

# A Methodological Framework for Tailoring National Indicators to Regional Contexts

**Elpida Samara<sup>1</sup>, Pavlos Kilintzis<sup>2</sup>, Nicos Komninos<sup>3</sup>, Paraskevi Kosti<sup>4</sup>, Anastasia Vardaka<sup>5</sup>**

<sup>1</sup>Department of Accounting and Finance, University of Western Macedonia, Kozani, Greece

<sup>2</sup>Department of Mechanical Engineering, University of Western Macedonia, Kozani, Greece

<sup>3</sup>Professor emeritus; Urenio Research, Aristotle University, Thessaloniki, Greece

<sup>4</sup>Department of Chemical Engineering, University of Western Macedonia, Kozani, Greece

<sup>5</sup>Regional Association of Local Governments of Western Macedonia, Kozani, Greece

## Abstract

Innovation systems are made up of multiple entities within the quadruple helix model, including their interactions and connections. The role of smart technologies and ICT is critical for the operational effectiveness of such systems. Additionally, the regional context is considered essential for the evaluation of the level of innovation within these systems. A significant obstacle in this direction, is the absence of adequate data at a regional level. To address this gap, this paper introduces a novel methodology for transforming national level numerical indicators to the regional level. This methodological model-fit approach employs regression analysis to tailor national indicators to the regional level using comparable available data. The method is evaluated using data from Greek NUTS 2 regions, yielding regional-level estimates for four innovation indicators based on four existing indicators that are found to be significantly correlated to them. However, the same technique may be used to any EU country or the entire EU. The findings, their implications for future research, and prospective applications are discussed. Overall, the provision of regional-level indicators is seen as critical for formulating effective development strategies.

**Keywords:** Innovation, Regionalization of Indicators, Regional Innovation Systems