COMPARATIVE ANALYSIS OF SECTORAL PERFORMANCE OF INDIAN STATES USING SHIFT SHARE MODEL

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ABSTRACT

This paper attempts to analyze the sectoral growth of Indian states by decomposing the growth rates using modified version of Shift Share Model and compare the composition of sectoral growth during the pre-financial crisis period (2005-06 to 2007-08) and post financial crisis period (2008-09 to 2012-13).

Keywords : *Indian States; Sectoral Growth; Shift-Share Model.*

Introduction and Literature Review

The state level growth rates for the last 8 years points out the wide divergence not just at the aggregate level but also at the sectoral level. These divergent patterns of sectoral growth requires a deeper analysis so as to design appropriate policies at Centre as well as State level that would facilitate appropriate channelization of investments.

India's growth performance across states has been studied by several researchers from various perspectives. Goldar and Seth (1989) studied trends in industrial output across 12 major states during the period 1960-61 to 1985-86 in order to trace the causes of industrial decelaration experienced during the 60s at the national level. Dholakia(1989) studied the dispersion in the industrial growth and highlighted the existence of north-south divide in the Indian industrialization. Dholakia (1994) studied the sectoral growth rates for different states over the period 1960-61 to 1989-90 using switching regression model. Besley and Burgess (2004) analyzed the impact of differential labor market regulation on the inter-state growth performance. Aghion et al (2008) analyzed the impact of delicensing on the industrial growth across states. Aiyar and Mody (2011) traced the difference in the state level performance to demographic characteristics. Kumar et al (2012) analyzed the phenomenon of rising disparity across states post 2000 and found that the rich states grew at a faster rate than the relatively poorer states and the impact of global crisis was comparatively felt more on the rich states as they were more open. The period covered by all these papers was prior to 2005. But no study has been, to the best of my knowledge, undertaken to analyze the sectoral

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growth in each state since 2005 which is attempted by this paper using Shift Share model.

The rest of the paper is organized as follows: Section 2 gives a brief note on basic Share Shift Model. Section 3 discusses the data and methodology. The findings are briefly presented in Section 4. Section 5 analyses the findings. Section 6 summarizes and concludes the paper. The results are presented in detail in the appendix.

Shift-share Model

Shift-share analysis is a tool used to decompose the change in a local economic variable over a time period into various components (Maudos, 2008). The local variable (for eg. value of agriculture in a state) under consideration is a part of a sectoral variable (for eg. value of agriculture of the country to which the state belongs) which again is a part of global variable (for eg. GDP of the country).

Suppose l(t) was the value of the local variable at time 't' and l(t+1) is the value of the local variable at time 't+1', then the change in the local variable (i.e l(t+1)- l(t)) can be attributed to three components namely:

National share effect (NS) is portion of change in local variable associated with the growth in the global variable. It is computed by multiplying the growth rate of global variable (Gg) with the initial value of the local variable.

$$NS = Gg*l(t)$$

Industry mix effect (IM) is the portion of growth in local variable associated with the growth in the sectoral variable(Gs). It is computed by multiplying the change in the local variable with the excess/deficit of growth in sectoral variable over growth in the global variable.

$$IM = l(t)*(Gs - Gg)$$

Local share effect (LS) is the portion of growth attributed to the local influences. It is computed by multiplying the change in the local variable with the excess/deficit of growth in local variable (Gl) over growth in the sectoral variable. This component is of primary importance for analysis.

$$LS=l(t)*(Gl-Gs)$$

Thus,

$$l(t+1)- l(t)= NS+IM+LS$$

Data and Methodology

Data: The source of the data is the state level GDP and its components i.e agriculture, agriculture and allied activities, manufacturing, industry and services from 2004-05 to 2012-13 given by Central Statistical Organization compiled by Planning Commission. The mining sector has been deliberately excluded from analysis since the sector's development is more dependent on the natural endowments and cannot be significantly influenced by policy.

Methodology:

Since the basic share-shift model decomposes the change in the local variable while we wish to decompose the growth rate in the local variable i.e state level sectoral growth rate, we take the weighted average sectoral growth rate for analysis in place of absolute growth rate. The weighted average growth rate of the sector i in the state j at time (t+1) is computed as follows:

$$Gij\ (t+1) = \frac{Vij\ (t+1) - Vij(t)}{Vj(t)} * 100$$

where

Vij(t+1)= Value of the output in sector i for state j at time t+1

Vij(t)= Value of the output in sector i for state j at time t

Vj(t)= Value of output in state j at time t

This weighted average growth rate is decomposed into three components: National Share(NS), Industrial Mix (IM) and Local Share(LS).

The components have been computed as follows:

$$NSij(t+1)=Gij(t+1)*G(t+1)$$
$$IMij(t+1)=Gij(t+1)*Gi(t+1)- NS(t+1)$$
$$LSij(t+1)= Gij(t+1)- Gij(t+1)*Gi(t+1)$$

where

G(t+1) = growth rate of national GDP at time t+1 in %

Gi(t+1)= growth rate of sector i at national level at time t+1 in %

NSij(t+1)= National Share of sectoral growth rate for sector i in state j at time t+1

IMij(t+1)= Sectoral share of sectoral growth rate for sector i in state j at time t+1

LSij(t+1)= Local share of sectoral growth rate for sector i in state j at time t+1

Thus, Gij(t+1)= NSij(t+1)+ IMij(t+1)+ LSij(t+1)

We find the average of these components during the pre and post crisis period in order analyze the change in them post crisis.

Thus

$$NSij(pre-crisis) = \frac{\sum_{t=2004-05}^{2007-08} NSij(t+1)}{5}$$

$$IMij(pre-crisis) = \frac{\sum_{t=2004-05}^{2007-08} IMij(t+1)}{5}$$

$$LSij(pre-crisis) = \frac{\sum_{t=2004-05}^{2007-08} LSij(t+1)}{5}$$

$$NSij(post-crisis) = \frac{\sum_{t=2008-09}^{2011-12} NSij(t+1)}{5}$$

$$IMij(post-crisis) = \frac{\sum_{t=2008-09}^{2011-12} IMij(t+1)}{5}$$

$$LSij(post-crisis) = \frac{\sum_{t=2008-09}^{2011-12} LSij(t+1)}{5}$$

NSij captures the growth in the sector i in state j due to growth in the entire country's GDP. IMij captures the growth in the sector i in state j due to growth in the sector i in the entire economy. LSij captures the growth in the sector i in state j due to characteristics associated with the state.

The share of NS, IM and LS in the total average growth rate is then computed by:

$$NSij(share) = \frac{NSijt}{NSijt - IMijt + LSijt}$$

$$IMij(share) = \frac{IMijt}{NSijt - IMijt + LSijt}$$

$$LSijt(share) = \frac{LSijt}{NSijt + IMijt + LSijt}$$

Where the subscript t denotes the period i.e pre-crisis and post crisis

*In case of Mizoram, Kerala, Rajasthan, Goa and Gujarat, the data for 2012-13 is not available. Hence the average is taken across four years from 2008-09 to 2011-12.

Results

As shown in Table 1 and Table 2, the national share for all states has been dominant in case of agriculture except for Chhattisgarh where the major contributor is the local share in both the periods while the sectoral share has always been negative during both periods indicating that the agriculture sector is growing at a rate slower than that of the national growth rate.

