

Estimation of Regional Economic Accounts at the City Level

STUDYING THE CASE OF CITY GDP FOR THANE

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Background

- India - city-level economic parameters missing in urban initiatives
- OECD – database of regional economic measures, GDP for metropolitan areas
- Cities’ economic strength ranked - McKinsey, Brookings etc. - city GDP unaccounted for
- Review of literature and databases on regional economic analysis for cities
 - “Calculating city-level GDP in India: An assessment of methodologies and an evaluation of feasibility” (The Economist Intelligence Unit, 2018)
 - “Consultation Paper on City GDP measurement Framework” (Ministry of Housing and Urban Affairs, 2019) [referred to as “Consultation Paper” henceforth].

(This paper is an outcome of the project “Estimation of City-Level GDP for Thane” funded by Thane Smart City Limited and CRISIL)

Database

Table 1: Data Sources

	Name of the Report	Year Published	Study Year	Organisation/Person
1	Economic Characteristics of Unincorporated Non-Agricultural Enterprises (excluding Construction) in India: NSS 67th Round, July 2010-June 2011	2012	2010-11	National Sample Survey Office, Ministry of Statistics and Programme Implementation
2	A Report on Unincorporated Non-Agricultural Enterprises (Excluding Construction) Based on Data Collected in State Sample: 67th Round of National Sample Survey (July 2010 - June 2011) Vol. I	2013	2010-11	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra
3	Employment and Unemployment Situation in India: NSS 68th Round, July 2011- June 2012	2014	2011-12	National Sample Survey Office, Ministry of Statistics and Programme Implementation
4	Census of India (Houselisting and Population, Housing)		2011	Office of the Registrar General of India and Census Commissioner, Ministry of Home Affairs
5	District Census Handbook Thane: Village and Town Directory	2014	2011	Directorate of Census Operations, Maharashtra
6	District Census Handbook Thane: Village and Townwise Primary Census Abstract	2014	2011	Directorate of Census Operations, Maharashtra
7	A Report On 'Employment and Unemployment Situation' Based On Data Collected in State Sample Of 68th Round Of National Sample Survey (July 2011 – June 2012) Volume I	2014	2011-12	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra
8	A Report on Unincorporated Non-Agricultural Enterprises (Excluding Construction) Based on Data Collected in Central, State and Pooled Samples of 67th Round of National Sample Survey	2016	2010-11	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra
9	Employment and Unemployment Situation in Cities and Towns in India: NSS 68th Round, July 2011-June 2012	2016	2011-12	National Sample Survey Office, Ministry of Statistics and Programme Implementation
10	Report on Sixth Economic Census Maharashtra State	2016	2013-14	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra
11	Report on Pooling of Central and State Sample Data: 68 th Round of NSS Employment and Unemployment	2017	2011-12	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra
12	Economic Survey of Maharashtra 2018-19	2019	2018-19	Directorate of Economics and Statistics, Planning Department, Government of Maharashtra

- Additional datasets for estimating rural and urban income at the state level – National Accounts Statistics national level methodology - *“National Accounts Statistics: Sources and Methods 2012”*, CSO, MoSPI, GoI (Chapter 31 Estimation of Rural and Urban Income, 2004-05)

Methodology

Methods of estimation of **Gross City Domestic Product (GCDP)**:

1. Apportioning based on population

2. Apportioning based on sectoral employment

3. Using Gross Value Added Per Worker (GVAPW) and Number of Workers by NIC Categories

4. Urban Maharashtra (UM) + Labour Input (LI) Method

5. Thane City (TC) + LI Method



“Simple Methods”



Broadly utilised by the study - as proposed by the Consultation Paper, with minor additional elements.

