Multi-level Comparisons of Input-Output Tables using Cross-Entropy Indicators

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The availability of several alternative MRIO databases raises the issue of obvious variation in the analytical results that could cast doubt on their policy relevance. Upon this apprehension, comparative evaluations of different MRIO databases have been extensively discussed in the literature. Our study also contributes to this line of work, where we propose a novel method to comparing MRIO databases by introducing a cross entropy (CE) indicator. Specifically, we quantify the extent to which two input-output tables or two tables with results based on input-output analysis differ from each other. The CE indicator enables researchers to study differences between the inputs (the MRIO tables themselves) and outputs (the analytical results) of input-output studies at different levels of detail, in a single framework. More interestingly, the CE indicator can be decomposed, which allows for matrix comparisons at various levels within one coherent framework. To illustrate the power of this approach, we apply the technique to five multi-region input-output (MRIO) tables for 2011, derived from the Eora, EXIOBASE, GTAP, OECD and WIOD databases. We find that answers to questions relate to broader aggregates are generally quite similar, but that answers to questions at the level of single industries might be rather different.