

Well-being and the *Great Recession* in Spain

Jesús Peiró-Palomino, Francesco Perugini & Andrés J Picazo-Tadeo

To cite this article: Jesús Peiró-Palomino, Francesco Perugini & Andrés J Picazo-Tadeo (2019) Well-being and the *Great Recession* in Spain, Applied Economics Letters, 26:15, 1279-1284, DOI: [10.1080/13504851.2018.1545076](https://doi.org/10.1080/13504851.2018.1545076)

To link to this article: <https://doi.org/10.1080/13504851.2018.1545076>



Published online: 11 Nov 2018.



Submit your article to this journal [↗](#)



Article views: 73



View Crossmark data [↗](#)

ARTICLE



Well-being and the *Great Recession* in Spain

Jesús Peiró-Palomino ^a, Francesco Perugini ^b and Andrés J Picazo-Tadeo ^c

^aDepartament d'Economia, Universitat Jaume I and INTECO Research Group, Castelló de la Plana, Spain; ^bCentre for Innovation and Entrepreneurship, Università Politecnica delle Marche, Ancona, Italy; ^cDepartament d'Economia Aplicada II, Universitat de València and INTECO Research Group, Valencia, Spain

ABSTRACT

This letter assesses the impact of the *Great Recession* on well-being in Spanish provinces using two alternative composite indicators of objective well-being that include somewhat different dimensions. Whereas the crisis notably eroded *economic well-being*, its impact on *overall well-being* – which in addition to economic dimensions also includes non-economic ones – was imperceptible. This result points to the need to carefully define and assess well-being in empirical analyses.

KEYWORDS

Composite indicators; economic crisis; Spain; well-being

JEL CLASSIFICATION

C61; I30

1. Introduction and motivation

Assessing well-being is a challenging task. Whereas traditional measures have been based on simple economic indicators, mostly GDP per capita, society as a whole calls for a more comprehensive way to gauge well-being. In addition to economic issues, fresh measures should include other non-economic dimensions of well-being such as health, education or the environment, to name just a few. In response to this social demand, the *Human Development Index* was created by the United Nations in the 1990s, and included income per capita, education and life expectancy (see UN 2016). Later on, the *Commission on the Measurement of Economic Performance and Social Progress* – launched in 2009 and headed up by the Nobel laureate Joseph Stiglitz – suggested several non-economic dimensions that, beyond economic ones, can affect well-being (Stiglitz, Sen, and Fitoussi 2009). Furthermore, the OECD provides data at both national (*Better Life Index* dataset), and regional (*OECD Regional Well-being Database*) levels on these dimensions (see Durand 2015).

Recently, several papers have employed these datasets to building objective composite indicators of well-being, mostly at the country level (e.g. Lorenz, Brauer, and Lorenz 2017; Peiró-Palomino and Picazo-Tadeo 2018). Nonetheless,

the rankings of countries resulting from these indicators are not significantly different from those derived from conventional measures of well-being, including GDP per capita. In addition, other recent research papers also conclude that there is a close relationship between subjective well-being and income (Stevenson and Wolfers 2013).

According to the arguments outlined above, it might be sensible to assume that indicators based on economic dimensions such as GDP per capita are good proxies of overall well-being. However, in this letter we show that this might not be the case when it comes to assessing the impact of an economic crisis on well-being. In doing so, we empirically evaluate the impact of the *Great Recession* that began in 2008 (IMF, 2009; Camacho, Gadea, and Pérez-Quirós 2018) on well-being in Spanish provinces, using two composite indicators of objective well-being computed with *Data Envelopment Analysis* (DEA) and *Multi-Criteria-Decision-Making* techniques (MCDM). One of them – referred to as *economic well-being* – just includes GDP per capita and the unemployment rate as essential economic dimensions of well-being, whereas the other – named *overall well-being* – also includes 5 non-economic dimensions. We find that: i) there are notable disparities in well-being across Spanish provinces;

ii) when objective well-being is assessed only with economic dimensions a sharp decline is observed as a result of the *Great Recession*; conversely, when non-economic dimensions are also accounted for, well-being remains fairly stable. Accordingly, our conclusion is that the choice of well-being indicators should be carefully justified in empirical analyses.

