Do upcoming "Smart cities" need to provide smart distribution of higher urban economic growth? Evidence from Urban India

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The present paper tries to understand the causes behind the emergence of India's large agglomeration (or giant cities) and how these large agglomerations are linked with economic growth. In addition, the distribution of urban economic growth is measured by the estimation of poverty, inequality and pro-poorness. The paper suggests that the upcoming "Smart cities" in India will emerge as a greater platform for future development of urban India, only if these cities surely ensure smart distribution of the fruits of urban economic growth to the poorer section of urban dwellers.

Key Words: Agglomeration, Economic growth, Poverty, Inequality, Urban India

JEL Classification: O18, R11, D 63

* Any opinions expressed here are mine and not necessarily those of the institute. The usual disclaimer applies, however.

I. Introduction

Creation of smart cities (about 100 in number) has been proposed as one of the planks for future urban development in India by the newly formed government under Hon'ble Prime Minister, Shri Narendra Modi. In simple terms, 'smart cities' means the cities have to be economically genial for healthier living, integrated with advanced information technology in order to increase efficiency, and supported by well thought out city plan or master plan for over all development of a city. In other words, we may call cities that are liveable, workable and sustainable as smart cities (Venkataramakrishnan, 2014). Therefore, this strategy can be considered as one of the best future strategies for reduction of urban congestion which now nullifies the benefits of urban agglomeration economies while increasing the potential contribution of urban economic growth to the national economy.

The current rate of urbanization in Indian is unprecedented. As per 2011 Census, for the first time since Independence, the absolute increase in population has been more in urban areas that in rural areas. Level of urbanization also increased from 27.81% (or 286 million) in 2001 Census to 31.16% (or 377 million) in 2011 Census. A McKinsey Global Institute study "India's Urban Awakening: Building inclusive cities, Sustaining Economic Growth" (MGI, 2010) projected that nearly 590 million Indians will be living in cities by 2030. The 2014 revision of the World Urbanisation Prospects shows that Delhi with a population about 25 million has become the world's second most populous city in 2014 after Tokyo which has an agglomeration of 38 million inhabitants (United Nation(UN), 2014). Mumbai is also projected to become the fourth largest city by 2030 with the population of 28 million, from the current 21 million. The study also predicts that seven Indian cities with 5 to 10 million inhabitants currently are projected to become mega cities by 2030. As per World Urbanization Prospects: 2011 Revision (UN, 2011), the number of large urban agglomerations with populations in excess of one million in the United States of America (or India) was 12 (or 5) in 1950. It increased to 44 (or 43) in 2010 and is projected to reach 56 (or 58) by 2025. This indicates that though agglomerations were mainly found in developed nations in the past, today many of them are found in developing countries. In fact, India, China, and Nigeria together are expected to account for 37 per cent of the projected growth of the world's urban population between 2014 and 2050 (UN, 2014).

The rapid urbanization in India is due mainly to the growth in population size and increase in the number of urban centres, along with expansion of geographical boundaries of urban

centres. The growth in population is attributable to several factors, such as, natural growth rate, rural to urban migration, expansion of city boundaries, and reclassification of rural areas as urban. However, India's urbanization (i.e. increase in the share of urban population) is mainly based on Class I cities, i.e. cities with over 100,000 population. The draft report of "Regional Plan 2021: National Capital Region" (GOI 2013) calculated that about 42.6% of India's urban population is concentrated in 53 metropolitan cities. The four major metropolitan cities in India, namely, Mumbai, Kolkata, Chennai and Delhi together account for 15.4% of the total urban population of India.

Urban India contributes over 50% of the national Gross Domestic Product (GDP). The share of urban economy in the total net domestic product (NDP) increased from 37.65% in 1970–1971 to 52.02% in 2004–2005. The growth rate of urban NDP at constant prices (1999–2000) was about 6.2 % from1970–1971 to 2004–2005, which is much higher than the growth rate of India's national NDP which about 4.87 % during the same period.[1] The Mid-Term Appraisal of the Eleventh Five Year Plan shows the urban share of GDP at about 63 per cent for 2009-10 and this share is projected to increase to 75 percent by 2030. A study by Indian Institute for Human Settlement (IIHS), "Urban India 2011: Evidence" (IIHS 2012) estimated that India's top 100 largest cities produced about 43% of the GDP, with 16 % of the population and just 0.24% of the land area.

Though growing cities are emerging as the main drivers of national economic growth, the distribution of the fruits of urban economic growth is still much below than the required level, as evidenced by the fact that large numbers of urban poor still live in slums and on the pavements in extremely bad conditions. Therefore, urban India is characterized by higher level of poverty and intra-urban inequalities. The India-Urban Poverty Report 2009 by Government of India (2009) finds that about 80 million people were estimated as poor in the cities and towns of India in 2007-08, and urban poverty in some of the larger states is higher than that of rural poverty, a phenomenon generally known as 'Urbanization of Poverty'. As per the Rangarajan Committee report (GOI 2014), urban poverty ratio has declined from 35.1 % (or 128.7 million people) in 2009-10 to 26.4 % (102.5 million people). These figures show that though poverty has declined, a large number of poor people still live in urban areas in abysmal poverty. The period also witnessed a steep increase urban inequality; it increased from 0.36 in 2004-05 to 0.38 in 2011-12. This scenario says volumes about the lack of

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[1] A detailed explanation of urban economic growth in different periods of time can be available from Tripathi (2013a).

direction in India's urban growth. For example, as of 2007, India alone accounted for 17 percent of the world's slum population (UN-HABITAT 2006). As per the recent Census data, roughly 1.37 crore households, or 17.4% of urban Indian households lived in slums in 2011.