Methodology

Step 1

Listing Maharashtra Gross State Domestic Product (GSDP) by “Compilation Categories”

Step 2

- **Estimating Rural and Urban GSDP for Maharashtra**

Step 3

- **Listing Urban Maharashtra GSDP by Compilation Categories**

Step 4

- **Calculating GVAPW (using ES 2010-11) and Estimated Workers (using EUS 2011-12) by Compilation Categories, for Urban Maharashtra and Thane City**

Step 5

- **Calculating Urban Maharashtra Gross Value Added (GVA) and Thane City GVA**

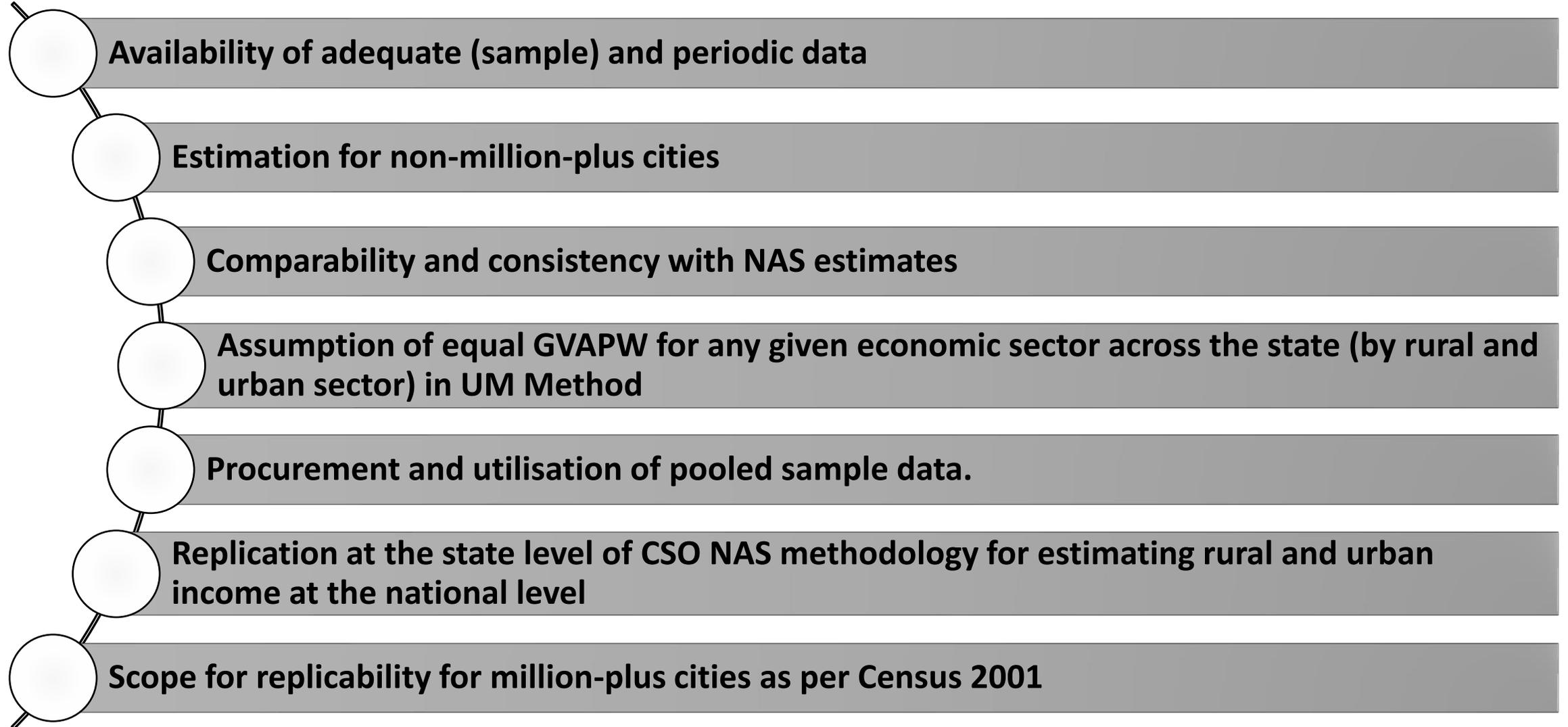
Step 6

- **Calculating the share of Thane City GVA in Urban Maharashtra GVA by Compilation Categories and applying the shares to Estimated Urban Maharashtra GSDP, to obtain Estimated Thane City Gross City Domestic Product (GCDP) by Compilation Categories**

