

An Index of the Quality of Life for European Countries: Evidence of Deprivation from EU-SILC Data

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Abstract: Starting from EU-SILC data, a sample survey that defines the harmonised lists of target primary (annual) and secondary (every four years or less frequently) variables transmitted to Eurostat by the 27 countries, we have chosen a set of about fifty indicators on a qualitative basis. An exploratory factorial analysis led us to accept only eleven variables distributed around three principle components, assuming that each of them could become, after further inquiry, an index of deprivation.

Then we carried out the factorial analysis on the three principle components just found. The distribution of the eleven remaining data can be roughly interpreted as follows: the first group indicates material deprivation; the second one social deprivation; the third one can be labelled as depending on economic policy. Three factorial indexes consist in the factor score resulting from the factorial analysis on the partial indicators summarizing information supplied by each variable; the sum of our three indicators offers a global index of the quality of life (QL-index), whose values can be classified in order to identify groups of countries with similar conditions. A map will be drawn to overview the condition of the countries considered. We will test the three obtained indicators with the Spearman rho, comparing it with the ranking score of the Human Development Index and the Inequality Adjusted Human Development Index of European countries. The expected result is quite high correlation between them, mainly for the material deprivation index. The correlation with the ranking score will allow us to compare the relation of HDI, our QL-index, and the three components of it considered separately. The comparison between the two, the HD Index and the QL-Index, should reveal that the latter is more correlated with the IHDI. The greater number of indicators in our index should improve its explaining power, taking into account also social dimensions not so relevant in the HDI. The articulation of our index makes it possible to analyse the phenomenon more precisely; at the same time, the sum of the three indicators could be a good validation of the HDI.

JEL Classifications: I32, C14, O15

Keywords: Deprivation, Human Development Index, Factorial analysis, European living conditions

1. Introduction

The long process in the creation of Europe as a great political entity have led to a Union of 27 countries (since 2007), which have very different standards of living: the GDP per capita (\$ PPP, 2008) goes from 78,920 in Luxembourg to 11,790 in Bulgaria and the Human Development Index is 96.5 in Ireland against 83.7 in Romania. The evolution of inequality exhibits irregular movements and no common international pattern; therefore a few Authors suggest to look at explanations based on the joint working of multiple factors (Brandolini, Smeeding 2009); Marlier *et al.* 2007 compare country rankings for the EU 25 on four indicators (income poverty risk, long-term unemployment, the proportion of working-age adults living in jobless households, and early school leavers; they find substantial differences in rankings of member states on even just these four indicators. As to the long period distribution of disposable income (1965-2005) in a group of advanced nations, we note that inequality rose sharply in the Anglo-Saxon countries, moderately in Sweden and Finland, but decreased in France (Brandolini, Smeeding 2009). The UK in the early 1980s shifted from a situation not too different from the Nordic countries to a model closer to the North American countries, and the overall tendency in the last two decades has been for an increase in both disposable and market income inequality in the large majority of rich nations (Brandolini, Smeeding 2009). Looking at the “equivalent disposable income” in EU 27 at the end of Nineties – beginning of 2000, we can draw the basic patterns of inequality: from inequality to equality, we have English speaking countries intertwined with Southern European countries; then the other continental European nations; and, finally, Nordic countries, with minimum inequality. Eastern Europe countries are spread throughout the entire tree (Brandolini, Smeeding 2009); however, in Europe the German threshold of poverty is over four times as high as that in Latvia or Lithuania; applying a common threshold set at 60% of median income across the EU as a whole, the share of the EU’s poor living in Eastern Europe would go up from 14 to 50% (Brandolini 2007). The risk of poverty and deprivation affects the members differently, indeed in the least deprived countries the deprivation rate is lower than the national based poverty risk rate, and, conversely, the most deprived countries have deprivation rates higher than their poverty risk rates (Guio 2005; Nolan and Whelan 2009). In order to deal with this heterogeneity, a set of indicators of deprivation has been studied, to understand better poverty, inequality and their material and social consequences. Also our model can contribute to deal with these problems, and the resulting classification of the countries offers a few results to think about.

