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Rural Non-Farm Sector: Revisiting the Census Towns

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Rural Non-Farm Sector: Revisiting the Census Towns

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Abstract:

The last decade (2001-2011) has witnessed a surge in the number of census towns (CTs) which accounts for 30% of the urban growth. Though several studies tried to understand the spatial patterns, factors which determine the emergence of these CTs at all India level are neglected. Due to an increase in non-farm activities villages have been transformed into CTs. In this paper, by considering 2328 CTs at all India level we investigate the relevant economic determinants of such transformation. To group similar CTs we use cluster analysis by considering several factors such as the size of the population of CTs, rural specific changes, climatic conditions, growth dynamics of large cities which may spill over to rural hinterland, economic potential, availability of infrastructure, and job opportunities. The analysis suggests that the availability of infrastructure and the growth dynamics of the large cities are important for the emergence of these CTs whereas rural poverty and unemployment rates do not seem to matter significantly. Finally, we suggest that for higher economic development the rural to urban transformation is essential. For this purpose, the new CTs can offer an opportunity for increasing the non-farm activities and the overall prospects for India. Hence, the policy directives will have to address the requirements of the CTs to emerge as centers of growth.

Key words: Census towns, non-farm activities, rural-urban transformation, India.

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1. Introduction

The rural non-farm sector has shown its growth momentum in the last decade (2001-11) resulting in the emergence of nearly 2500 new urban settlements which are widely noted as census towns (CTs).[1] They are so new that the local body is not yet formed from the domain of urban administration, though in terms of activities the non-farm sector dominates bypassing the share of agriculture in total employment. In other words, these towns are almost in transition - yet to be recognized by the government of India as urban areas, while the census authorities refuse to accept them as rural areas any more. In the backdrop of this growth the question which arises is related to the determinants of such transformation. After all, which processes initiated such rapid changes so that a sudden spur in the urban space could be located though such a phenomenon existed marginally in the previous decades after the independence.

Referring to the urban economics literature we may envisage a situation arising in large urban centers with agglomeration economies being surpassed by the diseconomies. The new firms in an attempt to take advantage of the agglomeration benefits still want to remain closer to the cities though the diseconomies do not permit them to invest within the city territory. Hence, the second best solution for them is to exploit the rural space adjacent to the city boundaries. Therefore, the new census towns will be seen as a spill-over of urban activities to the rural hinterland. Mitra and Kumar (2015) suggested that activities in areas which have already been urban tend to spillover to the rural hinterland and then usher in a change in their classification status, in a limited sense though.

On the other hand, the shift of labour to non-farm activities due to the lack of productive sources of livelihood in the agricultural sector is also a strong possibility and responsible for the growth of new towns (Mitra and Kumar, 2015) as many such towns were seen to have emerged in the remote areas much away from the large urban centers. Guin and Das (2015) claimed that in West Bengal, agrarian distress drove the increase of the rural non-farm sector, leading to enormous growth in census towns which follow the pattern of the existing urban centers.

[1] Census towns are characterized by the following: population exceeds 5,000; at least 75% of main male working population is employed outside the agricultural sector; minimum population density of 400 persons per km^2.

Using a field survey, Mukhopadhyay et al. (2016) studied census towns in Bihar, Jharkhand, Orissa, and West Bengal and found that the majority of census towns fulfill the role of market towns, which provide trade and other local services to a growing rural market. Karmakar (2015) argued that emergence of huge number of census town in West Bengal can be attributed partly to the change in the economy of the zone which include massive decline of the male workforce in agriculture and related activities along with shift to tertiary sector.

