What territorial disparity means? A methodological approach

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Keywords
local development, multidimensional approach, imbalances, planning policy

Abstract

The evaluation of local development provides useful tools to the devising of local policy strategies oriented to reduce the territorial imbalances. However, the efficiency of such a policy strategy is ensured by a deepen knowledge of the features of the area analyzed. The aim of this paper is provide a methodological model as support decision method to local policy makers. The proposed model – to be applied at local level – is based on a combined approach. Firstly, an assessment of the achieved development level is carried out, by clustering the territorial features in material and immaterial ones, allows to better understand the type of reached development. Then, the definition of indexes to measure the whole development, and their branches (material and immaterial ones) allows, also by considering the distance among 110 Italian provinces, to identify the deficiencies to be filled.

1. Introduction

The recent economic crisis has dramatically drawn the attention of national and international governments on topics such as poverty and imbalances, whose presence does not allow to achieve acceptable levels of general wellbeing and living (Palmer Fry et al., 2017). Addressing these problems is possible by planning targeted measures, aiming at the improvement of a community social wellbeing. Therefore, it is deemed necessary to establish statistical indicators for the measurement and assessment of social welfare (Newman, 2017).

The most used and widespread indicator is GDP, even though the current literature has shown its inability to provide useful information about several aspects that influence the quality of local development. Actually, GDP is related to "economic growth" and does not deal with goods that are outside of the market. In addition, it does not take into account negative externalities, wealth distribution and equity. Furthermore, Gross Domestic product does not provide any kind of information about the quality of public expenditure. Several new indicators have been recently developed, also qualitative ones; they are able to highlight the different parameters of the definition generally used for wellbeing.

Our analysis is developed with a combined approach, realized by: i) the construction of three different indexes - the main offers an overall measure of local development; other two sub-indexes that respectively reflect the level of infrastructural endowment about offered services and quality of the life- ii) the estimate of the distance of these obtained values from both an ideal threshold and an efficient one. Finally the lecture of results is offered both for each provinces and, following the EU planning 2014-2020 strategy, for the territorial aggregate in order to provide some consideration about the contrast among urban-intermediate and rural areas. This approach is applied to 110 Italian provinces.

The results underline that the obstacle for a correction of the regional unbalances derives from a policy approach that has privileged a quantitative endowment neglecting a multidimensional approach linked to the perceived quality of life (Capello, 2015; Capello, Caragliu, Nijkamp 2009).
The paper is structured as follows. After we have briefly mentioned the main models on the territorial unbalances, the second section presents the main methodologies that measure the

wellbeing of an area. The third section describes the methodology applied. The fourth section provides the results. In the final section we discuss the findings, provides policy suggestion, and conclude the paper.

Literature Review

In recent years the topic of wellbeing has been at the centre of a debate whose nature is international (OCSE, 2010; Scrivens et al., 2010; Hall et al., 2010; Stigliz et al., 2008), European (EENDR, 2010; Commission of the European Communities, 2009) and national (Cnel e Istat). This debate is also contributing to the definition of a theoretical reference framework, useful for the analysis and evaluation of the state and proffers of society, from a multidimensional point of view.
This interest derives from the verification that grown, strictly speaking, as a mere increase in incomes, industrialization and investments, does not always lead to positive effects on the life quality of the population, especially without appropriate social and environmental policies. Therefore, growth is possible only through wellbeing improvement.

From this perspective, the PIL is an inadequate indicator for the wellbeing assessment and needs to be integrated by other non-monetary indicators involving also social an environmental aspects, fundamental for the citizens' wellbeing and quality of life (Stigliz et al., 2008).

There are many contributions in the field which have been given in order to overcome and extend the traditional definition of growth, based entirely on the improvement of material developmental factors. This is also what the United Nations are trying to do by introducing, in 1990, the *Human Development Index* – HDI. An index that initially covered only three dimensions (income, education and health), but that was integrated with the multidimensional poverty index (MPI), giving an estimate of the poverty as a "multidimensional" condition, thus being useful in the destination of resources; and with the "fixed" index HDI which consider inequalities.

The OCSE, in turn, originated many initiatives on the wellbeing subject, thus defining some reference framework to measure society development and identifying some relevant domains. In 2011 the publication of report entitled "how is life?" tried to be a useful instrument for the comparison of the quality of life of 34 countries, developed and in development, on the basis of a wide set of indicators which could be representative of the performances reached in the 11 essential domains. The framework in which the indicators have been identified, can be divided in three macro pillars: a) The material conditions, analyzed with reverent to incomes and wealth, jobs, retributions and homes; b) Life quality, examined with reference to health, education and competences, balance between working and non-working time, civic engagement and governance, social relationships, environmental quality, personal safety and subjective wellbeing; c) sustainability, which focuses on stock and enabled to evaluate wellbeing sustainability in time together with productivity improvement. It is divided in: economic capital, environmental capital, human and social capital.
OCSE's approach provides new instruments for a better multidimensional vision of the progress, so as to broaden the knowledge of citizens and administrators and also to implement more effective policies.

The Stiglitz- Se- Fitoussi Commision, in 2008, stated the importance of not privileging the economic wellbeing measurement. However, there is no single measurement which could define all the different dimensions of wellbeing. Due to the impossibility of elaborating a single indicator, the Commission recommends drawing all the attention to the dimensions relevant for the wellbeing of the individuals. Among these, on the base of the available researches, 8 are deemed important: the psycho-physical state of people, knowledge and the capacity to understand the world in which we live, job, material wellbeing, environment, interpersonal relationships and the participation to social life with the perceived security/insercurity. In addition to this, it is necessary to consider the distribution of all the wellbeing (equity) dimensions and to see the sustainability not only as an environmental phenomenon due to its economic and social nature.