Table 1: Shift-Share Analysis of Agriculture sector

i=Agriculture		(Figures in %)					
		NSij		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*2.48*	*1.7*	*-1.08*	*-1.04*	*1.18*	*4.24*
	Chhatisgarh	*1.45*	*1.1*	*-0.64*	*-0.64*	*2.6*	*1.69*
	Jharkhand	*1.17*	*0.87*	*-0.5*	*-0.54*	*0.29*	*0.21*
	Madhya Pradesh	*2.3*	*1.53*	*-1.01*	*-0.92*	*-0.55*	*1.61*
	Odissa	*1.69*	*1.07*	*-0.75*	*-0.63*	*-0.34*	*0.32*
	West Bengal	*1.73*	*1.11*	*-0.76*	*-0.67*	*-0.44*	*-0.18*
Northern	Haryana	*1.95*	*1.23*	*-0.85*	*-0.76*	*-0.31*	*0.25*
	Himachal Pradesh	*1.74*	*1.01*	*-0.77*	*-0.65*	*-0.37*	*-0.13*
	Jammu and Kashmir	*2.02*	*1.35*	*-0.88*	*-0.82*	*-0.88*	*0.4*
	Punjab	*2.79*	*1.73*	*-1.22*	*-1.06*	*-0.83*	*-0.46*
	Uttar Pradesh	*2.44*	*1.57*	*-1.07*	*-0.96*	*-0.66*	*0.09*
	Uttarkhand	*1.37*	*0.66*	*-0.6*	*-0.41*	*-0.68*	*0.02*
North Eastern	Assam	*2.14*	*1.57*	*-0.94*	*-0.92*	*1.15*	*2.25*
	Manipur	*1.76*	*1.44*	*-0.77*	*-0.83*	*0.77*	*2.16*
	Meghalaya	*1.54*	*0.95*	*-0.67*	*-0.58*	*-0.37*	*-0.05*
	Mizoram	*1.24*	*1.14*	*-0.54*	*-0.66*	*0.57*	*1.1*
	Nagaland	*2.41*	*1.55*	*-1.05*	*-0.93*	*-1.14*	*0.51*

North Eastern	Sikkim	*1.47*	*0.73*	*-0.65*	*-0.51*	*-0.33*	*0.31*
	Tripura	*1.92*	*1.37*	*-0.84*	*-0.85*	*0.91*	*-0.3*
	Arunachal Pradesh	*1.53*	*1.14*	*-0.66*	*-0.71*	*1.22*	*0.14*
Southern	Andhra Pradesh	*1.86*	*1.27*	*-0.82*	*-0.77*	*0.67*	*-0.11*
	Karnataka	*1.44*	*0.99*	*-0.64*	*-0.59*	*0.25*	*0.16*
	Kerala	*1.25*	*0.73*	*-0.55*	*-0.45*	*-0.86*	*-0.44*
	Tamil Nadu	*0.9*	*0.55*	*-0.39*	*-0.33*	*0.2*	*-0.07*
Western	Goa	*0.49*	*0.27*	*-0.22*	*-0.17*	*-0.19*	*0.06*
	Gujarat	*1.29*	*0.88*	*-0.57*	*-0.54*	*0.88*	*0.19*
	Maharashtra	*0.78*	*0.51*	*-0.34*	*-0.32*	*0.77*	*-0.16*
	Rajastan	*1.97*	*1.42*	*-0.86*	*-0.85*	*-0.41*	*1.14*

Table 2 : Composition of each growth component in the total agricultural growth

i=Agriculture		**Share of each component in total growth(%)**					
		NSij		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*96.12*	*34.69*	*-41.86*	*-21.22*	*45.74*	*86.53*
	Chhatisgarh	*42.52*	*51.16*	*-18.77*	*-29.77*	*76.25*	*78.60*
	Jharkhand	*121.88*	*161.11*	*-52.08*	*-100.00*	*30.21*	*38.89*
	Madhya Pradesh	*310.81*	*68.92*	*-136.49*	*-41.44*	*-74.32*	*72.52*
	Odissa	*281.67*	*140.79*	*-125.00*	*-82.89*	*-56.67*	*42.11*
	West Bengal	*326.42*	*426.92*	*-143.40*	*-257.69*	*-83.02*	*-69.23*
Northern	Haryana	*246.84*	*170.83*	*-107.59*	*-105.56*	*-39.24*	*34.72*
	Himachal Pradesh	*290.00*	*439.13*	*-128.33*	*-282.61*	*-61.67*	*-56.52*
	Jammu and Kashmir	*776.92*	*145.16*	*-338.46*	*-88.17*	*-338.46*	*43.01*
	Punjab	*377.03*	*823.81*	*-164.86*	*-504.76*	*-112.16*	*-219.05*
	Uttar Pradesh	*343.66*	*224.29*	*-150.70*	*-137.14*	*-92.96*	*12.86*
	Uttarkhand	*1522.22*	*244.44*	*-666.67*	*-151.85*	*-755.56*	*7.41*
North Eastern	Assam	*91.06*	*54.14*	*-40.00*	*-31.72*	*48.94*	*77.59*
	Manipur	*100.00*	*51.99*	*-43.75*	*-29.96*	*43.75*	*77.98*
	Meghalaya	*308.00*	*296.88*	*-134.00*	*-181.25*	*-74.00*	*-15.63*
	Mizoram	*97.64*	*72.15*	*-42.52*	*-41.77*	*44.88*	*69.62*
	Nagaland	*1095.45*	*137.17*	*-477.27*	*-82.30*	*-518.18*	*45.13*
	Sikkim	*300.00*	*137.74*	*-132.65*	*-96.23*	*-67.35*	*58.49*
	Tripura	*96.48*	*622.73*	*-42.21*	*-386.36*	*45.73*	*-136.36*
	Arunachal Pradesh	*73.21*	*200.00*	*-31.58*	*-124.56*	*58.37*	*24.56*
Southern	Andhra Pradesh	*108.77*	*325.64*	*-47.95*	*-197.44*	*39.18*	*-28.21*
	Karnataka	*137.14*	*176.79*	*-60.95*	*-105.36*	*23.81*	*28.57*
	Kerala	*-781.25*	*-456.25*	*343.75*	*281.25*	*537.50*	*275.00*
	Tamil Nadu	*126.76*	*366.67*	*-54.93*	*-220.00*	*28.17*	*-46.67*
Western	Goa	*612.50*	*168.75*	*-275.00*	*-106.25*	*-237.50*	*37.50*
	Gujarat	*80.63*	*166.04*	*-35.63*	*-101.89*	*55.00*	*35.85*
	Maharashtra	*64.46*	*1700.00*	*-28.10*	*-1066.67*	*63.64*	*-533.33*
	Rajastan	*281.43*	*83.04*	*-122.86*	*-49.71*	*-58.57*	*66.67*

The change in local share is depicted in Chart 1.