In this background, the present paper addresses the following questions: First, how the emergence of India's giant cities (or large agglomerations) can be explained in terms of a standard economic model; second, what are the empirical evidences we have which links urban agglomeration with urban economic growth; third, what is the impact of higher urban economic growth on poverty and inequality; fourth, how can we quantify urban pro-poor growth; and finally, what are the main policies we should consider for the smart (or efficient) distribution of urban economic growth?

Urban agglomeration is defined as geographical concentration of urban population and related economic activities. This implies that urban agglomeration includes but is not equal to urbanization. The two methodological issues involved here are: choice of urban units of study and method to combine different indicators of population and related economic activities. Thus, urban agglomeration is defined in two ways in this study: First is population agglomeration where size of the city population is measured as units of analysis for urban agglomeration. Second is firm level agglomeration where number of firms operating in a particular city is considered for the measurement of urban agglomeration.

II. Explaining the reasons behind the formation of India's giant cities (or large agglomerations)

In this section we have tried to explain the standard economic model which explains the causes behind the emergence of giant cities. For this purpose, we mainly rely on the New Economic Geography (NEG) models to explain this phenomenon. It may be noted that the primary motivation for the development of NEG models was to explain 'agglomeration economies' in a better way as this has never been explained convincingly in earlier location theories, starting from Thünen's (1826) "The Isolated State".[2]

NEG models (Krugman 1991; Fujita et al. 1999) enclosed the old location theories within a general equilibrium model based on the Dixit-Stiglitz model of monopolistic competition to explain the causes behind the formation of large agglomerations in countries across the world. It explains the two opposite forces. 'centripetal' forces (pure external economics,

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[2] An excellent review of past location theories could be found in Fujita (2010) and Ottaviano and Thisse (2005).

variety of market scale effects, and knowledge spill-overs) that tend to pull population and the production process towards agglomerations, and the 'centrifugal' forces (congestion and pollution, urban land rents, higher transportation costs, and competition) that tend to break up such agglomerations (Overman & Ioannides 2001; Tabuchi 1998). In this process the economy will end up with a core-periphery pattern in which one region will have concentration of all manufacturing units. However, this depends on forward (the incentive of workers to be close to the producers of consumer goods) and backward (the incentive for producers to concentrate where the market is larger) linkages to overcome the centrifugal forces. In other words, the real income of workers will increase if they purchase goods at a lower price in the city than in more distance places. The main assumptions behind the rise of real income of the worker are that city has to offer a large variety of consumer goods and worker has to love the test of variety (i.e., from love of variety approach). This process leads to migration of consumers (=workers) and increases the demand of goods in the city. Therefore, more specialized firms will emerge and produce large variety goods in the city due to home market effect (i.e., the benefits of locating near a large market). Hence, through the forward linkages (the supply of greater variety of goods increases the workers' real income) and backward linkages (a greater number of consumers attract more firms) the concentration of firms and the workers in the city occurs, which in turn leads to the emergence of large agglomeration in this world. Finally, through these linkages, pecuniary externalities occur (i.e., reduction the cost of inputs for firms due to their location in close proximity), scale economies at the firm level emerge due to sharing the fixed cost by the firm which reduces the production costs and increasing returns occur at the city level (see for more details explanation in Fujita 2007, 2010). No other location theory evolved in last two decades or so has been more successful than NEG model explaining the reasons behind the formation of large agglomeration. In fact, this was the one of the seminal works for which Paul Krugman received the 2008 Nobel Prize in Economics.

Although, there are some international studies that tried to measure empirically the significance of NEG models in explaining the causes behind the formation of large agglomeration, studies in the Indian context are very few. This could be due to scarcity of relevant data on urban India.

While explaining the determinants of city population growth, Mathur (2005) found that post-liberalization urban growth was driven by the substantial growth of the urban population and changes in the share of employment in the manufacturing and service sectors. Sridhar

(2010) estimated the determinants of city growth and output both at the district and city levels and found that factors such as proximity to a large city and the process of moving from agriculture to manufacturing, determines the size of a city.

However, using the NEG model, Tripathi (2013b) studied exhaustedly the factors behind concentration of population in the 59 large cities in India. The study found that the market size control variables, cities located on a riverbank, degree of state trade openness, per capita income of a state, percentage of state's urban population, percentage of workers engaged in non-agricultural activity in a state, state capital dummy and city-wise sanctioned cost under JNNURM positively and significantly affect the large city urban agglomeration that is measured by size of city population (or growth rate of city population). In contrast, negative factors like distance from larger cities, state government expenditure on transport, city vehicle density, state size, city population coverage per primary school, city road length per 1000 population etc. negatively affect population agglomeration of the large cities. But other variables that do not have a strong impact on urban agglomeration include city crime rate, city temperature differences, and the dummy of the seaport city.

On the other hand, for measuring firm level agglomeration, Chakravorty et al. (2005) used the disaggregated industry location and size data for cities like Mumbai, Kolkata, and Chennai to analyze eight industrial sectors. Their indicative results suggest that general urbanization economies are more important than localization economies for firm's location decisions. Lall and Mengistae (2005) find that both the local business environment and agglomeration economies significantly influence business location choices across Indian cities. Lall et al. (2003) find that generalized urbanization economies (manifested in local economic diversity) provide the agglomeration externalities that lead to industrial clustering in metropolitan and other India's urban areas. Chakravorty's (2003) findings provide evidence both of inter-regional divergence and intra-regional convergence, and suggest that 'concentrated decentralization' is the appropriate framework for understanding industrial location in post-reform India. Lall and Chakravorty (2005) examine the contribution of economic geography factors to the cost structure of firms in eight industry sectors and show that local industrial diversity is an important factor with significant and substantial cost-reducing effects. Ghani et al. (2012a) find that urban district level local education levels, physical infrastructure quality play in promoting entry of a plant. The strict labor regulations discourage formal sector entry, and better household banking environments encourage entry in the unorganized sector.

