School enrolment of first- and second-generation immigrant students in Italy: A geographical analysis*

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Abstract. This paper analyses non-compulsory secondary school enrolment of immigrant students in Italy. Such enrolment implies a voluntary decision and can influence future career paths in the labour market. The results show that the enrolment rates of immigrants are lower than those of Italians. Immigrant students prefer vocational schools and shorter-term education. The pattern of these preferences remains constant across the throughout Italy, even if Italy presents strong differences in the economic development of its regions, with rich Northern and poor Southern regions. The enrolment rates of second-generation immigrant students differ from those of first-generation students, but the size of this component is still too small to indicate a clear trend.

JEL classification: I21, J24

Key words first-generation immigrants, second-generation immigrants, educational territorial pattern, schooling determinants, seemingly unrelated regressions

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1 Introduction

The growth of immigration over the past three decades represents the first massive flow of international migrants to Italy. They come from many countries and have diverse cultural backgrounds in terms of linguistic origins, professions of faith, traditions, and ethnic groups. The process of integration of immigrants in the country of destination is one of the main challenges facing countries and migrants. Schools and other educational institutions play a central role in the process of integration as they provide an important basis for cultural knowledge of the hosting society and for future success in their working lives. In this sense, they improve social cohesion (Entwisle and Alexander 1993).

There are many facets of the role of education in the process of integration. A great part of the literature underlines the relationships between the individual factors or determinants (gender, age, size of the family, educational level, type of job, household income) and school enrolment or academic achievement, using data collected at the micro level (Chiswick and DebBurman 2004; Glick and Homann-Marriot 2007).

Relatively little attention has been given to the influence of external factors that limit the possible effects of school enrolment, i.e., the economic and social conditions of the territory (e.g. unemployment rates, local Gross Domestic Product (GDP) per capita, employment rates of women), although some authors have underlined the relevance of labour market dynamics (Friedberg 2000; Bruni 2008) or of the general economic conditions of a region (Rodríguez-Pose and Tselios 2010) and the ethnical communities and their location and composition (Borjas 1995, 2000). For small areas the micro data are often very restricted and, therefore, the social and economic factors cannot always be included in a model.

In spite of the difficulties mentioned, starting from the hypothesis that education beyond compulsory schooling and the type of school attended, are affecting *when* and *how* a person will enter the labour market (Barban 2010), this paper analyses the enrolment of immigrants in secondary schools in Italy. In this country, secondary schooling is not compulsory, but it is one of the main elements affecting future opportunities for work, social integration, and social mobility (Rees and Mocan 1997). The paper focuses on geographical areas and their economic characteristics based on macro data at the provincial level, which is the smallest territorial unit for which such information is available – also termed NUTS 3, from the French "*Nomenclature des Unités Territoriales Statistiques*" (Regulation No. 1059/2003 of the European Parliament and of the European Council of 26

May 2003). This classification subdivides the territory of the European Union into regions at three different levels and the third level (NUTS 3) corresponds to the Italian provinces. More specifically, the paper: (1) presents a description of school enrolment at a macro level, which is rare in the literature, especially at the subnational level; (2) it draws attention to the effects of some macro-economic indicators of the geographical area on school enrolment, such as the local unemployment rate, the value added, and the gross data products; (3) it provides a snapshot of a geographical pattern of the reciprocal influences of school enrolment and educational-socio-economic indicators; (4) it indicates a potential use of the current statistical data at the geographical level. Rodríguez-Pose and Tselios (2011) have tackled some of these issues, but they used individual data (extracted from the European Community Household Panel over the period 1995-2000) and the regions (NUTS 2) as territorial units. Given the available information, the proposed approach is one way to introduce the socioeconomic variables in the model and, through the seemingly unrelated regressions, it provides new insights into the macro relationships between the choices of secondary school and the educational-socio-economic characteristics of a geographical area. However, it should be also mentioned that some issues affecting the choice of a school or a trade, such as self-selection of immigrants and family conditions, cannot be easily addressed in a macro set-up.

Secondary education in Italy is organized around many different types of schools, which can be clustered in three main groups. The *liceo* involves classical and scientific studies only at the theoretical level and implies access to university education. The technical school offers scientific studies at the theoretical and practical level and can lead to labour market entry and/or higher education. The vocational school deals with more specific technical and practical studies implying fast entry into the labour market. Consequently, the choice of the type of secondary school involves an important decision, affecting the possibility of obtaining a highly- or medium-skilled job and offering various career and social mobility prospects. In fact, for example, the choice of a *liceo* education delays access to the labour market because it usually leads to university enrolment, which increases future opportunities for gaining skills recognized in the labour market. Therefore, the enrolment rate in the *liceo* could be considered as an indicator of social mobility for young immigrants because it reflects their prospects for achieving advanced education and entrance into higher-paying, professional career paths. Conversely, enrolment in a technical or vocational school permits early access to the labour market, but with no

guarantee of obtaining a higher-skilled job. The paper focuses on these two extreme situations with the aim of obtaining a clear indication of the two different patterns concerning preparatory education for university studies as opposed to preparatory education for entry into the job market.

The first hypothesis is that immigrant status influences young people in different ways and to different degrees depending on the characteristics of the geographical area where they live. In other words, given that the data refer to a territorial unit and not to a single individual, the immigrant students' educational choices as a whole in each province are affected more than those of Italian students by the features of the local economic system, such as the provincial average household income and the provincial unemployment rate. This supposition may be supported only partially and indirectly by innumerable empirical findings obtained at the micro level (among many others, Glick and White 2004; Colding et al. 2009). Accordingly, it follows that dynamic contexts, where the economic system is prosperous and the labour market offers good prospects, are considered as push factors, encouraging young immigrants to choose a type of school that provides quick access to the labour market (vocational schools).

The second hypothesis, common in the literature (among many others, Chiswick and DebBurman 2004; Glick and Homann-Marriot 2007), is that the foreign-born (first-generation) immigrants tend to enrol in certain types of high schools (segregation), which may differ from those chosen by Italian-born (second-generation) immigrants. The term "second-generation" refers to those students born in Italy, but still considered as immigrants by Italian law, according to the so-called "bloodline law" (*jus sanguinis*). In fact, the Italian-born children of immigrants may acquire citizenship only at 18 years of age and if they have lived continuously in the country.

2 Background

The school enrolment of immigrants is influenced by several factors concerning individuals, families, previous schooling, socioeconomic conditions and culture of the areas in which the immigrant families live. Starting from the available literature, a brief outline of the basic issues characterizing foreign-born and native-born immigrants compared with non-immigrants is useful for framing the phenomenon and for a discussion of suitable variables available for our analysis.

The decision to attend a particular type of secondary school is generally influenced by many aspects of the private sphere: personal motivations,

preferences, expectations and an awareness of one's own abilities. This choice can also be influenced by many other factors such as the family's cultural background, knowledge of the language, and level of integration in the host country. However, these data are not available or easily manageable at the macro level.

Many factors specific to the school environment may affect the educational paths of immigrant students: the advice of teachers, peer influence/pressure, previous school years repeated owing to failing grades (hereinafter referred to as repeaters) in middle school (Jimerson et al. 2002; Rees and Mocan 1997), education options available in the area (i.e., the supply of schools in provinces, which can be decisive as regards both the choice of whether or not to continue one's education), and the type of schooling to be undertaken (Barban et al. 2008; Glick and White 2004). Among these factors, only the supply of schools in provinces and the average percentage of repeaters were available for modelling.

