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Subnational Finance**

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# ***Beneficiary Charges: The Cinderella of Subnational Finance\****

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## **I. Introduction**

A comprehensive literature on the benefit principle and the ability to pay principle of taxation starts with Musgrave (1959). Olson (1969) instead stressed the importance of the ‘principle of fiscal equivalence’ in strongly linking expenditures to taxes in order to give rise to a greater degree of fiscal accountability. Olson’s treatment of taxes and expenditures seems to imply that expenditures are a cost of providing a public service and taxes and charges are prices that the consumer-taxpayer pays to the government. A strong case is also made for benefit taxes and charges in the Tiebout (1956) model in which citizen taxpayers shop for localities and choose their residence along with a tax-expenditure package.<sup>1</sup>

Beneficiary charges are used to raise financial resources by governments at different levels. In some cases, they are combined with data on non-tax revenues. Local governments depend on beneficiary charges to meet part of the cost of delivering such community-based local public services as street lighting, water and sewerage services, municipal road maintenance, management of municipal markets and buildings, public education and primary health. Until the recent episodes of globalization and privatization, the significance of market efficiency and off-budget supply of local services was little recognized and benefit-based charges were largely ignored. The fiscal federalism literature is dominated by the expenditure assignment issue, leaving the financing of local expenditures mainly to the property tax and intergovernmental fiscal transfers (IGFT). However, it is necessary for local fiscal systems to be diversified with alternative revenue bases used to finance public projects (Sjoquist and Stoycheva, 2012). In this line of reasoning, community governments should tend to recognize the trade-offs within their own revenue sources, namely between taxes, charges and fees on one hand and between own funds and IGFT and loans, on the other. The overwhelming significance of IGFT including loans may, however, distort local fiscal choices and tend to displace local taxes in general and beneficiary charges in particular. The latter comprise fees, fines and user charges for public administrative services and the sale of public utility products such as water and sewerage services.

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<sup>1</sup> For arguments in favor of locality-based taxes and charges as part of the decentralization theorem, see Oates (1972, 2005).

The revenue objective to cover *the identifiable costs (in full or partly)* is important with respect to both fees and charges. All revenue sources -- taxes, fees, fines and user charges -- are instruments of cost recovery to meet the financial obligations of public administration and the public and private supply of public goods and services. In the case of publicly supplied local goods, such as public administration, public education, health services, street lighting and sanitation, cost recovery may not be the dominant objective. But cost recovery is tremendously significant in the case of privately supplied local public goods, such as water supply, sewerage, electricity and telephone. In recent years, user fees and charges have gained significance at the sub-national level mainly because of hard local budget constraints. Recession resulted in drastic cuts in intergovernmental transfers and reduced access to market loans. According to the 2009 International City and County Management (ICMA) State Survey in the US, for instance, 46 percent of reporting local governments increased existing fees by 23 percent and added new levies for additional funds (Ebel and Petersen, 2012). While these trends are encouraging, there is no systematic research to assess the efficacy of local government in collecting fees and user charges vis-à-vis performance of other institutional arrangements such as off-budget supply and privatization.

The structure of this paper is as follows. Section 2 discusses the principles and practices of user fees and charges and their revenue potential. Section 3 analyzes factors adversely impacting the growth of beneficiary charges in local government budgets, including the centralization of revenue, intergovernmental fiscal transfers, and alternative fiscal strategies such as tax earmarking and piggybacking. Section 4 examines the trade-off between budgetary and privatization regimes of water supply and the efficacy of cost recovery policies. Section 5 examines the implications of water utility policies for full and partial cost recovery vis-à-vis the marginal cost of public funds. This section also includes an analysis of the impact of willingness to pay for water on the marginal cost of public funds. An empirical analysis is carried out using the results of a contingent valuation survey in Mauritius and estimating an empirical model for measuring the welfare effects of water charges in terms of the willingness to pay and the cost of providing water. When willingness to pay exceeds the average cost of supplying water, the marginal cost of public funds is reduced, thus increasing the revenue potential of water charges. The last section concludes with policy implications.

## **II. Beneficiary Charges and Fiscal Performance**

### **Taxonomy of Beneficiary Charges**

Beneficiary charges encompass two significantly different sources of revenue, fees and user charges. In both cases, beneficiaries are identifiable but user charges, unlike fees, in principle require benefits to be measurable. Bahl and Linn (1992) set the following selection criteria for financing local governments and public utilities:

- i) Where the benefits of public services are measurable and accrue to readily identified individuals in a jurisdiction, user charges are the appropriate financing instrument;
- ii) Local public services, such as administration, traffic control, street lighting and security, which are services to the general public in the sense that it is difficult to identify beneficiaries and measure benefits and costs to individuals, are most appropriately financed by taxes on local residents;
- iii) The cost of services for which significant spillovers to neighboring jurisdictions occur (e.g., health, education and welfare), should be financed substantially by state or national inter-governmental transfers;
- iv) Borrowing is an appropriate source to finance capital outlays on infrastructure services, particularly public utilities and roads.

While the above classification is useful in setting out different financial options for local governments, it does not allow for fees, which are designed to address situations where beneficiaries are identifiable but the benefits of local public services to them are difficult to measure. Examples of such services are providing permits, business/trade licenses, and birth and death certificates. In such specific cases, fees or flat levies may be the most feasible method of charging for administrative services rendered, irrespective of benefits receivable.

A distinction is made in this paper between administrative fees and charges and user charges. User charges are mainly imposed for public services provided to specific persons, while fees and other beneficiary charges often correspond to the splitting of costs between specified groups of beneficiaries or all citizens in a local jurisdiction. Beneficiary charges may also be divided according to their obligatory character and the type of public service into "*price-like user charges*" and "*tax-like administrative charges*". User charges are similar to prices because the user has some scope with regard to the use of the public service. The payment is therefore of a voluntary nature. Tax-like administrative charges are on the other hand fees for some entitlement and privilege. In addition, fines and penalties may be applied for non-compliance with rules and obligations. In some cases, the cost of administration may exceed the amount charged when there is some justification in terms of external benefits and regulatory objectives. The allocative efficiency of different revenue sources may vary from lump sum or flat levies to progressive charges, with lump sum or flat taxes being the least distortionary but perhaps inequitable.

Chart I: Taxonomy of municipal functions and beneficiary charges

<b>Beneficiary</b>	<b>Extent of Benefit</b>		
	<i>Easy to measure</i>	<i>Hard to measure</i>	<i>Indeterminate due to spill over</i>
Assignable (Excludable)	Water and sewerage (User charges), Local public transport (User charges), Local roads (User charges), Municipal building (Rent)	Market services (License fees), Entitlement to privilege (Registration fee, birth and death registration fee), Local justice (Fees, fines)	Elementary education, Primary health (Tax)
Non-assignable (Non-excludable)		Street lighting, Fire fighting, Local traffic control, Local police (Tax)	

Source: Author

### ***Fees and Fines***

In any cost recovery framework, administrative fees may be collected at all levels of government. The objective may be regulatory, administrative control or information building, with revenue generation as a by-product. Fees and charges that have some regulatory purpose will carry double dividends, as they have both revenue and regulatory purpose, as in environmental levies. Birth and death registration and certificate fees are examples. The

objective in these cases is to obtain a privilege (*quid pro quo*) rather than use of goods and services for consumption purposes. Although these fees are utilized to finance services that are in nature more of a public good, they are extensively employed by community governments to raise revenue because direct beneficiaries can be easily identified and the benefits are more internal to the users (Chung et al., 2011).

Moreover, the advantage of fees is that they entail little conflict with consumption and production decisions of beneficiaries and no large loss of external benefits to the community. In this way, they are neutral and therefore efficient in terms of resource allocation. There is no market-like situation in which demand depends on price because parties cannot adjust their demands according to the amount of fees charged. Moreover, it is easy to elicit contributions from all beneficiaries independent of the place where they are liable to tax. This may help solve the problem of inter-jurisdictional spillovers to some extent. Market-based taxes, however, are a different category of revenue source. Business license fees, registration fees, market fees (rent) and permit fees are small lump sum payments to obtain a certificate to do business, which usually do not have any well-defined relationship with the amount of business the licensee or permit will generate.