III.   Empirical evidence of urban agglomeration and economic growth in India

Now the question arises whether the large agglomerations have any impact on economic growth or not? We expect large urban agglomeration to have a strong positive effect on urban economic growth, because larger cities have higher productivity, wages, and capital per worker (i.e. higher economies of agglomeration), and, therefore, greater efficiency benefits (Duraton 2008), as empirically supported by the World Bank (2004) and Narayana's (2009) study. In addition, major factors behind the existence of urban increasing returns, include sharing (e.g. local infrastructure), matching (e.g. employers and employees), and learning (e.g. new technologies) (Duraton & Puga 2004).

The recent theoretical model together with the framework of NEG (Krugman 1991; Venables 1996) establishes the link between agglomeration and growth combining elements from the endogenous growth model of Romer (1990) and Grossman and Helpman (1991). Most importantly, Fujita and Thisse (2002, p. 391) and finds that "growth and agglomeration go hand-in- hand". The empirical literature, such as Glaeseret al. (1995), Henderson (2003), Brülhart and Sbergami (2009), and Leitão (2013) also find a positive link between agglomeration and growth.

However, in the Indian context, there very few studies which link agglomeration with economic growth if we were to consider only size of city population. Mitra and Mehta (2011) estimated that cities' contribution to total gross state domestic product while revisiting the issue of cities as the engine of growth. The paper used the proportion of urban workers to total workers and then adjusted it for productivity differentials between rural and urban areas to arrive at the estimate of urban (city) domestic product. The study found that states with a higher share of urban state domestic product have witnessed higher growth in per capita income and lower incidence of poverty. The study has also found that per capita income is not necessarily high in all large cities that have been listed under the special urban renewal mission. The nature of activities conducted in a city is an important determinant of its per capita income.

Sridhar (2010) found that the literacy rate and ratio of employment in manufacturing to that in services has a positive impact on the city economic growth. However, a direct positive link between urban agglomerations by considering agglomeration variables endogenously (or exogenously) on urban economic growth has been studied in Tripathi (2013b). The results

showed that distance to a seaport city plays a more important role in India's urban economic growth than distance to the state capital and to a large city.

However, industrial agglomeration and linking with economic growth in terms of increasing industrial output has been studied extensively in Chakravorty and Lall (2007). The main finding is that manufacturing sectors that are operating in urban areas produce goods/services at decreasing returns to scale. Earlier, Lall et al. (2004) had also made a similar observation and concluded that benefits of locating in dense urban areas did not appear to offset associated costs. A more recent study by Tripathi (2014) finds a similar pattern in inefficiency of urban industries. The study considers not only location specific (all India – 'total urban', 52 large cities and 'rest of urban' areas) but also different industry specific variables to capture how inter-industry differences in technology affect the estimates of scale economies. The paper tries to measure the social over head capital which is the source of externalities for agglomeration economies at firm level and concludes that that India's firm level urban agglomeration is associated with negative external economies of scale that do not enhance productivity and also do not drive urban growth and development. However, all the studies we have reviewed here have considered the NEG framework to measure the industrial agglomerations.

Though there have been varying explanations and debates through various studies in India, a series of studies by Ezaz Ghani and others have now provided more insights in to this matter. The studies have given convincing explanation as to why manufacturing sector is moving away from dense cities and also on the trade-off between agglomeration economies and congestion cost, and many other related questions. For example, Desmet et al. (2012) found that this is because of the opportunity of high level of employment in service sector, particularly, high-tech service industries (computer and business service) in large cities than in the industrial sector. Ghani et al. (2012b) finds that while the organized sector is becoming less urbanized, the unorganized sector is becoming more urbanized. Ghani and Kanbur (2013) found that cities provided the ecosystem and generated agglomeration economies in the informal sector.

Therefore, the plausible conclusion is that industrial agglomeration is very much unpredictable in the case of India. In fact, NEG model which was more successful in explaining industrial agglomeration in China fail to explain India's industry-led urban agglomeration. This is may be because the main driving force behind India's urban (or

national) economic growth comes mainly from service sector. On the other hand, it could be also due to the failure of India's policy makers to choose the best policy to usher in industry led economic development in India. However, this debate is beyond the scope of the present paper.

In summary, our brief review of current literature suggests that though industrial agglomeration has a negative (or no) effect on urban economic growth, population agglomeration has a very strong positive effect on urban (or national) economic growth. As reported by Tripathi (2013b) in particular, a 10% increase in urban agglomeration (measured by growth rate of city population) results in an average increase in urban economic growth of 26%.

IV.   Measurement of Poverty and Inequality in Urban India

Having considered the empirical evidence on the positive link between urban agglomerations and economic growth in the previous section, our goal in this Section is to see how the gains of urban economic growth has been distributed among the city dwellers over the different period of time. In the Indian context, there is an enormous body of literature that measures levels of poverty and inequality across rural and urban sectors at national and state levels, from 1990 onwards. In general, these studies (Deaton and Kozel 2005; Sen and Himanshu 2004; Sundaram and Tendulkar 2003, Jha, 2002) provide evidence to show that while inequality between urban and rural sectors is increasing, poverty ratio is declining in both the sectors though the rate of decline in urban sector is much higher than in rural Sector. Certain other studies (Mazumdar and Son 2002; Bhanumurthy and Mitra 2004) have decomposed poverty changes in terms of growth effect and inequality effect. Their finding is that that rural-to-urban migration contributed to poverty reduction in rural areas by 2.6 per cent between 1983 and 1993-94.

