INTERNATIONAL CENTER FOR PUBLIC POLICY

International Center for Public Policy

Working Paper 24-04

June 2024

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Fiscal Sustainability of Small and Medium Cities in India: Some New Dimensions

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June 2024

Abstract

Three strands of performances of governments are embedded in a public finance cycle: how effectively expenditures get translated to services, services lead to revenues, and revenues result in effective expenditures. We assess the performances of 910 city governments in southern India using Slack-based Data Envelopment Analysis. Our main findings suggest that irrespective of size, services have not generated sufficient revenues, primarily due to poor collection efficiency. Cities could have incurred the same levels of expenditures with lesser revenues, indicating suboptimal resource utilization. Smaller cities suffer from unrecoverable supply bottlenecks, the maximum in roads followed by water. Finally, misutilization of establishment expenditures is prevalent.

Keywords: public finance, data envelopment analysis, revenue collection, expenditure management, service delivery, small and medium cities

JEL Classification: C14, H3, H41, H70, H71, H72, R51

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1. Introduction

The question of performance assessment of any level of government primarily centres around how well governments translate their spending into delivery of public services. This emanates from the rationale discussed in the public finance theory of optimal provision of certain services by governments, especially when preferences of the population cannot be revealed (Samuelson, 1956; Musgrave, 1959). But there exist other theories in public finance which discuss a) services as a crucial factor that helps generate revenues and b) the level of revenues generated affect spending by governments. We cultivate these strands of performance assessments from the perspective of fiscal sustainability and construct a new conceptual framework. This framework also guides us to develop a novel methodology for estimating the performances of governments of any level empirically.

We begin by discussing the public finance theories within which each of these strands is rooted. The role of government is to establish educational, physical, environmental, technological, financial, and social infrastructure in the economy (Stiglitz, 2005). It is imperative for governments to intervene in the provision of public goods because individuals generally do not reveal their preferences. Moreover, it is the role of the governments to ensure that citizens enjoy at least the minimum standards of living.

It is primarily governments at the local level that are entrusted with the responsibility for providing basic services like water supply, sewerage, street lighting, solid waste management, and roads to the population. According to the theory of decentralisation, local governments have better information on the tastes and preferences of their populations and therefore can spend in accordance with the demand for services (Oates, 2008; Slack, 2011, pp.2). Though there has been empirical evidence that fiscal decentralisation increases expenditure on infrastructure

(Grisorio and Prota, 2015), delegating such responsibilities to higher levels of governments could cause non-optimal supply of services. Therefore, local governments should incur expenditures in order to ensure optimal service delivery to the local population. In fact, according to the Camarelist school of economic thought, government expenditures are considered investments for generating future streams of revenues (Backhaus and Wagner, 1987). This can happen only when governments spend on the provision of public goods, which could generate revenues. Thus, service provision would require expenditures be incurred by governments. Expenditures by government, however, would be rendered inefficient if they do not translate into service provision.

The second crucial function performed by governments is to collect revenues from the people through tax and non-tax sources. The revenues collected are actually payments received from people in exchange for services provided by the government (Buchanan, 1949, pp. 498). It must be noted that most of the services provided are not pure public goods but merit goods in nature. In other words, although these goods exhibit positive externalities, these can be exclusionary in nature. Therefore, the relationship between benefits and payments must clearly be established in such cases. Some of the local public goods like water supply, roads, public parks, healthcare, or education fall under such a category. In a similar light, Olson (1969) calls for 'fiscal equivalence,' which means that those who receive the benefits of collective goods must pay for those benefits. Therefore, service provision should ideally lead to revenue generation for the government. Taxes, which are a major source of revenue for local governments, are higher in communities that spend more on public goods (Oates, 1969). Local taxes can be called a benefit tax. People are always willing to pay more to live in a community that provides high quality services (Oates, 1969; Bahl and Bird, 2008). Utility maximizing consumers would move to the

jurisdiction that provides them the greatest benefits (services) over costs (taxes paid) (Tiebout, 1956). In fact, regional competitiveness may depend on infrastructural services (Kitson et al., 2004). Factors like environment, urbanism and housing, security, mobility, culture, the economy, social service, and quality of living provide a better reputation to a city and can help attract population. City reputation can, therefore, impact positively economic activities, which are reflected in revenues collected as taxes on businesses and professional economic activities in cities (Delgado-García et al., 2018).

We can say that for a government to generate more revenues, they must provide good quality services to its population, which may be chargeable. We can also say that if service delivery cannot bring revenues by attracting people with higher incomes and quality of living, the quality of services could be questionable or there could be a problem with administration or revenue collection. In either of the cases, revenue generation is adversely affected.

