	0.10	0.11	1.51	0.01	-0.15	0.35	2.92
Banking & insurance	-0.18	0.08	-0.07	0.04	-0.68	0.03	-0.28	-0.19	-1.10
Real Estate, ownership of dwelling & business services	-0.10	0.07	-0.05	0.01	0.04	0.38	0.21	0.41	1.12
Public Administration	-0.41	-0.10	-0.57	0.17	-0.12	-0.08	-0.31	-0.28	-1.49
Other services	-0.35	0.63	0.23	0.07	1.29	0.11	0.18	0.68	3.11

Source: Calculated by authors

In order to find out the contribution of different components of service sector to the growth of aggregate service sector, we have used the method as mentioned in equation (2), and the result of this exercise is shown in Table-5. It is observed that there is a considerable variation in the contribution of sub-sectors (of service sector) to the growth of service sector SDP in the states of North East Region. It has been found that during the entire study period, the contribution of construction and trade, hotels and restaurants are significantly high in Assam whereas services like transport and communication; banking and insurance; real estate, public administration, other services etc have negatively contributed to the growth of service sector in Assam. In Arunachal Pradesh, the growth of service sector mainly depends on construction, banking and insurance;

real estate and other services. But the situation is different in other states of North East Region. In Manipur it is observed that the contributions of all the sub-sectors are positive except banking and insurance; and public administration. For Mizoram, all the sub-sectors of service sector have a positive impact on the growth of service sector except transport, storage and communication. In Meghalaya, the major contributors to the growth of service sector are construction, trade, hotels and restaurants; real estate and business services; and other services. In case of Nagaland, except construction and public administration, all other components have positively contributed to the growth of service sector. For Sikkim, transport, storage and communication; banking and insurance; and public administration have contributed negatively to the growth of service sector whereas for Tripura, trade, hotels and restaurants; banking and insurance; and public administration have a negative contribution to the growth of service sector.

### Divergence in the Service Sector Structure

To analyse the divergence in the overall service sector structure, first we have computed the value of overall divergence using the formula given in equation (3), and then estimated a simple linear regression model as given in equation (4) to examine the trend of divergence. The results are shown in Table-6. The data in the table shows the values of time coefficients for each state in the region. It is observed that the coefficients of time are significant for each of the north east states, suggesting the presence of significant trends in the structure of service sector. The coefficients of time are positive and statistically significant for Arunachal Pradesh, Mizoram, Manipur, Assam, Tripura and Sikkim which implies that these states have experienced divergence in respect of service sector structure. On the contrary, the time coefficients are negative and significant for Meghalaya and Nagaland. This implies that there exists convergence in respect of service sector structure in these states.

States	Coefficients of time trend	R <sup>2</sup>
Arunachal Pradesh	0.001*** (2.34)	0.51
Meghalaya	-0.004*** (-16.41)	0.95
Mizoram	0.001*** (3.24)	0.91
Manipur	0.003** (2.72)	0.70
Nagaland	-0.003*** (-4.27)	0.64
Assam	0.003*** (2.50)	0.78
Tripura	0.001** (2.16)	0.39
Sikkim	0.001*** (3.18)	0.71

*Note: (\*\*) and (\*\*\*) indicate that the tests are significant at 5% and 1% level respectively. Structural breaks have been corrected by applying dummy variables.*

*Source: estimated by authors*

Since the above result does not show divergence in individual sector, we have further examined the divergence in each sector separately using the formula given in equation (5), and estimated a linear regression model given in equation (6) to analyse the performance of

a particular sub-sector. The result of this exercise is reported in Table-7. It shows the trend and position of individual sectors on the basis of relative per capita SDP for each component of service sector. It is observed that the relative per capita SDP from construction is high in Arunachal Pradesh, Manipur and Sikkim but over time, Arunachal Pradesh and Manipur are showing decreasing trend whereas the trend is insignificant for Sikkim. On the other hand, for Meghalaya and Tripura, though the value is lower than average, it has a positive trend over the years. However, for Assam and Nagaland, the share of construction is not only below the regional average, the share is also decreasing. Therefore, there is a sign of partial convergence of output in construction among these states in North East India. Similarly, the per capita SDP from transport in Meghalaya and Nagaland with respect to the per capita SDP from transport for all other states of North East Region is higher. But Nagaland shows a decreasing trend whereas the trend of Meghalaya is insignificant. The states like Assam, Arunachal Pradesh and Tripura which show a lower relative per capita SDP from transport have experienced an increasing trend over time. For trade it has been observed that Assam, Meghalaya, Mizoram and Tripura have experienced a high relative per capita SDP but most of the states are showing a decreasing trend for trade. Thus, the states of North East India are showing a sign of partial convergence of output in the share of trade. In case of banking, except Manipur, Mizoram and Tripura, the relative per capita SDP for all other states are higher than the average value. However, it is only Sikkim which shows an increasing trend. For real estate and public administration, Meghalaya, Nagaland, Mizoram and Sikkim have experienced high relative per capita SDP. It is also noticed that for real estate, only Tripura shows a positive trend whereas the trend of all other states are negative except Nagaland and Mizoram which show insignificant trend. Thus a sign of convergence of output has also been observed in the share of real estate. On the other hand, for public administration, only Sikkim and Tripura have experienced increasing trend over time. Finally, for other services, the relative per capita SDP is higher than average for Nagaland, Mizoram, Sikkim and Tripura but the trend is positive only for Mizoram and Tripura, whereas the trend is insignificant for all other states except Manipur which shows a decreasing trend.