II. Data and methodology

We employ information about 7 well-being dimensions at the level of the 50 Spanish provinces,¹ built with data from different sources for the period 2000–14 (Table 1). In constructing this dataset, we have attempted to assemble a set of indicators as close as possible to those proposed by Stiglitz, Sen, and Fitoussi (2009) and provided by the OECD at both national and regional levels, but using the much more limited information available for the Spanish provinces. Using these figures, we have computed averages for each indicator in the growth period 2000–07 and the crisis period 2008–14. To ensure comparability across dimensions, and given that the indicators have different measurement units, the data have been standardised on a 0–1 scale using the *min-max* method, with higher values representing better performance; minimum and maximum values are chosen from the whole 2000–14 period to ensure comparability over time. Finally, normalised data on dimensions have been used to build a couple of composite indicators of objective well-being: the first, *economic well-being*, includes only the economic

dimensions of income and jobs, while the other, *overall well-being*, considers all 7 dimensions.

Regarding the methodology, we have used DEA and MCDM techniques as in Peiró-Palomino and Picazo-Tadeo (2018). First, following Lovell, Pastor, and Turner (1995) we have computed a composite well-being indicator for each province p with DEA as:

$$\text{Composite indicator}_{p'} = \text{Maximise } w_{dp'} \sum_{d=1}^D w_{dp'} \text{dimension}_{dp'}$$

Subject to:

$$\begin{aligned} \sum_{d=1}^D w_{dp'} \text{dimension}_{dp} &\leq 1 & p &= 1, \dots, 50 \\ w_{dp'} &\geq 0 & d &= 1, \dots, D \end{aligned} \quad (1)$$

where dimension_{dp} is the observed value for dimension d in province p , and w_{dp} is the *idiosyncratic* weight assigned to dimension d in the composite indicator of province p . Moreover, composite indicators from (1) are, by construction, bounded between zero and one, the latter representing the highest well-being; i.e. the lower the score, the worse the well-being.

Whereas DEA provides a successful approach to the building of a composite well-being indicator, it might be less effective when it comes to ranking provinces. In this respect, comparisons might be meaningless as provinces' well-being indicators are computed with different sets of weightings (Kao and Hung 2005); besides, program (1) could assign a score of one – meaning highest well-being – to some provinces just because of a lack of discriminating power (see technical details in Dyson et al. 2001). In order

Table 1. Well-being dimensions and indicators.

Dimension	Indicator (<i>unit of measurement</i>)	Source	Years
Income	GDP per capita (<i>constant € at 2011 prices</i>)	Spanish Statistical Office (INE)	2002–2014
Jobs	Unemployment rate (%)	INE	2002–2014
Health	Life expectancy at birth (<i>years</i>); mortality rate (%)	INE	2000–2014
Education	Years of education (<i>people aged 16–64</i>)	Valencian Institute of Economic Research	2000–2013
Environment	Air particles PM10 (<i>yearly average</i>)	Ecologistas en Acción, and Spanish Ministry of Agriculture, Fishing and Environment	2001–2014
Safety	Homicide rate (<i>per 100,000 inhabitants</i>)	Spanish Ministry of Home Affairs	2000–2004; 2010–2014
Civic engagement	Voter turnout in general elections to congress, Spanish residents (%)	Spanish Ministry of Home Affairs	2000, 2004, 2008, 2011

Note: The dimension health has been measured as the simple average of its two indicators.