Step 7

- **Summing Estimated Thane City GCDP by Compilation Categories from Step 6 to get overall Thane City GCDP**

Limitations and Scope for Replicability



About Thane: An Economic Profile

Table 2: Demographic details of Thane City, 2011

Population	18.4 lakhs
Decadal Growth Rate of Population (2001-2011)	45.86
Area	128 km ²
Population Density	14361
Scheduled Caste Population %	6.84
Scheduled Tribe Population %	2.32
Literacy Rate	89.41
Sex Ratio	888
Child Sex Ratio	908
Source: Census 2011	

Table 3: Percentage Shares of GVA by Compilation Categories, 2010-11

Compilation Category	Urban Maharashtra	Thane District	Thane City
Manufacturing	25.7	48.7	12.6
Electricity, Water, Gas*	-	-	-
Railways, Transport, Storage	5.6	5.3	10.4
Communication	0.6	0.7	0.4
Trade, Hotels, Restaurants	44.3	31.3	48.5
Banking & Insurance	1.0	0.8	1.0
Real estate	0.8	0.5	0.4
Other Services	21.9	12.7	26.7
Total	100.0	100.0	100.0
Total GVA (in ₹ crore)	63849.7	15225.7	5042.8

Source: Computed by Authors using NSS Enterprise Survey 2010-11
 Note: ES 2010-11 does not include Agriculture, Forestry and Fishing, Mining and Quarrying, Construction, and Public Administration sectors
 * Electricity, Water, Gas #

Table 4: Percentage Share of Establishments by Broad Industry Division, 2013-14

Broad Industry Division	Maharashtra	Urban Maharashtra	Thane District	Thane City
Primary	26.0	2.5	2.2	0.8
Secondary	17.0	22.0	24.3	20.5
Tertiary	57.0	75.5	73.5	79.7
Total	100	100	100	100
Number (in lakhs)	61.37	28.43	4.39	0.74

