

# **Spatial Concentration/Diversification: Comparative Analysis of Class I Cities Located within and outside Urban Agglomerations in India (1991-2001)**

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## **1. Introduction:**

The process of urbanization in India is large city oriented as there has been continuous concentration of population in class I cities (100000 population and above) throughout all the decades in last century. According to 1991 census 56.68% of the country's urban population lived in class I cities which increased to 62.29% in 2001. The basic reason for increasing dominance of these cities is a graduation of lower order towns into class I category. Within this category, cities with million plus population (metropolitan cities) have shown a significant increase in their number and a much higher population growth. In addition, Urban Agglomerations are also important phenomena which dominate the urban scenario of the country.

Beside the dominance of large cities, it has been observed that there are spatial disparity in terms of their distribution and other characteristics. Since class I cities itself is not a homogeneous category, this paper aims to see the effect of location on characteristics of these cities. In this context it compares the class I cities located within UA boundaries and those located outside UA's in terms of their population and workforce characteristics. It also aims to analyze the process of concentration/dispersal of population in the urban agglomerations of million plus cities. The latter part of this paper deals with the sectoral and spatial concentration of workforce in class I cities according to size class and their location within or outside the urban agglomerations.

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## 2. Distribution and growth of class I cities within and outside Urban Agglomerations:

The process of Indian urbanization is basically large city oriented as the number of class I cities has systematically gone up during last century. Between 1991 and 2001 their number has increased from 322 to 441. Within class I category, the number of cities with million plus population (Ia) has increased from 18 to 31. There were 32 cities in class Ib category (cities with 500000 to 1000000 population) which have increased to 40 in 2001. The corresponding figures for class Ic (cities with 100000 to 500000 population) were 272 and 370.

**Table-2.1**

**Class I Cities According to Size Class (1991-2001)**

Size Class	Number of Cities		% Increase in Population
	1991	2001	
I	322	441	45.74
Ia	18	31	57.41
Ib	32	40	30.98
Ic	272	370	40.73

Source: Calculated from Census of 1991 and 2001

In terms of decadal growth class I cities have recorded 45.74% growth during 1991 and 2001, while cities with million plus population have registered higher growth (57.41) followed by class Ic (40.73%) and class Ib (30.98%). Table-2.1 presents the distribution of class I cities within and outside UAs.

**Table-2.2**

**Distribution of Class I Cities Within and Outside the Urban Agglomerations (1991-2001)**

Size Class	Number of Class I Cities					
	1991		2001			
	1991	2001	Inside UA	Outside UA	Inside UA	Outside UA
I	322	422	214	108	268	154
Ia	18	27	17	1	24	3
Ib	32	42	27	5	32	10
Ic	272	353	170	102	212	141

Source: Calculated from Census of 1991 and 2001

Note: In 2001 parts of same city treated as class I cities are excluded

During 1991, out of 322 cities I class I category 214 cities were located within UAs, while 108 cities were outside UAs. The corresponding figures for 2001 were 268 and 154. The concentration of class I cities within UAs is observed in their size class distribution also. It shows that in 1991, out of 18 million plus cities 17 cities were located within UAs against 1 located outside UA. In 2001, out of 27 million plus cities only 3 cities were located outside UAs. Similar is the case with cities in Ib and Ic.

Table-2.3 presents size class distribution of common cities between 1991 and 2001 to show the change in their class during this period. It may be observed here that within class I category cities from class Ib and Ic have graduated to higher size class. In 1991, there were 16 cities in class Ia category located within UAs which increased to 24 in 2001 whereas the figures for cities located outside UAs were 1 and 2 respectively.

**Table-2.3**

**Size Class Distribution of Common Class I Cities Within and Outside the Urban Agglomerations (1991-2001)**

Size Class	Number of Class I Cities			
	1991		2001	
	Inside UA	Outside UA	Inside UA	Outside UA
I	204	104	204	104
Ia	16	1	24	2
Ib	27	5	31	10
Ic	161	98	149	92

*Source: Calculated from Census of 1991 and 2001*

Note: Only common cities between 1991 and 2001 are used by considering their size class distribution in the base year.

Number of class Ib cities has increased by 4 (from 27 to 31) within UAs and their number outside UAs has increased by 5 (from 5 to 10). On the other hand class Ic has registered a decline in its number of cities within and outside UAs by 12 and 6 respectively during considered period. The observed pattern confirms that a larger number of class I cities located within UAs have moved to higher size classes compare to cities which are located outside UAs.

**Tables-2.4**

**Population Distribution of Class I Cities Within and Outside the Urban Agglomerations**

Size Class	1991		2001	
	Inside UA	Outside UA	Inside UA	Outside UA
I	81.82	18.18	78.46	21.54
Ia	97.90	2.10	93.46	6.54
Ib	86.87	13.13	77.52	22.48
Ic	63.81	36.19	62.78	37.22

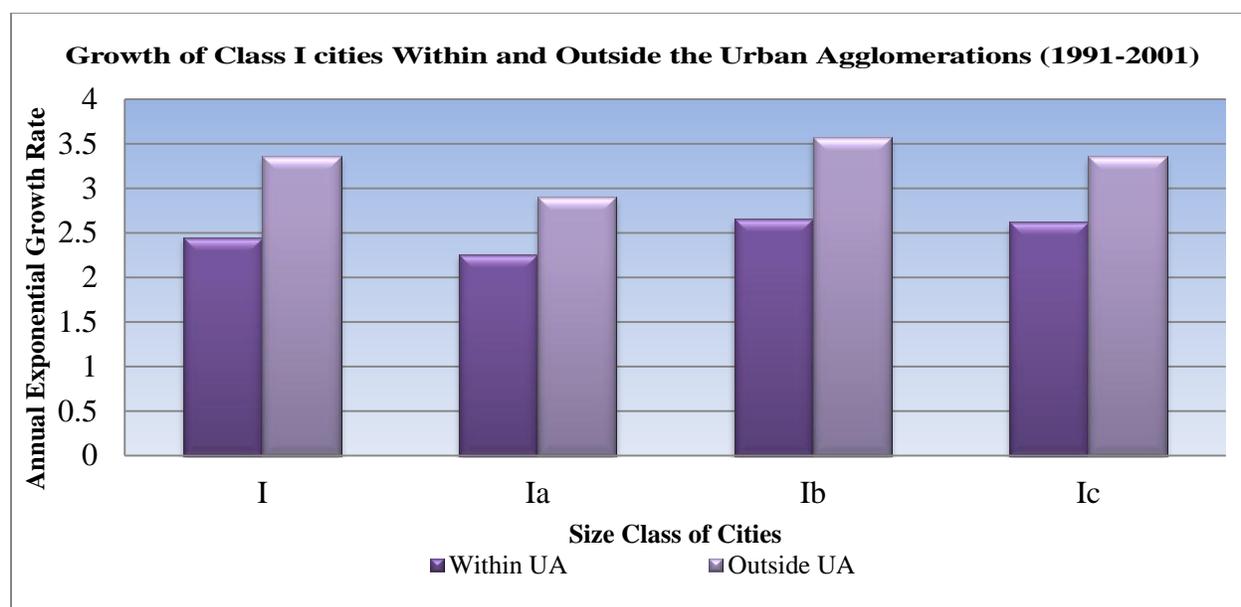
*Source: Calculated from Census of 1991 and 2001*

Note: Only common cities between 1991 and 2001 are used by considering their size class distribution in the base year.