The role of the governments is not limited to generating and collecting revenues. Revenues collected must be spent on infrastructure, services, and other social welfare goals. This is the third critical role of the government, called as redistribution of income and wealth, and is done through taxes and subsidies (Musgrave and Musgrave, 1989). Expenditures will depend on the revenue generation handles by any level of government which would maximise social welfare (Buchanan, 1949, pp. 497). The literature on fiscal federalism also assigns the redistribution of income through taxation and expenditures as a major role of even the local governments (Bird, 1993). Local governments spend their revenues collected on the provision of services like water supply, electricity, roads, sewerage, street lighting, and waste disposal and provide liveable conditions to their populace. Here, own revenues play a significant role. Local residents hold local officials accountable if local public services are financed through locally imposed taxes and

user charges (Oslon, 1969). This makes raising revenues through taxes and user charges important for spending on those collective goods or services. There should exist a directly proportional relationship between revenues raised by governments and expenditures incurred by them. In other words, if local governments increase spending, residents pay higher taxes and if taxes/revenue sources are reduced, then local residents would receive lower levels of services (Bird, 2010). Therefore, higher expenditures would require higher revenue generation through taxes and user charges. Subnational taxes (revenues) should provide enough revenues for subnational units to cover expenditures (Bird, 1993). If revenues generated are not utilized for expenditure on services, this could indicate a lack of willingness to spend or the existence of unutilized public money.

Three different aspects of fiscal sustainability emerge from the above discussions through which we can also assess the performances of governments and some existing lacunae, empirically. In the present paper, we develop a novel conceptual framework and thereafter an empirical methodology for performance evaluations of governments from these three dimensions. While this framework and methodology can be applied to any tier of government, the present paper analyses the performances of city governments in India, as local government performance is rarely evaluated worldwide due to complexities in operations with intergovernmental dynamics and a paucity of data.

The paper is structured as follows. A conceptual framework to analyze the performance of local bodies is described in section 2. In section 3, we discuss the methodology that evolves from this conceptual framework, with data, variables used for the analysis, and technique. Section 4 gives the stylized facts, and section 5 discusses the results. The paper ends with conclusions and policy recommendations in section 6.

2. Conceptual Framework: Towards a New Methodology

Following the discussion in the previous section, the paper develops a conceptual framework that could be used to build a methodology for assessing the performance of any level of government, central, state, or local, in a holistic manner. The framework estimates efficiencies of governments for their three major functions in an input-output framework.

The first strand considers expenditures as inputs and services as outputs, which helps us understand how effectively expenditures incurred by governments are translated into provisions of services. This is the most widely used measure of efficiency to assess the performance of governments. The possibilities of inefficiencies through **misappropriation** or **leakages in expenditures** can be traced through this strand of efficiency from the input side. We can also trace possibilities of inefficiencies through **service inadequacy** from the output side.

The second strand considers services as inputs and revenues as outputs. The rationale for this draws from the fact that the generation of own revenue sources of the governments (tax and non-tax revenues) depends on the quality of services delivered. The possibilities of inefficiencies through **an inadequacy of revenue handles** or **inappropriate or unrevised taxes and user charges** can be traced from the input side of this strand. We can also trace the possibilities of inefficiencies through **poor revenue collection** from the output side through this strand.

The third strand considers revenues as inputs and expenditures as outputs. The revenue generated by governments should be spent on service delivery. It is important to see how effectively revenues generated are translated into expenditures. The possibilities of inefficiencies through **ineffective revenue channelizations** can be traced from the input side of this strand. We can also trace the possibilities of inefficiencies through **underutilized revenues** from the output side of inefficiency through this strand.

A closer look at each of these strands would help us identify the sources of gaps and leakages in the performances of governments from the policy perspective. In the present paper, we use this generic conceptual framework and design a new methodology, to assess the performance of the local governments which shoulder the crucial task of providing basic services and improve the living conditions of local populace. We apply this to the Indian urban local bodies, which are beset with complex problems like lack of autonomy, poor infrastructure, lack of human resources, and mismanagement of operations. Once we build up the methodology with the technique, we describe a set of stylised facts emerging from the framework and the technique.

3. Data, Variables and Slack-based Efficiency Models

The performance assessment of local bodies has been undertaken by a few studies. Literature analyses the performance of local governments by estimating their levels of efficiency using a frontier approach.[1] Studies look at how expenditures affect the service delivery in an urban area considering expenditures as inputs and service delivery as outputs.[2] These studies also undertake a two-stage analysis in some cases. In the first stage, they estimate the technical efficiency score using Data Envelopment Analysis, and in the second stage, they explain the scores using exogenous factors like the stage of decentralisation, purchasing power of municipalities, geographical distance to the main centre, level of commercial activity in municipality, level of tourist activity, potential voters, type of political parties, size of political coalition, rate of urbanisation, level of computer usage, importance of tourism, type of management of local body, personal income of population, unemployment rate, level of education of population, and

[1] de Borger et al., 1994; de Borger and Kerstens, 1996; Worthington and Dollery, 2000 Sampaio de Sousa et al., 2005; Ibrahim and Salle, 2006; Afonso and Fernandes, 2008; Balaguer-Coll et al., 2010; Kalb et al., 2011; Bosch et al., 2012; Nakazawa, 2013; Storto, 2013; Benito et al., 2014; Kalb, 2014; Sorensen, 2014.

