Matrix difference statistics and their use in comparing input-output databases

Topic: Methodological aspects of input-output analysis III
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The last five years has seen the development of a number of multi-regional input-output (MRIO) databases and there is growing interest in both the variation in data used and construction methods employed by the models. Understanding the differences in the results at a regional and sector level choice is important to users of MRIO systems as they are increasingly applied to important policy questions. This paper applies matrix difference statistics to calculate variations between multi-regional input-output databases. There is no single statistical test that can be used to determine the accuracy with which one matrix corresponds to another (Butterfield and Mules, 1980). This paper describes and evaluates a suite of statistical tests including those that measure 'distances' and 'goodness of fit' as well as 'information based statistics'. To enable meaningful comparison between the Eora, EXIOBASE, GTAP and WIOD MRIO databases, each is aggregated to a common classification system of sectors and regions. Matrix difference statistics are employed to calculate the similarity of the results from aggregated versions of MRIO databases. The matrix difference statistics can also indicate which sectors and regions within each system contribute most to model differences. Matrix difference statistics can give insight into the variation in outcome that can be expected if different models are used and aid transparency within the field of MRIO modelling.