Table – 7: Trend and Position of Individual Sectors on the basis of Per-capita Service Sector SDP

Type	Components	States
Above par	Construction	Arunachal Pradesh (-), Manipur(-), Sikkim(?)
	Transport	Meghalaya(?), Nagaland(-)
	Trade	Assam (?), Meghalaya (?), Mizoram(-), Tripura(?)
	Banking	Assam(?), Arunachal Pradesh(-), Meghalaya(-), Nagaland(?), Sikkim(+)
	Real estate	Meghalaya(-), Nagaland(?), Mizoram(?), Sikkim(-)
	Public administration	Meghalaya(-), Nagaland(-), Mizoram(?), Sikkim(+)
	Other services	Nagaland(?), Mizoram(+), Sikkim(?), Tripura(+)
	Below par	Construction
Transport		Assam(+), Arunachal Pradesh(+), Manipur(?), Mizoram(?), Sikkim(?), Tripura(+)
trade		Arunachal Pradesh(-), Manipur(-), Nagaland(-), Sikkim(-)
Banking		Manipur (?), Mizoram(?), Tripura(?)
Real estate		Assam(-), Arunachal Pradesh(-), Manipur(-), Tripura(+)
Public administration		Assam(-), Arunachal Pradesh(?), Manipur(?), Tripura(+)
Other services		Assam(?), Arunachal Pradesh(?), Manipur(-), Meghalaya(?)

Note: (+), (-) and (?) represent positive, negative and insignificant trend respectively.

Source: estimated by authors.

### **Limitations of the Study**

The present study is mainly concentrated on the growth of service sector SDP both at aggregate as well as disaggregate level. But the study has not examined whether this growth of service sector is instrumental or not. It has not thrown any light on the impact of service sector growth on other sectors as well as on the overall economic growth.

### **Scope for Future Research**

In this area, future research could examine the impact of service sector growth on other sectors of the region as well as on the overall economic growth. However, such type of study would face challenges due to scarcity of relevant data for the region.

### **Conclusion**

During the past few decades, structural transformation has occurred in the economy of the North East India. We have analysed service sector at a disaggregated level and found a number of interesting facts about the service sector in the region. Firstly, the trend of service sector SDP has been examined both at aggregate as well as at disaggregate level and it has been found that the service sector SDP both at aggregate as well as at disaggregate level has been showing an increasing trend over time for each of the states of North East Region. Secondly, it is observed that during the study period, the average growth of transport, storage and communication is highest for the entire region, which is followed by banking and insurance; and construction service. On the other hand, the average growth is lowest for trade, hotels and restaurants. Thirdly, we have found that there is a considerable variation in the contribution of different sub-sectors (of service sector) to the growth of service sector. It is found that only Mizoram has experienced positive growth in maximum number of sub-sectors (of service sector) whereas Assam has experienced negative growth in maximum number of sub-sectors (of service sector). Mizoram and Nagaland are the states which have experienced relatively balanced contribution from different sub-sectors. The contribution of services like, transport, storage and communication; banking and insurance; and public administration are very poor for most of the states. Finally, we have examined the trend of convergence or divergence in the structure of service sector and found that there exists convergence in the service sector structure in Meghalaya and Nagaland, whereas all other states have experienced divergence in respect of overall service sector structure. However, for individual sector, we have observed partial convergence of output among the states of the North East Region.

The divergence structure of the service sector which is the key finding of the present study raises serious question regarding uniform government policy, especially of the Central Government for development of service sector across North East Region. Over the years we can see Central Government policy towards the development of service sector in terms of focused area, targeted investment and channelization of public firm etc have remained similar across the states. In many occasions, the government takes policies for North East Region based on the scenario of Assam – the giant of North East Region. There is a need to understand that though culturally most of the states share uniformity, the structure of service sector growth is not similar. Policies mean to develop the service sector in the region must suit the existing feature of the service sector and a better understanding of their diversity for a successful lifting of this sector.

## Notes

1. There are eight states in the north east region of India – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. The region is surrounded by Bangladesh, China(Tibet), Bhutan and Myanmar.
2. The publications of RBI on SDP do not provide data at uniform constant price figures. For obtaining consistent set of data, the usual procedure of linking the indices by changing the base of constant prices is followed.
3. In order to calculate the growth rate of a variable (Y) in period t over period t-1, following simple method has been applied:

$$G_{rt} = \left[ \frac{Y_t - Y_{t-1}}{Y_{t-1}} \right] \times 100 \quad \text{Here,}$$

Grt is the percentage change in variable Y from period t-1 to t.

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#### *Authors' Profile*

**Panchatapa Deshamukhya** stood first class second in M.A Economics from Assam University (A Central University), Silchar, India. She is a brilliant student having very good academic career since matriculation. She has been awarded with UGC-NET-JRF and also ICSSR Doctoral fellowship. However she is currently pursuing Ph.D research under the supervision of Prof. Niranjana Roy from the department of Economics as JRF fellowship of the UGC.

**Niranjana Roy** is a Professor in Economics, Assam University, Assam, India. He is an established academician and completed 25 years in teaching and research. He has authored eight edited and reference books and published 34 research papers in different journals. He has supervised 14 Ph.D scholars and 7 M.Phil scholars. He has visited many countries on academic programmes. He is the recipient of EU Erasmus Mundus NAMASTE Staff visiting fellowship to Goettingen University, Germany.

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