However, there are very few detailed studies that have attempted to measure poverty and inequality in inter and intra urban (or agglomeration) dimensions which could be due to limitation of data availability in the public domain.

 Coming to city level inequality in India, Kundu (2006) found that as of 1999-2000, the per capita monthly consumption expenditure of million plus cities was Rs. 1070, about 53 per cent higher than that of small towns. The Urban Poverty Report by the Government of India (2009) found that across the Indian states, poverty is negatively correlated with the level of

urbanization, and that large and medium cities have a lower incidence of poverty than small cities in India. Other studies (World Bank 2010; Gangopadhyay et al. 2010) have also found that the poverty level in large cities is much lower than that in the small towns, though their method of analysis was different from earlier researchers. In contrast, Tripathi's (2013c) analysis of 2004-05 unit level data of National Sample Survey consumption expenditure using the new theoretical framework proposed by Araar and Timothy (2006) reveals that in urban areas the marginalized group (or other group) has a lower level of inequality (or a higher level of inequality) and higher level of poverty (or lower level of poverty). The decomposition of the Gini index by the six Indian geographical urban zones shows that 'within' group inequality contributes higher than 'between' group inequality to total urban inequality. The OLS regression results suggest that large city population agglomeration, the growth rate of the city output, the district level Upper Primary Gross Enrollment Ratio (UPGER) and the city poverty rate, all have a strong positive effect on city inequality. Besides this, the level and growth rate of the city output, the large city population agglomeration, and the UPGER also have a significant negative effect on the city poverty rate.

Based on this brief review of literature, we can now consider more recent data pertaining different aspects, as and where available, to gain more insights into the different dimensions of urban inequality. Inequality is measured by the familiar Gini coefficient, while poverty is measured by the Poverty Headcount Ratio (PHR), the Poverty Gap Ratio (PGR), and the Squared Poverty Gap ratio (SPGR). The importance of using these three poverty indices is elaborately discussed in the Hand-Book of Poverty and Inequality (specifically in Chapter 4) by Haughton and Khandker (2009).

Due to non-availability of income data at the individual level, the urban monthly per capita consumer expenditure (MPCE) data from respectively the 61st and 68th Round of the National Sample Survey (NSS) are used for the years 2004-05 and 2011-12. Following the Expert Group's (Tendulkar committee) suggestion, the MRP (Mixed Reference Period) based inequality and poverty estimation is considered.[3]

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[3] MRP-based estimates capture the household consumption expenditure of the poor households on low frequency items of purchase more satisfactorily than the URP (Uniform Recall Period). However, recently Rangarajan committee has used the MMRP (Modified Mixed Recall Period) to work out the new poverty line. As MMRP based MPCE data are not available for the year 2004-05, poverty ratio for 2004-05 based on Rangarajan methodology cannot be directly estimated. Therefore, we use Tendulkar committee's recommended poverty line to compare poverty and inequality situation from 2004-05 to 2011-12. On the other hand, 66th

Table 1 presents the calculated poverty indices for 'total urban' areas, 57 large cities and 'rest of urban' areas by considering different attributes.[4] The main reason behind consideration of the different attributes is that it helps us to know the poverty situation among different sections of population in Urban India, which in turn helps to prescribe accurate policy measures. The calculated results show that the PHR is lowest for 57 large cities in India than 'total urban' area and 'rest of urban' areas. The PHR was 8.25 for 57 large cities in India in 2011-12 which is much lower than the 'total urban' PHR (i.e., 13.69) and PHR for 'rest of urban' areas (i.e., 17.8). Most importantly, the 'rest of urban' areas have a higher PHR than 'total urban' India as also 57 large cities. In general, the calculated values of PHR, PGR, and SPGR show "Other Religious Group" i.e. sum total of Islam, Christianity, Sikhism, Jainism, Buddhism, Zoroastrianism and others except Hinduism, "Backward Caste" i.e. sum total of Scheduled Tribe, Schedule Caste, Other Backward Class, and "Children" i.e. those below than 18 years of old as having a higher poverty head count ratio.[5] On the other hand, "Upper Middle Class" educated people i.e., those who have passed secondary/higher secondary/diploma course/graduate/post graduate or above, families having at least one "Regular Salary Earner", and people belonging to "General Caste" have the lowest poverty rate, irrespective of all size classes of urban areas. In contrast, the calculated values of SPGR in 2011-12 are higher for "Females" those live in 57 large cities in India.

Round of NNS in 2009-10 consumption expenditure data are not used here as 2009-10 was not a normal year because of severe drought and hence NSSO repeated the consumption expenditure survey in 2001-12. So a comparison between 2009-10 and other years may not give useful results.

[4] World Population Prospects: The 2011 Revision provides projected population figure for 58 urban agglomerations with 750,000 inhabitants or more as of 2011 in India, for the period of 1950-2025. Coimbatore and Tiruppur cities belong to Coimbatore district, hence Coimbatore city is considered as a representative of Coimbatore district. Tiruppur city district was carved out of the Coimbatore and Erode districts in 2009, but as we have used 61st Round NSS data in 2004-05, we consider Tiruppur city a part of Coimbatore district.