Source: 6th Economic Census
 * includes Mumbai City + Mumbai Suburban

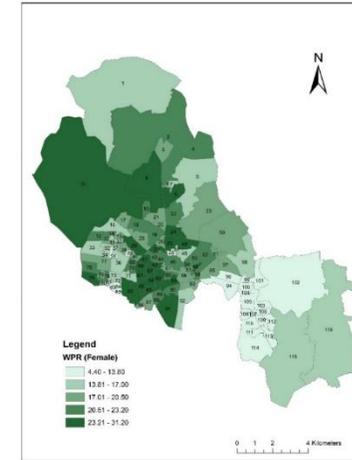


Figure 1: Ward-wise Female WPR, Thane, 2011

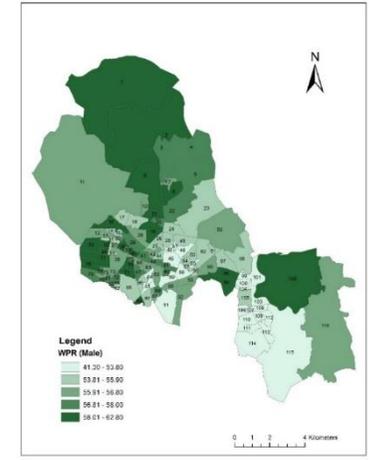


Figure 2: Ward-wise Male WPR, Thane, 2011

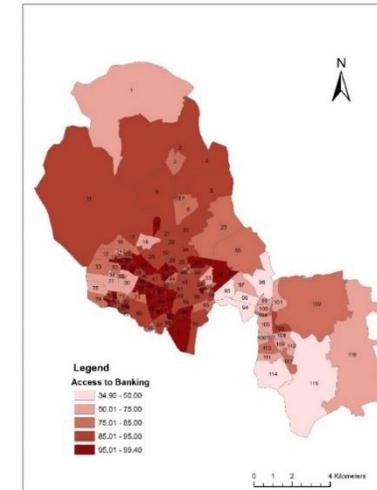


Figure 3: Ward-wise Access to Banking, Thane, 2011

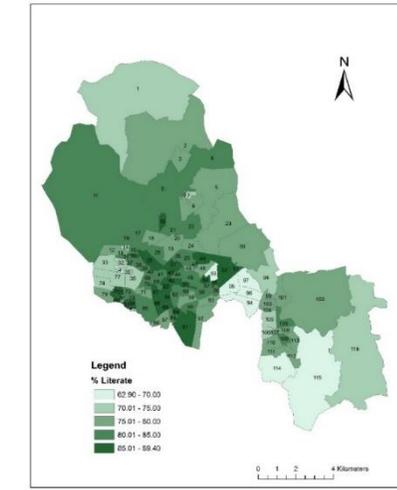


Figure 4: Ward-wise Literacy Rate, Thane, 2011

Review of Methods for Calculating City GDP

Table 5: Summary of Outputs from Simple Methods of estimating city-level GDP, 2011-12

Method		Thane City GDP
1. Apportioning using City Population	Using State Population and State Domestic Product	₹ 18,851 Crore
	Using District Population and District Domestic Product	₹ 26,903 Crore
2. Apportioning Using Sectoral Employment	Assuming distinct Worker Population Ratios for City and State	₹ 30,873 Crore
	Assuming equal Worker Population Ratio for City and State	₹ 36,118 Crore
3. Using Gross Value Added Per Worker and No. of Workers by NIC Compilation Categories		₹ 6718 Crore

Table 6: Summary of GDP values obtained for Thane City, Thane District, Urban Maharashtra, and Maharashtra State, 2011-12

Region	Gross Domestic Product 2011-12 (in ₹ crore)	Notes
Maharashtra [#]	1170120	
Urban Maharashtra [^] (LI Method)	694533	59.3% of Maharashtra GSDP
Urban Maharashtra [^] (CSO NAS Method)	To be computed	-
Thane District ⁺	158190	13.5% of Maharashtra GDP
Thane City [^] (UM Method + LI Method)	26037.8	3.1% of Estimated UM GDP
Thane City [^] (UM Method + CSO NAS Method)	To be computed	-
Thane City [^] (TC Method + LI Method)	22927.9	2.8% of Estimated UM GDP
Thane City [^] (TC Method + CSO NAS Method)	To be computed	-
[#] From Economic Survey of Maharashtra 2014-15		
⁺ From District Domestic Product of Maharashtra 2004-05 to 2013-14		
[^] Computed by authors		

- **CSO NAS Methodology for estimating Rural and Urban Income**

- The last year for which economic activity-wise rural/urban breakup of value added is available is 2011-12 (year of base change).
- Attempt to replicate methodology at state level; no resolution till now for a refined approach to GCDP estimation

Measurement and Analysis of Thane GCDP: 2011-12 to 2017-18

Table 7: Estimated Thane City GVA by Compilation Categories, using UM + LI Method (₹ crore)

