2.4. Interpretation of results

It is perhaps not surprising that authors who finally surmounted the obstacles in the way of estimating systems of demand equations should have professed themselves satisfied with their hard won results. Mountaineers are not known for criticising the view from the summit. And certainly, models such as the linear expenditure system, or which embody comparably strong assumptions, yield very high R^2 statistics for expenditures or quantities with (-values that are usually closer to 10 than to unity. Although there are an almost infinite number of studies using the linear expenditure system from which to illustrate, almost certainly the most comprehensive is that by Lluch, Powell and Williams (1977) who fit the model (or a variant) to data from 17 developed and developing countries using an eightfold disaggregation of commodities. Of the 134 R^2 statistics reported (for 2 countries 2 of the groups were combined) 40 are greater than 0.99, 104 are greater than 0.95 and only 14 are below 0.90. (Table 3.9 p. 49). The parameter estimates nearly all "look sensible" and conform to theoretical restrictions, i.e. marginal propensities to consume are positive yielding, in the case of the linear expenditure system, a symmetric negative semi-definite Siutsky matrix. However, as is almost invariably the case with the linear expenditure system, the estimated residuals display substantial positive autocorrelation. Table 3.10 in Lluch, Powell and Williams displays Durbin--Watson statistics for all countries and commodities: of the 134 ratios, 60 are less than 1.0 and only 15 are greater than 2.0. Very similar results were found in my own, Deaton (1975a), application of the linear expenditure system to disaggregated expenditures in post-war Britain. Such results suggest that the explanatory power of the model reflects merely the common upward time trends in individual and total expenditures. The estimated $ parameters in (33), the marginal propensities to consume, will nevertheless be sensible, since the model can hardly fail to reflect the way in which individual expenditures evolve relative to their sum over the sample as a whole. Obtaining sensible estimates of marginal propensities to spend on time-series data is not an onerous task. Nevertheless, the model singularly fails to account for variations around trend, the high R^2 statistics could be similarly obtained by replacing total expenditure by virtually any trending variable, and the t-values are likely to be grossly overestimated in the presence of the very severe autocorrelation, sec, e.g. Malinvaud (1970, pp. 521-2) and Granger and Newbold (1974). In such circumstances, the model is almost certainly a very poor approximation to whatever process actually generated the data and should be abandoned in favor of more appropriate alternatives_ It makes little sense to "treat" the autocorrelation by transforming the residuals by a Cochrane—Orcutt type technique, either based on (44) with a common parameter, or using a full vector autoregressive specification. [See Hendry (1980) for some of the consequences of trying to do so in similar situations.]