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DEVOLVUTION OF FUNDS FROM STATE GOVERNMENT TO LOCAL BODIES:
A Quantitative approach

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DEVOLUTION OF FUNDS FROM STATE GOVERNMENT TO LOCAL BODIES: AQUANTITATIVE APPROACH

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Abstract

Several approaches exist for formulating an approach towards devolution of funds to Local Bodies. While some of these have a partial theoretical base, most others are purely ad-hoc. This paper proposes a formula based devolution mechanism for devolution of funds to Local Bodies. The overriding objective of the mechanism is to propose a system that possesses the following qualities: (a) Political Feasibility (b) Equality (c) Adequacy (d) Computational Transparency and (e) Efficiency. The mechanism that we have proposed is data intensive and has been tested for 245 urban local bodies in the state of Maharashtra. However, the applicability of the mechanism can extend to other state as well, provide adequate data are available.

Key Words : Decentralization, Fiscal Devolution, Local Governments, Formula-based Devolution

***JEL Code(s)* :** H70, H77

DEVOLVUTION OF FUNDS FROM STATE GOVERNMENT TO LOCAL BODIES: A Quantitative approach

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Introduction

There are several approaches or methods in existence for formulating an approach towards devolution of funds to Local Bodies. Some of these have, at least, a partially theoretical basis, while some others are purely ad-hoc (informed by political and such other exigencies). There are some premises or propositions that we presume in working out our conceptual framework.

To begin with, realistic and pragmatic attitude demands that we should assess and delimit the relevant objectives that are to be addressed. *Not every 'good' objective needs to be incorporated in the objective function of every governing body (such as a LB).*

This point bears some elaboration. Burdening any given institution with several objectives leads to several problems. The multiple objective criterion decision-problem is often saddled with internal conflicts. This is generic to the class of such decision problems as a whole. There is always the issue of prioritization of the multiple objectives and the related problem of assignment of relative weighting pattern. There is a more important issue involved. The situation outlined above lead to almost an impossible situation with respect to accountability and evaluation of the concerned institutional performance. The game of passing the buck and general obfuscation is easily played. Also, given the total quantum of funds available for disbursal, it would be quite wrong to expect too much. At least as of now, one can expect that provision of local services with predominantly public goods character needs to be met through disciplined operations of LBs. For other things such as 'social justice' which involves redistributive effort on a large scale perhaps a higher level initiative is the answer. Burdening a LB with too many responsibilities makes evaluation of its functioning difficult.

Devolution schemes involve assignment of revenues from a higher level government to a lower level of government on the basis of some formulae. Though the origin of such revenues may be reflected in such formulae, we believe that it is not necessary and that the formulae should *inter alia* be based on some exogenous factors such as population, and some other measures of need.

2. Our Approach

Our approach, specifically and importantly, will comprise of five cardinal principles or '*Panchtatva',* abbreviated as **PEACE**. PEACE stands for (a) **P**olitical Feasibility (b) **E**quity (c) **A**dequacy (d) **C**omputational Transparency and (e) **E**fficiency.

Let us now elaborate briefly on each of these, leaving the details of specific variables to be incorporated and the weighting patterns (with justification) to be employed for discussion at a later stage.

2.2 Political Feasibility

Administrative and technical agents (like bureaucrats or economists) often come up with brilliant plans or schemes. However, the best laid plans risk coming to naught unless they are laced with a healthy dose of realism. This, in the main, means that the implications of implementing or operationalising the plans have to be politically palatable (and perceived to be so!). Pragmatism therefore demands that due weight be given to political considerations. In concrete terms this implies the following:

(a) The devolution structure recommended should not vary in distance from the existing devolution pattern by too much since such radicalism will be quite unacceptable to political agents. This translates into symbols as:

$$\delta (dp^r , dp^e) \leq \varepsilon \qquad (2.1)$$

where,

δ is the metric,

dp^r is the recommended pattern of devolution,

dp^e is the existing pattern of devolution and

ε is the politically acceptable level of tolerance.

(b) The corollary is that, *as a norm*, none of the LBs must get fewer funds (in absolute terms) in comparison to the existing scenario, as a result of our recommendations. The newer (innovative and/or stricter) criteria should in effect apply to the sharing of the feast in an incremental sense.

(c) Transition in regimes should be informed by gradualism rather than radicalism. Nature and politics obviously move continuously rather than in catastrophes. This means that if, α is the weight or proportion dedicated to newer criterion then: $\alpha = o \mid 0.5 \mid$, i.e., α should be of order 0.5.

2.2 Equity

Equity is a crucially important *need based* component. An authority that assumes a paternal role, vis-à-vis its citizens, can ill afford to neglect this aspect. Distributional considerations are paramount. Non-homothetic growth may be a natural phenomenon in some cases, but has weighty objections lined against it in the context of political economy. To repeat, if the power has to go to the people and their aspirations are to find articulation through the functioning of LBs, they have to be empowered and fortified with adequate funds (resources) to carry out at least the minimal normal functions. This reflects what is 'needed' by the relevant LB. There is normally a tendency to overestimate ones own needs (both because one really believes it and also as bargaining strategy). In deciding the actual devolution there has to be some sense of the *absorptive*

capacity of the LB. Sudden increase in funds will lead to inefficiencies in terms of consumption as well as production use.