Guin (2018) taking the case of Sehara, a new CT in the state of West Bengal, argued that the process of structural transformation of economy in such settlements is not necessarily unidirectional and agriculture plays a strong role in this process. Fluctuation of non-farm employment makes such towns an 'undecidable category'. Sircar (2017) through a mixed methods case study of a 'census town' in West Bengal argued that the urban is a spatial articulation of the specific historical experiences of people inhabiting the context and brings into relief the continuities between agrarian relations and urban forms. Sircar (2016) also agreed that the emergence of Census towns is due to the development of non-farm activities. They are emerging without much support from the government and these are developed by local capital generated from the farms in the surrounding rural areas, various types of real estate projects or business activities (Samanta, 2012). The spatial spread of new towns from a perspective of regional economy has been studied and it is seen that the increase in urban population is purely Matlthusian, as the average population density of the country is higher than the level fixed in the definition of 'urban' (Chatterjee, 2014).

Pradhan (2013) noted that the 2,553 new CTs, which were rural areas in 2001, accounted for 29.5% of the urban growth in the last decade. The author indicated that a dispersed pattern of in situ urbanisation, with the reluctance of state policy to recognise them as new statutory towns is partly responsible for the growth of new CTs. Urban transformation in India is less about moving people, that is to say rural-urban migration, than about morphing places, or the change in the economic structure of existing settlements, many of which continue to be governed as rural areas (Mukhopadhyay, 2017). There is little to distinguish between villages that are proximate to Census towns from those proximate to statutory towns. The importance of CTs will be maintained in the urban structure, and a significant share of urban population will continue to grow beyond municipal limits. The influence of large towns on the growth of CTs

will be persistent in the future, but a more localised form of urbanisation is also evident where the effect of agglomeration is less (Roy and Pradhan, 2018).

As argued by Jain (2018) the census towns will require the following: (i) the enforcement of reforms to empower Gram Panchayat for spatial planning and growth regulation; (ii) the discontinuation of subsidized infrastructure provision and charging development tax; and (iii) investment in decentralized infrastructure for more accountable and more efficient delivery of basic amenities. Denis et al. (2012) called the growth of census towns as the politics of classification. Bhagat (2005) discussed a set of factors that play a role in states deciding to retain a settlement as a census town. However, while comparing the growth of census towns with statutory towns Jain and Korzhenevych (2020) find that census towns are better endowed with toilet facilities and electricity connections, although they are poorly endowed with educational and health infrastructure. Furthermore, these are more urban than statutory towns with respect to high non-agricultural employment and literacy levels. But Samanta (2014) examined Singur city in West Bengal and found that the provision of infrastructure and services remains poor under the rural administration due to the lack of financial resources.

In this study, we categorise new census towns (that have emerged as per the 2011 Census) based on cluster analysis. Our purpose is to identify the heterogeneity that may exist among this class of towns. These differences in fact may unravel the wide variations in mechanisms responsible for the growth and emergence of such urban centers and their performance indicators. These in turn may feed into the policy requirement which can be pluralistic in approach.

2. Methodology and analysis of results

Several factors are hypothesized to be responsible for the emergence of new census towns. Cluster analysis helps us group similar units based on the observed values of several variables for each individual unit. In other words, it is done to identify the set of objects with similar characteristics. Though the K Means clustering method is more efficient to handle big data set, it requires prior knowledge of K i.e. number of clusters we want to divide our data into. As we do not have any prior information regarding the number of clusters we use the hierarchical cluster method for the analysis. It creates a series of models with cluster solutions from 1 (all cases in one cluster) to n (each case is an individual cluster). We follow the agglomerative clustering in which most hierarchical methods fall into. We use Ward's minimum variance method to specify

a linkage algorithm to define the distance from a newly formed cluster to other clusters in the solution. The method combines those objects whose merger increases the overall cluster variance (i.e., the homogeneity of clusters) to the smallest possible degree. The approach is typically used in combination with (squared) Euclidean distances. The squared Euclidean distance raises the importance of a large distance while fading the significance of small distances.

It is very much important to select clustering variables. We consider the following variables for categorization.

(a) The size of the population of the census towns.

(b) Rural effects are measured by the total rural to urban migration, rural literacy rate, poverty headcount ratio, and rural unemployment rate. As these factors are not available at the level of census town, we consider them at the district level.

(c) A favorable climate may attract the rural population to a town. With the availability of data, we consider rainfall and temperature differences to capture the climate effect.