The availability of EU-SILC¹ data for UE 27 enables one to build up a composite indicator of the quality of life and, conversely, deprivation that takes into account more variables than the Human Development Index (HDI). Delving into those data, we have selected eleven indicators out of a chosen group of fifty, which we deem significant. As described below, this smaller group can help to assess the multidimensional phenomenon of social and material deprivation.

Using the factorial analysis we have grouped our variables in three factors, which explain more than 73% of the model’s variance. The score has been tested with the HDI by the Spearman *Rho*: it shows that the first factor (material deprivation) is largely correlated with the HDI and in our global index it weighs more than the second (elements of deprivation likely to be modified by macroeconomic policies) and the third one (social deprivation). We have also compared the three factors with the Inequality Adjusted Human Development Index (IHDI) created in 2010. Finally, we provide the ranking of the European countries into six classes and levels of deprivation, putting forward some comments.

¹ EU-SILC: European Union Statistics on Income and Living Conditions.

2. Material and Methods

The EU has wanted to fight against poverty and social exclusion, as stated in the Lisbon strategy. However, ten years later 17% of Europeans have a low level of resources to meet the needs of minimum subsistence (Eurostat 2010). Some European data can measure the living conditions; the present paper uses the EU-SILC (European Union Statistics on Income and Living Conditions) survey data, which collect timely and comparable cross-sectional and longitudinal multidimensional micro-data on income, poverty, social exclusion and living conditions. Indeed, EU-SILC is the EU reference source for comparative statistics on these issues, particularly in the context of the Open Method of Coordination (OMCs) on social inclusion, pensions and health care. The purpose of SILC is to allow the Member States and the European Commission to monitor national and EU progress towards key EU objectives in the areas of social inclusion and social protection, and to support mutual learning and identification of good (and bad) practices in terms of policies and institutional processes. This represents a major step forward in the development of EU cooperation in social policy, and may transform the framework within which the members develop their national (and sub-national) policies to tackle poverty and social exclusion (European Community 2003; Freguja and Pannuzi 2007). Thus we have chosen a set of about fifty indicators from the EU-SILC data. An exploratory factor analysis led us to accept only eleven variables distributed around three principal components, assuming that each of them could become, after further inquiry, an index of deprivation and the sum of our three indicators could offer a global index of the quality of life (QL-index).

2.1 Methodology

Clustering the items in a limited number of dimensions can be useful in order to simplify the interpretation of the information available in the list of variables, also highlighting any different pattern of the quality of life in different countries.

To do so, some technical choices have to be made. We can group items together according to the meaning of their underlying characteristics on the basis of arbitrary criteria (for example all housing items together), or empirically, through data analysis. We have chosen the second way and carried out this study by the factor analysis².

Factor analysis is a statistical technique aiming at simplifying a complex data set by representing the set of variables in terms of a smaller number of underlying variables. This makes it possible to study the correlations of a large number of variables, grouping them around the factors, so that they are arranged on factors highly correlated with each other (Dillon and Goldstein 1984). This methodology is attractive because of its flexibility, the only preliminary choice being the initial data set: indeed, it allows explaining the variance of the phenomenon under scrutiny without requesting the estimation of parameters, which would compel to create a previous model.

The factor analysis can be written algebraically as follows. If we have p variables X_1, X_2, \dots, X_p measured on a sample of n subjects, then variable j can be written as a linear combination of m factors F_1, F_2, \dots, F_m where $m < p$ (Härdle and Simar 2003). Thus,

$$x_j = k_{j1}F_1 + k_{j2}F_2 + \dots + k_{jm}F_m + e$$

² This methodology has been used, with some technical differences from ours, to analyse poverty and deprivation in the UE 15; the three main factors identified were housing conditions, economic strain and enforced lack of durables (Guio 2005; see also Guio 2009). In 2008 the analysis based on seventeen deprivation items for UE 24 plus Norway and Iceland led to three distinct but correlated dimensions: consumption deprivation, household facilities, neighbourhood environment, the first one capturing exposure to deprivation more broadly (Whelan et al. 2008).

where k_{jh} ($h=1, 2, 3, \dots, m$) are the factor loadings (or scores) for variable j ($j=1, 2, 3, \dots, n$).

