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Social Exclusion in European Regions: a Multilevel Latent Class Approach

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Abstract

In recent years there has been a shift in public discourses of several European countries from "poverty" to "social exclusion", a terminology emerged with reference to problems related to a new poverty that is not just monetary. The current European debate has revitalized the path towards Lisbon 2010, making social inclusion a key element of socio-economic development.

After giving an operational definition of "social exclusion" referring to different areas of human life, in this contribution we propose a hierarchical Latent Class (LC) model for the analysis of the differences and the similarities about experiences and perceptions of social exclusion in European regions. Social exclusion is a situation that affects individuals, and derives from a multidimensional deprivation in different domains of their life, namely an economic, a social and an institutional dimension. We treat social exclusion as a latent construct, quantified via indirect manifest indicators referring to the identified dimensions. The latent classes represent the latent levels of social exclusion, which structure the individuals with respect to a set of observed indicators. The regional differences in the latent variable distribution are modelled following a non-parametric approach for the random-effects at regional level. This multilevel extension leads to the identification of a typology of regions, underlying a different social exclusion structure for different European areas. The model allows showing the relevance of the different dimensions and risk factors of social exclusion across regions, verifying whether and to what extent the same risks and disadvantages determine the same perception of marginalization and exclusion in different political, economic, social and cultural contexts.

The analysis is carried out using the 56.1-2001 Eurobarometer Survey, which focused on poverty and social exclusion situations, from both a subjective and an objective point of view.

Keywords: European Regions; Hierarchical Latent class Models; Individual and Regional Profiles; Multidimensional deprivation; Social exclusion.

1 Introduction

In recent years, the term "social exclusion" has taken a prominent place in discussions concerning social policies and inequalities, in all European countries. Social exclusion is not only a negative condition *per se*, it also represents a disruptive element for social and economic development, both at individual and societal level, entailing "*the risk of allowing a two-tier society to become established by default*" (European Commission, 1993, p. 1). The fight against poverty and social exclusion is now one of the central objectives of the European Union (EU) and of its member States, in a context where the links between the economic and the social spheres are assuming an increasing central importance (Atkinson *et al.*, 2004). At the launch of the Lisbon strategy in 2000, the European Council invited member States and the Commission to take steps to make a decisive impact on the eradication of poverty and social exclusion by 2010 (European Union, 2007a; 2007b).

Social exclusion is a complex state that emerges when deprivation on material, cultural and social resources are as severe as to exclude people from the mainstream society. In this sense, social exclusion is a multidimensional concept, which includes several forms of disadvantage and marginality, and affects individuals in different activities of their daily life. However, while the multidimensional nature of social exclusion is widely acknowledged, empirical studies have seemed to fail the multidimensional approach. As a result, there is a tendency to use poverty as a proxy for social exclusion, thereby undermining the multidimensional nature of exclusion. One still registers a lack of a comprehensive and common understanding about social exclusion, despite the growing interest around social exclusion issues, both at political and academic level.

Our aim is to propose a statistical framework which allows to study social exclusion considering at the same time both relational and distributional aspects. The relevance of the different elements of exclusion may vary depending on the context, in term of time and place, of the analysis (Atkinson and Davoudi, 2000; Mayes *et al.*, 2001; Bhalla and Lapeyre, 2004). Referring to the 15 countries belonging to European Union in 2001, there are three dimensions we consider appropriate to represent the spheres of human life in which it is most important for individuals to participate: economic, social

and institutional dimensions. In order to operationalise this framework, we propose a hierarchical Latent Class (LC) model, which allows accounting for all these elements, together with the introduction of subjective elements, used to better characterize objective situations. The multilevel extension will enable to account for the dependencies of observations within the region, and for the different social, economic, and cultural contexts in which individuals live and that may affect their attitudes and perceptions.

The 56.1-2001 round of Eurobarometer Survey is especially useful for the study of social exclusion. The sample refers to the 15 countries of European Union before the recent enlargement, and the data structure allows performing the analysis below the national level, using the so-called NUTS regions at the first level of Eurostat classification (www.eurostat.com).

This paper proceeds as follow. Section 2 presents first a general overview of the concept of social exclusion, and introduces the conceptual model adopted in this paper; secondly, it describes the statistical framework in which we will carry out the analysis (§ 2.2). Section 3 provides a brief depiction of the European context referring to poverty and social exclusion situation and perception. In Section 4 we specify the model, after a presentation of the data and indicators used, along with the individual and contextual covariates (§ 4.1-4.3). Finally, in Section 5 the mainly results are highlighted and discussed. Section 6 concludes the paper with a brief discussion.

2 Modelling social exclusion

2.1 Social exclusion as multidimensional concept

The terminology linked to social exclusion has emerged with reference to the problems related to a “new poverty” that is not just monetary. Weakening of family ties, increasing of job precariousness and unemployment rate, decline in social participation, and growing feeling of insecurity, are concrete current problems that cannot be adequately described by standard measures of poverty.

While the notion of social exclusion has acquired important strategic connotations, the precise meaning of the term remains somewhat elusive. Even if a univocal definition of social exclusion seems far to be achieved, an agreement has recently emerged in academic and institutional discussions regarding a number of attributes of social exclusion.

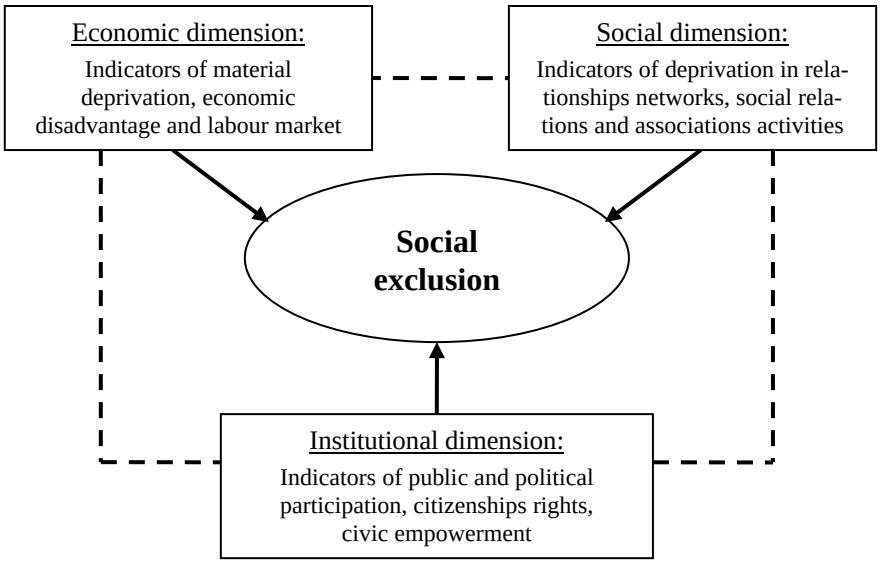
Literature agrees in considering social exclusion as a multidimensional concept (e.g. Silver, 1994; Room, 1995; Jordan, 1996; Peace, 2001). *Multidimensionality* implies that the deprivation and the lack of resources determining social exclusion have to refer to a broad set of quantitative and qualitative elements, that is both relational and distributional factors are relevant (Bhalla and Lapeyre, 2004). In this perspective, the evaluation of the individuals' standard of life cannot be based merely on economic indicators – namely income measures – and it involves the necessity to extend the analysis to the field of social relationships. Weak social interactions and inadequate social participation represent a serious threat to social integration, both at individual and at collective level.

A comprehensive and multidimensional approach is more appropriate in a debate that considers social exclusion as a relative concept. *Relativity* means that an individual is socially excluded only with respect to other members of his society, and it does not exist an *absolute* social exclusion condition. In this sense, in order to reach a meaningful understanding of factors determining social exclusion, one needs to adopt an appropriate spatial-temporal perspective: to judge if a person is excluded or not, we should observe the person relative to the context and the society he lives in. It is reasonable to hypothesize that the criteria to identify critical situations may have different weight depending on the reference context (Silver and Miller, 2003). Therefore, we deem crucial to introduce into the analysis also subjective elements. The qualitative aspects are as important as the quantitative ones to explain social exclusion situations, in all the considered dimensions; thus, for example, social dimension should account for social contacts and for the subjective perception of these relationships, two aspects that may go differently according to contextual conditions, as well as for objective and subjective poverty. Previous findings (Petrucci and Schifini, 2004; Pirani and Schifini, 2008) have highlighted that there exist differences across European regions in the individual's perception of social exclusion. Particularly, areas characterized by a high perception of social exclusion include not only poor regions, but also some areas that would not be classified as disadvantaged based on objective indicators: the role of economic conditions seems to be reduced introducing also elements of subjective perception.

According to the recent literature (e.g. Berghman, 1995; Hills *et al.*, 2002; Bhalla and Lapeyre, 2004), we propose a conceptual model of social exclusion based on the

identification of three principal dimensions we consider relevant on this issue: economic, social and institutional dimensions. Figure 1 depicts the proposed conceptual model.

Figure 1 – Proposed conceptual model



The *economic dimension* relies directly to the concept of poverty. It refers principally to monetary and financial aspects, such as income, wealth, saving capability, and so on. Indeed, in a broader sense, it includes also people's capability to access to goods and services market, their actual living conditions and their employment condition. The concepts of poverty and social exclusion are related and, to some extent, complementary, even if they are not the same thing (Atkinson, 1998): while economic factors are undoubtedly a key aspect of social exclusion, social exclusion cannot be reduced to economic factors.

The *social dimension* concerns primarily with the domain of relations among individuals: social relationships with family, friends, neighbours, local community, and so on. These relationship networks may be viewed as forms of social capital at individual level, that can be activated when necessary, mainly in case of emergencies or transitional troubles, thus providing not only emotional support but also material assistance. The presence of a reliable social network around individuals constitutes a "life net" that may allow triggering mechanisms of solidarity (Böhnke, 2008). Moreover, these social relations acts as facilitators of access to information and contacts (Granovetter, 1985), and in this way they may play an important role in overcoming unemployment. At

macro level, all these elements combine to determine the sense of solidarity of a society and its social cohesion. The social participation of individuals in all its different forms represents an important indicator of integration, raising the sense of belonging to a social community.