In Italy, the Statistical Bureau (Istat) in 2010 started a national research program, together with the Economy and Labour National Council (Cnel), which contributed to the development of a set of indicators of equal and sustainable wellbeing (BES). In this way they integrated wellbeing with equity and sustainability which refer to the following dimensions: environment, health, economic wellbeing, education; job and life time conciliation; social relationships, security, subjective wellbeing, territory and cultural heritage, research and innovation, service quality, politics and institutions.

Despite the significant attention payed on the topic, the concept of wellbeing is still very vague and difficult to explain in operational terms, without having a universally accepted definition. Giovannini (2007) claimed that "the concept of wellbeing changes depending on the time, the paced and the cultures and cannot be defined in a single way, but only through a process which involves the society themselves. The debate the measurement of wellbeing needs the contribution of the citizens, the associations, the companies and the institutions".

3. Wellbeing evaluation: the methodology proposed

The wellbeing measurement of a territory is analyzed by means of a multidimensional approach concerning several features – immaterial and material ones - which influence life quality of the people. Considering the critical issues which could arise in the synthesis of such a complex phenomenon in terms of information loss, we set out to measure territory wellbeing by means of synthetic indexes which could reflect the wellbeing dimensions taken into account in the model and thus following the statement of Stiglitz Commission (2008).

The methodology consists of a combined use of different measurement tools: i) the construction of both a composite index, namely Local Development index (LDI) - which offers a vertical comparison among the observation by ranking the level of development achieved -and two sub-indexes, namely LDI_immaterial and LDI_material - that provide in details an horizontal comparison by respectively reflecting the level of quality of the life and of infrastructural endowment; ii)starting from the obtained results, the estimate of the deviations of each observation from both an ideal threshold and an efficient one.

With reference to a multidimensional approach to wellbeing, the analysis has been conducted by dividing the basic indicators/variables that measures the specific features of 110 provinces in Italy. We have constructed the dataset by following the scheme proposed by the Regional OECD Better Life Index, since its hierarchy framework appears the most exhaustive among the indices used currently to calculate the well being (OECD, 2011). This index is computed both at country level and regional level(or TL2) and it is comprised of 12 dimensions a tnational level and 11 at regional one.. In this paper, we use the regional index in order to build it at a sub regional level – TL3. Given the available data provided by ISTAT, MEF and DPS, 21 basic indicators/variables have been identified and grouped into 2 cluster: Immaterial features and material one (tab. 1).

From a territorial and demographic point of view, those aspects that best represent the context have been selected, in order to find a further characterization of each territorial system in terms of rurality and urbanization.

Tab.1 Data selected

Label	Macro area/Dimension/Variable	Regional OECD Better Life Index	LDI	Data source	Year
IMMATERIAL FEATURES					
Income					
Income_percap	Householddisposableincome	x		Italian Ministry of Economy and Finance	2015

Jobs					
Empl_rate	Employment rate	x		OECD.Stat	2015
Unemp_rate	Unemployment rate	x		OECD.Stat	2015
Housing					
Hous	Average number of rooms per inhabitant	x		ISTAT[1]	2015
Health Status					
Life_exp	Life expectancyatbirth	x		Eurostat	2015
Mort_rate	Age adjustedmortality rate	x		Eurostat	2015
Education and skills					
Edu_att	Educationattainment	x		ISTAT[1]	2015
Environmentalquality					
Air_qual	Air quality	x		OECD.Stat	2015
Personal security					
Homic_rate	Homicide rate	x		OECD.Stat	2015
Civic engagement and governance					
Vot_turn	Votertornout	x		Italian Ministry of the Interior	2015
Accessibility of services					
Digit_Div	Broadband connection	x		ISTAT[1]	2015
Work-life balance					
Work_balance	Employees working very long hours		x	ISTAT[1]	2015
MATERIAL FEATURES					
Infrastructure and service endownment					
Water_effic	Water management efficiency		x	ISTAT[1]	2015
Separ_waste	Separate wastecollectionservices		x	ISTAT[1]	2015
RES_prod	Renewableenergy production		x	ISTAT[1]	2015
Energy_grid	Energy grid		x	ISTAT[1]	2015
Schools	Schools		x	ISTAT[1]	2015
Hospit_accom	Hospital accomodation		x	ISTAT[1]	2015
Railway_st	Railway station		x	ISTAT[1]	2015
Bank_point	Check-cashingplace		x	ISTAT[1]	2015
Urban_access	Access to urbannode		x	ISTAT[1]	2015

[1] ISTAT is the Italian National Institute of Statistics. It is the main producer of official statistics in the service of citizens and policy-makers. Statistics are availableat: http://www.istat.it/en/

The development of these synthetic indexes is based on the methodology proposed by OCSE (2008) applied to different case studies (Nicoletti et al.2000; Ercolano and Romano, 2012; Arbolino et al., 2017)), which consists of the following operations:

Date selection;

Multivaried analysis, so to measure the dataset compatibility and to define the following methodological choices;

-Ponderation and aggregation procedure.

The evaluation of the territorial disparity is based on the calculation of two indexes:

"disparity distribution index" based on the review of the headcount ratio and income gap ratio, Sen (1976);

G Gini index, measures the degree of inequality among the provinces

3.2 Multivariate analysis

The data matrix has been tested through the Principal Component Analysis (PCA), that allows to identify the correlation among the different variables and to create a new framework, which is easier to read and interpret (Pearson, 1910, Hotelling, 1933).