¹Spanish provinces correspond to NUTS 3 in the Eurostat nomenclature, while regions correspond to NUTS 2. The autonomous cities of Ceuta and Melilla have been excluded from the analysis.

to ensure comparability and also increase the discriminating power, in a second stage we have employed MCDM techniques to compute a composite well-being indicator with *common* weights across provinces for dimensions, as proposed by Despotis (2002). Formally:

$$\text{Minimise } m_d, w_d, h \quad t \frac{1}{50} \sum_{p=1}^{50} m_p + (1-t) h$$

Subject to:

$$\begin{aligned} & \sum_{d=1}^D w_d \text{dimension}_{dp} + m_p \\ & = \text{Composite indicator}_p \quad p = 1, \dots, 50 \\ & (m_p - h) \leq 0 \quad p = 1, \dots, 50 \\ & m_p \geq 0 \quad p = 1, \dots, 50 \\ & w_d \geq \varepsilon \quad d = 1, \dots, D \\ & h \geq 0 \end{aligned} \quad (2)$$

where w_d is the common weight assigned to dimension d ; ε is a non-Archimedean small number; h is a non-negative parameter to be estimated; m_p represents the deviation between the composite indicator for province p calculated with DEA, and that computed with MCDM; finally, t is a parameter ranging from 0 to 1, which we have set to 1 (see details in Peiró-Palomino and Picazo-Tadeo 2018).

III. Results and discussion

Table 2 displays averages for *economic* and *overall well-being* in both growth (2000–07) and crisis (2008–14) periods for provinces and regions; also, averages for regions are weighted by population.² In this respect, as well-being affects people, we have considered population-weighted averages to be much more illustrative than simple ones. Figure 1 illustrates the geographic distribution of well-being in Spain, with darker colours representing better performance. *Overall well-being* is unevenly distributed across space with no clear patterns, although the lowest scores are found in the Mediterranean coast and Southern provinces. Furthermore, a positive (although moderate) association is

Table 2. Well-being scores: from 0 (worst) to 1 (best).

Regions (NUTS 2) and their provinces (NUTS 3)	Economic well-being		Overall well-being	
	2000–07	2008–14	2000–07	2008–14
Andalucía	0.582	0.115	0.640	0.648
Almería	0.789	0.080	0.668	0.654
Cádiz	0.431	0.010	0.595	0.564
Córdoba	0.505	0.114	0.727	0.738
Granada	0.615	0.083	0.669	0.675
Huelva	0.548	0.144	0.536	0.650
Jaén	0.548	0.129	0.779	0.765
Málaga	0.666	0.111	0.612	0.578
Sevilla	0.583	0.203	0.609	0.670
Aragón	0.966	0.618	0.864	0.895
Huesca	0.989	0.721	0.938	0.970
Teruel	1.000	0.677	1.000	0.949
Zaragoza	0.955	0.585	0.826	0.870
Asturias	0.797	0.539	0.823	0.816
Illes Balears	0.899	0.495	0.569	0.665
Islas Canarias	0.746	0.160	0.580	0.690
Las Palmas	0.750	0.112	0.595	0.666
Santa Cruz de Tenerife	0.741	0.212	0.563	0.715
Cantabria	0.848	0.624	0.872	0.965
Castilla y León	0.820	0.561	0.918	0.918
Ávila	0.833	0.375	0.868	0.829
Burgos	0.911	0.642	0.921	0.931
León	0.810	0.512	0.882	0.841
Palencia	0.885	0.572	0.881	0.889
Salamanca	0.714	0.528	0.956	0.967
Segovia	0.877	0.638	0.957	0.995
Soria	0.982	0.708	0.988	0.952
Valladolid	0.791	0.613	0.931	0.987
Zamora	0.752	0.464	0.919	0.833
Castilla – La Mancha	0.810	0.333	0.910	0.866
Albacete	0.817	0.297	0.888	0.830
Ciudad Real	0.777	0.279	0.822	0.821
Cuenca	0.853	0.430	0.917	0.858
Guadalajara	0.884	0.509	1.000	1.000
Toledo	0.793	0.300	0.964	0.872
Cataluña	0.902	0.553	0.701	0.716
Barcelona	0.890	0.556	0.709	0.712
Girona	0.907	0.502	0.628	0.714
Lleida	0.999	0.710	0.997	0.798
Tarragona	0.932	0.496	0.545	0.703
Comunidad Valenciana	0.808	0.351	0.649	0.755
Alicante	0.769	0.311	0.613	0.751
Castellón	0.928	0.350	0.764	0.781
Valencia	0.809	0.380	0.649	0.753
Extremadura	0.557	0.230	0.843	0.841
Badajoz	0.532	0.195	0.820	0.807
Cáceres	0.600	0.288	0.880	0.898
Galicia	0.760	0.559	0.794	0.876
A Coruña	0.748	0.611	0.790	0.890
Lugo	0.858	0.675	0.684	0.875
Ourense	0.795	0.553	0.843	0.832
Pontevedra	0.724	0.457	0.824	0.874
Madrid	0.971	0.658	0.794	0.915
Murcia	0.809	0.330	0.812	0.844
Navarra	1.000	0.735	1.000	1.000
País Vasco	0.907	0.758	0.880	0.892
Álava	0.952	0.787	0.969	0.960
Bizkaia	0.848	0.704	0.823	0.840
Guipuzkoa	0.984	0.834	0.933	0.946
La Rioja	0.956	0.622	0.961	1.000
Population-weighted average	0.809	0.439	0.747	0.792
Simple average	0.807	0.449	0.806	0.828
Standard deviation	0.144	0.220	0.144	0.118

