

Using the Regional Social Accounting Matrix to Forecast Household Expenditures: a Fuzzy Approach

Topic: Input-Output Analysis under Fuzziness, Uncertainty, and Bootstrapping

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Many techniques are available for updating Social Accounting Matrices (SAMs), which tend to have households as an overriding feature. Here we use a semi-qualitative approach that is based on the fuzzy set theory. Expert-provided Likert estimates of interindustry relationships are converted to quantitative ranges to update direct input-output coefficients, which are at the core of SAMs. The resulting fuzzy SAM is subsequently used to estimate the impacts of different exogenous factors—such as the final demand, value added, and institutional income—on the composition of household expenditures.

Our fuzzy approach for estimating impacts on household expenditures constitutes the following steps: (1) fuzzify the direct coefficients matrix (replacing each element by its fuzzy analogue); (2) estimate the fuzzy influence of exogenous factors on output, in particular, household incomes; (3) calculate fuzzy household spending from changes in household incomes; (4) compare fuzzy results with corresponding results from the classical approach.

We use a 57-industry 2010 SAM for New Jersey. The difference in estimates between the fuzzy and classical approaches on output does not exceed 0.044%. This suggests the fuzzy approach is a technically efficient and promising way to update tables.