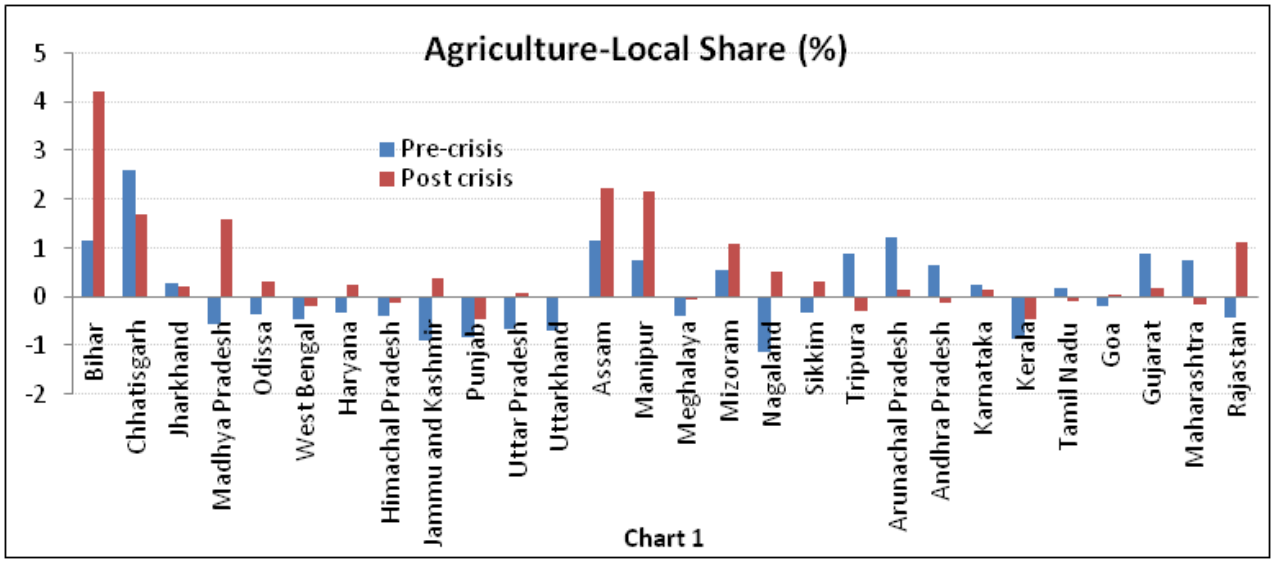

Chart 1

As shown in Table 3 and 4, the national share is the major contributor for agriculture and allied (A and a) activities both in pre and post crisis period except for Chhatisgarh where the major contributor is local share while the sectoral share has always been negative during both periods indicating that the sector is growing at a rate slower than that of the national growth rate.

Table 3 : Shift Share Analysis of Agriculture and Allied Activities

i=Agriculture and Allied Activites		***Figures in %***					
		Nsij		***Imij***		***Lsij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*2.93*	*1.95*	*-1.37*	*-1.20*	*1.30*	*4.55*
	Chhatisgarh	*2.01*	*1.44*	*-0.95*	*-0.85*	*2.80*	*2.20*
	Jharkhand	*1.53*	*1.12*	*-0.71*	*-0.69*	*0.36*	*0.24*
	Madhya Pradesh	*2.59*	*1.70*	*-1.22*	*-1.03*	*-0.63*	*1.63*
	Odissa	*2.12*	*1.33*	*-1.00*	*-0.79*	*-0.39*	*0.27*
	West Bengal	*2.17*	*1.41*	*-1.02*	*-0.86*	*-0.36*	*-0.24*
	Haryana	*2.05*	*1.29*	*-0.96*	*-0.80*	*-0.26*	*0.27*
	Himachal Pradesh	*2.31*	*1.39*	*-1.09*	*-0.88*	*-0.07*	*-0.24*
	Jammu and Kashmir	*2.52*	*1.65*	*-1.18*	*-1.00*	*-1.17*	*0.29*
	Punjab	*2.93*	*1.82*	*-1.37*	*-1.12*	*-0.78*	*-0.44*
	Uttar Pradesh	*2.69*	*1.74*	*-1.26*	*-1.06*	*-0.65*	*0.09*
	Uttarkhand	*1.84*	*0.90*	*-0.87*	*-0.56*	*-0.80*	*0.06*

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North Eastern	Assam	*3.25*	*2.13*	*-1.52*	*-1.33*	*0.48*	*-0.13*
	Manipur	*2.54*	*1.84*	*-1.20*	*-1.10*	*1.53*	*2.62*
	Meghalaya	*2.31*	*1.81*	*-1.08*	*-1.06*	*0.79*	*2.43*
	Mizoram	*2.12*	*1.29*	*-0.99*	*-0.79*	*-0.71*	*-0.07*
	Nagaland	*2.12*	*1.64*	*-0.99*	*-0.99*	*0.03*	*0.94*
	Sikkim	*3.07*	*2.01*	*-1.44*	*-1.21*	*-1.17*	*0.63*
	Tripura	*1.67*	*0.81*	*-0.78*	*-0.55*	*-0.40*	*0.27*
	Arunachal Pradesh	*2.33*	*1.79*	*-1.09*	*-1.09*	*1.09*	*0.84*
Southern	Andhra Pradesh	*2.26*	*1.53*	*-1.06*	*-0.94*	*0.76*	*0.06*
	Karnataka	*1.70*	*1.16*	*-0.80*	*-0.69*	*0.22*	*0.26*
	Kerala	*1.53*	*0.92*	*-0.72*	*-0.57*	*-0.93*	*-0.49*
	Tamil Nadu	*1.04*	*0.64*	*-0.49*	*-0.39*	*0.27*	*-0.06*
Western	Goa	*0.75*	*0.42*	*-0.36*	*-0.27*	*-0.22*	*0.01*
	Gujarat	*1.55*	*1.03*	*-0.73*	*-0.64*	*0.84*	*0.15*
	Maharashtra	*1.00*	*0.64*	*-0.47*	*-0.40*	*0.77*	*-0.22*
	Rajastan	*2.30*	*1.64*	*-1.08*	*-1.00*	*-0.47*	*1.11*

Table 4 : Composition of each growth component in total growth of Agriculture and Allied Activities

i=Agriculture and Allied Activites		**Share of each in total growth (%)**					
		Nsij		***Imij***		***Lsij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*102.33*	*36.75*	*-47.75*	*-22.63*	*45.42*	*85.88*
	Chhatisgarh	*52.17*	*51.50*	*-24.63*	*-30.43*	*72.46*	*78.93*
	Jharkhand	*129.45*	*165.91*	*-60.24*	*-101.73*	*30.79*	*35.82*
	Madhya Pradesh	*350.35*	*74.05*	*-164.66*	*-44.65*	*-85.69*	*70.60*
	Odissa	*289.42*	*166.34*	*-136.28*	*-99.70*	*-53.14*	*33.36*
	West Bengal	*273.95*	*446.56*	*-128.61*	*-271.11*	*-45.35*	*-75.45*
Northern	Haryana	*245.64*	*170.38*	*-114.69*	*-105.38*	*-30.95*	*35.00*
	Himachal Pradesh	*200.99*	*504.66*	*-94.60*	*-318.06*	*-6.39*	*-86.59*
	Jammu and Kashmir	*1484.64*	*174.90*	*-696.59*	*-106.09*	*-688.05*	*31.18*
	Punjab	*380.09*	*689.12*	*-178.58*	*-421.70*	*-101.51*	*-167.42*