Finally, we identify an *institutional dimension*, which concerns relationships between people and the State. In a sense, while social dimension accounts for the private sphere of people, the institutional one focuses on individuals as citizens. These relations may be measured, both from an objective and a subjective perspective, in terms of offer and enjoyment of civil, political and socio-economic rights, and they include the so-called active citizenship rights (Marshall, 1964; Berghman 1995). In this perspective, elements such as the access to right to justice, the limitation of personal freedoms, the exercise of political power and the public participation, or the right to personal security, to a minimum health care and so on, come to be relevant to account for the level of resources available to individuals (Tsakloglou and Papadopoulos, 2002; Ogg, 2005).

We deem that social exclusion could result from breakdowns in any of the identified dimensions. But it seems likely that one can only truly talk of social exclusion when, for individuals or groups, several of these systems break down. In point of fact, the major risk is that a single breakdown triggers a mechanism of instability also in the other dimensions of human life, as a chain reaction. Since these elements refer to different area of human life that interact and influence reciprocally, exclusion in one dimension could determine or make worse exclusion in the others. For instance, whether individuals are employed but poorly integrated in terms of family or community system, an unexpected (long-term) unemployment may lead to social isolation, which in turn will accentuate tendencies of poverty and civic marginalisation, culminating in social exclusion. On the other hand, the situations in which people are excluded from all the dimensions, contemporaneously and for long time, are very rare. This conceptualisation led some authors to conclude that it would be preferable to analyse separately each dimension of exclusion, rather than to think at socially excluded as a homogeneous group (Burchardt *et al.* 2002). We consider a multidimensional analysis more useful to address social exclusion issues. Taking into account, at the same time, several indicators describing different domains and sub-domains, leads to a better understanding of the weakest points according to different situations.

2.2 The Multilevel Latent Class Framework

Starting from the previous conceptualization of social exclusion, we propose a hierarchical LC model for the analysis of the differences and of the similarities about experiences and perceptions of social exclusion among European regions.

Through LC Analysis (McCutcheon, 1987; Clogg, 1995; Hagenaars and McCutcheon, 2002) we treat social exclusion as a latent construct that can be quantified via indirect manifest indicators, which are assumed to be related in some way with its dimensions. The latent classes identify different typologies of excluded people referring to the different dimensions of the phenomenon, and enhance the comprehension of the relations among the different factors that could trigger situations of exclusion.

In our analysis, the latent class model is placed in a multilevel statistical framework (Vermunt, 2003). We consider individuals nested in regions. Sharing the same region-specific influence, observations within a region tend to be more alike than observations coming from different regions. Treating within-region observations as independent may thus produce invalid standard errors (Agresti, 2002), when the clustering of units is considered a phenomenon of interest rather than a mere disturbance, such as the phenomena we are studying (Rampichini and Schifini, 1998). The approach followed to deal with the *intra-region* correlation is the so-called multilevel or hierarchical approach (Snijders and Bosker, 1999; Skrondal and Rabe-Hesketh, 2004), which applications in a latent class framework have recently received a renewed attention (see e.g. Vermunt, 2003; Skrondal and Rabe-Hesket, 2007; Asparouhov and Muthèn, 2008; Vermunt, in press).

The proposed hierarchical LC model allows focusing on individual differences of social exclusion and, at the same time, on its latent distribution among European regions. The first level of analysis is represented by individuals, and it corresponds to a standard LC analysis. Based on the observed indicators, individuals are classified in latent classes, representing the latent levels of social exclusion. The regions in which individuals live represent the second level: the regional differences in the distribution of the latent variable are modelled allowing some parameters to vary across regions.

Assuming observed responses nested within individuals, who are in turn nested within regions, the multilevel extension of the latent class probability structure is built by introducing a mixture model at each level of nesting. Particularly, for the specifica-

tion of the mixing distribution we follow a nonparametric approach, using a discrete latent variable for the random-effects at regional level. In this way, the homogeneity within group is dealt with the random-effects introduced by means of a finite mixture model.

This model specification yields a multilevel LC model in which one assumes a multinomial distribution for the latent variables at both levels. Unlike a parametric approach, in this case the second level latent variable serves to structure the second level units (i.e. regions) into a small number of latent classes, instead of placing them on a continuum. This choice is useful from both a substantial and a technical point of view (Vermunt, 2003). Firstly, the proposed approach allows the identification of different profiles both for respondents and for regions, allowing social exclusion to manifest itself in different ways for different subgroups across European regions. Secondly, we deem that in our context, Normal distributional assumptions about the random effects are not reliable, and they would lead to misleading inferences.

3 Social exclusion in European regions: an overview

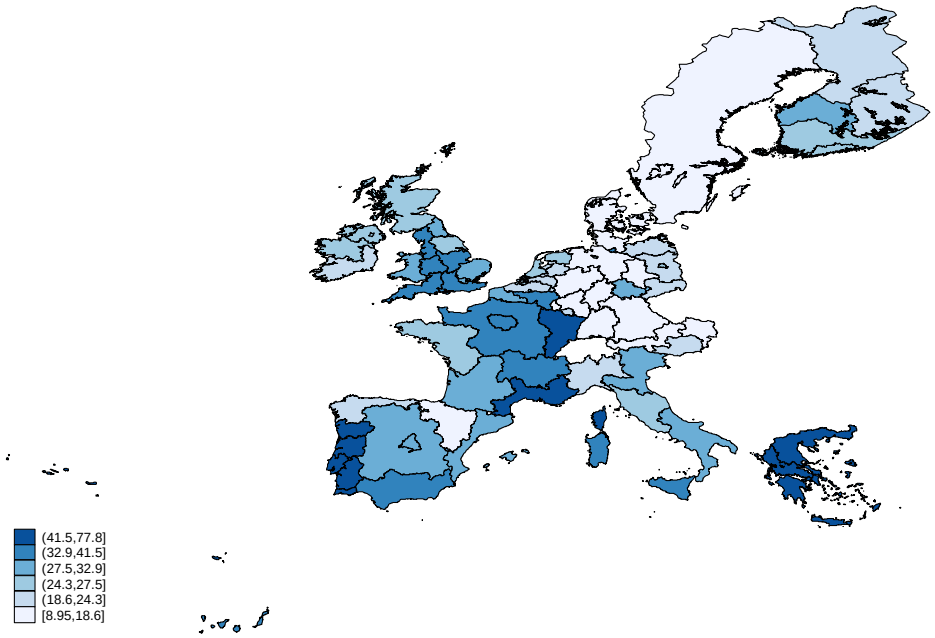
In this paragraph we briefly describe some principal findings about differences on poverty and social exclusion situations and perceptions among European regions. All these indicators prove that variability is high not only among nations, but also among regions within nations, showing as well as poverty and social exclusion represent a major challenge for all countries in European Union.

The map of Figure 2 depicts the regional distribution of the perception of poverty. Most of Southern regions experience very high levels of subjective poverty, as well as in almost all French regions and in England, where from 27 to 41% of people declare that their income is not sufficient to make ends meet. On the contrary, in Scandinavian countries, The Netherlands, Germany and Austria, the perception to be poor is lower than the EU average.

The map of Figure 3 shows that the majority of European citizens perceive themselves as socially integrated; however, there are some areas in which high percentages of people have negative perception about it. Finland's regions have high levels of social

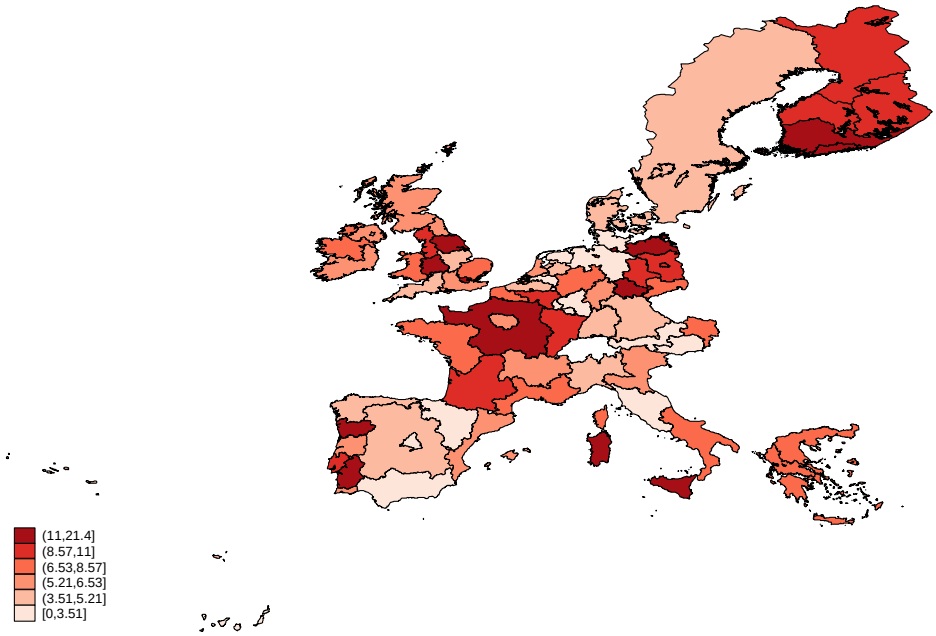
exclusion perception, beside East Germany and French regions, some UK and southern European regions (namely Greece, south of Italy and some Portuguese regions).

Figure 2 – Percentage of respondents having negative income perception, by European regions



Source: Our elaboration on Eurobarometer 56.1-2001 data.

