Dynamic Social Accounting Matrix: Methodology

Topic: Innovative SAM Structures
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Background The Dynamic Social Accounting Matrix (DySAM) is a consistent inter-temporal economic framework developed within a research and consulting group . It has been used in-house for country analysis and policy support. Since 2009 the DySAM is being used by the International Labour Organization (ILO) which has a long tradition in the development and use of employment impact assessment methodologies and has, for many decades, been using static Input-Output Tables and static Social Accounting Matrices. The Dynamic Social Accounting Matrix described here is a logical development of this tool set. The approach is Bayesian. ILO has supported the development of DySAMâ€™s in Indonesia, Mozambique, South Africa and Malaysia. Using the estimated DySAM matrices within sequential SAM models generates a useful set of over-time indicators (multipliers and linkages) for policy support. Country DySAMâ€™s have anchored policy applications such as the quantification of employment-investment links and more recently also green jobs, structural activity shifts (â€˜brownâ€™ to â€˜greenâ€™) and economy-wide projections. The DySAM methodology is now mature for publication and dissemination.

Data: The data requirements for constructing a DySAM are SNA macroeconomic time series data for a reference period (usually 8 to 10 years); vector time series on supply and demand components (like intermediate use, gross value added, and private consumption); a balanced static social accounting matrix (SAM) at least for one year within the reference period.

Methodology: There are usually four steps in constructing a consistent DySAM.
Step 1 ensure the consistency of input data. SNA macroeconomic time series data usually reveal inconsistencies between aggregate supply and demand, as well as, between receipts and outlays of other accounts (e.g. government budget, BoP etc.). These inconsistencies are corrected and a series of consistent national accounting matrices (NAM) are estimated. This is done in consultation with the country (data producers) and the use of placeholders where necessary.
Step 2 raise the static SAM by the NAM time series which are the macro controls and further restrict by sector time series (vector controls) where applicable. This generates a sequence of SAMs that are balanced at the macro level but are unbalanced at the interior sectoral account levels nesting within the corresponding macros.
The next task is to remove the meso-level inconsistencies or errors. Two iterative computations are initiated.
Step 3 (SPD) balance the commodity-activity blocks by initializing an iterative sequence of demand-side adjustments with supply anchors, a key assumption being that supply is historically more robustly estimated than demand.
Step 4 (RAS) submatrix rebalancing which ensures the balance of component sub-matrices in accounts . If a single invocation of the RAS does not converge a network of RAS subroutines has been effective in establishing convergence.

The above methodology has worked in all countries where it has been applied. It is sensitive to the structure of the observed SAM layout which differ across countries and has to be used accordingly.Finally, the consistent DySAM matrices have been used to build sequential SAM models. The solution of the DySAM models provides dynamic multipliers and linkage estimates for endogenous accounts. Counter-factual as well as forward-looking simulations may be carried out with the DySAM models and extended by attaching satellites, such as employment and emissions.