There are several parameters that select themselves automatically. These can be categorised into two types: one, the global indicators and two the local indicators at the level of LBs. Global here is being used in the sense of district level. These are assumed to be shared (to some extent at least) by the LBs in that district. At any rate very little information (consistent and reliable) is available at a level of disaggregation lower than the district. While the rural sector does not figure in our study, it needs to be noted that urban and rural sectors display strikingly different qualities in terms of quality and quantum of data available. This perforce leads to different treatment of the two sectors in terms of intensity and detail.

The need for equity is not just based on moral-ethico-political precepts. Post Keynes and given the inter-dependant nature of a maturing economy, *it is dictated by sturdy economic sense. Unless a basic level of development and dynamism is achieved in the rural sector, the urban sector will find it successively more difficult to grow and develop (suffocated as it will be by effective demand).* The huge market potential for both consumption and producer goods (which is so very essential for a vibrant economy) will remain a distant chimera.

2.2 Adequacy

Scarcity is omnipresent; indeed it is the *raison d'être* for economics and economists. The resource gap between what is available and what is 'needed' will be with us in the foreseeable future. One way out of the difficulty is to increase the Central pool of funds to be disbursed to a substantial extent. Given the context of the withdrawal of the state from many traditional spheres, one cannot realistically expect too much by this route. The LBs must learn to stand for, and help, themselves. This solution has its own limits and is beset with problems; however, there is no readily available alternative. Efforts for closing this gap by LBs must be lauded and rewarded by clubbing it with the efficiency criteria.

There are many issues – data problems apart – that are involved here. For instance there is the question of the extent to which *sub-national governments may be allowed to set their own taxes*. It is feared that excessive latitude in this regard can create unacceptable level of complexity and administrative burden, as well as spatial inequities and distortions in allocation of resources. Within limits, these problems need to be tolerated in the interest of gaining the benefits of decentralized government.

There is the other issue of changing regulatory practices in order to allow a *greater access to the credit markets* for the LBs. This is especially important in the context of the large capital requirements for infrastructure development. Which of these is the better option is a moot question answerable only in terms of actual empirical evidence. *Indeed, rather than a clear option, this involves a selection of a proper mix of these and similar such possibilities*. The need to try out innovative experiments however is beyond doubt. One of the important lessons that can be learnt from evidence elsewhere is that it is better if commercial principles are followed and the LBs have to compete for capital with other borrowing agencies in the interest of efficient utilization of resources.

2.2 Computational Transparency

Checking and replicating the devolution pattern as given by our formulation should be transparent and simple. Ad-hocism in setting the devolution pattern has the great defect that it makes even discussion and criticism difficult. Also there is a loss of credibility and all kinds of suspicions about motivation begins to surface, which is counter productive. The word "simple" used above in the context of devolution pattern, is being used as an antonym of complex. Of course, given the multitude of factors that need to be considered the whole algorithm is bound to become somewhat complicated. However, a detailed roadmap of the algorithm can be set out which can be followed by users of the algorithm without continuous guidance by the creators of the algorithm. Computational transparency also lends itself to constructive discussion, in that, it is possible to undertake the exercise of scenario building and simulation, and present it to the ultimate policy maker. Also, the logical structure can be traversed backwards and forwards thus making it useful.

2.2 Efficiency

This is really a corner stone of our conceptual framework. In the present context of the Indian economy, whence we are in the process of making changes in the way we conduct our macro-management affairs, there can be no doubt about the importance of having *incentive compatible systems* in place. As economists, we would push very hard for this component to be the most important (weight wise) in the scheme of things. However, political feasibility as well as adequacy requirements restrain us from going too far. Incentive compatible system implies that every effort reflected in performance gets a reward and every slide on efficiency front is penalised. Also, there is a static and a dynamic component to this criterion. For example, if a LB is well off in its current performance terms, this will entitle it for a reward. Further, if its performance involves a switch in regime (i.e., from being relatively better a LB becomes absolutely better off; illustratively, this will happen when its small deficit changes into surplus), once again a bonus may be given to the LB. Alternatively, a unit may be badly off but if it shows improvement (a return of the prodigal to the fold!) it would be entitled to a bonus.

Given that the total funds that are being disbursed under this criterion are not very large, the signaling aspect of this criterion needs to be underlined. There is a further point to be made here. Logically, efficiency as a criterion can conflict with some of the other components in our conceptual frame. This is a standard problem of a multi-objective decision function that we referred to earlier. Thus, it is conceptually necessary to set up the decision function in an add-on fashion rather than in a single simple formula. Of course, ultimately the whole exercise can be consolidated and hence a single formulation is implied, even by this approach.

3. Data And Computational Methodology

Let us now turn a mathematical (symbolic) presentation of our scheme. Anyone dealing with empirical economics and modeling knows that no mathematical model can be left to work by itself. The modeler has to be alert and around to do the

little bit in terms of ad-mul (*ad*ditive and *mul*tiplicative) factors so as to improve the batting average!

