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COMMITTEE ON COMMODITY PROBLEMS

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A DEMAND ANALYSIS FOR THE TEA MARKET - APPENDIX I

Starting from a specific cost function, the AIDS model gives the share equations in an n-good system as:

$$w_{it} = a_i + \sum_j^n \gamma_{ij}\, lnp_{jt} + \beta_i ln\left(\frac{X_t}{P_t}\right) + u_{it} \qquad i=1,....,n \qquad (1)$$

and where, in observation t;

w_{it} is the budget (expenditure) share of the i^{th} good;

p_{jt} is the nominal price of the j^{th} *good*;

$\ln X_t$ is total expenditure;

u_{it} is the random or error term; and

$\ln P_t$ is the translog price index defined by:

$$lnP_t = a_0 + \sum_j a_j\, lnp_j + \frac{1}{2}\sum_i^n \sum_j^n \gamma_{it}\, lnp_i lnp_j \qquad t=1,......,T \qquad (2)$$

This price index makes the system non-linear, which normally complicates the estimation process. In order to overcome this problem, Deaton and Meulbauer (1980) suggest using another linear price index, namely the Stone price index:

$$logP = \sum_{i=1}^n w_{it}\, logp_{it} \qquad (3)$$

Eales & Unnevehr (1988) showed that the substitution of the Stone's price index for the translog price index causes a simultaneity problem, because the dependent variable (w_{it}) also appears on the right-hand side of the LA/AIDS. They suggested using the lagged share ($w_{i, t-1}$) for Equation 3. Replacement of equation 3 with the lagged shares into Equation 1 yields the LA/AIDS, given by:

$$\boldsymbol{w_{it} = a_i + \sum_j^n \gamma_{ij}\, lnp_{jt} + \beta_\iota(lnX - \sum_{i=1}^n w_{it} logp_{it}) + u_{\iota t}} \quad (4)$$

Equation 4 is applied to the empirical data and the estimated parameters were used to calculate the required elasticities.

Compensated and uncompensated elasticities were calculated by using the formulas reported by Jung (2000) as shown in Equations 5 and 6 respectively:

$$\boldsymbol{e^*_{i,t} = e_{it} + \overline{w} + \widehat{\beta}\left(\frac{\overline{w}_j}{\overline{w}_i}\right) = -\delta_{ij} + \frac{\widehat{\gamma}_{it}}{\widehat{w}_t} + w_j} \qquad \text{i,j=1,2,.....,n} \quad (5)$$

$$\boldsymbol{e_{i,t} = -\delta_{ij} + \frac{\widehat{\gamma}_{it}}{\overline{w}_t} - \beta_t(\frac{\overline{w}_j}{\overline{w}_i})} \quad (6)$$

Where δ=1 for $i=j$ and δ=0 otherwise. The average expenditure shares are represented by $\boldsymbol{\overline{w}_t}$ whereas, $\boldsymbol{\widehat{\beta}_t}$ and $\boldsymbol{\widehat{\gamma}_{it}}$ are estimates from the LA/AIDS model.

The formula used to calculate the expenditure elasticities can be written as:

$$\boldsymbol{n_i = 1 + \frac{\widehat{\beta}_\iota}{\overline{w}_i}} \quad (7)$$