

Labor Productivity. A Marxian Critique of its Value-Added Decomposition

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Abstract

In the paper, we compare Marx's measure of sectoral labor productivity (Capital Vol. I, p.48, Lawrence & Wishart, 1954) with measures of sectoral labor productivity that are based on real value added per working hour, as defined and used in the United Nations' System of National Accounts (SNA), the exception being Richard Stone's original formulation of this SNA. We show by standard input-output technology assumptions, that real value added (whether obtained by single or double deflating methods) per worker does not mirror increases in labor productivity correctly, since – for example – the physical net product of a society can increase in all of its components, while the SNA measures show a decline in labor productivity in such a situation. The basic reason for this measurement failure is a simple one: Deducting from sectoral output physical input in terms of prices from a more or less distant past is a virtual measure of sectoral total income, but not at all a measure of the 'output' of the considered sector. Against this, the paper proposes as in Marx's Capital to use his concept of value in reciprocal form to characterize and define increases in labor productivity. If net production frontiers shift upwards (to more physical output), these measures of labor productivity will measure this always in a correct way.

Marxian values therefore form the appropriate measures by which the role of technological change in capitalist economies and resulting changes in labor productivity can be understood and discussed. They can – using factual input-output tables – be applied to actual economies. In the paper, we present in this respect a 7 sectoral example for ten successive years (Germany 1991 – 2000) which shows that Marx's productivity indexes have (with one exception) increased during this period. A basic mathematical proposition, explaining these empirical observations,

states that profitable technical change that is capital-using and labor-saving is always increasing the Marxian measures of labor productivity. There is moreover the mathematical proposition that the SNA measure would exactly mirror the Marxian measurement of labor productivity in the case of a uniform composition of capital across the seven considered industries, a mainstream transformation problem so to speak. Besides these results the paper finally shows that value added decompositions of real GDP (or NDP) do not represent a valid way to disaggregate towards the sectoral ‘outputs’ of industries, and it proposes another macro-measure and its corresponding sectoral decomposition (in the tradition of Marx, but also of Stone) instead, for the discussion of the relationship between physical technical change and the thereby implied in changes in sectoral indexes of labor productivity.

Contents

1	Introduction	3
2	Input-output tables and the measurement of real value added	5
3	Labor values as measures of labor productivity	7
4	Notes on technological change	12
5	Disaggregating aggregate measures of labor productivity	14
6	A summing up	18
	References	20