From SUT to SIOT and Backward: Exploring the Reverse Transformations under Product Technology and Industry Technology Assumptions

Topic:
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One of the main aims of constructing input-output balance models is to assess an impact of exogenous changes in net final demand (at constant prices, certainly) on simultaneous behavior of an economy. Nowadays, two approaches to constructing input-output coefficients are widely used in practice, namely, one based on so-called product technology assumption and another based on so-called industry technology assumption. These approaches provide direct transforming supply and use tables (SUT) to symmetric input-output tables (SIOT).

Focus of attention in the study is concentrated on analyzing the reverse transformations that link exogenous changes of final demand in SIOT with corresponding changes of the production and intermediate consumption matrices in initial SUT. Material balance equation, classical Leontief equation and product (or commodity) technology model form the system of equations with production and intermediate consumption matrices as unknowns. It is shown that this system has the solution that guarantees the exogenous changes in final demand to be at constant prices.

In turn, material balance equation, classical Leontief equation and industry technology model constitute another system of equations (with the same unknowns) that can be also resolved with respect to production matrix and intermediate consumption matrix. However, exogenous varying the final demand in obtained solution leads to quantity changes in the intermediate consumption matrix and to price changes in the production matrix. This type of economy's response to exogenous changes in final demand seems to be implausible artifact that is out of economic sense. Thus, there are some certain doubts about plausibility of underlying background for an industry technology assumption and a fixed product sales structure assumption that are widely used for transforming SUT to SIOT.