Research studies on high school students show differences in educational attainments by race, ethnicity, immigrant status, age at immigration, country of origin, first- and second-generation (Chiswick and DebBurman 2004; Glick and White 2004). For example, the educational attainments of immigrant youth are dissimilar to those achieved by youth in the third and higher generations (Glick and White 2004). A high concentration in vocational schools has been observed for immigrants, denoting a segregation leading to a probable low-skilled job in the labour market (EUMC 2004; NESSE 2008). Few variables concerning these aspects are manageable at the macro level, such as immigrant status and first and second generation, while ethnicity and country of origin were not considered here in order to avoid an increase of the number of equations to estimate and the loss of the degrees of freedom (see below).

The family has a fundamental role in determining educational attainment through parental employment status, household income, family structure and number/age of children (Rumberger 2004; Gang and Zimmermann 2000). On average, immigrant families have more children and a lower household income than native families, even if this cannot be generalized for all individuals (Caille and O'Prey 2002; Nauze-Fichet 2005). Expectations, cultural background and education of parents also play a major role in influencing their children's educational choices (Demarie and Molina 2004; Luciano et al. 2009). All these factors affect first- and second-generation immigrants in different ways. For instance, the former are more likely to drop out of school (Riphahn 2003; Perreira et al. 2006). Obviously, these data are not available at the macro level, except for household income,

which is summarized by its average for each province, but unfortunately it is not available separately for immigrant and Italian families.

The settlement process of immigrants across provinces and also across neighbourhoods of the cities is a result of endogenous location choices affected by segregation and often discrimination behaviours on the part of the immigrants themselves and, in a more incisive way, the host societies. Physical and social segregation of different groups of immigrant students in different schools is an effect of housing segregation, as the geographical distance between home and school location affects the choice of the place where the young immigrants attend the school. Migrant students benefit from well-balanced classes that include both native and foreign pupils (NESSE 2008). For example, a large concentration of migrant children in a school hinders their academic performances (Stanat and Christensen 2006). The dimensions of segregation are related to ethnicity, country of origin, and the components of race-specific and non-race-specific density (Bond Huie and Frisbie 2000), while the apportionment is affected by many factors showing a specific territorial or neighbourhood pattern (Woodraw-Lafield 2001; Reher and Silvestre 2009). Again, some variables are not available or, as in the case of ethnicity and country of origin, they introduce a high number of variables in the data set, which then becomes unmanageable.

The system of economic productivity and the dynamics of the local labour market may affect decisions to study or to work (Leslie and Drinkwater 1999; Bruni 2008). At the macro level, the system of economic productivity could be represented through various indicators, such as unemployment rates, employment rate in industrial districts, value added, and per capita GDP. Per capita GDP may influence school enrolment negatively because it is an indicator of the area's average wealth. An increase in GDP per capita implies an increase in employment opportunities, which tend to discourage choices involving long-term, full-time education. On the other hand, average household income may have a positive effect on secondary school enrolment, indicating that, even in wealthy areas, investment in children's education requires financial resources on the part of families. In fact, wealthy families generally encourage university education and frequently either one or both parents hold a university degree. However, GDP and average household income are highly correlated and, therefore, empirically the sign of the relationship may prove to be inverted.

3 Data sources and descriptive statistics

The analysis is performed at the national level, based on a collection of data in which the unit of analysis is the province (NUTS 3), referring to the geographical distribution prior to 2005: a total of 100 provinces out of 103 for which the data are always available (the provinces of Aosta, Bolzano, and Trent have not been included in the dataset because of missing data).

The reference period is the year 2007 for school and socio-economic data. Only the crime data refer to the year 2005 to ensure reliable values.

The data sources are the Ministry of Education (Ministero dell'Istruzione 2008a-c) and the Italian National Institute of Statistics (Istat 2008, 2009), the former serving for information on the educational system and the latter for labour and socioeconomic data. The sources used are sometimes incomplete, especially the educational system data. For example, it is not possible to determine whether immigrant students are behind in their schooling because the available data do not consider the age of students at enrolment for each school year.

As stated above, the paper focuses on three groups of students enrolled in secondary schools and aged between 14 and 19 years: foreign-born (first-generation) immigrants, Italian-born (second-generation) immigrants, and Italians. The other focal point is the type of secondary school chosen by youth because it could influence subsequent choices and career paths: *liceo*, technical school, or vocational school.

The available variables fall into two main categories: one referring to the educational system and the other referring to the socioeconomic context. The former category can be subdivided into two subsets. One subset contains the variables concerning enrolment in high school and constitutes the dependent variables. The other subset refers to the independent variables describing the educational system and regards aspects that could affect enrolment, such as the supply of high schools in provinces and the number of high school repeaters. They were selected in order to identify the differences between the behaviour of immigrant and Italian youths.

The dependent variables are the percentage of young immigrants enrolled in all high schools (PIMEA), the percentage of first-/second-generation young immigrants enrolled in *liceo* (P1EL/ P2EL) or in vocational schools (P1EV/ P2EV), the percentage of young Italians enrolled in all high schools (PITEA), the percentage of young Italians enrolled in *liceo* (PITEL) or in vocational schools (PITEV). Their definitions are given in Table 1 and avoid spurious effects depending on the different population sizes in the provinces.

The explanatory variables for school-related characteristics refer to the supply of schools and the performances of students. The schools-students ratio for all schools (SSRA) represents the supply of schools in provinces related to potential demand and aims to define the geographical distribution of educational institutions, which could influence both student enrolment and the type of school chosen. The average percentage of immigrant/Italian repeaters (PIMR/ PITR) may denote the average difficulty in completing a secondary school education. It may also be an indicator of future educational paths because the experience of failure may affect the decisions of both immigrant and Italian students as to whether to leave school or continue their education.

[TABLE 1 AFTER HERE]

Several independent variables are designed to reflect the effects of the labour market and socioeconomic characteristics in the different provinces. First, the number of immigrant/Italian working women per child (IM/ ITWWC) expresses the intensity of women's participation in the labour market, net of children (CNEL 2005): an increase in their participation should yield an increase in school enrolment. Other variables expressing the dynamics of the labour market are the provincial unemployment rate (PUR, Istat 2006; European Commission 2004) and the employment rate in industrial districts (ERID).

The provincial crime rate (PCR) is a social indicator and the definition reported in Table 1 was used in the belief that considering only crimes for which legal proceedings had been initiated would ensure a more reliable estimate of the actual crime rate.

Five variables capture the economic status and organization of the geographical areas. These include the value added by agriculture (VAA), the value added by industry (VAI), and the value added from services (VAS), which indicate the net contribution of these factors to the wealth of the area. The per capita GDP is an indicator of a province's economic wealth, while the average household income (AHI) is an index of the economic conditions of families.