The first step of the analysis consists in defining the number of the principal components. This choice is done through the Kaiser criterion, according to which only the factors with an eigenvalue higher than 1 and that cumulatively contribute to explain a variance value higher that 60% should be considered.

The second step is the rotation of the factors, in order to have a clearer illustration of the variables on each factorial axe. The used rotation method is the *Varimacrotation* (Linting et al., 2007), that minimises the number of variables having high loadings (correlation coefficients) on the axes. It ensures an easier interpretation of the factors (OECD, 2008).

The results of this procedure are explained in Tab. 2, where variable loadings are expressed by values between -1 and +1.

The first factor indicates the degree of "socio-economic dynamism", represented by the occupational and entrepreneurial activity.

The second factor indicates the "degree of rurality": those variables related to agricultural and forestry issues are strongly correlated.

The third axis is diametrically opposed to the second, regarding the degree of urbanization and taking into account the infrastructures and service endowment in a significant way.

The last considered factor, the fourth one, has been named "tourism-oriented development" and represents the viability of the touristic economic sector: in fact, the variable "hotel accommodation services" shows very high loadings on such axe.

3.3 Ponderation and Aggregation

According to OCSE (2008), the assignment of weights to the variables which have been aggregated refers to a theoretic framework that mainly takes into account the degree of correlation among the indicators and, then, choose the most appropriate weighting technique. Generally, weights can be distributed among all the indicators, or assigned according to the concern to the public and experts. This procedure is not always preferable, especially when objectivity and precision are required (Ercolano and Romano, 2012).

Even though there are many weighting techniques, in this work we use the PCA results in order to group the indicators according to their degree of correlation. According to OCSE methodology, weights are taken from the factors loading matrix after the rotation, since the squares of "factor loadings" represent part of the indicator variance explained by the factorial axe.

In other words, this approach consists of "weighting every single indicator according to the portion of its own variance explained by the factorial axle which it is linked to, while each principal component is weighed according to its contribution to the portion of explained variance of the dataset" (Nicoletti et al., 2001).

The methodology referred to in the paper is based on a different weighting and aggregation procedure, that has been tested in other studies (Arbolino and De Simone, 2015; Antony e Rao, 2007). Such procedure is based on factor score coefficients, namely each case studies (or each statistical unit) score (estimated using the regression methodology) on each principal component.

For each j-th (j-esimo) Province, synthetic indicators have been calculated according to the following formula:

$$Ij = \sum_{k=1}^{f} \left(\frac{\lambda k}{\Lambda}\right) * \alpha_k^{xj} \quad (1)$$

In which:

Ij represents the indicator for each j-th (j-esimo) Province;

$\alpha_k^{x_j} = \{\alpha_1^{x_j}, \ldots, \alpha_f^{x_j}\}$ represents the factor scores of each case studies – x_j– on each f-th factor;

$\lambda_k = \{\lambda_{k1},\ldots, \lambda_{kJ}\}$ represents the variance (%) explained by each f-th factor,
Λ stands for the cumulative variance
x_j represents the case studies.

In order to assess the wellbeing of Campania Provinces with a view to multidimensionality, it was considered appropriate to create a synthetic indicator for each dimension that we took into account in the model, by applying (1).
Such indicators can have positive or negative values, so they have been normalized using the min-max procedure:

$$SIj = \frac{(Ij - Min\ I)}{(Max\ I - Min\ I)} * 100 \quad (2)$$

Where:
Sj represents the single indicator, for each J-th Province;
Min I and Max I indicate the minimum and the maximum value of the Ij indicators;
Thus, each indicator will have a value between 0 and 100, making it easier to read the data.

Evaluating the territorial disparity

Once the indexes are calculated for each province, we have defined the threshold in order to identify those that not obtain a value equal to an acceptable level of life.

Thus, for limiting the sensitive to the size and number of provinces and according to OECD procedure (OECD, 2008), we not considering the 20% best values and the 20% worst. Then we have calculated "efficient value" as 'interquartile' average: between the first quartile and the third one; scenario 2 as "ideal value" equal to the maximum value resulted by the fourth quartile. Once calculated these value, the provinces that doesn't reach that threshold, become those to be improved within the sample.
These measure "disparity distribution index" is based on the review of the headcount ratio and income gap ratio:

$$S = H[I + (1 - I)G] \quad \text{(eq. 5)}$$

where- H is the diffusion disparity indicator (eq.6);computed as

$$H = \frac{q}{N} \quad \text{(eq. 6)}$$

in which q means the number of Italian provinces below the threshold value; N means the number of all Italian Provinces.
I is the disparity intensity indicator (eq.7): it measures the disparity intensity as distance of provinces less liveable from the threshold value -expressed as value of the composite indexes- following the structure of Income Gap Ratio-:

$$I = \frac{1}{q}\sum_{i=1}^{q}\frac{(z - y_i)}{z} \quad \text{(eq. 7)}$$

in which z is the threshold value; y_i is the values of the composite index for each province. This indicator can be interpreted as the quantuum needed to overcome, or to equalize at least, the threshold value.

G Gini index, measures the degree of inequality among those provinces which wellbeing values are below the threshold value

$$G = \frac{1}{2q^2}\sum_{i=1}^{q}\sum_{j=1}^{q}|y_i - y_j| \quad \text{(eq. 8)}$$

The obtained values could be understood as weight relative that every province, within the sample but below the threshold value could assume in an economic planning – financial.

