which yields

$$F = (I - ew^1)\, M. \qquad (98)$$

Once again $(I\ ew')$ is singular, and the identification problem recurs. Here price information is likely to be of less help since, with Leontief preferences, prices have only income effects. Even so, it is not difficult to construct Prais—Houthakker models which identified given sufficient variation in prices.

Since Prais and Houthakker, the model has nevertheless been used on a number of occasions, e.g by Singh (1972), (1973), Singh and Nagar (1973), and McClements (1977) and it is unclear how identification was obtained in these studies. The use of a double logarithmic formulation for *f,* helps; as is well-known, such a function cannot add up even *locally,* see Willig (1976), Varian (1978), and Deaton and Muellbauer (1980a, pp 19-20) so that the singularity arguments given above cannot be used. Nevertheless, it seems unwise to rely upon a clear misspecification to identify the parameters of the model. Coondoo (1975) has proposed using an assumed independence of m_0 on x as an identifying restriction; this is ingenious but, unfortunately, turns out to be inconsistent with the model. There are a number of other possible means of identification, see Muellbauer (1980), but essentially the only practical method is the obvious one of assuming a priori a value for one of the m_i's. By this means, the model can be estimated and its results compared with those of the Barten model. Some results for British data are given in Muellbauer (1977) (1980) and are summarized in Deaton and Muellbauer (1980a, pp 202-5). In brief, these suggest that each model is rather extreme, the Prais—Houthakker with its complete lack of substitution and the Barten with its synchronous equivalence of demographic and price substitution effects. If both models are normalized to have the same food scale, the Prais—Houthakker model also tends to generate the higher scales for other goods since, unless the income effects are very large, virtually all variations with composition must be ascribed directly to the ra_t's. The Barten scales are more plausible but evidence suggests that price effects and demographic effects are not linked as simply as is suggested by (93).

Gorman (1976) has proposed an extension to (90) which appears appropriate in the light of this evidence. In addition to the Barten substitution responses he adds fixed costs of children $\bar{y}_i(a^h)$ say; hence (90) becomes

$$e^l(u^h, p, a^h) = p\text{-}7(a^h) + c(u^h, p^*), \qquad (99)$$

with (94) retained as before. Clearly, (99) generates demands of the form

$$1,011 + g_i(x^h - p\cdot),(a^h), p^*). \qquad (100)$$