Uttar Pradesh	*345.40*	*226.31*	*-162.14*	*-138.38*	*-83.26*	*12.07*
Uttarkhand	*1055.18*	*227.29*	*-495.59*	*-141.65*	*-459.59*	*14.35*
Assam	*146.75*	*313.51*	*-68.48*	*-195.09*	*21.72*	*-18.42*
Manipur	*88.45*	*54.75*	*-41.60*	*-32.70*	*53.15*	*77.95*
Meghalaya	*114.22*	*56.72*	*-53.44*	*-33.23*	*39.22*	*76.51*
Mizoram	*510.52*	*301.87*	*-239.79*	*-184.91*	*-170.72*	*-16.96*
Nagaland	*183.02*	*102.98*	*-85.87*	*-62.08*	*2.84*	*59.10*
Sikkim	*663.23*	*140.33*	*-311.48*	*-84.62*	*-251.75*	*44.30*
Tripura	*345.57*	*155.06*	*-162.26*	*-106.11*	*-83.32*	*51.06*
Arunachal Pradesh	*100.18*	*116.30*	*-46.88*	*-70.80*	*46.70*	*54.50*
Andhra Pradesh	*115.19*	*232.53*	*-54.19*	*-141.74*	*38.99*	*9.20*
Karnataka	*151.33*	*158.98*	*-71.36*	*-94.75*	*20.04*	*35.77*
Kerala	*1296.85*	*-648.25*	*611.91*	*402.25*	*784.94*	*346.00*
Tamil Nadu	*127.08*	*343.65*	*-59.54*	*-210.23*	*32.46*	*-33.43*
Goa	*437.58*	*258.44*	*-208.49*	*-162.35*	*-129.08*	*3.91*
Gujarat	*93.48*	*192.37*	*-44.02*	*-119.91*	*50.54*	*27.53*
Maharashtra	*76.92*	*3190.63*	*-35.98*	*-1986.81*	*59.06*	*-1103.82*
Rajastan	*304.70*	*93.72*	*-142.87*	*-57.08*	*-61.83*	*63.36*

The change in local share for agriculture and allied services is depicted in Chart 2.

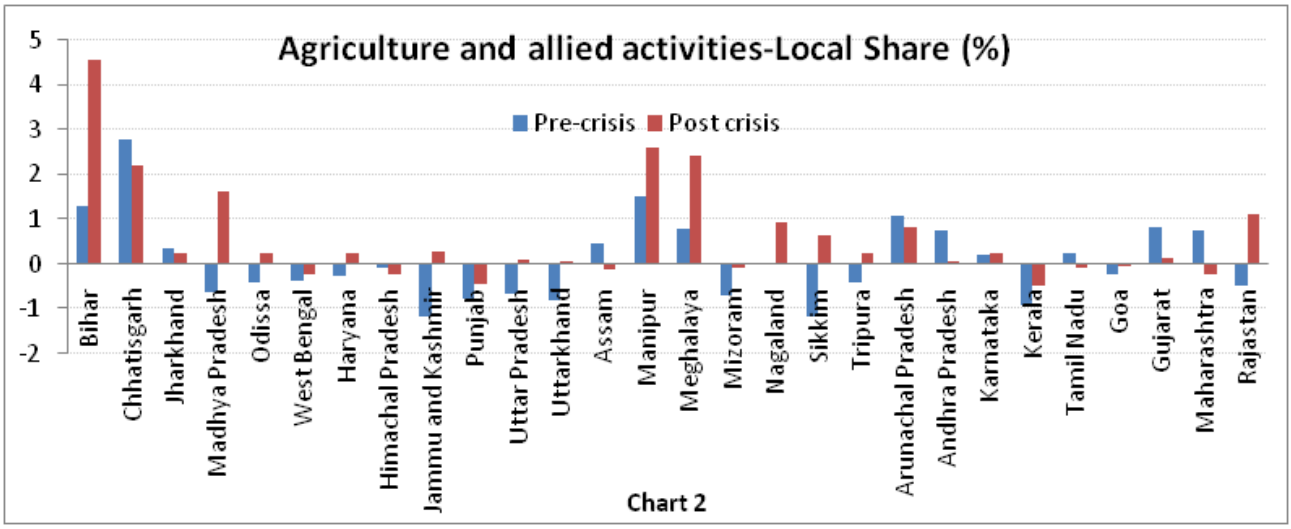

Chart 2

As shown in Table 5 and 6, the national share is dominant even in case of industry except for Bihar where local effects are more dominant. The sectoral effect remained positive in the pre crisis period while it became negative during the post crisis period. The reason for this is the crowding out effects caused by increased government spending in the post crisis period.

Table 5 : Shift Share Analysis of Industry Sector

(Figures in %)

i=Industry		*NSij*		*IMij*		*LSij*	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*1.37*	*1.30*	*0.16*	*-0.29*	*1.72*	*3.68*
	Chhatisgarh	*4.22*	*3.18*	*0.46*	*-0.63*	*4.82*	*2.59*
	Jharkhand	*4.50*	*3.06*	*0.50*	*-0.66*	*-3.19*	*-0.42*
	Madhya Pradesh	*2.61*	*2.16*	*0.29*	*-0.45*	*-0.40*	*1.09*
	Odissa	*3.24*	*2.55*	*0.36*	*-0.53*	*1.14*	*-0.65*
	West Bengal	*2.02*	*1.44*	*0.22*	*-0.30*	*-0.91*	*-0.23*
Northern	Haryana	*3.08*	*2.15*	*0.35*	*-0.44*	*-0.79*	*0.10*
	Himachal Pradesh	*3.68*	*2.97*	*0.41*	*-0.61*	*-0.03*	*0.89*
	Jammu and Kashmir	*2.68*	*1.92*	*0.30*	*-0.39*	*-0.97*	*-1.37*
	Punjab	*2.50*	*2.19*	*0.28*	*-0.46*	*1.58*	*-0.15*
	Uttar Pradesh	*2.29*	*1.76*	*0.26*	*-0.37*	*0.08*	*-0.26*
	Uttarkhand	*2.93*	*2.53*	*0.33*	*-0.54*	*4.00*	*2.35*
North Eastern	Assam	*2.44*	*1.72*	*0.27*	*-0.35*	*-1.64*	*2.28*
	Manipur	*3.45*	*2.32*	*0.39*	*-0.48*	*-0.31*	*-0.18*
	Meghalaya	*2.53*	*2.13*	*0.28*	*-0.44*	*-0.05*	*1.44*
	Mizoram	*1.76*	*1.51*	*0.21*	*-0.23*	*0.51*	*0.98*
	Nagaland	*1.30*	*1.15*	*0.15*	*-0.24*	*0.45*	*0.49*
	Sikkim	*2.77*	*3.36*	*0.31*	*-0.78*	*-0.28*	*15.12*
	Tripura	*2.39*	*1.79*	*0.27*	*-0.38*	*-0.72*	*1.34*
	Arunachal Pradesh	*2.97*	*2.30*	*0.34*	*-0.47*	*-1.47*	*0.61*
Southern	Andhra Pradesh	*2.35*	*1.81*	*0.26*	*-0.37*	*0.57*	*-0.25*
	Karnataka	*2.89*	*2.15*	*0.32*	*-0.44*	*0.47*	*-0.66*
	Kerala	*2.16*	*1.65*	*0.24*	*-0.25*	*-0.54*	*-0.18*
	Tamil Nadu	*2.98*	*2.18*	*0.34*	*-0.47*	*-0.01*	*1.05*
Western	Goa	*4.43*	*3.54*	*0.49*	*-0.53*	*-1.31*	*0.45*
	Gujarat	*3.79*	*3.21*	*0.42*	*-0.48*	*0.44*	*1.33*
	Maharashtra	*2.91*	*2.17*	*0.33*	*-0.45*	*1.50*	*-0.13*
	Rajastan	*2.98*	*2.45*	*0.33*	*-0.36*	*-0.32*	*0.59*

