Comparison of Mathematical Methods for SUT Construction Using WIOD Database

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We investigate the relative effectiveness of the projection methods of Supply and Use tables in relation to Use tables. The empirical bases of the study are the Use tables of 28 countries for the period from 1995 to 2010 from WIOD project. We conduct a comparative study of three mathematical methods that have proven the most effective in constructing projection of Use tables for Spain and the Netherlands from the empirical study by Temurshoev, Webb, and Yamano (2011). In these methods, Input-Output, Supply, and Use tables are constructed based on the benchmark table and the sums of the columns and the rows of the table under construction. Whereas the results of Op. Cit. show that the GRAS method is the most effective for the IOTs and for the Supply tables for Netherlands and Spain, in the case of Use tables some quadratic methods show similar results as GRAS.

Essentially, our results confirm the conclusions of Op. Cit. The most effective of the considered methods is GRAS, a version of the classical RAS algorithm. The results of applying this method under the number of criteria are closer to the published tables than the results of the INSD method and Kuroda method, which are based on quadratic programming. At the same time we have shown that in some cases the table cannot be balanced by GRAS method because of significant changes in the structure of the table. In 80% of these cases the tables were successfully balanced by the two quadratic methods. In these cases the Kuroda method is the most effective.

Our work is motivated by a recent project of retrospective construction of SUT for Russia. We conclude that GRAS method is a priority in the extrapolation of Use tables of Russia. At the same time, if the structure of the table under construction is expected to be essentially different from the structure of the benchmark one then a version of Kuroda method is more appropriate.