(d) Growth dynamics may spill over to the rural hinterland of the big city which can generate new urban spaces or census towns. To capture the spillover effect we consider the distance from the state headquarter, the nearby city with a population of 100,000 and above, and the nearest city with population 500,000 and more to a census town. We assume that the spillover effect declines with distance.

(e) Economic potential is also important for the census town. It is measured by the distance from a town to the nearest railway station.

(f) Better infrastructure of the town may pull people from the rural areas. Infrastructure is measured by the town level total road length, total number of latrines, total protected water supply, total number of electricity connections, total number of hospitals, total number of schools, colleges, and universities.

(g) Job opportunities in the town are measured by the dummy variable which considers 1 if a town has manufacturing industry and 0 otherwise.

Table 1 presents the descriptive statistics of the variable used for cluster analysis. The log of the total population, log of rural to urban migration, log of the total number of electricity connections, literacy rate, rainfall, temperature differences, and poverty headcount ratios appear to have only nominal differences in their means, implying a more symmetrical distribution.

However, it is not the case for the variables like the total protected water supply, distance to the railway station from a town, and total number of hospitals as the coefficient of variations for these variables is higher and differences in their means are significant.

Table 1: Descriptive statistics

Variable	Obser-vation	Mean	Standard deviation	Mini-mum	Maxi-mum	Coefficient of variation
Size of population						
Log of total town population (v1)	2328	9.2	0.6	5.4	12.7	6.96
Rural effect						
Log of district level total rural to urban migration (v2)	2328	12.1	1.2	5.4	14.6	9.63
District level literacy rate (v3) (in percent)	2328	78.7	10.41	36.1	97.21	13
District level poverty headcount ratio (v4) (in percent)	2328	23.2	16.91	0	94.506	73
District level unemployment rate (v5) (per 1000)	2328	29.01	31.67	0	246	109
Favorable climate						
Town level rainfall (v6) (in millimeter)	2075	1365.22	948.04	1	17110	69
Town level temperature differences (v7) (in centigrade)	2328	22.7	15.22	-40	427	67
Growth dynamics spilling over to the rural hinterland of the big cities						
Town to state headquarters road distance (in kilometers (kms.) (v8)	2328	269.04	214.98	1	1145	80
Town to nearest city with population of 1 Lakh and more Road Distance (in kms.) (v9)	2327	39.61	54.89	0	798	139
Town to nearest city with population of 5 Lakh and more road distance (v10) (in kms.)	2326	96.79	101.64	0	798	105
Economic potential						
Town to nearest railway station road distance (in kms.) (v11)	2188	15.9	33.33	0	328	210
Infrastructure effect						
Town wise total road length (in kms.) (v12)	2328	20.85	32.29	0	700	155
Town wise total number of latrine (v13)	2328	2181.37	2953.86	0	86293	135
Town wise total protected water supply (in kilo-liters) (v14)	2287	2352.72	19509.91	0	500000	829
Log of total number of electricity connection (v15)	2328	7.4	1.0	2.3	12.1	13.89
Town wise total number hospitals (v16)	2328	2.93	9.56	0	362	326
Town wise total number of school, college and universities (v17)	2328	46.18	102.84	0	513	223
Job opportunities in the towns						
Dummy for if town has manufacturing industry (v18)	2328	0.67	0.47	0	1	71

Source: Authors'

