

Methods of disaggregation of input-output tables

Topic: Environmental IO models 1

Author: Richard Wood

Co-Authors: Jan Weinzettel

The utility of input-output analysis (IOA) in systematically accounting for production factors in the economy has long been recognised. In input-output analysis, the total economy is subdivided into relevant product and industry groups in order to trace intermediate flows both within a domestic economy and in the case of multi-regional IOA (MRIOA) across exporting economies. The problem of aggregation of these products and industries is intrinsic to the field of input-output analysis and has been studied from the early years (Leontief 1947; Leontief 1947), with Fei (1956) probably giving the first comprehensive analysis of the problem. Early work, however, was often focussed on simplifying detailed production functions such that similar product/industry groups could be aggregated without affecting the utility function of another product. As computational limits have evaporated, and as research questions further focus on not just economically important products/industries, but environmentally and socially important products and industries we are now faced with the problem of reconciling a need for detailed data in input-output tables across a number of domains.

In order to be able to conduct analysis with the accuracy and precision desired in applications of environmentally-extended input-output (EEIO) and MRIOA, there has been a need to disaggregate input-output tables to a level of detail where (at least for environmental applications) environmentally important product flows are disaggregated to a level of detail commensurate to the type of impact being investigated. This disaggregation essentially involves estimating technology and sales structures of industries and products under sometimes very partial information.

In this paper, we review previous work that has been done on disaggregation techniques in input-output tables. We create a standard terminology and classification for different types of disaggregation, and discuss the benefits of each. We propose the state of the art in disaggregation techniques given commonly available data today. Finally, we apply these disaggregation techniques to a select number of aggregated input-output tables in order to estimate the quality of disaggregated tables under the assumptions of the different techniques.