

Challenges for the construction of well-being assessment measures

Elementary indicators and composite indices

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Policy evaluation at Istat (mainly ex-ante):

- Macro: macroeconometric model MeMo-It - what is the impact on GDP from the so called superammortamento
- Micro (firms): what are the distributional effects of the superammortamento
- Micro (households): what are the distributional effects of the so called '80 euro'
- Ex-post (micro): effects of the measure for R&D ('credito di imposta'), Propensity score matching ("Rapporto sulla competitività", chap. 4)
- Ex-post (micro): characteristics of the firms that have used the superammortamento in 2015 (descriptive, tax file)
- From 2017 BES – how to evaluate the effects of the policy on the selected 12 indicators (in 2017 only 4) – new challenges for macroeconometric models

From elementary indicators to composite indices

An elementary indicator is a quantitative or qualitative measure of a phenomenon that can

- reveal the relative position of a country (or a region) in a given geographical area;
- point out the direction of changes across units and through time.

Indicators are useful in identifying trends, drawing attention to particular issues, monitoring performance

From elementary indicators to composite indices

A composite index is formed when individuals indicators are aggregated.

A composite index should measure multidimensional concepts and can assess progress over time.

Composite indices are useful tools in policy analysis and especially in public communication (for the general public it is easier to interpret composite indices than to identify common trends across many separate indicators).

Warning: composite indices may send misleading policy messages if poorly constructed or misinterpreted.

International examples

Human Development Index (HDI)

The HDI was created in 1990 by the United Nation Development Programme to assess human well-being.

It emphasizes that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone.

The HDI is a number between 0 and 1. It is a composite index computed as the geometric mean of three (normalized) indicators:

- Life expectancy at birth
- Education Index: arithmetic mean of expected years of schooling and average years of schooling
- Gross National Income per capita

The HDI is used to compare countries and assess progress; it is also useful to question national policy choices and stimulate debate about government priorities.

International examples

Better Life Index

The Better Life Index is an interactive tool developed by OECD to measure well-being across OECD countries.

It is based on 11 topics that the OECD has identified as essential to well-being in terms of **material living conditions** (housing, income, jobs) and **quality of life** (community, education, environment, governance, health, life satisfaction, safety and work-life balance).

The composite index is computed as a weighted mean of 11 indicators (one for each topic) normalized between 0 and 1. The user may define its own weights.

The Index aims to involve citizens in the debate on how evaluate well-being, and to empower them to become more informed and engaged in the policy-making process that shapes all our lives.

International examples

Canadian Index of Well-being (CIW)

The CIW, developed by the University of Waterloo (Ontario, Canada) in 2011, regularly reports on the quality of life of Canadians – nationally, provincially, and locally

The CIW tries to capture the Canadian quality of life and to assess if the economy is growing at the cost of the environment, health, and education.

Eight domains of well-being are considered: Living Standards, Community Vitality, Democratic Engagement, Education, Environment, Healthy Population, Leisure and Culture, Time Use. Each domain has eight elementary indicators. Elementary indicators are normalized using a base year and index numbers; composite indexes are computed using arithmetic mean.

The CIW allows to measure progress through time and across provinces. Given the reference year, it allows comparisons of the temporal trends of different domains.

International examples

Portugal Well-being Index (WBI)

The Portugal Well-being Index has been developed by Statistics Portugal.

The WBI monitors the evolution of well-being and social progress (at a national scale) in two aspects – material living conditions of households and quality of life.

Ten domains of well-being are considered: economic well-being; economic vulnerability; labour and earnings; health; work-life balance; education; knowledge and skills; social interactions and subjective well-being; civic participation and governance; personal security; environment. Elementary indicators are normalized using a base year and index numbers; composite indices are computed using arithmetic mean.

Given the reference year, WBI is used to assess the percentage change in a period and in a domain and also to compare it with the change in other periods or other domains under review.

