Integration of migrants in Italy: A simple general and objective measure

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Abstract. Measuring migrants' integration into host societies is a challenging task as, in general, measuring any social behavior and social phenomena. The task is affected by many specific problems related to the definition of the objective of study and the impact of subjective evaluations in the construction of an index. Our study aims to provide a measure of integration as much as possible general and objective. More in details, first, we consider some different *general* aspects of the integration problem related to migrants' polarization, cultural diversification, social stability, integration in the labor market. Second, we aggregate them in a synthetic linear index, which is rather *objective* since the weights are computed by only considering the statistical properties of our dataset, i.e. choosing those weights that minimize the information loss in terms of data variances/co-variances.

Keywords: Migrations, migrants' integration, regional index, principal component analysis.

1. Introduction

Understanding and monitoring the diversity that lies under migrants' integration trends is a challenge that policymakers must be able to face. The challenge is important for governments and local administrations, but it is not limited to the national borders. The issue is a general and faced by all European institutions at different levels. In this vein, migrants' integration can be placed in the more general issue of social cohesion, one of the main policy targets of the European Union as the support of technological innovation in the so-called Lisbon Strategy.

The migrants' integration is also a challenging issue for its multi-disciplinary nature and extended implications. Migrants' integration is a socio-economic process that needs to be understood of expertise that varies from psychology to law or geo-political knowledge. Moreover, the growing impact of migrants on population affects other policy debate from the reform of social security to the education system organization. Political and socio-economic scientists as well as policymakers, in their current activities, need quantitative data to evaluate the impact of policy and to understand and monitor the current situation.

This paper attempts to derive a general index of integration. The aim of our index is to give a general picture of integration reached and, in particular, of the differences among Italian regions. The index is, of course, complementary to other indicators[1] (as specifically those related to specific micro-context) and not exhaustive of the phenomenon because of the variety and extent of the migrants' integration phenomenon.

The issue of measuring the integration of migrants into host societies is a challenging task as, more in general, quantifying any social behavior and social phenomena. In particular, measuring integration means evaluating two social processes since one cannot look at the migrants alone, but also has to take the members of the host society into consideration (see Borjas, 1994, 1999, Bauer and Zimmermann, 1997).[2]

The cornerstone for a measure of integration is its own definition since the concept of what integration means and is to achieve differs. These differences are reflected in the

[1] Other indicators will be later presented.

[2] An interesting specific aspect is that of the sentiments of natives towards immigrants. See, e.g. Bauer *et al*. (2000), who explore the possibility that immigration policy may affect the labor market assimilation of immigrants and natives' sentiments towards immigrants.

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national policy goals and range from next-to-assimilation to multiculturalism. Different definitions of what integration means form the basis of the national policies for improving migrants' integration, the standard of when integration can be considered successful varies.

This is important when it comes to compare the integration of migrants in different countries and societies: It is because of these differences that the principal concepts of integration and the different national policies resulting from these concepts need to be looked at more closely, because they form the background for evaluating migrants' integration. The national policies often reflect different definitions of what is meant by integration. Although the term itself means joining parts (in) to an entity, its practical interpretation and social connotation may vary considerably: *Assimilation* as well as *multicultural society* may be considered synonyms or descriptions of (successful) integration. Thus, all forms of cultural or social behavior ranging from completely giving up one's background to preserving unaltered patterns of behavior are covered by the term of integration. This problem of definition, of course, has a bearing on measuring integration, because the requirements for success in assimilation are much more difficult to meet than requirements for multicultural coexistence in a society that remains indifferent about other people's rites or customs.

Notwithstanding the definition or concept of integration applied, one will agree that the integration of migrants into their respective host societies has at least four basic dimensions concerning the social, economic and cultural (in terms of both assimilation of the host society culture and of the native culture) role migrants play in their new environment. We can summarize integration in four dimensions:

1) the degree of polarization,
2) cultural diversification,
3) social stability,
4) integration in the labor market.

These four dimensions will hardly be disputed by anybody as important fields of integration. See, among others, Borjas (1994), Freeman (1995), Hansen (1999), Rogers and Tillie (2001), Boeri *et al*. (2002), Entzinger and Biezveld (2003), CNEL (2004),

Penninx (2004), Geddes and Niessen (2005), which deeply discuss and survey different integration aspects.

This paper considers the above dimensions of interaction and by taking account of them provides an aggregate measure of integration. The task of measuring integration is affected by many specific problems related to the definition of the objective of study and the impact of subjective evaluations in the construction of the index, these aspects cannot be neglected. This paper aims to provide a measure of integration as much as possible general and objective. We consider the aforementioned aspects of integration and aggregate them in a synthetic one-dimensional index by using the principal component analysis. Our index is computed at a regional level; thus, it ranks region levels of integration.

There are some related studies to our paper. The first is a CNEL study of 2004 (CNEL, 2004). This study investigates the regional differences by considering the four dimensions above described. It aggregates twenty indicators by a simple ordinal procedure. We will describe it more in detail in the next sections since our dataset is based on this study. Another attempt to measure general integration is provided by the Italian Commission for integration policy,[3] which proposed the concept of "reasonable integration" founded on no discrimination and of inclusion of differences. This concept can be related to two dimensions of integration: integrity of the individual and positive integration. The former means well-being and the latter living together peacefully (see Zincone, 2000, 2001).