[2] Some of the studies use this framework to estimate cost efficiency of the local bodies using the Stochastic Frontier Analysis (Nakazawa, 2013; Kalb, 2014).

population size. The other strand of literature highlights the ineffectiveness in the operations of local bodies due to corrupt practices (Kahkonen and Lanyi, 2001; Rinaldi et al., 2007; Asthana, 2012).

However, there exist certain gaps in the literature. All the studies that have attempted efficiency analysis have assessed the performance of local governments through their efficiencies in service provisions. This has been explained as the 'first strand' of efficiency of governments in our paper. The other two strands have not been cultivated to estimate the performances of local bodies empirically. Secondly, there is hardly any discussion on managerial and operational inefficiencies of local governments. While the exogenous factors presented in the literature explain the cause of efficiency or inefficiency, these factors do not help identify the exact source of leakages in the operations of local governments or gaps in management by local bodies, which could lead to their inefficient performance.

As far as Indian local bodies are concerned, we have a few studies which assess their performances by looking at their fiscal health.[3] Most of these studies only compare the revenue capacity with the expenditure needs of the local bodies. Despite the autonomy provided with respect to functions and finances under the 73rd and 74th Amendment Act in the early 1990s, most of the local government in India continue to suffer from poor fiscal health and operational and administrative constraints. Most of the local governments face budgetary rigidities due to high dependences on grants or transfers or ineffective devolution of certain functions. These rigidities in budgetary structures of local governments may lead to inefficiencies in service delivery (Balaguer-Coll and Prior, 2009).

[3] Sridhar et al., 2007; Bandyopadhyay and Rao, 2009; Bandyopadhyay et al., 2011; Bandyopadhyay, 2015; Bandyopadhyay and Sharma, 2020; Bandyopadhyay et al., 2022.

Another gap found in the literature is that the studies tend to bypass the problems of smaller cities, which makes assessing their performances extremely crucial. Even the urban growth policy in general is skewed towards big city regions and fails to address the economic needs of smaller cities (Beel et al., 2020). A bigger city would generally have better resources, larger population, and better opportunities than a smaller city. More often than not, small- and medium-sized cities, which are huge in number, support a larger chunk of the population and yet remain neglected. This is also true for India. In India, although the proportion of small- and medium-sized city is higher than that of Municipal Corporations in total number of local bodies in India, it is the latter which are more densely populated (Table 1).

Table 1. Proportions of Different Types of Urban Local Governments and Their Population Distribution in India

Local Governments	Number	Proportion in total number of Urban Local Governments (in %)	Population (in million)	Area (sq. km)	Population Density (number per sq km)
Municipal Corporations	209	5	172.21	22919.13	7514
Municipality	2171	51	112.02	35126.41	3189
Town Panchayats	1879	44	32.53	19356.10	1680

Source: Ahluwalia et al., 2019; authors' calculation

If these small- and medium-sized cities grow in terms of their infrastructure provision and finances, they can attract populations from bigger cities (which are already saturated). Also, an increase in property tax rates of big cities in core areas may result in urban sprawl, as inhabitants from the core areas move to the surrounding smaller cities (Ermini and Santolini, 2017). This would ensure a more balanced growth of cities of different sizes, which would support sustainability. It makes it all the more imperative to study if these small cities are performing well enough to absorb the population of big cities in the wake of higher taxes. Small cities also warrant a separate study because, these cities might have simpler operations and are more transparent. This leads to a better community satisfaction and in turn efficiency in operations of

small cities (Ananda and Fernandes, 2006). There has been no study which has identified the problems facing these smaller cities and thereby provide recommendations for their growth.

The present study is conducted in 910 Urban Local Bodies (ULBs) in southern part of India, of which 213 are in the state of Karnataka and 718 are in the state of Tamil Nadu. The distribution of urban local governments into Municipality and Town Panchayat across the two states is provided in Table 2. For the present study we do not include Municipal Corporations into the analysis because these are big in size, have different finance sources and functions, and are amongst the best performing local bodies in India. We focus on the other local bodies which are smaller in size, larger in number, and face serious administrative and operational challenges.