[5] The United Nations Convention on the Rights of the Child (CRC) defines child as "a human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier". However, according to Indian laws the definition of 'child' remains ambiguous. See for more details; http://infochangeindia.org/agenda/child-rights-in-india/who-is-a-child.html. Therefore, we consider the definition of child as it is defined by CRC to make a universal comparison.

Table 1: Measurement of Poverty across Different Size Classes of Cities by Different attributes

Different attributes		2004-05									2011-12								
		Total Urban Areas			*57 Large Cities*			*Rest of Urban Areas*			*Total Urban Areas*			*57 Large cities*			*Rest of Urban Areas*		
		HPR	PGR	SPGR	HPR	PGR	SPGR	HPR	PGR	SPGR	HPR	PGR	SPGR	HPR	PGR	SPGR	HPR	PGR	SPGR
Overall	Urban	25.79	6.09	2.05	17.20	3.73	1.20	31.98	7.79	2.67	13.69	2.70	0.80	8.25	1.44	0.41	17.80	3.66	1.09
Religion	Hindu	23.09	5.36	1.80	15.24	3.30	1.06	28.79	6.85	2.33	12.18	2.43	0.73	7.33	1.35	0.40	15.90	3.26	0.98
	Others	35.19	8.65	2.95	24.17	5.26	1.70	42.94	11.03	3.82	18.82	3.64	1.03	11.49	1.77	0.43	24.08	4.98	1.46
Social Group	Backward	34.15	8.38	2.90	24.45	5.65	1.89	40.21	10.09	3.53	17.95	3.63	1.09	11.73	2.13	0.61	22.21	4.66	1.42
	General	15.87	3.37	1.05	10.01	1.83	0.52	20.84	4.69	1.50	7.38	1.34	0.36	3.75	0.56	0.14	10.55	2.01	0.55
Land owners	Yes	27.88	6.69	2.26	18.86	4.19	1.34	33.76	8.33	2.86	15.47	3.06	0.91	9.10	1.54	0.43	19.91	4.12	1.24
	No	19.77	4.36	1.46	13.32	2.66	0.88	25.94	5.99	2.00	8.41	1.65	0.47	6.14	1.21	0.35	10.58	2.06	0.58
Salary earners	Yes	15.16	2.93	0.83	11.55	2.13	0.57	18.35	3.64	1.05	6.64	1.13	0.30	4.61	0.69	0.17	8.59	1.56	0.43
	No	33.77	8.46	2.97	22.41	5.21	1.78	40.78	10.48	3.71	19.32	3.96	1.19	11.96	2.21	0.65	23.90	5.05	1.53
Ration card holders	Yes	26.26	6.15	2.06	17.43	3.64	1.14	32.48	7.92	2.70	14.47	2.91	0.87	5.65	0.96	0.27	18.65	3.89	1.17
	No	24.46	5.91	2.04	16.60	3.96	1.36	30.50	7.42	2.56	11.36	2.08	0.58	6.41	1.09	0.30	14.73	2.83	0.81
Sex	Male	24.67	5.77	1.93	16.25	3.49	1.12	30.86	7.45	2.53	13.27	2.63	0.77	7.82	1.36	0.37	17.47	3.61	1.08
	Female	27.02	6.44	2.19	18.27	4.00	1.29	33.18	8.16	2.82	14.14	2.79	0.82	8.73	1.54	0.44	18.15	3.71	1.10
Marital status	Widow	26.91	6.28	2.09	18.10	4.02	1.30	33.14	7.88	2.65	13.63	2.67	0.77	7.81	1.44	0.42	17.94	3.58	1.04
	Non-widow	25.73	6.08	2.05	17.15	3.71	1.20	31.92	7.79	2.67	13.69	2.71	0.80	8.27	1.44	0.41	17.79	3.66	1.09
Education level	Up to middle	27.79	6.31	2.06	19.28	4.03	1.27	33.72	7.89	2.61	16.16	3.15	0.92	10.32	1.73	0.47	20.27	4.15	1.24
	Upper middle	7.66	1.41	0.39	4.49	0.76	0.21	10.52	1.99	0.56	4.86	0.84	0.23	2.32	0.35	0.09	7.09	1.27	0.35
Age	Child	34.02	8.57	3.02	24.28	5.62	1.91	40.31	10.47	3.74	18.50	3.76	1.13	12.04	2.20	0.64	23.15	4.88	1.49
	Adult	21.43	4.78	1.54	13.80	2.82	0.86	27.25	6.27	2.06	11.50	2.23	0.64	6.60	1.12	0.30	15.29	3.08	0.90

Source: Author's calculation using the NSS 61st Round in 2004-05 and 68st Round in 2011-12 on consumer expenditure.

What is presented in Table 2 is the percentage decline of poverty rate from 2004-05 to 2011-12. The percentage decline of PHR is highest for 57 large cities in India than the 'total urban' area and 'rest of urban' areas. The results show that those who are not "land owners" (i.e., homestead only/ homestead and other land/ other land only), "salary earners", "not ration card holders (i.e., those not holding any ration card belong to Antodaya/ BPL/ others)

Table 2: Decline of Poverty Rate across Different Size Classes of Cities by Different attributes

