it is appropriate that they should be generalised inverses of one another. For example, using 7 to denote the vector of price or quantity partial derivatives, (9) and (26) combine to yield

$$q \quad \{u, 7d (u, Vre(u, p))). \tag{28}$$

Hence, differentiating with respect to *p/x* and repeatedly applying the chain rule, we obtain at once

$$S^* = S^*AS^* \tag{29}$$

Similarly,

$$AS^*A, \tag{30}$$

where $S^* = xS$. Note that the homogeneity restrictions imply $Aq = S^*p = 0$ which together with (29) and (30) complete the characterization as generalized inverses. These relationships also allow passage from one type of demand function to another so that the Slutsky matrix can be calculated from estimates of indirect demand functions while the Antonelli matrix may be calculated from the usual demands. The explicit formula for the latter is easily shown to be

$$A = (xS + qq^1)^1 — x^{-2}pp', \tag{31}$$

with primes denoting transposition, see Deaton (1981a). The Antonelli matrix has important applications in measuring quantity index numbers, see, e.g. Diewert (1981, 1983) and in optimal tax theory, see Deaton (1981a). Formula (31) allows its calculation from an estimate of the Slutsky matrix.

This brief review of the theory is sufficient to permit discussion of a good deal of the empirical work in the literature. Logically, questions of aggregation and separability ought to be treated first, but since they are not required for an understanding of what follows, 1 shall postpone their discussion to Section 4.

2. Naive demand analysis

Following Stone's first empirical application of the linear expenditure system in 1954, a good deal of attention was given in the subsequent literature to the problems involved in estimating complete, and generally nonlinear, systems of demand equations. Although the issues are now reasonably well understood, they deserve brief review. I shall use the linear expenditure system as representative of