

Well-Being in Italian Regions. Measures, Civil Society consultation and Evidence *

Tommaso Rondinella[†] Elisabetta Segre[‡] Massimiliano Mascherini[§]

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Abstract

Efforts recently attempted to integrate various aspects of economic progress, environmental sustainability and social welfare into an aggregate measure of wellbeing share one major weakness concerning the identification of key aspects of wellbeing and of weights to aggregate these dimensions, they all suffer from lack of legitimacy. In this paper we present an innovative and well tested approach that attempts to overcome such limitation granting legitimacy through a broad consultation of civil society organisations. After a brief review of the state of the art, we present the methodology followed to build the QUARS (Index of Regional Quality of Development) and we point out strengths and weaknesses of our approach. We summarize the results according to the selected variables for Italian regions, we present the outcomes of our dissemination work and assess the robustness of the composite indicator.

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[†]Lunaria Association, Via Buonarroti 39, 00186 Rome. Tel: +39068841880; fax: +39068841880; email address: rondinella@sbilanciamoci.org

[‡]Department of Economics, Sapienza University of Rome, P.le Aldo Moro 5, 00185 Rome. Fax: +39064453246; email address: elisabetta.segre@uniroma1.it

[§]European Foundation for the Improvement of Living and Working Conditions, Wyattville Road Loughlinstown 18 Dublin; email address: mm@eurofound.europa.eu

1 Introduction

During the last few decades a large number of indicators has been developed to overcome the limits of GDP as a measure of well-being and to assess the impact of policies. From a methodological point of view such efforts had to cope with three central issues which make the GDP an unsatisfactory measure of progress - meant here as a sustainable pattern of well-being (see Stiglitz, Sen, and Fitoussi 2008). First, GDP is an aggregate measure: the aggregation allows for compensation (e.g. distributional issues: an increase in the well-being of the best off can offset a decrease in the well-being of the worst off), needs the identification of a weighting system and hides distributional issues. Second, the metric is exclusively monetary: weights are set by markets through prices, implying that some goods or services with no market, e.g. natural services and household work, weight zero and therefore are not included in accounting. Finally, GDP measures only productive flows, ignoring the impact on stocks, in particular natural and social capital.

Beyond these methodological issues, a further problem needs to be stressed: the overcome of GDP is mainly a cultural and political process rather than a merely methodological issue. Even if the academy would converge on a widely accepted measure of well-being which solves all methodological challenges, this would not be a guarantee for a rapid switch from GDP to this new measure. In other words, new measures of well-being have in common with GDP a lack of legitimacy ¹. Legitimacy establishes a right to rule for the policy makers and an obligation to obey for citizens. Such rules should be able to keep (or bring) the society on a path towards well-being, sustainability and progress. The problem rises when there is no collective agreement on what well-being and progress are and therefore on how to measure them. In the last decades it has been taken for granted that economic growth is able to lead automatically to higher living standards. After the Second World War the developed economies experienced an unprecedented phase of economic growth that had extraordinary consequences from the point of view of living standards. The pro capita GDP gained legitimacy and became the basic indicator of welfare and

¹“Legitimacy is a shared expectation among actors in an arrangement of asymmetric power, such that the actions of those who rule are accepted voluntarily by those who are ruled because the latter are convinced that the actions of the former conform to pre-established norms” Schmitter (2001).

the fundamental criterion for measuring the level of well-being, although even Kuznet, the creator of GDP, stated that “the welfare of a nation can scarcely be inferred from a measurement of national income” (Kuznet 1934) . Starting from the late seventies a growing number of academic works have shown how an increase in GDP might be generated by activities that are socially considered harmful to individuals, society and the environment, suggesting that policies oriented merely at an increase in GDP might lead to a failure in meeting policy objectives connected to well-being and sustainability. Nevertheless things have slightly change at political level, mainly because those are academic experiment with a rather scarce legitimacy. A democratic process is needed in order to foster a change in collective goals. Along with the change in goals goes the change in indicators.

To try to address this challenge, the Italian civil society campaign Sbilanciamoci supported by a team of experts set up a wide consultation of its network of organizations, more than 40 based at national level, in order to learn the civil society’s priorities, i.e. identification of variables and weights, and at same time to grant legitimacy to the selected variables and to the way they are combined. This process allowed us to identify key dimensions and variables, that have finally been combined in a composite indicator (QUARS) using standard and sound statistical methodology. Once the index was ready, the campaign started a parallel work of dissemination and political pressure on local Governments and Institutions.

The structure of the paper is as follows. After a review of the literature on well-being indexes, section 1, in section 2 we present our methodology both for the consultation process and for the building of the composite index. In section 3 we summarize empirical findings and political results. Section 4 presents the result of uncertainty and sensitivity analysis conducted in order to check the robustness of our index, while section 5 draws conclusions.

2 Related Literature

A possible classification of the literature on alternative indicators might be run looking at the GDP’s shortcoming that those indicators attempt to overcome. The bulk of the literature is made by aggregate indicators. Some try to integrate the information contained in GDP finding

solutions to monetize those goods and services with no markets; others aggregate social, economic and environmental variables into a composite indicator.

The construction of aggregate indicators involves stages where judgement has to be made in particular with regard to two central issues: the selection of sub-indicators and how to weigh them. The choice of variables is usually done according to the discretion of the index constructor, whose choice may be supported by a consultation process (either with experts or more in general with stakeholders) and/or by statistical tools to minimize correlation between variables. Two steps in this procedure are too often neglected. In the vast majority of examples the concepts to be measured are not made explicit, whether this being environmental sustainability, social well-being or their combination. The definition of the concept is therefore made explicit by the variables used to build the composite index. Seemingly it may exist a discrepancy between the chosen variables and what available indicators are able to measure. Therefore the ability of variables and indicators to well describe the concept is usually taken for granted.

The second central issue in the debate on composite indicators is the way the variables are aggregated, i.e. choice of weights and aggregation methodology.