International examples

Composite indices of Well-Being

Composite Index(es)	Author	Normalization method	Aggregation method
Human Development Index	UN Development Programme	Min-Max 0-1	Geometric Mean
Better Life Index	OECD	Min-Max 0-1	Arithmetic Mean
Canadian Index of Well-being	Univ. of Waterloo (Canada)	Index number, reference year	Arithmetic Mean
Portuguese Well-Being Index	Statistics Portugal	Index number, reference year	Arithmetic Mean

Composite indices in 'Rapporto BES'

From 2015 the Italian National Institute of Statistics has decided to include the computation of composite indices (at a national and regional level) in the annual report on equitable and sustainable well-being in Italy.

These composite indices provide an easy tool to compare complex dimensions, also over time. They facilitate the communication with the general public and promote accountability.

Twelve domains of well-being are considered: Health, Education and Training, Work and Life balance, Economic well-being, Social relationships, Politics and Institutions, Safety, Subjective well-being, Landscape and Cultural heritage, Environment, Innovation and Research and Creativity, Quality of services.

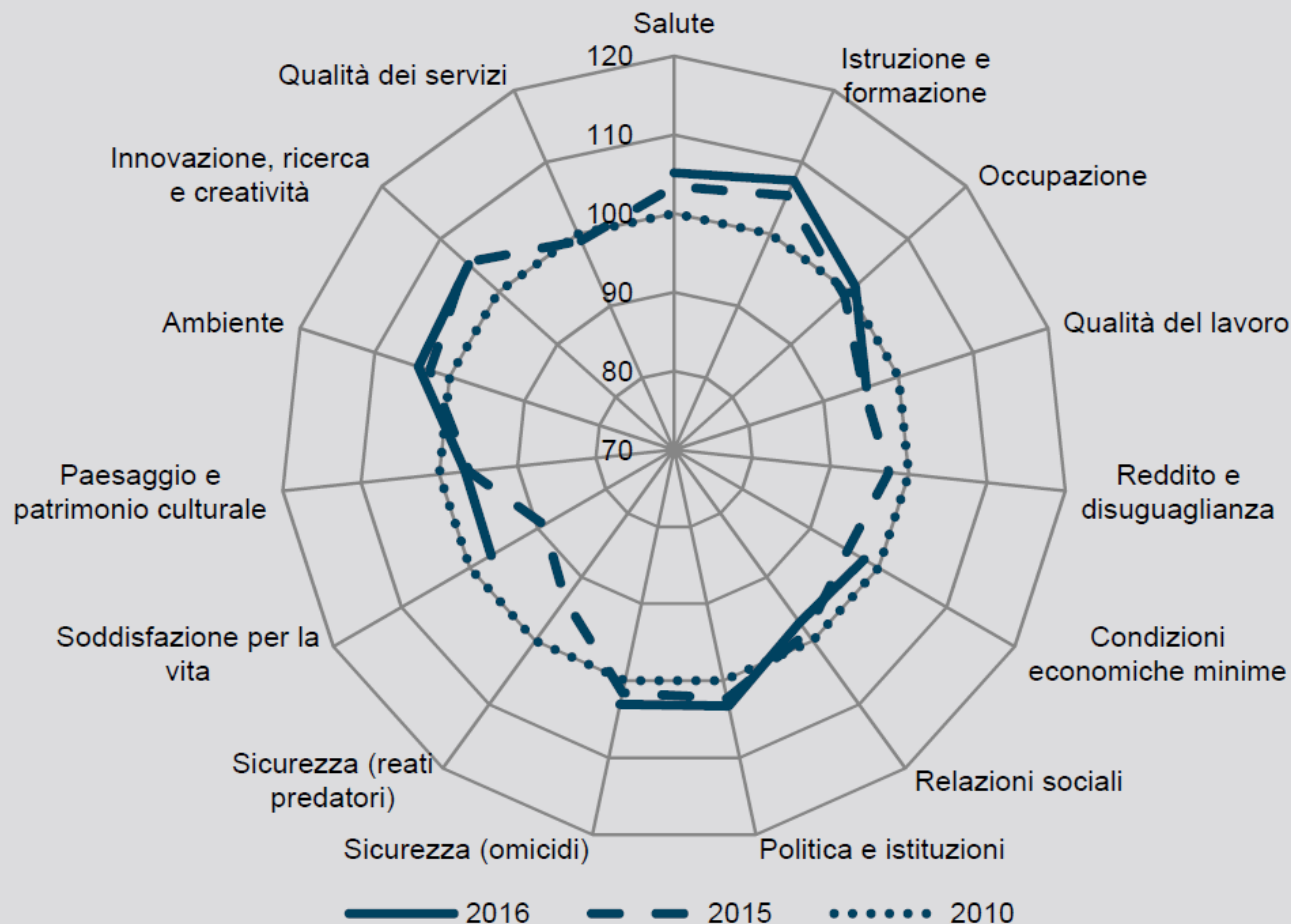
Composite indices in 'Rapporto BES'

