The Role of Tariffs in Managing Urban Water Supply and Sanitation

John J. Boland
The Johns Hopkins University
Baltimore, MD 21218
USA

Irvine, CA--19 August 2008

jboland@jhu.edu

Water Tariff

- A water tariff is the set of prices and charges for water and sanitation services
- The tariff is the means by which a water agency achieves fiscal sustainability
- Tariffs are also the principal tools for achieving certain management objectives:
  - Economic efficiency
  - Equity
  - Fairness
  - Affordability
  - Incentives for water conservation

Water Tariff (cont.)

- An “ideal” tariff would satisfy all of the various objectives
  - Also, it would be transparent, politically and socially acceptable, easy to implement, etc.
- In practice, however, there are significant conflicts
- Compromises between conflicting objectives are required
- Unfortunately, some widely accepted compromises may unnecessarily weaken the performance of water tariffs

Some Conflicts

- Examples of well-known conflicts:
  - Economic efficiency vs. fiscal sustainability (marginal cost vs. average cost pricing)
  - Equity vs. affordability (cost of service vs. ability to pay)
- We focus on the following conflict:
  - Resource conservation vs. affordability

    [Attempts to use the tariff to promote efficient use of water may increase the cost burden on low-income households; attempts to aid low-income households may reduce the incentive for efficient use of water]

Affordability vs. Efficiency

- Resource conservation
  - In order to promote water conservation, each price should equal the marginal social cost

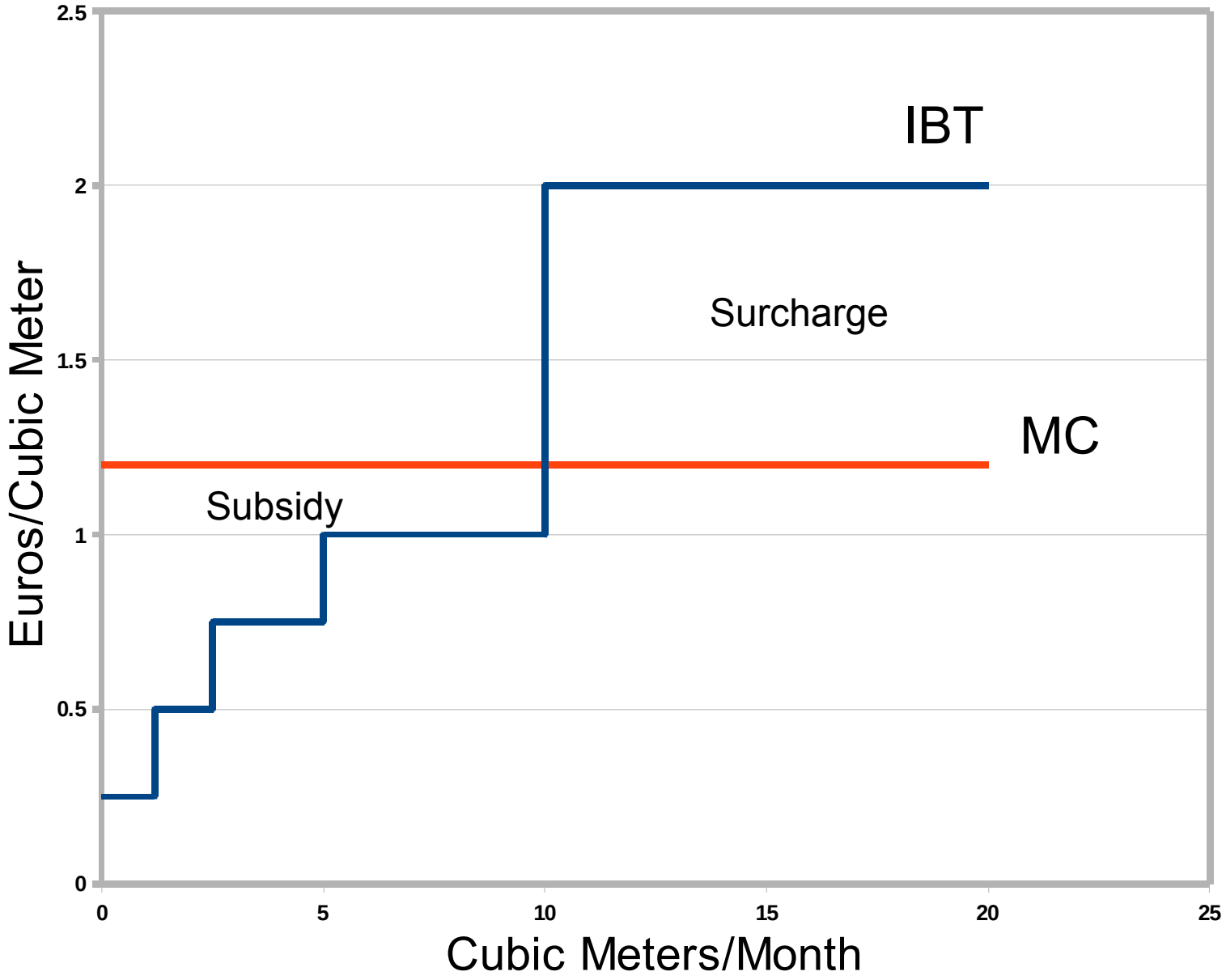
    Common sense interpretation: the correct incentive for efficient use of water is to require each user to pay to replace the water used
- Affordability
  - For social and public health reasons, assistance should be provided to those households which have difficulty in paying, or are unable to pay