All aforementioned studies are inspired by the Council of Europe guidelines in terms of social cohesion (Council of Europe, 2000) and are in line with the European debate on migrants' integration. In 2003, the European Commission has underlined the priorities and political orientations on the consolidation of a legal European structure on immigration, the strengthening of coordination policies, the attention towards processes of integration and social inclusion, including attempts to have detailed and statistically homogeneous information on the evolvement of the migratory fluxes.[4] The OECD also

[3] See Golini *et al*. (2001).
[4] See the European Commission *Report on immigration, integration and employment*, 2003. See also the *First report on integration and immigration in Europe* (2004), the *Handbook on integration* (2005), the *Green book on immigration* (2005) and the *Action plan on legal immigration* (2005).

stress that to be effective, integration actions need to be based on the gathering and analysis of information (see OECD, 2006)

The studies of the CNEL and *Commission for integration policy* attempt to give the general picture of the integration in Italy. However, it should be note that specific indexes are as much important since migrants' integration has a specific nature that varies according to the different dimensions under scrutiny or a geographical diminution that can have a high degree of heterogeneity. Although we do not survey these indexes[5] here because we also aim to build a general index, we would like to underline that the policymaker needs of both to coordinate their decisions at a micro and macro levels. Geddes and Niessen (2005) develop the "European civic citizenship and inclusion index," which is an attempt to measure the potential effectiveness of the actions implemented by several member states as "civic citizenship" policies and for the job market. The index is not related to the success of the immigrants' integration process, but it measures if the legal conditions to support such a goal have been created. The inclusion indicators were chosen for each of the five legal fields that seemed to be more relevant for integration: 1) labor market, 2) residence, 2) family reunion, 4) naturalization, 5) addressing discrimination.

The rest of the paper is structured as follows. Section 2 describes our dataset, which is collected by CNEL (2004). Section 3 compares our aggregation methodology to that used in CNEL (2004). Section 4 derives and comments our result. A final section occludes our work.

2. Integration and our data

At the beginning of 2004, according to the data of the Ministry of Interior Affairs, regular migrants in Italy were 2.2 millions. The data of the Ministry is the most relevant for policy analysis and refers to the people who have requested a residence permit. This data underestimates migrants since it does not takes account of the migrants under 18 years. Each year, the data is corrected by the CARITAS report on migration; in 2004 migrants are estimated as 2.6 millions. Migrants thus represents about 4.5% of the

[5] Some recent examples of these studies are Billotta *et al*. (2006), who investigates the second-generation integration in the school, Gregori and Mauri (2005) and Gregori (2006), who attempt to measures integration in labor markets and migrants' socio-professional integration.

Italian population (one migrant each 22 residents) and by considering the net flow, which is 681.665 units, their number is increased of 45% between 2003 and 2004 (cf. CARITAS, 2004). Migrants are also reordered by ISTAT, which consider the census data. The unit of observation of the census data is the resident migrants, who are migrants registered at the General Registry Office a sub-sample of migrants who have requested the residence permit (registered by the Ministry for Interior Affairs). The first of January 2004, the resident migrants were 1.990.159 (978.232 female and 1.011.927 male). The resident migrants were thus the 3.4% of the total number of residents with an increase with respect to the previous year of 28.4%.

All the data register the growing relevance of the migrants' dimension and thus of the associated problems and perspectives. Migrants have a heterogeneous composition and distribution in the territory. Their incidence is stronger in the Northern and Central regions. The most represented foreign nationalities are Rumania, Morocco and Albania, followed by Ukraine and China. However, migrants are uneven distributed since they tens to concentrates according to their nationality; an emblematic case is that of the Chinese in the province of Prato, who represent almost the 100% of the migrants and more than the 50% of the population.

Italy becomes a country of immigration in the 1970s from a long experience of emigration. Although it is a country that only recently experienced this phenomenon, it has already face the evolution of the immigration process from the first to the second generations and a growing number of new problem related to the integration. The change from the emigration to the immigration perspective and the economic impact of the immigration are described in details by Del Boca and Venturini (2005).

In 30 years, integration thus becomes a very lively debated issue as well as the policies supporting it important in both the domestic and the European,[6] the problem of international is, in fact, related to the more general discussion on the European welfare system (see Boeri *et al*. 2002). The debate is complex and articulated. The common departing point should be however that of measuring integration both for positive and normative analysis. Integration can be measured by different factors that can be grouped in subjective and objective measures. After a long preliminary study, CNEL (2004) has

[6] See Zimmermann (2005) for a comparative study.

summarized information about integration in some indicators, which represents our dataset.[7] It collects a group of indicators that represent the migrants' integration under different perspectives. More in details, CNEL individuates twenty key indicators, which are describes below.