Note: Regions' averages are weighted by population; also note that some Spanish regions are single-province regions.

²Weights correspond to the provinces' population as a share of the total regional population in each period.

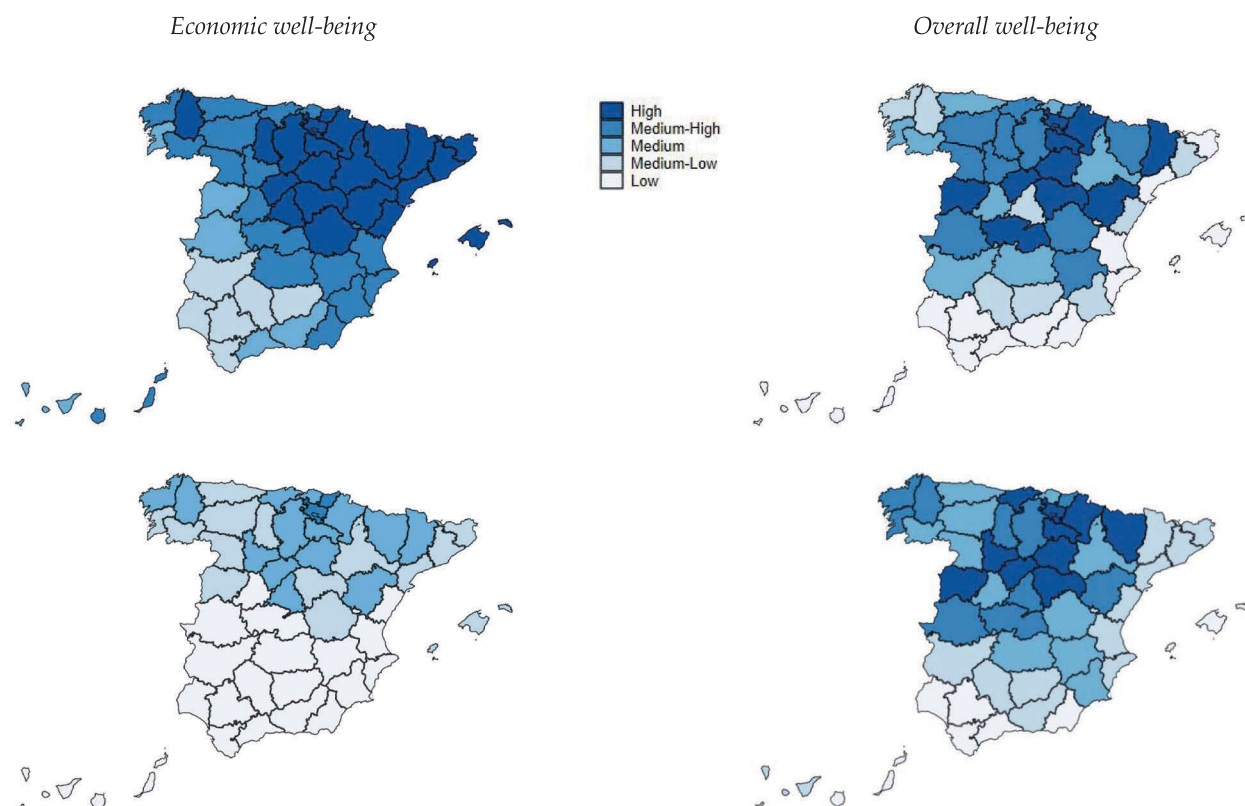


Figure 1. Provincial distribution of *economic* and *overall well-being* in 2000–07 (top maps) and 2008–14 (bottom maps).

Note: Well-being is categorised through the quintile distribution of our composite indicators for the entire period, in order to evaluate disparities across regions and also over time.