3.1 Mathematical Formulation

Let the Total Corpus (T) to be devolved be divided as:

$$T = T_R + T_U \text{ (i.e., a convex combination)} \quad (3.1)$$

where, the subscripts R and U refer to Rural and Urban respectively.

Further,

$$T = \alpha T + (1- \alpha)T \quad (3.2)$$

where,

$\alpha T = T_R$

$(1- \alpha)T = T_U$

The values of parameters, such as α, used above and to appear later in this sub-section need to be given specific values. For instance, in the context of this report, where the focus is entirely on the urban sector, $\alpha = 0$.

3.1.1 Formulation for Rural Sector

As stated above, from the point of the exercises reported herein, the rural sector is irrelevant, we nonetheless present the conceptual formulation for this sector for the sake of completeness.

Thus, considering the Rural sector, we write,

$$T_R = \beta T_R + (1-\beta)T_R \quad (3.3)$$

This is a convex combination to determine need based and other allocation and

$\beta T_R = R_{GI}$

$(1-\beta)T_R = R_{EB}$

R_{GI} is to be disbursed on the basis of *Global Indicators* at the district level.

R_{EB} is the amount to be disbursed under the *Efficiency Based Indicators* to Gram Panchayats (GPs), based on their performance with respect to public goods delivery, revenue collections, etc. It may be a combination of performance reward and reverse discrimination to be routed through the Zilla Parishads in set proportion. Given the extremely large number of GPs in the State (about 27,000 in Maharashtra) it is impossible for the State Finance Commission to have information on all of them. Hence, it seems best to leave the task of monitoring the performance of GPs to Zilla Parishads.

The allocation going to the ith district on the basis on Global Parameters is given by:

$$D_i^{GI} = \sum_{j=1}^{J} \gamma_{ij}^{GI} R_{GI} \quad (3.4)$$

where,

γ_{ij}^{GI} is the weight based on the jth characteristics of the i^{th} district.

The J characteristics are population, income, poverty, etc.

The amount disbursed to a district on the basis of global parameters, D_i^{GI}, has to be further allocated among Zilla Parishads (ZP), Panchayat Samitis (PS) and Gram Panchayats (GP). This is done as follows:

$$D_i^{GI} = \lambda_{ZP} D_i^{GI} + \lambda_{PS} D_i^{GI} + \lambda_{GP} D_i^{GI} \quad (3.5)$$

λ_{ZP} = share of Zilla Parishad

λ_{PS} = share of Panchayat Samiti

λ_{GP} = share of Gram Panchayat

The summation of all λs equals one and each λ lies between zero and one.

Consistency requires that:

$$R_{GI} = \sum_{i=1}^{I} D_i^{GI} \quad (3.6)$$

We now look at Efficiency Based (EB) allocation. It need to be pointed out that as far as EB allocations are concerned, these will be made directly to Gram Pachayats since it is these local bodies that are directly involved in service delivery to citizens. The allocation going to the kth GP in the ith district on the basis on Efficiency Parameters is given by:

$$GP_{ik}^{EB} = \sum_{j'=1}^{J'} \gamma_{ikj'}^{EB} R_{EB} \quad (3.7)$$

where,

$\gamma_{ij'}^{EB}$ is the weight based on the j'th characteristics of the kth GP in the i^{th} district.

The J' efficiency based characteristics include public service delivery, revenue generation, etc.

Again consistency requires that:

$$R_{EB} = \sum_{i=1}^{I} \sum_{k=1}^{K} GP_{ik}^{EB} \quad (3.8)$$

Given D_i^{GP} and $\sum_{k=1}^{K} GP_{ik}^{EB}$ (the allocations to districts and to lower bodies) it will be true that:

$$D_i^{GP} + \sum_{k=1}^{K} GP_{ik}^{EB} = D_i^{R} \quad (3.9)$$

which is the district allocation, and

$$\sum_{i=1}^{I} D_i^R = T_R \quad (3.10)$$

3.1.2 Formulation for Urban Sector

The following conceptualisation is the most relevant from the point of view of this report. Hence, considering the Urban sector we write,

$$T_U = \pi T_U + (1-\pi)T_U \quad (3.11)$$

This is a convex combination to determine need based and other allocation where,

$$\pi T_U = U_{GI} \quad (3.12)$$

$$(1-\pi)T_U = U_{EB} \quad (3.13)$$

where,

U_{GI} is to be disbursed on the basis of *Global Indicators* at the district level

U_{EB} is the amount to be disbursed on the *Efficiency Based* Indicators to ULBs on the basis of their efficiency indicators.

3.1.2.1 Need based Allocation

The allocation going to the ith district on the basis on Global Parameters is give by:

$$D_i^{GI\,(U)} = \sum_{j=1}^{J} \mu_{ij}\, U_{GI} \quad (3.14)$$

where,

μ_{ij} are the jth characteristics (i.e., urban population, urban area, income, inverse income, backlog) of the ith district.

Consistency requires that the summation of allocations to the urban segment of districts (D_i^U)

$$\sum_{i=1}^{I} D_i^U = \pi T_U \quad (3.15)$$

This completes the distribution on *need based* criterion to the district level.