Fines and penalties are very different in nature. The objective of fines and penalties is to create deterrence. The social gains due to deterrence in such cases may exceed the revenue generated. A range of possible penalties can be imposed on offenders, including various fines, damages and restitution, probation, jail, and prison terms. The idea that penalties should be proportionate to the crime implies that society must maintain a relatively high level of monitoring and enforcement effort in order to deter violations of rules and laws than solely relying on high penalties. Fines sometimes fail to foster deterrence. Such substitutes as jail sentences, forfeitures, withdrawal of the right to carry on a business or profession, and even public shaming, must be taken into account in designing optimal fines (Polinsky and Shavell, 2000). Mookherjee and Png (1994) discuss various alternatives and find that penalties for lesser degrees of non-compliance should follow the principle of marginal deterrence and should be less than the marginal social loss so that citizens have an incentive to substitute away from higher levels of non-compliance

### *User charges*

There are four important dimensions of user charges – efficiency, equity, administrative feasibility and political economy. User charges promote efficiency by providing information on demand to the providers of public services and also ensure that what the public sector supplies is valued (at the margin) by citizens. Moreover, they are built on the assumption that consumers can adjust their use in response to price changes, as there is a *quid pro quo* relationship. Huber and Runkel (2004) have shown that road user charges are efficient for congestible public goods and for public goods with negative externalities, such as traffic congestion and pollution. Hellwig (2005) discusses efficient financing schemes with cross subsidies. There can be some user fees that cover more than costs and can add to budget resources to finance other public goods. On the other hand, depending on their characteristics, user fees may recover less than full cost. This applies to water charges, for example, where marginal cost pricing results in less than full cost recovery and improves social welfare.

Public goods like water combine the characteristics of collective as well as individual goods. Hence, they are characterized, on one hand by the presence of external effects and on the other, by the fact that the principle of exclusion is applicable for at least one component of the good. If full cost recovery is the objective, citizens may be asked to pay charges according to the marginal costs and fees and contributions (option prices) to cover the fix costs (World Bank, 1989). The other way of cost recovery can be a *multi-part tariff* in which the consumer pays a certain fixed sum (a fee, contribution) for the right to use the service plus a variable sum (a charge) dependent on the amount of the service consumed. The variable charge is related to the marginal costs of providing the service while the contribution should be designed so as to not affect the level of use. This alternative has the advantage that it can reconcile marginal cost pricing as well as the *principle of total cost recovery*. Finally, there is the possibility to vary the charges depending on the user (discriminatory charges) (Prud'homme, 1987). In this way –with varying price elasticity of the consumers – more income is generated (fiscal aspect) and differences in purchasing power of the consumers are taken into account (distribution aspect).

## Revenue Significance

It is vital to note that the importance of user charges is greater in principle than the relatively small amounts of money most countries collect from this variegated group of levies (Bird, 2000). The fiscal significance of beneficiary charges varies from country to country and within a country between local government budgets. Moreover, data on beneficiary charges in developing countries is scarce Table 1 portrays the case of South Africa, an advanced developing country. User charges constitute about 45 percent in metro councils and 51 percent in local municipalities. Similarly, large (Top 5) municipalities in India raise only 17 percent from user charges but the bottom 5 municipalities show a much higher resource mobilization to the extent of 48 percent from user charges and fees (Table 2). The share of user fees and charges varies dramatically in some African countries, from 23 percent in Ghana and Zambia to 5 percent in Uganda and Swaziland (Table 3). Developed county dependence on user charges and fees is, again, quite disparate. Although it is difficult to get data on a comparable basis, Table 4 presents some information using the data from EUROSTAT. Greece is followed by Finland, Luxembourg and Germany.

Table 1: Budgeted total revenue by source and municipality type: South Africa

Total budgeted Revenue	Metro (A)		Local municipalities (B)		District municipalities (C)		All municipalities	
	Allocation	% share of total revenue	Allocation	% share of total revenue	Allocation	% share of total revenue	Allocation	% share of total revenue
R'000								
Tax	11,031,369	26.7	3,590,280	16.7	1,363,612	43.0	15,985,260	24.2
User charges	18,871,713	45.7	11,069,240	51.5	192,106	6.1	30,133,058	45.7
Other	3,810,543	9.2	1,949,012	9.1	283,165	8.9	6,042,719	9.2
Special funds	565,060	1.4	262,326	1.2	22,257	0.7	849,643	1.3
Subsidies / grants	2,870,821	7.0	3,130,583	14.6	1,276,344	40.3	7,277,748	11.0
Debt	4,155,495	10.1	1,493,236	6.9	31,615	1.0	5,680,346	8.6
Total	41,305,000	100.0	21,494,676	100.0	3,169,098	100.0	65,968,774	100.0

Source: Whelan (2002), Original Source: National Treasury 2002, Government of South Africa

There are examples of some successful applications of user pricing in land development and public services (Mohanty et al., 2007). In Colombia road improvements, water supply and other public services have been financed by “valorization”. Under valorization the cost of public works is allocated to the affected properties in proportion to the estimated benefits conferred on them by those works. Its success depends on (i) careful planning and execution, (ii) active involvement of beneficiaries, (iii) an effective revenue collection system, and (iv) significant initial transfers to the ‘valorization fund’ by higher levels of government. In Korea and some other countries, large land parcels have been developed by local governments. After development, a part of the property is returned to the original owner in proportion to his original occupation. The balance is sold at market prices to recover the development costs. The scheme requires fairly sophisticated procedures of land management for success.

Development charges, impact fees and lot levies are popular in North America. They are levied to accommodate population expansion in new development areas. Levies are imposed on would-be property developers in proportion to the estimated cost of the needed infrastructure. Both off-site and on-site impacts are taken into account in the calculation of the fees. US impact fees are ‘one-time’ charges levied by local governments to pay for public infrastructure required by new development. They are imposed as a condition for approval to proceed with development. The facilities financed from impact fees may include on-site and offsite infrastructure, such as roads, water supply, sewerage, storm water drainage, flood control measures, open space, solid waste management, fire protection, libraries, schools, police services, public buildings and administration.

In Singapore, transferable Certificates of Entitlement for ownership of motor vehicles are auctioned every fortnight and constitute a major source of government revenue (Chia, 1998).

Table 2: Composition of Revenues of Municipal Corporations in India (2003-04)

Share in total revenue receipts	Top 5 MCs (combined)	Bottom 5 MCs (combined)
<i>Own Taxes</i>		
(i) Property Tax	37.86%	23.96%
(ii) Profession Tax	8.47%	0.14%
(iii) Entertainment Tax	4.01%	0.5%
<i>Non-Tax Revenue</i>		
(i) User Charges & Fees	17.10%	48.32%

Source: Nallathinga (2009)

Local business license fees in the Philippines have proven to be an important revenue source. The major form of business tax or fee is a gross receipts tax, with the tax rate varying according to the type of business and total sales. The second is an annual fixed amount, levied without regard to the volume of sales, resembling a license fee paid for the privilege of doing business in the local area. The third is an amusement tax, imposed as a flat percentage rate on admissions to places of entertainment. While the first component is the largest revenue raiser, the three components together, in many jurisdictions, have surpassed even the local property tax (Bahl and Schroeder, 1983).