Table 2: Raw correlation coefficients

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
V1	1.00																	
V2	0.25	1.00																
V3	0.25	0.49	1.00															
V4	-0.30	-0.34	-0.45	1.00														
V5	0.22	0.05	0.42	-0.23	1.00													
V6	0.18	0.16	0.53	-0.22	0.36	1.00												
V7	-0.33	-0.27	-0.56	0.43	-0.41	-0.48	1.00											
V8	0.00	-0.01	0.05	-0.01	-0.03	0.06	-0.08	1.00										
V9	-0.10	-0.38	-0.16	0.13	0.05	0.07	-0.05	0.08	1.00									
V10	-0.16	-0.49	-0.24	0.22	0.03	0.03	0.03	0.10	0.41	1.00								
V11	-0.09	-0.35	-0.04	-0.04	0.14	0.02	-0.06	-0.05	0.40	0.50	1.00							
V12	0.48	0.18	0.39	-0.26	0.38	0.37	-0.40	0.00	0.00	-0.08	-0.03	1.00						
V13	0.69	0.24	0.29	-0.30	0.26	0.23	-0.36	-0.03	-0.07	-0.14	-0.07	0.68	1.00					
V14	-0.02	-0.12	-0.07	-0.01	0.00	-0.04	0.00	0.00	0.30	0.18	0.21	0.02	-0.01	1.00				
V15	0.74	0.31	0.41	-0.43	0.23	0.26	-0.53	0.05	-0.06	-0.14	-0.06	0.47	0.63	-0.01	1.00			
V16	0.07	0.01	0.09	-0.05	0.07	0.05	-0.08	-0.01	0.01	-0.01	0.00	0.11	0.09	0.00	0.07	1.00		
V17	-0.04	-0.02	0.02	-0.04	0.06	-0.17	-0.26	0.31	0.07	-0.02	0.04	-0.06	-0.01	0.05	0.13	0.00	1.00	
V18	0.19	0.08	0.25	-0.16	0.25	0.23	-0.24	0.01	-0.02	0.06	0.01	0.22	0.18	0.00	0.24	0.06	-0.02	1.00

Note: See table 1 for variable definitions. Correlation coefficients are based on 1973 observations.
Source: Authors' calculation

Table 2 presents the pair-wise correlation coefficients of the variables used for the cluster analysis. The results show that collinearity is not at a critical level. The variables such as log of town population and log of the total number of electricity connections show the highest correlation of 0.74, which is clearly lower than 0.90 thresholds. This indicates that we can proceed to the analysis using all eighteen clustering variables.

Table 3: The Variance ratio criterion (VRC) and Duda-Hart indices

	Duda/Hart Je(2)/J2(1) index		VRC
No. of clusters	Je(2)/Je(1)	pseudo T-squared	Calinski/ Harabasz pseudo-F
1	0.3422	3789.38	
2	0.1659	40.24	3789.38
3	0.5554	1569.54	4148.21
4	0.184	31.05	4819.27
5	0.7243	742.36	4660.8
6	0.5962	241.11	5119.16
7	0.3382	624.17	6184.02
8	0.1672	9.96	8182.7
9	0.2686	95.3	8124.16
10	0.6895	716.96	8314.47
11	0.6439	175.84	8692.23
12	0.25	27	9228.05
13	0.7126	283.13	9407.86
14	0.6608	154.54	9717.78
15	0.5102	398.35	10041.61

Source: Authors' calculation

Now to decide the number of the clusters we depend on graphical and statistical measures. Dendrogram of appendix figure 1 does not show clearly the number of groups. Therefore, we rely on statistical measures. Table 3 suggests that the largest Duda–Hart Je(2)/Je(1) stopping-rule value is 0.7243, corresponding to the 5th group. But for this group, the pseudo-T-squared value is not the lowest, and Calinski–Harabasz pseudo - F value is not the highest. Keeping all these in mind we consider thirteen-group solution with the second-largest Duda–Hart Je(2)/Je(1) stopping-rule value (0.7126) and lower pseudo-T-squared value (283.13) and a higher Calinski–Harabasz pseudo - F value (9407.8).

Table 4: Number of clusters

Cluster	Frequency	Percent	Cumulative percentage
1	890	45.11	45.11
2	704	35.68	80.79
3	18	0.91	81.7
4	19	0.96	82.67
5	303	15.36	98.02
6	17	0.86	98.88
7	1	0.05	98.94
8	10	0.51	99.44
9	1	0.05	99.49
10	5	0.25	99.75
11	3	0.15	99.9
12	1	0.05	99.95
13	1	0.05	100

Source: Authors' calculation

The output in Table 4 shows that the cluster analysis assigned to all 1973 census towns unravels thirteen segments. The first cluster comprises 890 towns (45 %), the second cluster 704 towns (36%), and the fifth cluster 303 towns (15 %). These three are the major ones among the thirteen clusters. The rest of the clusters do not comprise more than 1 percent each of the observational units.