1. Incidence (INC) measures the quota of foreign residents on the total number of residents in each region.
2. Incremental indicator (INR) measures the percent variation of foreign residents between 1992 and 2002.
3. Permanence (PER) is the proportion of net migrant flows (residence permits released in the year and still valid at the end of the year) on the gross flows (residence permits released in the year).
4. Flow indicator (FLU) is the incidence of the new net flow of migrants on the total amount of resident foreigners.
5. Pluralism indicator (PLU) is the number of foreign nationalities represented by foreign resident in each region.
6. National heterogeneity 1 (ET1) measures the incidence of the largest foreign national group on the total amount of foreign residents.
7. National heterogeneity 2 (ET2) measure the incidence of the ten foreign groups more present on the total number of migrants.
8. Continental heterogeneity (ETC) is the degree of diversification of the continental representatives, which is computed among the 10 foreign groups more numerous within the migrants, It is build by an index number that considers the migrants' continental areas, the number of migrants' ethnic groups of the continent more represented (for more details, see CNEL, 2004).[8]
9. Religious difference (REL) measures the heterogeneity of the regional confessions among migrants. It is the number of people accepting the more diffused religious confession on the number of migrants.

[7] The dataset is presented in the appendix (see Table 1.A).
[8] In the original dataset, ETC is a lexicographical indicator. Following CNEL (2004), we transform by using an ordinal ranking to obtain a quantitative measure.

10. Family reunion (RIC) is the incidence of foreign resident for family reasons on the total amount of them.
11. Long (LUN) measures the long stays, i.e. the incidence of migrants who are present from at least 10 years on the total number of migrants in 2000.
12. Citizenship (CIT) is the yearly number of foreign resident who acquire the Italian citizenship for every 1.000 foreign residents.
13. Stability residence (STA) indicates the incidence of stable residents on the total; stable residents are people resident for job, adoption, rejoining, study, religion, elective residence, waiting for citizenship.
14. Deviance (DEV) is the incidence of resident foreigners complained to the police authorities on the total number of resident foreigners (2001).
15. Potential employment (OCP) is the incidence of the foreign labor force on total of foreign residents.
16. Effective employment (OCE) is the percentage of the foreign unemployed on the foreign labor force.
17. Labor market sustainability (LAV) corresponds to the migrants' incidence of the net yearly flow of migrants hiring on the total number of net hiring;
18. Entrepreneurship (IMP) is the proportion of foreign entrepreneurs on the total number of foreign citizens.
19. Work injury (INF) is the percentage of indemnities paid to foreign citizens on the total indemnities in 2001.

The above indicators can be grouped according to the integration dimension they capture. More in details, PER, INC, PRE, INR, FLU can be related to the degree of polarization; ET1, ET2, ETC, REL, LUN can be associated to the cultural diversification; STA, RIC, DEV, PLU, CIT concern about the social stability; and LAV, OCE, OCP, INF and IMP summarize the integration in the labor market. In the next section we critically describe how these indicators are aggregated by the CNEL study and propose an alternative methodology that goes beyond some specific limitations.

Finally note that, as it will be later clear, to perform our analysis it is convenient to consider quantitative indicators that display a value of zero for the lower possible level of integration. Thus, our indicators are slightly different from the original data of CNEL. We transformed some original data to obtain positive (increasing) measures of integration and a zero measure for no integration. More in detail, we considered the complement to one of the following indicators: ET1, ET2, DEV, OCE, INF and REL, which in the original dataset are negative (decreasing) measures of integration. In our framework, the interpretation of the indicators is exactly opposite to the original one and the transformation is without any loss of generality since all variables were expressed in percentage terms. For instance, consider OCE, in the original data set it indicates the incidence of the unemployed on the total labor force within migrants; a high value measures a low integration. By contrast, in our setup OCE indicates the complement to one of the original variable, i.e. the incidence of the employed on the total labor force within migrants and high values of OCE measure a high integration.

3. The CNEL aggregation and our methodology

The CNEL index is obtained by a two-step aggregation procedure. First all the indicators are transformed in ordinal variables. Each of the 20 indicators is ordered and a number between 1 and 20 assigned, 20 is also the number of observations i.e. the Italian regions, 20 (1) for the highest (lowest) score, which indicates the best (worst) performance in terms of integration. At the end each region is thus classified on the basis of its ordinal rank.[9] Second, transformed indicators are aggregated by simple sum of the region scores. There are two levels of aggregation. The first one is partial and measures the integration under the different aforementioned four dimensions of the integration by considering only the indicators that refer to a specific dimensions (i.e. polarization; cultural diversification; social stability; integration in the labor market); the second measures the general level of integration and takes account of all of them. For instance, after the dataset transformation in ordinary values, by summing the scores of Abruzzo in PER, INC, PRE and INR, we obtain the value for the index of

[9] See the appendix (Table 2.A).

polarization for Abruzzo, by summing all the indicators we derive the score of CNEL integration index for Abruzzo.

The four sub-indexes and the CNEL integration index obtained as described above are reported in the following table.

Table 2 – The CNEL indexes.

