

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 revenue component figure. This figure was then used to compute the respective values of cities without data, using their population as the scaling variable. The same approach was followed for each component of total revenue, from which the corresponding percentage shares were calculated.

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 tax revenue estimates were derived for those 5 cities.

Extrapolation Steps

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

- 1. Base Data**

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

- 2. Per Capita Calculation**

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

- 3. Extrapolation**

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

Similarly non-tax revenue, assigned revenue, revenue grants and subsidies, other own income and miscellaneous income was estimated and corresponding percentage shares were calculated.

Illustrative Example

Total tax revenue of 31 cities: ₹372,000 Crore

Combined population of 31 cities: 62 million

Per capita tax revenue = ₹372,000 crore ÷ 62 million = ₹6,000 per person

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

Therefore, the estimate tax revenue of the 5 cities with missing data will be:

10 million * ₹6,000 = ₹6,000 Crore

Hence, the total tax revenue of 36 cities in the 1M - 4M category = 372,000 + 6,000 = **3,78,000 crores.**

In case of any further queries, please reach out to data@cityfinance.in