Given the need-based amount allocated to each district, this amount is further distributed at the level of ULBs as follows:

$$D_i^U = \sum_{i=1}^{I} \phi_i^{MC} D_i^U + \sum_{i=1}^{I} \phi_i^A D_i^U + \sum_{i=1}^{I} \phi_i^B D_i^U + \sum_{i=1}^{I} \phi_i^C D_i^U \quad (3.16)$$

where,

$\sum_{i=1}^{I} \phi_i^{MC} D_i^U$ = share of Municipal Corporation

$\sum_{i=1}^{I} \phi_i^A D_i^U$ = share of A class Councils

$\sum_{i=1}^{I} \phi_i^B D_i^U$ = share of B class Councils

$\sum_{i=1}^{I} \phi_i^C D_i^U$ = share of C class Councils

ϕ_i's = weights associated with each level of ULB.The summation of all ϕs, within a level of ULB equals one and each ϕ lies between zero and one.

Deciding the values of the ϕ's is crucial for determining the shares of the ULBs in the amount being allocated to a district. In the exercises that follow we have based the values of ϕ on the relative sizes, as measured by total expenditures, of each class of ULB. Having obtained the ratio of expenditure of a class of ULB to expenditure of all classes of ULBs, we normalised the smallest ratio to unity; this happened to be for the C class councils. This process gave us the following normalised ratios (nr) for all ULBs (Table 3.1):

Given the normalised ratios of Table 3.1, we examined the distribution of ULBs within each district. This is listed below in Table 3.2 for ready reference:

Points are generated for each district by the product of the nr (Table 3.1) and the number of each level of ULB in the district. Thus, for Thane, points are computed as:

4*(No. of MC = 6) + 2* (No. of A Class Councils = 4) + 1*(No. of B Class Councils = 4) + 1*(No. of C Class Councils =1) = 37

In general,

$$\text{Points for } D_i = \sum_k (nr)^k * (ULB_i^k) \qquad (3.17)$$

where,

D_i = ith district

$(nr)^k$ = normalised ratio for kth level of ULB (Table 3.1), k = MC, A Class Councils, B Class Councils and C Councils

(ULB_i^k) = Number of ULBs of the kth level in the ith district

Having obtained total points, we are now in a position to compute the ϕ's:

$$\phi_i^k = [(nr)^k * (ULB_i^k)] / [\sum_k (nr)^k * (ULB_i^k)] \qquad (3.18)$$

The construction of ϕ_i^k ensures that $\sum \phi_i^k$ always equals unity.

From (3.16) above we are able to obtain the allocation that will go to each level of ULB within a district. However, within a class of ULBs there is a multiplicity of local governments. Thus, the class of MC in Thane has 6 municipal corporations; likewise, in the class of C Class Councils in Pune district, there are 7 local governments. We need to devise a scheme, which will enable us to compute the actual share of each ULB (and not just the class of ULB) in each district. Consequently, we need a way to discriminate

between the various ULBs within a class of ULB. The only information that is available about each ULB, apart from financial data, is population and area. We also need to impose weights to determine the relative importance of population and area in determining. Finally, we need to estimate shares based on population and area of each ULB within a class of ULB. Bearing all this in mind the allocation to each ULB is determined as follows:

$$A_i^{j,k} = \phi_i^k * D_i^U [\xi^{pop} * (sp)_j^k + \xi^{area} * (sa)_j^k] \quad (3.19)$$

where,

$A_i^{j,k}$ = allocation to the jth local government in the kth class of ULB in the ith district

D_i^U = allocation going to the urban segment of the ith district

ξ^{pop} and ξ^{area} = weights on population and area respectively, $\xi^{pop} + \xi^{area} = 1$

$(sp)_j^k$ = share, based on population, of the jth local government in the kth class of ULB, $\sum_{j=1}^{J} (sp)_j^k = 1$

$(sa)_j^k$ = share, based on area, of the jth local government in the kth class of ULB, $\sum_{j=1}^{J} (sa)_j^k = 1$

Consistency requires that:

$$D_i^U = \sum_{k=1}^{K} \sum_{j=1}^{J} A_i^{j,k} \quad (3.20)$$

Finally, the total allocations made to the urban segments of all districts must satisfy:

$$\sum_{i=1}^{I} D_i^U = \sum_{i=1}^{I} \sum_{k=1}^{K} (\phi_i^k D_i^U) \quad (3.21)$$

and

$$\pi T_U = \sum_{i=1}^{I} D_i^U = U^{MC} + U^A + U^B + U^C \quad (3.22)$$

where,

U^{MC}, U^A, U^B and U^C are allocations made to Municipal Corporations, Councils A, B and C, respectively.

This completes the need based allocation to ULBs.

3.1.2.2 Performance And Efficiency Based Allocation

The amount $U_{EB} = (1-\pi)T_U$ is to be allocated on the basis of performance and efficiency of each ULB

- Performance Based allocation is $\eta (1-\pi)T_U$
- Efficiency Based allocation is $(1-\eta)(1-\pi)T_U$

Performance Based Allocation

Performance is evaluated on the basis of static and dynamic measures.

