convenient point, i.e.

$$\text{dq}, = h_{i0} + h,du + \text{Es}_{\text{u}}\text{cip}_{\text{i}}. \tag{56}$$

But from (10) and (14)

$$\text{dlnu} = (\text{dlnx- Ew}_{\text{k}}\text{dinp}_{\text{k}}\text{HaInc/dlnur'}, \tag{57}$$

so that writing dq,= *g,* din *q,* and multiplying (56) by $p_{;}$ */x,* the approximation becomes

$$\text{w•dinp)+Ec}_{\text{ii}}\text{dlnp}_{\text{i}}, \tag{58}$$

where

$$a_e\text{- } p_e h,_o/x$$

$$\frac{up,h\bullet}{} \;(alnc)^{-1}$$

$$ag_e \tag{59}$$

$$b_e = x' \,\text{In}\, u \qquad = P'\,ax$$

$$Ci1 = PisiiPj/x\text{-}$$

Eq. (58), with ti_e*,* *b,* and c_{ij} parametrized, is the *Rotterdam* system of Barten (1966), (1967), (1969) and Theil (1965), (1975b), (1976), It clearly offers a local first-order approximation to the underlying relationship between q, *x* and *p.*

There is, of course, no guarantee that a function *h,(u, p)* exists which has a, *b,* and c_{1j} constant. Indeed, if it did, Young's theorem gives $h_{uej} = h_{ue},$ which, from (59), is easily seen to hold only if $c_{if} =$ - $b_i b)$*.* If imposed, this restriction would remove the system's ability to act as a flexible functional form. (In fact, the restriction implies unitary total expenditure and own-price elasticities). Contrary to assertions by Phlips (1974, 1983), Yoshihara (1969), Jorgenson and Lau (1976) and others, this only implies that it is not sensible to impose the restriction; it does not affect the usefulness of (58) for approximation and study of the true demands via the approximation, see also Barten (1977) and Barnett (1979b).

Flexible functional forms can also be constructed by approximating *preferences* rather than demands. By Shephard's Lemma, an order of approximation in prices (or quantities)-but *not* in utility-is lost by passing from preferences to demands, so that in order to guarantee a first-order linear approximation in the latter, *second-order* approximation must be guaranteed in preferences. Beyond