In the vast majority of cases the definition of progress, the consequent selection of relevant dimensions and eventually the decision on the weighting system is made by academic experts. Therefore the relevant literature can be classified accordingly to different aggregation procedures.

Two major ways to aggregate variables are identified by Gadrey and Jany-Catrice (2003). One is the monetisation and consequent adding up in the tradition of GDP. In this case weights are set by markets which can be either real or artificial (shadow prices). The main target becomes the correction of GDP in order to turn it into a more complete measure of sustainable well-being (e.g., the MEW, Measure of Sustainable Welfare, developed by Nordhaus and Tobin (1971)). The Index of Sustainable Economic Welfare (ISEW) (Daly and Cobb 1991) is one of the most advanced attempts to create an indicator of economic welfare. Its main objective is to measure the portion of economic activity that delivers welfare to people. The ISEW composite indicator, which in 1994 turned into the widely known Genuine Progress Indicator, is calculated as the simple arithmetic average of the indicators considering the positive and negative signs of

the various sub-indicators relatively to their impact on well-being.

Many examples of combination of variables through the use of weights other than prices are present in literature. Prepared by UNDP (1990), the Human Development Index (HDI) is probably the most famous example. The HDI is calculated as the arithmetic average of three variables equally weighted: life expectancy, education and income per capita. An hybrid procedure that combines composite and monetary frameworks is the Index of Economic Well-Being developed by Osberg and Sharpe (Osberg and Sharpe 2002). It identifies four dimensions of well-being: average consumption flows, aggregate accumulation of stocks of productive resources, inequalities in income distribution, insecurity in the anticipation of future income. Among the most influential composite indexes are the Index of Human Well-Being by Prescott-Allen (2001), a re-scaling of twenty socio-economic variables, and the combination of normalization and principal component analysis performed by Rahman et al. (2005). While these examples attempt to measure social welfare and environmental sustainability, the Ecological Footprint (Wackernagel and Rees 1996) exclusively monitors the relationships between economy and environment, without going deeply into considerations about social well-being. Within the framework of social metabolism (Fisher-Kowalski 1998) the Material Input Service (MIPS) developed by the Wuppertal Institute has to be quoted. The MIPS sums the material used directly or indirectly for each production service unit measured in tons. Although integration is a difficult process, it is supported by the idea that aggregated indicators are statistically valid and that the creation of a bottom line is much more useful in gathering media and policy makers interest than the use of sets of indicators (Osberg and Sharpe 2002). Only few attempts try to integrate social and environmental dimensions, aspects that are often seen in literature as substitutes. Even if in the definition of sustainability a great importance is given to social conditions (according to the definition made by the Brundtland commission in 1989 sustainability means to meet the needs of the present generations without compromising the ability of future generations to meet their own needs), most works move from the consideration that it exists a trade-off between the two dimensions and therefore composite indicators concentrate on only one aspect ². Some

²Basically, one can consider the two separate notions: a high level of current well-being can be achieved at the price of lower sustainability; while conversely higher sustainability today may imply lower current well-being.

exceptions exist, though. We already quoted the GPI that monetizing environmental goods and services integrates different dimensions. We can further quote here the attempt made by the New Economic Foundation that developed the Happy Planet Index, i.e. a composite index that aims to measure the ecological efficiency with which well-being -in particular “happy life years”- is delivered (NEF 2006).

Examples of non-aggregative sets of indicators include OECD Society at a Glance (OECD 2006), a set of 33 specific indicators grouped into eight areas in order to assess social needs and social policy challenges for developed countries. The OECD motivation for developing this set is to identify what have been the major social developments in OECD countries. A wider approach, extended to most countries in the world and to economic and environmental variables, is the one of the World Development Indicators produced every year by the World Bank (WorldBank 2007) and the one produced by the Commission on Sustainable Development of the UNDP (CSD 1995). The Sustainable Development Strategy of the European Union is supported as well by a set of indicators for the 27 members of the Union: the Sustainable Development Indicators (SDI) defined by Eurostat (<http://europa.eu.int/comm/eurostat>). A similar set of indicators, but from a civil society point of view, is the one collected by Social Watch in order to monitor in most countries the objectives set by the United Nations in the Copenhagen and Beijing Summits in 1995 (see Social-Watch 2005). Finally it is worth to mention the Dashboard of Sustainability, which has been developed by the Joint Research Centre of the European Community, to provide assistance in the decision making process (<http://esl.jrc.it/envind/dashbrds.htm>).

As said before, in this literature definition of progress, development or well-being, the consequent selection of variables and the weighting system is done following an expert approach. As Valentin and Spangerberg (2000) well said “Indicator development is always a two-way process. Indicators are not only desired from policy aims, but they also help to concretize and mould them. So developing indicators cannot be a purely technical or scientific process; rather, it should be an open communication and policy process”. The concept is made clear in Bossel (1999) “Experts, because they are experts, are likely to focus on issues and items of their profes-

This consideration underscores the importance of separate measures for these two concepts. (Stiglitz, Sen, and Fitoussi 2008)

sional expertise while neglecting others that may have a significant effect in the real system...the best knowledge of systems and problems, including their long-term perspective, can usually be found with those who have to cope with them daily". These shortcomings may be overcome either through a political process, such as the one which led to the Millennium Development Goals set of indicators, or through a consultation process such those usually performed at community level Valentin and Spangerberg (2000).

3 Measuring well-being from a civil society perspective

To build a widely shared measurement of social and environmental sustainable development, we carried out a consultation at national level able to grant legitimacy to the selected variables and to the way they are combined (Segre and Villa 2007, and (Sbilanciamoci! 2006)). The result is a synthetic index called QUARS³, the Italian acronym for Regional Quality of Development. It is an indicator tailored for Italian regions and based on the priorities set by the organizations joining Sbilanciamoci! campaign. Sbilanciamoci! is a network of 46 Italian civil society organizations active at national level on many different issues. The index had to give a picture as complete as possible of the key dimensions of sustainable well-being according to the view of the organizations joining the network. The consultation process is, therefore, the central activity to better define the concept of quality of development. The QUARS is in fact representative of a large and diverse group, yet limited to the Italian civil society, that may have different approaches to regional development and that may fix different priorities for a desirable development path.