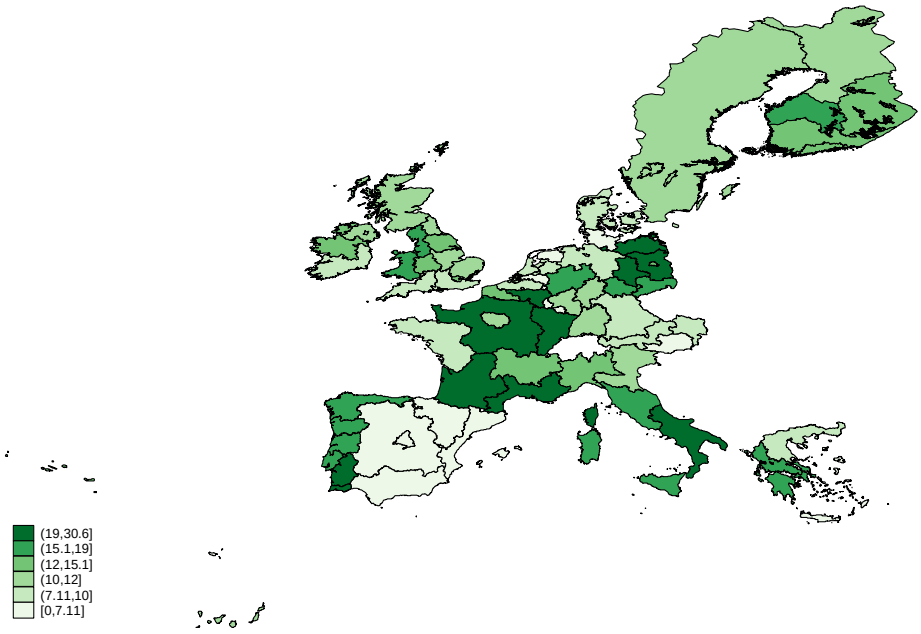
Figure 3 – Percentage of respondents having feeling of social exclusion, by European regions



Source: Our elaboration on Eurobarometer 56.1-2001 data.

The map in the Figure 4 depicts how the sense of uselessness is high in almost all French regions, Italy, Portugal, East Germany and Finland. Citizens of Spain (with exception for the north), Austria and The Netherlands experience the lowest level for this variable.

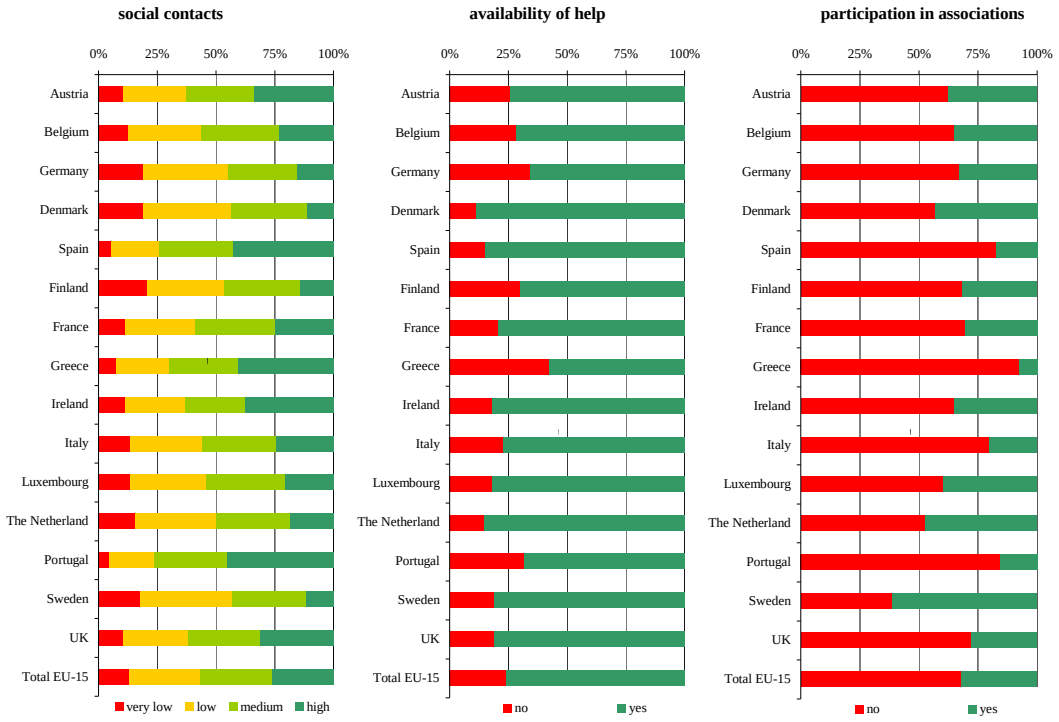
Figure 4 – Percentage of respondents having feeling of uselessness, by European regions



Source: Our elaboration on Eurobarometer 56.1-2001 data.

Figure 5 shows that people in Southern countries (Spain, Portugal, Greece) together with people in Ireland, have higher levels of social contacts with respect the average. Anyway, in same cases, they feel socially isolated (see map in the Figure 3). This difference should point attention to the importance of both qualitative and quantitative aspects of social relations in explaining the perception of social isolation. In line with the sociability models in European countries, we see that in Northern countries there are the lowest levels of social contacts. However in this countries there are generally high proportions of people with someone to count on, outside their family, in case of need (in case of depression, search for a job or to borrow money). The highest levels of people participating in associations (from 40 to 60%) are found in Denmark, Sweden, The Netherlands and Luxembourg. On the contrary, for Greece, Italy, Spain and Portugal, from 80 to 92% of people do not take part in associations.

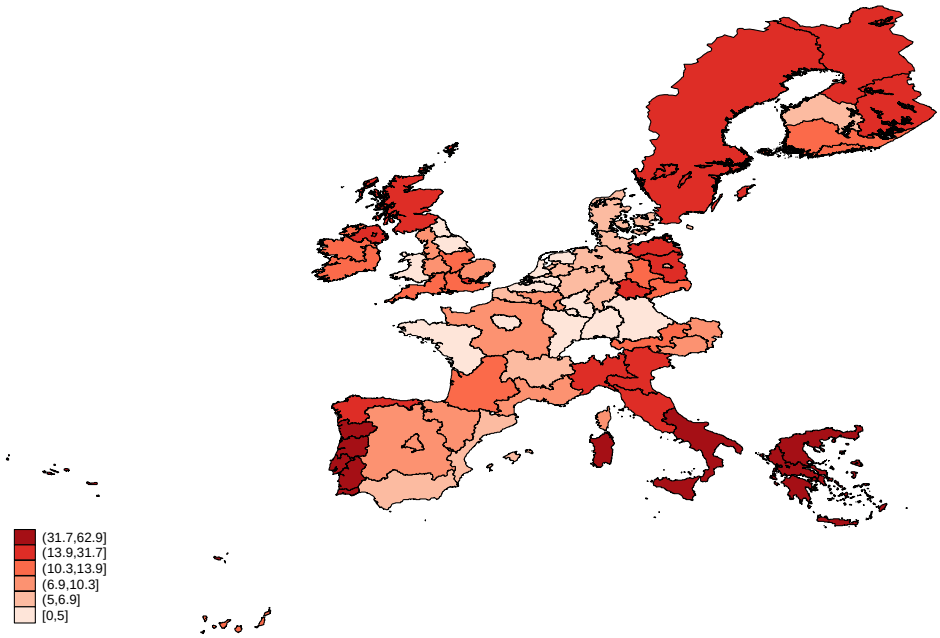
Figure 5 – Social contacts, availability of help and participation in associations by European countries



Source: Our elaboration on Eurobarometer 56.1-2001 data.

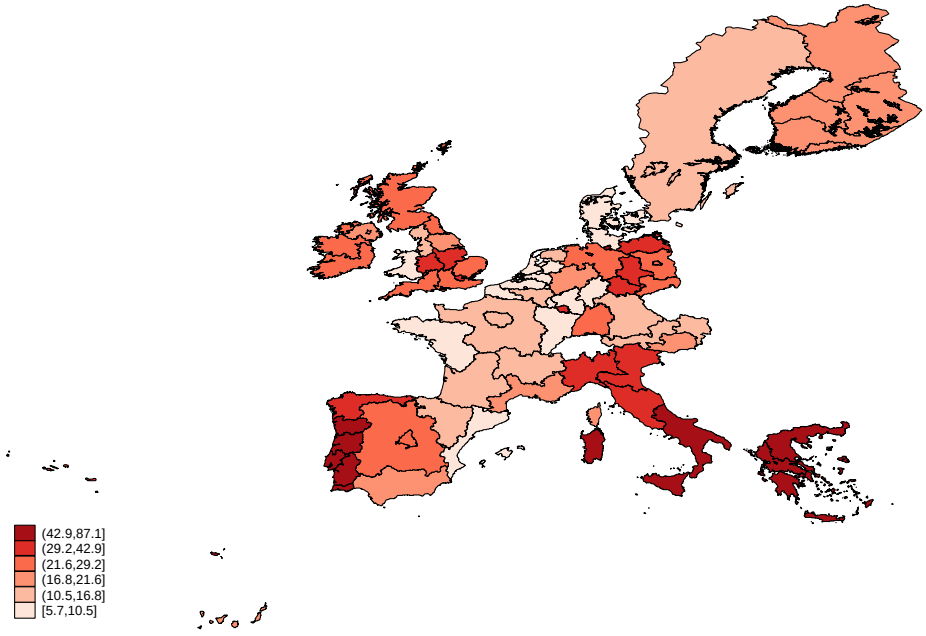
Finally, also the level of dissatisfaction with the social security and social assistance system varies across European countries and across European regions. In Southern European regions, except Spain, from 25 to 63% of citizens are unsatisfied with the presence of health and medical services in the area where they live (map in Figure 6). Dissatisfaction is present also in Sweden, Finland, Scotland, Northern Ireland and East Germany (10-20%), while continental Europe, together with England, seems to be overall satisfied with respect this aspect of daily life. The social discontent about the social assistance and protection system is depicted in the map of the Figure 7. In this case we note a higher homogeneity at country level. Once more, Southern European countries have high level of dissatisfaction in this respect (from 40 to 70%), while the situation in this case is good for Swedish and Finland citizens, and in some continental regions (less than 20%).

Figure 6 – Percentage of respondents having negative perception of health services, by European regions



Source: Our elaboration on Eurobarometer 56.1-2001 data.

