Total Factor Productivity Surplus and Constant Input-Output Multipliers

Topic:
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The study of economic multipliers represents a fundamental element in economic analysis, providing an advanced analytical framework that allows one to understand and evaluate the impact of any shock on the economic activities of any country. Input-output (I-O) multipliers focus on interdependencies between sectors and how changes in one or more of them may produce effects on others and spread throughout the whole economy. In this sense, the key to interpreting I-O multipliers is understanding that they represent the proportion by which a shock in a certain input or output component of the supply or demand triggers changes in the economyâ€™s total output.
Traditionally, academia focused on nominal I-O multipliers. However, in the last few decades, there have been attempts to reproduce and use physical or constant I-O tables instead of ordinary monetary or nominal I-O tables for several reasons, such as a better understanding of structural and technological change or avoiding price-biased results. Multiple applications of constant price I-O exist; however, the commonly accepted technique to obtain constant tables is the double deflation approach. While academia recognizes the flaws of double deflation and already provides valid alternatives, all substitutes are grounded on what we consider inaccurate theoretical premises: the notion of balanced I-O tables. We believe that any method based on this assumption does not appropriately meet the requisites of constant impact analysis as it would challenge the definition of structural change, according to which a constant price system of accounts is unbalanced by nature. This disequilibrium is the source of productivity gains.
The present paper addresses the issue of constant impact analysis by proposing the single deflation method in which productivity gains (total factor productivity surplus, TFPS) play a fundamental role in determining the effect of any shock in the economy. In this sense, we apply single and double deflation to the Spanish 2016 I-O tables for 2010-2016. We then analyze the differences between our proposed alternative and the standard method, observing that the differences between the two approaches appear quite significant depending on the sector. These results refute previous literature that tends to consider the differences between nominal and constant applications negligible.
Moreover, we put forward a new I-O multiplier, the TFPS multiplier, that will compute the effect of a shock in demand in the distribution of total factor productivity among sectors. Finally, we provide a reinterpretation and extension of the TFPS identification methodology, expanding and detailing its study from 9 to 64 economic sectors.