Compilation Category	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Agriculture, Forestry & Fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining & Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	4568.5	5237.0	6020.7	6350.2	6924.6	7001.7	7630.8
Construction	1528.7	1593.4	1756.2	1919.7	1905.6	2063.4	2302.6
Electricity, Water, Gas	350.8	382.8	527.7	512.0	541.3	518.3	677.4
Railways, Transport, Storage	1566.2	1831.5	1897.7	2121.4	2318.5	2481.4	2756.8
Communication	812.1	920.4	1110.5	1261.9	1484.0	1478.2	1459.6
Trade, Hotels, Restaurants	3063.6	3707.1	3954.9	4314.3	4531.0	5143.9	5806.8
Banking & Insurance	3759.2	4118.2	4776.6	5234.4	5686.1	5844.3	6555.9
Real estate	9373.2	11026.6	13053.4	15341.7	17266.8	19841.0	22389.8
Public administration	1149.1	1275.6	1410.0	1523.6	1670.3	1870.2	2097.8
Other Services	3716.7	4369.0	5069.9	5933.8	6778.1	7859.1	9096.0
Total	29888.1	34461.6	39577.6	44512.9	49106.4	54101.5	60773.5
% of Maharashtra GSVA	2.61	2.66	2.69	2.80	2.85	2.85	2.89
% of estimated Urban Maharashtra GSVA	3.65	3.69	3.73	3.80	3.83	3.91	3.92
Note: The compilation categories used in this calculation would require clarification from the DES regarding sub-categorisation, for final confirmation.							

Table 8: Estimated Percentage Shares of Compilation Categories in Thane City GVA (using UM + LI method), 2017-18

Compilation Category	GVA (₹ crore)	% Share
Agriculture, Forestry & Fishing	0.0	0.0
Mining & Quarrying	0.0	0.0
Manufacturing	7630.8	12.6
Construction	2302.6	3.8
Electricity, Water, Gas	677.4	1.1
Railways, Transport, Storage	2756.8	4.5
Communication	1459.6	2.4
Trade, Hotels, Restaurants	5806.8	9.6
Banking & Insurance	6555.9	10.8
Real estate	22389.8	36.8
Public administration	2097.8	3.5
Other Services	9096.0	15.0
Total	60773.5	100.0
% of Maharashtra GSVA	2.89	
% of estimated Urban Maharashtra GSVA	3.92	
* The estimates may be lower due to inadequate sample size for Thane City, for instance, for Electricity, Water and Gas, there are no entries. They can be recomputed using pooled sample data.		

Measurement and Analysis of Thane GCDP: 2011-12 to 2017-18

Figure 5: Shares of Compilation Categories in Estimated Thane City GVA, 2011-12 to 2017-18 (UM+LI Method)

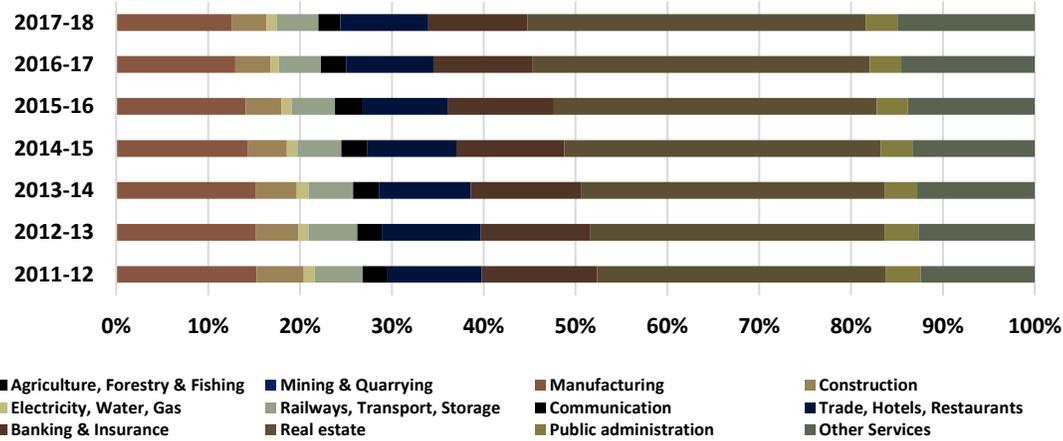


Figure 6: Percentage Shares of Compilation Categories in Estimated Thane City GVA for 2017-18 (UM+LI Method)

