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TITLE: AN APPLICATION OF EM ALGORITHM TO ANALYSE AND FORECAST LONG-RUN I-O COEFFICIENT CHANGES

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ABSTRACT:

In this paper, the analogy between the set of demand coefficients of a closed Leontief model and the transition probabilities matrix of a Markov chain is used to analyse the long-run determinants of I-O coefficient changes. It is assumed that the dynamics of the demand coefficients can be represented by a multinomial logistic function, parametrized in terms of time and of the gross output of the input sector. It is also assumed that gross outputs by sector are generated by AR(p) processes. Under these assumptions, by applying the EM algorithm, it is possible to produce Bayesian estimates of long-run input and demand coefficients, as well as estimates of the corresponding long-run inter-sectoral flows and of their variance-covariance matrix. This is also possible when the time series of the available I-O tables is not complete, i.e. when some observations are missing. As an example, this methodology is applied to the time series of 42 yearly, constant price I-O tables for the Italian economy, estimated by G. Rampa (Economic Systems Research, 20,3, 259-276), aggregated at a four sector level. The estimated long-run values of I-O coefficients and the corresponding information matrix are then used to produce GLS estimates of quarterly, four-sector I-O tables, as in Antonello, P. (1990) (Economics Systems Research, 2, 2, 157-171).