

Effect of Grouping of Observations on Co-efficient of Determination in Engel Curve Analysis

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1. INTRODUCTION

In Engel curve analysis, it is not uncommon to obtain regression of mean consumption on mean income (usually total expenditure) instead of corresponding variables or their appropriate transformations for individual households. This approach is followed because micro-level individual households data are either not available or even when available cost involved in processing these is too high to warrant their use in Engel curve analysis. These considerations notwithstanding a macro-Engel curve derived from grouped data cannot *prima facie* be treated equivalent to or as a substitute for micro-Engel curve estimable from individual households data to capture the underlying behaviour of a typical consumer with variable income, other things remaining unchanged. This is because certain regularities not present in original ungrouped data tend to get built into macro data due to grouping and some definite results at macro level embodied therein, which do not hold good in the case of former data, follow. And it will, therefore, be fallacious to use and apply these macro regularities and results which are in the nature tautologies, implicit as these are in the very process of aggregation, for analysing and interpreting micro-level phenomenon represented by original ungrouped data.

It is known that under usual conditions of family budget data grouping overstates predictive power of income as measured in terms of coefficient of determination (Prais and Aitchison, 1954 and Cramer, 1964). But what is the extent of overstatement in coefficient of determination in the case of models commonly articulated in Engle-curve analysis is, however, not known. The precise object of this paper is to formulate and develop such models just to answer this question. To this end, first a bivariate normal population model has been adopted, which implies that regression of consumption on income is linear and that income is normally distributed.