Figure 7 – Percentage of respondents having negative perception of social assistance and protection system, by European regions



Source: Our elaboration on Eurobarometer 56.1-2001 data.

4 A multilevel latent class model to study social exclusion

4.1 Data

In the 56.1-2001 Eurobarometer survey, indicators about involvement in the three dimensions previously described are considered for all EU-15 countries. Eurobarometer data enables to go below the national level, and to use the so-called NUTS regions at the first level of Eurostat classification (NUTS-1). NUTS-1 represent a sort of meso-level between macro social structures and micro-demographic characteristics, although they are not defined all over in the same way. The choice of NUTS at the first level of classification represents a compromise between the territorial homogeneity and meaningfulness on the one hand, and the availability of statistical information on the other. Moreover, NUTS-1 have the advantage to have become a sort of standard of reference in the literature, also for the formulation and implementation of social policies at European level (e.g. Stewart, 2003; Vignoli and De Santis, 2009).

To summarise, the hierarchical structure of our analysis consists of 15,927 individuals nested in 77 regions belonging to 15 countries, with minimum and maximum group sizes equal to 11 and 1,001 respondents respectively (Table 1).

Table 1 – Respondents, regions and countries, EB sample 56.1-2001

Countries	**N. regions**	**N. respondents**	**Respondents in Regions**	
			minimum	**maximum**
France	8	1,002	73	196
Belgium	3	1,032	100	590
The Netherland	4	1,006	93	479
Germany	16	2,009	11	303
Italy	5	992	106	284
Luxembourg	1	600	---	600
Denmark	1	1,001	---	1,001
Ireland	2	996	278	718
United Kingdom	12	1,288	44	304
Greece	3	1,004	100	580
Spain	7	1,000	38	273
Portugal	7	1,001	22	343
Finland	4	996	105	645
Sweden	1	1,000	---	1,000
Austria	3	1,000	225	433
Total	*77*	*15,927*	*11*	*1,001*

Source: Our elaboration on Eurobarometer 56.1-2001 data.

For Ireland, Finland and Portugal, which are constituted by a unique NUTS at first level, we used NUTS-2. The unbalanced structure is not a problem, as it is efficiently handled by maximum likelihood methods. The number of clusters and their sizes are sufficient to achieve high power and good accuracy of the asymptotic distributions of the estimators (Snijders and Bosker, 1999; Maas and Hox, 2004).

4.2 Indicators of social exclusion

Reckoning with limited data availability, we selected from the Eurobarometer (EB) 56.1 some indicators for each identified domain of exclusion: the economic, the social and the institutional one.

Firstly, an objective measure of the economic and financial situation is introduced by means of the income quartile of individuals, together with a composite indicator of the economic difficulties that people coped with in last twelve months (for a more detailed description of the build indicator, see Pirani 2009). The self-rated measure of income is introduced for comparative purposes: in fact, two individuals or households with the same level of absolute resources may feel the situation differently, and assess differently the difficulties they have to face with (Strobel, 1996). This subjective perception is particularly useful, if not necessary, in such a composite and variegated context we deal with, such as the European Union. Eurobarometer 56.1 asked individuals how well they get by with their income via four categories of response (with great difficulty, with difficulty, easily, very easily), which have been aggregated in two categories (with difficulties, without difficulties) for the analysis. Generally, there is a significant correlation between the self-rated measure of economic difficulty and the objective one (Bhalla and Lapeyre 2004), anyway, the simultaneously introduction of both indicators enables to highlight discrepancies between the actual economic situation and the economic situation perception. Finally, to better characterize the economic dimension from a subjective perspective we refer to the degree of agreement expressed by the respondents to the EB question: “Some people look down on me because of my income or job situation” (agree, neither agree nor disagree, disagree).

Secondly, referring to the social dimension, the 56.1-2001 Eurobarometer dataset provides information about the frequency of the relationships with the “immediate” sphere of individual relationships. Particularly, it is asked if people meet (a) their

friends, (b) their relatives and (c) their neighbours several times a week (yes or not). Using together these three variables, we build a composite indicator measuring the overall magnitude of personal relationships, which takes the value "high" for individuals who respond to have frequent social contacts with friends, relatives and neighbours; "medium" when the social contacts are frequent for two categories of subjects; "low" when one has frequent contacts only for one category, and "very low" whether all kinds of social contacts are scarce. Moreover, to capture the existence of effective social networks, we consider how much practical and emotional support people would expect to get from members outside their household in three situations of need: whether they feel depressed, they help need to find a job, they urgently need to borrow money. Finally, another EB question offers the possibility to investigate also the participation in social activities like leisure or sport clubs. We think that the subjective expectation of remaining isolated in situations of need and the personal dissatisfaction with one's family life and participation in society, are warning symptoms of social exclusion.

An Eurobarometer question is attention-getting for the purpose of our analysis: "Do you feel left out of society?". Respondents had to say whether they agree (via a five-level Likert scale) with this statement. Using this subjective perception of social exclusion we can investigate to what extent risk factors traditionally relied to social exclusion are really decisive in individual perception. Secondly, people were asked the degree of agreement with the statements: "I don't feel that the value of what I do is recognised by the people I meet" and "I don't feel that I have the chance to play a useful part in society". To be engaged in activities which are positively valued by others is important for the psychological wellbeing of people, and may contribute to enhance social relations and social participation.

Finally, referring to the institutional dimension, the Eurobarometer questions enable to account, to some extent, for the attachment between citizens and public institutions, and their satisfaction about them. Data are provided about the subjective evaluation (satisfied, not satisfied) of the respondents about the medical services in their local area, their social entitlements in case of sickness, invalidity and unemployment. As indicators of personal security, we chose the perception, expressed by individuals, of the presence of vandalism and theft in the place where they live. Unfortunately, the lack of

appropriate data referring to this dimension prevents from an accurate and a comprehensive evaluation of the "institutional" context in which individuals live.

4.3 Individual and contextual covariates

In LC models, the indicators are used to define and measure the latent concept, while covariates help to predict the latent classes' membership, thus improving their description.

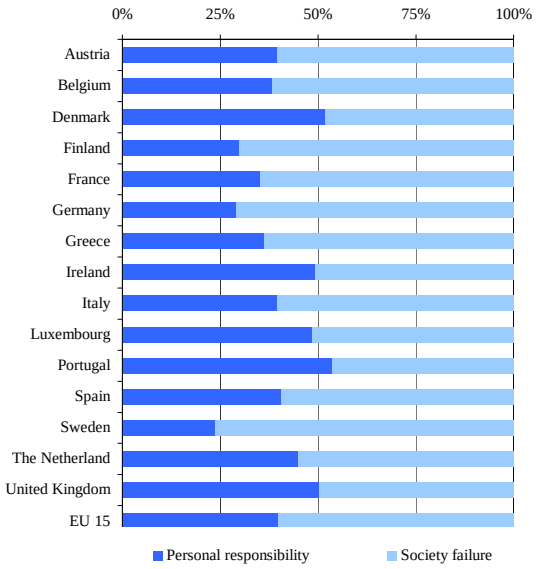
The individual attributes used in the model are age (15-24, 25-34, 35-54, >55) and occupational status of the respondents (employed, homemaker, unemployed, retired/unable, student). These elements are not properly indicators of exclusion *per se*, even if we can hypothesize that age and occupational status involve differences in experiencing and in perceiving the risk factors of social exclusion, in all the considered dimensions. Particularly, the unemployment status has several consequences on the individual (Negri e Saraceno, 2000), involving not just a lack of financial resources, but also a weakening and a change in social network of individuals.

Other individual covariates had been tested, but not included in the final model, because of they were not significant.

In social exclusion evaluation, also elements operating at regional level are relevant. Solidarity with and willingness to help the poors will probably be more widespread when responsibility is largely ascribed to injustice in society (Böhnke, 2008). In this sense, starting from individual responses to an Eurobarometer question, we computed an indicator in order to quantify, for each European region, the percentage of people attributing the responsibility of poverty and social exclusion either to individual or to societal failure (see Pirani 2009 for more details). This indicator describes whether the prevalent opinion in a population is that poverty and social exclusion are personal responsibility of each individual living in these situations, or are instead a consequence of injustice in society. The distribution of the responses about the causes of poverty and social exclusion is shown in Figure 8. Only in Denmark, Portugal and UK personal causes are more important than social causes in explaining poverty. However personal responsibility is over the European average in Ireland, Luxembourg and in The Netherlands. On the contrary, social causes predominate as an explanation of poverty in Sweden, Germany, and Finland, and, in a lower measure, also in France and Belgium. This

results poses some questions about the solidity of the European social model based on social justice (Bhalla and Lapeyre 2004). It is worthwhile noting, also, that the injustice explanation varies greatly over time and is related to the overall socioeconomic conditions (European Commission 2004).

Figure 8 – Percentage of respondents by poverty and social exclusion as a personal responsibility or as a failure of the society, by European countries

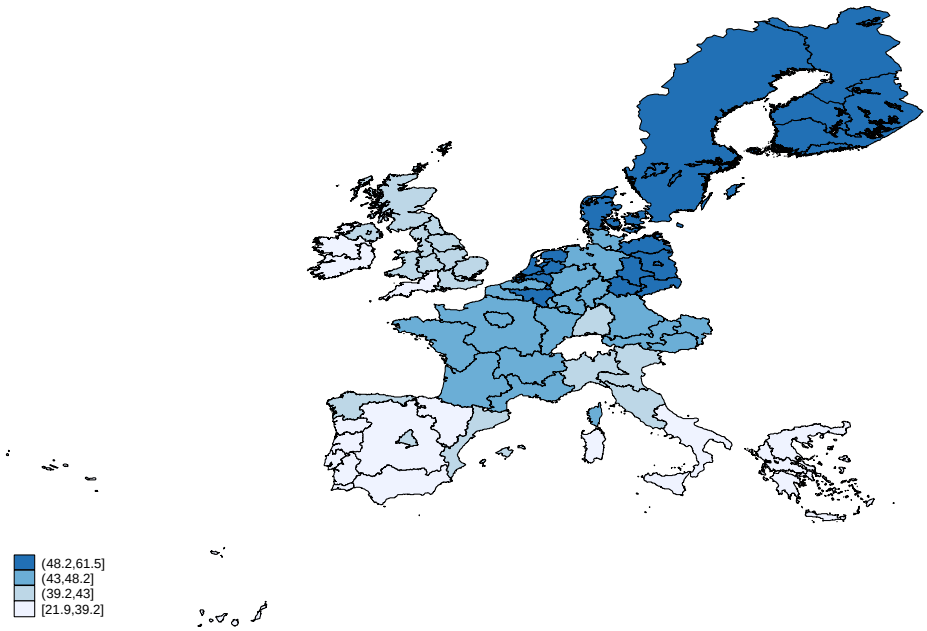


Source: Our elaboration on Eurobarometer 56.1-2001 data.

