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INTERGENERATIONAL INCOME MOBILITY IN ITALY

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Intergenerational income mobility in Italy

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Abstract

The present paper contributes to the growing number of studies of intergenerational mobility by providing a measure of income elasticity for Italy. The absence of an appropriate data set is overcome by adopting the two-sample two-stage least squares method. The analysis, based on the Survey of Household Income and Wealth, shows that intergenerational mobility is lower in Italy than it is in other developed countries. We find evidence of non-linearity, with income mobility being lower at the upper tail of income distribution. We also examine the reasons why the long term labour market success of children is related to that of their fathers.

1 Introduction

The intergenerational association between the socioeconomic achievements of parents and those of their children has always been of interest to social scientists. In the past this was prevalently a sociological topic, although in the last decades economists have entered this field adopting income as an indicator of success. The present paper contributes to this literature in three ways. Firstly, it computes the magnitude of intergenerational income elasticity for Italy, thus adding a new country which is representative of the Mediterranean area. Secondly, it investigates income persistence across quantiles of income distribution. In both cases elasticity estimates are accompanied by a discussion of the differences between diverse countries. Thirdly, the paper examines the reasons behind the observed social inheritance, and looks at certain policy implications.

The main requirement when analysing income mobility is an appropriate data set spanning at least two generations. In order to overcome the problem we had of not possessing such a suitable data set for Italy, we adopted an approach that combines information from two separate samples. In the first sample we have a father's 'hypothetical' income (y^f) together with information about his socioeconomic status (z). In the second sample we have a son's income (y^s) with the same set of variables (z) reported as retrospective information about his family background. We regress incomes on such variables in the first sample, and then we use coefficients estimated to predict fathers' incomes in the second sample. Finally, we run the standard regression of sons' incomes on fathers' (predicted) incomes to get a measure of intergenerational income elasticity. The latter is called the TS2SLS (two-sample two-stages least squares) estimator. The two-sample estimation method was introduced by Arellano and Meghir (1992) and by Angrist and Krueger (1992), and was applied to intergenerational mobility studies for the first time by Björklund and Jäntti (1997). It clearly represents a significant step forward, since repeated cross-sections are far more readily available than sufficiently long panel data. More recently, it has been used in a number of different studies, and so we now have some comparative international figures which enable us to say whether Italian intergenerational elasticity is high or low. It turns out that Italy is a substantially immobile society, the least of all those developed countries studied so far.

The second contribution made by this paper consists in its exploration of non-linearities in the relationship between the incomes of parents and those of their children. The conditional mean represents a powerful, synthetic indicator of the degree of mobility in a given country; however, it provides a rather incomplete picture of the relationship between parents' and children's incomes. A useful instrument for our purposes is the quantile regression conceived by Koenker and Basset (1978) and used to an increasingly greater extent in several fields. It enables us to quantify the effect of the explanatory variables (father's income) across the distribution of son's income, and not just on the mean, as is the case in traditionally OLS estimation. Quantile regression can be useful when we wish to see whether the explanatory power of father's incomes is different for sons ending up at the top of the sons' income distribution than it is for those at

the bottom of the distribution. Once again we have compared our results with those of other studies and we have reviewed those quantile estimates concerning intergenerational mobility.

Finally, we examine the reasons why people's long term labour market success is related to that of their parents. In particular, we examine educational and occupational mobility across generations, together with the mechanisms underlying the observed social inheritance. The policy implications of our findings are also presented.

The paper is organised as follows. Section 2 consists of a review of literature. Section 3 describes the methodological approach and data used to compute intergenerational elasticity. In section 4 we provide evidence of non-linearities in the father-son relationship across income distribution. Section 5 examines educational and occupational mobility, while section 6 presents our conclusions.

2 Literature review

A standard measure of intergenerational mobility is income elasticity; this summary indicator shows the degree to which economic differences between individuals persist across generations. Intergenerational elasticity is derived by regressing sons' incomes on fathers' incomes as follows:

$$y^s = \alpha + y^f \beta + \varepsilon \tag{1}$$

where y^s and y^f are the $n \times 1$ vectors of the permanent incomes, expressed in log terms, of sons and fathers (or some other combination of representatives of the two different generations), respectively. The coefficient β is our chosen summary measure of intergenerational (im)mobility.[1]

Empirically speaking, children's economic status tends to be positively linked to their parents economic status in every society for which we have data; and the magnitude varies between 0 and 1.[2] If β is less than one then the income distribution is said to regress to the mean: while fathers with incomes above (or below) the mean will have children with above (or below) average income levels, the deviation from the mean will not be as great. A high value indicates the high persistence of the economic status, because the individual's position in the income distribution is largely a reflection of his parents' position in their own distribution. A value close to zero indicates a very mobile society in which an individual's socioeconomic position does not strongly depend on his parental background.[3]

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[1] A milestone in scientific research into intergenerational mobility is represented by Galtonian regression. Galton studied the height of individuals and that of their parents, and summed up «when mid-parents are taller then mediocrity, their children tend to be shorter than they... When mid-parents are shorter than mediocrity, their children tend to be taller than they».

[2] In Grawe (2004a) we discovered the only known exception, concerning Ecuador, where β is slightly greater than 1.

