A new approach to updating SAMs

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A New Approach to Updating SAMs[1]

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October 1995

SOM theme C: Coordination and Stabilization of Economic Systems
SOM theme D: Structural Change and Long-term Development

Keywords: Nonsurvey updating techniques, RAS method, Social Accounting Matrix

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Abstract: Especially in developing countries the last few decades have witnessed a rising popularity of analysing macro-economic policy measures with Computable General Equilibrium (CGE) models. This increasing popularity has caused a rising demand for up-to-date Social Accounting Matrices (SAM), which form the main source of data for CGE models. Because most researchers' primary interest is analysis with the CGE model, only little time is left to work on the building of the SAM. Especially if we realize that it takes a national statistics office about half a decade to finalise a SAM, it is understandable that most researches take refuge in the updating of old SAMs using a nonsurvey technique with only fragmentary new data.

During the last three decades a consensus has been reached, at least among Input-Output researchers, on using the RAS method to update SAMs. However, the updating of SAMs with only fragmentary new data often leads to situations in which the new column and row totals are not all known in advance. Also, the overall total of all matrix entries may not be known. This leads to a situation in which the updating problem becomes unconstrained as there are more degrees of freedom than constraints. It is obvious that in such a situation the RAS method cannot be used, as an unconstrained updating problem will lead to unreliable results.

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[1] The author wishes to thank M. van den Berg, H. Dietzenbacher, B. Lensink, J. van der Linden, J. Oosterhaven, C. van Wesenbeeck and especially H. Löfgren for valuable comments on earlier drafts of this paper.

To solve this problem a general version of the RAS method based on information theory is developed in this paper. This method, which includes the RAS method as a special case, is more flexible in its demand for necessary information and can be used in cases which would be unconstrained if the RAS method is applied. This method can be applied even in the theoretical situation where only one new matrix entry is known in advance. New information can be added to the updating process in the form of restrictions with the only limitation that restrictions should not be contradictory. The method simply minimizes the `surprise' of changes in the matrix given its old structure.

All additional information can be added as a restriction to the minimisation procedure. In this paper it is proved that the minimum indeed exists, if at least one binding constrained is added to the minimisation process. To find the optimal solution a mathematical computer program like GAMS may be used, making the method easy to apply.