(a) Static measure: As per the static measure a Bonus is reserved for those ULBs that do well. "Doing Well" is understood as a healthy Dependency Ratio (DR) [see equation 4.5 below]. The amount available is given by:

$$T_U^{DR} = \psi_s \eta (1-\pi) T_U \quad (3.23)$$

Bonuses based on this measure are given only to ULBs that achieve a surplus in their overall fiscal balance.

Bonus to Municipal Corporations

Share of MCs in the total amount available for DR is given by:

$$MC^{DR} = \omega_{MC}^{DR} T_U^{DR} \quad (3.24)$$

The bonus to an ith MC on the basis of DR is given by $su_{i(MC)}MC^{DR}$ and consistency requires that:

$$MC^{DR} = \sum_{i=1}^{I} su_{i(MC)} MC^{DR} \quad (3.25)$$

where,

$su_{i(MC)}$ = surplus of MC_i / $\sum_{i=1}^{I}$(surplus of all MCs)

$\sum_{i=1}^{I} su_{i(MC)} = 1$

Bonus to A class Municipal Councils

Share of A-Councils in the total amount available for DR is given by:

$$A^{DR} = \omega_A^{DR} T_U^{DR} \quad (3.26)$$

The bonus to council A_i on the basis of DR is given by $su_{i(A)}A^{DR}$ and consistency requires that:

$$A^{DR} = \sum_{i=1}^{I} su_{i(A)} A^{DR} \quad (3.27)$$

where,

$su_{i(A)}$ = surplus of council A_i / $\sum_{i=1}^{I}$(surplus of all A class councils)

$\sum_{i=1}^{I} su_{i(A)} = 1$

Bonus to B class Municipal Councils

Share of B-Councils in the total amount available for DR is given by:

$$B^{DR} = \omega_B^{DR} T_U^{DR} \quad (3.28)$$

The bonus to a council B_i on the basis of DR is given by $su_{i(B)}B^{DR}$ and consistency requires that:

$$B^{DR} = \sum_{i=1}^{I} su_{i(B)} B^{DR} \quad (3.29)$$

where,

$su_{i(B)}$ = surplus of council B_i / $\sum_{i=1}^{I}$(surplus of all B class councils)

$\sum_{i=1}^{I} su_{i(B)} = 1$

Bonus to C class Municipal Councils

Share of C-Councils in the total amount available for DR is given by:

$$C^{DR} = \omega_C^{DR} T_U^{DR} \quad (3.30)$$

The bonus to council C_i on the basis of DR is given by $su_{i(C)}C^{DR}$ and consistency requires that:

$$C^{DR} = \sum_{i=1}^{I} su_{i(C)} C^{DR} \quad (3.31)$$

where,

$su_{i(C)}$ = surplus of council C_i / $\sum_{i=1}^{I}$(surplus of all C class councils)

$\sum_{i=1}^{I} su_{i(C)} = 1$

Finally, note that the shares of MC, A, B and C Councils must add up to one. That is:

$$\omega_{MC}^{DR} + \omega_A^{DR} + \omega_B^{DR} + \omega_C^{DR} = 1 \quad (3.32)$$

(b) Dynamic Measure: As per the dynamic measure as well a Bonus is reserved for those ULBs that do well. This is understood as an improvement in DR, labeled as ΔDR. The amount available is given by:

$$T_U^{\Delta DR} = \psi_d \eta(1-\pi) T_U \quad (3.33)$$

Rewards based on this measure are given *only to those ULBs which show an improvement in performance* as compared to the previous year

Bonus to Municipal Corporations

Share of MCs in amount available for ΔDR is given by:

$$MC^{\Delta DR} = \omega_{MC}{}^{\Delta DR}\, T_U{}^{\Delta DR} \qquad (3.34)$$

The bonus to ith MC on the basis of ΔDR is given by $IM_{i(MC)}MC^{DR}$ and consistency requires that:

$$MC^{\Delta DR} = \sum_{i=1}^{I} IM_{i(MC)} MC^{\Delta DR} \qquad (3.35)$$

where,

$IM_{i(MC)} = \Delta DR_{i(MC)} / \sum_{i=1}^{I} \Delta DR_{i(MC)}$

$\Delta DR_{i(MC)} < 0$

$\sum_{i=1}^{I} IM_{i(MC)} = 1$

Bonus to A class Municipal Councils

Share of 'A' class councils in amount available for ΔDR is given by:

$$A^{\Delta DR} = \omega_A{}^{\Delta DR} T_U{}^{\Delta DR} \qquad (3.36)$$

The bonus to a council A_i on the basis of ΔDR is given by $IM_{i(A)}A^{DR}$ and consistency requires that:

$$A^{\Delta DR} = \sum_{i=1}^{I} IM_{i(A)} A^{\Delta DR} \qquad (3.37)$$

where,

$IM_{i(A)} = \Delta DR_{i(A)} / \sum_{i=1}^{I} \Delta DR_{i(A)}$

$\Delta DR_{i(A)} < 0$

$\sum_{i=1}^{I} IM_{i(A)} = 1$

Bonus to B class Municipal Councils

Share of 'B' class councils in amount available for ΔDR is given by:

