Pollak and Wales (1981) call the addition of fixed costs "demographic translating" as opposed to "demographic scaling" of the Barten model; the Gorman model (99) thus combines translating and scaling. In their paper, Pollak and Wales test various specifications of translating and scaling. Their results are not decisive but tend to support scaling; with little additional explanatory power from translating Once scaling has been allowed for. Note, however, that the translating term in (99) might itself form the starting point for the modelling, just as did the multiplicative term in the Engel model. If the scaling terms in (99) are dropped, so that p replaces p^*, and if it is recognized that the child cost term $p \cdot y(a^h)$ is likely to be zero for certain "adult" goods, then for i an adult good, we have

(101)

independent of a^h. For all such goods, additional children exert only income effects, a proposition that can be straightforwardly tested by comparing the ratios of child to income derivatives across goods, while families with the same outlay on adult goods can be identified as having the same welfare level. This is the model first proposed by Rothbarth (1943) and later implemented by Henderson (1949-50a) (1949-50b) and Nicholson (1949), see also Cramer (1969). Deaton and Muellbauer (1983) have recently tried to reestablish it as a simply implemented model that is superior to the Engel formulation for applications where computational complexity is a problem.

3.3. Zero expenditures and other problems

In microeconomic data on consumers expenditure, it is frequently the case that some units do not purchase some of the commodities, alcohol and tobacco being the standard examples. This is of course entirely consistent with the theory of consumer behavior; for example, two goods (varieties) may be very close to being perfect substitutes so that (sub) utility for the two might be

$$u = avh + a_2 q_2, \qquad (102)$$

so that, if outlay is x, the demand functions are

$$q_i = x,/p, \quad \text{if } Pi/Pi < ai/ai$$
$$=0 \quad \text{otherwise}, \qquad (103)$$

for $i, j = 1,2$ and for $p_1 a_2 \pm p_2 a_1$. It is not difficult to design more complex (and more realistic) models along similar lines. For a single commodity, many of these