And, e is the part of variable x_j that cannot be explained by the factors.

The information contained in a matrix of correlation or variance / covariance, trying to identify statistically the latent and not directly observable dimensions, is summarised by factorial analysis and the number of the latent data dimension is determined when the explained variance is between 65 and 75% (Stevens 2002).

Thus the analysis of the principal components generates a shift of the reference system at the centre of gravity; in fact what changes is only the viewpoint of the study (Dillon and Goldstein 1984). Since the variables can be saturated in almost the same way by different factors, the problem of the rotation of the factors does exist (Krzanowski et Marriott 1995). The plurality of techniques for the rotation of factors causes indeterminacy in the factor solution, because one cannot decide which rotation is the best, not only when choosing between orthogonal rotation and oblique rotation, but even within the two types of rotation. This implies that contradictory sets of factor scores are equally plausible and the choice of a solution rather than another appears to be arbitrary; indeed this technique is sometimes criticised (Guilford and Hoepfner 1971; McKay and Collard 2003). As the analysis is data driven, different solutions can be obtained from different samples or from the same sample over time; anyway, in the analysis conducted to gain information about the latent structure of the observed data, the very existence of many mutually consistent interpretations can be considered a position of privilege and not a disadvantage (Johnson & Wichern 2002).

As for the present case, subsequent tests with different algorithms for extraction and rotation have showed a real stability of the extracted factors. However, it has seemed appropriate to apply the rotation varimax that maximizes the variance between the factor loadings with subsequent iterations; for each factor, high loadings (correlations) result for a few variables, the rest being near zero (Kaiser 1958).

The interpretation of factors is identified through the factor score coefficient matrix [c_{hj}]; by inverting the equations X_j , one can obtain the equation of the factors, which are expressed as a linear combination of original variables (Härdle and Simar, 2003).

$$F_h = c_{j1}x_1 + c_{j2}x_2 + \dots + c_{jn}x_n + e_h$$

Starting from each factor, a partial index can be determined, which is composed by inter-correlated variables. The index consists of the factor score resulting from the factorial analysis on the partial indicators. This figure quantifies the position of each country in the space of components and conveys the information of all the partial indicators (Michelozzi et al. 1999, Johnson and Wichern 2002, Hogan and Tchernis 2004). The index can assume both positive and negative values: if it is negative, socio-economic conditions are better than average; the opposite if it is positive (Testi and Ivaldi, 2011).

Our variables have been chosen and processed so that they are standardized and we may aggregate the partial indicators in order to obtain the indicator of the quality of living (QL-index).

2.2 The Validation

After being sure that the partial indicators had been set correctly, we have tested the obtained indicators with the Spearman *Rho* (Soliani et al. 2011), comparing them to the ranking score of the Human Development Index (HDI) and the Inequality Adjusted Human Development Index (IHDI) of the European countries³.

³ For small European countries the Inequality Adjusted Human Development Index is not calculated: for example this is the case of Malta.

The Spearman *Rho* can vary from 0 (between the respective ranks no correlation exist) to 1 (between the respective ranks perfect correlation exists).

The Human Development Index was devised explicitly as a more complete index than GNP per capita and is based on longevity, basic education and per capita income. The Inequality-adjusted HDI is the evolution of HDI. Under perfect equality HDI and IHDI are equal. When there is inequality in the distribution of health, education and income, the lower the IHDI (and the greater the difference between it and the HDI), the greater the inequality, just because the IHDI takes into account not only the country's average human development, as measured by health, education and income indicators, but also how it is distributed. We can think of each individual in society as having a "personal HDI". Had everyone the same life expectancy, schooling and income (hence the average social level of each variable), the HDI for this society would be the same as each personal HDI level, that is the HDI of the "average person". In practice there are differences across people, and personal HDI levels differ from the average HDI. The IHDI considers inequalities in life expectancy, schooling and income by "discounting" each dimension's average value according to its level of inequality. Then the HDI can be viewed as an index of the "potential" human development (or the maximum IHDI that could be achieved if there was no inequality), while the IHDI is the actual level of human development (accounting for inequality). The difference between the HDI and the IHDI measures the "loss" in potential human development due to inequality (Human Development Report 2010).

