EXTENDED ABSTRACT

Title: Is the EU Social Progress Index robust? Implications for the design of European regional Cohesion Policy

Authors and e-mail of all:

Mercedes Beltrán-Esteve. Email: Mercedes.beltran@uv.es
Jesús Peiró-Palomino. Email: Jesus.peiro@uv.es
Andrés J Picazo-Tadeo. Email: Andres.j.picazo@uv.es
Department of Applied Economics II and INTECO Research Group.
University of Valencia, Valencia, Spain.

Vicente Rios. Email: Vicente.rios@unimi.it
Department of Economics. University of Milan, Milan, Italy.

Subject area: S03 – Desafíos en la construcción de indicadores compuestos para el seguimiento de políticas públicas.

Abstract:

Introduction and motivation

In the 1930s, the economist Simon Kuznets proposed Gross Domestic Product per capita (GDPpc) as a suitable variable for assessing economic development; since then, this simple indicator has been widely used to evaluate not only economic but also social progress. From the outset, however, the limitations of GDPpc in this regard have been widely recognized. Even so, it was not until the 1970s that the first initiatives aimed at proposing more comprehensive indicators of economic and social development emerged. In the intervening years, more than 80 such measures have been proposed (Barrington-Leigh and Escande, 2018), covering economic and non-economic facets of development—e.g., the Human Development Index (HDI) published by United Nations since the 1990s, or the Better Life Index (BLI) proposed by the OECD in 2009.

A more recent initiative is the European Social Progress Index (EU-SPI) launched by the European Commission in 2016 to assess social progress in the European Union (EU). The EU-SPI, the latest edition of which is from 2020, is provided at the regional

level and includes three dimensions that represent progressively more advanced features of social progress: basic human needs, foundations of well-being, and opportunities. These dimensions are built by aggregating several components grounded on a wide array of raw statistical indicators. It should be noted that economic indicators are deliberately excluded from the EU-SPI, as it is intended to complement GDPpc as a tool for policymaking.

The EU has witnessed profound changes in recent decades. The great enlargements that took place from 2004 onwards have created a more complex and unequal Union, with severe economic and social inequalities between the early members and the newcomers. Therefore, understanding social progress disparities becomes crucial to the pursuit of a more socially integrated and cohesive Europe. In fact, the EU-SPI represents one of the European Commission's attempts to better understand the EU's reality and to provide policymakers and stakeholders with fresh tools that can help them to design a more successful Cohesion Policy (see Fratesi and Wishlade, 2017; Crescenzi et al., 2020). The European Commission's renewed policy guidelines for the period 2019-2024 include, in addition to economic targets, other essential goals that matter for people's lives and social progress, some of which are closely related to features accounted for in the EU-SPI. These include a European green deal, a Europe fit for the digital age, the protection of rule of law, and a new push for European democracy.

In spite of the great potential the EU-SPI offers for policymaking, the allocation of funds provided under the European Cohesion Policy currently depends on regions' GDPpc. This may well be because the index is still fairly new, but also because its robustness needs to be proved. In fact, the European Commission encourages the scientific community to inform the EU-SPI developers about how to improve the index, and to provide guidelines on how to better measure social progress and ensure the uptake of the index by the regional governments. Composite indexes are comprehensive and very useful for summarizing; however, their construction relies on some subjective decisions regarding crucial issues such as the selection and normalization of raw indicators, the degree of compensability across components and aggregation methods (OECD, 2008). In this regard, if the assessment of social progress were significantly affected when the index construction parameters were altered, the EU-SPI would be a poor policy instrument. Thus, policymakers would face a trade-off between allocating funds according to a simplistic but widely-accepted indicator such as GDPpc, or considering more compre-

hensive indicators that better reflect people's reality, such as the EU-SPI, the robustness of which can be questioned.