The share of urban population in class I cities which are common between 1991 and 2001, within and outside UAs is shown in figure. Their growth are given in tables-2.4 and 2.5. It may be clearly observed that during this period, class I cities located outside UAs have shown increase in their share of urban population by 3.36% (from 18.18% to 21.54%) as against a decline in population share of cities within

UAs. Among class I cities larger increase (by 9.35%) was recorded by class Ic , followed by class Ia (4.44%) and class Ic (1.02%).

**Figure: 2.1**



**Tables-2.5**

**Growth of Class I cities Within and Outside the Urban Agglomerations (1991-2001)**

Size Class	Inside UA		Outside UA	
	Decadal Growth Rate	Annual Exponential Growth Rate	Decadal Growth Rate	Annual Exponential Growth Rate
I	27.82	2.45	40.00	3.36
Ia	25.35	2.26	33.79	2.91
Ib	30.49	2.66	42.87	3.57
Ic	29.93	2.62	39.90	3.36

*Source: Calculated from Census of 1991 and 2001*

Note: Only common cities between 1991 and 2001 are used by considering their size class distribution in the base year.

A similar pattern is observed in terms of growth of these cities, where in class I cities outside UAs have recorded higher annual exponential growth rate (3.36%) compare to cities located within UAs (2.45%). Among class I category higher growth rate was registered by class Ib (3.57%) followed by class Ic (3.36%) and Ia (2.91%). This higher growth rate of cities which are outside UAs may be because the marginal increase in population in UAs is generally absorbed by smaller urban areas located around the large city due to high cost of living, lack of infrastructure and high land value within large city, where as individual cities located outside UAs easily accommodate their increasing population.

Tables-2.6. and Table-2.7 gives an account of class I cities which are declassified and newly added between 1991 and 2001.

**Tables-2.6**

**Declassified and Newly Formed Class I Cities between 1991 & 2001**

Size Class	Number of Class I Cities	
	Declassified	Newly Formed
I	10	110
Ia	0	0
Ib	0	1
Ic	10	109

Source: Calculated from Census of 1991 and 2001

Since the number of class I cities in country during this decade has gone up from 322 to 422 (excluding parts of same city) because 10 cities have lost their class I status , on the other hand 110 new cities attained class I status. The 10 cities which lost their class I status belonged to class Ic, while out of 110 new class I cities 1 city has attained class Ib and other 109 cities were added in class Ic category.

**Tables-2.7**

**Change in Status of Class I Cities Within and Outside Urban Agglomerations (1991-2001)**

Size Class	Number of Class I Cities			
	Within UA		Outside UA	
	Excluded	Added	Excluded	Added
I	10	64	4	54
Ia	1	0	0	1
Ib	0	1	0	0
Ic	9	63	4	53

Source: Calculated from Census of 1991 and 2001

If we look at the change in the number of cities located within UAs and located outside UAs then it is observed that 10 cities which were located within UAs were excluded during this period against 4 cities located outside UAs, while 64 new cities were added in former and 54 cities were added in latter category. A million plus city which has excluded from UA and added in class I cities outside UA is Jaipur, which was An UA in 1991 census but derecognizes as UAs in 2001 census. In class Ib, only 1 city was added that is within UAs category, while in class Ic, 9 and 4 cities were excluded respectively from within and outside UA category. The corresponding figures for newly added cities were 63 and 53.

**3.1 Growth pattern of class I cities/UAs with million and above population:**

Class I cities with million and above population are a major feature of Indian urbanization because despite their small number they contain a large proportion of the urban population. According to the 2001 census

India has 35 cities and UAs with million and above population which were only 23 in 1991. These cities are further concentrated in few developed states which have a higher level of urbanization. Here an important observation from Table-3.1 is that some of the largest and historically important cities/UAs for example Greater Mumbai, Kolkata Chennai have recorded lower growth rates compare to other cities.

**Table-3.1**  
**Growth of Urban Agglomerations & Class I Cities with Million and Above Population**

<b>Sl. No.</b>	<b>Urban Agglomeration/City</b>	<b>Decadal Growth Rate</b>	<b>Annual Exponential Growth Rate</b>
<b>UAs/Cities common in 1991 &amp; 2001</b>			
1	Greater Mumbai	29.94	2.62
2	Kolkata	19.91	1.82
3	Delhi	51.93	4.18
4	Chennai	18.49	1.70
5	Bangalore	37.69	3.20
6	Hyderabad	27.37	2.42
7	Ahmadabad	36.44	3.11
8	Pune	50.58	4.09
9	Surat	85.09	6.16
10	Kanpur	32.54	2.82
11	Jaipur	52.98	4.25
12	Lucknow	35.81	3.06
13	Nagpur	27.58	2.44
14	Patna	55.27	4.40
15	Indore	47.79	3.91
16	Vadodara	32.44	2.81
17	Bhopal	37.23	3.16
18	Coimbatore	31.37	2.73
19	Ludhiana	34.11	2.94
20	Kochi	18.83	1.73
21	Visakhapatnam	25.76	2.29
22	Varanasi	17.55	1.62
23	Madurai	10.01	0.95
<b>UAs/Cities added between 1991 &amp; 2001</b>			
24	Agra	39.38	3.32
25	Meerut	37.37	3.18
26	Nashik	58.83	4.63
27	Jabalpur	25.68	2.29
28	Jamshedpur	32.88	2.84
29	Asansol	42.70	3.56
30	Dhanbad	30.60	2.67
31	Faridabad	70.94	5.36
32	Allahabad	24.28	2.17
33	Amritsar	41.63	3.48
34	Vijayawada	19.56	1.79
35	Rajkot	53.12	4.26

