

# **Regional socioeconomic assessments with a genetic algorithm: an application on income inequality across municipalities**

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## **Abstract-**

Available data to depict socioeconomic realities are often scarce at the municipal level. Unlike recurring or continuous data, which are collected regularly or repeatedly, nonrecurrent data may be sporadic or irregular, due to significant costs for their compilation and limited resources at municipalities. To address regional data scarcity, we develop a bottom-up top-down methodology for constructing synthetic socioeconomic indicators combining a genetic algorithm and regression techniques. We apply our methodology for assessing income inequalities at 178 municipalities in Spain. The genetic algorithm draws the available data on circumstances or inequalities of opportunities that give birth to income disparities. Our methodology allows to mitigate the shortcomings arising from unavailable data. Thus, it is a suitable method to assess relevant socioeconomic conditions at a regional level that are currently obscured due to data unavailability. This is crucial to provide policymakers with an enhanced socioeconomic overview at regional administrative units, relevant to allocating public service funds.

**Index Terms-** Income inequality · Inequality of opportunities · Genetic algorithm · Socioeconomic indicator · Data scarcity · Municipalities

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