

RETURNS TO SCALE EFFECT IN LABOUR PRODUCTIVITY GROWTH

Hideyuki Mizobuchi¹

January 22, 2011

Abstract

Labour productivity is defined as output per unit of labour input. It is well known that technical progress as well as capital input growth raises labour productivity. However, the little attention has been paid to the fact that the change in labour input also could have impact on the labour productivity. Since this effect disappears for the constant returns to scale production frontier, we call it the returns to scale effect. We decompose the growth of the labour productivity into two components: 1) the joint effect of technical progress and capital input growth, and 2) the returns to scale effect. We propose theoretical measures for these two components and show that they coincide with the index number formulae consisting of the prices and quantities of inputs and outputs. In the end, the decomposition result is applied to the U.S. industry data of the years 1970–2007. It is well known that the labour productivity of services sector grow much slower than that of goods sector. We conclude that the returns to scale effect can explain the large part of the gap in the labour productivity growth between two sectors.

Key Words

Labour productivity, index numbers, Malmquist index, Törnqvist index, output distance function, input distance function

Journal of Economic Literature Numbers

C14, D24, O47, O53

¹ Research Fellow of the Japan Society for the Promotion of Science, Keio Economic Observatory, Keio University, Mita 2-15-45, Minato-ku, Tokyo, Japan, 108-8345; Email: hideyuki.mizobuchi@gmail.com