Source: Calculated from Census of India for year 1991 & 2001

While some regionally important cities like Faridabad, Nasik, Jabalpur, Asansol and Dhanbad etc. have come up as metro cities by achieving million plus population during this period. Most of these cities are either located near already existing UAs or along forming urban corridor. The demographic growth in metro cities has been higher than that of common towns or even the class I cities in recent decades.<sup>1</sup> The growth would have been even higher but due to pressure exerted by environment lobby to locate the industrial units outside the municipal boundary it is not as high as expected. This is facilitated by easy availability of land, access to unorganized labour market, besides lesser awareness and less stringent implementation of environmental regulations in the rural settlements at the urban periphery. The poor are able to build shelters in these 'degenerated peripheries' and find jobs in the industries located therein or commute to the central city for work.<sup>2</sup> The entrepreneurs, engineers, executives, etc., associated with modern industries and business, however, reside within the central city and travel to the periphery through rapid transport.

### **3.2 Core and peripheral growth of metropolitan cities/urban agglomerations:**

There were 23 million plus cities in 1991 whereas their number has gone up to 35 in 2001. Most of these cities are multi municipal agglomerations which comprise a large city in the core with smaller urban areas in the periphery. Present section examines the growth of million plus cities in terms of the core<sup>3</sup> vis-a-vis the periphery.<sup>4</sup> While looking at the growth of million plus cities four important features have been noticed, that is; declining core-growing periphery, growing core-declining periphery, growing core-growing periphery, declining core- declining periphery. These are presented in table: 1.1. Among 35 metropolitan cities Jaipur, Faridabad, and Ludhiana do not have an agglomeration whereas Rajkot and Bhopal UAs do not have peripheral urban areas. However, an observation of intra-urban agglomeration of large metropolitan cities indicates that within agglomerations of the large cities for example, Greater Mumbai, Kolkata, Chennai, Hyderabad and Ahmadabad have recorded declining growth rate in core as well as in periphery but at the same time higher growth rate is recorded by their peripheries. These are one of the oldest UAs of the country and have been experiencing high growth rate and influx of population for a long period of time. On the other hand Delhi, Nagpur, Lucknow, Madurai, Coimbatore and Nasik have declining core and growing peripheries. Here Delhi needs a special mention because there have been planned efforts to control the growth of core city by creating counter magnet towns in its hinterland which resulted in higher growth of its peripheries. Huge population, lack of infrastructure and amenities, cost of living, and stringent land laws, may have decelerated the capacity of the core areas of their cities to absorb the marginal increase of population, which as a matter of fact, find place in and around the core city, indicating the faster growth of UA.<sup>5</sup>

Another category of UAs comprise Pune, Surat, Indore, Agra, Jabalpur and Jamshedpur which have growing core and declining peripheries. The characteristic feature of these cities is that these cities except Surat have acquired million plus population in 1991 census, since these are newly emerging UAs therefore experiencing concentration of population in their core cities. Whereas UAs like Bangalore, Kanpur, Patna, Vishakhapatnam and Dhanbad have growing cores and growing peripheries. Here Kanpur

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<sup>1</sup> Kundu, 2006.

<sup>2</sup> Kundu 1989 and Kundu et al. 2002.

<sup>3</sup> The main city within urban agglomeration

<sup>4</sup> Periphery is defined as urban areas around the main city but within the boundaries of urban agglomeration

<sup>5</sup> Sivaramakrishnan, et al 2005.

and Dhanbad are located near Lucknow and Kolkata respectively which are experiencing decline in their core and periphery both, therefore former are playing important role in absorbing the increasing population burden on latter. The regional cities like Jamshedpur and Asansol which have shown faster growing peripheries may play an important role in terms of rural urban integration. Thus smaller metropolitan cities in India still continue to experience in-filling within