Regions	Polarization	Culture index	Social Stability	Job integration	CNEL index
Abruzzo	47	45	58	53	203
Basilicata	39	24	44	43	150
Calabria	60	40	31	62	193
Campania	36	69	49	55	209
Emilia Romagna	71	53	66	56	246
Friuli Venezia Giulia	71	63	53	42	229
Lazio	51	84	41	44	220
Liguria	43	72	51	48	214
Lombardia	59	80	56	68	263
Marche	74	45	60	57	236
Molise	43	28	52	39	162
Piemonte	65	48	61	69	243
Puglia	36	35	29	42	142
Sardegna	30	55	66	58	209
Sicilia	27	49	57	51	184
Toscana	73	68	38	65	244
Trentino Alto Adige	53	47	53	63	216
Umbria	59	47	51	32	189
Valle d'Aosta	33	19	87	46	185
Veneto	80	76	47	57	260
mean	52,5	52,35	52,5	52,5	209,9

Source: CNEL (2004).

According to the CNEL results, Italy is divided in three areas of integration. Above the average: Lombardia, Veneto, Emilia Romagna, Toscana, Piemonte, Marche and Friuli Venezia Giulia, respectively; close to the average: Lazio, Trentino Alto Adige, Liguria, Campania, Sardegna, Abruzzo and Calabria; below the average: Umbria, Valle d'Aosta, Sicilia, Molise, Basilicata and Puglia. The index emphasizes regional heterogeneities and an easier integration in the North of the country. Regions also display certain heterogeneity.

The procedure followed by CNEL to build the index has two main limitations:

1. It does not consider the relative distance among regions (by assuming an ordinal score to the region according to their absolute position);
2. It attributes the same weight (1/20) to all variables in the construction of the index.

Our aim is to obtain an index that takes account of the above criticisms by using an alternative procedure of aggregation. We directly aggregate the 20 indicators described in Section 2 without transforming them by the principal component analysis.

Principal components analysis is one of the best-known and earliest ordination methods, first described by Karl Pearson (1901). The underlying idea is to reduce the dimensionality of the dataset by retaining its variability as much as possible and derive synthetic indices of integration. Formally, it consists of an eigen-analysis of a covariance or correlation matrix calculated on the original measurement data.

The principal component analysis searches for a few uncorrelated linear combinations (principal components) of the original variables that capture most of the information in the original variables.[10] In the bi-dimensional case, one can summarize the correlation between two variables by a scatter plot and a regression line. The regression line represents the *best* summary of the linear relationship between the variables. If we could define a variable that would approximate the regression line, that variable would capture most of the *essence* of the two original variables, i.e. the dataset. The subjects' single scores on that new factor, represented by the regression line, could then be used in future data analyses to represent that essence of the two items. In a sense, we have rebuilt the two variables to one *factor* or *component* – the factor is in fact a vector made up of two numbers that can be conceived as weights on the former variables. Note that the new factor is actually a linear combination of the two variables and its significance increases in the two-variable correlation.

The example described above, which combines two correlated variables into one factor, illustrates the basic idea of principal components analysis. If we extend the two-variable example to multiple variables, then the computations become more involved, but the basic principle of expressing two or more variables by a single factor remains the same. By considering more than two variables, we can think of them as defining a space, just as two variables defined a plane. Thus, when we have three variables, we could plot a

[10] For instance, considering an extreme example, suppose to study the height of a group of people in inches and centimeters, so to have two variables that measure height. If in future studies, we want to research, for example, the effect of different nutritional food supplements on height, considering both measures should be useful since height is one characteristic of a person, regardless of how it is measured. Hence, variables can be redundant with respect to the available information and, in some circumstances, a large number of indicator utility.

three-dimensional scatter plot, and, again we could fit a plane through the data (a plane will individuate by *two* orthogonal lines). In the principal components analysis, after the first factor has been extracted, that is, after the first line has been drawn from the data, we continue and define another line that best fits the remaining variability, and so on. In this manner, consecutive factors are extracted.

The principal component analysis can be performed by considering centered and non-centered data. In the latter original data are used. In the former entries of the matrix of data are transformed in deviations from the mean of the variables. The difference between the two procedures is however not trivial and we need to discuss it as it is relevant for our investigation. Non-centered principal components analysis implies an all-zero point (vector) of reference: no interlock linkages. By contrast, centering on, or normalizing by, some variables shifts the reference points to a hypothetical average stand.[11] Our benchmark is the case of no integration and we are attempting to find a measure of how much each region differs from this reference point, we thus consider the non-centered analysis, i.e. the zero vector as benchmark i.e. no integration.[12]

4. Empirical results

The principal component analysis produces a synthetic picture of a dataset by reducing the loss of information, i.e. in term of explained variance. The principal component analysis extracts, from the data matrix, the linear weights (loading) used to build an index (component) from the data. One the first component is extracted, the process is replicated and a second one obtained. The second component is the set of weights that minimize the explained variance under the additional constraint of obtaining a component uncorrelated to the first one. The process can be replicated as the number of components is equal to the number of variables and all the expected variance is replicated.

The principal component analysis can be performed by using either the mean deviations (centered analysis) or not (non-centered analysis). The former synthesizes the sample variability with respect to a hypothetical average observation (region, in our case). The

[11] See Di Bartolomeo and Marchetti (2003) or Carbonai and Di Bartolomeo (2006) for discussions about the two procedures for some specific cases. See Noy-Meir (1973) for a general discussion.
[12] See also Noy-Meir (1973) for a more technical discussion about between and within heterogeneity.

latter investigates the variability with respect to an hypothetical region scoring zero to all observed variables, which correspond to a region with the minimum degree of integration. Moreover, the principal component analysis can be performed by considering either the standardized or the non-standardized variables. The best methodological choice depends on the researcher's aim and the problem under scrutiny.