The final step is grouping our indexes into categories to identify areas with a similar quality of living. We have selected the areas following the parameters of the distribution (means and variance) (Carstairs and Morris, 1991), in order to retain the discriminatory features of the distribution (Carstairs 2000).

3. Results

After the exploratory factorial analysis, eleven monetary and non-monetary variables from EU-SILC were chosen among about fifty of those affecting income, poverty, social exclusion and living conditions. The selected variables are set out in Table 1.

Table 1 Variables description

Variables in 11 groups
(1) At-risk-of-poverty rate for pensioners
(2) Crime, violence or vandalism in the area
(3) Distribution of population aged 18 and over by education level and age group Pre-primary, primary and lower secondary education - levels 0-2 (ISCED 1997)
(4) Enforced lack of a computer
(5) Inequality in the income distribution (Gini coefficient)
(6) Noise from neighbours or from the street
(7) Pollution, grime or other environmental problems
(8) Severe housing deprivation rate
(9) Severe material deprivation rate by age and gender
(10) Share of total population considering their dwelling as too dark
(11) Share of total population having neither a bath, nor a shower in their dwelling

The rate of pensioners at risk of poverty (being the threshold of poverty 60% of the median income) is to be interpreted as an indicator of inequality, rather than one of immediate material deprivation; indeed any variation of income affecting in the same proportion the whole universe would not modify this index. "Crime and violence" is an important indicator of deprivation;

however, being based on an individual perception, this data is likely to underestimate the deprivation of regions where established organized crime plays a significant role; generally speaking, the action of government may deal with it efficiently. Education is the typical indicator of social deprivation. The Gini coefficient applied to income distribution is the standard tool to measure inequality. The “enforced lack of a computer” and the sanitary fittings endowment, together with the “severe housing deprivation rate”, describe material deprivation. “Severe material deprivation” is explained in detail in the EU SILC study⁴. Noise, pollution and darkness regard the perceived quality of housing; it depends on the standard of living in the area (noise and pollution), or on the quality of the building.

The factorial analysis reveals that the variables are distributed on three principal components. Our three components are able to explain the variance at 74% of the total variability of the model.

Table 2 Total variance explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	3.696	33.596	33.596
2	2.376	21.600	55.196
3	2.035	18.496	73.692

Extraction Method: Principal Component Analysis

Three components (Table 2 and Table 3 on the next page) give evidence of material and social deprivation, trying to grasp the multidimensional nature of deprivation and its tendency to last through time. Furthermore, focusing on each specific type of deprivation may help to frame the appropriate policy response (Nolan and Whelan 2009).

The first one is a significant indicator of material deprivation in its objective and subjective dimensions; it includes the overall factors “Severe housing deprivation rate” and “Severe material deprivation rate by age and gender”, and also two factors regarding the endowment of the house, so that it can be considered up to the common European standard (sanitary fittings) and satisfying the expressed exigency of being part of the more advanced share of population (enforced lack of a computer). Our factorial analysis follows and supports the approach seeking “absolute” material deprivation measures, which was defined starting just from “economic strain”, enforced lack of durables and problems with housing, in order to give a more complete picture of the living conditions of people in different national contexts (Guio 2005). Public action aiming at poverty reduction and focused on specific social groups can be efficient to cope with the situation. Generally speaking, such policy are not redistributive, for example welfare actions that stress targeting the poor elderly are far less redistributive than are comprehensive (and therefore generous) pension programs (Lefebvre 2007).

⁴ The **material deprivation rate** is an indicator in EU-SILC that expresses the inability to afford some items considered by most people to be desirable or even necessary to lead an adequate life. The indicator adopted by the Social Protection Committee measures the percentage of the population that cannot afford at least three of the following nine items: to pay their rent, mortgage or utility bills; to keep their home adequately warm; to face unexpected expenses; to eat meat or proteins regularly; to go on holiday; a television set; a refrigerator; a car and a telephone. **Severe material deprivation rate** is defined as the enforced inability to pay for at least four of the above-mentioned items (Guio et al. 2009).