$$B^{\Delta DR} = \omega_B{}^{\Delta DR} T_U{}^{\Delta DR} \qquad (3.38)$$

The bonus to a council B_i on the basis of ΔDR is given by $IM_{i(B)}B^{DR}$ and consistency requires that:

$$B^{\Delta DR} = \sum_{i=1}^{I} IM_{i(B)} B^{\Delta DR} \quad (3.39)$$

where,

$IM_{i(B)} = \Delta DR_{i(B)} / \sum_{i=1}^{I} \Delta DR_{i(B)}$

$\Delta DR_{i(B)} < 0$

$\sum_{i=1}^{I} IM_{i(B)} = 1$

Bonus to C class Municipal Councils

Share of 'C' class councils in amount available for ΔDR is given by:

$$C^{\Delta DR} = \omega_C{}^{\Delta DR} T_U{}^{\Delta DR} \quad (3.40)$$

The bonus to council C_i on the basis of ΔDR is given by $IM_{i(C)} C^{DR}$ and consistency requires that:

$$C^{\Delta DR} = \sum_{i=1}^{I} IM_{i(C)} C^{\Delta DR} \quad (3.41)$$

where,

$IM_{i(C)} = \Delta DR_{i(C)} / \sum_{i=1}^{I} \Delta DR_{i(C)}$

$\Delta DR_{i(C)} < 0$

$\sum_{i=1}^{I} IM_{i(C)} = 1$

Finally, note that the shares of MC, A, B and C councils must add up to one. That is:

$$\omega_{MC}{}^{\Delta DR} + \omega_A{}^{\Delta DR} + \omega_B{}^{\Delta DR} + \omega_C{}^{\Delta DR} = 1 \quad (3.42)$$

(c) Efficiency in Taxation: An important element in judging the efficiency of a government is the vigour with which it collects tax revenue. Most local bodies have a problem of large arrears in tax collections. The measure of performance being proposed here looks at the effectiveness of a local body in recovering arrears and current demand in collection of property taxes (see equation VI.6 below). It is our belief that increasingly property taxes will become very important in determining the resources available to an ULB for performing its functions. Hence, vigour in recovering arrears and current demands in property taxes would be a good indicator of the performance of an ULB.

The amount available for good performance in recovery of arrears is given by:

$$T_U{}^{PTAX} = \psi_{PTAX}\, \eta(1-\pi) T_U \quad (3.43)$$

Disbursement to Municipal Corporations

Share of MCs in amount available for PTAX is given by:

$$MC^{PTAX} = \omega_{MC}{}^{PTAX} T_U{}^{PTAX} \quad (3.44)$$

Reward to MC_i on the basis of performance in recovery of property tax is given by $s_{i(MC)}MC^{PTAX}$ and consistency requires that:

$$MC^{PTAX} = \sum_{i=1}^{I} s_{i(MC)}MC^{PTAX} \quad (3.45)$$

where,

$s_{i(MC)}$ is the share of MC_i based on performance in recovery of property tax

$\sum_{i=1}^{I} s_{i(MC)} = 1$

Disbursement to A class Municipal Councils

Share of 'A' Councils in amount available for PTAX is given by:

$$A^{PTAX} = \omega_A{}^{PTAX} T_U{}^{PTAX} \quad (3.46)$$

Reward to council A_i on the basis of performance in recovery of property tax is given by $s_{i(A)}A^{PTAX}$ and consistency requires that:

$$A^{PTAX} = \sum_{i=1}^{I} s_{i(A)}A^{PTAX} \quad (3.47)$$

where,

$s_{i(A)}$ is the share of council A_i based on performance in recovery of property tax

$\sum_{i=1}^{I} s_{i(A)} = 1$

Disbursement to B class Municipal Councils

Share of 'B' Councils in amount available for PTAX is given by:

$$B^{PTAX} = \omega_B{}^{PTAX} T_U{}^{PTAX} \quad (3.48)$$

Reward to council B_i on the basis of performance in recovery of property tax is given by $s_{i(B)}B^{PTAX}$ and consistency requires that:

$$B^{PTAX} = \sum_{i=1}^{I} s_{i(B)}B^{PTAX} \quad (3.49)$$

where,

$s_{i(B)}$ is the share of council B_i based on performance in recovery of property tax

$\sum_{i=1}^{I} s_{i(B)} = 1$

Disbursement to C class Municipal Councils

Share of 'C' Councils in amount available for PTAX is given by:

$$C^{PTAX} = \omega_C{}^{PTAX}\, T_U{}^{PTAX} \qquad (3.50)$$

Reward to council C_i on the basis of performance in recovery of property tax is given by $s_{i(C)}C^{PTAX}$ and consistency requires that:

$$C^{PTAX} = \sum_{i=1}^{I} s_{i(C)}C^{PTAX} \qquad (3.51)$$

where,

$s_{i(C)}$ is the share of council C_i based on performance in recovery of property tax

$\sum_{i=1}^{I} s_{i(C)} = 1$

Finally, note that the shares of MC, A, B and C Councils must add up to one. That is:

$$\omega_{MC}{}^{PTAX} + \omega_A{}^{PTAX} + \omega_B{}^{PTAX} + \omega_C{}^{PTAX} = 1 \qquad (3.52)$$

Efficiency Based Allocation

Efficiency based allocation is determined by two indicators: (1) expenditure on Administration relative to Total Expenditure and (2) expenditure on Public Goods relative to Total Expenditure.