Different attributes		% decline of poverty ratios from 2004-05 to 2011-12								
		Total Urban Areas			*57 Large Cities*			*Rest of Urban Areas*		
		HPR	PGR	SPGR	HPR	PGR	SPGR	HPR	PGR	SPGR
Overall	Urban	46.93	55.61	61.21	52.05	61.28	66.17	44.34	53.07	59.08
Religion	Hindu	47.26	54.64	59.47	51.89	59.02	62.32	44.77	52.46	57.94
	Others	46.53	57.94	65.12	52.46	66.32	74.74	43.92	54.87	61.84
Social Group	Backward	47.45	56.72	62.38	52.04	62.31	67.46	44.78	53.87	59.86
	General	53.50	60.42	65.84	62.54	69.37	73.80	49.39	57.08	63.13
Land owners	Yes	44.53	54.25	59.91	51.79	63.27	67.96	41.03	50.49	56.69
	No	57.49	62.28	67.79	53.88	54.49	60.25	59.21	65.56	70.86
Salary earners	Yes	56.20	61.34	63.48	60.07	67.53	70.80	53.19	57.20	59.07
	No	42.80	53.20	59.93	46.64	57.48	63.52	41.40	51.81	58.79
Ration card holders	Yes	44.92	52.68	57.87	67.59	73.55	76.23	42.59	50.96	56.80
	No	53.57	64.83	71.48	61.37	72.42	77.77	51.71	61.81	68.14
Sex	Male	46.19	54.41	59.98	51.88	60.98	66.73	43.39	51.57	57.30
	Female	47.66	56.77	62.37	52.22	61.56	65.74	45.29	54.56	60.80
Marital status	Widow	49.33	57.45	63.00	56.86	64.19	68.03	45.86	54.50	60.81
	Non-widow	46.80	55.50	61.12	51.80	61.12	66.11	44.26	53.01	58.98
Education level	Up to middle class	41.85	50.08	55.34	46.47	57.07	62.99	39.89	47.40	52.49
	Upper middle class	36.62	40.43	42.05	48.24	54.08	57.14	32.61	36.03	38.39
Age	Child	45.61	56.17	62.44	50.41	60.91	66.53	42.57	53.44	60.13
	Adult	46.34	53.40	58.31	52.21	60.44	64.69	43.88	50.81	56.07

Source: Same as Table 1.

and "general castes" experienced higher percentage decline of poverty rate, irrespective of all the size classes of urban areas.[6] On the other hand, "Upper Middle Class" educated people experienced lowest percentage decline in poverty rate. In addition, those who have education up to "Middle Class", families that have no "Regular Salary Earner" and "Land Owners"

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[6] In India ration card is used for drawing subsidized food and fuel (LPG and kerosene). Therefore, it is an important document for the poor people for subsistence, identity and to remain connected with the government database. It has become the proof of their existence. It works for their identity, eligibility and entitlement of entire public system (PDS).

experienced the lowest percentage decline in poverty rate. In contrast, the calculated values of SPGR for 'rest of urban' areas show that the category "Adult" experienced lower decline in poverty rate. The "Ration Card" holders in 57 large cities in India experienced the highest decline of PHR during the period.

Table 3: Measurement of Inequality across Different Size Classes of Cities by Different attributes

Different attributes in Urban India		2004-05			2011-12			% increase from 2004-05 to 2011-12		
		Total Urban areas	*57 Large cities*	*Rest of Urban areas*	*Total Urban*	*57 Large cities*	*Rest of Urban areas*	*Total Urban areas*	*57 Large cities*	*Rest of Urban areas*
Overall	Urban	0.364	0.369	0.345	0.377	0.380	0.360	3.40	2.85	4.25
Religion	Hindu	0.359	0.364	0.341	0.375	0.379	0.355	4.27	4.08	3.96
	Others	0.376	0.383	0.348	0.374	0.367	0.370	-0.56	-4.23	6.08
Social Group	Backward	0.323	0.321	0.316	0.339	0.342	0.327	5.11	6.45	3.55
	General	0.366	0.367	0.347	0.385	0.381	0.372	5.13	3.89	7.30
Land owners	Yes	0.369	0.376	0.349	0.380	0.391	0.355	3.14	4.03	1.77
	No	0.350	0.353	0.331	0.360	0.349	0.363	2.75	-1.10	9.77
Salary earners	Yes	0.341	0.347	0.324	0.358	0.361	0.345	5.09	4.16	6.59
	No	0.371	0.383	0.344	0.376	0.389	0.351	1.51	1.57	1.93
Ration card holders	Yes	0.355	0.355	0.342	0.360	0.361	0.346	1.40	1.61	1.03
	No	0.386	0.397	0.353	0.405	0.409	0.389	4.96	2.89	10.37
Sex	Male	0.363	0.367	0.345	0.377	0.377	0.360	3.69	2.95	4.55
	Female	0.366	0.372	0.345	0.377	0.382	0.359	3.07	2.69	3.94
Marital status	Widow	0.370	0.373	0.351	0.372	0.388	0.342	0.58	3.97	-2.81
	Non-widow	0.364	0.369	0.345	0.377	0.379	0.361	3.54	2.79	4.61
Education level	Up to middle	0.315	0.318	0.304	0.329	0.328	0.320	4.44	3.14	5.26
	Upper middle	0.348	0.347	0.333	0.371	0.369	0.357	6.60	6.42	7.31
Age	Child	0.340	0.349	0.322	0.355	0.357	0.344	4.36	2.26	6.56
	Adult	0.367	0.369	0.349	0.379	0.381	0.362	3.34	3.20	3.62

Source: Same as Table 1.