Table 2: Distribution of Urban Local Governments across Karnataka and Tamil Nadu

State/ULG Type	Municipality	Town Panchayat
Karnataka	133	69
Tamil Nadu	149	559
Total	282	628

In the present paper, we use Data Envelopment Analysis (DEA) for the three strands developed in the conceptual framework. On the basis of the conceptual model discussed above, we consider the following three inter-related models:

- Model 1: Expenditure as input and service delivery as output
- Model 2: Service delivery as input and revenue as output
- Model 3: Revenue as input and expenditure as output

Table 3: Variables Used for Efficiency Estimation

Expenditure[4]	Service Delivery	Revenue[5]
1. Operation and maintenance cost 2. Labour cost 3. Establishment expenditure	1. Total annual water supplied in a ULB (in liters) 2. Total road length in a ULB (in km) 3. Total number of streetlights in a ULB 4. Solid waste transported after collection (tonnes per day) for Karnataka 5. Storm water drains (in km) for Tamil Nadu 6. Length of roads cleaned daily in a ULB (in km)	1. Tax revenue 2. Non-tax revenue

Slack-based model of efficiency

We use Data Envelopment Analysis (DEA) to assess the performance of ULBs. The standard estimates of radial efficiencies fail to capture the full extent of potential that could be exhausted by a DMU, when they are already on the efficiency frontier. Therefore, we use off-radial estimates of Data Envelopment Analysis to not only understand the extent of inefficiency in the operations of ULBs, but also the further possibility of expansion of outputs or contraction of inputs once the ULB has reached the efficiency frontier.

For the DEA formulation, let x be the vector of inputs and y the vector of outputs. $y=f(x)$ where y is the maximum amount of output producible from a given level of input x. Let $x^j = (x_{1j}, x_{2j},\ldots, x_{nj})$ be the input vector and $y^j = (y_{1j}, y_{2j},\ldots, y_{nj})$ be the observed output vector of firm j ($j=1,2,3,\ldots N$).

The slack-based, input-oriented measure of technical efficiency of a firm t, producing output y^t from the input bundle x^t, under Variables Returns to Scale (VRS) is derived from the solution to the following problem:

[4] We have considered only revenue expenditure because the decentralized regions spend a large share of their budget on revenue expenditure, and very small share is spent on capital expenditure (Alegre, 2010).

[5] We consider only own revenue sources for our study. The local expenditure is more stable when it is financed through property tax and more volatile when financed through grants because the local decision makers are accountable for their own revenues (Sacchi and Salotti, 2017).

$$\min \theta^{\sim} = \theta - \epsilon(\sum_{k=1}^{m} s_k^+ + \sum_{i=1}^{n} s_i^-)$$

$$s.t. \sum_{j=1}^{N} \boldsymbol{\lambda_j x^j + s_i^- = \theta x^t};$$

$$\sum_{j=1}^{N} \boldsymbol{\lambda_j y^j - s_k^+ = y^t};$$

$$\sum_{j=1}^{N} \boldsymbol{\lambda_j = 1};$$

$$\boldsymbol{\lambda_j \geq 0\ (j = 1, 2, \ldots., N)}$$

Here ϵ is an infinitely small, positive number.

Let ($\theta^*, \lambda_1^*, \lambda_2^*, \ldots., \lambda_N^*$) be the optimal solution. Define $x^t = \theta^* x^t$. Then the input-oriented technical efficiency of the firm *t* is given by $TE_I^t\ (x^t, y^t) = \theta^*$.

The slack-based, output-oriented measure of technical efficiency of firm *t* producing output y^t from the input bundle x^t is obtained from the solution to the following:

$$\max \emptyset^{\sim} = \Phi + \epsilon(\sum_{k=1}^{m} s_k^+ + \sum_{i=1}^{n} s_i^-)$$

$$s.t. \sum_{j=1}^{N} \mu_j \mathbf{x^j} + + \mathbf{s_i^-} = x^t;$$

$$\sum_{j=1}^{N} \mu_j \mathbf{y^j - s_k^+ = \emptyset y^t};$$

$$\sum_{j=1}^{N} \mu_j = \mathbf{1};$$

$$\mu_j \geq \mathbf{0\ (j = 1, 2, \ldots., N)}$$

Here Є is an infinitely small positive number.

Define $\Phi^* y^t = y^t$. Then the output-oriented technical efficiency of firm *t* is given by

$$TE_O^t = 1/\Phi *$$

s_k^+ and s_i^- indicate the output and input slacks, respectively, at the optimal solution. If output slack is positive, it is possible to expand a particular output by the amount of slack, even if the DMU is on the efficiency frontier. Similarly, if the input slack is positive, it means that there exists a further possibility of reducing the individual inputs, even if the DMU is on the input efficiency frontier.

4. Stylized Facts

An amalgamation of DEA methods into each of the strands helps us interpret the performance of governments through different lenses, which are developed as stylized facts. We look at the estimates of slack-based technical inefficiency to highlight gaps in operations and management of governments. We compare both input and output efficiency estimates. We take a step further and also look at the proportion of urban local governments which are experiencing outputs and inputs slacks. Following are the plausible explanations for each of the models developed:

Model 1: Expenditure as input and service delivery as output

The radial estimation of input inefficiency would mean that the local body could have provided the same levels of services by incurring lesser expenditures. We interpret this as a **misappropriation or leakage of expenditures**. At the same time, an output inefficiency would mean there is a possibility of delivering higher levels of services with the same levels of expenditures. We interpret this as **service inadequacy**.