We consider standardized variables in a non-cantered analysis. We standardize the variables to eliminate the effects of the unit of measure since not all the variables are expressed in terms of ratio and as already claimed we use the non-centered analysis since our benchmark is the worst case of no integration.

Table 3.A – Dataset variance/covariance matrix.

	PER	INC	PRE	INR	FLU	ET1	ET2	ETC	REL	LUN	STA	RIC	DEV	PLU	CIT	LAV	OCE	OCP	INF	IMP
PER	51,19																			
INC	11,88	3,64																		
PRE	5,94	1,57	1,76																	
INR	13,53	3,34	2,33	4,54																
FLU	18,59	4,30	1,79	4,39	7,68															
ET1	19,02	4,41	1,85	4,47	7,41	8,34														
ET2	**66,40**	15,22	7,51	16,99	24,52	26,01	88,86													
ETC	12,47	2,77	1,76	3,01	4,65	5,21	16,99	4,25												
REL	40,19	9,52	4,85	10,42	14,98	16,15	53,65	10,54	33,37											
LUN	27,95	6,03	3,64	7,55	9,90	10,44	37,23	7,26	22,61	16,87										
STA	**157,2**	36,21	19,70	42,28	56,61	59,76	**208,0**	39,66	**126,0**	88,60	**494,2**									
RIC	51,43	11,74	5,79	12,99	18,90	19,93	68,50	13,01	41,14	28,63	161,02	53,53								
DEV	19,59	4,15	2,02	4,57	7,68	7,76	25,96	5,25	15,77	10,79	**60,75**	20,20	8,60							
PLU	41,37	9,57	5,80	11,66	14,58	15,20	53,99	10,60	32,82	23,30	**129,8**	41,74	15,66	35,03						
CIT	20,02	4,52	1,88	4,68	7,85	8,02	26,80	4,89	16,17	10,94	**62,32**	21,02	8,39	15,67	8,92					
LAV	23,41	5,44	3,03	6,30	8,52	8,97	31,00	6,17	18,89	13,27	**73,17**	23,65	9,24	19,36	9,07	11,91				
OCE	12,29	2,47	1,32	2,92	4,92	4,97	16,35	3,53	10,18	7,22	37,69	12,37	5,11	9,93	4,82	6,22	4,00			
OCP	56,64	13,43	7,52	15,70	20,07	21,41	**74,83**	14,34	45,61	31,94	178,24	57,54	21,46	47,15	21,90	26,76	13,53	**64,98**		
INF	11,85	3,24	1,78	3,80	3,92	3,96	15,03	2,44	9,05	6,25	36,55	11,55	3,84	9,86	4,22	5,35	2,28	13,67	3,64	
IMP	10,29	2,47	1,30	2,51	4,09	3,87	13,58	2,84	8,33	6,12	32,04	10,61	4,09	8,65	4,16	4,86	2,91	11,40	2,11	3,14
	PER	INC	PRE	INR	FLU	ET1	ET2	ETC	REL	LUN	STA	RIC	DEV	PLU	CIT	LAV	OCE	OCP	INF	IMP

By using the above matrix, we obtain the loadings indicated in Table 2 for the first component as result of a non-centered principal component analysis on standardized data.

Table 2 – First component loadings.

Indicators (1/2)	Loadings (1/2)	Indicators (2/2)	Loadings (2/2)
PER	**0,13**	CIT	0,05
INC	0,03	LAV	0,06
PRE	0,02	OCP	**0,14**
INR	0,03	IMP	0,03
FLU	0,05	ET1	**0,19**
ETC	0,03	ET2	0,09
LUN	0,07	DEV	**0,58**
STA	**0,39**	OCE	**0,48**
RIC	**0,13**	INF	**0,37**
PLU	0,10	REL	**0,15**

The first component explains the 99% of sample variance; we thus do not consider the other components, which are reported in the appendix. The indicators that contribute more to the index are emphasized.

The region scores are reported in the following table that also indicates the average deviation from the average region.