Table 3: Composition of local government revenue in four Sub-Saharan African countries (%)

	Ghana	Uganda	Swaziland	Zambia
Own taxes	22	15	67	21
Shared taxes	0	0	0	0
User fees / charges	23	5	5	23
Single source revenues	18	0	1	18
Central government transfers	3	66	17	3
Donor contribution	0	11	0	0
Other non-tax revenues	34	4	5	34
Borrowing	0	0	5	0
Total revenue	100	101	100	99

Source: Dirie (2005)

As indicated earlier, 'beneficiary charges' is an open ended category comprising different combinations of fees and user charges. In India, for instance, at times local functions were reassigned to higher levels of government while at other times functions were transferred to local bodies without any transfer of revenue authority (Nath and Purohit, 1995). Due to disparate coverage and this reshuffling of expenditure and revenue functions between different levels of

government, the reported trends in revenue significance of beneficiary charges are tentative. Nevertheless, they indicate a significant degree of substitution between different sources of finance and a potential for additional revenue mobilization using the benchmark of high performing municipal governments within a country. We discuss this issue next.

Table 4: User fees as percent of local government revenue in developed countries

Country	2005	2010
Austria	10.4	9.9
Belgium	7.4	7.8
Czech Republic	14.3	13.3
Denmark	5.6	5.5
Estonia	7.6	8.9
Finland	19.1	23.6
France	14.7	16.5
Germany	18.7	19.7
Greece	23.3	27.3
Hungary	10.3	9.3
Iceland	10.4	10.8
Ireland	13.5	14.8
Italy	6.5	6.8
Luxembourg	20.2	20.0
Netherlands	15.9	15.8
Norway	14.5	15.0
Poland	10.3	9.0
Portugal	14.6	12.7
Slovakia	13.8	12.5
Slovenia	13.7	14.8
Spain	8.7	10.2
Sweden	11.0	10.7
United Kingdom	12.1	13.7

Source and Notes: Computed from EUROSTAT data (2010).

Note: In the absence of readily available information, data on user fees as per cent of local government revenue are user charges and fees as per cent of GDP divided by local government revenue as per cent of GDP and multiplied by 100.

## Revenue Potential

Except for business license fees, fees and charges do not explicitly have the objective of raising revenues for general purposes. They are essentially instruments for the partial or full cost

recovery for administrative and judicial services rendered and the sale of public utility products (e.g., water). Since the administration of fees and fines is done as part of public administration, they are not expected to raise any stipulated share to meet the rising cost of public expenditure so their buoyancy with respect to GDP is not relevant. The same can be said even of water charges because what is relevant is the extent to which the average cost of water supply is recovered and as mentioned above, tax financing of water utilities is efficient as long as marginal costs are recovered.

While political constraints are important in local revenue mobilization, greater revenue significance of user charges and fees in some municipalities than in others suggests that there is a varying degree of underutilization of this revenue source. On the basis of available information, we can discuss some revenue potential estimates which may give a quantitative dimension to this problem. In one exercise, for instance, the Karnataka Revenue Reforms Committee (2003) in India estimated that the potential for additional resource mobilization from non-tax revenue in Karnataka was 9 times higher than current levels. In reality, of course, the revenue prospects of beneficiary charges would depend on the political will of the local legislature. For example, over a third of government non-tax revenue in Singapore, a country with no mineral or forest resources (unlike some Indian states as Karnataka) comes from fees and charges (Chia, 1998). In German towns and cities more than four fifths of local community charges come from only two revenue sources, namely sewage (42.8 percent) and waste disposal (38.2 percent) (Edling, 1998).

In another exercise, Mohanty et al. (2007) projected municipal revenue, which gives an idea of revenue potential in urban local bodies in India. Cost recovery was defined as the ratio of user charges to revenue expenditure. The optimal performer in terms of proportion of cost recovery was chosen as a benchmark. Thus, to work out the potential of non-tax collections (user charges and fees), the proportion of cost recovery of the optimal performer was applied to aggregate revenue expenditures of other urban local bodies in the country. Projections for the year 2004-05 are presented in Table 5.<sup>2</sup> The table however does not present the projected revenues for different

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<sup>2</sup> The choice of best performer in revenue collection as a benchmark can be replaced by the representative tax system and taxable capacity factor. In the former, average rate base regimes are generated and applied to potential base or total cost or revenue expenditure. The taxable capacity method uses the regression method in which tax to

periods to help clarify an overall trend. Nevertheless, it is instructive to note that user charges and fees are expected to yield revenues very close to the property tax, which is about 30 percent of total potential revenue.

Table 5: Projection of Potential Revenues of ULBs in India (2004-05)

Revenue Source	Projected Revenues (Rs Crores)
Property Tax	10,577
Profession Tax	2,389
Advertisement Tax	510
All Major Taxes (1+2+3)	13,476
Non Tax (User charges & fees)	9,746
Grants in Aid	4,064
Total Potential Revenue (4+5+6)	27,285

Source: Mohanty et al. (2007)

In an interesting revenue potential exercise as part of a governmental municipal support program in Mozambique, financed by Austrian, Danish and Swiss development agencies, Boex (2011) used three criteria for the assessment of the revenue effort: (i) the quality and coverage of tax registers/cadasters (“coverage ratio”), (ii) the assessment of the fiscal obligations of tax payers (“assessment ratio”), and (iii) the degree by which taxpayers comply with their obligations (“compliance ratio”). This method allows for estimating the unutilized reserves of own source revenue potentially available to the municipalities for the year 2009. The results show that the (untapped) revenue potential varies across the sample according to the size, localization and age of the municipalities, the existing type of urbanization, the institutional capacity of the municipal tax administration and other factors. In a way, each of the municipalities examined tells its own story about revenue collection policies, priorities and results. Despite these variations, however, revenues from market fees generally contribute relatively more and thus have less (non-utilized) potential.

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income ratios are regressed on capacity factors and residuals serve as a measure of revenue effort. The fitted values give a rough magnitude of potential revenue. See Bahl (1972) and Bahl (1971) for the two methodologies, respectively.

To understand the entries in Table 6, let us take economic activity tax first. It is assessed on the basis of the nature of business, location of the establishment and area occupied. More than three-quarters of all business operators are covered by the tax, i.e. the coverage ratio is 80 percent. The assessment ratio tells us that on an average, they pay 70 percent of the maximum charge fixed by the statute, and 64 percent of these imposed charges are actually collected and find their way into the municipal treasury. By multiplying the three ratios, we get the maximum potential collections for economic activity tax (36 percent). This implies an unrealized share of this tax collection of 64 percent of the revenue potential. Property related taxes are the least exploited and market related charges are relatively more tapped.

Table 6: Municipal revenue effort and potential In Mozambique in 2009

Revenue source	Collection ratio	Assessment ratio	Coverage ratio	Tax effort	Unrealized potential
Economic activity tax*	64	70	80	36	64
Market land use license fee	55	73	55	22	78
Market fees (Rent)	72	94	72	49	51
Property tax	11	31	24	1	99
Municipal property transfer tax	33	29	53	5	95

\*Business license fee

Source: Weimer (2012), Original Source: Boex (2011)

Thus, for many municipal levies sizeable revenue potential remains unrealized and the factors contributing to these shortfalls are primarily administrative and political.<sup>3</sup> Revenue can be increased by indexing the levies in terms of the rising cost of public administration, growth of local expenditure, and growth of public sector employment or wages. Specifying the minimum share of beneficiary charges in local budgets might also stimulate more use of this revenue

<sup>3</sup> For some discussion of these issues, see Bird and Tsiopoulos (1997).

source. While no attempt is made to measure revenue potential with international data sets, a discussion will be presented of additional factors that are found to drag the fiscal performance of beneficiary charges.