Moreover, in order to account for the regional economic background, we defined an indicator given by the ratio between the amount of taxes, social contribution and transfers paid, and the primary income. This indicator could represent a *proxy* of social protection expenditure of the region or, even, the amount of expenditure financed using public taxation. Then, we considered the level of gross domestic product (GDP), particularly its quartile distribution among European regions. Figures 9 and 10 show the average regional values of these two contextual covariates: the ratio between taxes and income (map 9), and the GDP (map 10). Concerning the first one, we note scarce differences within nations. This is not surprisingly, as well as the fact that the highest level of taxation and social contributions (from 48 to 60%) are for Scandinavian countries (namely Sweden, Finland, The Netherlands, Denmark, and also for Eastern Germany). On the other side, we find southern European countries and Ireland (from 20 to 40%). Major differences among regions, also within nations, are for the mean level of GDP for

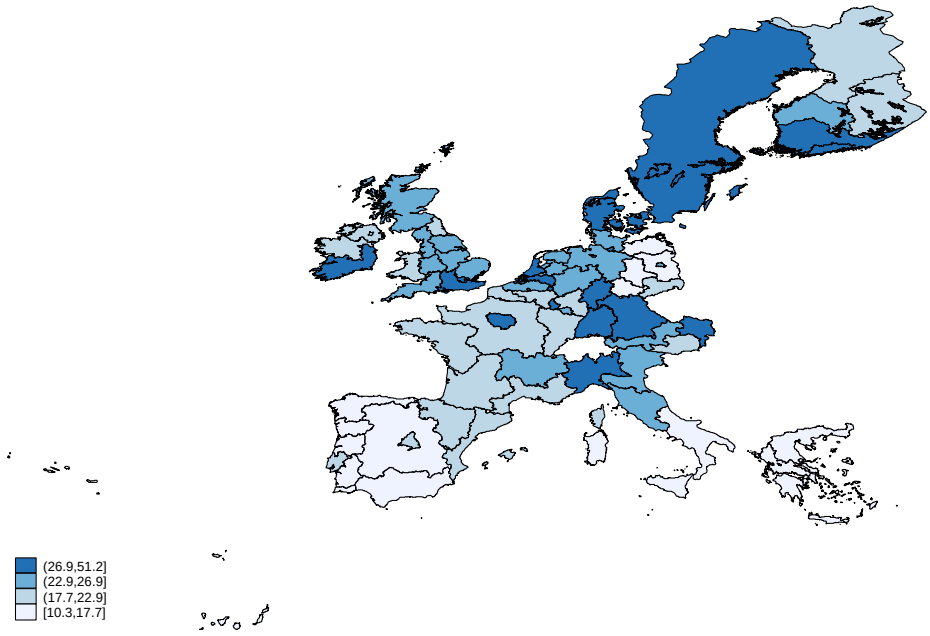
inhabitants (map 10). As expected, the richest regions are in the Northern Europe, UK, Germany, The Netherlands, beside Ile de France and North-western Italy (higher than 26,000 of Euro per inhabitant on average). The lowest levels are for south of Italy, Greece, Spain and Portugal, and regions of East Germany (less than 17thousand Euro).

Figure 9 – Regional distribution of the ratio between taxes level and the income



Source: Our elaboration on Eurostat data, 2001.

Figure 10 – Regional distribution of the mean regional level of GDP (thousands of Euro)



Source: Our elaboration on Eurostat data, 2001.

4.4 Model specification

The probability structure of a multilevel latent class model is composed by two finite mixture models, each of them referring to a level of analysis, individuals and regions. Consider individuals $i = 1, \ldots, I$ originated from an international sample of 77 European regions, $j = 1, \ldots, 77$; for each individual i we dispose of the set of K indicators previously described denoted by Y_{ik} with $k = 1, \ldots, 12$. So, Y_{ijk} represents the response to item k of person i coming from region j, whereas $\mathbf{Y}_{ij}$ refers to the full vector of responses of the same individual i, and $\mathbf{Y}_j$ to the full vector of responses of all individuals in region j. $\mathbf{Z}_{ij}$ and $\mathbf{Z}_j^q$ denote respectively the individual and the contextual covariates. We assume a latent variable X_{ij} that represents the individual condition of social exclusion. Given their response patterns to the selected indicators, individuals will be classified in a probabilistic way in one of the T latent classes of X_{ij}, with $t = 1, \ldots, T$. This represents the *lower-level part* of the model, that is a standard LC model for the selected indicators with a categorical latent variable. The *upper-level part* of the model, that is the multilevel extension, is implemented assuming the existence of a latent variable W_j at regional level, with $m = 1, \ldots, M$ classes, conditionally on which the individual responses are assumed to be mutually independent. This multilevel component implies that the latent class probabilities vary across regions, that is, the second level latent variable has the role of a random effect in the model for X_{ij}, and it aims to identify latent types of regions for which parameters in the specified model differ. Note that one knows to what j-th region individuals belong to, but the membership of the $m = 1, \ldots, M$ classes of the discrete latent variable at group level W_j is unknown a priori, as well as it is unknown the membership of individuals to the latent classes of X.

Thus, the lower level part of the model refers to the conditional probabilities of the response vector $\mathbf{Y}_{ij}$ conditional on the latent variable at second level:

$$\begin{aligned} P\left(\mathbf{Y}_{ij} = \mathbf{s} \middle| W_j = m, \mathbf{Z}_{ij}\right) &= \sum_{t=1}^{T} P\left(X_{ij} = t \middle| W_j = m, \mathbf{Z}_{ij}\right) P\left(\mathbf{Y}_{ij} = \mathbf{s} \middle| X_{ij} = t, W_j = m\right) \\ &= \sum_{t=1}^{T} P\left(X_{ij} = t \middle| W_j = m, \mathbf{Z}_{ij}\right) \prod_{k=1}^{K} P\left(Y_{ijk} = s_k \middle| X_{ij} = t, W_j = m\right) \end{aligned} \tag{1}$$

The probability associated with all responses of a given region, denoted by $P\left(\mathbf{Y}_j \middle| \mathbf{Z}_j\right)$ can be obtained by taking the sum over m of the products of $P\left(\mathbf{Y}_{ij} = \mathbf{s} \middle| W_j = m, \mathbf{Z}_{ij}\right)$ over the n_j individuals belonging to each region, and multiplying by the probability that region j belongs to a particular class at group level:

$$P\left(\mathbf{Y}_j \middle| \mathbf{Z}_j\right) = \sum_{m=1}^{M}\left[P\left(W_j = m \middle| \mathbf{Z}_j^g\right)\prod_{i=1}^{n_j} P\left(\mathbf{Y}_{ij} = \mathbf{s} \middle| W_j = m, \mathbf{Z}_{ij}\right)\right] \tag{2}$$

Substituting (1) in (2), we obtain

$$P\left(\mathbf{Y}_j \middle| \mathbf{Z}_j\right) = \sum_{m=1}^{M}\left[P\left(W_j = m \middle| \mathbf{Z}_j^g\right)\left[\prod_{i=1}^{n_j}\sum_{t=1}^{T} P\left(X_{ij} = t \middle| W_j, \mathbf{Z}_{ij}\right)\prod_{k=1}^{K} P\left(Y_{ijk} = s_k \middle| X_{ij}, W_j\right)\right]\right] \tag{3}$$

which shows the probability structure of the model we adopted. From (3) it is clear the presence of a separate finite mixture distribution at each level of nesting.

The right-hand side of equation (3) consists of three components, specified using multinomial logit models:

a) the probability that region j belongs to a particular level of the latent variable W_j, given the three regional covariates

$$P\left(W_j = m \middle| \mathbf{Z}_j^g\right) = \frac{\exp\left(\alpha_{0m} + \alpha_{1m} Z_{1j}^g + \alpha_{2m} Z_{2j}^g + \alpha_{3m} Z_{3j}^g\right)}{\sum_{m'=1}^{M}\exp\left(\alpha_{0m'} + \alpha_{1m'} Z_j^g + \alpha_{2m'} Z_{2j}^g + \alpha_{3m'} Z_{3j}^g\right)} \tag{4}$$

b) the probability that respondent i belongs to a particular class of the latent variable at the first level X_{ij}, given regional latent class membership and the two individual covariates

$$P\left(X_{ij} = t \middle| W_j = m, \mathbf{Z}_{ij}\right) = \frac{\exp\left(\gamma_{0tm} + \gamma_{1t} Z_{1ij} + \gamma_{2t} Z_{2ij}\right)}{\sum_{t'=1}^{T}\exp\left(\gamma_{0t'm} + \gamma_{1t'} Z_{ij} + \gamma_{2t'} Z_{2ij}\right)} \tag{5}$$

c) the joint probability that the i-th respondent follows the pattern $\mathbf{s}_i$ given individual and regional latent class membership

$$\prod_{k=1}^{K} P\left(Y_{ijk} = s_k \middle| X_{ij} = t, W_j = m\right) = \prod_{k=1}^{K}\frac{\exp\left(\beta_{0s_k} + \beta_{1s_k t} + \beta_{2s_k m}\right)}{\sum_{s'}^{S_k}\exp\left(\beta_{0s'} + \beta_{1s't} + \beta_{2s'm}\right)} \tag{6}$$