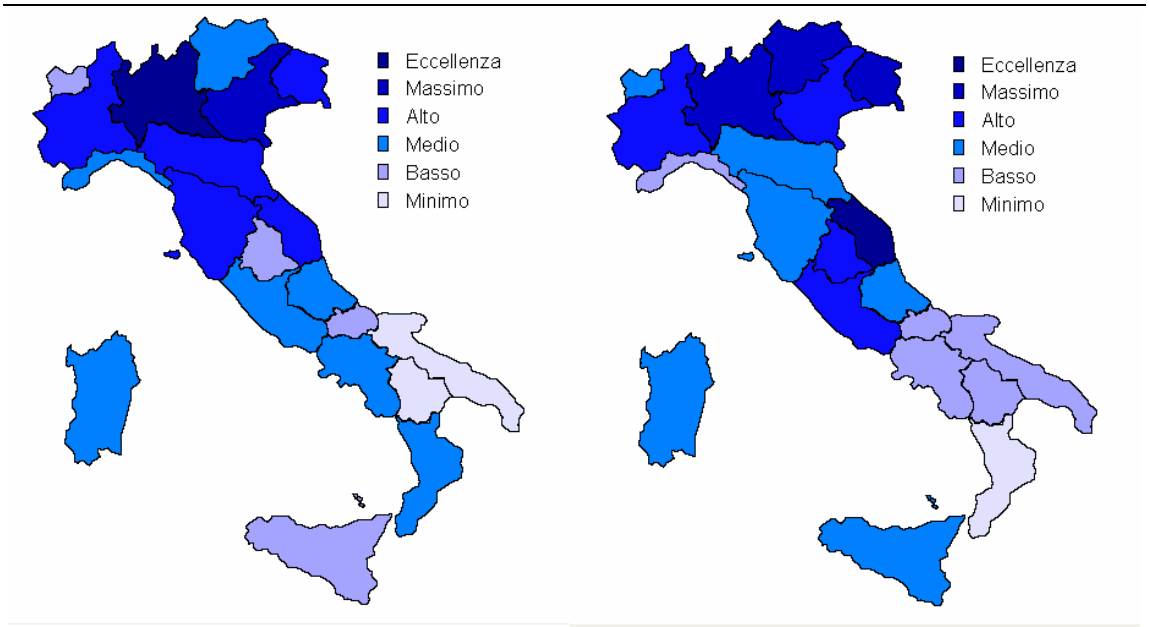
Table 2 – Integration index.

Regions	Integration index	Average % deviation
Marche	13,018	3,04%
Friuli Venezia Giulia	12,881	1,95%
Lombardia	12,874	1,90%
Trentino Alto Adige	12,874	1,90%
Piemonte	12,854	1,74%
Veneto	12,841	1,64%
Lazio	12,830	1,55%
Umbria	12,827	1,52%
Emilia Romagna	12,760	0,99%
Abruzzo	12,736	0,80%
Sardegna	12,730	0,76%
Valle d'Aosta	12,695	0,48%
Toscana	12,626	-0,07%
Sicilia	12,590	-0,35%
Campania	12,489	-1,15%
Puglia	12,377	-2,04%
Liguria	12,369	-2,10%
Molise	12,326	-2,44%
Basilicata	12,235	-3,16%
Calabria	11,756	-6,95%
Mean	12,634	0.00%

The table describes the index (left column) and the percentage deviation of each region with respect to the Italian regional average (right column). Marche, Friuli Venezia Giulia, Lombardia are above the average. Emilia Romagna, Abruzzo, Sardegna, Val d'Aosta, Toscana and Sicilia are closet o the average. Campania, Puglia, Liguria, Molise, Basilicata and Calabria are below the average. Marche achieves the best performance (3,04% above the average), Calabria the worst one placing itself largely below the average (-6,95%). The index displays great and net heterogeneity in favor of the North Regions.

Our index is finally compared to that of CNEL in the following figure.

Figure 1 – A comparison between the CNEL index and our index.



(a) CNEL index (b) PCA index

According to our index, the most integrated region is Marche, instead of Lombardia (CNEL index), which is one of the most integrated regions, but it occupies only the third position in PCA index. The distance between the North and the South of Italy is magnified, whereas the performance of the central Italy is greatly improved.

5. Conclusions

Measuring migrants' integration into host societies is a challenging task sine the many specific problems related to the definition of the objective of study and the impact of subjective evaluations in the construction of an index cannot be neglected. In this study, we have provided a measure of migrants' integration relatively general and objective.

We have considered some important aspects of integration by taking account of 20 indicators, derived from a preliminary CNEL study that have derived these indicators from a more large set. The 20 indicators measure different *general* aspects of migrants' integration about polarization, cultural diversification, social stability, integration in the labor market at a regional level. Then we have aggregated these indicators in a linear index, which is a rather *objective* measure of integration since its weights have been

computed by only considering the statistical properties of the dataset. In other words, weights have been chosen by minimizing the dataset information loss.

Our study shows a further element of division between the North and South of Italy, which is alarming news and a public policy field since the growing relevance of the immigration problem. We have in fact found that Italy can be divided in some different macro regions with very different levels of integration. In particular, by comparing our results to those of previous studies, we found that there is not a substantial difference between the North and Centre Italy, many central regions performs better than those of the North. In contrast, the difference between North and South Italy is more than that previously documented. The performance of the Sicily and Sardinia is more close to that of the regions at the bottom of the North Italy that to that of the southern regions.

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Appendix A – The data set

Table 1.A – CNEL data.