3.1 Descriptive statistics of geographic clusters of provinces

Descriptive statistics of the variables outlined above are provided in Table 2. The participation of immigrants in the high school system (53.9%) is generally lower than that of Italians (77.9%), and the spatial variability of

the immigrants is higher than that of Italians. However, vocational school enrolment is higher for immigrants (21.4%, if we consider the first- and second-generation students together) than for Italians (15.5%). On the other hand, far fewer immigrants (7.1%) than Italians (26%) are enrolled in the *liceo*. The comparison of school enrolment between immigrants and Italians is illustrated in Figure 1, where the provinces are grouped by region and it is possible to note the asymmetry of the two groups region by region.

[FIGURE 1 AFTER HERE]

[TABLE 2 AFTER HERE]

Among the explanatory variables, we can note that the average repeater rates are higher among immigrants (10.2%), at almost double the rate of Italians (5.4%). The number of immigrant working women per child (10.6%) is more than twice the number of working women per child among Italians (5.6%).

The first territorial analysis refers to the usual geographical classification adopted by Istat (Table 2), which divides Italy into the Northwest, Northeast, Centre, and South (including the Islands), and it investigates the differences between areas by means of the multivariate analysis of variance and Scheffé's multiple-comparison test (Dowdy et al. 2004). It is important to note that in Italy, the Northern areas are among the richest areas in European Union, while the Southern areas are among the poorest and the Central regions are in between.

For immigrants, the profile of secondary school enrolment is similar to that of Italians, with the exception of the South (50%), where it is lower than in the Northeast (57.1%) and the Northwest (52.8%), and significantly lower than in the Centre (58.6%) with a p-value equal to 0.036 ($p<0.036$). For Italians, high school enrolment in the South (79.5%) is higher than in the North. In the Northwest (71.9%), high school enrolment of Italian students is lower than in the Northeast (77.2%, $p<0.083$), the Centre (82.2%, $p<0.000$) and the South ($p<0.001$). It is common knowledge that these geographical aggregations have different economic performances (Felice 2007; Lanzafame 2009), as already underlined. This also justifies the purposes specified in the introductory section.

The other dependent variables concerning second-generation immigrants (enrolment in the *liceo* and in vocational school) do not significantly differ between areas. The percentage of first-generation immigrants enrolled in the *liceo* is lower in the Northwest (4.6%) than in the Centre (7.6%, $p<0.016$) or

the South (7.5%, $p<0.007$) of Italy. The percentage of first-generation immigrants enrolled in vocational school is lower in the South (16.2%) than in the Centre (23.6%, $p<0.001$) or in the Northeast (24.1%, $p<0.001$). The enrolment of Italians in the *liceo* is significantly lower in the Northwest (21.9%) than in the Centre (28.9%, $p<0.001$) or in the South (27.4%, $p<0.001$). The value for the Centre is also statistically higher than that for the Northeast (25%, $p<0.034$). Enrolment in vocational schools does not differ significantly between areas or between immigrants and Italians, although the percentages of immigrants enrolled tend to be higher than those of Italians.

Among the independent variables showing significant differences, the unemployment rate in the South (10.7%) is higher than the rates in other areas. On the contrary, the employment rate in industrial districts of the South (5.8%) is lower than the rates in districts of other areas. The crime rate is high in the South (6.6‰) and the Northwest (6‰). In both areas, the crime rates are statistically higher than that of the Northeast (3.7‰), with $p<0.002$ and $p<0.047$, respectively. The value added by industry is significantly lower in the South (1.9), compared to the Northwest (6.1) with $p<0.006$. The per capita GDP of the Northeast is statistically equal to that of the Northwest, and is significantly different for all other pairwise comparisons of these two areas with the Centre and South. The average household income shows the same profile, as it is highly correlated with per capita GDP ($r=0.912$). The average household income and per capita GDP are negatively correlated with the provincial unemployment rate ($r= -0.838$ and $r= -0.860$, respectively).

4 The determinants of school enrolment

School enrolment is analysed through a seemingly unrelated regressions model (SUR) for immigrant and Italian students. Five equations refer to immigrant students (IM), in which the independent or explanatory variables concern the indicators previously defined, referring to both the supply of schools and the social and economic context of provinces. The territorial effect is analysed through the inclusion of the regional indicators (RI), i.e., the dummy variables of the macro-regions, except for Piedmont, which was taken as the reference region and included in the intercept (or constant). Moreover, a spatial effect has been introduced for each dependent variable because both spatial interdependence between the observations of a given variable and errors' spatial autocorrelation might affect the reliability of

estimations, also in a SUR model (Anselin 1988; Anselin et al. 1996). Similarly, three equations refer to Italian students (IT), with each equation having one of the school enrolment indicators defined above as the dependent variable. The set of explanatory variables is the same as that adopted for immigrant students, with two variables adapted appropriately: the percentage of (Italian) repeaters and the number of (Italian) working women per child. The eight equations are

$$\begin{cases} y_{\mathrm{IM};ij} = \beta_{j0} + \beta_{j1}\,\mathrm{SSR}_{l_j;i} + \beta_{j2}\,\mathrm{PIMR}_i + \beta_{j3}\,\mathrm{IMWWC}_i + \beta_{j4}\,\mathrm{PUR}_i \\ \qquad + \beta_{j5}\,\mathrm{ERID}_i + \beta_{j6}\,\mathrm{PCR}_i + \beta_{j7}\,\mathrm{VAA}_i + \beta_{j8}\,\mathrm{VAI}_i + \beta_{j9}\,\mathrm{VAS}_i \\ \qquad + \beta_{j10}\,\mathrm{GDP}_i + \beta_{j11}\,\mathrm{AHI}_i + \delta_{jk}\,\mathrm{RI}_i + \lambda_j\, W_{ij}\, y_{\mathrm{IM};ij} + \varepsilon_{ij} \end{cases} \tag{1}$$

$$\begin{cases} y_{\mathrm{IT};im} = \beta_{m0} + \beta_{m1}\,\mathrm{SSR}_{l_m;i} + \beta_{m2}\,\mathrm{PITR}_i + \beta_{m3}\,\mathrm{ITWWC}_i + \beta_{m4}\,\mathrm{PUR}_i \\ \qquad + \beta_{m5}\,\mathrm{ERID}_i + \beta_{m6}\,\mathrm{PCR}_i + \beta_{m7}\,\mathrm{VAA}_i + \beta_{m8}\,\mathrm{VAI}_i + \beta_{m9}\,\mathrm{VAS}_i \\ \qquad + \beta_{m10}\,\mathrm{GDP}_i + \beta_{m11}\,\mathrm{AHI}_i + \delta_{mk}\,\mathrm{RI}_i + \lambda_m\, W_{im}\, y_{\mathrm{IT};im} + \varepsilon_{im} \end{cases} \tag{2}$$