Contributions

The present paper feeds into this debate with two contributions. First, the robustness of the EU-SPI to different methodological choices in its construction is assessed by performing both local and global sensitivity and uncertainty analyses. Second, the paper provides an in-depth comparison of regions' social progress according to the EU-SPI and their level of economic development evaluated with GDPpc. Even though social progress displays a strong correlation with GDPpc, the former catches aspects for which income is likely to be a poor indicator—e.g., there may be regions with high GDPpc but high levels of pollution, or relatively rich regions with modest performance regarding social rights. In particular, this paper assesses whether regions eligible for funding under the EU's regional Cohesion Policy according to their level of GDPpc would also be eligible on the basis of their social progress. In this regard, Döpke et al. (2017) found that the distribution of funds would be similar whether using GDPpc or an indicator based on the BLI. However, the EU-SPI is not only more comprehensive in terms of indicators than the BLI, but also more closely linked to the EU's regional reality and the European Commission's policy objectives. Moreover, this research goes beyond the abovementioned paper by identifying the dimensions of social progress which are more strongly related to GDPpc, which thus offers a better understanding of the facets of people's life that can sensibly be assessed by income, and those needing alternative indicators.

Methodological features of the 2020 EU-SPI and alternative proposals

The 2020 release of the EU-SPI assesses social progress in 240 European regions at the NUTS2 level, and is made up of 12 components measured by 55 raw indicators. The indicators capture only social and environmental facets of social progress, thus excluding economic issues; they measure outcomes rather than inputs; and they cover issues that can be directly addressed by policy intervention. Components are further aggregated into three wider dimensions which, as mentioned above, are: i) basic needs, including issues that are necessary to achieve social development, although not sufficient; ii) foundations of well-being, which include more advanced factors of social and environ-

mental progress; and iii) opportunities, representing more sophisticated facets of a cohesive and tolerant society. Annoni and Bolsi (2020) describe in detail how it is built.

The indicators included in each component are selected after having verified with Principal Component Analysis (PCA) (Rencher and Christensen, 2012) that they are internally consistent. Once the raw indicators have been selected and the data recorded, the main steps involved in building the EU-SPI are normalizing the data to produce comparable figures; aggregating indicators into the composite indicator; and analyzing robustness. In this regard, the use of different normalization and aggregation criteria could lead to notably different indexes of social progress and rankings of regions (OECD, 2008, p. 83).

Regarding *normalization*, raw indicators within each component of the EU-SPI are converted into a common scale using the min-max transformation with indicator-specific boundaries. These boundaries identify the best and worst performance on each indicator by any region, and they are set by using utopian and dystopian values—when meaningful—or by maximum and minimum scores across indicators' time series. Whereas this procedure allows the tracking of regions' absolute performance, using utopian and dystopian values introduces a source of subjectivity in the computation of the EU-SPI. In order to avoid subjectivity three alternative normalization approaches are considered; two of them are also based on the min-max criterion, while the third follows a z-score standardization. All three alternative normalization methods proposed allow the tracking of relative rather than absolute performance, since the benchmarks are set by observations from the raw indicators of regions in the sample

Concerning *aggregation and compensability*, the 2020 release of the EU-SPI employs a hybrid approach to aggregate indicators, components and dimensions. Components are first calculated using unweighted arithmetic means of the normalized indicators included in each of them as the aggregating approach. Then, generalized means allowing for partial compensability are employed to aggregate components into dimensions, and dimensions into the EU-SPI. This research investigates the effect of different degrees of compensability—including the extreme cases of no compensability and total compensability—on the scores of social progress and rankings of regions, while still using the generalized mean to aggregate indicators. Furthermore, the effect of using other aggregating schemes on the assessment of social progress is also tested. In this regard, three alternative approaches are employed to aggregate components into dimensions, and

dimensions into the EU-SPI: i) Principal Components Analysis (PCA); ii) Data Envelopment Analysis and Multi-Criteria-Decision-Making (DEA-MCDM); and iii) the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS).