Table 3 presents the calculated inequality indices (i.e., the Gini coefficients) for 'total urban' area, 57 large cities and 'rest of urban' areas by considering different attributes. The calculated results show that inequality is highest in 57 large cities in India than 'total urban' area and 'rest of urban' areas. Inequalities are higher among groups like "Not Ration Card holders", "Others Religion Group", "Not Salary Earners" and "Widow". On the other hand, "Backward Caste", up to "Middle Class educated" group, "Child", and "Salary Earners" showed lower level of inequality in 2004-05. "Upper Middle Class" educated people also showed lower level of inequality in 57 large cities in India in 2004-05. In 'rest of urban' areas

"Adult" group showed the higher level of inequality in India in 2004-05, but in 2011-12, it was "Not Ration card" holders "General Caste", "Land Owners", and "Adult" that experienced higher level of inequality.

As can be seen from Table 3, "Upper Middle Class" educated group and "General Caste" experienced higher percentage increase in level of inequality in the period 2004-05 to 2011-12. On the other hand "Other Religion" group those live in 'total urban' (or 57 large cities) and "Up to Middle Class" educated people those live in 'rest of urban' areas experienced negative percentage increase in level of inequality during the same period which indicate that inequality level for these groups has declined. In addition, while it was an increase in the level of inequality for "backward caste", it was a decrease in inequality level for "Not Land Owners" in 57 large cities in India during the period 2004-05 to 1011-12. In the 'rest of urban' areas "No Ration card" holders and "Not Land Owners" experienced a higher percentage increase in level of inequality during the same times span.

V.   Measurement of Pro-Poor Growth in Urban India

Having given a detailed account of poverty and inequality situation in urban India as seen through different perspectives in section 4, let us now proceed to measure the pro-poor growth in urban India. For empirically measuring the pro-poorness of Indian urban economic growth, we have used the framework developed by Duclos (2009) and also followed the methodological approach of Araar et al. (2007, 2009) and Araar (2012). In Indian context, a similar approach is used by Motiram and Naraparaju (2014) by extending the framework to include the entire population, historical disadvantaged caste groups, the occupations at lower ranges of the rural (e.g. labourers, marginal and small farmers) and urban economy (casual labourers and self employed) in the analysis. However, in this paper we further extend this framework by specifically considering various aspects of urban India.

Duclos (2009) presents an axiomatic formulation of the two different approaches i.e., relative and absolute measurements of poverty. In the relative approach, we label a growth process pro-poor if the growth rate of the poor exceeds some standard (usually the average growth rate of the median or the mean), e.g., are the poor growing at 5 percent? In the absolute approach, we label growth as pro-poor if the absolute incomes of the poor increase by at least some standard, e.g., have the incomes of the poor increased by Rs. 100 or not? Araar et al. (2009) illustrate how we can statistically ascertain for pro-poor growth. There are two approaches, First Order and Second Order. In the First Order approach, we postulate that all

the poor grows at least at the standard rate imposed, whereas in the second order, (which is by definition weaker than First Order approach, we allow for pro-poorness even if some poor do not grow at the standard, provided that even those poor are growing at higher than the standard rate. The first order (or second order) approach is equivalent to checking for first order (or second order) stochastic dominance of the distribution of the poor in the first period by the normalized (using the standard) distribution of the poor in the second period.[7] The novelty of using this framework is that it is based on a new theoretical paradigm and analyzes pro-poor growth in a dynamic manner, and therefore it has rigorous statistical rationale. In fact, this model uses a range of poverty lines to assess the pro-poor growth which helps to measure pro-poor growth without applying a specific poverty line in India.[8]

Table 4: Measurement of Pro-Poor Growth across Different Size Classes of Cities by Different attributes

Srl. No.	Different Categories	Sub group of different categories	Total Urban areas	57 large Cities	Rest of Urban areas	Total Urban areas	57 large Cities	Rest of Urban areas
			Has economic growth in urban India been Pro-Poor between 2004-05 and 2011-12?					
			Absolute approach			*Relative approach*		
1	Overall	Urban	Yes	Yes	Yes	No	No	No
2	Religion	Hindu	Yes	Yes	Yes	No	No	No
		Others	Yes	Yes	Yes	No	No	No
3	Social Group	Backward class	Yes	Yes	Yes	No	No	No
		General caste	Yes	Yes	Yes	No	No	No
4	Land owners	Yes	Yes	Yes	Yes	No	No	No
		No	Yes	Yes	Yes	No	No	No
5	Salary earners	Yes	Yes	Yes	Yes	No	No	No
		No	Yes	Yes	Yes	No	No	No
6	Ration card holders	Yes	Yes	Yes	Yes	No	No	No
		No	Yes	Yes	Yes	No	No	No
7	Sex	Male	Yes	Yes	Yes	No	No	No
		Female	Yes	Yes	Yes	No	No	No
8	Marital status	Widow	Yes	Yes	Yes	No	No	No
		Non-widow	Yes	Yes	Yes	No	No	No
9	Education level	Up to middle class	Yes	Yes	Yes	No	No	No
		Upper middle class	Yes	Yes	Yes	No	No	No
10	Age	Child	Yes	Yes	Yes	No	No	No
		Adult	Yes	Yes	Yes	No	No	No

Note: Figures are not presented but available from the author upon request.
Source: Author's calculation using DASP software and the NSS 61st Round in 2004-05 and 68st Round in 2011-12 on consumer expenditure.

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[7] A detailed explanation of this theoretical model is given in Araar et al. (2007, 2009). In Indian context, the appropriateness of using this model and the conceptual problems in using this methodology for studying long periods of time are nicely explained in Motiram and Naraparaju (2014).
[8] The construction of poverty line in India is very much controversial. A detailed debate on India's poverty line can be found in Ray and Sinha (2014).