In these equations, $i \in (1,\ldots,99)$ denotes the provinces. In equation (1), referring to immigrants (index IM), $j \in (1\mathrm{L}, 2\mathrm{L}, 1\mathrm{V}, 2\mathrm{V}, \mathrm{A})$ denotes the dependent variables: *j*=1L for first-generation immigrants enrolled in *liceo*, *j*=2L for second-generation immigrants enrolled in *liceo*, *j*=1V for first-generation immigrants enrolled in vocational school, *j*=2V for second-generation immigrants enrolled in vocational school, and *j*=A for immigrants enrolled in all high schools (i.e., five different equations). On the right-hand side of equation (1), $l_j \in (\mathrm{L}, \mathrm{V}, \mathrm{A})$ indicates how the schools-students ratio changes when the left-hand side changes; on the right side, l_j=L for the dependent variables referring to first- or second-generation immigrants enrolled in *liceo*, l_j=V for the dependent variables referring to first- or second-generation immigrants enrolled in vocational school, and l_j=A for the dependent variable referring to immigrants enrolled in all high schools. The index $k \in (1,\ldots,8)$ denotes the dummy variables for the defined macro-regions, as indicated in Table 3. W_{ij} is the weighting matrices and λ_j is the coefficient of the spatial effect. In equation (2), referring to Italians (index IT), $m \in (\mathrm{L}, \mathrm{V}, \mathrm{A})$ denotes the dependent variables: *m*=L for Italians enrolled in *liceo*, *m*=V for Italians enrolled in

vocational school, m=A for Italians enrolled in all high schools (i.e., three different equations). Likewise, on the right-hand side of equation (2), $l_m \in (\mathrm{L}, \mathrm{V}, \mathrm{A})$ indicates how the schools-students ratio changes when the left-hand side changes; on the right side, l_m=L for the dependent variables referring to Italians enrolled in *liceo*, l_m=V for the dependent variables referring to Italians enrolled in vocational school, l_m=A for the dependent variable referring to Italians enrolled in all high schools. Again, the index $k \in (1,\ldots,8)$ denotes the dummy variables for the macro-regions, W_{im} the weighting matrices, and λ_m is the coefficient of the spatial effect. For both equations, β_{jp} and β_{mp} (p=1, …, 11) are the coefficients of the regression models for immigrants (1) and Italians (2), respectively; ε_{ij} and ε_{im} denote the disturbances or residuals.

Each equation is a multiple regression model, but the nature of dependent variables may induce a correlation between the residuals. In fact, they are percentage components of a whole. If one component increases, one or more than one of the remaining components should decrease. Moreover, the supply of schooling in the neighbouring provinces may affect the local schooling demand and, vice versa, the local schooling supply may attract students from the neighbouring provinces. In fact, an exploratory spatial data analysis (ESDA) tests the presence of spatial interdependence: The Moran's I test (Cliff and Ord 1981), computed according to a first-order queen contiguity matrix (Anselin 1988), highlights the presence of a positive spatial dependence for the whole set of dependent variables, thus confirming the existence of territorial patterns (among many others, see Le Gallo and Kamarianakis 2011; Mur et al. 2010). Consequently, the parameters of the system of regression equations are estimated simultaneously as a SUR model and the correlation of residuals is verified through the Breusch-Pagan test.

The application of this procedure generated the results reported in Table 3. For this estimated SUR model, the Breusch-Pagan test of independence of residuals provided an observed chi-square equal to 200.342, with 28 degrees of freedom, given by $M(M\text{-}1)/2$, where M is the number of equations (M=8). Its corresponding p-value is less than $p<0.001$, so the hypothesis of independence of residuals can be rejected. The coefficients of the spatial effects are in all equations statistically equal to 0, implying that the spatial correlation vanishes after introducing the regional dummy indicators (RI), which can explain all the spatial dependence in the data.

The illustration of the results obtained will often consider only the signs of the coefficient estimates, for the sake of brevity and simplicity, and not their values, indicating the impact on the dependent variables. In fact, the percentages of young immigrants enrolled in secondary schools are lower than those of Italians (Table 2) and the relative effects of the impacts will be different. Moreover, the description of the relationships between the dependent variables and the explanatory variables should not be intended as a causal interpretation, but only as a correlation. The model also involves the delicate issues of endogeneity and omitted variables. In general, endogenous variables are jointly determined by the system in the current time and in this sense all the handled variables could be reasonably considered exogenous. However, the dependent variables could be affected by some lagged independent variables, such as GDP, but this aspect would require a panel data structure and might represent a limit of the proposed approach. The omitted variables concern both some unmanageable potential explanatory variables, such as concentration of migrant children in the school or family conditions, and unavailable variables, such as poverty and inequality. Then, they might cause bias in the estimated coefficients of the variables that are in the equation. Thus, at the least the signs of the coefficients were evaluated with respect to the expected ones and were compared with other results in the literature, whenever possible: They were generally acceptable. However, it should be kept in mind that one cannot be sure of these facts in practice and further empirical evidence would be useful to make the presented findings robust. Finally, it should be noted that the ecological fallacy may affect the relationships observed (Robinson 1950), owing to the possibility that the correlation between variables at the aggregate level could differ (and even have the opposite sign) from the correlation between the same variables at the individual level, implying some spurious correlations. Therefore, it should be kept in mind that the results presented are obtained at a macro level and may be subject to ecological fallacy, i.e., they may be different from those obtained (by others) or existing at a micro level. In spite of this risk, they provide a reasonable and expected picture of the relationships between variables, a picture often consistent with the literature.

4.1 Total enrolment in high school

The total secondary school enrolment rates of immigrants (Table 3, column denoted by the acronym PIMEA) and Italians (Table 3, column denoted by the acronym PITEA) do not show similarities. The total schools-students

ratio positively affects both dependent variables, but it is significant only for Italians (4.203, $p<0.001$).

The number of immigrant working women per child has a positive influence on secondary school attendance (0.221, not significant), i.e., when the number of immigrant women who work increases, the school enrolment of immigrant children also rises. The same applies to the figure for Italian working women per child (2.304, $p<0.001$), but the coefficient is about thirteen times greater than that for immigrants. These results were expected because the increase of working women implies a growth in family income and, therefore, in the availability of resources to invest in the education of the family's young people.

The provincial unemployment rate does not enter the model, perhaps due to the fact that enrolment in secondary school is presumably expected of the offspring of most Italian families regardless of employment status. However, the economic crisis could trigger a negative trend in this area, especially if it persists over time because the family's vision of the future will become more pessimistic and its needs will increase, encouraging younger members to leave school and seek a job. Moreover, the employment rate in the industrial districts yields a negative coefficient for both dependent variables, and is significant only for Italians (–0.072, $p<0.009$), implying, as expected, that an increase in the local employment rate denotes a high labour demand, which may encourage young people to leave school and seek employment because there are many job opportunities and it is relatively easy for young people to join the labour market.

For Italians only, the value added by services and per capita GDP show negative coefficients: –0.168 ($p<0.062$) and –1.029 ($p<0.005$), respectively, as expected. The average household income delivers a positive coefficient, 0.989 ($p<0.001$), as expected, because families enjoying good economic conditions tend to persuade their children to continue studying, investing in their human capital with the hope that they will find an interesting, highly skilled and remunerative job.

[TABLE 3 AFTER HERE]

The territorial level, expressed by the regional indicators, shows many differences and coefficients significantly different from zero. Considering immigrants, the regions of Liguria, Emilia-Romagna, Tuscany, Umbria, and Marche have positive and significant coefficients for the total secondary school enrolment of immigrant children. For Italians, all the grouped

regions yield positive coefficients for total secondary school enrolment, implying an above-average enrolment percentage with respect to Piedmont.