### **III. Factors Constraining Growth of Beneficiary Charges**

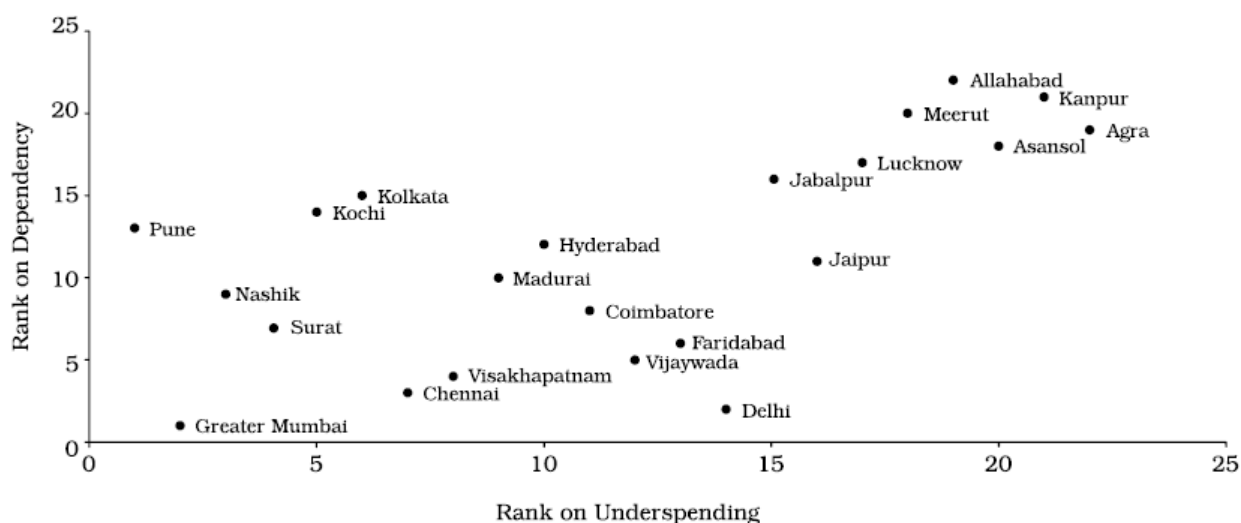
Political factors are the major stumbling block constraining frequent rate revisions and revenue performance of beneficiary charges. A different channel of political economy influences can be visualized when municipalities spend less on local services and, therefore, raise less in terms of taxes and charges (Gangopadhyay and Nath, 2006). What is instructive to note here is that the system of multiple financing of local public services is dominated by grants and shared taxes render beneficiary charges as marginal sources of local finance. Similarly, the overwhelming significance of property taxes in local finance is another factor. While property taxes have been discussed as a user charge (Vickery, 1963; Netzer, 1973), in the tax incidence literature they are not treated as a lump sum levy (Zodrow, 2007). In fact, property taxes have characteristics of a tax with efficiency, equity and political economy implications. But in practice, this tax has served as a piggyback base for property-linked local public services in many countries. In a recent paper, Nath and Schroeder (2010) have examined the potential of property tax as an environmental levy on international tourists. Besides the supremacy of the property tax and political factors hindering frequent rate revisions indicated above, there are a variety of other factors that have constrained the growth of fees and charges in local government budgets.

#### ***Intergovernmental fiscal transfers as indirect cost recovery***

The strong possibility of inter-jurisdictional spill-over benefits has created conditions favoring centralization of revenue collections and revenue sharing. The emphasis then shifts from ‘tax assignment’ to ‘revenue assignment’ and grants and loans significantly enter into the picture (Musgrave, 1983). Unlike taxes, Stehn and Fedelino (2009) find that fiscal transfers are procyclical in Germany. That is, revenue sharing follows the trends in collection performance of the grantor. According to the literature on the “soft budget constraint”, ” strong reliance on fiscal transfers and lack of own source revenue that would allow governments to internalize the costs

of their spending decisions both weaken incentives to spend with due consideration for debt sustainability (Rodden et al, 2003, Bordignon, 2006). It is also important to note that the flow of central transfers may not be regular and adequate because ‘revenues stick where they are collected’ (Bahl and Nath, 1986). Moreover, revenue centralization and expenditure decentralization as a vote maximizing political strategy (Brennan and Buchanan, 1980; Grossman and West, 1994; Nath, 2012) results in the surrendering of local tax authority to higher levels of government.

Chart II: Municipal Dependency Ratio and Under-spending (1999-2004)



Source: Mohanty et al. (2007), p.114.

While maximizing revenue, sub-central governments would prefer less reliance on sub-central taxes, thus giving way to central taxes with a constitutionally mandated arrangement for sharing central tax proceeds. States utilizing comprehensive tax bases, especially a personal income tax, have been able to generate higher levels of aggregate tax revenues (Nelson, 1986). Although each sub-central government would have an incentive to deviate from stipulated norms, Nechyba (1997) has empirically established that the institution of state grants funded through a state income tax as an alternative to a local property tax can play such an enforceable role. In other words, local authorities may decide to forgo the right to property taxes in favor of a state-administered income tax with an explicit mechanism of revenue sharing. Goodspeed (2000) empirically established that higher national income tax rates (and lower poverty rates) are found

to lead to lower local income tax rates, indicating colluding behavior in designing tax rates by different levels of government.

Zhuravskaya (2000), based on a unique data set on Russian city budgets, shows that revenue sharing between regional and local governments provides local governments with no incentive to increase the tax base or provide public goods. It can be argued that grants may work as an indirect cost recovery channel. Mohanty et al. (2007) used the Zakaria Committee (1963) norms for minimum per capita municipal expenditure in India and demonstrated that under-spending is widely prevalent and it is, to some extent, positively related to the fiscal dependency ratio, that is, proportion of state grants in total spending (Chart II). In other words, the municipal corporations which under-spend more are relatively more dependent on fiscal transfers, which is an indicator of lack of local fiscal effort.

### ***Piggybacking: A substitute for independent beneficiary charges***

Subnational governments have attempted to diversify their revenue sources by resorting to piggybacking through tax base sharing in the form of supplemental charges and surcharges and tax base sharing by administering local taxes on the same base (For country experiences, see Martinez-Vazquez et al, 2006; Brunori, 2007). Surcharges on local property taxes are used extensively in developing countries to collect beneficiary taxes for which disaggregated data are generally not available. There are several other examples of piggyback supplements, namely flat rate profession taxes, like a local income tax, and surcharges on state taxes on passengers and goods, motor vehicles and entertainment in India. The advantage with independent local piggyback taxes is that they work like a user charge, which falls only on residents. Thus, there is no export of taxes to non-users of services. This is in contrast to the case of piggybacking on a tax base being administered by a higher government (in the form of a surcharge and supplementary cap) where the burden of such levies is also exported to non-residents.

### ***Tax earmarking as a vehicle of cost recovery***

Tax earmarking can take two forms. First, taxes or charges collected at the subnational level can be earmarked to finance a particular program at that level. The other form is in which a part of

the tax proceeds of a tax collectible at a higher level is dedicated to a particular expenditure program at the subnational level. Earmarking of user fees and benefit taxes collected at subnational level is easy to justify, like a market transaction to obtain benefits. Dedication of the gas tax to pay for highway fuels is an example of a benefit tax earmark. The strongest economic case for earmarking exists where there are clear benefit linkages between the taxes or charges levied and the expenditures financed, so that earmarked taxes act as an indirect form of user charges or public prices for services. Through the linking of user charges and specific benefit taxes to certain public services, earmarking facilitates the rational choice by taxpayers. However, the expenditure performance of such earmarking is less researched. In a recent article, Downing (2012) has shown that municipal expenditure levels may go down because of uncertainty in revenue collections of earmarked taxes.

The second kind of earmarking, however, is more interesting. While such earmarks may be implicit in the shared revenue and fiscal designs of many countries, these earmarks are explicitly in practice in some countries like Australia in different forms (For an extensive survey of literature, see Wagner, 1991; Bird and Jun, 2005; Carling, 2007). Buchanan (1963) argues that dedicating or earmarking revenues for programs with the greatest support among voters could constrain overall government expenditures. This contention is based on the theory that support for overall spending levels will decline if acceptable levels of spending are guaranteed for the most popular public programs. This condition typically applies to partial earmarking where users are simply paying for a quasi-private good which may also be subsidized by other public revenues.