If the output-oriented inefficiency is greater than the input-oriented inefficiency, we can say that the extent of service inadequacy is greater than the extent of misappropriation of expenditures or leakage of expenditures.

The off-radial estimation of positive input slacks would mean that there is a scope of further reducing misappropriation or leakages of expenditures with the same levels of service delivery once an urban local government has reached the efficiency frontier. Similarly, positive-output slack would mean there is a possibility to further provide higher levels of services with the same levels of expenditure after an urban local government has attained 100-percent efficiency.

Model 2: Service delivery as input and revenue as output

In this strand, input inefficiency would mean that the local body could have generated the same levels of revenues with lesser vectors of services. This could mean that some of the services are uncharged, which can be a cause of **an inadequacy of revenue handles** or **inappropriate or unrevised tax rates and user charges**. On the other hand, by output inefficiency we mean that given the same levels of services, the local body could have generated higher levels of revenues. If the service delivery is not translating into revenue generation, this shows a possibility of **poor revenue collection**. It could also be possible that the quality of service delivery is so poor that residents are not willing to utilize them and hence pay for those services, that there could be administrative delays in collecting revenues, or that revenue handles do not exist or have not been devolved to the local bodies by the upper tiers of government.

If we find that inefficiency in an output-oriented approach is higher than that in the input-oriented approach, we could say the extent of poor revenue collection is greater than the extent of existence of missing revenue handles/uncharged services.

The off-radial estimation of positive input slacks would mean that there is a scope of further reducing the uncharged services at the same levels of revenue generation once an urban local government has reached the efficiency frontier. Similarly, a positive output slack would mean there is a possibility to further improve revenue collections with the same levels of revenue collections once the urban local government is on the output efficiency frontier.

Model 3: Revenue as input and expenditure as output

By input inefficiency we mean that the local bodies could have generated the same levels of expenditures with even lesser revenues. We interpret this as **ineffective revenue channelization**. At the same time, the output inefficiency would mean that the local bodies could have incurred more expenditures with similar levels of revenues. This signals **underutilized revenues** by the local bodies.

If the inefficiency in output-oriented is greater than the inefficiency in input-oriented, we can say that the extent of ineffective spending is greater than the extent of ineffective revenue utilization.

A positive input slack would mean that there is a scope of further reducing ineffective revenue channelization at the same levels of expenditures once a ULB has reached the input efficiency frontier. A positive output slack would mean there is a possibility to further incur effective spending, given the same levels of revenues, after an urban local government has attained 100-percent efficiency.

5. Results and Analysis: Comparison of Output-oriented Inefficiency and Input-oriented Inefficiency

We compare the output inefficiency and input inefficiency in the operations of local bodies in Karnataka and Tamil Nadu (Table 4). We highlight, in particular, the results where the difference

between input inefficiency and output inefficiency is statistically significant according to KS-tests and t-tests.[6]

Table 4: KS-test and t-test for Comparing Distribution of Output Efficiency and Input Efficiency Scores in Urban Local Governments of Karnataka and Tamil Nadu

Local body	Strands	Output Efficiency Score	Input Efficiency Score	KS-Test	t-Test (Equal Variance)	Comparison of Inefficiencies[7]	Interpretation
				Significant (5%)	Significant (5%)		
Karnataka Municipalities	Service Delivery is Input and Revenue is Output	0.21	0.40	Yes	Yes	Output inefficiency> Input Inefficiency	Extent of Poor revenue collection> Extent of existence of uncharged services
Tamil Nadu Municipalities	Expenditure is input and Service Delivery is output	0.68	0.61	Yes	Yes	Input inefficiency > Output Inefficiency	Extent of Misappropriation/leakages of expenditures > Extent of Service Inadequacy
	Service Delivery is Input and Revenue is Output	0.53	0.70	Yes	Yes	Output inefficiency> Input Inefficiency	Extent of Poor revenue collection> Extent of existence of uncharged services
	Revenue is input and Expenditure is output	0.54	0.41	Yes	Yes	Input inefficiency > Output Inefficiency	Extent of Ineffective revenue channelization >Extent of revenue underutilization
Tamil Nadu Town Panchayat	Expenditure is input and Service Delivery is output	0.50	0.55	Yes	Yes	Output inefficiency> Input Inefficiency	Extent of Misappropriation/leakages of expenditures <Extent of Service Inadequacy
	Service Delivery is Input and Revenue is Output	0.33	0.57	Yes	Yes	Output inefficiency> Input Inefficiency	Extent of Poor revenue collection> Extent of existence of uncharged services
	Revenue is input and Expenditure is output	0.66	0.5	Yes	Yes	Input inefficiency > Output Inefficiency	Extent of Ineffective revenue channelisation> Extent of underutilization of revenues

Source: Authors' computation

We analyze results in two ways. First, we look at the similarities which exist across size classes. We then highlight the differences across size class. We find that regardless of size of the cities, the extent of poor revenue collection is higher than the extent of existence of uncharged services.