Region	PER	INC	PRE	INR	FLU	PLU	ET1	ET2	ETC	REL	LUN	STA	RIC	CIT	DEV	OCP	OCE	LAV	IMP	INF
ABR	38	64,1	1,4	2,8	12,3	142	21,6	65,9	6	35,2	16,9	96,2	42,7	12,4	8,7	46,4	2,9	13	5,2	7,11
BAS	34,9	82,2	0,23	1,05	15	99	32,4	76,3	16	51,2	18,1	93,7	37,1	12	13,1	48,8	7	21,1	0,3	3,2
CAL	41,1	84,8	1,2	1,8	24,8	135	27,7	65	17	50,9	25,5	78,3	28,8	7,56	11,1	42,9	18,8	26,2	11,3	1,9
CAM	36,2	2,1	3,9	2,2	7,2	153	17,5	66,5	14	28,7	27,3	94,5	40,7	4,4	7,6	47,8	9,7	24,1	3,8	2,1
EMI	40,8	110	10	6	9,7	166	17,7	61,3	2	48,7	27,7	97,7	31,8	5,8	5,1	60,2	4,51	14,8	4,92	13
FRI	42,9	75,6	3,2	5,2	13	155	13,1	67,9	6	29,2	22	93,4	36,2	7,7	6,16	47,9	4,1	15,5	3,4	15
LAZ	36	4,3	15,8	7,8	6,7	183	9,9	49	11	36,9	33,4	96,1	22,8	4,45	6,23	49,5	6,9	15,5	2,7	5,1
LIG	40,4	19,5	2,4	3,9	9,8	150	13,3	53,4	9	34,9	28,5	96,8	31,6	9	14,2	50,2	7,3	21,5	2,6	4,4
LOM	25,3	108	23	6,5	7,15	174	11,7	53,6	15	39,8	26,1	97,9	30,4	4,7	5,4	61	4,29	21,7	4,86	11,3
MAR	47,1	204	3,1	4,9	11,2	145	18	61,8	4	43,8	18,2	97,5	36,4	7,61	6	52,8	2,6	17,2	2,97	11,4
MOL	40,9	46,9	0,16	1,2	21,8	91	22,2	70,3	5	38,5	20,8	92,1	41,3	13,9	12,4	38,3	5,1	9,8	3,03	3
PIE	38,3	117	7,1	4,4	10,3	165	22,9	67,7	13	44,2	23,6	97,5	34,1	7,64	6,6	57,3	6,1	22,1	6,5	6,7
PUG	29,3	63,1	2,1	1,3	12,5	141	40,2	67,4	19	51,7	14,5	91,3	33,9	7	8,8	48,5	4,52	12,5	1,9	2,8
SAR	29,4	63,5	0,8	1,06	11,6	131	16,1	62,1	10	35,8	33,6	94,5	37,5	9,5	7,7	40,4	4,26	7,5	12	1,8
SIC	35,5	-23,5	3,3	1,7	7,1	148	19,1	74,6	20	43,3	36,8	95,8	35,8	5,7	7,5	53,7	8	14	3,9	3,1
TOS	41,3	90,4	7,4	5,3	11,2	164	18,2	62,1	12	33,2	21,5	96,7	31	6,4	9,1	51,8	4,28	19,1	5,3	6,5
TRE	34,4	95,2	2,6	5,6	10,1	144	14,3	69	1	34,1	25,4	97,6	27,8	5,5	5,2	62	3,2	23,4	2,1	13,3
UMB	39,1	66,9	2	6,2	11,5	150	20,1	61,6	3	39	19,6	96,9	32,2	5,2	4,1	52,1	5,5	9,2	0,7	10,5
VAS	35,7	67	0,19	3,5	8,2	91	30,4	73,6	8	50,3	35,1	97,8	36,5	8,9	4,8	53,8	8,2	20,7	2,8	7,14
VEN	46,1	154	10,2	5,5	10,3	162	15,2	60,9	18	38,8	20,4	97	33,4	5,1	6,1	58,8	3,5	14,8	4,4	14
Mean	37,6	74,8	5,0	3,9	11,6	144	20,1	64,5	10,5	40,4	24,8	95,0	34,1	7,5	7,8	51,2	6,0	17,2	4,2	7,2

Table 2.A – Ranking of the regions.

Region	PER	INC	PRE	INR	FLU	PLU	ET1	ET2	ETC	REL	LUN	STA	RIC	CIT	DEV	OCP	OCE	LAV	IMP
ABR	10	8	6	8	15	7	7	10	6	15	2	10	20	19	7	4	19	5	16
BAS	5	12	3	1	18	3	2	1	16	2	3	5	16	18	2	8	6	14	1
CAL	16	13	5	6	20	5	4	11	17	3	12	1	3	11	4	3	1	20	19
CAM	9	2	14	7	4	13	13	9	14	20	14	7	18	1	9	5	2	19	11
EMI	14	17	17	17	6	18	12	16	2	5	15	18	7	8	18	18	12	7	15
FRI	18	11	12	13	17	14	18	6	6	19	9	4	13	14	13	6	16	9	10
LAZ	8	3	19	20	1	20	20	20	11	13	17	9	1	2	12	9	7	10	6
LIG	13	4	9	10	7	11	17	19	9	16	16	12	6	16	1	10	5	15	5
LOM	1	16	20	19	3	19	19	18	15	9	13	20	4	3	16	19	13	16	14
MAR	20	20	11	12	11	9	11	14	4	7	4	15	14	12	15	13	20	11	8
MOL	15	5	1	3	19	1	6	4	5	12	7	3	19	20	3	1	10	3	9
PIE	11	18	15	11	10	17	5	7	13	6	10	16	11	13	11	16	8	17	18
PUG	2	6	8	4	16	6	1	8	19	1	1	2	10	10	6	7	11	4	3
SAR	3	7	4	2	14	4	14	13	10	14	18	6	17	17	8	2	15	1	20
SIC	6	1	13	5	2	10	9	2	20	8	20	8	12	7	10	14	4	6	12
TOS	17	14	16	14	12	16	10	12	12	18	8	11	5	9	5	11	14	12	17
TRE	4	15	10	16	8	8	16	5	1	17	11	17	2	6	17	20	18	18	4
UMB	12	9	7	18	13	11	8	15	3	10	5	13	8	5	20	12	9	2	2
VAS	7	10	2	9	5	1	3	3	8	4	19	19	15	15	19	15	3	13	7
VEN	19	19	18	15	9	15	15	17	18	11	6	14	9	4	14	17	17	8	13