At the basis of the construction of the QUARS is the identification of the variables that form its structure. The consultation process led to a set of 41 variables that are representative, as much as possible, of the idea of sustainable well-being that animates the work of the campaign. The set is composed of variables of environmental, social and economic type, divided into seven groups of the same importance. The seven groups are defined as follows:

³The indicator QUARS was firstly developed by Alessandro Messina and Martino Mazzonis (Sbilanciamoci! 2005), with the scientific support of Mario Pianta, Paolo Palazzi and Giulio Marcon. The current formulation of the index has been developed in 2006 by the authors

1. **Environment:** evaluation of the environmental impact deriving from the forms of production, distribution and consumption and policies adopted to mitigate its effects.
2. **Economy and labour:** working conditions and income distribution guaranteed by the economic system.
3. **Rights and citizenship:** accessibility of services and social inclusion of young people, the elderly, underprivileged people and immigrants.
4. **Education and culture:** participation in the school system and quality of the structures, education of the population, cultural activities.
5. **Health:** quality and efficiency of the service, proximity, general health of the population.
6. **Gender Equity:** absence of barriers, based on sex, against taking part in economic, political and social life.
7. **Democratic Participation:** political and social participation of citizens and elements of good governance.

It must be noticed that it has been decided not to include GDP per capita among the variables. GDP is in fact definitely relevant for reaching a higher well-being, but it is a mean to improve the different aspects that characterize development, it is not considered a virtue itself. The relationship between QUARS and GDP will be better addressed in paragraph 3.1.

3.1 The origin

Sbilanciamoci! is a campaign involving 46 associations, NGOs and networks ⁴ active on social issues, solidarity, environment, civil rights promotion, education and health monitoring, consumer protection and alternative economic activities, from fair trade to ethical banking. Since

⁴Aiab, Altreconomia, Antigone, Arci, Arci Cultura e Sviluppo, Arci Servizio Civile, Associazione Obiettori Nonviolenti, Associazione per la Pace, Beati i Costruttori di Pace, Campagna per la Riforma della Banca Mondiale, Carta, CIPSI, Cittadinanzattiva, CNCA, COCIS, Comunità delle Piagge Firenze, Comitato italiano contratto mondiale sull'acqua, Coop. ROBA dell'Altro Mondo, CRS, CTM Altromercato, Crocevia, Donne in nero, Emergency, Emmaus Italia, Fair, Finansol, Fondazione Culturale Responsabilità Etica, GESCO, Gruppo O.Romero SICAL Italia, ICS, Icea, Legambiente, LILA, Lunaria, Mani Tese, Microfinanza srl, Movimento Consumatori, Nigrizia, Pax Christi, Rete Lilliput, Rete degli Studenti, Terre des Hommes, UISP, Unione degli Studenti, Unione degli Universitari, Un Ponte per... , WWF

2000 Sbilanciamoci! has proposed alternatives to the Italian budgetary policies, arguing for social and environmental priorities. It pushes for a change in the perspectives behind public policies, proposing new economic and social priorities for a solid world in which more attention is given to people's rights and the environment instead of the needs of a market economy. Sbilanciamoci! elaborates an annual report (Sbilanciamoci! 2009) where, after reviewing the orientations of economic policies emerging from the Budget Law and from the State Budget, "develops alternative proposals about how to use public expenditure". Analysis and proposals of the campaign are based on the different knowledge and experience of the various organizations. The wideness of the coalition can in this way guarantee that many relevant issues for the study of the national budget are actually covered by qualified organizations. From the analysis of public policies rose the need of a tool able to measure and compare well-being among Italian regions that led in 2003 to the definition of a new index. A shared vision of sustainable well-being came directly from the previous work on public policies. In Sbilanciamoci!'s approach a region (or a territory in general) typified by a good quality of development is a region in which the economic dimension (production, distribution, consumption) is compatible with environmental and social factors, where the social and health services adequately meet the needs of all the citizens, where participation in cultural life is alive, where economic, social and political rights and equal opportunities are guaranteed and where environment is protected.

3.2 The latent construct

The concept underneath the object of the observation (the so-called latent construct, in our case the quality of development) was therefore already roughly defined when the idea of building a composite indicator emerged. Nevertheless the exact definition of the sub-groups of variables had been determined only after a first consultation of the organizations. Only the choice of the sub-groups and of the indicators to be used provides the real definition of the concept. In this sense the QUARS can be certainly considered a composite indicator built following a formative model. In a formative model the latent construct is dependent upon a "constructivist, operationalist or instrumentalist interpretation by the scholar" (Borsboom et al. 2003), in our case upon the interpretation of the representatives of the civil society organizations. Following the theoretical

considerations highlighted by Coltman et al. (2008) the nature of the construct itself suggests a formative approach. In fact the quality of development does not exist as an independent entity, it covers a very broad domain, it is multidimensional and it can be very diverse according to different people: the selected indicators are thus defining the concept. Moreover, the causal effect flows from the indicators to the concept, a change in selected indicators would change at the same time the quality of development of a region, and finally a different choice of indicators or of sub-groups (here called dimensions) would change the conceptual domain of the construct. The concept itself is then limited by data availability. The selection of the indicators has been done starting from the list of all freely available indicators for Italian regions, a strong limitation in the definition of a complex concept. During the discussions that led to the indicators' selection, the need for including specific indicators that were not available has in fact emerged many times. Data like average wage by sex at regional level, access to social housing and quota of military expenditure on total R&D , for example, could not be included into the formulation of the index and therefore into the definition of the latent construct.