[6] For descriptive statistics of output efficiency and input efficiency scores, refer to Table A1, Appendix. All the results where the differences between input inefficiency and output inefficiency scores are statistically significant as well as insignificant, according to a KS-test and t-test, are reported in Table A2, Appendix.

[7] Inefficiency is measured as (1- Input (or Output) Efficiency Score)

This means that even when a service is chargeable, revenues are not generated/collected. This could be because of poor administrative capacity of the local bodies to enforce the taxes and user charges and/or to collect the taxes and user charges from the local residents.

A major source of own revenue for local bodies is property tax. There is an exportation of property tax from residential to non-residential properties, which leads to poor revenue generation (Rao, 2013). In addition, the local bodies have poor information on property tax base, wide exemptions and existence of vacant properties (ibid., 2013). The 4th State Finance Commission for Karnataka has identified underassessment/non-assessment of property tax, short collection, and public non-compliance as the reasons for reduced own resources in ULBs in Karnataka (GOI, 2018). Rajah (2022) highlights the problem of poor allocation of resources to urban local bodies by the state government of Tamil Nadu. Bird et al. (2008) argue for governments of developing economies to be more responsive in order to increase their tax effort.

We find that in both municipalities and town panchayats the collection efficiency is abysmally low (Table 5). The smallest sized cities in both the states perform worse than middle sized cities.

Table 5: Collection Efficiency of Urban Local Governments in Karnataka and Tamil Nadu

Collection Efficiency	Municipality (Middle-sized City)	Town Panchayat (Small City)
Karnataka	65	57
Tamil Nadu	42.4	14.7

We also find that the extent of ineffective channelization of revenues is greater than the extent of ineffective spending from revenues across all city sizes. This highlights the problem of underutilization of revenues in all local bodies. It could be due to lack of will and planning in spending those resources.

The analysis shows that in the smaller cities, the extent of service inadequacy is greater than that of leakage of expenditures. The results are strikingly opposite for middle-sized cities, where misappropriation/leakage of expenditures is higher than the extent of service inadequacy. This is to be expected that small-sized cities have inadequate administrative capacity to operate as effectively as a middle-sized city. This could cause a greater inadequacy of service delivery in smaller cities as compared to the middle-sized cities.

Slack-based analysis

We look at the proportion of local governments having slacks in output- and input-oriented models. We want to know what proportion of local governments, which are already on the frontier, have a further scope of contracting inputs or expanding outputs. We identify patterns in our results within each strand and highlight key results. (Table 6–9).

Table 6: Proportion of Urban Local Governments Having Output-based Slacks in Karnataka

Models	Municipality (%)	Town Panchayat (%)
Expenditure as Input and Service Delivery as Output		
Water Supplied	32	35
Road Length	5	30
Number of Streetlights	29	12
Solid Waste Transported	30	26
Length of Roads cleaned	59	42
Service Delivery as Input and Revenue as Output		
Tax Revenue	1	6
Non-tax Revenue	20	16
Revenue as Input and Expenditure as Output		
Operations and Maintenance Expenditure	4	1
Labour Cost	7	43
Establishment Expenditure	72	10

Source: Authors' computation

Table 7: Proportion of Urban Local Governments Having Output-based Slacks in Tamil Nadu

Models	Municipality (%)	Town Panchayat (%)
Expenditure as Input and Service Delivery as Output		
Water Supplied	5	42
Road Length	23	47
Number of Streetlights	21	69
Storm water drainage	40	17
Waste collection	32	13
Service Delivery as Input and Revenue as Output		
Tax Revenue	11	50
Non-tax Revenue	7	32
Revenue as Input and Expenditure as Output		
Operations and Maintenance Expenditure	12	8
Labour Cost	85	5
Establishment Expenditure	16	22

Source: Authors' computation

Table 8: Proportion of Urban Local Governments Having Input-based Slacks in Karnataka

Models	Municipality (%)	Town Panchayat (%)
Expenditure as Input and Service Delivery as Output		
Operations and Maintenance Expenditure	4	0
Labour Cost	6	23
Establishment Expenditure	33	35
Service Delivery as Input and Revenue as Output		
Water Supplied	6	17
Road Length	36	29
Number of Streetlights	45	26
Solid Waste Transported	18	22
Length of Roads cleaned	18	12
Revenue as Input and Expenditure as Output		
Tax Revenue	0	0
Non-tax Revenue	5	10

Source: Authors' computation

Table 9: Proportion of Urban Local Governments Having Input-based Slacks in Tamil Nadu