4.2 Total number of students attending liceo

The percentage of first-generation immigrants enrolled in *liceo* (Table 3, column denoted by the acronym P1EL) is positively affected by the number of immigrant working women per child (0.286, $p<0.001$). The same is true for Italians (Table 3, column denoted by the acronym PITEL), but with a higher coefficient and a lower p-value: 1.023, ($p<0.009$).

The percentage of second-generation immigrants (Table 3, column denoted by the acronym P2EL) enrolled in *liceo* is positively affected by the schools-students ratio for *liceo* (0.814, $p<0.007$). The same is true for Italians (7.475, $p<0.001$). This positive dependence could denote an imitative effect, by virtue of which, where the *liceo* schools are more numerous, a large proportion of young Italians attend them, encouraging immigrants to do the same.

For Italians only, the percentage of repeaters has a negative coefficient (–0.323, $p<0.109$) and the average household income has a positive coefficient (0.318, $p<0.091$) with p-values almost equal to borderline level.

At the geographical level, many regional indicators have coefficients significantly different from zero. At first glance, the *liceo* enrolment rate of young Italians presents a complex regional pattern because 15 regions out of 18 have a significant impact on *liceo* enrolment levels. Only Lombardy and Veneto are similar to Piedmont, the reference region. The pattern for the *liceo* enrolment of immigrants is a somewhat different and less marked, with coefficients lower than those for Italians.

4.3 Total number of students attending vocational school

The percentage of first-generation immigrants enrolled in vocational schools (Table 3, column denoted by the acronym P1EV) is positively affected by the schools-students ratio for vocational schools (7.552, $p<0.002$). The same holds true for the second generation (0.891, $p<0.065$) and for Italians (9.777, $p<0.001$), as reported in Table 3 (columns denoted by the acronyms P2EV and PITEV, respectively). Per capita GDP shows a negative coefficient: –0.626 ($p<0.077$) for immigrants and –0.519 ($p<0.024$) for Italians, as expected.

The percentage of second-generation immigrants enrolled in vocational schools (Table 3, column denoted by the acronym P2EV) shows a positive

dependence also on average household income (0.105, $p<0.024$), while for young Italians this coefficient is not statistically significant. Furthermore, the percentage of second-generation immigrants enrolled in vocational schools is negatively affected by the provincial crime rate (–0.095, $p<0.025$). In fact, where crime rates are high, economic and social structures are often weak, social alienation is high, moonlighting is common, and the black economy is strong (Buonanno and Leonida 2006; Soares 2004; Visco 2011). Therefore, immigrants tend to be engaged in low skilled jobs and without resources to encourage their children to study.

For young Italians, there are no other significant relationships aside from those just mentioned above.

At the territorial level, vocational school enrolment shows impacts significantly different from zero for many regional indicators, especially for first-generation immigrants. The regions of the Centre-North (without Lombardy and Veneto) show positive impacts. Conversely, the regions of the South (Sicily and Sardinia) show a negative impact. Lombardy and Veneto yield negative impacts on the enrolment of second-generation immigrants in vocational schools. Liguria and Emilia-Romagna show positive impacts for Italian students, while Abruzzo, Molise, and Campania have negative impacts in the case of Italian students.

5 School enrolment by homogeneous economic areas

The previous classification of provinces is based on the geographical contiguity, where the resulting areas contain provinces often showing varied economic performances (Table 2). Therefore, the relationships observed tend to vanish inside those areas. Conversely, in the classification carried out according to some criteria of economic homogeneity, the relationships between dependent and independent variables may be more clearly highlighted. Therefore, new groups were made up considering the indicators defining the local economic production system, specifically, the value added (VA) in the three standard sectors, as is usual in empirical economics (Eurostat 2008): agriculture (VAA), industry (VAI), and services (VAS). The GDP did not show a determinant influence on the results.

Let $VAA(i)/\underline{VAA}$, $VAI(i)/\underline{VAI}$, $VAS(i)/\underline{VAS}$, be the ratios between the three economic indicator values in the i-th province and their corresponding national means: $\underline{VAA}$, $\underline{VAI}$, $\underline{VAS}$. The clustering algorithm first assigned a province to the group with all three indicators over the mean or to the group with all three indicators below the mean. Hereinafter, these two groups are

referred to as provinces over the mean (OM) and provinces below the mean (BM), respectively. If the assignment failed, the maximum of the three ratios defined a new group: agricultural provinces (AP), industrial provinces (IP), and service provinces (SP). The latter group contained only 8 provinces, and this size appeared to be too small. Therefore, considering the economic indicator in the second position, they were re-assigned to agricultural (1) or to industrial provinces (7). This solution was interesting in terms of comparison, as the number of geographic clusters amounted to four and the size of clusters did not undergo a strong change that might have limited the analysis in each of them.

The first group refers to the provinces over the mean and it consists of 14 cases. Four provinces of these 14 cases are metropolitan areas: Turin, Venice, Bologna, and Rome. The second group refers to industrial provinces and includes 28 cases. Five of these provinces are metropolitan areas: Milan, Genoa, Trieste, Florence, and Naples. The third group concerns the agricultural provinces and consists of 32 cases. Four of these provinces are southern metropolitan areas: Bari, Cagliari, Catania, and Palermo. The fourth and last group concerns the provinces below the mean and is made up of 26 cases. One of these 26 provinces is a metropolitan area: Messina.

In the analysis of school enrolment in each homogeneous economic area, the heterogeneity of some variables is reduced and the standard error of estimates too. Perhaps the different complex patterns across the territory emerge in relation to economic and social characteristics, in spite of the low number of cases in each new area. Therefore, the three value added components are not included in the model. Moreover, to increase the degree of freedom of estimates and avoid saturating the model, the regional indicators are not included amongst the explanatory variables and only the total secondary school enrolment rates of immigrants and of Italians are used in the system of equations:

$$\begin{cases} y_{\mathrm{PIMEA};i} = \beta_0 + \beta_1 \mathrm{SSRT}_i + \beta_2 \mathrm{PIMR}_i + \beta_3 \mathrm{IMWWC}_i + \beta_4 \mathrm{PUR}_i \\ \qquad + \beta_5 \mathrm{ERID}_i + \beta_6 \mathrm{PCR}_i + \beta_7 \mathrm{GDP}_i + \beta_8 \mathrm{AHI}_i + \varepsilon_{\mathrm{IM};i} \\ y_{\mathrm{PITEA};i} = \beta_0 + \beta_1 \mathrm{SSRT}_i + \beta_2 \mathrm{PITR}_i + \beta_3 \mathrm{ITWWC}_i + \beta_4 \mathrm{PUR}_i \\ \qquad + \beta_5 \mathrm{ERID}_i + \beta_6 \mathrm{PCR}_i + \beta_7 \mathrm{GDP}_i + \beta_8 \mathrm{AHI}_i + \varepsilon_{\mathrm{IT};i} \end{cases} \tag{3}$$

The symbols are identical to those in the previous equations, with the difference that the first equation comes from equation (1) and the second

equation comes from equation (2). In Table 4 the two equations are indicated repeatedly in each pair of columns, that is, PIMEA and PITEA.