There are isolated research findings which support or contradict the positive impact of partial earmarking on local revenue efforts. Dye and McGuire (1992) analyzed the effect of state earmarks for three broad categories of spending—education, highways, and state aid to non-school local governments—using two years of data from 1984 and 1988 compiled by the National Conference of State Legislatures (NCSL). Controlling for a variety of economic, demographic, and other factors likely to affect spending levels, they found that the effects of state earmarks on local spending levels were ambiguous. They further show that a greater reliance on earmarking as a share of expenditures results in either no change in spending or

lower expenditures. Nonetheless, Gwilliam and Kumar (2003) provide evidence that in a number of developing countries, earmarking revenues through ‘road funds’ appears to have improved allocative efficiency without either undermining fiscal flexibility or fostering rent-seeking.

The dampening impact of partial earmarking on revenue efforts will additionally emerge because the recipient government can treat the tax money as a fungible resource. This fiscal behavior gets eminent support when the fiscal environment suffers from a soft budget constraint. The question of fiscal discipline is therefore very pertinent in this context. ‘Bailout’ and fiscal rescue operations by the central government, followed by a moral hazard type of fiscal extravagance at the local level constitutes one of the principal dangers (Prud'homme, 1995). Since fees and user charges constitute only a small portion of subnational budgets, the rest of the administrative and public utility expenditures are financed either from earmarked or general tax revenues or from earmarked or general transfers, including loans. The availability of funds from such sources may result in the underutilization of beneficiary charges. However, Bird (1997), drawing on earlier work by Buchanan (1963) and others, suggests that when earmarked taxes are viewed as substitutes for user charges, especially when the latter are difficult to collect, a benefit tax argument can be made for the optimality of earmarking.

### ***Political economy factors***

In the context of local public service delivery, politicians should favor imposition of beneficiary charges, but in reality, they may prefer taxes. This is because choosing between two revenue sources and choosing between two tax/charge schedules are different issues. In regards to the first, while the consumers may prefer beneficiary charges because of the correspondence between benefits and payments, a politician may prefer taxes for three reasons. First, it may be politically difficult to revise rates at regular intervals as it may result in a loss of popular support. Second, taxes allow authoritarian fixing of tax rates independent of expenditures and through the exploitation of fiscal illusion, because the payments are disguised. Thirdly, maintaining political power frequently depends on the discretionary use of public funds. Yet, when it comes to choosing between flat rates and progressive rates, on theoretical grounds, the former will be preferred not only because flat rates are neutral in an allocation sense, but also because the lack

of discriminatory progressive rates would engender effective control over the leviathan (Brennan and Buchanan, 1980). But revenue maximizing leviathan governments may prefer discriminatory progressive taxes. Moreover, beneficiary user charges also face political resistance on the grounds that these services are already being partly financed through taxes, so there is a need to clarify the difference between which portion of the public service is financed with taxes and which portion is more appropriate to be financed with user charges (Duff, 2004).

To sum up, there are fiscal practices that hamper the independent local revenue authority to raise fees and charges when higher layers of government transfer a part of their revenue collection to local governments as grants-in-aid. Secondly, higher level governments often administer and collect taxes with the explicit objective of sharing the proceeds with local governments. Thirdly, local governments themselves may piggyback on their own major taxes, such as property taxes and sales taxes to collect fees and charges, again replacing beneficiary charges. What is vital to note is that there is a substantial transfer of fiscal authority from one tax to another and from one level of government to another and, as a result, local fiscal initiative is adversely affected. Moreover, local fiscal authority may be displaced or undermined when local public utilities are privatized in full or part, as discussed next.

#### **IV: Is Privatization a Lifeline for User Charges? The Case of Water**

Ownership change from public to private is not a smooth process. The private management of user charges would face stiff resistance from local government employee unions, as they will fear losing their jobs. Citizen-voters may stall such proposals for the fear of an increase in the cost of subsidized public services. What is relatively easier is to limit the role of the private sector to collection of service charges, development and maintenance of public parks and maintenance of streetlights and local roads. However, in the case of publicly provided quasi-public goods, such as water, sewage and waste management, there may be ample opportunities to involve the private sector in improving service standards and raising the level of cost recovery. Local governments have generally not succeeded in such efforts due to lack of capacity, lengthy legislative processes and political interference. If revenues from user fees are not forthcoming because the economy remains weak or there are political constraints in revising rates,

governments may have to contract out such public services to private and non-profit vendors or renegotiate service responsibilities with other levels of government. We focus here on the case of water.

### *Water as a quasi-public good*

The decision whether to provide water publicly or privately would depend on such considerations as the costs of exclusion, externalities and cost structure of the industry. Higher exclusion costs and externalities as well as decreasing unit costs of production support public provision or private supply with regulation. Contestability, that is, potential competition in supply is another concern. If markets are less contestable, there will be the danger of monopolization of public production and pricing.

Table 7: Characteristics of piped water supply

Type of System	Nature of Good		Contestability	Externalities	Comment
	Rivalry	Exclusion			
<b>Piped Water Supply</b>					
• <b>Trunk System</b> (intake pumping station)	H <sup>a</sup>	H	L	PH, GD	Private good characteristics
• <b>Distribution System</b>	L	M	L	PH	Public good characteristics
• <b>Terminal Equipment</b>					
Common	M	L	H	PH	Public good characteristics
Individual	M	H	H	PH	Private good characteristics

Source: Based on World Bank (1993)

Notes: L: Low; M: Medium; H: High; PH: Public Health; GD: Ground water depletion; <sup>a</sup>: Depending on the degree of water resource scarcity.

Table 7 shows specific demand and supply characteristics of water supplied by piped networks for different uses. We find that intake-pumping stations of the trunk system are characterized by a high degree of rivalry, assuming that water from the aquifer is scarce. As more water is extracted, less is available to other possible users of that aquifer. This result would also hold for surface water stations. Costs of excluding people from using water at the pumping station, on the other hand, are low so that there is a predominance of private goods characteristics. The costs of preventing people from using water at reservoirs are medium and could vary according to the size of the storage facility. If the reservoir is big, for instance, it could be difficult to monitor its use and prevent people from illegally drawing water for irrigation or other uses. If the reservoir is located far from places that are inhabited or developed, we might expect the degree of exclusion to be lower.

Costs of monitoring illegal extractions from the distribution system or tampering with meters are high in some countries, so that this part of the supply system will entail a medium degree of exclusion. Exclusion at the terminal equipment end is potentially high, but in the case of common equipment, it may not be feasible due to social factors. Moreover, there are positive externalities associated with the consumption of potable water, namely, the improvement of the general health of the community through the reduction in the incidence of waterborne diseases. Similarly, the existence of a large number of negative externalities in consumption like water-logging, salinization, and new diseases establish a general case for government involvement in its provision. Besides externalities, cost recovery arguments are dominant, which support surrendering of the local fiscal authority to a private operator.

### ***Ownership versus cost efficiency of water utilities: Theory and evidence***

Private sector participation in local public service delivery has been considered a way forward in recent years, considering its impact on cost recovery regimes. But the success of experiments with the privatization of such publicly produced goods and services is a mixed blessing. It is commonly argued that private ownership will result in higher cost efficiency as compared to public ownership, *ceteris paribus* (Megginson and Netter, 2001). The reasons for this contention are derived from three strands of the literature: principal agent theory, property rights theory and

public choice theory. Principal agent theory predicts greater efficacy of private ownership in providing managers with incentives to act in line with the enterprise's goals. From the property rights perspective, public sector officials and politicians have lower property rights to the gains associated with improved utility performance and diminished incentives to improve public sector enterprises. Public choice theory argues that public managers would seek to maximize their own utility, such as size of their own budgets, which may result in loss of social welfare gains.