Empirical results

By using the illustrated procedure in section 3.1-3.2-3.3-3.4, we obtained LDI ranking. In order to provide useful information for the policy makers we have investigated also the role played by quality of life dimension and infrastructure provision one in achieving higher level of local development. In doing so, a disaggregated analysis is carried out by calculating provincial LDI_immaterial and LDI_material, following the same methodology. All of these values are presented in Appendix A while Table 2 synthesizes the obtained values for macro territorial areas providing statistical informations

The Italian provinces belonging to the Northern and Central area are placed above country average (Table 2). Such data represents 56% of the analysed phenomenon (66 provinces out of 110). At the first ten positions the Northern provinces are classified, except for Siena belonging to a Central region. This confirms the relationship between economic growth and well-being: these provinces belong to regions traditionally performing a strong economic dynamism mainly driven by industry sector. (Della Porta et al., 2016).

The Southern provinces (with just five provinces of Central Italy) present the worst performance of the LDI, by showing how a general reduction of growth and a wider slowdown in economic activities can affect the quality of life negativly (Della Porta et al., 2016).

Thus, from a LDI geographical distribution point of view, in Italy there are two macro areas - the North and the South - which border is represented by the Centre Italy by confirming the historical Italian dualism between an economically developed area (the Central and the Northen areas) and an economically undeveloped one (the Southern area) (Jules, 2017). A disaggregated analysis has been carried out in order to provide a better explanation of the role of the macro categories - immaterial services (QI) and for material ones (ISI): the Provinces with a better performance of LDI, show that the development is equally due to the quality of life factors and to the existence of infrastructure. However, if we considered the provinces with a LDI above the country average, many of them show a displacement: the wellbeing is driven by good life satisfaction derived from better economic features. The worst performing provinces display that a low liveability is affected by both analyzed sub domains.

In this research the issue of territorial disparity between urban areas and rural ones is also considered. For evaluating the distance between the provinces and, thus, provide a support to the policy makers in defining suitable policies, two scenarios have been analysed: the first one represents the acceptable situation by computing an efficient threshold of the LDI and of the two sub-indexes; unlike, the second one is based on the ideal threshold. The obtained results explain the relative weight of each province on the total of those that are below the threshold.

In order to provide further consideration, the provinces have been classified in Predominantly Urban (PU), Intermediate (IN) and Predominantly Rural (RU), following the OECD classification (OECD, 2010).

In the first scenario, the disparity distribution index shows that the weakness of rural areas is mainly linked to the quality of life and to wealth distribution rather than to the lack of infrastructural endowment. That means the infrastructures and the essential services exist, but their functionality is relatively low. Moreover, within this cluster there is on average the wider gap from the threshold but a lower standard deviation than the others clusters.

The urban area are closer to the threshold despite they present a higher infrastructural deficit and the number of involved provinces is wider than rural. Finally, the Intermediate cluster show issues in both domain (material and immaterial); also considering the gap from the threshold this cluster is in intermediate position than the others.

The second scenario shows lower values on average because of the considered sample is wider by considering provinces with lower gap by the threshold. The results confirm those of efficient scenario, however it is even more highlighted that the urban and intermediate area show mainly lack in infrastructural endowment, while the opposite occur for the rural area.

In conclusion, by these results on the analysis on the territorial disparity we can argue that it is not more possible to associate to urban-rural dichotomy with that rich areas -poor ones, since low levels of wellbeing occur within all territorial categories.

Table 2- Statistics information for geographical areas

Geo Area	Statistic information	WBI Value*	WBI Value**	QI***	ISI ****
Italy	Min	-1,06	0,0000	0,00	0,00
	Max	0,90	1,0000	1,00	1,00
	Mean	0,00	0,5429	0,60	0,39
	DevSt	0,48	0,2440	0,27	0,21
North	Min	-0,02	0,5312	0,56	0,00
	Max	0,90	1,0000	1,00	1,00
	Mean	0,39	0,7430	0,82	0,44
	DevSt	0,22	0,1145	0,11	0,24
Center	Min	-0,45	0,3128	0,38	0,01
	Max	0,63	0,8655	0,91	0,64
	Mean	0,08	0,5842	0,70	0,32
	DevSt	0,28	0,1428	0,15	0,14
South	Min	-1,06	0,0000	0,00	0,06
	Max	0,24	0,6676	0,61	0,76
	Mean	-0,50	0,2899	0,30	0,38
	DevSt	0,32	0,1632	0,14	0,18

		Efficient Scenario Disparity distribution index			Ideal Sceanario Disparity distribution index		
		LDI	LDI_imm	LDI_mat	LDI	LDI_imm	LDI_mat
Urban	Average	0,094	0,123	0,100	0,031	0,026	0,055
	St. Dev.	0,059	0,034	0,049	0,025	0,0264	0,024
Rural	Average	0,152	0,161	0,048	0,049	0,049	0,029
	St. Dev.	0,035	0,047	0,013	0,021	0,024	0,017
Intermediate	Average	0,097	0,099	0,079	0,039	0,037	0,047
	St. Dev.	0,044	0,041	0,044	0,026	0,026	0,019