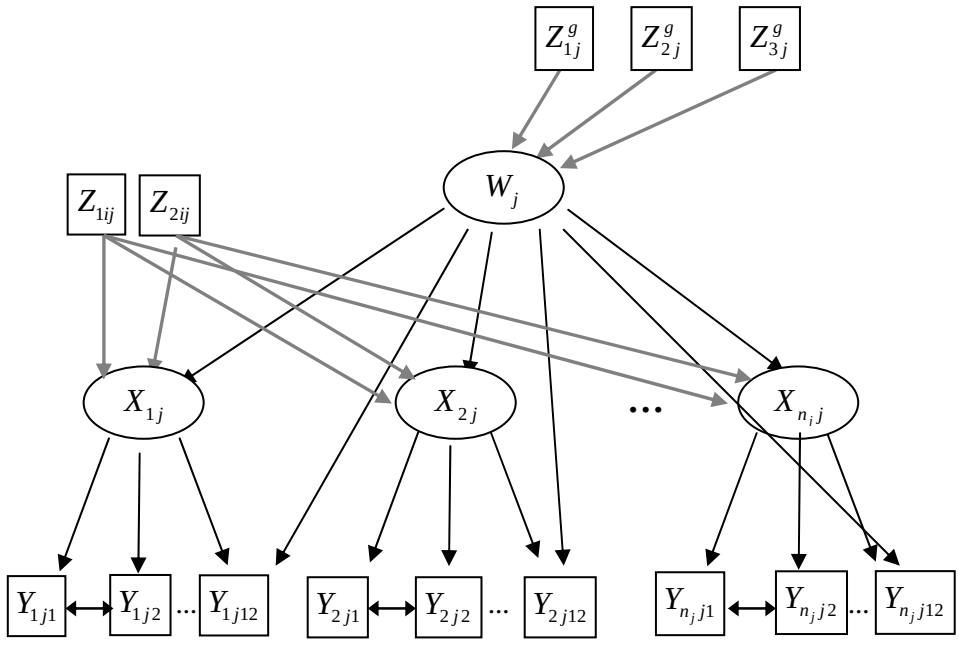
In equation (4) we are assuming that the three group level covariates affect level-2 latent class membership, whereas in equation (5) the probability of belonging to a certain level-1 latent class depends on the group-level latent variable and on the two level-1

covariates. The three α_{0m} and the 20 γ_{0tm} intercepts represent respectively the category effects of the group-level latent variable and the W_j-dependent category effects of the latent variable at individual level X_{ij}. In equation (6) conditional probabilities depend on the individual level latent variable X_{ij}, as indicated by parameters β_{1s_kt} and on the group-level latent variable W_j through the direct effects β_{2s_km} (Hagenaars, 1988; Hagenaars and McCutcheon, 2002). This specification enables to take into account situations in which individuals belonging to different groups respond to certain items in a different manner. Particularly, we assumed direct effects of the group-level latent variable for the indicators "Social contacts" and "Participation in associations". Finally, we estimated 14 additional parameters $\beta_{2s_ks_h}$ accounting for the interaction between some pairs of indicators, i.e.:

$$P\left(Y_{ijk}=s_k, Y_{ijh}=s_h \middle| X_{ij}=t\right)=\frac{\exp\left(\beta_{0s_k}+\beta_{1s_kt}+\beta_{0s_h}+\beta_{1s_ht}+\beta_{2s_ks_h}\right)}{\sum_{s''=1}^{S_h}\sum_{s'=1}^{S_k}\exp\left(\beta_{0s'}+\beta_{1s't}+\beta_{0s''}+\beta_{1s''t}+\beta_{2s's''}\right)} \qquad (7)$$

The model structure is depicted in the path diagram of Figure 11, which highlights the presence of effects between indicators, between covariates and latent variables, and between latent variables and indicators.

Figure 11 – Path diagram of the multilevel Latent Class model adopted for the analysis of social exclusion



5 Results

In the multilevel LC framework, model estimates can be obtained for a fixed number of classes at group and at individual level, M and T respectively. A priori, we could assume the existence of two most relevant latent classes at individual level: "excluded" versus "not excluded", an opposition that is certainly clear and not ambiguous, and that enables to identify two clear-cut groups. Anyway, we believe that because of the multidimensionality of the concept "social exclusion", it could coexist different subgroups in the population, each of them characterized by different forms or different degrees of exclusion in each of the identified dimensions. In order to choose among multilevel Latent Class models for different values of M and T, many models have been estimated, and the relative fit of the alternative model specifications examined by means of the minimum BIC rule (Vermunt and Magidson, 2005). The model we discuss here involves 6 distinctly different respondent types as regard their deprivation status in all the relevant domains, i.e. $T = 6$ latent classes at individual level, and 4 clusters at regional level, i.e. $M = 4$ which enable to differentiate rather well among regions. Raising the number of latent classes describing social exclusion does not provide an effective model improvement, both in terms of model fitting and of substantial meaning.

5.1 Individual profiles: the latent levels of social exclusion

The characteristics of each class, in terms of their similarities and differences, are shown in Table 2. This "profile" table contains, in the first line, the *estimated marginal latent probabilities* $\hat{P}(X = t)$ for each t-th class. These probabilities represent the class size. Secondly, in the core of the Table, the *class-specific marginal probabilities* associated with each indicator $\hat{P}(Y_{ijk} = s_k \mid X = t)$ show how the latent classes are related to the 12 indicator variables used in our analysis. Through the examination of the profile table, we can characterize each class of the latent variable in term of response probability to each level of the indicators, and thus to describe the different typologies that emerge.

Our model allows, first, the identification of the presence of two "extreme" profiles of respondents: class number 6 encompasses individuals who have negative and "deprived" responses on all the indicators. Individuals classified in this class have high risk to be in the first two income quartiles, to perceive difficulties to make ends meet

with their income, to feel excluded from the society, to have low personal relationships (even if with a probability which is not too high), and to have a negative perception of the institutional system. For this class, which groups the 11.2% of the sample, the probability to answer in a "disadvantaged" manner is the highest for almost all the indicators.

In the opposite situation, we find more than one-third of the population (37.9%): in class 1 individuals have a positive situation, that is high levels of income, good relationships with family, friends and neighbours, and a solid social network on which they could rely on in case of problems. Also from a subjective point of view, their situation is not problematic: they don't feel inferior to the others or excluded, and they judge positively their institutional environment in terms of social assistance, health services and security. Class 1, moreover, has the highest probability to participate in social leisure and sport associations. Thus, class 6 raises to be the "excluded class", and class 1 the "not excluded class".

An interesting characteristic in class 2 (size equal to 18.3%) is the disagreeing between the objective measure of income (income quartile) and the perception to get by with that income. Individuals classified in this class have a high probability to be in the lowest income quartiles, but answer that their income is sufficient to make ends meet. This class has low probability to include people who feel unhelpful, marginalized or excluded, or people who is unsatisfied with the social and security system. The low level of income, which represents the unique "negative" element of this class, do not affect the capability of these individuals to integrate in the mainstream society and to feel overall satisfied.

The profile of latent class 3 identifies individuals who perceive, in a measure higher than the overall mean, the risk of social exclusion and the difficulty to have a useful role in the society. The economic situation, both objective and subjective, of this class is on the average but in this case the critical aspect is represented by the social relationships. People in this class (the 11.9% of the sample) have the highest probability to have low or very low social contacts with family, friends and neighbours, and, most important, they answer that they could not rely on anyone in case of problems. It seems to raise a situation in which the risk of marginalization and the feeling of social exclusion is not linked to a lack of economic stability, but rather to a lack of a stable and positive social network.

Table 2 – Profile table of the latent variable at individual level X_{ij} : class size $\hat{P}\left(X = t \middle| \mathbf{Z}_i\right)$ and class specific marginal probabilities $\hat{P}\left(Y_{ijk} = s_k \middle| X = t\right)$ by indicator

	Latent classes of X_{ij}						
t	**1**	**2**	**3**	**4**	**5**	**6**	**Overall**
Class size $\hat{P}\left(X = t \middle| \mathbf{Z}_i\right)$	0.379	0.183	0.119	0.143	0.064	0.112	1.000
Indicators Y_k							
Income perception							
with difficulties	0.043	0.116	0.043	0.794	0.325	0.973	0.286
without difficulties	0.957	0.884	0.957	0.206	0.675	0.027	0.714
Economic difficulties							
++ diff.	0.004	0.002	0.009	0.250	0.071	0.495	0.099
+ diff.	0.039	0.008	0.086	0.452	0.205	0.334	0.142
no diff.	0.956	0.990	0.904	0.298	0.724	0.171	0.759
Income quartiles							
-- (first quartile)	0.045	0.367	0.216	0.338	0.092	0.594	0.231
- (second quartile)	0.161	0.359	0.328	0.358	0.232	0.302	0.266
+ (third quartile)	0.315	0.193	0.276	0.210	0.325	0.085	0.248
++ (fourth quartile)	0.479	0.081	0.180	0.095	0.352	0.019	0.256
Feeling of inferiority							
Yes	0.049	0.035	0.119	0.218	0.081	0.240	0.103
don't know	0.078	0.084	0.333	0.175	0.115	0.215	0.141
No	0.873	0.881	0.548	0.607	0.804	0.545	0.756
Social contacts							
Very low	0.131	0.089	0.205	0.126	0.092	0.144	0.130
Low	0.306	0.260	0.359	0.302	0.262	0.299	0.300
Medium	0.311	0.326	0.271	0.313	0.328	0.298	0.309
High	0.252	0.326	0.165	0.259	0.318	0.259	0.261
Participation in assoc.							
No	0.566	0.670	0.790	0.685	0.867	0.924	0.688
Yes	0.435	0.330	0.210	0.315	0.133	0.076	0.312
Availability of help							
No	0.094	0.228	0.414	0.233	0.207	0.606	0.241
Yes	0.906	0.772	0.586	0.767	0.793	0.394	0.759
Feeling of social exclusion							
Yes	0.006	0.031	0.113	0.102	0.048	0.260	0.068
don't know	0.027	0.057	0.311	0.117	0.045	0.220	0.102
No	0.967	0.913	0.576	0.782	0.908	0.520	0.830
Feeling of uselessness							
Yes	0.025	0.106	0.206	0.146	0.070	0.378	0.121
don't know	0.066	0.177	0.407	0.189	0.122	0.285	0.173
No	0.909	0.717	0.387	0.666	0.808	0.338	0.707
Health services satisfact.							
Bad	0.072	0.054	0.165	0.109	0.653	0.401	0.159
Good	0.928	0.946	0.835	0.891	0.347	0.599	0.841
Social assistance satisfact.							
Bad	0.106	0.055	0.274	0.265	0.697	0.678	0.241
Good	0.895	0.945	0.726	0.735	0.303	0.322	0.759
Theft and violence							
Yes	0.158	0.199	0.267	0.324	0.336	0.361	0.236
don't know	0.155	0.130	0.466	0.223	0.232	0.275	0.216
No	0.687	0.671	0.267	0.453	0.432	0.364	0.548

Source: Our elaboration on Eurobarometer 56.1-2001 and Eurostat data.