The mean values for the thirteen clusters are given in Table 5. Comparing the mean values across the clusters, we find that among the different variables the first cluster stresses on literacy rate, amount of rainfall, road distance to the nearest city with a population of 5 lakh and more, road distance to the state headquarters, the total number of latrines, and total protected water supply while the other variables are less important.

The main variables in the second cluster are rainfall, the total number of latrines, road distance to state headquarters, and total protected water supply. The third and fourth clusters consider rainfall, road distance to state headquarters, the total number of latrines, and total protected water supply. The fifth cluster stresses on rainfall, road distance to state headquarters, the total number of latrines, literacy rate, and total protected water supply.

Table 5: Comparison of means

Cluster	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
1	8.8	11.8	75.1	28.7	21.9	973.5	29.5	270.0	36.9	100.6	15.9	10.4	773.0	195.0	6.8	2.7	50.8	0.6
2	9.3	12.2	81.9	18.8	29.4	1770.7	20.9	317.4	38.7	98.7	15.1	24.8	2300.0	736.2	7.8	3.0	59.2	0.7
3	9.2	11.8	73.2	27.9	23.1	753.5	29.1	225.7	36.6	163.7	20.3	16.2	1686.4	21459.7	7.3	1.8	16.3	0.7
4	9.1	11.2	77.9	18.8	21.1	827.9	29.6	187.3	46.7	152.4	47.9	12.9	1371.4	9217.9	7.4	4.6	18.8	0.7
5	10.2	12.7	85.4	11.0	49.9	1778.3	15.3	279.5	30.3	63.1	10.4	52.0	6439.0	952.2	8.9	3.7	47.4	0.9
6	10.8	12.5	82.7	7.9	39.5	1657.8	19.2	131.6	24.7	47.3	11.4	85.4	14850.8	1658.8	9.5	2.2	34.5	0.8
7	12.7	13.2	95.9	10.8	74.0	3053.0	13.0	219.0	0.0	0.0	0.0	700.0	86293.0	5313.0	12.1	43.0	128.0	1.0
8	9.2	12.3	73.9	31.5	12.5	816.2	31.2	316.3	22.4	46.6	13.6	11.6	1389.5	47500.0	7.2	1.0	8.4	0.4
9	8.8	7.9	60.0	2.2	0.0	3280.0	14.0	460.0	696.0	696.0	164.0	30.0	1651.0	75000.0	7.6	4.0	227.0	0.0
10	9.0	11.4	72.7	27.1	21.6	594.8	29.8	231.6	121.2	293.2	62.2	12.6	1104.6	104000.0	7.3	2.0	40.4	0.6
11	9.1	10.4	72.6	32.5	35.0	1066.3	22.3	381.0	307.7	322.0	109.7	96.7	2466.7	156666.7	7.4	3.0	133.0	0.7
12	8.9	7.7	72.2	1.0	150.0	2500.0	5.0	241.0	266.0	629.0	266.0	15.0	1733.0	200000.0	6.9	3.0	95.0	1.0
13	8.2	8.6	67.1	0.0	17.0	1440.0	16.0	319.0	360.0	360.0	142.0	11.0	735.0	380000.0	7.1	3.0	307.0	1.0
Total	9.2	12.1	79.2	22.1	29.1	1385.6	24.1	286.4	37.6	96.0	15.6	23.1	2374.2	1873.0	7.5	3.0	52.7	0.7

Note: See table 1 for variable definitions
Source: Authors' calculation

Other clusters also identify some of these variables as the predominant ones. This indicates that literacy rate, unemployment rate, rainfall, road distance to state headquarters, road distance to the city with a population of 1 lakh and more, road distance to the city with population 5 lakh and more, road distance to the nearest railway station, the total number of latrines, and total protected water supply play the most important role in clustering the new census towns into thirteen segments.