Figure: 3.2.1

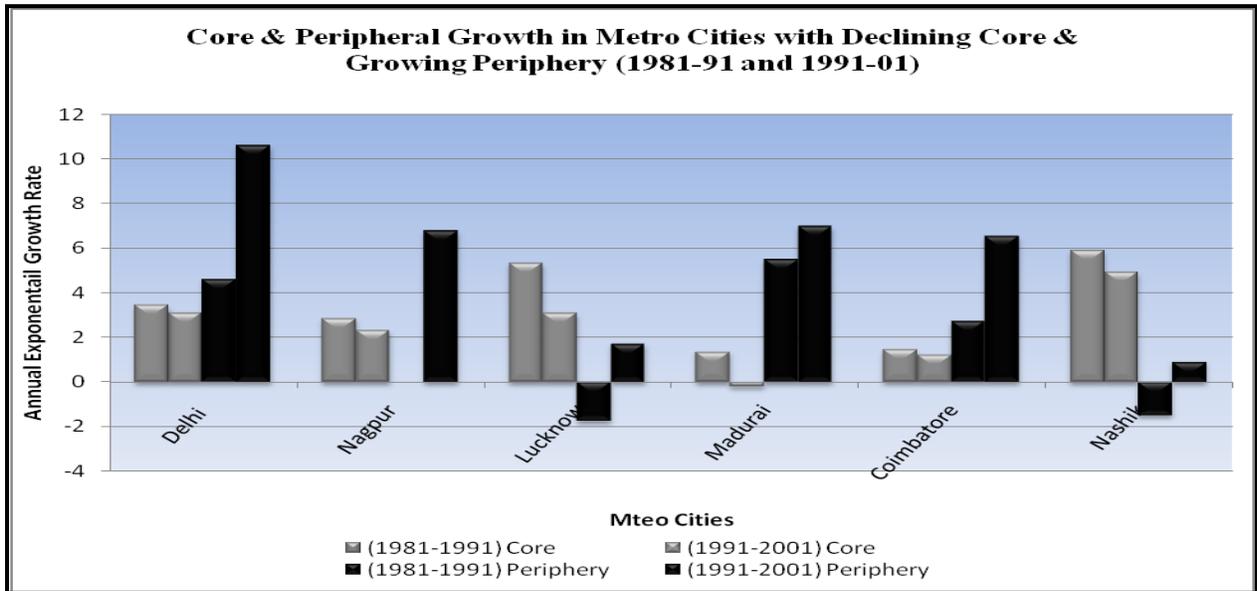


Figure: 3.2.2

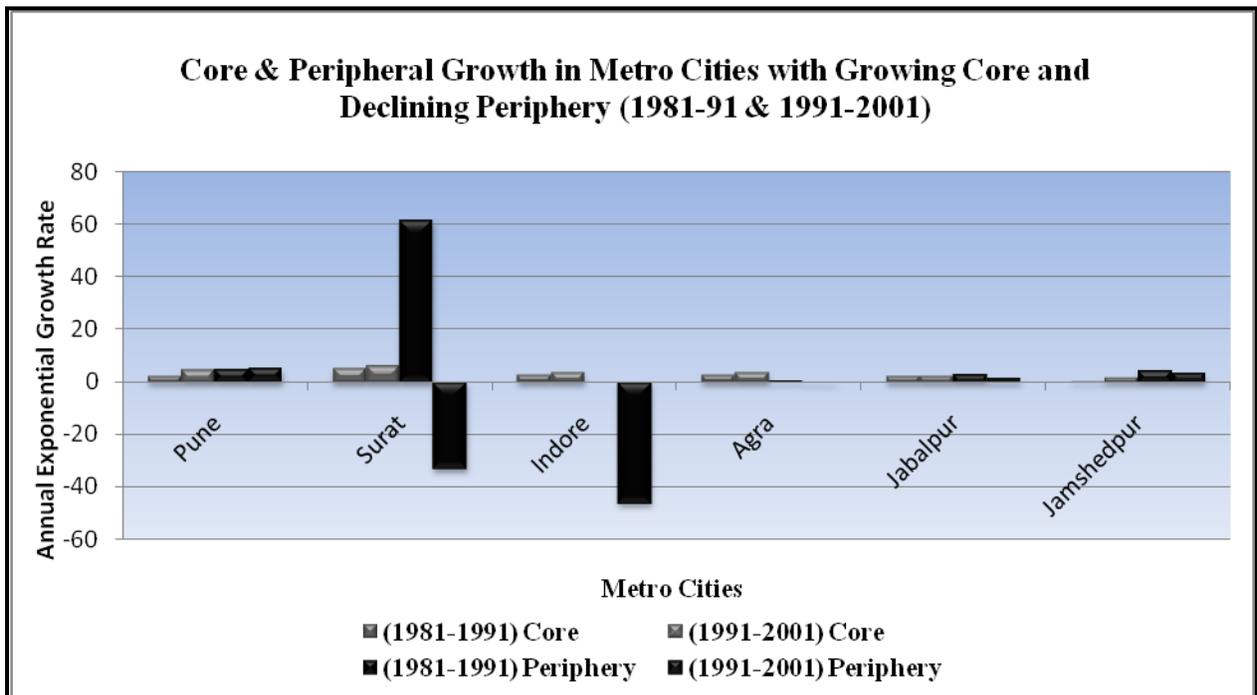


Figure: 3.2.3

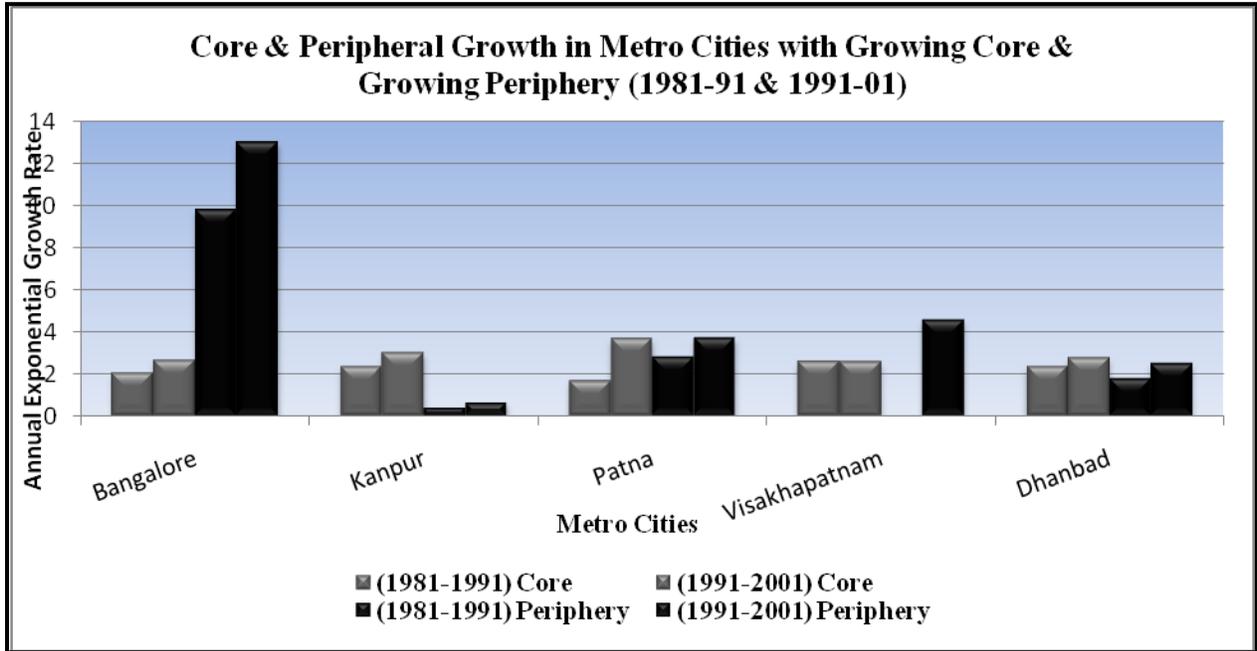
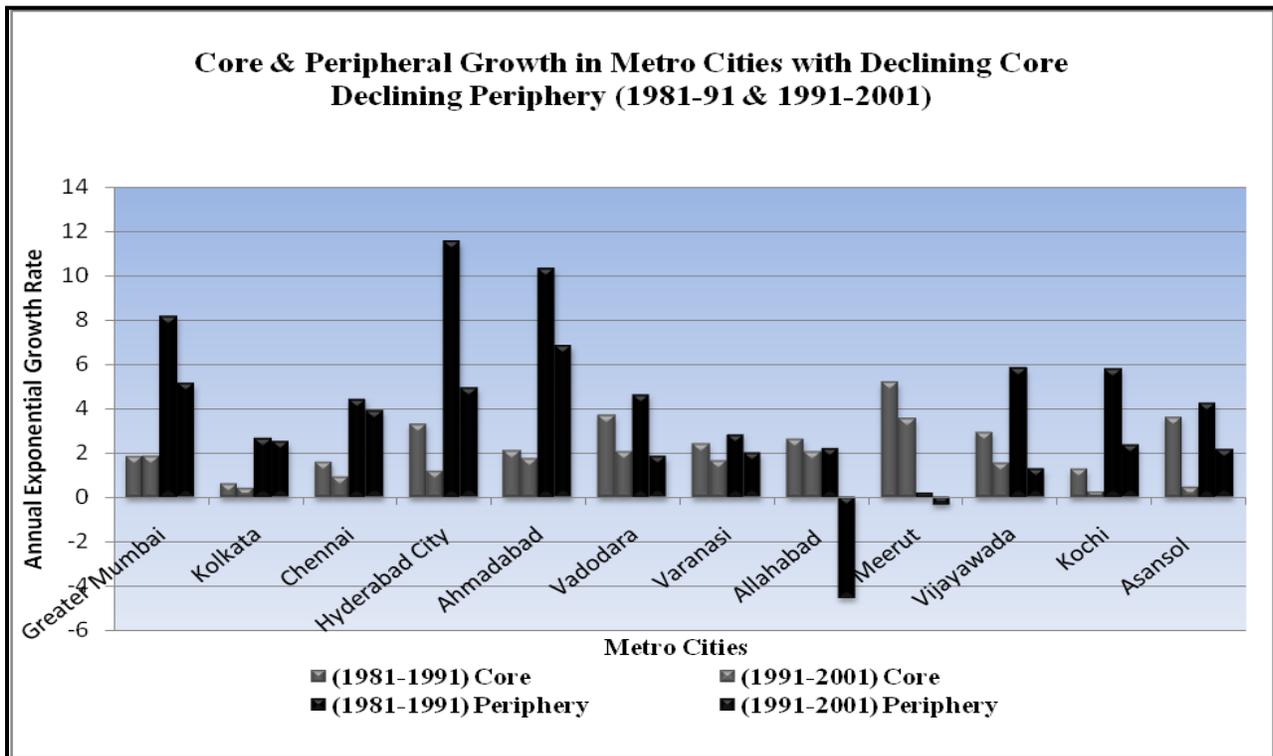