A group of relevant indicators for each domain has been chosen by experts, and then normalized and aggregated with equal weights, in a simple way.

Elementary indicators are normalized between 70 and 130 considering their values for every year and every region. A reference geographical domain and year (Italy, 2010) is also used, and normalized to 100.

Composite indices can be used to assess temporal changes in a given period and domain, but also to compare different periods and domains under review.

Composite indices in 'Rapporto BES'



(a) Per gli indici compositi di *Reddito e disuguaglianza*, *Sicurezza (reati predatori)* e *Qualità dei servizi* l'ultimo aggiornamento è riferito al 2015.

Composite indices in 'Rapporto BES'

Elementary indicators are normalized and aggregated using a non-compensatory approach suggested by Mazziotta and Pareto (AMPI index).

After normalization, the variability among elementary indicators is penalized, so that a deficit in one indicator cannot be completely offset by a surplus in another component.

Composite indices in 'Rapporto BES'

This approach has some advantages... :

- 1) Easy to compute and to reproduce, avoids arbitrary choices.
- 2) Allows temporal and spatial comparisons.
- 3) Reduce the variability of the elementary indicators, so that the most variable indicators do not weight more than the others in the aggregation.
- 4) Favors a balanced development of the indicators.

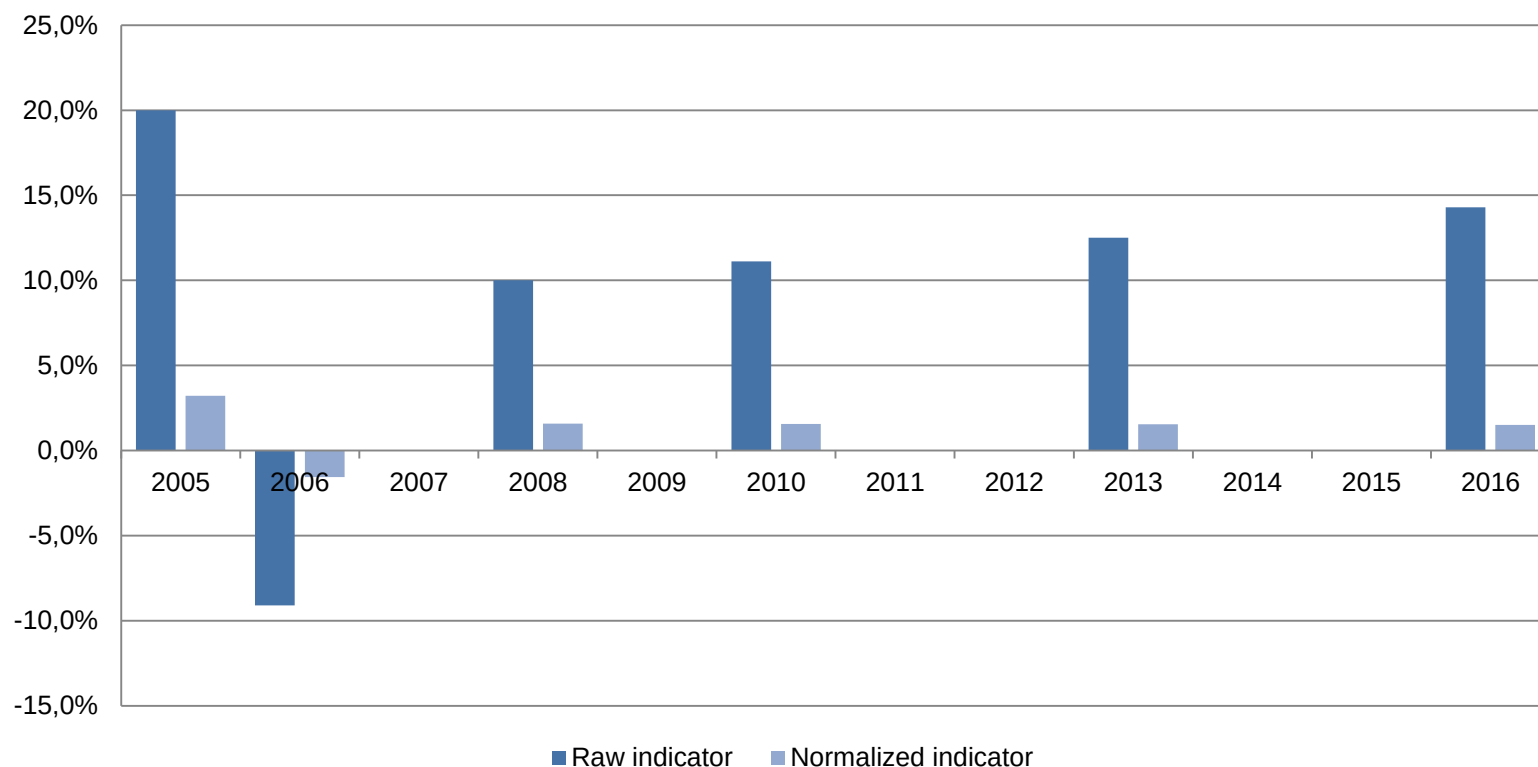
Composite indices in 'Rapporto BES'