Table 3 Factorial analysis: Rotated Component Matrix

	Components		
	1	2	3
Enforced lack of a computer	.911	.241	.123
Severe housing deprivation rate	.906	.210	-.016
Severe material deprivation rate by age and gender	.887	.256	.055
Share of total population having neither a bath, nor a shower in their dwelling	.887	.212	.123
Share of total population considering their dwelling as too dark	.095	.810	-.021
Gini coefficient	.376	.717	.327
Crime, violence or vandalism in the area	.165	.704	-.137
At-risk-of-poverty rate for pensioners	.255	.609	.020
Noise from neighbours or from the street	.120	-.157	.863
Pollution, grime or other environmental problems	.299	-.035	.780
Distribution of population aged 18 and over by education level and age group Pre-primary, primary and lower secondary education - levels 0-2	-.354	.317	.722

Notes: Extraction method--Principal Component Analysis;
 Rotation method--Varimax with Kaiser Normalization;
 A Rotation converged in 3 iterations.

The second component reflects inequality (income distribution, rate of pensioners risking poverty) and political and social condition (crime and violence); one specific factor (darkness of houses) regards spatial inequality. General macroeconomic policies of redistribution and welfare (pension programs...) could be used to deal with most of these factors of deprivation; moreover, evidence exists that higher social spending is positively correlated with economic growth in the long run (Lindert 2004), and benefit adequacy and good labour market performance can go together, as the case of Denmark shows (Adema 2006; Nolan, Marx 2009). Esping-Andersen and Myles maintains that the winning strategy of poverty reduction (for example, the case of lone mothers) is job creation; all this provides additional support for Kenworthy's (2004) argument that welfare states' pursuit of maximum employment may be the really crucial strategy for equality (Esping-Andersen, Myles 2009).

The third component represents the social deprivation: particularly, education is a very important element affecting the social place and the relations of people. Noise and pollution can also spoil previously high-standard urban areas (where poor equipment and darkness are not

relevant), which have suffered subsequent urban transformations, where dwellers are not likely to belong to the lowest classes; thus, they suggest social, rather than material deprivation. Preventive social intervention can be useful in this case.

With the selected variables, four indexes were calculated: *material*, *policy*, *social* and *QL-index*.

The first three indexes consist in the factor score resulting from the factorial analysis on the partial indicators, while QL-index is the sum of the three indexes (Table 4).

Table 4 Social, material and QL indexes

Country	Material	Policy	Social	QL
Sweden	-0.80	-1.01	-1.34	-3.14
Finland	-0.68	-0.88	-1.06	-2.61
Ireland	-0.51	-0.31	-1.34	-2.16
Denmark	-0.75	-0.68	-0.63	-2.06
Austria	-0.49	-0.71	-0.59	-1.80
Slovakia	-0.11	-1.53	0.06	-1.58
Czech Republic	-0.29	-0.92	-0.32	-1.53
Hungary	0.67	-1.07	-1.07	-1.46
France	-0.48	-0.41	-0.34	-1.23
Luxembourg	-0.79	-0.68	0.29	-1.18
Netherlands	-0.84	-0.53	0.21	-1.16
Belgium	-0.55	-0.23	-0.13	-0.92
Poland	0.57	-0.37	-0.90	-0.69
Germany	-0.60	-0.42	0.56	-0.46
Slovenia	0.01	-0.21	-0.26	-0.45
United Kingdom	-0.62	0.94	-0.56	-0.24
Estonia	0.27	1.25	-1.19	0.33
Spain	-0.56	0.46	0.47	0.37
Lithuania	0.93	0.56	-0.82	0.67
Greece	0.08	0.08	0.72	0.89
Italy	-0.31	0.25	1.08	1.02
Malta	-0.68	-0.70	2.74	1.37
Portugal	-0.07	0.46	1.39	1.78
Cyprus	-0.50	1.32	1.06	1.89
Bulgaria	2.30	1.88	-0.19	3.99
Latvia	1.54	2.85	0.49	4.88
Romania	3.26	0.60	1.64	5.50

We have tested the three obtained indicators with the Spearman *Rho*, comparing it with the ranking score of the Human Development Index and the Inequality Adjusted Human Development Index of European countries. The rank correlation, factor by factor, with the Human Development Index and the Inequality Adjustment Human Development Index reveals that the first component (material deprivation) is more correlated with the HDI and weighs more than the second (elements influenced by macroeconomic policies) and the third (social relations) ones.