3.3 The consultation process

In order to select the sub-groups and the single indicators a three phases consultation was carried out. The first phase was dedicated to the definition of the sub-groups. It started from a version of the index developed by think tank Lunaria that appeared still weak and inconsistent. A few meetings have been held with representatives of the organizations, with the coordinators and with a few professors of the scientific entourage of the campaign so to reach a first framework of analysis represented by seven dimensions: environment, economy, social inclusion, education, health, gender equity, democratic participation. This first framework of analysis was not constrained by data availability. Through these dimensions Sbilanciamoci! campaign tried to provide the priorities to take care of when a territory is characterized by sustainable level of well-being. During the first phase clearly emerged that the final objective of building a composite indicator by a civil society campaign was the provision of a tool for policy makers. It has soon appeared clear that the QUARS should consider relevant issues able to represent policy objectives at local or national level. On one side the QUARS represents an

alternative vision of development with respect to the “economy centred” ones, on the other side it is an indicator on which policy makers can intervene quite directly. This approach allows the identification of direct interlocutors to the campaign as well as to the local civil society in Italian regions that can use the QUARS as an advocacy tool. Yet it has been decided to exclude public expenditure (that was included in the first version of the index) since it provides no information on how the money have been actually spent for, including in the index only output measures. The choice between producing a composite index or maintaining the whole set of variables was discussed as well during the first phase. Although the cons of merging all the variables into a single number have been presented, the effectiveness of a tool able to compare Italian regions and to produce rankings was the most important aspect when taking into considerations the aims of a civil society campaign that needs to spread as much as possible the idea underlying the index. A single number, as well as the seven sub-groups which are composite indicators themselves, attracts easily the attention of the media, of the public and of policy makers. A single number to refer to is more effective in advocacy activity and can become an identification mark for the campaign. The analysis of all the variables separately is anyway produced in order to show the reasons behind the general results.

The second phase has been dedicated to more restricted meetings between the authors and experts on the different issues in order to choose the indicators to be actually used for a good definition of the latent construct. A list of hundreds of available regional statistics has been produced by the authors in order to carry out this phase and select the indicators out of the available ones. All data considered come from institutional sources and are freely available. Not all of them refer to the same year and a few are not updated every year. For the index calculated in 2009, years are ranging between 2005 and 2009 with a couple of exceptions. (See Appendix A for a complete list of indicators, years and sources). Since at this point it was already clear that the methodology for aggregating the composite indicator would have been of equal weighting (see paragraph 2.4), the experts have been asked to provide a set of variables able to cover the relevant aspects of each issue trying to find as well an equilibrium among the selected indicators. The consultations have led also to the definition of some sub-composite-indicators still based

on official data. Some of them are indexes produced by civil society organizations, such as the indexes of eco-mafia, eco-management and school ecosystem produced by Legambiente or social assistance by Associazione Nuovo Welfare and healthcare waiting lists by Cittadinanzattiva, while some others has been elaborated only for the QUARS, like the ones on mobility, on labour precariousness and on migrants' integration. They will be better presented in paragraph 2.5.

The third and last phase of the consultation process was aimed at the finalisation of the set of variables. In this phase all the organizations and the experts surrounding the campaign have been asked an opinion on the overall structure and on the internal equilibrium of the index. The final output of the consultation is a set of 41 variables grouped into seven categories. During the last three years a few small changes were brought to the set because either better sources for the same variable have become available (for example income distribution) or because some data were not published anymore, thus obliging to remove the variable (it is the case of cinemas in small towns).

The consultation process that led to the selection of the variables listed in Appendix A.

3.4 Aggregation Methodology

Once the set of variables has been identified, the variables must be aggregated into a single synthesis value. To do this, all the variables must first be expressed in values that are comparable with each other: they can be percentages or scores defined a priori or numbers that have been normalized in some way. In any case what is important is that they are pure numbers without different units of measurement. Various methods of normalizations has been taken into account (Nardo et al. 2005). Unfortunately, it was not possible to identify a target value from which measuring a distance for every one of the 41 variabili. It was therefore not possible to identify a maximum to build a *distance to reference* measure. The creation of an ideal target in many cases would be arbitrary while in others would simply makes no sense (i.e. the number of libraries or the number of voluntary organizations). We had to choose a normalization whose scores are relative to the results of the rest of the regions. One of the possible ones is the *re-scaling* of values, establishing that the highest value present in the distribution represents a maximum and the lowest value a minimum: this means assigning a value of 1 (or maximum score) to

the former and a value of 0 (or minimum score) to the latter. This way of working, greatly used, leads to the distortion of the distribution and on the relative distances among units. In presence of outliers the rest of values can appear much closer to each other, while the distances could increase when observations are all very close to each other because of the widening of the range. We decided, instead, to apply a standardization of the variables. It is a largely used methodology, more robust than the re-scaling, that even if not solving completely the problem with outliers ⁵ (slightly exaggerating the effects of extreme values on the index) have a more moderate biased effect (Nardo et al. 2005). This technique does not allow to compare values of the index and of the dimensions overtime, this can be done only for the original value of each single variable or for the ranking values of the synthetic measures. Nevertheless the fact that the standardization imposes an average of zero to the distribution has positive communicative implications. Positive values represent a score above the average of the regions and negative ones a score below. The further away the values are from zero, the further away they are from the mean value. To each indicator it has been applied a transformation of this kind:

$$z_{i,j} = \frac{x_{i,t} - \mu_j}{\sigma_{x_j}} \quad (1)$$

where: $x_{i,t}$ is the value of indicator j for the region i ; μ_j is the average value of indicator j ; σ_{x_j} is the standard deviation for the indicator j ; $z_{i,j}$ is the standardized value of indicator j for the region i .

