

## Of Yeast and Mushrooms: A comparison between TFP growth and hyper-integrated labour productivity changes

Topic: Classical IO applications: Industrial economics, Productivity and Efficiency

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Automation, machine learning and outsourcing are changing productive interactions across sectors and countries. When an algorithm learns by itself how to exploit new arbitrage opportunities, who should be rewarded with the additional value added or net product generated? How do our current frameworks to measure productivity changes in a multisectoral economy compare to each other and in what way do they capture (if they do) this changing nature of production?

The aim of this paper is to specify and compare (within a unified scheme) two frameworks for measuring productivity changes, rooted in the Input-Output tradition: Neoclassical TFP growth (Wolff, 1994; ten Raa, 2004) and Classical (vertically) hyper-integrated labour productivity growth (Pasinetti, 1981, 1988).

Departing from revenue-outlay relations, it is shown how TFP growth actually measures real cost reductions, i.e. profitability changes. In contrast, departing from expenditure relations, it is argued that total labour productivity indicators consistently capture the interdependent nature of volume changes in input use per unit of (subsystem) output. The former requires to adopt a price system for input aggregation, whereas the latter relies on defining an indispensable factor (labour) for the reduction of inputs and outputs in terms of factor content.

As volume productivity increases occur at the subsystem level whilst real cost reductions occur at the industry level, uneven sectoral patterns and effects of technical progress emerge. By adapting and implementing in a novel way the notion of 'Harberger diagram' (Harberger, 1998) to both measurement frameworks, the paper discusses the pervasiveness and unevenness (Inklaar and Timmer, 2007) of sectoral growth in profitability and productivity for a subset of national economies from the World Input-Output Database (WIOD), hinting at some (ongoing) changes in the nature of production.

### [References]

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