3. Conclusions and policy implications

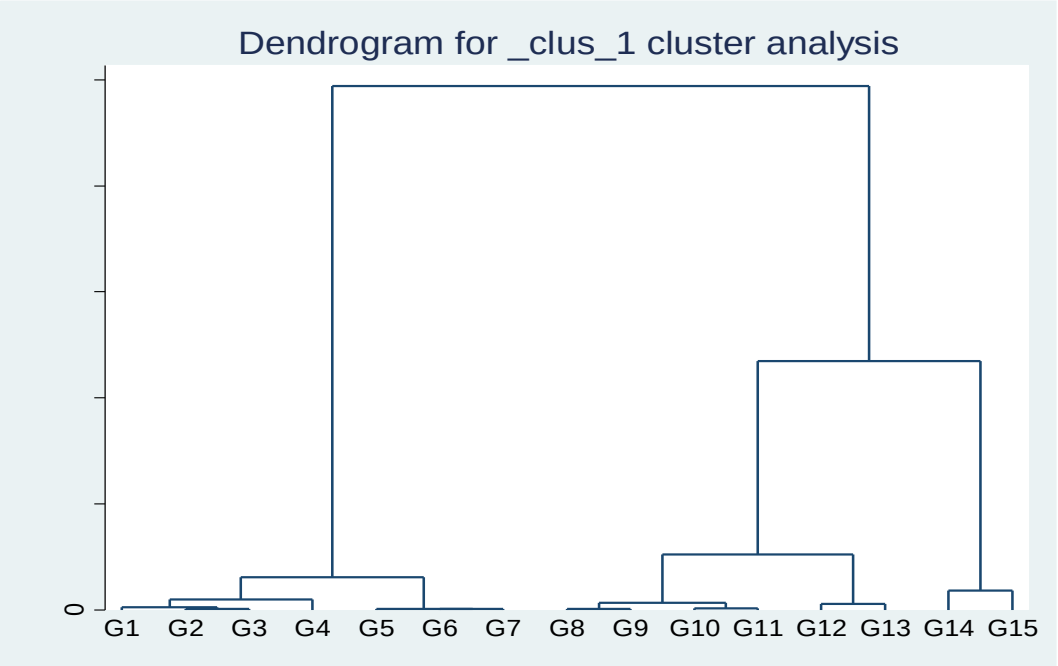
The present study investigates the economic determinants of new census towns which emerged in the 2011 Census. We consider 2328 census towns for the analysis. We apply cluster analysis to find out the similar groups within the set of new census towns. For clustering these new census towns, we consider several factors that are responsible for transforming a village into an urban space. Variables include population size of census towns; rural effect measured by district level rural to urban migration, literacy rate, poverty, and unemployment rate; favorable climate of a town is measured by town level rainfall and temperature differences; growth dynamics spilling over to the hinterland of the big cities measured by the road distance from a census town to state headquarters, the nearest city with a population of 1 lakh and more, the nearest city with a population of 5 lakh and more; the economic potential is measured by road distance from a census town to the nearest railway station, infrastructure effect is measured by total road length, latrines, protected water supply, electricity connections, hospitals, and educational centers; and a town is taken to have better job opportunity if it has manufacturing industry.

Overall, our analysis suggests that the emergence of the new towns is associated with infrastructure provision and the growth dynamics of some of the large cities. In other words, the new towns have been growing more as satellite towns with a strong reference to the agglomeration economies existent in large cities. Livelihood opportunities are explored with the provision of infrastructure endowment which facilitates population movement from the rural areas to the hinterland of the big cities. While space tends to shrink in the large cities with a concentration of economic activities, the rural hinterland provides land for new towns to emerge and benefit from the agglomeration economies which remain within the reach of the new firms and the workers both. Livelihood diversification becomes possible for the rural population and

earnings are expected to be higher as the external economies of scale get manifested in terms of higher levels of productivity.