Table 3 Efficient Scenario

N.	OECD Class_	Provinces	SEN LDI	SEN_ Immaterial	SEN_ material	N.	OECD Class_	Provinces	SEN LDI	SEN_ Immaterial	SEN_ material
1	Intermediate	Ancona	-	-	0,092	40	Rural	Medio Campidano	0,112	0,115	0,023
2	Intermedi	Bologna	-	-	0,025	41	Rura	Enna	0,110	0,125	-

	ate						l				
3	Intermediate	Forlì-Cesena	-	-	0,021	42	Rural	Nuoro	0,110	0,107	0,039
4	Intermediate	Mantua	-	-	0,026	43	Rural	Ogliastra	0,104	0,128	-
5	Intermediate	Parma	-	-	0,082	44	Rural	Viterbo	0,057	0,048	0,031
6	Intermediate	Piacenza	-	-	0,024	45	Rural	Campobasso	0,056	0,077	-
7	Intermediate	Rovigo	-	-	0,075	46	Rural	Oristano	0,056	0,085	-
8	Intermediate	Savona	-	-	0,105	47	Rural	Olbia-Tempio	0,056	0,082	-
9	Intermediate	Taranto	0,172	0,132	0,150	48	Rural	Matera	0,055	0,100	-
10	Intermediate	Siracusa	0,162	0,133	0,121	49	Rural	Potenza	0,039	0,084	-
11	Intermediate	Caserta	0,155	0,152	0,056	50	Urban	Bergamo	-	0,032	-
12	Intermediate	Caltanissetta	0,145	-	0,076	51	Urban	Florence	-	-	0,081
13	Intermediate	Reggio di Calabria	0,131	0,140	0,018	52	Urban	Genoa	-	-	0,053
14	Intermediate	Cagliari	0,129	0,093	0,124	53	Urban	Gorizia	-	-	0,112
15	Intermediate	Agrigento	0,129	0,131	0,034	54	Urban	La Spezia	-	-	0,136
16	Intermediate	Catanzaro	0,122	0,126	0,027	55	Urban	Livorno	-	-	0,034
17	Intermediate	Sassari	0,121	0,087	0,112	56	Urban	Milan	-	-	0,167
18	Intermediate	Cosenza	0,120	0,165	-	57	Urban	Modena	-	-	0,063
19	Intermediate	Trapani	0,098	0,083	0,060	58	Urban	Padua	-	-	0,040
20	Intermediate	Latina	0,096	0,086	0,047	59	Urban	Pisa	-	-	0,065
21	Intermediate	Vibo Valentia	0,092	0,118	-	60	Urban	Pistoia	-	-	0,088
22	Intermediate	Frosinone	0,090	0,077	0,054	61	Urban	Reggio Nell'Emilia	-	-	0,065
23	Intermediate	Messina	0,084	0,091	-	62	Urban	Trieste	-	-	0,177
24	Intermediate	Salerno	0,073	0,129	-	63	Urban	Venice	-	-	0,121
25	Intermediate	Fermo	0,058	0,017	0,105	64	Urban	Naples	0,194	0,185	0,084
26	Intermediate	Avellino	0,054	0,078	-	65	Urban	Barletta-Andria-Trani	0,187	0,152	0,142
27	Intermediate	Benevento	0,048	0,079	-	66	Urban	Brindisi	0,156	0,117	0,141
28	Intermediate	Pescara	0,042	0,022	0,050	67	Urban	Bari	0,140	0,116	0,098
29	Intermediate	Chieti	0,040	0,036	-	68	Urban	Lecce	0,133	0,135	0,034

30	Intermediate	Massa-Carrara	0,033	-	0,076	69	Urban	Ravenna	0,116	-	-
31	Intermediate	Ferrara	0,026	-	0,159	70	Urban	Ragusa	0,109	0,127	-
32	Rural	Arezzo	-	-	0,048	71	Urban	Catania	0,085	0,114	-
33	Rural	Isernia	-	0,067	-	72	Urban	Rome	0,078	0,067	0,043
34	Rural	L'Aquila	-	0,022	-	73	Urban	Palermo	0,076	0,094	-
35	Rural	Rieti	-	0,018	-	74	Urban	Prato	0,046	-	0,172
36	Rural	Rieti	-	0,020	-	75	Urban	Imperia	0,027	-	0,028
37	Rural	Foggia	0,177	0,177	0,057	76	Urban	Monza and Brianza	0,027	-	0,104
38	Rural	Crotone	0,168	0,199	-	77	Urban	Rimini	0,023	-	0,151
39	Rural	Carbonia-Iglesias	0,112	0,108	0,039	78	Urban	Lucca	0,019	-	0,101

Tab.4Ideal Scenario

N.	OECD Class_	Provinces	SEN LDI	SEN_Immaterial	SEN_material	N.	OECD Class_	Provinces	SEN LDI	SEN_Immaterial	SEN_material
1	Intermediate	Agrigento	0,071	0,070	0,048	55	Rural	Enna	0,064	0,068	0,036
2	Intermediate	Alessandria	0,008	0,006	0,033	56	Rural	Foggia	0,088	0,086	0,056
3	Intermediate	Ancona	0,020	0,003	0,067	57	Rural	Isernia	0,027	0,048	
4	Intermediate	Arezzo	0,024	0,015	0,053	58	Rural	L'Aquila	0,019	0,032	
5	Intermediate	Ascoli Piceno	0,018	0,017	0,035	59	Rural	Matera	0,044	0,060	0,006
6	Intermediate	Asti		0,006	0,014	60	Rural	Medio Campidano	0,064	0,065	0,045
7	Intermediate	Avellino	0,044	0,052	0,021	61	Rural	Nuoro	0,064	0,062	0,050
8	Intermediate	Benevento	0,042	0,052	0,015	62	Rural	Ogliastra	0,062	0,069	0,028
9	Intermediate	Biella	0,006		0,038	63	Rural	Olbia-Tempio	0,044	0,053	0,020
10	Intermediate	Bologna	0,005		0,045	64	Rural	Oristano	0,044	0,054	0,018
11	Intermediate	Bolzano-Bozen				65	Rural	Perugia	0,019	0,015	0,039
12	Intermediate	Cagliari	0,071	0,057	0,078	66	Rural	Potenza	0,039	0,054	
13	Intermediate	Caltanissetta	0,076	0,070	0,062	67	Rural	Potenza			0,004
14	Intermediate	Caserta	0,080	0,077	0,055	68	Rural	Rieti	0,019	0,031	0,005
15	Intermediate	Catanzaro	0,068	0,069	0,046	69	Rural	Sondrio		0,032	