... but also some drawbacks:

1) The normalization procedure does not respect the intensity of the year-to-year growth rates of the elementary indicators (and so temporal comparisons are less informative).

Composite indices in 'Rapporto BES'

Indicator 'Homicides' (positively polarized), raw and normalized. Italy. Years 2005- 2016. Annual percentage changes.

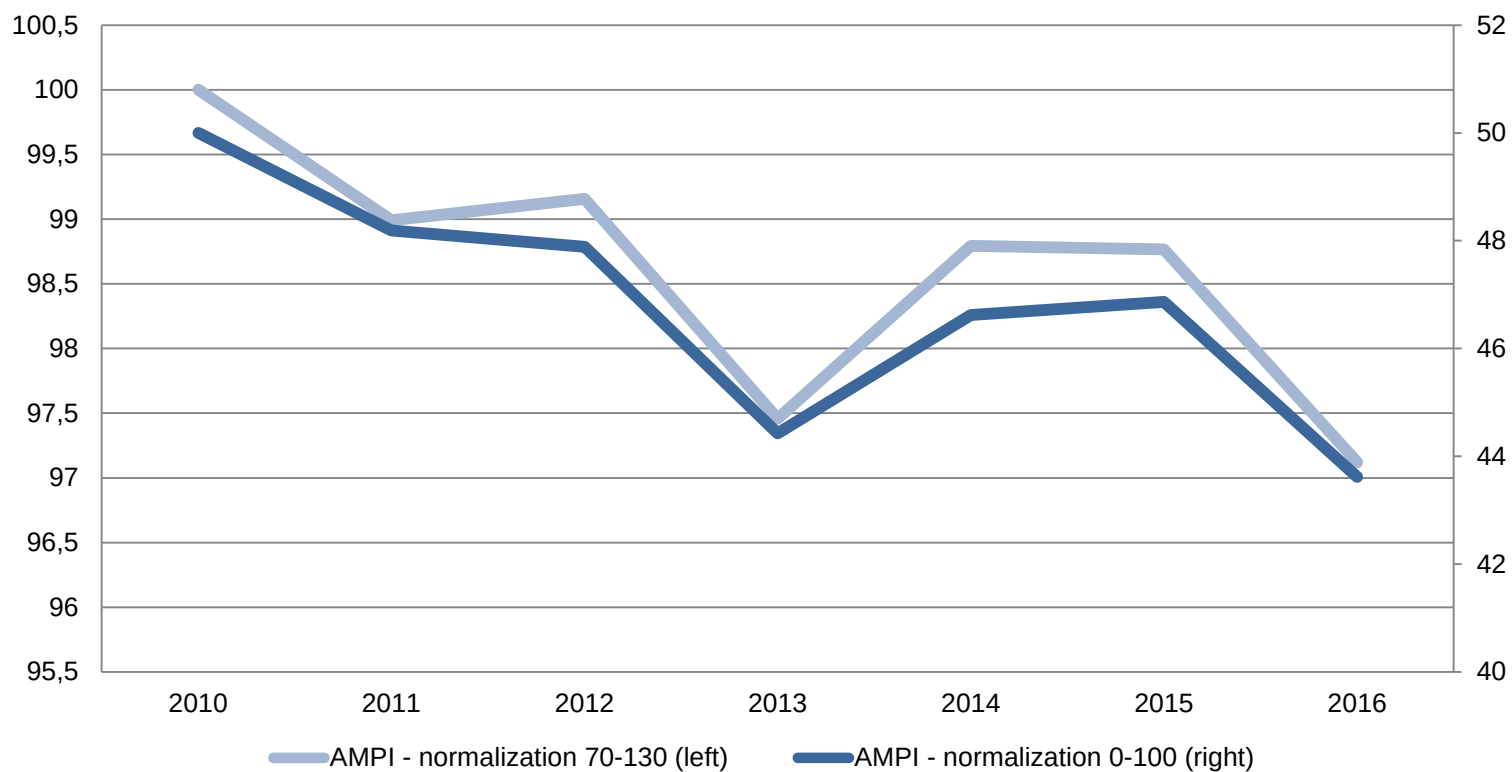


Composite indices in 'Rapporto BES'