Figure: 3.2.4



city limits, while the large metros mostly show declining growth in the core and continue to expand outwards engulfing many villages and smaller towns in the surrounding area.<sup>6</sup>In addition, proximity of such cities for example, Vadodara-Ahmadabad-Surat, Mumbai-Pune-Nasik, Kolkata-Dhanbad-Jamshedpur, Amritsar-Jalandhar-Ludhiana and Chennai-Coimbatore-Madurai indicates a spatial concentration of population along these urban corridors

**Table-3.2.1**

**Growth of Urban Population Inside and Outside Urban Agglomerations (1991-2001)**

<b>Metropolitan Cities</b>	<b>1981-1991</b>		<b>1991-2001</b>	
	<b>Core</b>	<b>Periphery</b>	<b>Core</b>	<b>Periphery</b>
<b>Declining Core; Growing Periphery</b>				
Delhi Municipal Corporation (Urban)	3.46	4.59	3.09	10.63
Nagpur	2.87	0*	2.33	6.79
Lucknow	5.35	-1.74	3.10	1.74
Madurai	1.37	5.52	-0.19	7.00
Coimbatore	1.47	2.75	1.23	6.56
Nashik	5.91	-1.48	4.94	0.93
<b>Growing Core; Declining Periphery</b>				
Pune	2.01	5.19	4.83	5.01
Surat	4.89	61.63	5.85	-33.22
Indore	2.91	0*	3.65	-46.27
Agra	2.50	0.58	3.46	-0.01
Jabalpur	1.96	3.08	2.19	1.32
Jamshedpur	0.47	4.51	1.75	3.40
<b>Growing Core; Growing Periphery</b>				
Bangalore	1.98	9.75	2.62	12.99
Kanpur	2.29	0.37	2.98	0.60
Patna	1.61	2.78	3.64	3.69
Visakhapatnam	2.52	0*	2.54	4.56
Dhanbad	2.33	1.73	2.71	2.47
<b>Declining Core; Declining Periphery</b>				
Greater Mumbai	1.86	8.18	1.83	5.12
Kolkata	0.64	2.68	0.40	2.50
Chennai	1.59	4.44	0.93	3.90
Hyderabad City	3.31	11.53	1.21	4.94

<sup>6</sup> Shaw, A. (2005), Peri-Urban Interface of Indian Cities, Growth, Governance and Local Initiatives, Economic and Political Weekly, p. 129

Ahmadabad	2.09	10.32	1.74	6.84
Vadodara	3.68	4.64	2.07	1.85
Varanasi	2.43	2.85	1.66	1.99
Allahabad	2.64	2.23	2.05	-4.55
Meerut	5.19	0.19	3.54	-0.33
Vijayawada	2.94	5.83	1.53	1.27
Kochi	1.27	5.80	0.24	2.36
Asansol	3.61	4.24	0.45	2.15

Source: Calculated from Census of India 1991 and 2001.

Note: 0\* Did not have periphery in 1981.

#### 4. Growth of workers: cities which have maintained class I status in 1991 and 2001 Census

Table shows the growth of total workers in class I cities located within and outside UAs according to size class. Between 1991 and 2001 the total workers in class I cities have increased by 3.85 percent exponentially. However, size class wise metro cities have registered a lower growth rate of workers (2.80 percent) compared to class Ib (4.87 percent) and class Ic (4.46 percent). In terms of location, an interesting observation is that metro cities located outside UAs have shown higher growth rate as against recorded by their counterparts located within UAs. Equally important to note is the fact that Ludhiana<sup>7</sup> was the only common metro city located outside UA between 1991 and 2001 census.

**Table-4.1**

#### **Annual Exponential Growth Rates of Total Workers (1991-2001)**

Size Class	Annual Exponential Growth Rate		
	Total	Within UA	Outside UA
I	3.85	3.51	5.33
Ia	2.80	2.12	16.19
Ib	4.87	4.94	4.45
Ic	4.46	4.68	4.04

Source: Census of India (1991 and 2001)

Note: The growth rates for cities in different size categories have been computed by considering these by their size class distribution in the base year.

<sup>7</sup> Since the analysis has been done for common class I cities between 1991 and 2001, the size-class Ia for class I cities located outside UAs represent only Ludhiana.

On the other hand cities of class Ib and Ic (4.94 and 4.68 percent) located within UAs experienced a relatively higher growth rate of workers than the cities of same size class (4.45 and 4.04 percent respectively by class Ib and Ic) located outside UAs.