Class 4 (size equal to 14.3%) is characterized by high probability to be in the two lowest income quartiles and to perceive the income as not sufficient. Individuals in this class perceive problematic social relations in the sense that they feel a sense of inferiority with regards the others due to their income or their job situation. In this case, the perceptions of social exclusion and of social uselessness, even if not too high, are still relevant. Another critical dimension is represented by the perception to live in a violent and unsafe area, while in this class the health system is positively judged. Conversely, the social contacts of people in this class are medium or high.

Finally, class 5 seems to identify mainly a situation of exclusion from what we called "institutional dimension": the probability to be dissatisfied with the social assistance and health care system is the highest, as well the assessment about the presence of violence and theft in the area. Moreover, people in this class tend not to participate in association activities. The responses about the economic situation, the social network and the subjective perception, do not identify problematic conditions. Particularly, notwithstanding a negative "institutional dimension", the other areas of life are good. This class is the smallest (size equal to 6.4%).

Summarizing, we identify 6 latent levels of social exclusion, according to different domains of life. Whether we consider only the indicator "perception to be left out from society" as indicator of social exclusion situations, some of them are not properly situation of social exclusion: individuals in class 1, 2 and 5 do not perceive to be socially excluded. The low level of income, when not associated to a negative perception of the economic situation (class 2), does not represent an element that influences negatively the perception of social marginalization. Class 5 identifies a typology that is dissatisfied with the social and protection system, but this does not affect the perception of social exclusion and social uselessness, so that the "institutional" dimension *per se* is not sufficient to determine social exclusion situations. Conversely, classes 3, 4 and 6 have high probabilities to include people who feel excluded (respectively 0.11, 0.10 and 0.26), even if they present important differences in the response probabilities of the indicators referred to the three dimensions: class 6 identifies a typology of people with all negative indicators and thus excluded from all the dimensions; class 3 refers mainly to relational exclusion and class 4 to economic exclusion.

5.2 The higher level: clusters of regions

Let us now move to the second level of the analysis. Following the BIC criterion, the choice of 4 latent levels for the variable W_j seems to operate quite well, providing a clear classification of regions. The region classification based on these cluster membership probabilities given only group-level covariates $P\left(W_j = m \middle| \mathbf{Z}_j^g\right)$ – sometimes referred to as *prior or model probabilities* –is depicted in Figure 12.

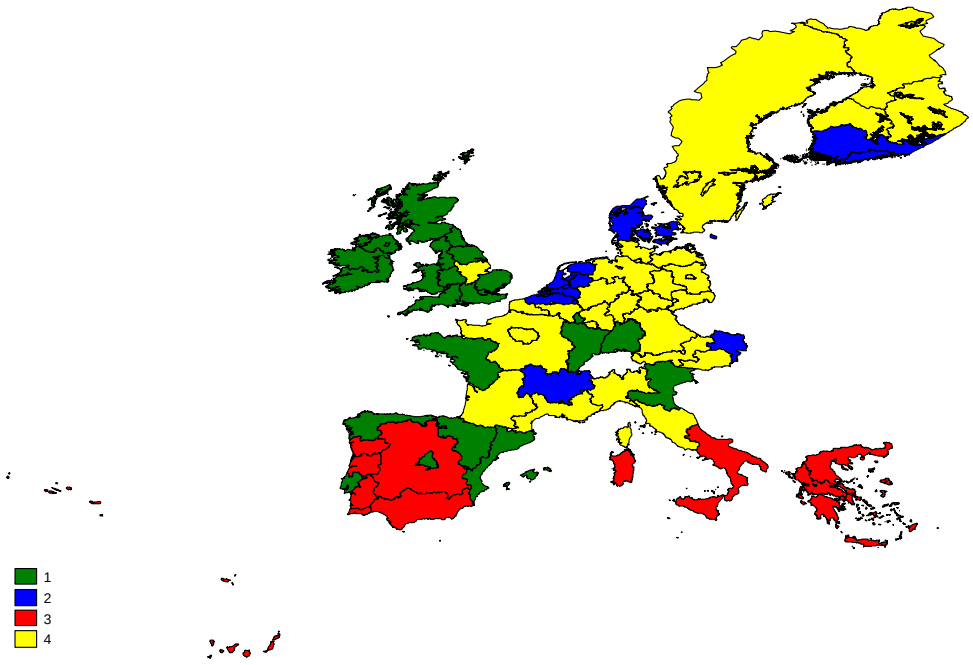
In cluster 1 are classified almost all UK regions, Ireland, two German regions (Bremen and Baden-Wurttemberg), the North-East of Italy, the East and the West of France, and some Spanish regions, which give a cluster size equal to 33.3%. These regions are characterized by a medium-low level of GDP and of the ratio between taxation and primary income, while the condition of poverty and social exclusion is mainly seen as an individual responsibility. In terms of response probabilities to the indicators, the first cluster groups together regions for which individuals don't seem to be in a disadvantaged condition. The probability to be in the third and fourth income quartile, given the latent class, is higher than the average, as well as the probability to have an high level of social contacts and to feel satisfied with the social and protection system.

A positive situation is identified also for regions belonging to cluster 2, which are, on average, in the fourth GDP quartile and have an high level of taxation. The regions classified with the highest probability in this cluster are the Dutch regions, Denmark, South-Finland, East-Austria and Centre-East France. Here people have low probabilities to have high levels of social contacts, but all other dimensions seem to go well. In this cluster, which size equals 12.9%, we register the highest probability to participate in leisure, culture or sport activities and associations, and a high probability that people may rely on someone from outside their own household in case of problems. In these regions, we depict a sociability model according to which social contacts and social networks are mainly established via friends and organized activities, rather than to be family-centred.

The latent regional cluster 3 is in the opposite situation. For this cluster the probability to feel left out of society is the highest (0.13). From map in Figure 1, one sees that this cluster groups together southern European regions (Greece, South and Islands of Italy, most Portuguese and Spanish regions, for a cluster size equal to 15.8%), which are at low levels of GDP, and where the share of social security and protection system

financed by means of public taxation is rather low. The unique indicator in this class that is likely to assume a "positive" value with high probability is the indicator concerning the presence of high social and personal contacts with family, friends and neighbours. The probability that an individual classified in this class is in the lowest income quartiles is 0.56, and this is the only cluster where the subjective evaluation of the personal income has an high probability to be negative, in line with literature. High probabilities are found also for "negative" responses concerning the institutional dimension. This cluster identifies regions where the social contacts are important, but the lack of potential support outside the one's own household undermines the individual perception of social integration.

Figure 12 – Classification of the 77 European regions included in the analysis, on the basis of group-level prior membership probabilities given group-level covariates $P\left(W_j = m \middle| \mathbf{Z}_j^g\right)$



Source: Our elaboration on Eurobarometer 56.1-2001 and Eurostat data.

Finally, the group-level cluster 4 is the biggest one (size equal to 37.9%), and it includes most German and French regions, Austria, Sweden, North Finland, and North-West and Centre Italy. The most pronounced feature of this cluster is that it groups regions where the probability to have low levels of income is higher than the average, but the individuals perceive their income to be sufficient to make ends meet. Except for the

subjective evaluation of the social assistance and health system, the other indicators assume negative values with high probabilities, e.g. social contacts, availability of help, and subjective feeling of exclusion, uselessness and inferiority. In terms of group level covariates, this cluster is characterized by a medium-high level of taxation (typical of Nordic regions, see also cluster 2) and of GDP. A remarkable characteristic is the high percentage of people who declare that the condition of poverty and social exclusion is due to a failure of the society and to their injustices, and it is an inevitable part of modern progress.

The different composition of individual social exclusion typologies among the four clusters of regions identified is analysed by computing the probability of being in a certain latent class of X_{ij} for each level of W_j that is $P\left(X_{ij}=t\middle|W_j=m\right)$, that are obtained aggregating over covariates patterns. Considering the relative size of individual-class within a region-cluster (Table 3), we note that individual latent classes 1 and 2 (which are "not excluded classes") are highly present mainly in region-clusters 1 and 2 (which, in fact, are the less disadvantaged) and, although in a lower measure, also in region-cluster 4. Individual-level class 4 is present in all region-clusters, except the third. Indeed, classes 5 and 6 are prevalent in region-cluster 3.

Table 3 – Probability of being in each latent class of X_{ij} for each level of W_j : $P\left(X_{ij}=t\middle|W_j=m\right)$

		Latent cluster of W_j				**Marginal probabilities** $\hat{P}\left(X=t\right)$
		1	**2**	**3**	**4**	
Latent classes of X_{ij}	**1**	**0.502**	**0.495**	0.085	**0.315**	*0.379*
	2	0.150	**0.309**	0.042	0.181	*0.183*
	3	0.060	0.041	0.059	**0.241**	*0.119*
	4	0.194	0.130	0.035	0.152	*0.143*
	5	0.022	0.000	**0.409**	0.009	*0.064*
	6	0.072	0.025	**0.370**	0.103	*0.112*
Marginal probabilities $\hat{P}\left(W_j=m\right)$		*1.000*	*1.000*	*1.000*	*1.000*	*1.000*

Source: Our elaboration on Eurobarometer 56.1-2001 and Eurostat data.