2) Combining the normalization in a given range and non-compensatory approaches might give different results in terms of the direction of the trend of the composite index, depending on the chosen range.

Composite indices in 'Rapporto BES'

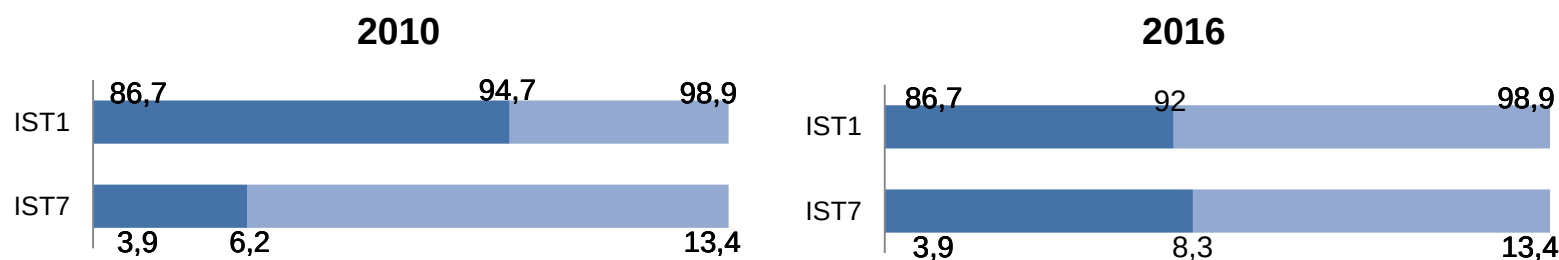
Index 'Social relationships'. Normalization between 70-130 or 0-100. AMPI aggregation. Italy. Years 2010- 2016.



Composite indices in 'Rapporto BES'

3) Using a reference year, in which all the elementary indicators are balanced by construction, makes the concept of penalization almost unjustified.