Table 6 : Composition of growth components in Industry Sector

i=Industry		Share of each in total growth(%)					
		NSij		*IMij*		*LSij*	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*42.15*	*27.72*	*4.92*	*-6.18*	*52.92*	*78.46*
	Chhatisgarh	*44.42*	*61.87*	*4.84*	*-12.26*	*50.74*	*50.39*
	Jharkhand	*248.62*	*154.55*	*27.62*	*-33.33*	*-176.24*	*-21.21*
	Madhya Pradesh	*104.40*	*77.14*	*11.60*	*-16.07*	*-16.00*	*38.93*
	Odissa	*68.35*	*186.13*	*7.59*	*-38.69*	*24.05*	*-47.45*
	West Bengal	*151.88*	*158.24*	*16.54*	*-32.97*	*-68.42*	*-25.27*
Northern	Haryana	*116.67*	*118.78*	*13.26*	*-24.31*	*-29.92*	*5.52*
	Himachal Pradesh	*90.64*	*91.38*	*10.10*	*-18.77*	*-0.74*	*27.38*
	Jammu and Kashmir	*133.33*	*1200.00*	*14.93*	*-243.75*	*-48.26*	*-856.25*
	Punjab	*57.34*	*138.61*	*6.42*	*-29.11*	*36.24*	*-9.49*
	Uttar Pradesh	*87.07*	*155.75*	*9.89*	*-32.74*	*3.04*	*-23.01*
	Uttarkhand	*40.36*	*58.29*	*4.55*	*-12.44*	*55.10*	*54.15*
North Eastern	Assam	*228.04*	*47.12*	*25.23*	*-9.59*	*-153.27*	*62.47*
	Manipur	*97.73*	*139.76*	*11.05*	*-28.92*	*-8.78*	*-10.84*
	Meghalaya	*91.67*	*68.05*	*10.14*	*-14.06*	*-1.81*	*46.01*
	Mizoram	*70.97*	*66.81*	*8.47*	*-10.18*	*20.56*	*43.36*
	Nagaland	*68.42*	*82.14*	*7.89*	*-17.14*	*23.68*	*35.00*
	Sikkim	*98.93*	*18.98*	*11.07*	*-4.41*	*-10.00*	*85.42*
	Tripura	*123.20*	*65.09*	*13.92*	*-13.82*	*-37.11*	*48.73*
	Arunachal Pradesh	*161.41*	*94.26*	*18.48*	*-19.26*	*-79.89*	*25.00*
Southern	Andhra Pradesh	*73.90*	*152.10*	*8.18*	*-31.09*	*17.92*	*-21.01*
	Karnataka	*78.53*	*204.76*	*8.70*	*-41.90*	*12.77*	*-62.86*
	Kerala	*116.13*	*135.25*	*12.90*	*-20.49*	*-29.03*	*-14.75*
	Tamil Nadu	*90.03*	*78.99*	*10.27*	*-17.03*	*-0.30*	*38.04*
Western	Goa	*122.71*	*102.31*	*13.57*	*-15.32*	*-36.29*	*13.01*
	Gujarat	*81.51*	*79.06*	*9.03*	*-11.82*	*9.46*	*32.76*
	Maharashtra	*61.39*	*136.48*	*6.96*	*-28.30*	*31.65*	*-8.18*
	Rajastan	*99.67*	*91.42*	*11.04*	*-13.43*	*-10.70*	*22.01*

The change in local share is depicted in Chart 3

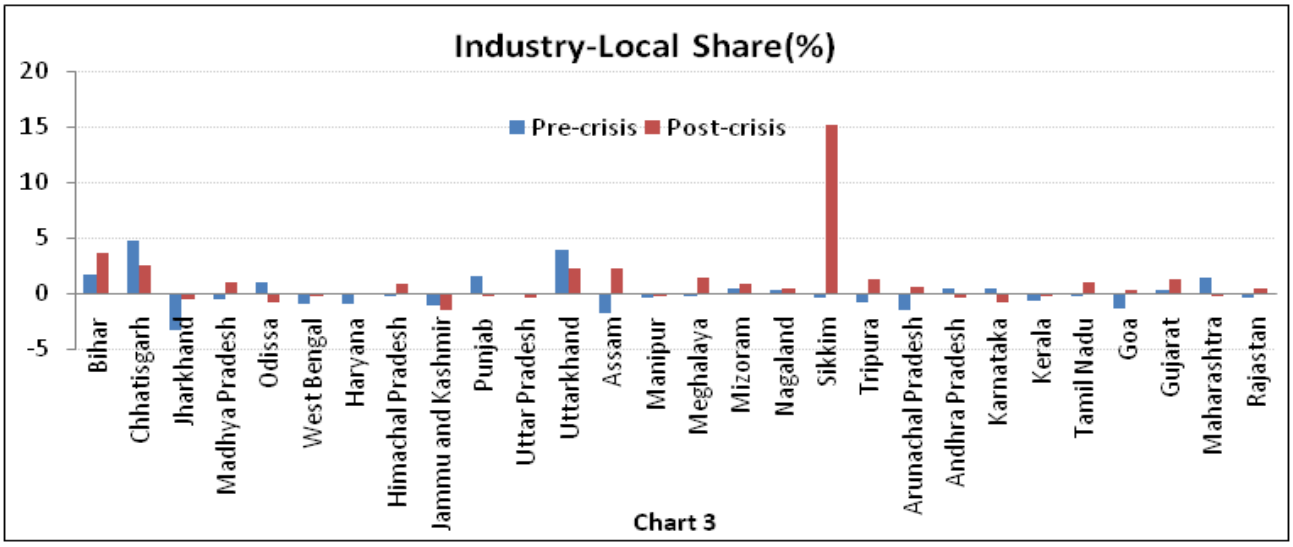

Chart 3

As shown in Table 7 and 8, the national share is dominant even in case of manufacturing except for Uttarakhand where local effects are more dominant. The sectoral effect remained positive in the pre crisis period while it became negative during the post crisis period. The reason for this is the crowding out effects caused by increased government spending in the post crisis period.