**Table-4.1**  
**Growth of Workers by Gender (1991-2001)**  
**Annual Exponential Growth Rate**

Size Class	Total	Male	Female
I	3.85	3.40	6.71
Ia	2.80	2.35	5.61
Ib	4.87	4.42	7.86
Ic	4.46	4.00	7.32

*Source: Census of India (1991 and 2001)*

Note: The growth rates for cities in different size categories have been computed by considering these by their size class distribution in the base year.

Looking at the growth of male and female workers separately it is observed that number of female workers have grown faster than that of male workers for all size classes of class I cities located both within and outside UAs. In all class I cities the female workers have grown by an annual exponential growth rate of 6.71 percent. The growth rate of male workers was 3.40 percent per annum for the same time period. According to size class, male workers in metro cities have recorded an annual growth rate of 2.35 percent while in class Ib and Ic their growth rate was 4.2 percent and 4.00 percent per annum respectively. Female workers have also shown a higher growth rate in class Ib (2.86 percent) and class Ic (7.32 percent) as compared to metro cities (5.61 percent). This increase in female urban employment is often called feminization of labourforce. These developing tendencies of feminization have developed mainly for the work at the lower end of the value chain which involves low paid, inferior working conditions. It can be inferred that as an impact of the liberalization policies and the labour market deregulations, this kind of feminization was a response to the need of the employers for a more flexible labourforce. This pattern of “feminization” does not call for any celebration but what it requires essentially is to frame a social policy to protect the rights of such women workers and provide them with better employment contracts<sup>8</sup>

Looking at the growth rates of workers based on the location of class I cities, it is found that both, male as well as female workers, have grown at a faster rate in class I cities located outside UAs. Unlike class I cities which are part of UAs, class I cities which are located outside UAs have rural hinterland and are regionally important cities dominating large area, therefore concentration of economic activities or industries in these cities has led to relatively higher workforce growth as compared to their counterparts located within UAs.

<sup>8</sup> S. Mitra (2006), Patterns of Female Employment in Urban India Analysis of NSS Data (1983 to 1999-2000), *Economic and Political Weekly*, Vol. 41, No. 48, p. 5008

**Table-4.3****Growth of Workers in Class I Cities by Location and Gender (1991-2001)**

Size Class	Annual Exponential Growth Rate					
	Within UA			Outside UA		
	Total	Male	Female	Total	Male	Female
I	3.51	3.05	6.41	5.33	4.91	8.03
Ia	2.12	1.66	5.01	16.19	15.37	26.13
Ib	4.94	4.48	8.08	4.45	4.00	6.79
Ic	4.68	4.22	7.55	4.04	3.60	6.88

Source: Census of India (1991 and 2001)

Note: The growth rates for cities in different size categories have been computed by considering these by their size class distribution in the base year.

Added to this, they do not face the problems of congestion high rent and land prices within city so they are in process of catching up with the large cities located within UAs. Further looking at differences in size class level within UAs, it is observed that in case of metro cities the growth of male and female workers (1.66 and 5.01 percent respectively) is lower than other two size class cities. The growth rate of male and female workers in these two size class cities are 4.48 and 8.08 percent and 4.22 and 7.55 percent respectively. At the same time, however, class I cities located outside UAs shows that Ludhiana, the only metro city located outside UA, has shown a substantial growth in the number of both, male and female workers (15.37 and 26.13 percent per annum respectively) in its workforce. On the other hand, class Ib and Ic cities located within UAs have registered a higher growth rate of male and female workers compared to their counterparts located outside UAs.

**Table-4.4****Growth of Main and Marginal Workers in Class I Cities Within and Outside UAs (1991-2001)**

Size Class	Annual Exponential Growth Rate					
	Total		Within UA		Outside UA	
	Main Workers	Marginal Workers	Main Workers	Marginal Workers	Main Workers	Marginal Workers
I	3.24	20.63	2.92	20.53	4.64	20.97
Ia	2.29	20.53	1.62	19.62	15.58	0*
Ib	4.22	22.40	4.28	21.95	3.83	26.62
Ic	3.78	20.04	4.04	20.68	3.30	19.09

Source: Census of India (1991 and 2001)

Note: The growth rates for cities in different size categories have been computed by considering these by their size class distribution in the base year.

Last decade has observed a faster growth of marginal workers in class I cities, being 20.63 percent annual exponential as against growth of main workers at 3.24 percent per annum. According to size class, the highest growth in the number of main workers was recorded by class Ib cities by 4.22 percent, followed by class Ic (3.78 percent) and Ia (2.29 percent). In case of marginal workers also Class Ib has shown a higher growth rate (22.40 percent), followed by class Ia or metro cities (20.53 percent) and class Ic (20.04 percent). In term of location of class I cities within and outside UAs, it is observed that among the cities which are located within UAs, class Ib cities have recorded a higher growth rate of main workers, at the rate of 4.28 percent followed by class Ic cities (4.04 percent) and class Ia cities (1.62 percent). Excluding class Ia for cities located outside UAs as latter constitutes just one city, which is Ludhiana. Other two size classes viz. class Ib and Ic have shown 3.83 percent and 3.30 percent annual exponential growth rate of marginal workers respectively. At the same time, however, the growth rate of main workers has been higher in class I cities located within UAs. In case of marginal workers, class Ib cities have registered a higher growth rate (26.62 percent) as compared to cities of same size class located within UAs. The growth rate of marginal workers in the latter has been 21.95 percent during the same decade. On the other hand class Ic cities located within UAs have recorded a relatively higher growth rate of marginal workers (20.68 percent) than their counterparts located outside UAs (19.09). Ludhiana, the only metro city outside UA, did not have marginal workers in 1991. A large proportion of marginal workers in urban areas is employed in informal activities mainly in service sector. As Mitra's study shows, in around 70 per cent of the class I cities, i e, each with a population of 1,00,000 and above, tertiary activities accounted for more than 60 per cent of the informal sector<sup>9</sup>.

## **5. Population change in the core city and Urban Agglomeration (1991-2001):**

Metropolitan areas and their component communities grow for a combination of four reasons: (1) because their businesses and industries have a competitive advantage in the national or global marketplace as a result of agglomeration economies, inherent resource advantages, an innovative culture, and/or a favorable business cost structure; (2) because of quality-of-life advantages that attract population and jobs; (3) because they are in a central location able to serve a growing "hinterland" and/ or are able to link into global trade and business networks; and (4) because their growth and development is subsidized or sponsored through increased (national) government spending.<sup>10</sup>

For as long there have been cities and urban agglomerations, the urban growth is accompanied by decentralization. The table presents twenty UAs out of thirty five urban agglomerations (common UAs between 1991 and 2001, which have core and periphery). Comparison of core city growth vis-à-vis their urban agglomeration is presented in Table 5.1. Here core is defined as the largest city in an urban agglomeration and its periphery includes all the towns and cities located within its urban agglomeration boundaries. Further, the UAs are classified into four categories viz. UAs with declining periphery, UAs with growing core and declining periphery, growing core and growing periphery and UA with declining core and declining periphery.

