

## **The emergent properties of the determinant of the Input- Output matrices: the case of the relationship among functional income distribution, labor productivity and the index of circularity**

Topic: Mathematical analysis of input-output data

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This paper have two mains motivations; first, to expose the possibility of interpreting the determinant of input-output table as an indicator that captures the complexity and technological change of an inter-industry system, through the circularity index; second, to answer the question: "Is the complexity and cost of new technologies and their impact which changes the structure of income and labor-saving and modify the production function towards more capital intensive methods? ".

The sectoral circularity indexes (Latner 1972, Gazon 1976) are indicators that allow to measure the technological change and the complexity of the network associated with an input-output table. Therefore, when this indicator is related to labor productivity and the functional distribution of income (measure as the share of wages in the value added) through Granger & Toda-Yamamoto causality tests and cointegration and unit root tests, the question formulated in the second purpose can be answered; in turn, to establish if the variables maintain a long-term relationship.

The respective indicators are estimated with the information of the tables of input - output for Brazil and Mexico in three key years - circa 1980, 2003 and 2013 - and considering compatible disaggregation levels. Data sources to be used are provided by the Statistic and Geography National Institute (INEGI) and the Statistic and Geography Brazilian Institute (IBGE) for the respective years.

While there have been, studies analyzing the circularity index, an indicator that synthesizes without losing information the circular relationships represented by a table of input-output, no studies have been done to take this indicator as representing technological change and complexity and, even less, research has been conducted to consider this indicator of a joint form with labor productivity to determine the functional income distribution, the mode of distribution less addressed in the economic literature, however, its importance.

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