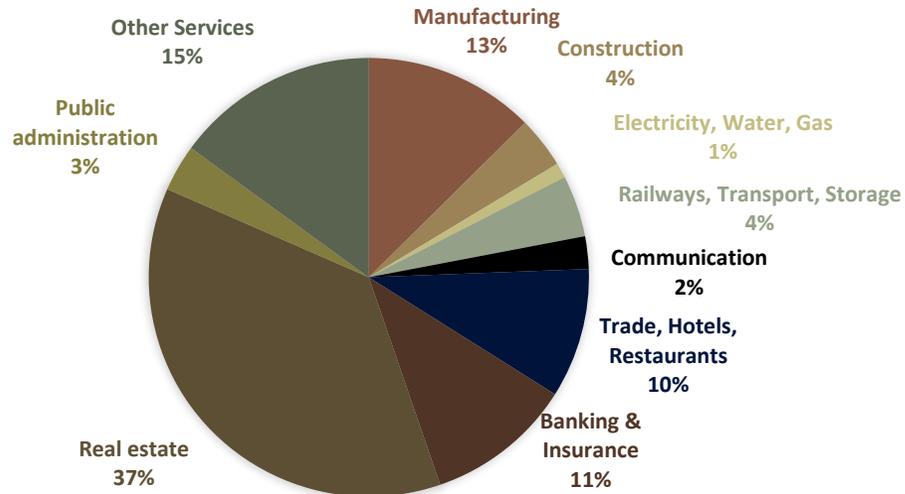
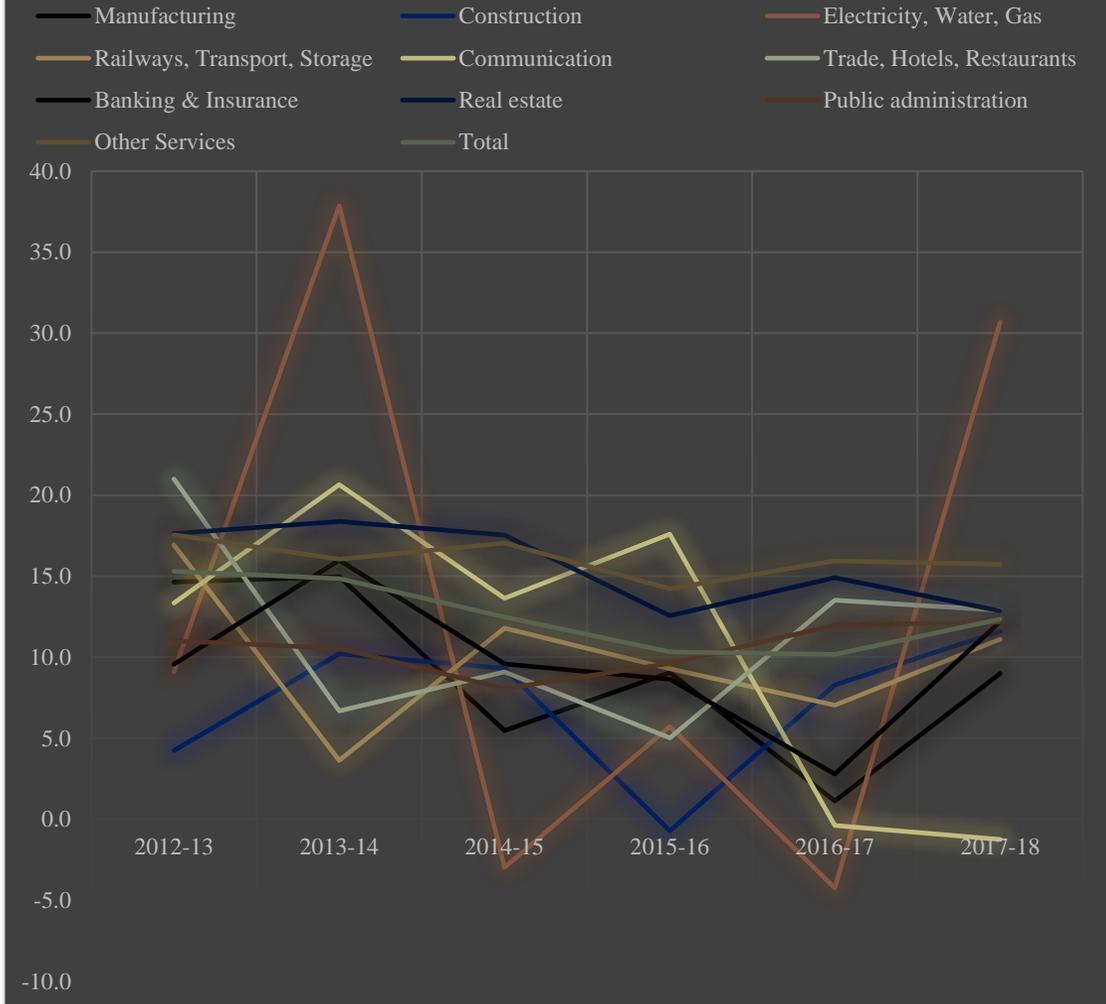