The comparison between the two HD Index and the QL-Index reveals that the latter is more correlated with the IHDI (Table 5).

Table 5 Spearman's Rho correlations

	Material	Policy	Social	QL	HDI 2010	IHDI 2010
Material	1.000	.464	.062	.529	-.779	-.835
Policy	.464	1.000	.308	.806	-.458	-.645
Social	.062	.308	1.000	.701	-.227	-.318
QL	.529	.806	.701	1.000	-.652	-.768
HDI 2010	-.779	-.458	-.227	-.652	1.000	.949
IHDI 2010	-.835	-.645	-.318	-.768	.949	1.000

The distribution of the index has been divided into six classes: class 1 identifies the countries with the best socio-economic conditions, whilst class 6 contains, on the contrary, countries characterized by the highest index value (Table 6). In order to identify homogeneous areas the values of 0 and $\pm 1/2$ have been used as a cut off.

Table 6 Country's classes

Class	Countries
1	Sweden, Finland, Ireland
2	Denmark, Austria, Slovakia, Czech Republic, Hungary, France, Luxembourg, Netherlands
3	Belgium, Poland, Germany, Slovenia, United Kingdom
4	Estonia, Spain, Lithuania, Greece, Italy
5	Malta, Portugal, Cyprus
6	Bulgaria, Latvia, Romania

In Figure 1 on the next page, the six classes are put in evidence with different graphic signs.

4. Discussions

Separately analysing the three indicators some observation can be made. The indicator of material deprivation ranges from -0.84 (the Netherlands, the less deprived country) to 3.26 (Romania). In this rank the best placed countries are Sweden, Luxembourg, Denmark and Finland. Regarding the indicator "policy", the highest is Slovakia, with a score of -1.53, followed by Hungary, Sweden, the Czech Republic and Finland, whilst the last is Latvia, with a score of 2.85. The social indicator presents in first place Ireland (-1.34), then Sweden, Estonia, Hungary and Finland; Malta drops in the last position (2.74).