The aggregation is done in two steps. Standardized indicators are firstly merged into the seven dimensions by using a simple arithmetic mean. Secondly, the arithmetic mean of the seven dimensions forms the QUARS. We took the decision not to assign weights to the variables assuming that their definition would have been a much more complex and subjective matter. The a priori decision to adopt the technique of equal weighting implies that the subjective component of construction of indices would lie exclusively in the choice of variables (Salzman 2003). It would have taken time to the discussion surrounding the choice of the indicators and would have allowed the inclusion of not very much significant indicators with a small weight. Moreover it appeared

⁵In a sample of n observations it is possible for a limited number to be so far separated in value from the remainder that they give rise to the question whether they are not from a different population, or that the sampling technique is a fault. Such values are called outliers (Marriott 1990)

too complicated to assign numerical values to social and environmental phenomena. The use of multivariate techniques would have led to a selection dependent on the correlation among variables but not taking into consideration the political or social relevance that some variables have. Since the choice of producing a composite indicators stands mainly in the need of having an easily communicable tool, of attracting the attention of public, media and policy makers, it was considered fundamental to be able to analyse all the indicators separately, and excluding some of those for “statistical reasons” would have reduced very much the “political information”. The chosen aggregation method had to take into consideration the existing trade-off between the need of a statistically reliable method and the communication needs of reaching a wide audience. We took into consideration two more aggregation techniques: Analysis in Principal Components and concave means (Palazzi 2004). An example of concave mean applied to the QUARS database is provided in Corsi and Guarini (2009). The former did not produce very useful results (low variance explained) and the first two components could not be easily interpreted. The latter did not produce significant variations in the results and the transformation function has been considered subjective as well as the definition of weights. In both cases the added value of sophisticated techniques did not seem to offset the loss in communication easiness.

The main weakness of the methodology stands among the typical ones affecting most composite indexes. QUARS does not identify distance-to-target. Therefore, QUARS does not permit to determine a region’s performance in absolute terms, but only in relation to the other regions taken into consideration. As a consequence, it is not possible to build QUARS time series of a region. Only the rank position of a certain region can be followed over time. And of course QUARS does not directly indicate why a region is doing well or not so well. Only the disaggregated analysis can reveal whether good or bad performance is due to the social, economic or environmental situation of a region. A great limitation concerning the transfer of the same indicator to other countries or territorial levels is represented by the scarce availability of non-conventional data namely some surveys from Istat, the indicators built by Legambiente that in some cases required an ad hoc research or data on democratic participation.

4 Empirical findings of well-being in Italy

Table 1: The QUARS and its dimensions.

Region	QUARS	Envir	Econ	Rights	Health	Educ	Gender	Partic
TrentinoAA	0.77	1.28	1.11	0.92	0.62	-0.22	0.19	1.51
EmiliaRomagna	0.55	-0.02	0.82	0.44	0.59	0.63	0.78	0.58
ValleAosta	0.53	0.56	0.81	0.37	0.52	-0.82	1.77	0.50
FriuliVG	0.47	-0.06	0.91	0.64	0.87	0.44	-0.07	0.56
Toscana	0.43	0.17	0.91	-0.48	0.09	0.52	1.37	0.44
Marche	0.38	-0.04	0.71	0.44	0.28	0.45	0.61	0.23
Piemonte	0.33	0.27	0.67	0.26	0.50	0.16	0.41	0.02
Lombardia	0.31	-0.46	0.39	-0.07	0.96	0.19	0.18	0.98
Veneto	0.30	0.03	1.02	0.31	0.50	-0.17	-0.14	0.57
Umbria	0.27	-0.06	0.27	0.19	0.32	0.64	0.55	-0.05
Liguria	0.11	-0.37	0.43	0.07	-0.20	0.27	0.51	0.06
Lazio	-0.09	-0.40	-0.61	-0.40	0.02	0.82	-0.02	-0.02
Abruzzo	-0.10	0.14	0.04	0.12	-0.33	-0.04	-0.25	-0.38
Molise	-0.28	-0.09	-0.46	0.30	-0.70	0.41	-0.96	-0.45
Basilicata	-0.31	0.42	-0.96	-0.03	-0.27	-0.54	-0.38	-0.40
Sardegna	-0.34	0.05	-0.94	-0.05	-0.65	-0.17	-0.35	-0.25
Puglia	-0.73	-0.41	-0.75	-0.31	-0.97	-0.69	-1.09	-0.91
Calabria	-0.75	-0.13	-1.56	-0.42	-0.58	-0.56	-0.90	-1.12
Sicilia	-0.92	-0.34	-1.55	-1.18	-0.83	-0.65	-0.99	-0.92
Campania	-0.92	-0.55	-1.27	-1.09	-0.74	-0.66	-1.19	-0.97

The composition of the seven dimensions into the QUARS is able to provide an overall picture of well-being in Italian regions, ranking them and synthetizing in a single number the differences provided by the analysis of a high number of variables (Table 1). An overall picture of the composition of the QUARS according to the seven variables for each region is presented through the Figures in Appendix B. The mean value practically corresponds to the position of Lazio, that scores very closely to zero. Lazio, together with Abruzzo, represents the frontier between the North and the South of the country. Italy according to the QUARS is therefore divided exactly as in the traditional geographical division. Trentino Alto Adige is strongly at the

top of the classification thanks to the excellent results in Environment, Rights and Participation and to the good performance in Economy and in Health. A region that by our analysis appears careful to the territory and to social quality and where the only indicator below the average is Education and Culture, that is distorted by a peculiar system of regional vocational training that escapes the official statistics. The second place is occupied by Emilia Romagna with results well over the average for all dimensions, and in particular for Rights, Education, Gender equity and Participation. Its only negative result is the one related to the environmental conditions -very slightly below zero- showing a strong impact of the productive system as well as some effective policies. Friuli Venezia Giulia, with the best result in Health, and with excellent results in Economy, Rights and Education covers the third position. This region gets its worst result in Environment too. Whereas the average of the indicators led it to the fourth position, Toscana shows a controversial situation: it gets very good results for Environment, Gender equity and Participation, but it gets the third worst score for the Rights and citizenship indicator because of the worst housing condition of the country and of an access to basic services considered very negatively by the citizens. A similar analysis can be done for Valle d'Aosta -that associates brilliant results in Environment and Gender equity to a critical situation for the indicators of Education- and for Lombardia - that shows the second best health indicator and a dramatic impact on the environment. The tough impact on the environment represents a problem also for Veneto that gets otherwise quite good results. Piemonte, Liguria, Lazio, Abruzzo and Sardegna, are characterized by values that are never very far from zero. The only exceptions are represented by the case of Lazio -that holds the first position for the Education macro-indicator thanks to the cultural and educational supply offered by Rome- and by the third position of Sardegna in the Rights and citizenship classification. Molise and Basilicata get almost the same score with slight positive results for Molise in Education and for Basilicata in environmental care. The last four regions, Calabria, Puglia, Sicilia and Campania, occupy constantly the last positions on all dimension. The only good exception is the low environmental impact for Calabria due to few emissions and pollutants and to vast protected areas.