Critics have challenged the above approaches on the grounds they do not consider the degree of competition faced by firms in assessing performance of such utilities (Rees, 1998; Vickers and Yarrow, 1989). Another problem with these approaches is that they assume cost-minimizing privatization of public and private utilities (McGuire and Ohsfeldt, 1986). Renzetti and Dupont (2003) argue that since the water industry is largely monopolistic, mere privatization would not necessarily lead to better performance. Saal and Parker (2000) use a time dummy to test for the impact of privatization and regulation on the industry's cost in UK. Their results show that lower costs of utilities can be attributed to tightened regulation and are not necessarily due to privatization. Moreover, in the presence of regulation and transaction costs, threats of takeover and bankruptcy do not provide perfect incentives for managers to make efficient choices (Saal and Parker, 2001). Bakker (2003) notes that the recent trend in the English and Welsh water industry suggests a move away from privatization towards mutualization, that is, ownership by customers and run as non-profit privatization. Erbetta (2006) shows that in an industry characterized by high degree of monopolistic tendency, price reduction is more effective than price increase as an incentive mechanism for correcting technical distortions. That is, upward revisions in water charges by privatized public utilities may introduce distortions.

Evidence from developing countries is scanty and fairly recent. It is interesting to note that the findings emerging from developing countries generally do not support significant differences in performance between public and private utilities. Kirkpatrick, Parker and Zhang (2004), for instance, employ DEA and cost frontier approaches using data from 110 African utilities and find no significant difference in costs once environmental factors are accounted for. Regulation in their sample does not significantly impact water utility's cost. Similar results are obtained by Estache and Rossi (2002) who estimate a stochastic cost frontier with data from 15 firms in 19

Asian countries. Seroa da Motta and Moreira (2004) use DEA to analyze performance of 4000 municipalities in Brazil over years 1996 to 2002. The authors conclude that there is no significant difference between public and private provision in terms of productivity. Only two studies are found to support gains due to privatization. Estache and Kouassi (2002) estimate a production frontier with data from 21 African water utilities and find that private operators are more cost efficient. The researchers also find that corruption worsens efficiency and in their sample, corruption matters more than ownership. Arikon (2008) shows that given the official-firm connection, increased privatization leads to an increase in corruption. Estache and Trujillo (2003), using an unbalanced panel of data from 4 provinces in Argentina over years 1992-2001, conclude that significant improvements have resulted from 1990 reforms irrespective of ownership status.

Bayliss and Kessler (2006), conducting research at the International Poverty Centre, present an interesting discussion on privatization and commercialization of public services to help meet the MGDs and conclude that reliance on private supply of public services will fail to address the central challenges of public provision because privatization will undermine the accountability and capacity of the state to provide accessible and affordable public services. They argue against full cost recovery and support the case of capacity building of the state in these services. In their analysis, the importance of private sector participation in supply of public services and user fees is not underplayed.

In recent research, Madhoo (2007a) develops a logit model to analyze cross-country determinants of cost recovery levels in water utilities to explore the likelihood of efficiency impacts of water utility ownership arrangements while controlling for other factors. An ordered cost recovery level variable is regressed on ownership, water availability, GNP per capita, Gini, external aid to water utility and good governance and corruption. An ordered logit model is estimated using data from developed and developing countries. It is postulated that the probability of achieving a higher level of cost recovery would be greater if the water industry has a higher degree of private involvement. While ownership is found to bear a positive sign, there appears to be a weak link between private involvement in water provision and the probability of achieving higher cost recovery levels, as the ownership variable is statistically

insignificant. The insignificance of the ownership variable may be explained by a high degree of government regulation, political interference and consumer resistance to increases in water prices beyond certain levels. This contention is generally supported by findings in the empirical literature. In the absence of data, the author does not compare the performance of privatized utilities with autonomous (specific purpose and general purpose) utilities separately. One can, however, conjecture that the prospects of privatization may be further diminished if professional and commercial dimensions of off budget autonomous boards are brought into the picture.

## **V. User Charges and Marginal Cost of Public Funds**

User charges find their most appropriate role in natural monopolies of the government, such as water and sewer services. Pricing considerations are guided by the decreasing cost nature of water utilities and whether the total cost of the water supply has to be recovered from users. In the case of full cost recovery, charging a positive price—say to cover average costs—may deny some consumers access to a good that provides a positive community benefit at a low, non-zero marginal cost.

According to theory of public utility pricing, marginal cost pricing will result in efficiency prices and optimal water output, which is social-welfare maximizing. In the absence of government owned utilities, water can be provided by the private sector with government regulation. Private providers can be offered authority to charge the average cost including an allowable profit. The other alternative is to allow a water tariff equivalent to the marginal cost plus a subsidy equal to the difference between average and marginal costs. Apparently there seems to be no difference between the two options, but private providers may choose option one, in which case the quantity produced will be lower than when the latter option is chosen. If there are enough private bidders, marginal cost pricing can be enforced. Other options may include incremental cost pricing and non-linear pricing structures, like two-part tariffs and graduated block prices with lifeline subsistence rates (See Madhoo, 2009). The latter, known as increasing block rates (IBRs) apply progressively higher prices to water users falling in higher consumption blocks. In this way, affordability is ensured for meeting basic needs (social goal) and cross-subsidization between users occurs. While such a pricing scheme can potentially help to achieve

full cost recovery, it rarely succeeds in doing so. Developing country experiences show that partial cost recovery (through direct charges) is the norm when more users fall in the lower ‘subsidized’ consumption block(s). The economics of partial cost recovery rests on the notion that fixed cost components of the total utility expenditure are sunk costs, which have no alternative use and therefore need not be recovered. This brings us to the recovery of operation and maintenance costs of water utilities.<sup>4</sup>

### ***Marginal cost of public funds and marginal cost pricing***

Charging user fees in public utilities should reflect the marginal cost of an additional user of the publicly provided good or service. Since sub-national governments are suitable for providing congested public goods (in comparison to pure public goods), the marginal cost of providing a service should be positive and less than the average cost. However, shifting away from average cost pricing would entail deficits in utility budgets, which will be financed from taxes and loans (deferred taxes). Given the current tax financing of utility deficits, distortionary effects of taxes will have to enter into the revenue cost of water supply. Marginal cost of public funds is an accepted measure of distortion. It is the direct tax burden plus the marginal welfare cost produced in acquiring the tax revenue, which is a composite impact (effects of tax on labor supply, tax on consumption, and their relative effects on government expenditure and utility) (Ballard and Fullerton, 1992). The welfare improving effect of a tax would require that

$$\partial U/\partial t > 0, \quad (1)$$

$$\partial l/\partial t < 0 \quad (2)$$

where U is utility, t is tax and l is leisure.

The first condition states that a balanced budget increase in taxes and government expenditure should increase utility and the second stipulates that given that leisure is normal, additional taxes should increase the supply of labor. Both conditions will be satisfied in the case of a lump sum tax (Ballard and Fullerton, 1990) (Most beneficiary charges will be classified as lump sum

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<sup>4</sup> Note, however, that depreciation of fixed assets and interest charges of loan financing are included in operation and maintenance costs.

taxes). For other taxes, since  $\partial V / \partial t > 0$ , an increase in taxes will increase demand for leisure and, hence, supply of labor will fall.

Since the marginal cost of public funds will vary from one tax to another general tax (MCF<sub>gt</sub>) as against the cost of lump-sum taxes (MCF<sub>lump</sub>), the efficient supply with optimal pricing would require that the sum of marginal benefits (MB) is equal to the marginal cost of a project (CP) with proper adjustment for marginal cost of public funds (MCF). If MCF is greater than one, the benefits of the projects must cover more than the cost of the project and vice versa (Most empirical estimates show MCF exceed unity, see Ballard and Fullerton, 1992 and Bird, 2005).