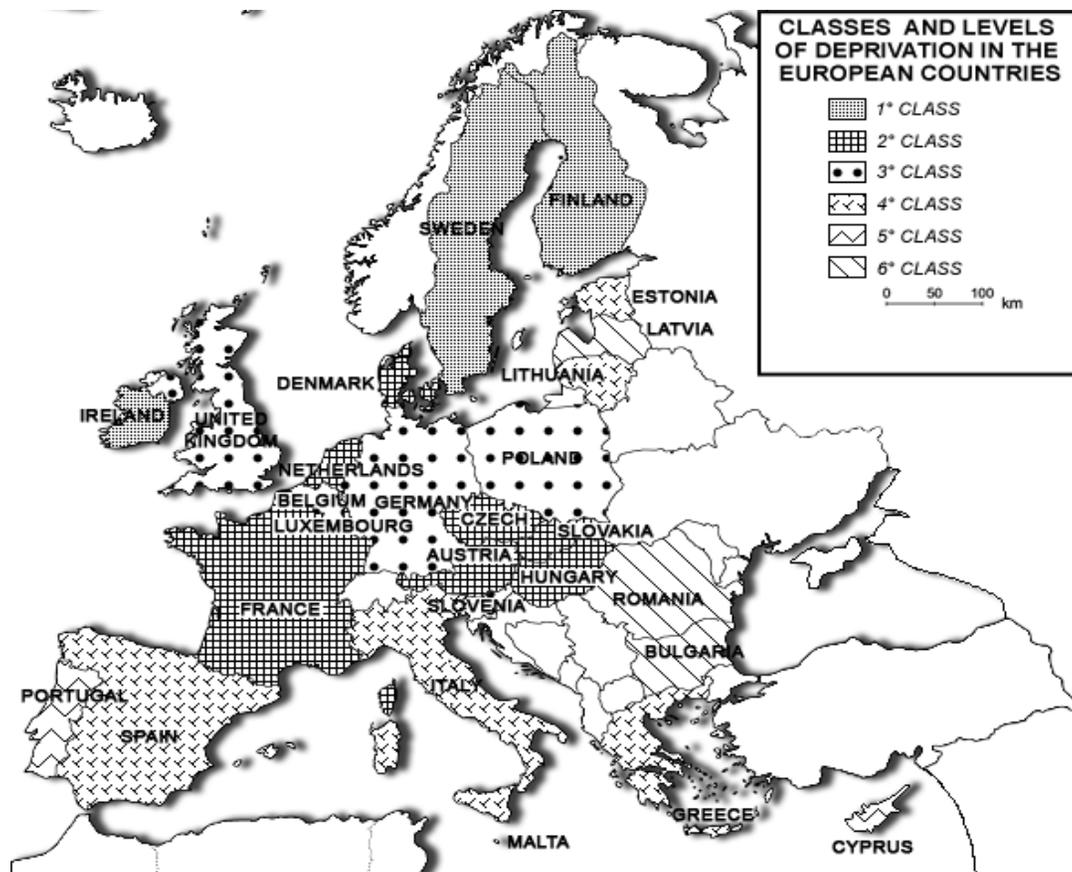


Figure 1 Classes and levels of deprivation in the European Country

The sum of our three partial indicators leads to the definition of the QL-Index (Quality of Life). Here the rank of some European countries is quite different from what one would expect at first sight; however it should be noted that we do not follow a “weighted” approach, taking into account the most frequently deprived items in each country, but rather absolute measures of deprivation (Guio 2005; Whelan *et al.* 2008). The socio-economic conditions in Czech Republic, Slovakia and Hungary (placed in the second class) are better than in Germany and in the United Kingdom (placed in the third class); this can be explained by the comparatively low inequality and perceived crime, as shown by the indicator we called “policy” (and confirmed by the factorial score), where Slovakia occupies first place. However, we should be aware that not any social problem can be fully explained by our index: for example, Slovakia experiences difficulties in dealing with the Gipsy minority, but the ethnic difference is not classified explicitly in the database we used, and it hardly could be taken into account in comparing countries where the citizenship rules are different (e. g. in France the *banlieu* riots had also ethnic roots, but the majority of people involved were French citizens); moreover, according to our data, the problem of the Gipsy minority could be reflected rather by the social deprivation index, which is quite low. Hungary also has a high educational level, indeed it is second and fourth in the “policy” and “social” indicators, whereas it falls into the 23rd place when “material” deprivation is concerned: it seems the case of a country with nice potentiality that can and must grow and improve the standard of living of its citizens. Probably the recent reforms of retirement have not affected the Gini coefficient yet; in fact, also the score “at-risk poverty rate of pensioners” depends on inequality, as well as on pensions’ amount. The low score of the United Kingdom is only due to inequality and crime. Germany is penalized by the social indicator (only 21st place), because of its average level of education, which is quite low (probably

due to the great share of immigrants), and perceived pollution, as confirmed in its factors: we can guess that the inclusive policy adopted has not provided good results in education, in comparison with other countries (e. g. France). Education and environmental policies are relevant to the performance of Sweden and Ireland (first place, together with Finland): their social index is the highest in UE 27; Finland and Sweden offer satisfying scores in all three indicators, whereas the “policy” index of Ireland is not so good. Ireland has grown fast in recent years, hence low material deprivation and widespread basic education, but unequal distribution of income, which is part of the “policy” index (Guio 2005). This is confirmed also by another crucial variable: in Sweden child poverty is almost absent, and transfers account for almost 70% of income in poor households. The child poverty reduction, which provides a good test of the Rawlsian maximin principle (any redistribution should be to the greatest benefit of the worst off), is strong in the Nordic countries, whereas the UK is much less redistributive. Continental Europe is heterogeneous: Italy’s performance, for instance, is close to the Anglo-Saxon regime. This is valid also for general poverty reduction (Esping-Andersen, Myles 2009).