In the provinces with all value added components over the national mean (Table 4, the pair of columns denoted by the acronym POM), the pattern of impacts was complex for immigrants and for Italians. The Breusch-Pagan test of independence of residuals (χ_1^2=13.880, p<0.001) led to the rejection of the hypothesis justifying the adopted SUR model. The degree of freedom of the chi-square, $M(M-1)/2$, is equal to 1 because the number of equations, M, is equal to 2. The average percentage of repeaters yields coefficients with opposite signs. For immigrants it is negative (–5.660, p<0.001), meaning that their failure at school easily implies an interruption in their studies, while for Italians it is even positive (2.170, p<0.018), implying that the families insist on their children continuing to study in spite of their failure. The number of working women per child shows coefficients with opposite signs again. For immigrants it is negative (–3.345, p<0.001), meaning that young immigrants tend to leave school when good jobs are easy to find, as is the case in this group. Conversely, for Italians, the coefficient is positive (8.828, p<0.001), implying that Italian families tend to persuade their children to continue their studies even if good jobs are available. The impact of per capita GDP is negative (–2.074, p<0.051) for Italians. The income of the family has a significant negative effect (–7.046, p<0.013) for immigrants, which is unexpected and probably occurs because it counterbalances the unexpected positive effect of GDP.

[TABLE 4 AFTER HERE]

The industrial provinces do not show a complex pattern of impacts (Table 4, the pair of columns denoted by the acronym IP). The Breusch-Pagan test (χ_1^2=4.610, p<0.032) justifies the adopted SUR model. For immigrants, the employment rate in industrial districts and the per capita GDP yield negative impacts: –0.228 (p<0.043) and –2.706 (p<0.051), respectively. Conversely, for Italians, there are no significant impacts.

The agricultural provinces do not show a complex pattern of impacts again (Table 4, the pair of columns denoted by the acronym AP) and a significant model is estimated only for Italians. The Breusch-Pagan test (χ_1^2=3.694, p<0.055) does not justify completely the SUR model adopted. Italians reveal a positive coefficient only for the school-students ratio (5.955, p<0.038), while Italians do not reveal any significant impacts.

The provinces with all value added components below the national mean (Table 4, the pair of columns denoted by the acronym PBM) show a few significant variables for Italians only. The Breusch-Pagan test (χ_1^2=4.150, p<0.042) justifies the use of the SUR model. For Italians, the schools-students ratio (5.904, p<0.001) and the average household income (1.228, p<0.006) yield positive coefficients and the explanations reported above apply here as well. The employment rate in industrial districts provides a negative coefficient (–0.176, p<0.003), as expected.

6 Conclusions

In Italy, the school enrolment of immigrants is lower than that of Italians, with many different territorial patterns. Specifically, the enrolment rate of young immigrants is higher in the Centre-North and lower in the South, where the household income of the families is low (Caille and O'Prey 2002; Nauze-Fichet 2005), but the South is also an initial point of arrival and is therefore an area of transit, i.e., immigrant families remain there only for the time needed to find a better destination, implying that an education for their children is not a priority at that particular time.

The enrolment rates for the different types of schools show many differences between young immigrants and young Italians, in keeping with the results of other studies (Barban et al. 2008). For example, immigrants have a higher rate of enrolment in vocational schools than Italians (EUMC 2004; NESSE 2008), but a lower rate of *liceo* enrolment. There are also differences across the country: in the Centre-South a preference for the *liceo* emerges, while in the Centre-North there is a preference for vocational schools. Presumably, the low labour demand in the Centre-South drives young people to spend a longer period in full-time education in the hope that this will make it easier for them to find a job in the future. On the contrary, the high labour demand in the Centre-North drives young people, especially immigrants, towards a preference for shorter-term education and vocational schools because they permit rapid entry into the labour market.

The economic structure of the territory proves to influence secondary school enrolment rates of immigrants, with different variables. The number of working women per child positively affects the secondary school enrolment of immigrants (Brinbaum and Kieffer 2005), underlining the positive effects of the employment of women in increasing the economic resources available to families. The employment rate in industrial districts is often negative, implying that a booming labour market tends to tempt young

people to leave school or to choose a shorter course of study; moreover, the predominance of small and medium enterprises, in Italy, tends to involve a demand for employees with short-term vocational training. Per capita GDP and average household income affect school enrolment as expected. Widespread regional differences emerge for both immigrants and Italians.

The education choices of Italian-born immigrants revealed intermediate patterns between first-generation immigrant and Italian students. However, the low level and the low variability of the phenomenon might affect the variables selected in the model.

The analysis of macro data, each datum referred to a territorial statistical unit, gives an acceptable stylized representation of school enrolment with respect to some educational-socio-economic characteristics of geographical areas. The latter and immigrant status seem to affect the educational paths and working lives of young immigrants, but of Italians as well. Accordingly, a territorial pattern of school participation appears to emerge linked to the economic performances of the provinces. Together with the types of data and statistical models, these concluding observations are what one can learn from the analysis and the approach used, and they represent the specific contribution of this study. The limitations mentioned may be surmounted by means of a large micro survey covering the national territory and when the latter becomes available in Italy, further, more complete evidence could be obtained in a more detailed form, enabling the application of multilevel models to handle micro and macro data simultaneously.

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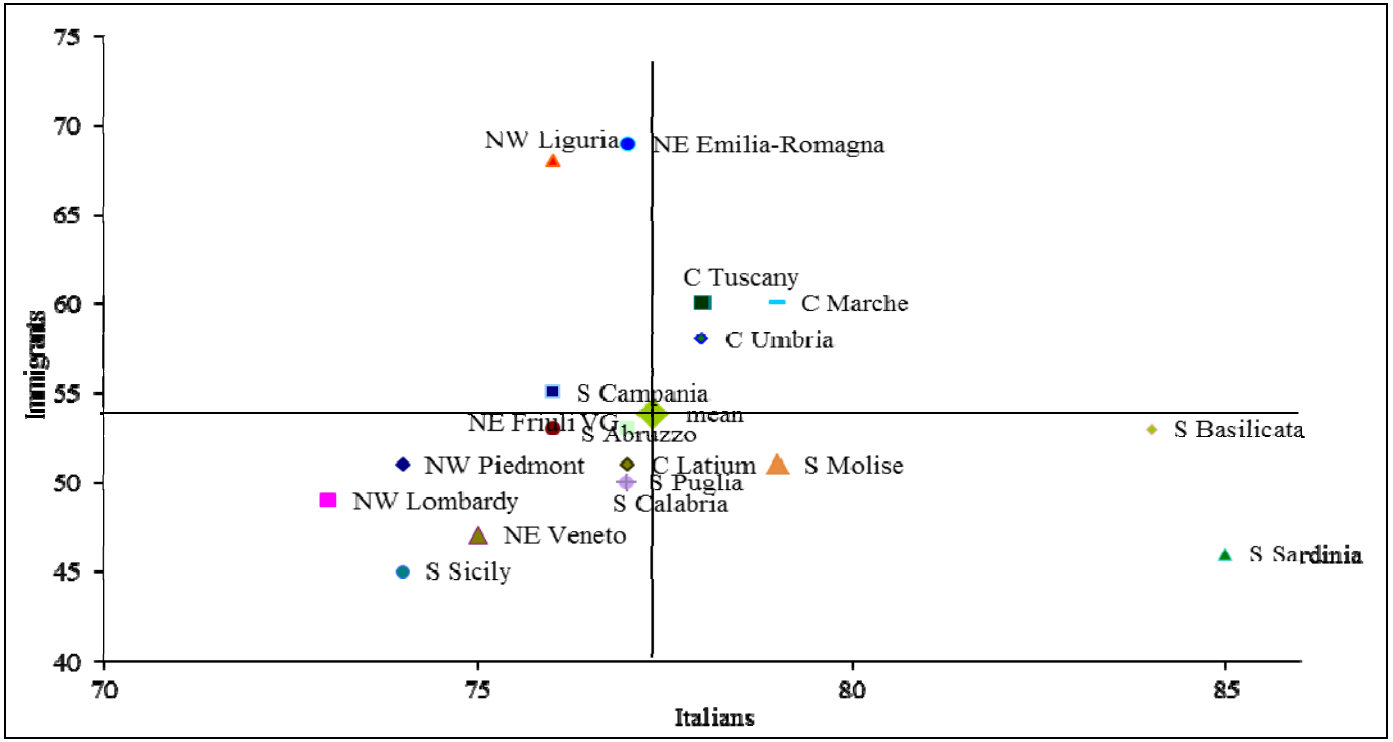

