

MUNICIPAL CHARGES IN GREECE AS A TOOL FOR WASTE CHARGING: A STATISTICAL ANALYSIS OF POSSIBLE CORRELATIONS WITH THE POPULATION AND THE NUMBER OF HOUSEHOLDS IN MUNICIPALITIES

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EXTENDED ABSTRACT

This paper presents the results from an analysis of municipal charges and the related waste-charging system in Greece, since the fees paid by municipal waste producers to the municipal authorities are included in these charges and constitute a major part of them. The term “waste-charging system” refers to the calculation and billing systems used for the cost recovery of waste services, as well as to the pricing model of waste generation. Specifically, the results of a statistical analysis on municipal charges and related data, based on the flat-rate system, are presented. Aim is to determine whether the local authorities are following specific policies in municipal waste charging and which are the factors that formulate these policies and influence municipal councils in the formulation of the level of these charges. The study included 341 Hellenic municipalities, which concentrated appr. 62% of the overall population in the country. The sample was divided in 5 classes (A-E) according to the population and in 4 classes (I-IV) according to the number of households. The variability of municipal charges (charging coefficients for residences - C_r - and stores - C_s) was studied according to the population and the number of households, both constituting important factors that affect the production of municipal solid wastes and the resulting costs. For statistical reasons, a range control was performed. Two limits of this range control were defined for 95%-confidence (i.e. 2-sigma control), i.e. an Upper (UCL) and a Lower Control Limit (LCL), as follows: $UCL = \bar{X} + 2S$, $LCL = \bar{X} - 2S$ (if $LCL < 0$ then $LCL = 0$), where: \bar{X} : Average value of C_r (or C_s) in each class, S : Standard deviation of the values within each class. It is evident that the charging coefficients for municipal charges (both for residences and stores) increase with the size of the municipality. This increase is more evident in the case of stores, when compared to residences (households), i.e. C_s increases much more abruptly than C_r , as the size of the municipality increases, for both class divisions. It was observed that, in both class divisions, C_r and C_s present a wider range of values in the case of small municipalities than in the case of large ones. This indicates that the charging policy is more variable and volatile in small municipalities than in large ones, both for residences and for stores. Furthermore, in each and every class, C_s has a larger range of values than C_r , which indicates that the charging policy for stores is generally more volatile than for residences. Some municipalities were found to have charging coefficients with values outside the 2-sigma control limits (‘outliers’). These municipalities were mostly of small size (classes: A, B, I and II). The higher the population (or the number of households), the fewer the cases of outliers, whereas almost all outliers charged extremely high and most of them belonged to class A and or I. Finally, cases of excessive charging to stores were analysed and suggestions for further research were compiled and discussed.

Keywords: Waste Charges, Municipalities, Statistical Correlations, Outliers.