Table 7 : Shift Share Analysis of Manufacturing Sector

(Figures in %)

i=Manufacturing		***NSij***		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*0.49*	*0.39*	*0.11*	*-0.07*	*0.11*	*0.67*
	Chhatisgarh	*1.93*	*1.31*	*0.39*	*-0.20*	*1.90*	*-0.36*
	Jharkhand	*2.64*	*1.66*	*0.57*	*-0.35*	*-2.17*	*-1.44*
	Madhya Pradesh	*1.13*	*0.96*	*0.24*	*-0.17*	*0.16*	*0.23*
	Odissa	*1.16*	*1.12*	*0.25*	*-0.21*	*1.17*	*0.07*
	West Bengal	*1.01*	*0.79*	*0.22*	*-0.15*	*-0.45*	*-0.09*
Northern	Haryana	*1.99*	*1.40*	*0.44*	*-0.26*	*-0.67*	*-0.01*
	Himachal Pradesh	*1.09*	*1.08*	*0.24*	*-0.21*	*-0.29*	*1.34*
	Jammu and Kashmir	*0.62*	*0.53*	*0.14*	*-0.10*	*-0.01*	*0.00*
	Punjab	*1.53*	*1.42*	*0.34*	*-0.28*	*1.11*	*0.09*
	Uttar Pradesh	*1.31*	*1.00*	*0.29*	*-0.20*	*-0.01*	*-0.27*
	Uttarkhand	*1.49*	*1.78*	*0.34*	*-0.35*	*4.38*	*1.94*
North Eastern	Assam	*0.93*	*0.58*	*0.20*	*-0.11*	*-0.86*	*0.66*
	Manipur	*0.43*	*0.35*	*0.09*	*-0.07*	*0.22*	*0.16*
	Meghalaya	*0.43*	*0.47*	*0.10*	*-0.10*	*1.25*	*0.19*
	Mizoram	*0.13*	*0.10*	*0.03*	*-0.01*	*0.02*	*-0.04*
	Nagaland	*0.17*	*0.16*	*0.04*	*-0.04*	*0.08*	*0.13*

North Eastern	Sikkim	*0.35*	*1.46*	*0.08*	*-0.52*	*-0.12*	*11.41*
	Tripura	*0.30*	*0.21*	*0.06*	*-0.04*	*-0.53*	*0.16*
	Arunachal Pradesh	*0.21*	*0.16*	*0.05*	*-0.03*	*0.03*	*0.00*
Southern	Andhra Pradesh	*1.14*	*0.87*	*0.25*	*-0.16*	*-0.18*	*-0.14*
	Karnataka	*1.73*	*1.30*	*0.37*	*-0.22*	*-0.08*	*-0.44*
	Kerala	*0.77*	*0.62*	*0.17*	*-0.05*	*-0.22*	*-0.23*
	Tamil Nadu	*1.91*	*1.44*	*0.42*	*-0.29*	*-0.04*	*0.48*
Western	Goa	*2.79*	*2.12*	*0.62*	*-0.19*	*-1.54*	*-0.21*
	Gujarat	*2.65*	*2.22*	*0.59*	*-0.21*	*0.17*	*0.75*
	Maharashtra	*2.11*	*1.53*	*0.48*	*-0.28*	*1.23*	*-0.52*
	Rajasthan	*1.25*	*1.12*	*0.28*	*-0.10*	*0.05*	*0.42*

Table 8 : Composition of growth components in Manufacturing Sector

i=Manufacturing		**Share of each in total growth(%)**					
		NSij		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*69.01*	*39.39*	*15.49*	*-7.07*	*15.49*	*67.68*
	Chhatisgarh	*45.73*	*174.67*	*9.24*	*-26.67*	*45.02*	*-48.00*
	Jharkhand	*253.85*	*-1276.92*	*54.81*	*269.23*	*-208.65*	*1107.69*
	Madhya Pradesh	*73.86*	*94.12*	*15.69*	*-16.67*	*10.46*	*22.55*
	Odissa	*44.96*	*114.29*	*9.69*	*-21.43*	*45.35*	*7.14*
	West Bengal	*129.49*	*143.64*	*28.21*	*-27.27*	*-57.69*	*-16.36*
Northern	Haryana	*113.07*	*123.89*	*25.00*	*-23.01*	*-38.07*	*-0.88*
	Himachal Pradesh	*104.81*	*48.87*	*23.08*	*-9.50*	*-27.88*	*60.63*
	Jammu and Kashmir	*82.67*	*123.26*	*18.67*	*-23.26*	*-1.33*	*0.00*
	Punjab	*51.34*	*115.45*	*11.41*	*-22.76*	*37.25*	*7.32*
	Uttar Pradesh	*82.39*	*188.68*	*18.24*	*-37.74*	*-0.63*	*-50.94*
	Uttarkhand	*23.99*	*52.82*	*5.48*	*-10.39*	*70.53*	*57.57*
North Eastern	Assam	*344.44*	*51.33*	*74.07*	*-9.73*	*-318.52*	*58.41*
	Manipur	*58.11*	*79.55*	*12.16*	*-15.91*	*29.73*	*36.36*
	Meghalaya	*24.16*	*83.93*	*5.62*	*-17.86*	*70.22*	*33.93*
	Mizoram	*72.22*	*200.00*	*16.67*	*-20.00*	*11.11*	*-80.00*
	Nagaland	*58.62*	*64.00*	*13.79*	*-16.00*	*27.59*	*52.00*
	Sikkim	*112.90*	*11.82*	*25.81*	*-4.21*	*-38.71*	*92.39*
	Tripura	*-176.47*	*63.64*	*-35.29*	*-12.12*	*311.76*	*48.48*
	Arunachal Pradesh	*72.41*	*123.08*	*17.24*	*-23.08*	*10.34*	*0.00*
Southern	Andhra Pradesh	*94.21*	*152.63*	*20.66*	*-28.07*	*-14.88*	*-24.56*
	Karnataka	*85.64*	*203.13*	*18.32*	*-34.38*	*-3.96*	*-68.75*
	Kerala	*106.94*	*182.35*	*23.61*	*-14.71*	*-30.56*	*-67.65*
	Tamil Nadu	*83.41*	*88.34*	*18.34*	*-17.79*	*-1.75*	*29.45*

Western	Goa	*149.20*	*123.26*	*33.16*	*-11.05*	*-82.35*	*-12.21*
	Gujarat	*77.71*	*80.43*	*17.30*	*-7.61*	*4.99*	*27.17*
	Maharashtra	*55.24*	*209.59*	*12.57*	*-38.36*	*32.20*	*-71.23*
	Rajasthan	*79.11*	*77.78*	*17.72*	*-6.94*	*3.16*	*29.17*

The change in local share is depicted in Chart 4.