An alternative way to detect similarities among regions according to the seven dimensions

consists in conducting a cluster analysis. This tool of exploratory data analysis allows to group objects of similar kind into respective categories using different algorithms and methods, so that the degree of association between to objects is maximal if they belong to same group. We conduct a cluster analysis with the seven dimensions and we obtained a structure of clusters very consistent with the ranking obtained through aggregation (see Appendix C). The five clusters are:

1. Trentino-Alto Adige;
2. Emilia-Romagna, Toscana and Valle d'Aosta;
3. Friuli-Venezia Giulia, Lombardia, Marche, Umbria, Veneto, Piemonte and Liguria;
4. Lazio, Abruzzo, Sardegna, Molise and Basilicata;
5. Calabria, Puglia, Sicilia and Campania.

The observation of the dimensions and the variables composing the QUARS allows an in-depth analysis of Italian regions under a number of relevant point of view. The use of the QUARS is not in fact limited to the final ranking but it represents a wide set of variables to be constantly monitored.

4.1 QUARS and GDP

QUARS is an indicator born because of the need to signal the difference between income level (especially if measured in terms of GDP pro capita) and development quality in order to move the attention from the former to the latter. As we have argued before, the QUARS goes beyond the consideration and measurement of absolute or per capita income or of other purely economic indicators, while assessing how wealth is used and distributed and how the economic system treats its citizens. These are considered much more relevant factors for the well-being together with the quality of social services (education, health, assistance), the participation of all citizens to social and public life and the quality of the environment, that does not only mean attention for the environment but evaluation of the impact of the economic structure of production and consumption. Naturally, with greater resources there are greater possibilities for promoting

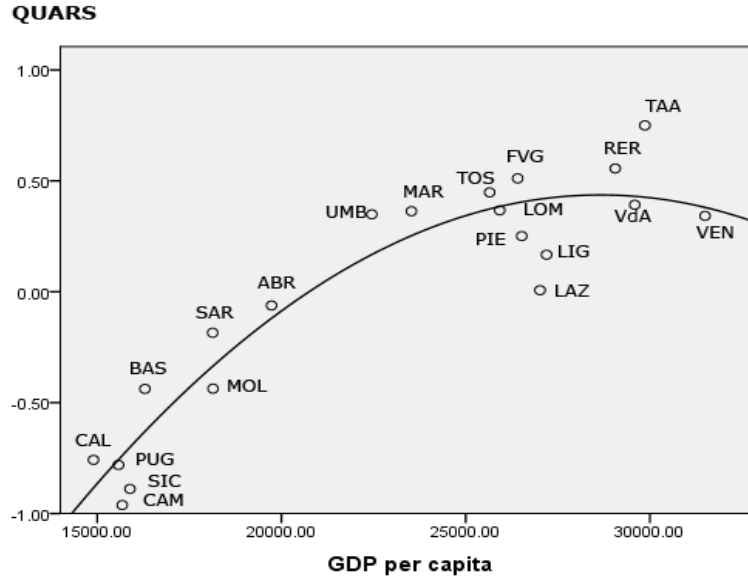


Figure 1: QUARS and GDP

adequate policies for attaining these objectives. But GDP – as well as public expenditure – does not translate automatically into quality of life and development. Regions with a higher GDP may show a lower quality of development and vice-versa. The scatterplot in Figure 1 shows a positive correlation between QUARS and GDP. But at the same time, the non-linear interpolation of data indicates a convex relation between them. This means that the relation between quality of development and income becomes weaker for higher level of income, which confirms the idea that income has decreasing return to progress. The curve presents a maximum after which the correlation become even negative.

4.2 Political Results and diffusion

During the last years the campaign has carried out a dissemination work in order to animate the debate on well-being measures and to pressure national and local Governments and Institutions towards the adoption of a wider set of indicators. Among the outcomes of this activity is the inclusion of the QUARS within best practices at EU's Beyond GDP conference (Goossens

2007) and the participation at the OECD's Global Project. the adoption of QUARS by regional governments in Lazio (the region of Rome) and Tuscany in their documents for economic planning (DPEFR – Documento di Programmazione Economica e Finanziaria Regionale) shows the possibility of applying QUARS for public regional reporting. The application of QUARS by official regional reporting indicates its policy relevance and its usefulness as a policy tool. Local authorities are asked to intervene on all aspects addressed by QUARS. In this way the QUARS is meant to support decision-making on each dimensions as well as each one of the variables. During next years it remains to be seen to which degree QUARS will guide the decision-making of the regional government of Lazio and Tuscany. Following the approach of the QUARS, well-being analysis have been carried out for some sub-regional levels, in some cases with the building of an ad hoc indicator, after Sbilanciamoci! have been asked to assess the quality of development of the provinces of Rome, Trento and Ascoli Piceno.

5 Uncertainty and Sensitivity Analysis

The robustness of the QUARS cannot be fully assessed without evaluation of uncertainties underlying the index and an evaluation of the sensitivity of the country scores and rankings to the methodological approaches utilized. A summary of the uncertainty analysis follows.

Every composite index, including the QUARS, involves subjective judgments such as the selection of indicators, the choice of aggregation model, and the weights applied to the indicators. Because the quality of an index depends on the soundness of its assumptions, good practice requires evaluating confidence in the index and assessing the uncertainties associated with its development process. To ensure the validity of the policy conclusions extracted from the QUARS, it is important that the sensitivity of the index to alternative methodological assumptions be adequately studied.

