

## Methodology: Data Extrapolation for Cities without Data

Certain Urban Local Governments (ULGs) had incomplete data records for some fiscal years, which posed challenges in conducting a comprehensive analysis. To address this, a systematic extrapolation methodology was applied to estimate missing values and ensure a complete and consistent dataset for all years under study.

For each population category, cities with available data were used to derive per capita own source revenue figure. This figure was then used to compute the respective values of cities without data, using their population as the scaling variable (population is based on the 2011 census).

### Example

In the 1 million to 4 million (1M - 4M) population category, there are 36 cities in total. For FY 2020-21, revenue data was available for 31 cities, while 5 cities had no reported figures. The extrapolation steps below describe how own source revenue estimates were derived for those 5 cities.

### Extrapolation Steps

To ensure full coverage, extrapolation of own source revenue was performed as follows:

#### 1. Base Data

We used the existing total own source revenue data of the 31 cities in the 1M - 4M category.

#### 2. Per Capita Calculation

The per capita own source revenue was calculated by dividing the total own source revenue of these 31 cities by their combined population.

#### 3. Extrapolation

For each of the 5 cities without data, own source revenue was estimated by multiplying their population by the per capita own source revenue derived in Step 2.

### Illustrative Example

Total own source revenue of 31 cities: ₹372,000 Crores

Combined population of 31 cities: 62 million

Per capita own source revenue = ₹372,000 crores ÷ 62 million = ₹6,000

Total population of the 5 cities with missing data = 10 million

Therefore, the estimated own source revenue of the 5 cities with missing data will be: 10 million \* ₹6,000 = ₹6,000 Crore

Hence, the total own source revenue of 36 cities in the 1M - 4M category = 372,000 + 6,000 = 378,000 crores.

In case of any further queries, please reach out to [data@cityfinance.in](mailto:data@cityfinance.in)