16	Intermediate	Chieti	0,039	0,037	0,041	70	Rural	Viterbo	0,045	0,041	0,047
17	Intermediate	Cosenza	0,067	0,082	0,025	71	Urban	Bari	0,075	0,065	0,069
18	Intermediate	Cremona		0,002		72	Urban	Barletta-Andria-Trani	0,092	0,078	0,084
19	Intermediate	Cuneo		0,015		73	Urban	Bergamo	0,015	0,036	
20	Intermediate	Fermo	0,045	0,030	0,072	74	Urban	Brescia	0,014	0,019	0,020
21	Intermediate	Ferrara	0,034	0,009	0,089	75	Urban	Brindisi	0,081	0,065	0,083
22	Intermediate	Forlì-Cesena	0,005		0,044	76	Urban	Catania	0,055	0,064	0,022
23	Intermediate	Frosinone	0,057	0,051	0,055	77	Urban	Como	0,007	0,026	0,014
24	Intermediate	Grosseto	0,027	0,027	0,034	78	Urban	Florence	0,019	0,005	0,064
25	Intermediate	Latina	0,059	0,055	0,053	79	Urban	Genoa	0,015	0,004	0,055
26	Intermediate	Macerata	0,016	0,013	0,036	80	Urban	Gorizia	0,014		0,074
27	Intermediate	Mantua	0,016	0,009	0,046	81	Urban	Imperia	0,034	0,029	0,047
28	Intermediate	Massa-Carrara	0,036	0,025	0,062	82	Urban	La Spezia	0,028	0,007	0,081
29	Intermediate	Messina	0,055	0,056	0,038	83	Urban	Lecce	0,072	0,072	0,048
30	Intermediate	Parma	0,015		0,064	84	Urban	Lecco	0,002	0,008	0,012
31	Intermediate	Pavia	0,003	0,018		85	Urban	Livorno	0,026	0,019	0,048
32	Intermediate	Pesaro e Urbino	0,006	0,007	0,025	86	Urban	Lodi	0,013	0,008	0,042
33	Intermediate	Pescara	0,039	0,032	0,053	87	Urban	Lucca	0,031	0,015	0,070
34	Intermediate	Piacenza	0,009		0,045	88	Urban	Milan	0,028	0,001	0,092
35	Intermediate	Pordenone			0,023	89	Urban	Modena	0,016	0,003	0,058
36	Intermediate	Reggio di Calabria	0,071	0,073	0,043	90	Urban	Monza and Brianza	0,034	0,018	0,071
37	Intermediate	Rovigo	0,023	0,009	0,062	91	Urban	Naples	0,094	0,089	0,065
38	Intermediate	Salerno	0,051	0,069	0,074	92	Urban	Novara	0,008	0,007	0,029
39	Intermediate	Sassari	0,068	0,055	0,072	93	Urban	Padua	0,012	0,002	0,050
40	Intermediate	Savona	0,029	0,012	0,020	94	Urban	Palermo	0,052	0,057	0,029
41	Intermediate	Siracusa	0,083	0,071	0,077	95	Urban	Pisa	0,018	0,005	0,058
42	Intermediate	Taranto	0,086	0,071	0,086	96	Urban	Pistoia	0,026	0,011	0,066
43	Intermedia	Teramo	0,029	0,031	0,030	97	Urban	Prato	0,041	0,016	0,093

	te											
44	Intermediate	Terni	0,020	0,018	0,036	98	Urban	Ragusa	0,064	0,069	0,034
45	Intermediate	Trapani	0,060	0,054	0,057	99	Urban	Ravenna	0,011		0,075
46	Intermediate	Udine			0,028	100	Urban	Reggio Nell'Emilia	0,015	0,002	0,059
47	Intermediate	Verbano-Cusio-Ossola		0,023		101	Urban	Rimini	0,033	0,009	0,086
48	Intermediate	Vercelli	0,008	0,005	0,034	102	Urban	Rome	0,052	0,048	0,051
49	Intermediate	Vibo Valentia	0,058	0,066	0,025	103	Urban	Treviso	0,008	0,004	0,036
50	Rural	Aosta Valley		0,005	0,017	104	Urban	Trieste	0,028		0,095
51	Rural	Belluno		0,002	0,016	105	Urban	Turin	0,012	0,030	
52	Rural	Campobasso	0,045	0,051	0,025	106	Urban	Varese	0,019	0,020	0,030
53	Rural	Carbonia-Iglesias	0,065	0,062	0,050	107	Urban	Venice	0,025	0,005	0,077
54	Rural	Crotone	0,085	0,094	0,031	108	Urban	Verona	0,004	0,003	0,029
						109	Urban	Vicenza	0,007	0,004	0,033

5. Conclusions

The ongoing international, European and national debate about the welfare assessment continues to provide points of discussion and analysis, both in theoretic and evaluation terms.