In the context of policy recommendation, we suggest that new census towns have to be empowered with a higher level of infrastructure and job opportunities. The transformations from rural agriculture-led economy to industrial and service-led urban economy are an inevitable stage of development. The basic idea is that the urban economy uses resources such as land and labor more productively than the rural areas. Hence, it leads to higher economic development. Therefore, to facilitate the smooth transformation from rural to urban, the development of new census towns is very important. The proper management of new census towns will play a pivotal role in the context of higher and balanced urbanization (lower differences in population size among the cities and towns). This will also help reduce the pressure in the large cities and the impact of the other diseconomies while the benefits of agglomeration economies originating from the large cities can still be achieved. However, for this to happen in a significant manner the census towns will have to be endowed with better infrastructure and investment in terms of urban facilities and services.

Appendix Figure 1: Dendrogram for wards linkage cluster analysis



Appendix

Measurement of variables and data sources

Town population: Total populations of a town. Source: Town amenities, District Census Hand Book, Census of India 2011. Website: http://censusindia.gov.in/2011census/dchb/DCHB.html

Rural to urban migration: District specific migration is defined by total number of migrants to a particular urban area of a district (where the sample town is located) from elsewhere in rural India for all durations of residence. Source: Census of India 2011, Government of India. Website: http://censusindia.gov.in/2011census/d-series/d-6.html.

Literacy rate: District level literacy rates. Source: Census of India 2011. Website: https://www.census2011.co.in/district.php

Rural poverty rate: Poverty head count ratio (HCR) is the proportion of a population that exists, or lives, below the poverty line. For measuring district poverty rate, we use the Rangarajan committee – recommended poverty line in 2011-12 by considering monthly per capita consumption expenditure based on modified mixed reference period (MMRP). However, as India's official estimates do not provide the district-level poverty line, state-specific urban poverty lines have been used for measuring district-level (which is used as proxy of a town) rural poverty for the towns located in the corresponding district. Source: Author's calculation using unit level data of the NSS 68th Round on consumption expenditure of 2011-12.

Rural unemployment rate: National Sample Survey does not provide town level employment/unemployment data. Rural samples of a town district (i.e. the district to which the sample town is located) are considered to measure the unemployment rate. Rural unemployment rate (per 1000) for all persons according to usual status (principal status+ subsidiary status) (adjusted) for each town district are estimated. Source: Unit level data of NSS 68th Round on Employment and Unemployment in 2011-12.

Rainfall: Town level total rainfall. Source: Town amenities, District Census Hand Book, Census of India 2011.

Temperature difference: Town- wise temperature difference (maximum-minimum). Source: Town amenities, District Census Hand Book, Census of India 2011.

Road Distance: Road distance from a town to state headquarters, nearest city with population of 1 Lakh and more, nearest city with population of 5 Lakh and more, and nearest railway station. Source: Town amenities, District Census Hand Book, Census of India 2011.

Total road length: Both Kachcha road length and Pucca road length are considered for the measurement of total road length of a city. Source: Town amenities, District Census Hand Book, Census of India 2011.

Number of Latrines: Total number of pit, flush/pour, services, and other latrines. Source: Town amenities, District Census Hand Book, Census of India 2011.

Total water supply: Total protected water supply in city. Source: Town amenities, District Census Hand Book, Census of India 2011.

Electricity connection: Total number of electricity connections in domestic, industrial, commercial, road lighting, electricity, and other connections. Source: Town amenities, District Census Hand Book, Census of India 2011.

Total hospitals: It includes allopathic hospitals, alternative medicine hospitals, dispensary/health Centers, family welfare centers, maternity and child welfare centers, maternity homes, TB hospitals/ clinic, and nursing homes Source: Town amenities, District Census Hand Book, Census of India 2011.

Total number of schools, colleges, and universities: It includes all the private and governments' school, colleges and universities of a city. Source: Town amenities, District Census Hand Book, Census of India 2011.

Manufacturing industry: Town level manufactured commodities. Source: Town amenities, District Census Hand Book, Census of India 2011.

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