Table 3.A – PCA results

	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
Eigenvalues	3194.2	5.527	1.759	1.432	1.263	1.192
Percentage	99.431	0.172	0.055	0.045	0.039	0.037
Cumulative Percentage	99.431	99.603	99.658	99.702	99.74	99.78
PCA variable loadings						
	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
PER	0.125	0.08	-0.186	0.012	0.005	-0.078
INC	0.026	0.054	-0.596	-0.079	0.027	-0.031
PRE	0.016	-0.335	-0.035	-0.037	0.098	0.144
INR	0.034	-0.298	-0.363	-0.096	0.096	0.121
FLU	0.045	0.321	-0.038	0.141	-0.102	-0.158
ETC	0.032	0.055	0.393	0.128	0.001	-0.033
LUN	0.071	-0.116	0.526	0.107	0.028	0.031
STA	0.393	0.030	0.010	-0.148	0.128	-0.142
RIC	0.128	0.367	-0.004	-0.084	0.197	-0.206
PLU	0.103	-0.295	0.010	0.027	-0.119	0.098
CIT	0.050	0.367	0.009	-0.099	-0.12	-0.181
LAV	0.058	-0.112	-0.027	0.460	0.653	0.033
OCP	0.142	-0.243	0.010	0.066	0.117	0.065
IMP	0.026	0.085	-0.204	0.825	-0.309	-0.046
ET1	0.191	-0.129	0.024	0.000	-0.329	-0.008
ET2	0.092	-0.233	0.000	0.000	-0.491	0.074
DEV	0.577	-0.070	0.000	0.000	0.000	-0.149
OCE	0.477	-0.059	0.000	0.001	0.000	-0.126
INF	0.372	0.348	-0.001	-0.002	0.000	0.769
REL	0.149	-0.181	0.000	0.000	0.005	-0.428
PCA case scores						
	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5	Axis 6
Abruzzo	12,736	0.479	-0.153	-0.140	-0.117	-0.318
Valle Aosta	12,695	0.381	0.235	-0.052	0.479	0.171
Basilicata	12,235	0.857	0.120	-0.168	0.456	0.185
Calabria	11,756	0.592	-0.014	0.913	-0.119	0.445
Campania	12,489	-0.183	0.379	0.150	0.274	-0.346
Emilia Romagna	12,760	-0.519	-0.272	-0.055	-0.074	-0.098
Friuli Venezia Giulia	12,881	0.028	-0.193	-0.118	-0.061	-0.143
Lazio	12,830	-0.909	0.250	-0.092	-0.368	0.441
Liguria	12,369	-0.218	0.210	-0.013	-0.122	-0.116
Lombardia	12,874	-0.952	-0.015	0.104	-0.003	0.121
Marche	13,018	0.134	-0.644	-0.210	0.026	0.090
Molise	12,326	0.998	0.004	-0.246	-0.18	-0.349
Piemonte	12,854	-0.014	-0.156	0.219	0.205	0.227
Puglia	12,377	0.447	0.161	-0.172	0.084	0.338
Sardegna	12,730	0.434	0.261	0.319	-0.595	-0.073
Sicilia	12,590	0.032	0.755	0.047	0.110	0.083
Toscana	12,626	-0.362	-0.177	0.095	-0.026	-0.262
Trentino Alto Adige	12,874	-0.480	-0.181	-0.04	0.283	-0.125
Umbria	12,827	-0.181	-0.219	-0.438	-0.162	0.004
Veneto	12,841	-0.429	-0.299	-0.039	-0.081	-0.255

Table 2.B – Index comparison.

Regions	ACP	CNEL	Difference
Abruzzo	11	8	3
Basilicata	2	2	**0**
Calabria	1	7	-6
Campania	6	9	-3
Emilia Romagna	12	18	-6
Friuli Venezia Giulia	19	14	5
Lazio	14	13	1
Liguria	4	11	-7
Lombardia	18	20	-2
Marche	20	15	5
Molise	3	3	**0**
Piemonte	16	16	**0**
Puglia	5	1	4
Sardegna	10	10	**0**
Sicilia	7	4	3
Toscana	8	17	-9
Trentino Alto Adige	17	12	5
Umbria	13	6	7
Valle d'Aosta	9	5	4
Veneto	15	19	-4