This paper, according to the Commission Stiglitz-Sen-Fitoussi recommendation (2008), has tried to address the problem of different levels of development in the Italian Provinces of Italy. In doing so, we created three indexes for evaluating the development at provinces level, first by define the lack within the provinces both of immaterial features and the material ones; then for highlighting the differences among the urban-rural and intermediate areas(Ferrucci and Picciotti, 2017).

Given the necessity of identifying specific areas where homogeneous interventions could be implemented, the definition of "rural" is considered residual compared to the concept of "urban", so it is not clearly formulated. This circumstance is evident in OCSE classification schemes, that classifies territories as "predominantly rural", "significantly rural" and "urban" on the base of a single variable, namely population density. In some cases, in addition to the population size and the population density, other indicators have been taken into account. They have been useful in order to ascertain the "rural" component from the "urban" one of a specific territory. In this direction, the Mipaaf method is the instrument used by Italian institutions to classify Italian region rural areas in the context of 2014-2020 PSR. It uses other variables, such as agricultural and forestry surfaces, the SAT/surface of the territory ratio and the population density(Biennale, 2017).

Even this approach does not take into account a number of welfare dimensions, so, when planning, it should be considered as a starting point for further improvements, considering it not sufficient (Rocchi Turchetti, 2013). Limited attention to the evaluation of life quality and infrastructural provision is evident in the rural development programmes in Italian regions, with exception of Piemonte and Emilia Romagna. These programmes proposed models that are able to develop synthetic indexes whose aim is to expand the quality of life analysis. In this work, we wanted to highlight the importance of a full comprehension of the decisional problem that has to be faced in each decision making process . It has been highlighted the importance of structuring the

decisional problem in a way that takes into account the relationship between the objectives and the instruments, in order to fully support the strategic and operative planning activity towards the creation of efficient, effective and feasible solution.

In particular, we tried to show the possibility of realizing this aim using some instruments that are able to provide the information that decision maker needs in each specific decisional moment, if they are used in an integrated way (Arbolino et al., 2017). The relevance of our results and policy implications make it necessary to begin a systematic data collection on a sub-provincial level, in order to make all the relevant variable about quality of life on a municipality level available. Despite the progress made by Italy in the assessment of welfare, data and information on a municipal level are not adapted to the space-time requirements of the welfare analysts.

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Appendix A

Table 2 – Ranking of Italian Provinces according to WBI values and its sub indices – QI and ISI

Rank	Provinces	LDI Value**	LDI_immaterial ***	LDI_material ****	LDI_immaterial % *****	LDI_material % *****
1	Bolzano-Bozen	1,0000	0,848	0,909	0,48	0,52
2	Trento	0,9487	0,911	0,705	0,56	0,44
3	Cuneo	0,9210	0,756	0,901	0,46	0,54
4	Pordenone	0,9151	0,989	0,512	0,66	0,34
5	Verbano-Cusio-Ossola	0,8773	0,678	0,941	0,42	0,58
6	Udine	0,8769	0,964	0,475	0,67	0,33
7	Siena	0,8655	0,913	0,536	0,63	0,37
8	Belluno	0,8580	0,886	0,564	0,61	0,39
9	Sondrio	0,8424	0,598	1,000	0,37	0,63
10	Asti	0,8284	0,841	0,578	0,59	0,41
11	Aosta Valley	0,8266	0,854	0,554	0,61	0,39
12	Cremona	0,8224	0,885	0,495	0,64	0,36
13	Lecco	0,8201	0,822	0,592	0,58	0,42
14	Pavia	0,8109	0,733	0,719	0,50	0,50
15	Verona	0,7959	0,868	0,470	0,65	0,35
16	Bologna	0,7893	0,932	0,353	0,73	0,27
17	Forlì-Cesena	0,7865	0,923	0,362	0,72	0,28
18	Biella	0,7837	0,893	0,405	0,69	0,31