While uncertainty analysis provide an overlook of the different sources of variability and their impact on the composite indicator, sensitivity analysis lets one examine the framework of a composite index by looking at the relationship between information flowing in and out of it (Saltelli, Tarantola, and Campolongo (2000) and Saltelli, Chan, and Scott (2000)). Using

sensitivity and uncertainty analysis, we can study how variations in QUARS scores and ranks derive from different sources of variation in the assumptions.

Sensitivity analysis also demonstrates how each indicator depends upon the information that composes it. It is thus closely related to uncertainty analysis, which aims to quantify the overall uncertainty in a country's score (or rank) as a result of the uncertainties in the index construction. A combination of uncertainty and sensitivity analyses can help to gauge the robustness of the QUARS results, to increase the transparency and to help frame the debate around the use of the index.

The validity of the scoring and respective ranking is assessed by evaluating how sensitive it is to the assumptions that have been made for the construction of the composite indicator. These four sources of uncertainty exist and their combined effect on country rankings needs to be tested for this reason we tried to tackle all possible sources of uncertainty, which arise from:

1. Data Normalization
2. Weighting Scheme
3. Composite Indicator Formula (Aggregation Rule)
4. Inclusion/Exclusion of Basic Indicators

The essential point of the methodology used for the uncertainty analysis is based on computer simulations. The four sources of uncertainty are turned into 4 input factors with uniform probabilities across the different alternatives, i.e. different approaches and methods see Table 2, then all possible combinations of input factors are run, delivering in total 588 simulations with corresponding set of indicators values and country rankings.

For every region the results of the relative distribution of their rankings achieved in the 588 simulations are presented (Figure 2). The variability of these distributions can be considered as the impact of the uncertainty in the composite indicator. We discuss ranks and not scores because non-parametric statistics are more appropriate in our case given the non-normal character of the data and the scores. The results of the simulations are organized in a relative frequency matrix and the overall QUARS is calculated across the 588 scenarios. Besides the frequency

Table 2: The QUARS and its dimensions.

X_1	Standardization
1	Z-Scores
2	Min-Max
3	Ranking across countries
X_2	Weighting Scheme
1	Equal Weight
2	Predetermined set of Weights
3	PCA weights
4	DEA weights
X_3	Aggregation Rule
1	Linear
2	Geometric
3	No further Aggregation (for DEA)
X_4	Excluded Sub-Indicator
1	Indicator 2 omitted
2	Indicator 2 omitted
3	Indicator 3 omitted
...	...
60	Indicator 60 omitted
61	Indicator 61 omitted
62	No indicator omitted

matrix, the median rank per country was selected as benchmark to be compared with the rank recorded in the QUARS composite indicator.

A first consideration is that the overall ranking is enough stable and few countries show a relevant variability; in fact considering the whole 588 simulations most of the region clustered unambiguously. No doubt that the top performing countries are Trentino Alto Adige and Emilia Romagna. Then, Piemonte, Valle D'Aosta, Marche Veneto ed Umbria follow the leaders and they show the highest variability. Finally the performance of laggards is quite stable and robust recording a bad performance with respect to the QUARS in all the 588 scenarios considered.

Although further investigation is needed, the higher variability recorded in the above mentioned regions is probably due to the combined effect of weighting design and the inclusion of

analysis.png

	Piemonte	Valle d'Aosta	Lombardia	Trentino-Alto Adige	Veneto	Friuli Venezia Giulia	Liguria	Emilia-Romagna	Toscana	Umbria
1				86.6				13.3		
2	7.1	5.6		6.6		1.9		72.1		
3	0.7	29.3		6.0		41.5		7.5	4.6	
4	12.1	9.4		0.9	0.7	34.2		0.3	26.0	0.7
5	13.8	4.1			5.1	9.2		0.3	47.3	5.6
6	16.2	6.6			16.5	12.2		1.9	18.4	0.5
7	26.5	7.5	4.4		25.3	1.0		4.6	3.6	16.2
8	20.9	9.4	12.2		28.9				0.2	14.8
9	2.7	11.9	38.4		16.3					30.6
10		9.7	44.9		7.1		0.3			31.6
11		3.9					94.2			
12		2.7					5.4			
13										
14										
15										
16										
17										
18										
19										
20										
	100	100	100	100	100	100	100	100	100	100
	Marche	Lazio	Abruzzo	Molise	Campania	Puglia	Basilicata	Calabria	Sicilia	Sardegna
1	0.2									
2	6.6									
3	10.5									
4	15.8									
5	14.6									
6	27.7									
7	10.9									
8	13.6									
9										
10			6.3							
11			1.9							
12		19.6	72.3							
13		76.0	19.6				3.6			0.9
14		3.2		48.3			17.2			31.3
15		1.2		15.0			36.9			46.9
16				36.7			42.3			20.9
17						33.5		66.5		
18						66.5		33.5		
19					37.8				62.2	
20					62.2				37.8	
	100	100	100	100	100	100	100	100	100	100

Figure 2: Uncertainty analysis

some relevant indicator. This combined effect probably bias the ranking especially when the excluded indicator belong to a dimension with a small number of indicators.

Finally, it is worth to notice that, for every region, in most of the case the mode of the distribution of the uncertainty analysis coincides with the ranking recorded in the QUARS composite indicator. Thus, for the remaining regions the difference between the QUARS rank and the observed mode rank is less than 2 positions. So that, for all the regions studied, the very modest sensitivity of the QUARS ranking to the four input factors (standardization, weighting scheme, aggregation rule and inclusion/exclusion of a single indicator) implies a considerably robustness of the index. In sum the overall performance of the QUARS composite indicator appears to be robust as other indices presented in the literature.