Lithuania and, particularly, Estonia score good results in terms of social index, but are penalized by the other two indicators, so they belong to the fourth class; on the contrary regarding Italy, which is just pulled down by the social indicator; Spain, also in the fourth class, suffers from social deprivation and also inequality, but its index of material deprivation is fair. Bulgaria, Latvia and Romania close the classification, with bad values of all three indicators, with the exception of Bulgaria, that reaches the 14th ranking in the social index.

The ranking we have found can be fruitfully compared with the degree of public redistribution; thus the good performance of Nordic countries will appear even clearer. The difference between the Gini index for market income and for disposable income (that is, the comparison of inequality levels before and after taxes and transfers) provides a first estimate of redistribution: examining a selected group of nine developed countries at the end of 1990s-beginning of 2000s, Brandolini and Smeeding 2009 note that Finland, Denmark and Sweden show strong redistribution, followed by Germany and Czech Republic. This estimate can be refined: McCarty and Pontusson 2009 provide evidence of public and publicly mandated social spending as a percentage of GDP for a selected group of advanced countries in 2003 and discuss a couple of data sets: direct social spending by government (“gross”) and direct spending plus tax credits and government-mandated private spending minus direct and indirect taxes on benefits (“adjusted net”). When adjusted net data are considered, the range of variation is more compressed and the rank ordering of countries is quite different: Germany and France raise to the top, while Scandinavian countries fall. Furthermore, policies affect also the market based distribution in two major ways: the welfare state allows the existence of people with low market incomes and provides resources to citizens that affect their earning potential. Indeed policies ensuring a more equal opportunity structure will diminish inequalities in the distribution of market income (Esping-Andersen, Myles 2009). An example of policy aiming at improving individual capabilities and enhancing human capital and productivity is the public aid to young in order to spread the Internet and high technologies, such as the Italian policy in 2005, when government gave money to teen-agers for buying a personal computer.

5. Conclusions

Deprivation and inequality depend upon a great deal of causes, income distribution being only one element of a broader inequality (Atkinson 1997; Atkinson, Bourguignon 2000), and poverty may be a matter of exclusion from various aspects of the life of society due to lack of resources in comparison with the minimum acceptable way of life of the country; it has at its core a concern with opportunities and constraints (Nolan, Marx 2009; Townsend 1979). Particularly in Europe, the analysis of poverty seeks to incorporate non-income information in the identification of the poor,

relating to the multidimensionality of social exclusion. This body of research aims at: identifying the poor more accurately; capturing the multidimensional nature of poverty; encompassing social exclusion conceived as something broader than ‘financial poverty’.

Our “aggregate”, additively decomposable, QL-index sets in the wake of this research. It has a very good inverse correlation with the “composite” HDI and, even better, IHDI (on the definition of “aggregate” and “composite” indicators, see Marlier et al. 2007 and Guio et al. 2009). This of course validates it; at the same time, the sum of the three indicators could be a good validation of the HDI, at least for the European countries (indeed the developing world differs in fundamental ways: see Salverda, Nolan, Smeeding 2009). However the QL-index conveys more information and, compared with its three components, can allow one a better understanding of the possible causes of deprivation; indeed they express different ideas of “deprivation”, as confirmed by their correlation. The greater number of indicators in our index (whose elaboration is quite easy and requires only EU-SILC data) should improve its explaining power, taking into account social dimensions not so relevant in the HDI; at the same time, we limited the number of variables, trying to grasp the main aspects of deprivation in the heterogeneous geographical space of UE 27 with a comparatively simple tool. Even though EU-SILC data derive from interviews, the QL-index also contains objective components (sanitary fittings, Gini coefficient, at-risk-of-poverty pensioners and education). Measures of material deprivation add information to that provided by conventional income measures and permit further understanding of the causal mechanisms at work (Boarini and Mira D’Ercole 2006), so the QL-index and its articulations, which consider social deprivation as well, make it possible to analyse the phenomenon more precisely.

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