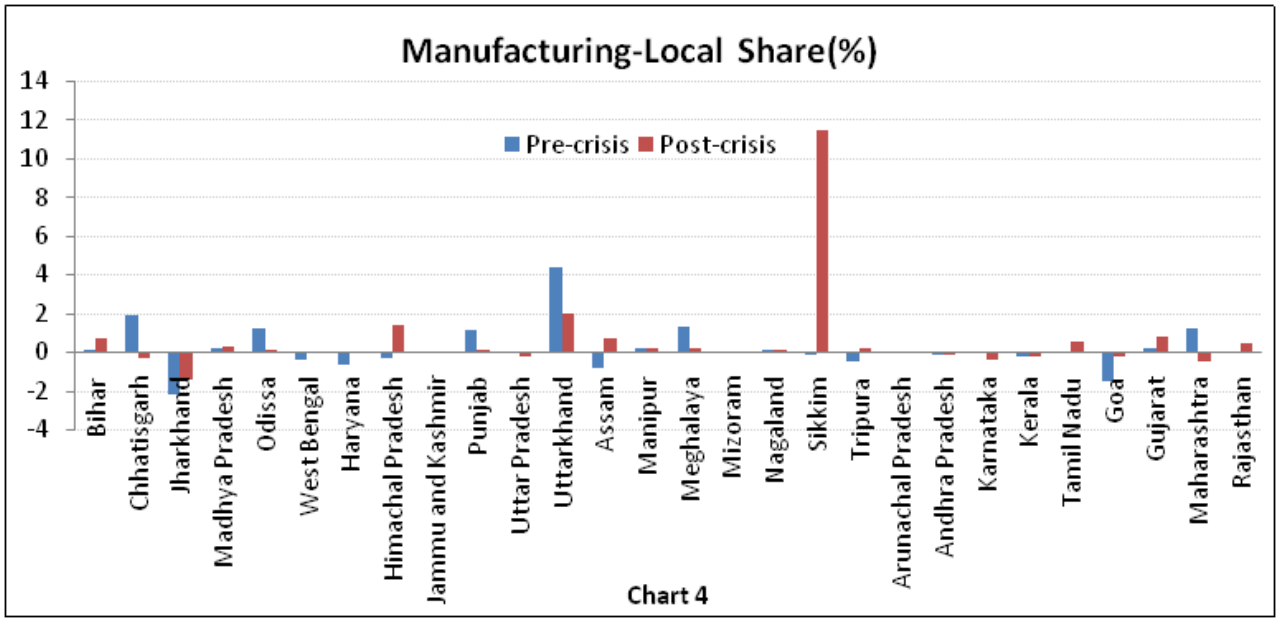

Chart 4

As shown in Table 9 and 10, though the national share is dominant even in case of service sector, the sectoral impact has been positive both during the pre and post crisis period. This is natural as the service sector in India has grown at a pace greater than the national income. Also, the share of national effects has reduced for major states in the post crisis period and has been replaced by the sector effects. This is primarily due to the globalised nature of service sector in India.

Table 9 : Shift Share Analysis of Services Sector

i=Services		***NSij***		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*5.16*	*3.93*	*0.52*	*1.05*	*1.88*	*7.22*
	Chhatisgarh	*3.22*	*2.55*	*0.32*	*0.68*	*2.04*	*3.85*
	Jharkhand	*3.43*	*2.99*	*0.34*	*0.79*	*-0.19*	*1.42*
	Madhya Pradesh	*4.25*	*3.31*	*0.43*	*0.90*	*-1.51*	*0.96*
	Odissa	*4.09*	*3.29*	*0.41*	*0.88*	*-0.15*	*0.43*
	West Bengal	*5.27*	*4.32*	*0.53*	*1.17*	*0.65*	*0.15*

Northern	Haryana	*4.32*	*3.72*	*0.43*	*1.00*	*1.39*	*1.36*
	Himachal Pradesh	*3.47*	*2.80*	*0.35*	*0.76*	*-0.33*	*0.51*
	Jammu and Kashmir	*4.25*	*3.59*	*0.43*	*0.97*	*-0.81*	*0.09*
	Punjab	*4.03*	*3.16*	*0.41*	*0.85*	*-1.19*	*0.10*
	Uttar Pradesh	*4.47*	*3.67*	*0.45*	*0.99*	*-1.03*	*0.13*
	Uttarkhand	*4.68*	*3.74*	*0.47*	*1.00*	*2.76*	*1.29*
North Eastern	Assam	*4.47*	*3.61*	*0.45*	*0.98*	*1.14*	*3.52*
	Manipur	*3.70*	*3.04*	*0.37*	*0.82*	*0.13*	*2.85*
	Meghalaya	*4.81*	*3.75*	*0.49*	*1.01*	*-1.76*	*0.37*
	Mizoram	*5.58*	*4.56*	*0.57*	*1.11*	*-2.20*	*-11.96*
	Nagaland	*5.09*	*4.01*	*0.51*	*1.09*	*0.49*	*1.23*
	Sikkim	*5.02*	*3.00*	*0.51*	*0.84*	*-1.00*	*0.54*
	Tripura	*4.74*	*3.59*	*0.48*	*0.97*	*-2.21*	*0.27*
	Arunachal Pradesh	*3.23*	*2.74*	*0.32*	*0.71*	*-0.93*	*0.50*
Southern	Andhra Pradesh	*4.85*	*3.83*	*0.49*	*1.03*	*0.44*	*0.08*
	Karnataka	*4.88*	*3.86*	*0.49*	*1.04*	*0.87*	*-0.76*
	Kerala	*5.76*	*5.14*	*0.58*	*1.25*	*0.84*	*0.59*
	Tamil Nadu	*5.43*	*4.35*	*0.55*	*1.17*	*1.66*	*-0.28*
Western	Goa	*4.28*	*3.74*	*0.43*	*0.91*	*-0.79*	*1.66*
	Gujarat	*4.12*	*3.47*	*0.42*	*0.85*	*0.60*	*0.22*
	Maharashtra	*5.55*	*4.35*	*0.56*	*1.17*	*0.56*	*0.13*
	Rajastan	*4.18*	*3.62*	*0.42*	*0.88*	*-0.52*	*0.36*

Table 10 : Composition of growth components in Services Sector

i=Services		**Share of each in total growth(%)**					
		NSij		***IMij***		***LSij***	
Region	***j = State***	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**	**Pre-crisis**	**Post-Crisis**
Eastern	Bihar	*68.25*	*32.21*	*6.88*	*8.61*	*24.87*	*59.18*
	Chhatisgarh	*57.71*	*36.02*	*5.73*	*9.60*	*36.56*	*54.38*
	Jharkhand	*95.81*	*57.50*	*9.50*	*15.19*	*-5.31*	*27.31*
	Madhya Pradesh	*134.07*	*64.02*	*13.56*	*17.41*	*-47.63*	*18.57*
	Odissa	*94.02*	*71.52*	*9.43*	*19.13*	*-3.45*	*9.35*
	West Bengal	*102.33*	*80.90*	*10.29*	*21.91*	*-12.62*	*-2.81*
Northern	Haryana	*70.36*	*61.18*	*7.00*	*16.45*	*22.64*	*22.37*
	Himachal Pradesh	*99.43*	*68.80*	*10.03*	*18.67*	*-9.46*	*12.53*
	Jammu and Kashmir	*109.82*	*77.20*	*11.11*	*20.86*	*-20.93*	*1.94*
	Punjab	*124.00*	*76.89*	*12.62*	*20.68*	*-36.62*	*2.43*
	Uttar Pradesh	*114.91*	*76.62*	*11.57*	*20.67*	*-26.48*	*2.71*
	Uttarkhand	*59.17*	*62.02*	*5.94*	*16.58*	*34.89*	*21.39*