The entire empirical analysis is done using the Distributive Analysis Stata Package (DASP) software package (Araar and Duclos, 2007). Here, we again use MRP data for the entire calculation exercise. However, though we have used the poverty line as formulated by Tendulkar Committee, for the calculation of poverty rate in section 4, here we use the poverty line as formulated by Tendulkar and Rangarajan committee to compare whether the urban economic growth is absolutely and relatively pro-poor or not.[9]

We calculate the real MPCE by using the deflator with base 1987-88 (=100). In urban India there was higher growth in real MPCE from Rs. 326.80 in 2004-05 to Rs. 413.53 in 2011-12 - an increase of 27% in the 7-year period under review.

The results as estimated are summarized in Table 4. The results indicate that, by comparing the situation between 2004-05 and 2011-12, the change in distribution was absolutely pro-poor for all the attributes of urban India. In contrast, comparing the situation between 2004-05 and 2011-12, the change of distribution was not relatively pro-poor for all the attributes of urban India which are considered for the analysis. These estimations were carried out by considering first order and second order statistical test. Therefore, our results are robust in terms of statistical measurements and from different attributes or perspective specific to different size classes of urban India. Finally, we could find evidence for statistically anti-relative pro-poorness in urban economic growth between 2004-05 and 2011-12. However, in line with the findings of Motiram and Naraparaju (2014), we also suggest that our findings may be sensitive to the method that we have used. Yet, our results are more robust as we have measured pro-poorness of urban economic growth from different perspectives of urban India unlike the limited number of indicators used by Motiram and Naraparaju (2014). [10]

VI.   Conclusions and Policy Implications

The main conclusions from this paper are the following: First, urbanization in India is taking place at an unprecedented rate not only through increasing the percentage of urban population but also by the formation large agglomerations. Second, though industry-led urban agglomeration does not have any significant effect on economic growth, increasing

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[9] It is important to note here that Official Planning Commission urban poverty line for 2011-12, based on the Expert Group (Tendulkar) was Rs. 1000/ per capita per month, whereas, based on Expert Group (Rangarajan) was Rs. 1407/ per capita per month.

[10] There are some other notable work also are done for the measurement of inclusion of economic growth in India, such as, Suryanarayana (2009) and Jayaraj and Subramaniam (2012) for all India level by considering rural and urban distinction. The large city specific inclusiveness is measured by Tripathi (2013d). Although, all the studies including Motiram and Naraparaju (2014) have used different methodology but the results suggest that actually the Indian poor marginally benefited from higher economic growth.

concentration of urban population does make Indian cities engine of economic growth. Third: though the contribution of urban India to the overall national economic growth is quite high, a large number of urban dwellers are still unable to benefit from it.

Now coming to policy implications, it is very important to note that the newly formed government in India intends to create 100 smart cities which might shift attention from the extant policy perspective of overall development of urban India. MGI report (MGI, 2010) already mentioned that "The speed of urbanisation poses an unprecedented managerial and policy challenge – yet India has barely engaged in a national discussion about how to handle the seismic shift in the makeup of the nation." In fact, India's urbanization is mainly guided by Todaro's model. The model suggests that urban area increases job opportunity which attracts greater migration from rural to urban areas, which would in turn, paradoxically increase their unemployment rate. Indian urban development policies have implicitly been guided by such a model for a long time. This is discernible from the fact that our policies have always tried to 'prevent' migration from rural to urban areas as it is discussed in Sridhar (2014). Therefore, the creation of 100 smart cities may reverse the situation and increase the speed of urbanization in India by creating more employment opportunities. In addition, this strategy will be one of the potential successors to JNNURM (Guha, 2014).

The paper suggests that the roadmap for creation of 100 smart cities should be formulated in such a way that it factor in the pressing need for augmenting the wellbeing of poorer sections of urban dwellers. In this context, World Development Report 2009: Reshaping Economic Geography (World Bank, 2009), can be profitably used learn lessons about the early experience of developed countries in this regard and draw up practical implications of urbanization policies in today's developing countries, such as India. In case of India, challenges of urbanization from the view point of planning, infrastructure, sustainability, finance and governance and inclusions of governance are well discussed in Ahluwalia et al. (2014). Many case studies which reveal the provision of public services in Indian cities can be found in Ahluwalia (2014).

It is quite understandable that smart cities will have smart infrastructure – roads, water, solid-waste management, drainage network, etc. But it is also obvious that private sector will necessarily play a major role through investment in the smart cities. But the question arises what fraction of advantage from this large investment would be available to the poorer sections in the smart cities because the "markets are neither efficient nor stable and tend to

accumulate money in the hands of few rather than engender competition which produces slower growth and lower GDP" (Stiglitz, 2012). Finally, we suggest that government decisive role to play not only in creating 100 smart cities but also in ensuring equitable distribution of urban GDP to all sections, particularly the poorer section of urban dwellers.

It would be very appropriate to compare it with the "East Asian miracle" which is all about the remarkable success achieved by the economies of the eight East Asian countries (i.e., Hong Kong, Indonesia, Japan, the Republic of Korea, Malaysia, Singapore, Taiwan (China), and Thailand). One of the most important factors behind this success was that the benefits of higher economic growth were spread widely among the population. The government policies that promoted greater degree of equality were accompanied by years of higher economic growth. Urban India has to emulate this example for higher and sustainable economic growth in India.

In addition to that, the centre and state Government need to design specific formats to generate (or improve) the urban data base on major urban growth variables (such as, income, infrastructure, business, finance, education, etc.) for better management of urban India. Further, collection of information on the basic socio-economic status and development trend of various cities is essential to enable the various government departments to formulate appropriate urban development strategies at sub national levels. This would help to raise the standard of urban management practices and for monitoring the implementation of various urban policies.

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