Models	Municipality (%)	Town Panchayat(%)
Expenditure as Input and Service Delivery as Output		
Operations and Maintenance Expenditure	5	45
Labour Cost	56	17
Establishment Expenditure	23	29
Service Delivery as Input and Revenue as Output		
Water Supplied	44	86
Road Length	21	71
Number of Streetlights	11	21
Storm water drainage	50	76
Waste collection	30	27
Revenue as Input and Expenditure as Output		
Tax Revenue	14	10
Non-tax Revenue	14	6

Source: Authors' computation

When we consider the first strand of expenditures as inputs and service delivery as outputs, we find that the smaller cities, that is town panchayats, are more stressed than the middle-sized cities—the municipalities; the proportion of ULBs having maximum slacks in different variables is highest in case of town panchayats compared to municipalities. This implies that the proportion of ULBs which have a scope of further reducing wastage of expenditures/leakages in expenditures (given the same levels of service delivery) as well as proportion of ULBs having a scope of further improving service delivery (with the same levels of expenditures) is higher in smaller cities. Smaller cities suffer from inefficient administration, which might cause a wastage of expenditures or inadequate service delivery. We find that in case of output-oriented estimates, the proportion of ULBs registering slack is maximum in water supply and road lengths. Adil (2019) points out the water supply crisis in southern parts of India due to depleting underground water levels. Moreover, the local governments have suggested implementing water management policies (ibid.). The flooding of water due to rainfall has also led to poor quality of roads. These problems are more pronounced in smaller cities due to poor revenue collections. Similarly, in

case of input-oriented measures, we find that the proportion of town panchayats having input slack is maximum in the case of establishment expenditures. The smaller cities lack adequate monitoring of establishment expenditures and hence face leakages.

When we compare the service delivery with the norms prescribed by the High Powered Expert Committee (GOI, 2011) (Table 10),[8] we find that in Karnataka the municipalities are just meeting the bare minimum norm and the town panchayats fall short of the norms for road length. Karnataka local governments are far behind the norms for water supply. Similarly, water supplies for local governments in Tamil Nadu are much below the prescribed norm levels.

Table 10: Comparison of Service Levels and Minimum Norms Prescribed in Local Bodies in South India

Local Body	Service	Actual Service Levels (Median)	Service Levels Norms
Karnataka Municipalities	Water Supply (litres per capita per day)	83 lpcd	135 lpcd
	Road Length (per sq km)	7	7 For class III cities[9]
Karnataka Town Panchayats	Water Supply (litres per capita per day)	96 lpcd	135 lpcd
	Road Length (per sq km)	5	7 For class IV+ cities[10]
Tamil Nadu Municipalities	Water Supply (litres per capita per day)	72 lpcd	135 lpcd
Tamil Nadu Town Panchayats	Water Supply (litres per capita per day)	65 lpcd	135 lpcd

Source: Authors' computation

In the model where revenue is the input and expenditure the output, we find that in the case of output-oriented estimates, the middle-sized cities are more stressed than the smaller cities. The proportion of municipalities having maximum slacks is highest in the case of operations and maintenance.

[8] We have estimated the norms where data were available.

[9] The service level norms are given in terms of size classes of cities (Class I-IV+). Class III cities refer to the city with population range of 20,000–50,000. The median population of Karnataka Municipalities is 39,243.

[10] Class IV+ cities refer to the cities with population less than 20,000. The median population of Karnataka Town Panchayat stands at 19,208.

We identify some contrasting results as well across the two states. In Model 1, we observe that the number of services for which the proportion of smaller cities and middle-sized cities have maximum slacks is the same in Karnataka. In Tamil Nadu, however, we observe that smaller cities are more stressed than the middle-sized cities. In Model 2, in the case output-oriented slacks, we find that smaller-sized cities are more stressed than middle-sized cities in Tamil Nadu, whereas middle-sized cities are more stressed than smaller ones in Karnataka. In the case of input slacks, we find a similar pattern. When we consider Model 3, in the case of input slacks we find that smaller cities are more stressed than the middle-sized cities in Karnataka, whereas in Tamil Nadu middle-sized cities are more stressed than smaller cities.

6. Conclusions

Medium and small cities in India have been growing rapidly, but most of these cities are not equipped to provide basic services and a good quality of living to their populace. The 73rd and 74th Amendment Acts in the Constitution of India aimed to make local bodies autonomous in order to ensure effective provision of services. However, despite three decades of proposed reforms, most of the cities do not have autonomy with respect to the functions and finances. Cities in general are characterized by poor revenue collections and utilization, misappropriations and leakages in expenditures, and service inadequacy. These pose a serious threat to the fiscal sustainability of the cities.