North Eastern	Assam	*73.76*	*44.51*	*7.43*	*12.08*	*18.81*	*43.40*
	Manipur	*88.10*	*45.31*	*8.81*	*12.22*	*3.10*	*42.47*
	Meghalaya	*135.88*	*73.10*	*13.84*	*19.69*	*-49.72*	*7.21*
	Mizoram	*141.27*	*-72.50*	*14.43*	*-17.65*	*-55.70*	*190.14*
	Nagaland	*83.58*	*63.35*	*8.37*	*17.22*	*8.05*	*19.43*
	Sikkim	*110.82*	*68.49*	*11.26*	*19.18*	*-22.08*	*12.33*
	Tripura	*157.48*	*74.33*	*15.95*	*20.08*	*-73.42*	*5.59*
	Arunachal Pradesh	*123.28*	*69.37*	*12.21*	*17.97*	*-35.50*	*12.66*
Southern	Andhra Pradesh	*83.91*	*77.53*	*8.48*	*20.85*	*7.61*	*1.62*
	Karnataka	*78.21*	*93.24*	*7.85*	*25.12*	*13.94*	*-18.36*
	Kerala	*80.22*	*73.64*	*8.08*	*17.91*	*11.70*	*8.45*
	Tamil Nadu	*71.07*	*83.02*	*7.20*	*22.33*	*21.73*	*-5.34*
Western	Goa	*109.18*	*59.27*	*10.97*	*14.42*	*-20.15*	*26.31*
	Gujarat	*80.16*	*76.43*	*8.17*	*18.72*	*11.67*	*4.85*
	Maharashtra	*83.21*	*76.99*	*8.40*	*20.71*	*8.40*	*2.30*
	Rajastan	*102.45*	*74.49*	*10.29*	*18.11*	*-12.75*	*7.41*

The change in local share is depicted in Chart 5.

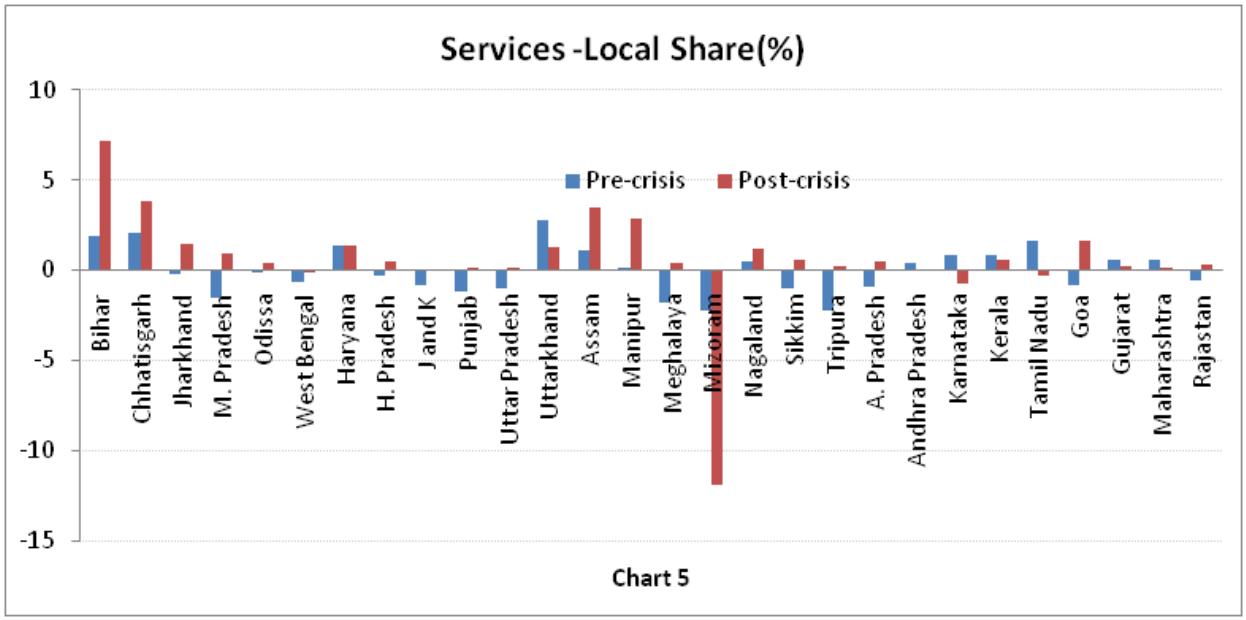

Chart 5

Analysis of the findings

Since local share determines the impact of state level effects on the sector, we primarily concentrate on the local share figures. The following points are observed on analyzing the findings.

1. The states of Bihar, Madhya Pradesh, Uttarakhand, Sikkim, Nagaland, Arunachal Pradesh, Gujarat and Rajasthan have performed well in all the five sectors even post crisis as their share has either improved or remained positive. The states of Bihar, Madhya Pradesh and Gujarat have shown improvement due to

efficient governance. Sikkim and Nagaland, on the other hand, have shown improvement due to stable governance and massive investment in developmental activities undertaken by the respective state governments. The adoption of North East Industrial and Investment Policy in 2007 has also contributed to the positive local effects.

2. The performance of West Bengal has remained negative across all sectors indicating negative impact of local effects on all the sectors. This is mainly due to the political situation in the state.

3. The states of Punjab, Kerala, Andhra Pradesh and Maharashtra have performed well on the service front while their performance has not been good in all other sectors but the share of local effects in total growth has deteriorated in Maharashtra from 8.4% in pre crisis period to 2.3% in post crisis period and for Kerala, it has deteriorated from 11.7% in pre crisis period to 8.45% in the post crisis period.

4. The states of Orissa, Jammu and Kashmir, Jharkhand, Haryana, Chhatisgarh, Manipur and Uttar Pradesh have performed well in all other sectors apart from industry or manufacturing.

5. The state of Himachal Pradesh has performed well in all sectors other than agriculture. This is due to various tax sops given for establishing units in the state and ample availability of electricity. The local share effect on agriculture sector has remained negative due to the geological nature of the state.

6. The states of Tripura and Meghalaya have performed well on allied activity front while have not done so on the agriculture due to geological reasons and adoption of North East Industrial and Investment Policy in 2007.

7. The states of Assam, Mizoram and Goa have performed well in agriculture and industry. In case of Assam and Mizoram, this is due to adoption of North East Industrial and Investment Policy in 2007.

8. The state of Karnataka is shown to have performed well only on the agriculture and allied activities front. This may be due to the impact of global crisis on the IT sector which is dominant in Karnataka. The negative results pertaining to industry and manufacturing would require further investigation as Karnataka is one of the leading producers of industrial and manufacturing goods in India.

9. The state of Tamil Nadu has performed well only on the manufacturing front while its performance has decelerated in all other sectors. In case of agriculture, the negative local effect is experienced due to falling share of agriculture in the total SGDP. On the service front, the deceleration of the service sector may be due to the impact of global crisis on the IT and BPO sector.

Summary and Conclusion

This paper has attempted to segregate the national and sectoral effects from the sectoral growth rates of individual state using the Shift Share so as to analyze the impact of state level factors on the sectoral growth rates. A few factors supporting the results obtained out of this exercise have been cited. But a detailed investigation of the figures could give us a clearer picture on the sectoral performance in each of the states.

Acknowledgement

I am highly indebted and grateful to Dr. Subrahmanyam Ganti, our professor for

Analytical Research Models, for his inputs, encouragement, support and advice on this paper. I would also like to thank him for his help and important suggestions. I also convey my gratitude to IGIDR authorities for the infrastructural support and all the staff associated with CC and library. Doing this term paper was a pleasant and learning experience for me.

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