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<sup>9</sup> A. Mitra, (1994), *Urbanisation, Slums, Informal Sector Employment and Poverty: An Exploratory Study*, DK Publishers and Distributor, p.79

<sup>10</sup> J. Landis (2009), The Changing Shape of Metropolitan America, *The ANNALS of the American Academy of Political and Social Science*. Vol.626. No.154

The core city population growth rates during 1991 and 2001 ranged from high of 62 percent in Surat and Pune to low of 2 percent in Kochi. While Madurai is the only core city which has lost its population during same period and this is located in UA with growing periphery.

**Table: 5.1**

**Core City and Urban Agglomeration Population Change 1991 and 2001**

<b>Urban Agglomeration</b>	<b>Population Change in Core City (%)</b>	<b>Population Change in UA (%)</b>	<b>Ratio of Core City to UA Population Change (%)</b>	<b>Share of Core City in UA Population Change (%)</b>	<b>City Size Rank (1991)</b>	<b>City Size Rank (2001)</b>
<b>Declining Core; Growing Periphery</b>						
Delhi	36	52	0.70	60	2	2
Nagpur	26	28	0.95	93	9	13
Lucknow	36	36	1.01	98	10	12
Madurai	-2	10	-0.19	-17	19	30
Coimbatore	13	31	0.42	31	22	29
<b>Growing Core; Declining Periphery</b>						
Patna	44	54	0.81	70	18	17
Surat	62	85	0.72	72	12	10
Indore	44	48	0.92	92	14	14
<b>Growing Core; Growing Periphery</b>						
Bangalore	30	38	0.80	64	5	4
Kanpur	35	33	1.07	99	8	9
Pune	62	54	1.14	163	11	8
Visakhapatnam	29	26	1.12	80	26	26
<b>Declining Core; Declining Periphery</b>						
Greater Mumbai	20	30	0.67	53	1	1
Kolkata	4	20	0.21	8	3	3
Chennai	10	18	0.53	37	4	5

Hyderabad	13	27	0.47	33	6	7
Ahmadabad	19	36	0.52	46	7	6
Vadodara	23	32	0.71	67	16	18
Varanasi	18	18	1.03	93	20	20
Kochi	2	19	0.13	6	32	32

*Source: Census of India 1991 and 2001*

Out of twenty metropolitan cities three core cities namely Kanpur, Pune and Vishakhapatnam have grown faster than their urban agglomerations. All three are located in UAs with growing core and growing periphery. They have also shown larger percentage change in population as share of their UA population change. On the other hand Kolkata and Kochi have observed lowest population change as share of UA population change. It has also been observed that small core cities have grown somewhat faster than larger ones, although the relationship is not consistent. Added to this, some of the largest core cities like Mumbai, Chennai and Ahmadabad have recorded lower growth compared to other core cities.

## 5.2 Patterns of density change:

Along with the outward growth, India's UAs also grow upward. The Table 5.1.4a gives average density of largest urban agglomerations in India and percentage change in their density during 1991 and 2001.

Compared by the above mentioned categories it may be clearly observed that average densities increased the most among UAs with growing core and declining peripheries rising from 8273 persons per square kilometer in 1991 to 11444 persons per square kilometer in 2001. At the opposite end of the spectrum, average densities increased the least among UA with declining core and declining periphery rising from 10005 persons per square kilometer in 1991 to 10210 persons per square kilometer in 2001. The average for UAs with declining core and growing periphery and UAs with growing core and growing periphery falls between these extremes.

**Table: 5.2**

### **Average Densities of Largest Urban Agglomerations 1991-2001**

Urban Agglomeration	Density (Persons per Sq. Km)	Density (Persons Per Sq. Km)	Change in Density (Persons Per Sq. Km)	Percentage Density Change (Persons Per Sq. Km)
	1991	2001	1991-2001	1991-2001
<b>Declining Core; Growing Periphery</b>	<b>8505</b>	<b>10036</b>	<b>1531</b>	<b>18.0</b>

Delhi	12801	14393	1591	12.4
Nagpur	7272	9263	1990	27.4
Lucknow	4946	6717	1771	35.8
Madurai	9853	8498	-1355	-13.8
Coimbatore	3612	3815	203	5.6
<b>Growing Core; Declining Periphery</b>	<b>8273</b>	<b>11444</b>	<b>3171</b>	<b>38.3</b>
Patna	8314	12560	4246	51.1
Surat	9917	11867	1950	19.7
Indore	6715	9923	3209	47.8
<b>Growing Core; Growing Periphery</b>	<b>5608</b>	<b>6212</b>	<b>604</b>	<b>10.8</b>
Bangalore	9185	10534	1350	14.7
Kanpur	6789	8938	2149	31.6
Pune	5890	5619	-271	-4.6
Visakhapatnam	3399	4080	681	20.0
<b>Declining Core; Declining Periphery</b>	<b>10005</b>	<b>10210</b>	<b>206</b>	<b>2.1</b>
Greater Mumbai	12101	14420	2319	19.2
Kolkata	12233	12787	554	4.5
Chennai	10225	9153	-1071	-10.5
Hyderabad	6538	6731	194	3.0
Ahmadabad	13011	10309	-2702	-20.8
Vadodara	8227	6978	-1249	-15.2
Varanasi	9835	10886	1052	10.7

Kochi	3129	2994	-135	-4.3
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Source: Census of India 1991 and 2001

### 6.1 Concentration/ Diversification of workers across major industrial groups:

Herfindhal-Hirschman index (HH Index) of concentration has been used to measure the sectoral concentration of employment. The estimated values for HH index for common class I cities between 1991 and 2001 are 2132.2 and 2107.4 respectively which shows high concentration of workers since index value above 1800 indicates concentration of workers (Table 5.2.1a). The negative change in the index during considered period shows diversification of employment in class I cities. According to size class, the metro cities have recorded relatively more diversification as compared to other size class cities. On the other hand, class Ic cities have recorded increase in the value of HH index indicating concentration tendencies of employment. While comparing class I cities according to their location within and outside UAs, it has been observed that class Ia and Ib both the cities have shown tendency for diversification, at the same time this tendency is much stronger in these cities which are located outside UAs, particularly metro cities. Whereas in case of class Ic cities, employment is found to be concentrating in certain industries.