The problem of poor revenue collection in southern states requires effectively devolution of revenue handles to local governments. Some of the revenue streams that can be devolved to urban local governments in Tamil Nadu and Karnataka are taxes on vacant land, electricity cess, fire tax, drainage tax, tolls on roads and bridges, tax on vehicles, development charges, sanitary cess, and tax on parking spaces in any non-residential building. Despite generating revenues,

local governments are not utilizing these existing revenue handles adequately. The nature of revenue sources is important to consider for utilization of revenues. The problem of ensuring expenditures on services from revenues generated can be resolved if the local governments bring in more non-tax revenue handles under the purview.

Non-tax revenues can bring in more accountability in expenditures. Also, periodic auditing of accounts should be done to ensure timely and effective utilization of revenues. The supply bottlenecks in smaller cities particularly with respect to water supply and roads need to be addressed. The deterioration of roads, due to heavy rainfall in the area, can be checked by maintenance of roads at regular intervals. As far as the water supply is concerned, groundwater depletion can be arrested by stopping the wastage of water. Revising water tariffs in states concomitant with the demand for water can help reduce wastage. Revision of water tariffs should be accompanied by effective collection of tariffs by urban local governments.

Administrative reforms like performance evaluation of local governments through systematic monitoring and effective audits are required to check misappropriations and leakages in expenditures in both medium- and small-sized cities. Smaller cities are crippled with leakages in establishment expenditures, which also warrants timely audits of budgets. In medium-sized cities, local governments must ensure there are adequate expenditures on operations and maintenance for the upkeep of services.

Service inadequacy is a perpetual problem in Indian cities, which can be cured by taking appropriate measures to eliminate misappropriation of expenditures and ensuring better utilization of the revenue base along with handles. Often service inadequacy is a result of misappropriation of expenditures, which in turn is a result of lack of administrative machinery to ensure checks and balances in the system. Often, even lower levels of expenditures, utilized

properly, can bring in higher service levels. As is the case with revenues: if utilized better, even lower revenues can result in expenditures higher than existing levels. So, the starting point is proper invigilation of the existing revenue challenization and expenditure utilization. The next step would be to ensure the effective devolution of functions and finances so that the missing revenue handles can be rediscovered, implemented, and utilized.

Appendix

Table A1: Input and Output Efficiency Scores of Urban Local Governments in Karnataka and Tamil Nadu

ULB Type	**Municipality (Median, SD)**				**Town Panchayat (Median, SD)**				**Average**			
State	Karnataka N=133		Tamil Nadu n=149		Karnataka n=69		Tamil Nadu n=559		Karnataka		Tamil Nadu	
Strands	Efficiency		Efficiency		Efficiency		Efficiency		Efficiency		Efficiency	
	Output	Input	Output	Input	Output	Input	Output	Input	Output	Input	Output	Input
Service Delivery as input and Revenue as Output	0.21, 0.35	**0.40, 0.29**	0.53, 0.27	**0.70, 0.21**	0.60, 0.3	**0.71, 0.24**	0.33, 0.33	**0.57, 0.23**	**0.60**	**0.70**	**0.62**	**0.76**
Revenue as Input and Expenditure as Output	0.18, 0.24	**0.20, 0.26**	**0.54, 0.21**	0.41, 0.26	**0.51, 0.28**	0.45, 0.41	**0.66, 0.20**	0.5	**0.56**	**0.55**	**0.73**	**0.64**
Expenditure as Input and Service Delivery as Output	**0.45, 0.27**	0.42, 0.298	**0.68, 0.21**	0.61, 0.23	0.79, 0.25	**0.81, 0.27**	0.50, 0.24	**0.55, 0.24**	**0.75**	**0.74**	**0.73**	**0.72**

Source: Authors' computation

Table A2: KS- Test and t-test for Comparing Distribution of Output Efficiency and Input Efficiency Scores in Urban Local Governments in Karnataka and Tamil Nadu

Local Body	Strands	Output Efficiency Score	Input Efficiency Score	KS-Test	t-Test (Equal Variance)
				Significant (5%)	Significant (5%)
Karnataka Municipality	Expenditure is Input and Service Delivery is Output	0.45	0.42	No	No
	Service Delivery is input and Revenue is output	0.21	0.4	Yes	Yes
	Revenue is input and Expenditure is output	0.18	0.21	No	No
Karnataka Town Panchayat	Expenditure is Input and Service Delivery is Output	0.79	0.81	No	No
	Service Delivery is input and Revenue is output	0.61	0.71	Yes	No
	Revenue is input and Expenditure is output	0.51	0.45	No	No
Tamil Nadu Municipality	Expenditure is Input and Service Delivery is Output	0.68	0.61	Yes	Yes
	Service Delivery is input and Revenue is output	0.53	0.7	Yes	Yes
	Revenue is input and Expenditure is output	0.54	0.41	Yes	Yes
Tamil Nadu Town Panchayat	Expenditure is Input and Service Delivery is Output	0.5	0.55	Yes	Yes
	Service Delivery is input and Revenue is output	0.33	0.57	Yes	Yes
	Revenue is input and Expenditure is output	0.66	0.5	Yes	Yes

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