Fig. 1. Regions by the corresponding participation rates in high school for immigrants and Italians

Note: NW= Northwest, NE=Northeast, C=Centre, S=South.

Table 1. Definition of the dependent and independent variables

Variables	Acr.	Definition
Immigrants enrolled in all high schools	PIMEA	100 * [the total number of immigrant students enrolled in all high schools]/ [(the immigrant population in the age range of 14 to 19 years)= **IM.P14-19**]
Second-generation immigrants enrolled in *liceo*	P2EL	100 * [the number of second-generation *liceo* students]/IM.P14-19
Second-generation immigrants enrolled in vocational school	P2EV	100 * [the number of second-generation vocational school students]/IM.P14-19
First-generation immigrants enrolled in *liceo*	P1EL	100 * [the number of first-generation *liceo* students]/IM.P14-19
First-generation immigrants enrolled in vocational school	P1EV	100 * [the number of first-generation vocational school students]/IM.P14-19
Italians enrolled in all types of high schools	PITEA	100 * [the total number of Italian students enrolled in all high schools]/ [(the Italian population in the age range of 14 to 19 years)= **IT.P14-19**]
Italians enrolled in *liceo*	PITEL	100 * [the number of Italian students enrolled in *liceo* schools]/IT.P14-19
Italians enrolled in vocational school	PITEV	100 * [the number of Italian students enrolled in vocational schools]/IT.P14-19
Schools-students ratio for all schools	SSRA/	1000 * [the number of schools considered: All …
Schools-students ratio for *liceo*	SSRL/	- *liceos* …
Schools-students ratio for vocational school	SSRV	- vocational schools]/ [IT.P14-19]
Average percentage of immigrant repeaters/ Average percentage of Italian repeaters	PIMR/ PITR	The geometric mean of the average rate of immigrant/Italian repeaters in middle school (at age 11-13) and the average rate of immigrant/Italian repeaters in the first three years of secondary school
Number of immigrant working women per child/ Number of Italian working women per child	IMWWC/ ITWWC	100 * [the number of immigrant/Italian working women]/ [the number of immigrant/Italian children enrolled in kindergarten]
Provincial unemployment rate	PUR	Official definition
Employment rate in industrial districts	ERID	100 * [the number of workers employed in an industrial district]/ [the total number of workers employed in the province]
Provincial crime rate	PCR	1000 * [the number of reported criminal offences against persons, for which judicial proceedings have begun]/ [the resident population]
Value added by agriculture ($\times 10^{-3}$)	VAA	Official value divided by 1000
Value added by industry ($\times 10^{-3}$)	VAI	*Idem*
Value added by services ($\times 10^{-3}$)	VAS	*Idem*
Gross domestic product per capita ($\times 10^{-3}$)	GDP	*Idem*
Average household income ($\times 10^{-3}$)	AHI	*Idem*

Table 2. Descriptive statistics of the dependent (in percentages) and independent variables by geographical areas

Variables	Acr.	NW(23)		NE(20)		Centre(21)		South(36)		Total (100)	
		$\overline{x}$	SD	$\overline{x}$	SD	$\overline{x}$	SD	$\overline{x}$	SD	$\overline{x}$	SD
Immigrants enrolled in all high schools	PIMEA	52.8	9.8	57.1	14.0	58.6	8.4	50.0	9.7	53.9	10.9
Second-generation immigrants enrolled in *liceo*	P2EL	0.6	0.4	0.6	0.3	0.7	0.4	0.7	0.8	0.6	0.6
Second-generation immigrants enrolled in vocational school	P2EV	1.2	0.9	1.5	1.0	1.1	0.7	0.8	1.1	1.1	1.0
First-generation immigrants enrolled in *liceo*	P1EL	4.6	2.1	5.5	4.2	7.6	2.1	7.5	3.0	6.5	3.2
First-generation immigrants enrolled in vocational school	P1EV	20.4	5.9	24.1	5.9	23.6	5.8	16.2	7.2	20.3	7.1
Italians enrolled in all types of high schools	PITEA	71.9	7.4	77.2	7.1	82.2	4.7	79.5	6.7	77.9	7.5
Italians enrolled in *liceo*	PITEL	21.9	4.2	25.0	4.8	28.9	4.3	27.4	3.8	26.0	4.9
Italians enrolled in vocational school	PITEV	14.0	4.1	16.0	4.2	16.5	4.1	15.5	4.0	15.5	4.1
Schools-students ratio for all schools	SSRA	3.1	0.6	3.2	0.7	3.2	0.7	2.9	0.5	3.1	0.6
Schools-students ratio for *liceo*	SSRL	2.7	0.7	2.4	0.9	2.4	0.9	2.3	0.5	2.4	0.7
Schools-students ratio for vocational school	SSRV	3.7	1.1	3.7	1.2	3.4	1.3	3.8	3.0	3.7	2.0
Average percentage of immigrant repeaters	PIMR	9.9	2.8	9.2	2.2	12.1	9.8	9.8	4.3	10.2	5.4
Average percentage of Italian repeaters	PITR	5.6	1.7	4.5	0.8	5.4	3.1	5.7	2.2	5.4	2.1
Number of immigrant working women per child	IMWWC	6.2	2.6	9.7	3.8	8.3	2.4	15.3	5.2	10.6	5.4
Number of Italian working women per child	ITWWC	7.0	0.8	6.9	1.1	6.4	0.9	3.9	1.5	5.7	1.8
Provincial unemployment rate	PUR	3.9	1.1	3.1	0.7	5.2	1.9	10.7	2.8	6.5	3.8
Employment rate in industrial districts	ERID	37.2	33.5	32.1	29.9	32.5	34.0	5.8	14.3	23.9	30.3
Provincial crime rate	PCR	6.0	2.2	3.7	1.5	5.3	2.2	6.6	3.2	5.6	2.7
Value added by agriculture ($\times 10^{-3}$)	VAA	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.2	0.3	0.2
Value added by industry ($\times 10^{-3}$)	VAI	6.1	8.0	4.8	3.1	3.2	3.1	1.9	1.5	3.7	4.7
Value added by services ($\times 10^{-3}$)	VAS	12.8	20.2	9.1	5.2	10.9	21.7	6.7	6.5	9.5	14.6
Gross domestic product per capita ($\times 10^{-3}$)	GDP	28.8	3.5	30.3	2.5	26.0	3.6	18.1	2.0	24.6	5.8
Average household income ($\times 10^{-3}$)	AHI	44.7	3.5	46.6	3.0	42.8	4.4	34.0	2.5	40.8	6.2

Notes: N, W, and E stand for North, West, and East, respectively. $\overline{x}$ and SD stand for mean and standard deviation, respectively. The number of provinces (or the total number of provinces) in the group is in parentheses.