Table 3 presents model results linking the individual and the regional classes, and enables to quantify the influence of the level-one latent classes across level-two latent clusters. These findings highlight the presence of different structures for the same latent variable "social exclusion" across regions, depending on the effect of the latent variable

grouping the regions, and, at the same time, they show how the importance of the different dimensions change across groups of regions. For instance, while the probability to belong to the individual latent class 6 (the most disadvantaged one) equal 0.07 for regions belonging to cluster 1, it raises to 0.37 for regions belonging to cluster 3. It seems that in certain regions (e.g. cluster 4) social exclusion situations are mainly linked to a lack of social networks and thus to the relational dimension. In other regions (e.g. cluster 3) the critical factor is represented by poverty and dissatisfaction towards the social protection system. Finally, in some other areas (identified in cluster 1) the most important elements in determine social exclusion situation and/or perception are the material and economic deprivation. We can thus remark that the meaning, the interpretation and the comprehensiveness of the concept of social exclusion may change across Europe, given different social, economic, cultural, political and historical contexts.

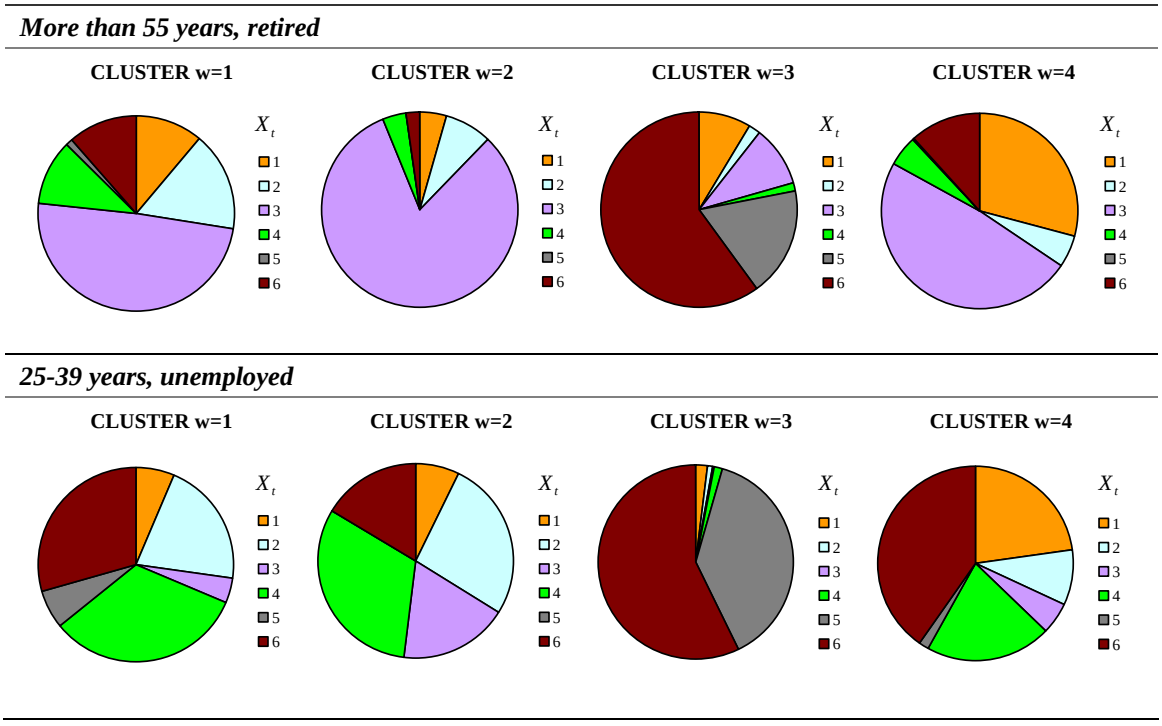
5.3 Effects of individual and contextual covariates

Membership to individual latent classes, that is characterization of social exclusion situations, is often related to external variables describing the demographic and the socio-economic condition of individuals. Hence, the probability that an individual belongs to a particular latent class has been modelled to depend also on his socio-demographic characteristics (equation (5)). Age of individuals and their occupational status are statistically significant.

The effect of age is relevant, particularly for some profiles. The class number 1 is overrepresented in the age groups 25-39 and 40-54, whereas the class 2 is overrepresented among people over 55 years. Class 4 is overrepresented among young people (15-24), and adult and elderly people have a higher presence of people belonging to class 6. Also the occupational status helps to predict the class membership probabilities. As expected, employed people present a high proportion of people in class 1, which included a positive individual condition for all the dimensions. Retired people have high probability to belong to class 2, characterized by a low level of income but, on the whole, a global satisfaction about the other aspects investigated. The unemployment rises the probability to be in the classes characterized by the higher risk of social exclusion, mainly in the economic dimension (classes 4 and 6). The status of homemaker has not significant effect on the membership probability to a given latent class.

Notwithstanding the mean effect of these covariates, their relevance changes according to the region to which individuals belong. Computing the individual latent class probabilities conditional to regional latent class for different covariate patterns, i.e. $\hat{P}\left(X=t\middle|W=m,\mathbf{Z}_{i*}\right)$, allows to show how the probability of classification in one of the six latent classes changes depending on the cluster membership. Some results are shown in Figure 13. Consider, for instance, an hypothetical individual with more than 55 years and retired. For this individual, the probability to belong to class 6 is 0.02 whether he belongs to regional cluster 2, but it raises to 0.37 if he belongs to regional cluster 3, against a probability of 0.11 for an average region. For clusters 1, 2 and 4, this hypothetical individual has high probabilities to belong to class 2, characterized by low levels of income and a positive subjective evaluation of the overall conditions in all domains of one's own life.

Figure 13 – Individual latent class probabilities conditional to regional latent class, for selected covariate patterns $\hat{P}\left(X=t\middle|W=m,\mathbf{Z}_{i*}\right)$



Source: Our elaboration on Eurobarometer 56.1-2001 and Eurostat data.

In the same way, if we consider a young unemployed person, the probability to belong to the latent class of excluded people changes significantly according to the re-

gional cluster membership, and also in this case the highest probability is given membership to cluster 3 (0.57). On the other hand, for these regions, such an individual has high probability to be classified also in class 5, the class of "institutional exclusion" (0.38 versus a probability of 0.03 for an average region). Except for cluster 4, the probability for this hypothetical individual to belong to class 3 (relational exclusion) is low.

6 Concluding remarks

A modern society cannot disregard both an equally income distribution and the promotion of a high social cohesion. However, current empirical analyses, even if they recognize social exclusion as a multidimensional and comprehensive concept, fail to treat it through a multidimensional approach. In this paper, we want to enhance our understanding of social exclusion across European (EU 15) regions, evaluating this condition from an individual point of view, in a multidimensional perspective and accounting for contextual environment in which people live.

Starting from a working definition of social exclusion, which encompasses some founding elements of social exclusion notion, namely multidimensionality, subjectivity and relativity, we implemented a multilevel Latent Class model, which simultaneously derives regional and individual profiles.

Firstly, LC models allow treating social exclusion as a multidimensional concept thus underlying different types of exclusion, according to the different identified dimensions. Our outcomes have proved that an individual might be excluded from the economic point of view, but not deprived in his social relationships; conversely, situations in which individuals suffer for weak social relations and interactions do not always go with a disadvantaged economic situation. The role of economic conditions in determining social exclusion situations seems thus to be reduced whether one considers in the analysis also the relational dimension. Our findings identified also a profile for individuals who result excluded from all the dimensions, which represents the most serious situation, and a profile of individuals for whom the social exclusion does not represent a concrete threat. The latent class modelling allows introducing in the analysis also subjective elements in all the dimensions, highlighting that negative objective situations are not always perceived in the same way. The profiling of social exclusion situations is

strongly related to demographic variables, as well as to other cultural, social and environmental elements.

Secondly, the multilevel modelling enable to take into account the hierarchical structure of the population under investigation, and to carry on a comparative perspective. The multilevel extension, particularly the choice to use a non-parametric approach to model the regional level, led to the identification of a typology of regions, underlying different structures of the same latent concept "social exclusion" for different European regions. Considering the multidimensionality of the concept, it emerges that the importance of the different dimensions varies across regions. For some European areas – like Great Britain and Ireland, the regions of Bremen and Baden-Wurttemberg in Germany, the North-East of Italy, the East and the West of France, and the richest regions of Spain and Portugal – the condition of social exclusion is mainly due to the economic deprivation and difficulties. In the Netherlands and Denmark and in some other regions (South-Finland, East-Austria and Centre-East France) even whether the financial situation is not completely positive, people do not perceive to be in a disadvantaged condition, neither for the economic nor for the social and institutional sphere of their life. In countries that have a solid institutional system and where the welfare system is well-implemented, negative economic situations at individual level are well balanced, so reducing the risk of social exclusion. The relational dimension has appeared to be particularly important in determining social exclusion situations and perception mainly in continental Europe (most regions of Germany, Austria, France and Belgium) besides Sweden, Finland and north-centre Italy. Finally, for the south of Europe (that is Greece, the South and Islands of Italy and, with some exceptions, all regions of Portugal and Spain) we found a strong detachment of the citizens with respect the institutions and the public context. In these regions, moreover, the social exclusion is linked to all the three considered dimensions.

It is worthwhile to note that, notwithstanding the identification of certain national patterns, in some cases the analysis identifies clearly the presence of relevant intra-national differences among the regions (NUTS-1 level).

These findings lead to the conclusion that social networks, as well as the social and protection system, might not to have the same impact both in influencing the perception of social exclusion and in reducing the risk of social exclusion in all European regions. In this sense, we deem that the contextualization and the knowledge of the cul-

tural, economic, social and institutional environment is fundamental to understand the relations among the risk factors that may trigger social exclusion situations, and that these differences should be accounted for during the formulation and implementation of the measures and policy strategies at European level.

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