Rewriting the conditions, we get

$$\sum MB_{wp} = CP_{wp} * MCF$$

$$MCF = 1 \text{ (Samuelson (1954) efficiency, first best) (3)}$$

Since  $MCF_{gt} > 1 > MCF_{lump} < 1$ ,

$$\sum MB_{wp} = CP_{wp} * MCF_{lump} \text{ (second best) (4)}$$

$$\sum MB_{wp} = CP_{wp} * MCF_{gt} \text{ (third best) (5)}$$

Conditions (4) and (5) show that since MCF<sub>lump</sub> is less than unity and MCF<sub>gt</sub> (income tax and sales tax, for instance) is greater than unity, beneficiary charges and general taxes are second and third best, respectively. This is because beneficiary charges do not change the relative prices between labor supply and leisure (as income tax does) or between two goods (as sales tax does). Lower MCF reduces the marginal cost of public projects and increases the quantity of water produced, due to greater availability of funds for water projects.

### ***Willingness to pay for water and marginal cost of public funds***

Consumer preferences are the building blocks of beneficiary charges and these preferences are manifested in the choice of a menu of public services and modes of raising public funds. The marginal cost of public funds provides a working rule for choosing between taxes and beneficiary charges (on the basis of excess burden in consumption and supply of work effort that these resources entail during service delivery). Usher (2006) discusses that MCF is the

appropriate mark-up of benefit over cost for public sector projects and programs and Lui (2006) proposes that MCF should be made person specific to include distributional considerations. What is vital is that both decision makers and citizen-taxpayers have their own choices about the mode of financing the program. Nath and Purohit (1992) show that increases in income commonly result in supplemental private financing of local services when there is inadequate response by public authorities and grant substitution of own revenue sources. We explore this mindset of the citizen-voter and posit that willingness to pay for different tax-service and charge-service packages can provide useful information about the marginal cost of public funds and choice-based social welfare. It can be postulated that higher willingness to pay would reduce the marginal cost of funds from beneficiary charges and taxes because there will be a lesser dependence on distortionary taxes and loans. Moreover, consumers' willingness to pay (WTP) would have substantial impact on design of user charges and taxes.

Given that water is an input in improving efficiency of labor (L), higher willingness to pay for water through taxes or charges would imply more supply of labor. Furthermore, the benefits of user charges will be more visible than that of taxes (including property taxes) and therefore higher willingness to pay would engender a greater supply of work effort than those produced by other taxes. Symbolically,

$$\partial U / \partial wtp = \partial U / \partial L * \partial L / \partial I * \partial I / \partial t * \partial t / \partial wtp \quad (6)$$

$$(\?) \quad (+) \quad (-) \quad (+ \cdot -) \quad (+)$$

Given the condition that  $\partial I / \partial t < 0$ , beneficiary charges are welfare promoting, that is,  $\partial U / \partial wtp > 0$

subject to

- (i)  $\partial I / \partial t > 0$  for general taxes
- (ii) wtp (user charge) > average cost of water supply
- (iii) Wtp (user charge) > wtp (property tax) > wtp (tax)

It can be noted that condition (i) is satisfied for general taxes, the following two results are in order.

- (a) Condition (ii) indicates that since willingness to pay for water is higher than AC, MCF is lower than unity. This measures the impact of willingness to pay on MCF and shows that the dependence on distortionary taxes and loans for financing local water supply is close to zero at the limit.
- (b) Condition (iii) explains the impact of willingness to pay on the design of beneficiary charges vis-à-vis taxes, keeping in view the pre-existing budgetary deficits.

### ***Some Empirical Results for Water Off Budget Utility in Mauritius***

To test the above assertions, current water prices were collected and LRMC and AC estimates were computed using the budgetary data from Central Water Authority (CWA) in Mauritius.<sup>5</sup> Willingness to pay (WTP) estimates were prepared using data collected from a contingent valuation method (CVM) survey in Mauritius in 1997 in which focus group respondents were asked to reveal their willingness to pay for improved residential water supply. Whitehead (2003) empirically established that quality is a determinant of willingness to pay, but both reinforce each other. To estimate WTP, logit specifications were tested with survey data on 215 observations. Bid, income and household size are found to be statistically significant. Education, gender, location, altitude and age were found to be statistically insignificant. Focus groups were not informed about the magnitude of fiscal deficits in utility budget so that they do not get influenced by deficits and play strategies such as tactical over-responding or under-responding. Mean WTP1 and Mean WTP2 were generated using bivariate and multivariate logit models, respectively.<sup>6</sup> Information on water prices, AC and LRMC, and WTP estimates are presented in Table 8.

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<sup>5</sup> While it is easy to compute average cost of water manufacturing, we need to generate estimates of LRMC, which is more hypothetical in nature. To measure LRMC, we estimate the following AC function by integrating the learning effect (see Berndt, 1991):

$$\ln AC = \ln k' + \varphi_1 \ln n + \varphi_2 \ln y + u$$

where  $\varphi_1 = (\alpha_c/r)$  and  $\varphi_2 = (1-r)/r$ , and  $r$  is the returns to scale parameter,  $\alpha_c$  is elasticity of average costs with respect to cumulative volume,  $k'$  is a technological coefficient,  $y$  is output level and  $n$  refers to cumulative volume of water.  $r > < 1$  indicates increasing, constant and decreasing returns to scale respectively.  $\varphi_1$  is learning effect on average cost and  $\varphi_2$  is returns to scale effect on average cost. Then

$$LRMC = AC + \varphi_2 AC$$

<sup>6</sup> Econometric estimates are not reported here: see Madhoo (2007b).

Table 8: Revenue impact of residential price revisions: Mauritius

	<i>TR Domestic</i>	<i>TR (all)</i>	<i>TC</i>	<i>Surplus / Deficit</i>	<i>Surplus / Deficit</i>
	<i>Rs Mn</i>	<i>Rs Mn</i>	<i>Rs Mn</i>	<i>Rs Mn</i>	<i>Rs/m3</i>
Current water prices	273.34	358.81	528.91	-170.10	-2.01
Efficiency pricing					
AC (Rs6.25/m3)	415.88	528.91	528.91	0.00	0.00
LRMC (Rs5.60/m3)	372.62	459.66	528.91	-69.25	-0.82
WTP Estimates					
Median WTP (Rs7.55/m3)	502.38	589.41	528.91	60.50	0.72
Mean WTP1 (Rs8.31/m3)	552.95	639.98	528.91	111.07	1.31
Mean WTP2 (Rs8.80/m3)	585.55	672.58	528.91	143.67	1.70

Source: Madhoo (2007b)

The prices charged by CWA are well below efficiency prices as well as the different WTP estimates. In particular, both median and mean WTP exceed the first best AC prices. The excess of estimated WTP over AC may be attributed to a premium that households are willing to pay for improved water services. These results indicate that a uniform increase in domestic water prices to long run marginal cost or average cost levels would tally with consumer preferences.

Although the information expressed is not believed to be tactically misrepresented in the CVM survey, it would obviously be useful to improve the quality of data and inferences on willingness to pay by greater interaction with focus groups that are included in the sample. Nonetheless, this analysis shows that estimates of WTP higher than AC or LRMC indicate that higher willingness to pay among residential water consumers has the ability to reduce the marginal cost of public funds, if beneficiary charges are employed to raise funds. In other words, distortionary means of financing water utilities can be minimized in this case.

Table 9: Distribution of households by size and geographical regions  
Mauritius (1997)

Expenditure Group	Households (%)	Cumulative (%)	Average Household Size	Urban (%)	Semi- urban (%)	Rural (%)	Average Monthly Expenditure on Water
less 2,000	2.25		2.2	27.74	15.33	56.93	45.83

2000 < 5000	18.25	20.50	3.2	31.58	19.91	48.51	74.18
5000 < 7500	25.31	45.81	4.0	40.37	20.34	39.29	92.93
7500 < 10000	20.45	66.27	4.4	45.18	20.31	34.51	107.55
10000 < 15000	20.40	86.67	4.6	52.83	16.04	31.13	119.26
15000 < 20000	7.41	94.08	4.8	55.41	12.12	21.47	125.63
20000 < 30000	4.04	98.12	4.9	61.26	18.18	20.55	155.90
30000+	1.88	100.00	4.7	72.65	7.69	19.66	158.55
<b>Total</b>	100.00		4.1				

Source: .Computed from CSO, 1997, Mauritius Household Budget Survey, 1996/97.