Table 3. Seemingly unrelated regressions of diverse proportions of students attending secondary school

Independent variables	P1EL	P2EL	PITEL	P1EV	P2EV	PITEV	PIMEA	PITEA
SSR for *Liceo*/ Vocational/ All (+)	0.617	0.814**	7.475***	7.552**	0.891 <	9.777***	1.452	4.203***
Immigrant/Italian repeaters - % (#)	–0.017	0.002	–0.323	–0.123	–0.026	0.036	–0.053	0.045
Immigrant/Italian Working Women (#)	0.286***	–0.016	1.023**	0.041	–0.039	0.043	0.221	2.304***
Provincial Unemployment Rate	–0.080	0.016	0.188	–0.221	–0.036	0.143	–0.415	0.025
Employment Rate in Industrial Districts	–0.004	0.003	–0.018	–0.003	0.006	0.014	–0.049	–0.072**
Provincial Crime Rate	–0.112	–0.029	–0.044	0.326	–0.095*	–0.035	–0.152	0.093
Value Added by Agriculture	–0.414	–0.025	0.637	–0.835	–0.635	2.252	–10.747 <	–0.388
Value Added by Industry	–0.094	–0.005	0.042	0.356	0.064	0.119	0.155	0.429
Value Added by Services	0.050	0.013	0.008	0.012	–0.001	0.011	0.099	–0.168 <
Gross Domestic Product per capita	–0.131	–0.019	–0.221	–0.626 <	–0.070	–0.519*	–0.756	–1.029**
Average Household Income	0.097	0.016	0.318 <	0.046	0.105*	0.137	0.536	0.989***
Lombardy & Veneto	–2.190 <	–0.241	–1.496	2.682	–0.941*	0.392	–6.755	2.037
Friuli Venezia Giulia	–0.213	0.164	5.001*	6.881*	–0.356	–0.545	2.321	6.913 <
Liguria & Emilia–Romagna	1.418	0.238	5.374**	11.938***	–0.061	1.992	12.255**	6.253**
Tuscany & Umbria & Marche	1.834	–0.017	6.678***	8.036***	–0.325	0.817	7.242 <	10.727***
Latium	2.800	–0.055	9.750***	–1.542	–0.306	–0.315	–2.594	14.407***
Abruzzo & Molise & Campania	–0.317	–0.167	7.955**	–3.827	–0.039	–3.943 <	0.761	13.512***
Puglia & Basilicata & Calabria	1.055	0.034	7.718*	–1.827	0.241	–1.939	–3.272	15.838**
Sicily & Sardinia	0.784	0.617	9.487**	–9.232*	1.464*	–3.356	–11.356	13.242**
Spatial autocorrelation parameter	–0.199	0.171	–0.079	–0.013	–0.082	0.166	–0.198	–0.031
Constant	4.580	–0.228	5.560	27.775*	–0.635	12.907	62.399**	33.871*
R square	0.458	0.372	0.604	0.582	0.425	0.489	0.515	0.602

Notes: <, *, **, *** statistical significance at 10%, 5%, 1%, 0.1% level respectively (two tailed).
The number of cases is *n*=99 provinces. The acronyms denote the dependent variables. P1EL denotes the Percentage of First–generation immigrants Enrolled in *Liceo*. P2EL is the Percentage of Second–generation immigrants Enrolled in *Liceo*. PITEL is the Percentage of Italian students Enrolled in *Liceo*. P1EV is the Percentage of First–generation immigrants Enrolled in Vocational school. P2EV indicates the Percentage of Second– generation immigrants Enrolled in Vocational school. PITEV is the Percentage of Italian students Enrolled in Vocational school. PIMEA is the Percentage of immigrants Enrolled in All types of schools. PITEA is the Percentage of Italians Enrolled in All types of schools.
(+) SSR stands for Schools–Students Ratio and this variable changes according with the dependent variable: for PIMEA and PITEA it is SSRT, for P1EL, P2EL, and PITEL it is SSRL, for P1EV, P2EV, and PITEV it is SSRV.
(#) The expression "Immigrant/ Italian" changes according to the dependent variable: for dependent variables concerning immigrants (P1EL, P2EL, P1EV, P2EV, and PIMEA), it becomes "immigrant" and for dependent variables concerning Italians (PITEL, PITEV, and PITEA), it becomes "Italian".

Table 4. Seemingly unrelated regressions of total participation in secondary schools by homogeneous economic areas

	POM (14) †		IP (28) †		AP (32) †		PBM (26) †	
Independent \ Dependent variables	PIMEA	PITEA	PIMEA	PITEA	PIMEA	PITEA	PIMEA	PITEA
Schools–Students Ratio for all schools	–0.736	1.750	–5.664	5.467	2.612	5.955*	6.130	5.904***
Immigrant/Italian repeaters – % (#)	–5.660***	2.170*	–1.491	–0.860	0.085	–0.493	–0.093	–0.264
Immigrant/Italian Working Women (#)	–3.345***	8.828***	0.755	2.312	0.042	2.092	0.092	0.171
Provincial Unemployment Rate	2.499	3.329	–4.457	0.686	–1.667	0.463	–1.133	–0.013
Employment Rate in Industrial Districts	–0.152	0.087	–0.228*	–0.026	–0.106	–0.183	–0.071	–0.176**
Provincial Crime Rate	–4.043	–0.721	0.301	–0.614	0.176	–0.697	–0.387	0.204
Gross Domestic Product per capita	2.477	–2.074 <	–2.706 <	–0.782	–0.687	–1.394	0.440	–0.597
Average Household Income	–7.046*	1.379	1.706	0.213	0.458	1.187	–0.719	1.228**
Intercept	399.024**	–9.409	106.297	65.857	55.253	44.464	67.882	36.149*
R^2	0.448	0.476	0.384	0.321	0.292	0.347	0.271	0.776

Notes: <, *, **, *** statistical significance at 10%, 5%, 1%, 0.1% level respectively (two tailed).
†The number of cases is given in parentheses, in the column headings. The acronyms for the groups are: POM (Provinces with all value–added components Over the national Mean), IP (Industrial Provinces), AP (Agricultural Provinces), PBM (Provinces with all value added components Below the national Mean). The acronyms in the second row denote the dependent variables. PIMEA is the Percentage of young immigrants enrolled in all schools. PITEA is the Percentage of young Italians enrolled in all schools.
(#) The rows reporting "Immigrant/ Italian" refer to the dependent variables, "Immigrant" in the case of PIMEA and "Italian" in the case of PITEA.