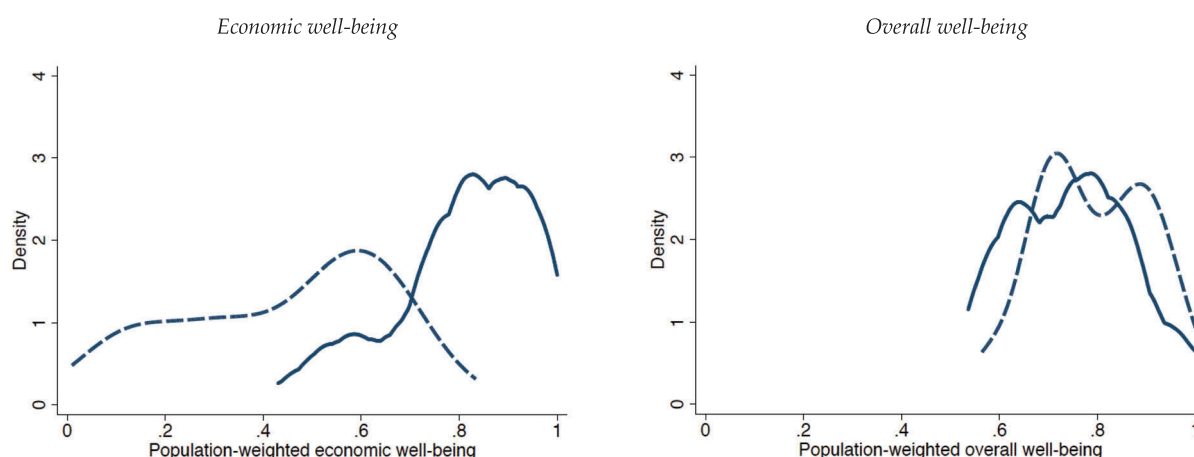


Figure 2. Population-weighted densities of *economic* and *overall well-being* for 2000–07 (solid lines) and 2008–14 (dashed lines).

observed between *overall well-being* and the level of development of provinces and regions – measured by real GDP per capita–, particularly in the recession period.³ Besides, lower *economic well-being* is found in Southern and Western provinces while

Northern and Eastern provinces perform notably better. Lastly, intraregional heterogeneity is high in most cases, especially for *overall well-being*.

