

## ANNEX B

# Methodology for Decomposition of Factors of Growth

The share of region  $i$  in the total GDP of the OECD can be written as:

$$\frac{GDP_i}{GDP_{OECD}} = \frac{GDP_j}{GDP_{OECD}} * \frac{GDP_i}{GDP_j} \quad (1)$$

where  $j$  denotes the country of region  $i$ . The GDP share of region  $i$  in country  $j$  is then equal to:

$$\frac{GDP_i}{GDP_j} = \frac{GDP_i / E_i}{GDP_j / E_j} * \frac{E_i / LF_i}{E_j / LF_j} * \frac{LF_i / WA_i}{LF_j / WA_j} * \frac{WA_i / P_i}{WA_j / P_j} * \frac{P_i}{P_j} \quad (2)$$

where  $P$ ,  $E$ ,  $LF$  and  $WA$  stand, respectively, for population, employment, labour force and working age (15-64) population. Therefore the GDP share of region  $i$  in country  $j$  is a function of its productivity, employment rate, participation rate, age-activity rate and population, relative to, respectively, the productivity, employment rate, participation rate, age-activity rate and population of its country defined as the following:

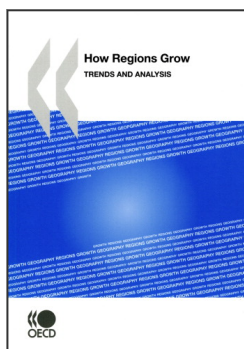
- Productivity is defined as GDP per worker ( $GDP/E$ ), where employment is measured at the place of work.
- The employment rate is defined as the percent of labour force that is employed ( $E/LF$ ), where the labour force is the number of employed plus the number of unemployed.
- The participation rate is the ratio between the labour force and the working age population ( $LF/WA$ ), where the working age population comprises the ages 15 to 64.
- The activity rate is the population in the working age class (ages 15 to 64) as a per cent of the total population.

By substituting equation 2 into equation 1, taking the logarithm and differentiating it, one obtains:

$$1. (g_i - g_j) = (g_{p,i} - g_{p,j}) + (g_{e,i} - g_{e,j}) + (g_{lf,i} - g_{lf,j}) + (g_{wa,i} - g_{wa,j}) + (g_{p,i} - g_{p,j})(3)$$

or, equivalently

$$\begin{array}{l} \text{Difference in} \\ \text{GDP growth} \\ \text{between region } i \\ \text{and the country } j \end{array} = \begin{array}{l} \text{Growth} \\ \text{difference in} \\ \text{GDP per worker} \\ \text{between region } i \\ \text{and country } j \end{array} + \begin{array}{l} \text{Growth} \\ \text{difference in the} \\ \text{employment rate} \\ \text{between region } i \\ \text{and country } j \end{array} + \begin{array}{l} \text{Growth} \\ \text{difference in the} \\ \text{participation rate} \\ \text{between region } i \\ \text{and country } j \end{array} + \begin{array}{l} \text{Growth} \\ \text{difference in the} \\ \text{activity rate} \\ \text{between region } i \\ \text{and country } j \end{array} + \begin{array}{l} \text{Growth} \\ \text{difference in} \\ \text{population} \\ \text{between region } i \\ \text{and country } j \end{array}$$



**From:**  
**How Regions Grow**  
Trends and Analysis

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264039469-en>

**Please cite this chapter as:**

OECD (2009), "Annex B: Methodology for Decomposition of Factors of Growth", in *How Regions Grow: Trends and Analysis*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264039469-8-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).