Estimating Consumer Demand with Missing Expenditure Data

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The response of consumer demand to prices, income, and other characteristics is important for a range of policy issues. Naturally, the level of detail for which consumer behaviour can be estimated depends on the level of disaggregation of the available data. However, it is often the case that the available data is differently aggregated in different time periods, with the information available in later time periods usually being more detailed. The applied researcher is thus faced with choosing between detail, in which case the more highly aggregated data is ignored; or duration, in which case the data must be aggregated up to the "lowest common denominator". Furthermore, since parametric demand systems invariably involve a large number of parameters, with the number increasing at least linearly with the number of expenditure categories, it may well be that only the second option is feasible. That is, there is simply not enough data available at the finer aggregation level for the chosen model to be estimated.

This paper develops a specification/estimation technique that exploits the entire information content of a variably-aggregated data set. The technique is based on the observation that the more highly aggregated data does in fact contain information on the finer subcategories: viz, the sum of certain subcategory expenditures is observed. It is thus possible, under certain simplifying assumptions, to write down, and maximize, the likelihood of the observed data as a function of the parameters of the chosen model written for the finest available level of disaggregation. The technique is applied to an ABS dataset containing historical information relating to private final consumption expenditures on up to 18 commodities, and found to be feasible for both the LES and AIDS.

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