(a) Allocation based on Efficiency in Administration: This indicator penalises an ULB for relatively higher spending on Administration (see equation VI.7 below). The total amount available for this criterion is:

$$T_U{}^{ADMIN} = \psi_{ADMIN}\,(1-\eta)\,(1-\pi)T_U \qquad (3.53)$$

Disbursement to Municipal Corporations

Share of MCs in the total amount available for efficiency in administration is given by:

$$MC^{ADMIN} = \rho_{MC}{}^{ADMIN}\, T_U{}^{ADMIN} \qquad (3.54)$$

Reward to MC_i on the basis of efficiency in administration is given by $s_{i(MC)}MC^{ADMIN}$ and consistency requires that:

$$MC^{ADMIN} = \sum_{i=1}^{I} s_{i(MC)}MC^{ADMIN} \qquad (3.55)$$

where,

$s_{i(MC)}$ is the share of MC_i based on efficiency in administration

$\sum_{i=1}^{I} s_{i(MC)} = 1$

Disbursement to 'A' class Municipal Councils

Share of 'A' Class Councils in the total amount available for efficiency in administration is given by:

$$A^{ADMIN} = \rho_A{}^{ADMIN} T_U{}^{ADMIN} \quad (3.56)$$

Reward to council A_i on the basis of efficiency in administration is $s_{i(A)}A^{ADMIN}$ and consistency requires that:

$$A^{ADMIN} = \sum_{i=1}^{I} s_{i(A)}A^{ADMIN} \quad (3.57)$$

where,

$s_{i(A)}$ is the share of each Council A_i based on efficiency in administration

$\sum_{i=1}^{I} s_{i(A)} = 1$

Disbursement to 'B' class Municipal Councils

Share of 'B' Class Councils in the total amount available for efficiency in administration is given by:

$$B^{ADMIN} = \rho_B{}^{ADMIN} T_U{}^{ADMIN} \quad (3.58)$$

Reward to council B_i on the basis of efficiency in administration is $s_{i(B)}B^{ADMIN}$ and consistency requires that:

$$B^{ADMIN} = \sum_{i=1}^{I} s_{i(B)}B^{ADMIN} \quad (3.59)$$

where,

$s_{i(B)}$ is the share of each Council B_i based on efficiency in administration

$\sum_{i=1}^{I} s_{i(B)} = 1$

Disbursement to 'C' class Municipal Councils

Share of 'C' Class Councils in the total amount available for efficiency in administration is given by:

$$C^{ADMIN} = \rho_C{}^{ADMIN} T_U{}^{ADMIN} \quad (3.60)$$

Reward to council C on the basis of efficiency in administration is $s_{i(C)}C^{ADMIN}$ and consistency requires that:

$$C^{ADMIN} = \sum_{i=1}^{I} s_{i(C)}C^{ADMIN} \quad (3.61)$$

where,

$s_{i(C)}$ is the share of each Council C_i based on efficiency in administration

$\sum_{i=1}^{I} s_{i(C)} = 1$

Finally, note that:

$$\rho_{MC}^{ADMIN} + \rho_{A}^{ADMIN} + \rho_{B}^{ADMIN} + \rho_{C}^{ADMIN} = 1 \quad (3.62)$$

(b) Allocation based on Efficiency in Public Goods Provision: This indicator rewards an ULB for relatively higher spending on Public Goods (see equation VI.8 below). It is clear higher spending on public goods need not necessarily lead to better service delivery. However, in the absence of adequate information on actual service delivery, there is no option but to use spending patterns on public goods as a proxy. The total amount available for this criterion is:

$$T_U^{PG} = \psi_{PG} (1 - \eta) (1 - \pi) T_U \quad (3.63)$$

Disbursement to Municipal Corporations

Share of MCs in the total amount available for efficiency in providing public goods is given by:

$$MC^{PG} = \rho_{MC}^{PG} T_U^{PG} \quad (3.64)$$

Reward to MC_i on the basis of efficiency in providing public goods is given by $s_{i(MC)}MC^{PG}$ and consistency requires that:

$$MC^{PG} = \sum_{i=1}^{I} s_{i(MC)} MC^{PG} \quad (3.65)$$

where,

$s_{i(MC)}$ is the share of MC_i based on efficiency in providing public goods

$\sum_{i=1}^{I} s_{i(MC)} = 1$

Disbursement to 'A' class Municipal Councils

Share of 'A' Class Councils in the total amount available for efficiency in providing public goods is given by:

$$A^{PG} = \rho_{A}^{PG} T_U^{PG} \quad (3.66)$$

Reward to council A_i on the basis of efficiency in public goods provision is given by $s_{i(A)}A^{PG}$ and consistency requires that:

$$A^{PG} = \sum_{i=1}^{I} s_{i(A)} A^{PG} \quad (3.67)$$

where,

$s_{i(A)}$ is the share of Council A_i based on efficiency in public goods provision