19	Pesaro e Urbino	0,7799	0,831	0,497	0,63	0,37
20	Como	0,7758	0,654	0,777	0,46	0,54
21	Vicenza	0,7721	0,858	0,438	0,66	0,34
22	Treviso	0,7683	0,864	0,420	0,67	0,33
23	Vercelli	0,7677	0,853	0,437	0,66	0,34
24	Novara	0,7639	0,831	0,466	0,64	0,36
25	Alessandria	0,7617	0,844	0,440	0,66	0,34
26	Piacenza	0,7558	0,889	0,355	0,71	0,29
27	Ravenna	0,7389	1,000	0,141	0,88	0,12
28	Padua	0,7297	0,880	0,317	0,73	0,27
29	Turin	0,7293	0,616	0,745	0,45	0,55
30	Lodi	0,7154	0,825	0,379	0,69	0,31
31	Gorizia	0,7097	0,959	0,150	0,86	0,14
32	Brescia	0,7089	0,719	0,537	0,57	0,43
33	Parma	0,7043	0,909	0,220	0,81	0,19
34	Bergamo	0,7035	0,559	0,786	0,42	0,58
35	Reggio Nell'Emilia	0,7009	0,881	0,259	0,77	0,23
36	Genoa	0,6985	0,861	0,286	0,75	0,25
37	Modena	0,6970	0,873	0,265	0,77	0,23
38	Macerata	0,6949	0,773	0,422	0,65	0,35
39	Mantua	0,6907	0,812	0,350	0,70	0,30
40	Pisa	0,6751	0,848	0,260	0,77	0,23
41	Ascoli Piceno	0,6722	0,741	0,428	0,63	0,37
42	Rieti	0,6684	0,606	0,640	0,49	0,51
43	Varese	0,6683	0,714	0,465	0,61	0,39
44	Perugia	0,6683	0,756	0,396	0,66	0,34
45	L'Aquila	0,6676	0,593	0,659	0,47	0,53
46	Florence	0,6622	0,855	0,223	0,79	0,21
47	Ancona	0,6594	0,869	0,196	0,82	0,18
48	Terni	0,6589	0,729	0,421	0,63	0,37
49	Rovigo	0,6336	0,812	0,237	0,77	0,23
50	Arezzo	0,6233	0,760	0,299	0,72	0,28
51	Venice	0,6092	0,848	0,128	0,87	0,13
52	Pistoia	0,6076	0,798	0,207	0,79	0,21
53	Livorno	0,6036	0,717	0,331	0,68	0,32
54	Isernia	0,5954	0,440	0,763	0,37	0,63
55	Grosseto	0,5942	0,642	0,433	0,60	0,40
56	Milan	0,5877	0,887	0,022	0,98	0,02
57	La Spezia	0,5844	0,838	0,095	0,90	0,10
58	Trieste	0,5825	0,895	0,000	1,00	0,00
59	Teramo	0,5791	0,607	0,460	0,57	0,43
60	Savona	0,5748	0,783	0,166	0,83	0,17

61	Lucca	0,5560	0,753	0,176	0,81	0,19
62	Rimini	0,5443	0,810	0,061	0,93	0,07
63	Ferrara	0,5340	0,810	0,040	0,95	0,05
64	Monza and Brianza	0,5313	0,727	0,169	0,81	0,19
65	Imperia	0,5312	0,619	0,345	0,64	0,36
66	Massa-Carrara	0,5110	0,662	0,235	0,74	0,26
67	Potenza	0,4921	0,384	0,648	0,37	0,63
68	Chieti	0,4900	0,544	0,383	0,59	0,41
69	Pescara	0,4849	0,592	0,295	0,67	0,33
70	Prato	0,4709	0,751	0,010	0,99	0,01
71	Benevento	0,4659	0,401	0,568	0,41	0,59
72	Avellino	0,4456	0,403	0,525	0,43	0,57
73	Matera	0,4415	0,330	0,635	0,34	0,66
74	Olbia-Tempio	0,4403	0,389	0,536	0,42	0,58
75	Oristano	0,4400	0,3809	0,549	0,41	0,59
76	Campobasso	0,4379	0,408	0,501	0,45	0,55
77	Viterbo	0,4351	0,504	0,340	0,60	0,40
78	Fermo	0,4331	0,608	0,166	0,79	0,21
79	Salerno	0,3854	0,235	0,677	0,26	0,74
80	Palermo	0,3757	0,352	0,468	0,43	0,57
81	Rome	0,3696	0,441	0,310	0,59	0,41
82	Messina	0,3509	0,361	0,402	0,47	0,53
83	Catania	0,3465	0,285	0,518	0,35	0,65
84	Frosinone	0,3301	0,408	0,285	0,59	0,41
85	Vibo Valentia	0,3239	0,271	0,496	0,35	0,65
86	Latina	0,3128	0,377	0,302	0,56	0,44
87	Trapani	0,3049	0,386	0,270	0,59	0,41
88	Ogliastra	0,2866	0,237	0,476	0,33	0,67
89	Ragusa	0,2695	0,241	0,436	0,36	0,64
90	Nuoro	0,2660	0,3077	0,320	0,49	0,51
91	Enna	0,2659	0,247	0,418	0,37	0,63
92	Medio Campidano	0,2623	0,281	0,356	0,44	0,56
93	Carbonia-Iglesias	0,2621	0,303	0,320	0,49	0,51
94	Cosenza	0,2358	0,112	0,577	0,16	0,84
95	Sassari	0,2338	0,372	0,151	0,71	0,29
96	Catanzaro	0,2277	0,243	0,348	0,41	0,59
97	Agrigento	0,2066	0,227	0,332	0,41	0,59
98	Cagliari	0,2061	0,355	0,123	0,74	0,26
99	Reggio di Calabria	0,2013	0,198	0,369	0,35	0,65
100	Lecce	0,1944	0,213	0,331	0,39	0,61
101	Bari	0,1719	0,276	0,183	0,60	0,40
102	Caltanissetta	0,1566	0,226	0,234	0,49	0,51

103	Caserta	0,1247	0,158	0,281	0,36	0,64
104	Brindisi	0,1193	0,273	0,083	0,77	0,23
105	Siracusa	0,1002	0,221	0,129	0,63	0,37
106	Crotone	0,0840	0,000	0,456	0,00	1,00
107	Taranto	0,0691	0,224	0,062	0,78	0,22
108	Foggia	0,0537	0,072	0,279	0,20	0,80
109	Barletta-Andria-Trani	0,0221	0,155	0,080	0,66	0,34
110	Naples	0,0000	0,044	0,216	0,17	0,83

* Absolute Value of the aggregated WBI

** Standardized Value of the aggregated WBI

*** Values of WBI achieved by taking into account only Quality of life variables

**** Values of WBI achieved by taking into account only Infrastructure and services variables

***** Percentage values explain how both QI and ISI have affected WBI (aggregated value) determination