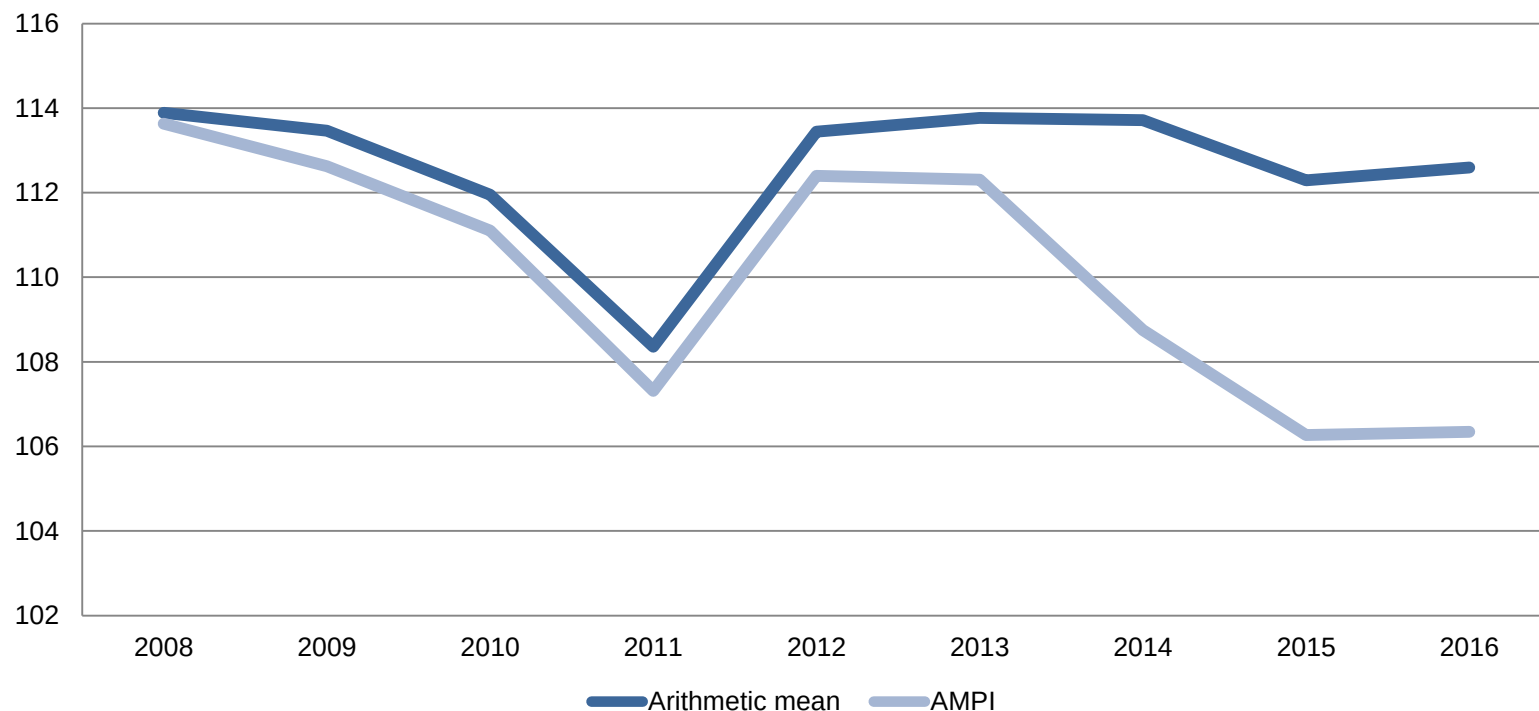
Raw indicators IST1 'participation in kindergartens' and IST7 'participation in continuing education'. Italy. Relative position of the indicators with respect to the minimum and the maximum of their values.



Composite indices in 'Rapporto BES'

4) The penalization could be too strong

Composite index 'Education and Training'. Normalization between 70-130. Aggregation by arithmetic mean and AMPI. Years 2008-2016. Lazio.



Composite indices in 'Rapporto BES'

We are studying alternative normalization and aggregation procedures.

Using index numbers and then the arithmetic mean (as for CWI, WBI) might be a solution.

THANK YOU

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