

# The GREAt rates fix

## Grant Related Expenditure Assessment and the Personal Social Services

One of the most important uses of statistical analysis in government is the methodology involved in computing Grant Related Expenditure Assessment (GRE.). Although it plays a major part in central government's control of local government finance, the rationale behind the computation of GREA is shrouded in mystery. This note attempts to summarise the basis for the part of GREA which relates to personal social services.

For many years the Rate Support Grant (from central government to local authorities) has been distributed on the basis of some measure of the comparative needs of local authorities. Before the major expansion of personal social services in the 1970's, fairly straight-forward indicators, such as the numbers of school children and miles of highway, were used. However in 1974 it was decided that a multiple regression analyses should be undertaken with respect to the "needs" element of the Rate Support Grant. The method was complex but basically involved a multiple regression analysis of the expenditure of authorities against various variables, most of which were derived from the national census. This regression equation was then used to predict the needs of each authority. However, since authorities who provided high levels of service tended to be rather similar in social structure, there was a danger of spurious relationships occurring. This led with political intervention in deciding which variables should and should not be included in the analyses (Jackman and Sellers, 1977). Dissatisfaction with this approach eventually led to changes in the whole basis of the computation, and a new method has been used since 1981/82.

This new method involves the computation for each local authority of its Grant Related Expenditure Assessment (GREA). It is claimed by central government (Local Government Finance Grants Working Group, 1985) that "for a particular authority [this] is an objective assessment of how much it would cost that authority to provide a common standard of service, having regard to its circumstances and responsibilities". In addition to being used in distributing the Rate Support grant, GREA is also used in determining penalties for local authorities which "overspend". It is presumably also used in the clandestine logic behind rate-capping. The GREA for an authority is built up from components which relate to the various functions of the authority, such as personal social services.

The component of GREA relating to personal social services is itself built up from elements corresponding to various client groups. The most sophisticated methodology is used for two client groups, children under five and the elderly, and appears to be as follows. For each of these client groups, a definition of what constitutes a person in need has been constructed (in fact there are two categories of need for the elderly). Unfortunately the definitions involve variables which are not available at the level of social services authorities (i.e. London boroughs, metropolitan districts and non-metropolitan counties). It was therefore necessary to develop predictive equations which relate whether or not a person is in need, as the dependent variable, to various items of census data, as the explanatory variables. These predictive equations were obtained from multiple linear regression analyses using data from surveys covering both the variables involved in the definition of need and variables occurring in the national census. The dependent variable was binary, indicating whether or not a person was in need, and the explanatory variables were those available from the census. It is then possible to use these equations with census data to predict the numbers of people in need in each local authority. The number of places required for each different service (such as day nursery places) is then obtained by distributing the number of places available for England between authorities in proportion to the estimated number of people in need.

As a separate exercise, estimates are made of the unit cost for an authority of providing each service. Again predictive equations have been obtained from regression analysis. Here a single explanatory variable was used. This is a social index of deprivation derived from a factor analyses of various items of census data. The predictive equation for the unit cost of each service was obtained by applying linear regression analysis to data of unit costs (after correction for the high costs in and near London) of social services authorities, as a dependent variable, and the values of the social index for these authorities, as an explanatory variable.

The contribution to GREA corresponding to a particular service is obtained by multiplying the estimated number of places which an authority requires by the estimated unit cost of the service. This is then adjusted so that the total cost for the whole country for each client group corresponds to a level of expenditure previously determined by central government. The GREA with respect to personal social services is obtained by adding up the various elements corresponding to the various services for the various client groups.

Linear regression provides a very poor statistical model for the predictive equations involved in the computation. This method is inappropriate for estimating whether or not a person is in need, on the basis of census data, because of the binary nature of the dependent variable and its very variable variance. In the regression analyses for unit costs, the use of a composite social index (derived from a largely irrelevant factor analysis) as an explanatory variable helps to produce equations with poor explanatory power. The effects of these inadequacies in the statistical models are not random;

they result in biases towards the mean. In other words, need is under-estimated where it is high and over-estimated where it is low. It is possible to make some estimate of the effect of the bias in the case of children under five, on the basis of information at regional level provided for the Local Government Finance Grants Working Group (1983). The following data relating to the survey which provided data for the regression analysis of need for children under five (Bone, 1977) can be extracted. The table shows the actual numbers of children under five meeting the definition of need in three groups of regions, and the numbers of children predicted according to the predictive equation used in the 1983/4 version of GREA.

	<u>Actual</u>	<u>Predicted</u>
South East	19	24.7
Rest of England:		
1. Not urban - Regions with less than half population in metro. counties	19	19.7
2. Urban - Regions with more than half population in metro. counties	31	26.1
England Total	69	70.5

From these figures the best estimate of the correction needed for a typical authority from the urban regions, so that its assessment is on the same basis as the assessment of a typical authority in the South East, is provided by multiplying by  $(31/26.1) \times (24.7/19) = 1.54$ , or adding 54%. Because of the very small sample used in the regression analysis, this estimate of bias will itself be liable to considerable error. However it gives some indication of the bias against urban areas in the GREA methodology. It should be noted that the whole of inner London constitutes less than 15% of the South East Region. The great bias against the deprived areas of central London is therefore completely swamped by the opposite bias of the surrounding areas of privilege.

References:

Bone M. (1977) Pre-school children and the need for day care. HMSO.

Jackman and Sellers (1977) The distribution of RSC: the hows and whys of the new needs formula. Centre for Environmental Studies Review 1-19-30.

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This paper was submitted by a member of the Rate Support Grant Subgroup.