6 Conclusions

The work presented here shows the building of a composite indicator according to an original and effective approach. The consultative process that led to the definition of the QUARS grants a strong legitimacy to the index that in this way overcomes a number of drawbacks due to the contribution of scholars alone. The inclusion of a large civil society coalition implies the lack of any particular interest, and focuses its attention to the reaching of wellbeing for all citizens. In particular, it is probably best practice in representing and encouraging one of the finest expressions of democratic decision-making: public participation. In the context of official indicators-based reporting this is an aspect which is often neglected, and whereas the measure we proposed is very much limited by data availability, it still represents an innovative approach to the measure of progress which deserves further investigation.

The empirical analysis we carried out demonstrates the validity of the set of indicators in providing an overarching picture of the country. The chosen aggregation method leads to a ranking of Italian regions that represents clearly the differences and that is confirmed by the use of other techniques. Thanks to the variety of indicators used, the QUARS is able to capture a number of different aspects contributing to the definition of wellbeing, representing the condition of each region in its complexity and multidimensionality. The sensitivity and

uncertainty analysis demonstrate that despite the large number of indicators used, the QUARS is a robust index towards variations in the indicators and aggregation methodologies.

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Appendix A

DIMENSIONS	VARIABLES	INDICATORS	YEAR	SOURCE
ENVIRONMENT	Population Density	People per km ²	2008	ISTAT
	Air Pollution	CO ₂ in millions of Mg	2005	ISTAT
	Water and Soil Pollution	Hundreds of Kilogramms of fertilizers (nitrogen, phosphorus and potassium) per ha of agricultural area	2007	ISTAT
	Environmental Illegality	Synthetic index on environmental crime, cycle of the cement and waste treatment	2008	LE GAMBIENTE
	Waste Collection	Share of Municipal waste being collected separately	2007	ISTAT
	Renewable Energy	GWh produced from renewable energy sources (hydroelectric, wind, photovoltaic, geothermal, biomass)	2007	ISTAT
	Protected Areas	Protected areas as percentage of regional surface	2008	ISTAT
	Eco Managment	Synthetic index on purchases by the government of high-energy efficiency and eco-label products, use of organic food in canteens, use of recycled paper in public offices, Agenda 21 implementation process, drafting reports on the state of Italy, mobility manager , energy manager	2007	LE GAMBIENTE
	Organic Farming	Simple average between area of organic farming over total of agricultural area and number of biological farms over total of farms	2006	AIAB
	Sustainable Mobility	Synthetic index: accidents, public transport, CO ₂ emissions from transport and use of rail, cars and bikes to go to work or school	2007	SBILANCIAMOCI!
ECONOMY	Job Precariousness	Simple average between percentage of temporary workers, illegal workers and parasubordinate workers	2007	SBILANCIAMOCI!
	Unemployment	Ratio between persons actively seeking employment and the total workforce	2007	ISTAT
	Income Inequality	Gini Index	2006	ISTAT
	Poverty	Percentage of population living below the poverty line	2007	ISTAT
RIGHTS	Housing	Number of evictions per 1,000 households	2007	ITALIAN HOME OFFICE
	Access to Basic Services	Synthetic index measuring the difficulty for households in reaching some key services, developed by Sbilanciamoci! on ISTAT data	2007	ISTAT
	Social Assistance	Synthetic index created from data on socio-medical care for seniors, adults, children and drug addicts	2006	NUOVO WELFARE
	Risk of Exclusion for Disabled	Number of cooperatives of type B per 100,000 inhabitants	2005	ISTAT
	Migrant Integration	Synthetic index prepared by Sbilanciamoci, which considers family reunions, school participation and the attractiveness of a region	2008	SBILANCIAMOCI!
	Younger Generation	High school dropout rates	2006	ISTAT

HEALTH	Integrated Home Assistance	Share of seniors assisted at home	2007	ISTAT
	Cancer Screening	Percentage of women undergoing screening for early detection of cancer of the female genital tract	2007	ISTAT
	Waiting Lists	Innovative procedures adopted in relation to waiting list	2007	CITTADINANZATTIVA
	Hospital Migration	Share of hospitalizations occurred in the region other than the one of residence	2005	ISTAT
	Public Health System Satisfaction	Synthetic index of satisfaction of medical, nursing and health services provided by the NHS	2007	SBILANCIAMOCI!
	Avoidable Mortality	Average of per capita number of days of life lost due to causes that may be actively opposed by the public health system and that led to death at an age between 5 and 69 years	2003	ERA
EDUCATION	School Ecosystem	Synthetic index on the quality of structures for primary and secondary education	2009	LEGAMBIENTE
	Secondary Education	High school participation among people aged between 14 and 18	2007	ISTAT
	Higher Education	Share of graduated population	2008	MIUR
	Students Migration	Share of undergraduates studying in the region of residence	2006	ISTAT
	Libraries	Number of libraries in the region every 100,000 inhabitants	2007	ISTAT
	Theater and Music	Per capita expenditure for theatrical and musical performances	2007	ISTAT
GENDER EQUITY	Family Advice Bureaux	Number of family advice bureaux every 20,000 inhabitants	2007	ITALIAN DEPARTMENT OF HEALTH
	Female Activity Rate	Spread in males and females activity rates	2007	ISTAT
	Political Participation	Council	2009	SBILANCIAMOCI!
	Municipal Crèches	children between 0 and 2 years	2007	CDIA
PARTICIPATION	Participation to Organized Civil Society	Persons aged 14 and over who participated in meetings of voluntary associations in support of civil rights, peace and environment among the total population aged over 14	2007	ISTAT
	Number of Voluntary Associations	Voluntary organizations per 10 thousand inhabitants	2003	ISTAT
	Ombudsmen	Number of Ombudsmen in the region	2009	SBILANCIAMOCI!
	Newspaper diffusion	Circulation of Daily Newspapers (non-sporting)	2008	AUDIPRESS
	Political Participation	Turnout at the polls	2008	ITALIAN HOME OFFICE

* Centro Documentazione Infanzia e Adolescenza

Appendix B