It is pertinent to ask why Mauritian residential water users are so enthusiastic about water supply services that they are willing to pay much higher water tariffs. There are two principal reasons. First, findings from the literature reveal that setting increasing block rates (IBRs) is not a sufficient condition for achieving equity (Madhoo, 2009; 2011). Household characteristics, living patterns, metering coverage, and access to piped water supply appear to be important determinants of the success of this pricing structure. The regressive nature of IBRs is evident where income level is negatively correlated to household size or when people live in apartments with shared water connections. Mauritius is a rare country in the sense that demographic factors have dominated the water policy factors in making water tariffs more acceptable. The uncommon positive relationship between household size and income/expenditure in Mauritius (Table 9) makes IBRs more effective when progressivity in water charges is introduced. It is further unique that lifeline water prices effectively benefit low-income/low-volume users. In the absence of a positive relationship between income and household size, modifications of increasing block structure have been implemented in some developed countries to circumvent this limitation of IBRs. For instance to make IBRs effective in Barcelona (Spain), the size of the second block is linked to household size, as depicted in Table 10, thereby ensuring that the benefits of lower prices effectively reach the targeted lower income categories that are assumed to have larger families.

The impact of progressive water charges due to atypical household size pattern becomes more pronounced in a single owner occupancy dominated country such as Mauritius where about 85-90 percent of houses are owner-occupied separate structures rather than apartments. There is

thus little shared water consumption from common connections inviting increased charges. Moreover, as Table 9 shows implicit water subsidies in Mauritius benefit the rural areas inhabited mainly by relatively lower income households. The objective of passing lower prices to promote less developed areas by taxing richer and more developed areas appears to be achieved in the Mauritian context.

Table 10: Water pricing in Barcelona, Spain (1998)

	Household size	Block Size (m <sup>3</sup> per quarter)	Water charge (ptas./m <sup>3</sup> )
First block	-	0-18	44.10
Second block	1-4	18-48	89.30
	5	18-55	89.30
	6	18-66	89.30
Third block			121.80

Source: OECD (1999)

Secondly, the impact of progressive incidence of IBRs in Mauritius is further enhanced by the wide coverage of metering including rural areas (about 99 per cent of supplies are metered), and the wide coverage of the public water system which provides access to more than 90 percent of the population. While cost recovery is a major technical constraint in reaping the benefits of privatization, extensive metering of the water supply with an off-budget autonomous water board has been a demonstrated successful experiment. To sum up, increasing household size with income/expenditure, predominantly owner-occupied dwellings (not apartments) and extensive metering also covering rural areas largely explain why IBRs are effective and why consumers are willing to pay higher user charges for water in Mauritius.

## VI. Conclusions and Policy Implications

Beneficiary charges and fees have assumed a greater role in the fiscal management of sub-national governments after the current recession in the world economy. The fiscal significance of beneficiary charges has varied from very low to high, sometimes surpassing local property taxes,

in a cross section of both developed and developing countries. Local governments also have some limited experience of off budget activities like departmental as well as autonomous public utilities and episodes of partial and full scale privatization of quasi-public service delivery. These trends have gained additional significance at the sub-national level because of the hard local budget constraint due to limited local fiscal capability, stickiness in revenue sharing and fiscal austerity resulting in drastic cuts in intergovernmental and limited access to loans. While the recent fiscal awakening about beneficiary charges holds a lot of promise for local budgets, nevertheless, the constraining factors are deep rooted.

Preference revelation and service delivery go hand in hand but financing of expenditures through 'user pays' and 'beneficiary pays' routes may seem to be politically difficult. What is politically more palatable is to raise general taxes at higher levels of government and resort to revenue sharing. Centralization of revenue collection, tax earmarking and piggybacking alternatives exert a dampening impact on the growth of beneficiary charges. Intergovernmental fiscal transfers on the grounds of inter-jurisdictional spillovers are taken as an instrument of indirect cost recovery. In other words, there is a tendency to surrender the local tax base to higher levels of government. However, what is vital is that a more diversified subnational fiscal policy lacks the visibility of both service benefits and user charges and fees.

Charging user fees in public utilities should reflect the marginal cost of an additional user of the publicly provided goods or service. Since sub-national governments are suitable for providing congested public goods (compared to pure public goods), the marginal cost of providing a service will be positive and less than the average cost. Charging a positive price—say to cover average costs—may deny some consumers access to a good that provides positive benefits at some lower marginal cost. So there is a challenge in setting the right price. While the charges tend to be proportional to benefits, equity objectives need to be imbedded in these cases. Unlike other public utilities (gas, electricity, bus transport and telephone), water possesses more public good properties that may necessitate well designed circuit breakers and comprehensive voucher plans to alleviate incidence of disparate charges. The trade-off between efficiency and equity will always haunt policy makers and will test the strength of political will for financial viability of water public utilities.

In the case of quasi-public goods and public utilities, private sector involvement has increased in an effort to reduce budgetary deficits and establish feasible charges. Although our analysis does not provide more disaggregated information about off budget activities (autonomous boards) vis-à-vis privatized water public utilities, the review of literature presented here and the empirical analysis utilizing international data do not confirm that privatization has improved the cost recovery performance of water utilities. Partial privatization, however, has had some success -- for instance when water is supplied by a private water company, municipalities set charges and distribute it and collection is privatized. Private public partnerships with significant foreign direct investment in urban infrastructure have also provided some examples of good working arrangements. There seems little scope of privatization in managing administrative fees and charges payable for public goods however.

Benefit charges have the advantage of lump sum taxes that are neutral fiscal instruments with little distortionary effects on supply of labor and consumer budgets. Citizen-voter preferences are the building blocks of beneficiary charges and these preferences are manifested in a menu choice of public services and mode of raising public funds. The marginal cost of public funds provides a working rule for choosing between taxes and beneficiary charges on the basis of excess burden in consumption and supply of work effort that these resources entail during service delivery. We explore the mindset of citizen-voters by analyzing and quantifying their willingness to pay for different tax-service and charge-service packages. Higher willingness to pay through a beneficiary charge reduces the marginal cost of funds. Residents' willingness to pay in excess of the average cost of water (and much higher than marginal cost) indicates relatively lower marginal costs of public funds, presumably lower than the marginal costs of other means of finance.

We discuss a case study of water pricing policy in Mauritius to demonstrate the support of demographic and socioeconomic factors coupled with good governance in making water pricing policy effective. IBRs were designed on the basis of increasing volumetric tariffs coupled with metering, as in other countries. Both urban and rural inhabitants favored extensive and well managed metering. But these measures were not sufficient to make the water charges progressive. It is interesting to note that the support to progressive charges came from two important features of demography and socio-economy: household size increased with

income/expenditure and most households lived in owner occupied built houses (not apartments). This experience emphasizes the importance of such non-policy factors as household size, house ownership patterns and the scale of metering since these factors may substantially contribute to the design of progressive water schedules.

The weak exploitation of beneficiary charges by sub-national governments indicates that there is untapped potential of revenues from the supply of local public goods and services. From the perspective of setting the prices right, tax financing of public administration should be discouraged. Revisions of administrative fees and charges should be periodically indexed by the cost of local government or the growth of local government employment. Subnational fiscal effort versus fiscal capacity estimates and representative charge system versus optimum performance analysis can provide useful information about the fiscal potential of beneficiary charges. It may be worthwhile to conduct more willingness to pay studies to compare citizens' preferences for taxes versus user charges as alternatives to reduce budgetary deficits in public utilities. Enhanced citizen-voter participation in fiscal endeavors may also increase the ability of local governments to prepare and implement revenue generating reforms that take into account the marginal cost of alternative financing modes.

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