Uncertainty and sensitivity analyses of the EU-SPI

Composite indicators can be thought of as models where several layers of uncertainty simultaneously coexist due to subjective choices made during their construction (Nardo et al., 2005; Saltelli et al., 2010). Therefore, outcomes from the EU-SPI—such as social progress scores or rankings of regions—are inherently uncertain, the degree of uncertainty in the construction of the EU-SPI and its sensitivity are assessed.

Considering our four alternative approaches for the normalization of raw indicators in the EU-SPI, and the nine ones in the aggregation stage—including in both cases those used by the European Commission, a total of 36 indexes of social progress and its dimensions have been computed. Using these computations as inputs, a first local sensitivity analysis is carried out, aimed at assessing the response of social progress outcomes to single changes in the construction of the index—i.e., changing one choice at a time, while keeping all others choices constant (Xu and Gertner, 2008). Furthermore, global uncertainty and sensitivity analyses are also performed, following Saisana et al. (2005) and Saltelli et al. (2008).

Results and policy recommendations

The results yield interesting messages for both academics and policymakers. First, the EU-SPI is robust to multiple alternative designs, as the relative position of European regions according to their social progress barely changes. This is an important finding that points to the EU-SPI as a powerful instrument for policymaking. Second, the EU-SPI and GDPpc are positively correlated but they are in no way substitutes. In this regard, social progress offers a complementary view to income, particularly the dimensions of foundations of well-being and opportunities.

Considering these results and the fact that the EU-SPI has been developed with a marked policy orientation, European policymakers are encouraged to make more effective use of this indicator. In this regard, further efforts should be made to develop criteria which judiciously combine GDPpc and the EU-SPI to determine the allocation of funds in the framework of *Agenda 2030*. Moreover, policies based on a combination of

economic and non-economic facets of development would provide a more appropriate response to the challenges of the immediate future and, more importantly, one that better reflects people's life.

References

Annoni, P. and Bolsi, P. (2020) *The regional dimension of social progress in Europe: Presenting the new EU Social Progress Index*. Working Paper 06/2020. Directorate General for Regional and Urban Policy. European Commission.

Barrington-Leigh, C. and Escande, A. (2018) 'Measuring Progress and Well-being: A Comparative Review of Indicators'. *Social Indicators Research*, 135, pp. 893–925.

Crescenzi, R., Fratesi, U. and Monastiriotis, V. (2020) Back to the member states? Cohesion Policy and the national challenges to the European Union. *Regional Studies*, 54 pp. 5–9.

Döpke, J., Knabe, A., Lang, C. and Maschke, P. (2017) 'Multidimensional Well-being and Regional Disparities in Europe'. *JCMS: Journal of Common Market Studies*, 55, pp. 1026–1044.

Fratesi, U. and Wishlade, F.G. (2017) The impact of European Cohesion Policy in different contexts. *Regional Studies*, 51, pp. 817–821.

Nardo, M., Saisana, M., Saltelli, A. and Tarantola, S. (2005) 'Tools for Composite Indicators Building'. European Commission, Join Research Centre. Report number JRC31473.

OECD (2008) *Handbook on Constructing Composite Indicators: Methodology and User Guide* (Paris: OECD Publishing).

Rencher, A. and Christensen, W. (2012) *Methods of Multivariate Analysis* (John Wiley & Sons).

Saltelli, A., Annoni, P., Azzini, I., Campolongo, F., Ratto, M. and Tarantola, S. (2010) 'Variance Based Sensitivity Analysis of Model output. Design and Estimator for the Total Sensitivity Index'. *Computer Physics Communications*, 181, pp. 259–270.

Saltelli, A., Ratto, M., Andres, T., Campolongo, F., Cariboni, J., Gatelli, D. and Tarantola, S. (2008) *Global Sensitivity Analysis: The Primer* (John Wiley & Sons).

Xu, C. and Gertner, G.Z. (2008) 'A General First-order Global Sensitivity Analysis Method'. *Reliability Engineering & System Safety*, 93, pp. 1060–1071.

Keywords: European Cohesion Policy; Regions; Social Progress; Uncertainty.

JEL codes: C43; F63; R11; R58