    NOTE: This is a household-level problem, not a community-level problem

Affordability vs. Efficiency (cont.)

- The usual approach to this problem: adopt an increasing block tariff (IBT)
  - IBTs divide each household's monthly water use into a number of blocks (tranches), charging a different price for each block – the price increases as water use increases
  - The premise is that low-income households are low water users, so that they can purchase most or all of their water at the lowest prices
  - This is believed to subsidize low-income households while promoting conservation on the part of higher-income users

Increasing Block Tariff



IBT Critique

- IBTs do not promote water use efficiency
  - Some users face a price (at the margin) in excess of marginal cost
  - Others face a price below marginal cost
  - Therefore, some conserve too little and some too much – net effect is indeterminant
- IBTs do not provide appropriate subsidies for low-income users
  - To the extent that water use is positively correlated with income, the subsidy embedded in an IBT is limited in size and regressive with respect to income

A Better Alternative

- Uniform Tariff with Rebate (UTR)
- Example of UTR:
  - All water use: 1.2 €/cubic meter (MC)
  - Lump sum rebate: 10 €/month (could be larger; same subsidy to each targeted user)
- Compare to maximum subsidy for the IBT example shown here
  - Area marked “subsidy” = 7.14 €/month
  - IBTs produce much smaller subsidy for many
- UTR Subsidy can be targeted
  - Therefore, cost of subsidy can be less, even if subsidy is larger

A Better Alternative (cont.)

- UTR, as compared to IBT
  - Every user, regardless of size, pays a price equal to marginal social cost
    - Therefore, the conservation incentive is optimal
  - If the low-income users can be identified, the subsidy can be targeted to only those users
    - This greatly reduces the cost of the subsidy
  - Targeted users receive a fixed, non-regressive subsidy
    - This results in a low average cost of water service for these customers, although they still pay the optimal conservation price at the margin
  - UBTs are equitable and generally considered fair

Conclusions

- Properly designed water tariffs serve multiple, socially important objectives
- Many tariffs are not properly designed, failing to reasonably achieve one or more objectives
- Affordability is commonly invoked as a reason for adopting tariffs that are not fiscally sustainable, or that fail to achieve other objectives
- Since affordability is a household problem and not a community problem, there is no reason for affordability to conflict with fiscal sustainability

Conclusions (cont.)

- Where IBTs have been adopted in the name of affordability:
  - There are unnecessary conflicts with most other tariff objectives
  - Resulting subsidies are limited and regressive
- It is possible to design tariffs that promote household-level affordability (targeted or untargeted) but are still consistent with economic efficiency, resource conservation, equity, fairness, and fiscal sustainability
  - One method: uniform tariff with rebate (UTR)