**Table: 6.1**

#### Sectoral Concentration of Workers in Common class I cities (1991-2001)

				<b>(Total)</b>
<b>HH Index</b>				
<b>Size Class</b>	<b>1991</b>	<b>2001</b>	<b>Change in HHI</b>	
I	2132.2	2107.4	24.8	
Ia	2339.9	2251.1	88.8	
Ib	2071.2	2057.1	14.1	
Ic	1966.4	2007.6	-41.2	
				<b>(Within UA)</b>
<b>HH Index</b>				
<b>Size Class</b>	<b>1991</b>	<b>2001</b>	<b>Change in HHI</b>	
I	2193.2	2149.9	43.3	
Ia	2342.0	2271.8	70.1	
Ib	2065.5	2057.9	7.7	
Ic	2051.0	2059.3	-8.3	

(Outside UA)

Size Class	HH Index		
	1991	2001	Change in HHI
I	1883.9	1950.8	-66.8
Ia	2706.6	2239.0	467.6
Ib	2156.2	2061.3	94.9
Ic	1847.4	1927.2	-79.8

Source: Computed from Census of India 1991 and 2001

## 6.2. Spatial concentration of workers:

The spatial concentration of workers in class I cities across size class has been measured by Grossack index of industrial concentration. To analyze the Grossack measure, the values of  $b$ ,  $r$  and  $(b/r)^2$  are estimated for relevant years. The 'b' coefficient gives us the magnitude of dispersal or concentration. For all class I cities since the value of  $b$  coefficient is  $< 1$  i.e. 0.86 percent, it shows that significant spatial units of base year have lost about 14 percent share of their workers on an average. Since the value of 'r' is high (0.98) and it is low for  $(b/r)^2$  i.e. 0.78, these conditions according to our method suggest that significant spatial units have lost their share to each other.

In other words it can be explained that the decade of 1991 and 2001 has experienced spatial diversification of employment with a shift of workers from large cities to relatively smaller cities where large cities within class I category have shown 14 percent.

Table-6.2

### Values of Parameters of Grosack's Measure

Parameters	Total	Within UAs	Outside UAs
b	0.86	0.72	0.77
r	0.98	0.98	0.99
$(b/r)^2$	0.78	0.53	0.61

Computed from Census of India 1991 and 2001

decline in their share of workers. This observation is also supported by the fact that relatively smaller class I cities have shown higher Work Participation Rate and workers growth as discussed in previous chapter.

The value of 'b' coefficient of class I cities located within UAs is 0.72 and for those located outside UAs is 0.77 which shows that significant spatial units have lost their 28 and 23 percent share of workers during the considered time period in both types of cities. But it is important to be noted that in case of class I cities which are located within UAs the significant units are metro cities employing a larger number of workers whereas in case of class I cities which are not part of UAs, the significant units are cities of class Ic. Therefore the values of 'b' coefficient for both types of cities have different explanation where large cities within UAs have lost their 28 percent share of workers whereas within UAs relatively smaller class I cities have lost their 23 percent share of workers. Both types of cities located within UAs and outside UAs have high  $r$  and low  $(b/r)^2$ . This indicates that either significant spatial units have lost to each other or large cities within UAs have lost their share of workers to other large cities. On the other hand relatively smaller cities outside UAs have lost their share to other smaller cities.

## Conclusion

Based on the above analysis following conclusions are drawn:

- The class I UAs and cities particularly which have population more than a million population have recorded higher growth rate compared to cities of lower size classes. A large number of class I cities are located within UAs at both points of time. Particularly the number of cities with million plus population located within UAs has increased from 17 to 24 while the figures for cities located outside UAs is 1 and 3.
- The share of urban population living in class I cities within UAs have gone down compare to their counterparts outside UAs. At the same time, the class I cities which are located outside UAs have registered higher annual exponential growth rate than the cities located within UAs.
- An observation of intra-urban agglomeration of large metropolitan cities have shown that within the UAs of one of the largest cities of the country core and periphery both have recorded declining growth rates but at the same time higher growth is recorded by their periphery. On the other hand, metro cities which have registered higher growth in both the core and periphery are located in close proximity to the above mentioned cities along urban corridors.
- The cities which have achieved million plus population during 1991 and 2001 are those which are located in proximity to pre-existing large metropolitan cities. For instance Nasik and Kalyan-Dombivili are located near Mumbai whereas Faridabad and Meerut in National Capital Region.
- Out of twenty metropolitan cities, three core cities namely Kanpur, Pune and Vishakhapatnam have grown faster than their urban agglomerations. All three are located in UAs with growing core and growing periphery. It has also been observed that small core cities have grown somewhat faster than larger ones, although the relationship is not consistent. Added to this, some of the largest core cities like Mumbai, Chennai and Ahmadabad have recorded lower growth compared to other core cities.
- Average densities increased the most among UAs with growing core and declining peripheries, At the opposite end of the spectrum, average densities increased the least among UA with declining core and declining periphery. The average for UAs with declining core and growing periphery and UAs with growing core and growing periphery falls between these extremes.

- According to Herfindahl Hirschman index of concentration, the metro cities have recorded relatively more diversification as compared to other size class cities. On the other hand, class Ic cities have recorded increase in the value of HH index indicating concentration tendencies of employment. Class Ia and Ib both the cities have shown tendency for diversification, at the same time this tendency is much stronger in these cities which are located outside UAs, particularly metro cities. Whereas in case of class Ic cities, employment is found to be concentrating in certain industries.
- The results of Grossack index show that both types of cities located within UAs and outside UAs have high  $r$  and low  $(b/r)^2$  which indicates that larger class I cities within UAs have lost their share of workers to other large cities whereas outside UAs relatively smaller cities have lost their share to other smaller cities. In other words within UAs, there is decentralization of workforce among larger class I cities whereas outside UAs, decentralization of workforce is observed among relatively smaller class I cities.

Finally the paper concludes that Indian urbanization is experiencing concentrated decentralization where growth is concentrated in class I cities particularly within UAs. While within this category, cities located outside UAs are catching up with those located within UAs. There is a Movement from Monocentric to Polycentric urban pattern in largest UAs of the Country. Larger class I cities are experiencing workforce diversification while concentration tendencies were in smaller cities particularly those which are located outside UAs.

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