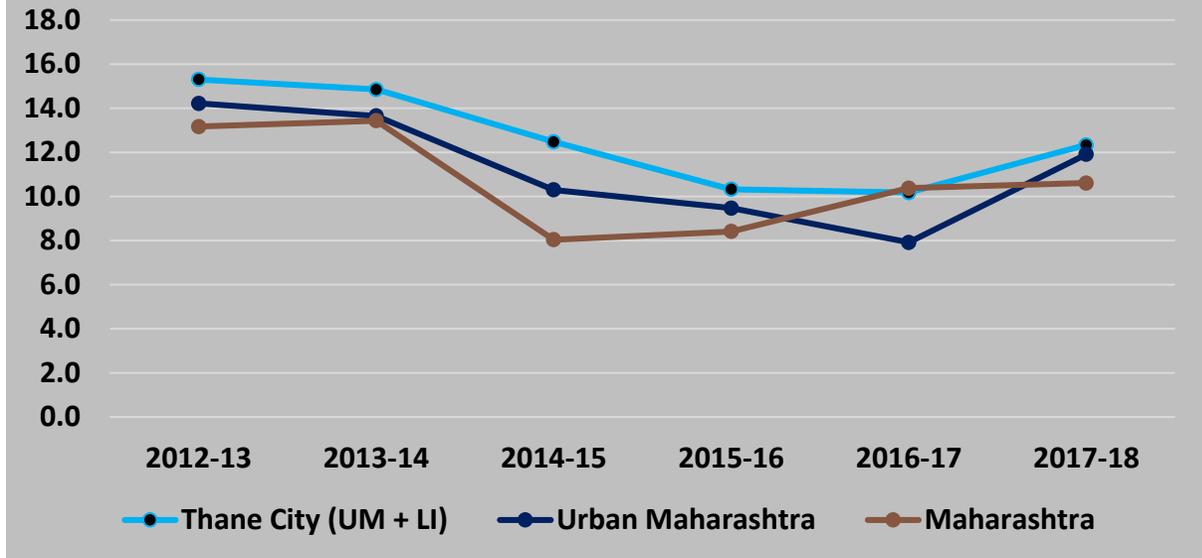
Figure 7: Annual Growth Rate of GVA of Thane City by Compilation Categories



Highlights

- Thane City makes up 1.64% of the State population and 3.62% of the population of Urban Maharashtra.
- The estimated GVA (by UM+LI method) for Thane City for FY 2017-18 is ₹ 60773 crores. Thane City accounts for 2.89% of Maharashtra's income and 3.92% of Urban Maharashtra's, as per this estimate.
- The estimated Gross City Domestic Product (GCDP) for Thane City, FY 2017-18, would, therefore, be ₹ 69695 crores (with GSDP taken from Economic Survey of Maharashtra 2018-19, Directorate of Economics and Statistics, Maharashtra).
- Real estate (37%), manufacturing (13%), banking and insurance (11%), trade, hotel & restaurants (10%), and other services (15%) sector constitute a majority of this.

