Aggregation bias: An experiment with input-output data of Canada

Topic: Bias and estimation methods in input-output tables
Author: Debesh Chakraborty
Co-Authors: K. Mukhopadhyay, P. Thomassin

The Problem of aggregation in the input-output analysis is an important issue. Aggregation can be defined as a process of operation by which detailed sectors are consolidated into broad sectors, thus reducing the total number of original sectors, no doubt, serves certain purposes. However, the gains obtained from consolidation have to be weighted against the disadvantages (for example, an increase in errors, loss of information of the original sectors) due to aggregation.

Since the early 1950s considerable attention has been given in the literature to formulate aggregation criteria and measure the effects of aggregation of sectors in input-output models. A large amount of theoretical and empirical work has been done to find good aggregation. The present paper examines several measures of the bias or error introduced by aggregation in input-output model. The paper uses the input-output table of Canada for the year 2003 as an example to measure the basis effects of aggregation.

Originally the use and make table of Canada consists of 697 commodities, 16 primary inputs, 286 industries, and 168 final demand categories at worksheet level. For the purpose of the aggregation error study, we have aggregated 697 commodities into 125 including 25 detail agricultural commodities. 16 primary inputs have been aggregated to 11. Like commodities, the scheme of detailed agricultural sector has also been applied to industry aggregation in make and use table of Canada. The industries are aggregated to 84 from 286, and final demand to 7 categories from 168 including private consumption, investment, change in stock, govt. expenditure, export, re-export and import. Thus use matrix consists of 125 commodities and 84 industries, 11 primary inputs and 7 final demand categories; and make matrix consists of 84 industries and 125 commodities. Next the paper estimates the bias due to the aggregation scheme in the input-output table of Canada.

The results show that the estimation of the bias due to the aggregation of input-output table varies across the sectors. For most of the sectors the error is marginal, though for same the size is not negligible. The paper also discusses the implication of the result for the use of the input-output model.