Generally speaking, our results show geographic patterns of well-being that are in line with those

³For the case of provinces, Spearman rank correlation coefficients are statistically significant with *p-values* of 0.095 and 0.002 for the growth and crisis periods, respectively.

from other studies of well-being (or quality of life) in Spain carried out using different methodological approaches, aggregation levels and time periods. In this regard, González, Cárcaba, and Ventura (2011, 2018) focused on quality of life at the municipal level, although they only considered a limited sample of municipalities and overlooked temporal variation. Murias, Martínez, and de Miguel (2006) and Zarzosa Espina and Somarriba Arechavala (2013) examined well-being and social welfare, respectively, at the province (NUTS 3) level, also omitting temporal comparisons. Jurado and Pérez-Mayo (2012) elaborated a multidimensional well-being index for the Spanish regions (NUTS 2) with data for years 2000 and 2006. More recently, Herrero, Villar, and Soler (2018) also assessed well-being at the region level for the period 2006–15, but they did not provide a composite indicator.

Regarding the impact of the *Great Recession*, a severe deterioration is observed in all provinces between 2000–07 and 2008–14 when well-being is assessed considering only economic dimensions; e.g. population-weighted average *economic well-being* decreases from 0.809 to 0.439. Conversely, well-being remains much more stable when it is assessed with our *overall well-being* indicator, with a weighted average that even increases slightly from 0.747 to 0.792.⁴ These findings can be clearly seen in Figure 1, which also suggests that the geographical North-East *versus* South-West division observed in the growth years persisted during the crisis. Furthermore, the population-weighted distributions of *overall well-being* among Spanish provinces are not statistically different between 2000–07 and 2008–14 (Figure 2); conversely, those of *economic well-being* are statistically different; i.e. a notable shift to the left has occurred as result of the crisis.

IV. Conclusions

In this letter, we report two main conclusions. First, the *Great Recession* has profoundly affected the economic dimensions of well-being in Spain, whereas *overall well-being* – which also includes

other *non-economic* dimensions – has remained fairly stable. Second, leaving aside the desire of academics, international organisations and society as a whole to broaden the notion of *well-being*, this concept needs to be carefully defined and assessed in empirical studies, as different measures may lead to quite different interpretations.

Acknowledgments

We gratefully acknowledge the comments and suggestions from two referees.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This research has been supported by the European Regional Development Fund and the Spanish Agencia Estatal de Investigación (ECO2014-55221-P, ECO2017-85746-P and ECO2016-75237-R); the Valencian regional government (PROMETEO/2018/102); and the Universitat Jaume I (UJI-B2017-33).

ORCID

Jesús Peiró-Palomino  <http://orcid.org/0000-0001-5535-2394>

Francesco Perugini  <http://orcid.org/0000-0001-7102-9829>

Andrés J Picazo-Tadeo  <http://orcid.org/0000-0002-7129-5606>

References

- Camacho, M., M. D. Gadea, and G. Pérez-Quirós. 2018. "The Great Recession: The Worst Ever?" *Revista de Economía Aplicada* 76: 73–100.
- Despotis, D. K. 2002. "Improving the Discriminating Power of DEA: Focus on Globally Efficient Units." *Journal of the Operational Research Society* 53: 314–323. doi:10.1057/palgrave.jors.2601253.
- Durand, M. 2015. "The OECD Better Life Initiative: How's Life? and the Measurement of Well-Being." *Review of Income and Wealth* 61 (1): 4–17. doi:10.1111/roiw.2015.61.issue-1.
- Dyson, R., R. Allen, A. Camanho, V. Podinovski, C. Sarrico, and E. Shale. 2001. "Pitfalls and Protocols in DEA."

⁴We have also computed a *non-economic* well-being indicator excluding the dimensions of income and jobs from the *overall* indicator. Results show that average *non-economic* well-being during the crisis (0.800) is noticeably higher than in the preceding growth period (0.624). Results for this indicator at the province and region levels are available to readers on request.