Figure 8: Annual Growth Rate of GVA



- Thane City's per capita GDP (as estimated from this study) is over ₹ 3 lakh – almost double that of the state.
- Thane City's estimated annual growth rate of GVA has consistently been around 2 percentage points higher than that of Urban Maharashtra and the state.

Conclusions

- Existing and new approaches for estimating city-level GDP explored; scope, replicability and feasibility of adapting to the Indian context examined
- Basic economic profile of Thane city from secondary official data sources, with spatial mapping (ward-wise visualisation) provided to establish a context
- Simple as well as rigorous methods (UM+LI and TC+LI; from data at granular level) used for GCDP estimation
- CSO NAS methodology for estimating rural and urban national income can be replicated at the state level, after seeking clarifications from CSO.
- Estimation components to be completed using pooled sample data (centre and state sample) from the DES.
- GCDP for Thane City, FY 2017-18, stood at ₹ 69695 crores. Real estate (37%), manufacturing (13%), banking and insurance (11%), trade, hotel & restaurants (10%), and other services (15%) sector constitute a majority of this.

Overall, this study pioneers the organisation of the structures and processes of estimation and enables evidence-backed policymaking and planning. This becomes instrumental for the growth and development of cities and in ascending towards the vision of a US\$ 5 trillion economy of 'New India'.

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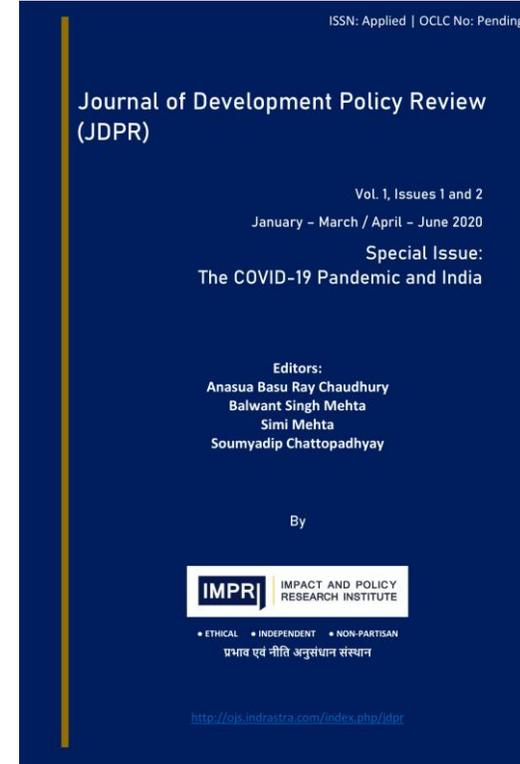


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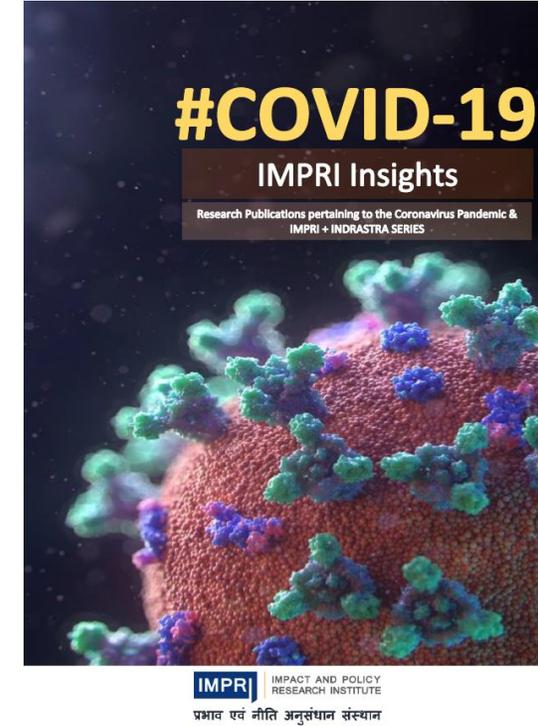
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