to much greater (small-sample) inefficiency than is actually obtainable. Indeed it may well be that estimation techniques which do not depend on estimating 12 will give better estimates in such situations. One possibility is the minimization of the *trace* of the matrix on the right-hand side of (48) rather than its *determinant* as required by FIML. This is equivalent to (non-linear) least squares applied to the sum of the residual sums of squares over each equation and can be shown to be ML if (the true) 12= a^2(/ - *ii')* for some a^2, see Deaton (1975a, p. 39). There is some general evidence that such methods can dominate SURE and F1ML in small samples, see again Srivastava and Dwivedi (1979). Fiebig and Theil (1983) and Theil and Rosalsky (1984) have carried out Monte Carlo simulations of symmetry constrained linear systems, i.e. with estimators of the form (52). The system used has 8 commodities, 15 observations and 9 explanatory variables so that their estimate of 12 from (50) based on the unconstrained regressions is singular. Fiebig and Theil find that replacing *52* by 12 yielded "estimates with greatly reduced efficiency and standard errors which considerably underestimate the true variability of these estimates". A number of alternative specifications for were examined and Theil and Rosalsky found good performance in terms of MSE for Deaton's (1975a) specification 12 = 43^2(f) - *vv')* where v is the sample mean of the vector of budget shares and U is the diagonal matrix of u's. Their results also give useful information on procedures for evaluating standard errors. Define the matrix A(X), element a,$_1$ by

$$a\,j(^2) = \text{E E}_{,\ 1\,k}\ ak \quad fs \quad , \tag{53}$$

where a^{k1} is the *(k, 1)th element* of 2:$^{-1}$, so that (*A(12))* ^{1} is the conventionally used (asymptotic) variance-covariance matrix of the FIML estimates $ from (47). Define also *B(E,12)* by

$$d \quad br \quad 0)=\text{EEEEE}_{as:,}^{tklmn} f,\text{nrrr}\ df,., \ 63_{imu}\ as: \tag{54}$$

Hence, if *13** is estimated from (47) using some assumed variance-covariance matrix 12 say (as in the experiments reported above), then the variance-covariance matrix *V** is given by

$$v^* = AO2)B(fj,s2)A(D). \tag{55}$$

Fiebig and Theirs experiments suggest good performance if *Si in B(12, Si)* is replaced by 12· from (48).