- European Journal of Operational Research* 132: 245–259. doi:[10.1016/S0377-2217\(00\)00149-1](https://doi.org/10.1016/S0377-2217(00)00149-1).
- González, E., A. Cárcaba, and J. Ventura. 2011. “The Importance of Geographical Level of Analysis in the Assessment of the Quality of Life: The Case of Spain.” *Social Indicators Research* 102: 209–228. doi:[10.1007/s11205-010-9674-8](https://doi.org/10.1007/s11205-010-9674-8).
- González, E., A. Cárcaba, and J. Ventura. 2018. “Weight Constrained DEA Measurement of the Quality of Life in Spanish Municipalities in 2011.” *Social Indicators Research* 136: 1157–1182. doi:[10.1007/s11205-016-1426-y](https://doi.org/10.1007/s11205-016-1426-y).
- Herrero, C., A. Villar, and A. Soler. 2018. *Las facetas del bienestar: Una aproximación multidimensional a la calidad de vida en España y sus Comunidades Autónomas (2006-2015)*. Bilbao: Fundación BBVA.
- IMF (International Monetary Fund). 2009. *World Economic Outlook–April 2009: Crisis and Recovery*. Multimedia Services Division: Washington DC.
- Jurado, A., and J. Perez-Mayo. 2012. “Construction and Evolution of a Multidimensional Well-Being Index for the Spanish Regions.” *Social Indicators Research* 107: 259–279. doi:[10.1007/s11205-011-9835-4](https://doi.org/10.1007/s11205-011-9835-4).
- Kao, C., and H. T. Hung. 2005. “Data Envelopment Analysis with Common Weights: The Compromise Solution Approach.” *Journal of the Operational Research Society* 56: 1196–1203. doi:[10.1057/palgrave.jors.2601924](https://doi.org/10.1057/palgrave.jors.2601924).
- Lorenz, J., C. Brauer, and D. Lorenz. 2017. “Rank-Optimal Weighting or ‘How to Be Best in the OECD Better Life Index?’.” *Social Indicators Research* 134: 75–92. doi:[10.1007/s11205-016-1416-0](https://doi.org/10.1007/s11205-016-1416-0).
- Lovell, C. A. K., J. T. Pastor, and J. A. Turner. 1995. “Measuring Macroeconomic Performance in the OECD: A Comparison of European and non-European Countries.” *European Journal of Operations Research* 87: 507–518. doi:[10.1016/0377-2217\(95\)00226-X](https://doi.org/10.1016/0377-2217(95)00226-X).
- Murias, P., F. Martinez, and C. de Miguel. 2006. “An Economic Wellbeing Index for the Spanish Provinces: A Data Envelopment Analysis Approach.” *Social Indicators Research* 77: 395–417. doi:[10.1007/s11205-005-2613-4](https://doi.org/10.1007/s11205-005-2613-4).
- Peiró-Palomino, J., and A. J. Picazo-Tadeo. 2018. “OECD: One or Many? Ranking Countries with a Composite Well-Being Indicator.” *Social Indicators Research* 139: 847–869. doi:[10.1007/s11205-017-1747-5](https://doi.org/10.1007/s11205-017-1747-5).
- Stevenson, B., and J. Wolfers. 2013. “Subjective Well-Being and Income: Is There Any Evidence of Satiation?” *American Economic Review: Papers & Proceedings* 103: 598–604. doi:[10.1257/aer.103.3.598](https://doi.org/10.1257/aer.103.3.598).
- Stiglitz, J. E., A. Sen, and J. P. Fitoussi. 2009. The Measurement of Economic Performance and Social Progress Revisited: Reflections and Overview. Columbia University, IEP. OFCE Working Paper 2009-33.
- UN (United Nations). 2016. *Human Development Report 2016: Human Development for Everyone*. New York: United Nations Development Programme.
- Zarzosa Espina, P., and N. Somarriba Arechavala. 2013. “An Assessment of Social Welfare in Spain: Territorial Analysis Using a Synthetic Welfare Indicator.” *Social Indicators Research* 111: 1–23. doi:[10.1007/s11205-012-0005-0](https://doi.org/10.1007/s11205-012-0005-0).