$\sum_{i=1}^{I} s_{i(A)} = 1$

Disbursement to 'B' class Municipal Councils

Share of 'B' Class Councils in the total amount available for efficiency in public goods provision is given by:

$$B^{PG} = \rho_B^{PG} T_U^{PG} \quad (3.68)$$

Reward to council B_i on the basis of efficiency in public goods provision is given by $s_{i(B)}B^{PG}$ and consistency requires that:

$$B^{PG} = \sum_{i=1}^{I} s_{i(B)}B^{PG} \quad (3.69)$$

where,

$s_{i(B)}$ is the share of Council B_i based on efficiency in public goods provision

$\sum_{i=1}^{I} s_{i(B)} = 1$

Disbursement to 'C' class Municipal Councils

Share of 'C' Class Councils in the total amount available for efficiency in administration is given by:

$$C^{PG} = \rho_C^{PG} T_U^{PG} \quad (3.70)$$

Reward to council C_i on the basis of efficiency in provision of public goods is given by $s_{i(C)}C^{PG}$ and consistency requires that:

$$C^{PG} = \sum_{i=1}^{I} s_{i(C)}C^{PG} \quad (3.71)$$

where,

$s_{i(C)}$ is the share of Council C_i based on efficiency in public goods provision

$\sum_{i=1}^{I} s_{i(C)} = 1$

Finally, note that:

$\rho_{MC}^{PG} + \rho_A^{PG} + \rho_B^{PG} + \rho_C^{PG} = 1$

4. Conclusion

The methodology discusses above is data intensive and can be employed only when a variety of data are available for every class of local body. However, once the data are available and the proportions have been worked out – these proportions will inevitably have a political component to them – each local body will be able to estimate

the exact amount of disbursement that will be forthcoming to it. This makes the entire process of decetralisation of resources transparent and precise.

The authors have employed this methodology for the state of Maharashtra, especially for the ULBs (Karnik et al 2002). We have been able to develop and algorithm based on the methodology that allowed us to estimate, for a given notional amount to be devolved, the exact share of each of the 245 ULBs in the state. Of course, the methodology is not Maharashtra specific. It can be applied to any state, which has a sufficiently rich database.

References:

Karnik A., A. Pethe and D.Karmarkar (2002) "An Approach To Designing Inter-Governmental Transfers" a study dealing with "Evolving Criteria For Allocation Of Funds As Per The State Finance Commission Recommendations From The State To Urban Local Bodies To Strengthen Decentralisation Efforts By Urban Local Bodies" Final report submitted to **United Nations Development Programme (UNDP) and United Nations Centre for Human Settlements (UNCHS/UN-HABITAT).**

TABLE 3.1

NORMALISED RATIOS

Class of ULB	Expenditure Levels	Expenditure Ratios	Normalised ratio(nr)
Municipal Corporation	208628.00	0.18	4*****
A class Councils	57343.46	0.10	2
B class Councils	31623.60	0.09	1
C class Councils	29253.92	0.64	1
Total	326849.00		

***** The normalised ratio for MC should have been 7. However, such a high value skews the already skewed distribution of resources further in favour of MCs. With the normalised ratio of 4 for MCs, the distribution of allocations yields MCs a share of about 25%; using the actual figure of 7 would have given MCs a share of almost 33%. The latter we believe would be excessive and MCs in any case are well placed to augment their resources from alternative sources, which is not possible for other ULBs.

TABLE 3.2
DISTRIBUTION OF ULBs IN DISTRICTS

	MC	A Councils	B Councils	C Councils
Mumbai	1	0	0	0
Thane	6	4	4	1
Raigad	0	1	1	9
Ratnagiri	0	0	2	2
Sindhudurga	0	0	0	3
Nashik	2	0	2	6
Dhule	1	0	2	0
Nandurbar	0	0	2	2
Jalgaon	1	1	4	7
Ahemadnagar	1	0	3	6
Pune	2	0	4	7
Satara	0	1	2	5
Sangli	1	0	2	2
Solapur	1	1	1	7
Kolhapur	1	1	1	7
Aurangabad	1	0	1	5
Jalna	0	1	0	3
Parabhani	0	1	1	6
Hingoli	0	0	2	1
Beed	0	1	3	2
Nanded	1	0	1	10
Osmanabad	0	0	1	7
Latur	0	1	1	3
Buldhana	0	0	5	6
Akola	1	0	1	4
Vashim	0	0	2	2
Amaravati	1	1	2	7
Yavatmal	0	1	2	5
Wardha	0	1	2	3
Nagpur	1	0	2	8
Bhandara	0	0	2	1
Gondia	0	1	0	1
Chandrapur	0	1	3	3
Gadchiroli	0	0	1	1
Total	***22.00***	***18.00***	***62.00***	***142.00***

Note: Mumbai will not be included in the computations carried out in a later section. It is included here for the sake of completeness.