[3] Intergenerational income elasticity is different from father-child correlation (ρ). If inequality in incomes (measured by the variance of logarithms) changes across generations, correlation

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The problem of estimating the intergenerational elasticity of incomes is particularly challenging, since the variables in question, namely the permanent incomes of parents and children, are generally unobservable. Instead, researchers usually have a short time-series of some income indicator, which they use in order to estimate intergenerational elasticity. Earlier studies, surveyed by Becker and Tomes (1986), estimated the father-son correlation to be 0.2 or less. These results have contributed towards the perception of the United States as an exceptionally mobile society, where earnings are not strongly transmitted from fathers to sons. However, Solon (1992) and Zimmerman (1992) empirically documented that those estimates of intergenerational correlations contained in previous studies were considerably downwards biased. To avoid measurement errors, Solon (1992) suggests taking averages of income figures over a number of different years in order to obtain better estimates of permanent income capacity.[4] After Solon (1992) and Zimmerman (1992), estimates of the intergenerational elasticity in income tended to be at least 0.4 and possibly higher, thus depicting US as a less mobile society than had been previously imagined.

Over the past decade, several important improvements have been witnessed in the design of the econometric framework and in the interpretation of results. Studies of income dynamics, for instance, suggest that the transitory component of incomes is highly persistent. Mazumder (2005), in particular, argues that in the US even a five-year average may still provide a rather poor measure of permanent income, and suggests that the true value of the parameter is around 0.6. Furthermore, several studies document the existence of a lifecycle bias. Grawe (2006) shows that, since income variance grows over the course of an individual's life, estimated income persistence decreases as the parents grow older, since a larger variance in their incomes must explain the same variance in their children's incomes. Similarly, intergenerational elasticity increases as we move forwards in a child's life cycle. Haider and Solon (2006) discuss how errors in the dependent variable may bias the estimate.[5]

The majority of earlier studies concern the US; however, the current availability of sufficiently long panel data, the access to fiscal data, and the improvement in econometric techniques, enable us to have a wider perspective of international evidence. *Figure A1* provides a summary of intergenerational persistence for father-son pairs for several different countries. The US and the UK have the highest levels of intergenerational elasticity. The Scandinavian countries and Canada, on the other hand, are the most mobile societies. Continental Europe (France and Germany) lies in the middle. An excellent, comprehensive

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can be obtained by scaling the regression coefficient by the ratio of the standard deviation of parental incomes to the standard deviation of sons' incomes.

[4] Another point they highlight is the representativeness of the sample. In fact, earlier studies were based on homogeneous samples, which led to an attenuation bias. Note, however, that the samples used by Solon (348 father-son pairs) and by Zimmerman (876) were still small, albeit more representative.

[5] A measurement error in the dependent variable may cause a bias because of the systematic heterogeneity in an individual's income pattern. Individuals with a high permanent income tend to have steeper income trajectories, and therefore the income variance at early stages of the life cycle understates the lifetime variance.

survey of this growing body of literature can be found in Solon (1999, 2002) and Corak (2006).[6]

Unlike other countries, Italy does not possess a sufficiently extensive longitudinal survey capable of providing information about current incomes of both parents and their children.[7] In order to overcome this problem Checchi et al. (1999) built an occupational index which takes into account the median income for any combination of job position and educational level, and ranked individuals accordingly.[8] They compare Italy with the US, and conclude that Italy is less mobile than the US. Piraino (2006) used a method similar to the one proposed in our paper, and found a strong degree of immobility between Italian generations.[9]

3   Intergenerational income elasticity

Italy lacks a suitable data set spanning at least two generations. The data sets that are available, such as the Survey of Household Income and Wealth (SHIW hereafter) and the European Community Household Panel (ECHP), feature a too short panel component to obtain convincing results.[10] To overcome this shortcoming we use information drawn from two separate samples.

3.1   Data

We use data drawn from the SHIW, a representative survey of the Italian population conducted by the Bank of Italy. It contains information on incomes and a large number of demographic and socio-economic characteristics of the individuals. As an indicator of economic status, we use earnings, which include earned income from wages, salaries and self-employment.[11] The main reason for focusing on earnings rather than disposable income is that mobility in relation

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[6] See also the volume edited by Bowles et al. (2005) regarding recent advances and future research prospects.

[7] Comi (2004) conducted a cross-country comparison using the same dataset (ECHP) for 12 countries. The short time component of the data produces a number of potential biases, such as life cycle bias due to the young age of children, and sample selection due to the choice of co-residing individuals. If one assumes that these distortions are similar across countries then a ranking of such societies may be drawn up. Italy results as being the most immobile country in Europe (together with Portugal and Greece).

[8] See also Checchi and Dardanoni (2003).

[9] Piraino (2006) and our paper were published on line at around the same time, even though they had been developed independently. The two papers present similar results, reinforcing each other, but also important differences. First of all, they adopt different sample selection rules: we use three waves of the survey rather than just one, and thus obtain a larger sample of individuals. We do not consider individuals living together because of the associated potential bias. Moreover, we use quantile regression to investigate non-linearities in intergenerational persistence. Finally we put a strong emphasis on educational and occupational structures to shed light on the mechanisms underlying the intergenerational transmission process.

[10] Francesconi and Nicoletti (2006) have examined the serious consequences associated with estimations using short panel data sets.

[11] Earnings are reported at 2004 prices, adjusted for inflation using the consumer price index (CPI) provided by Istat. All figures are given in euros.

to earnings provides a better measure of those societal opportunities afforded on the basis of individual merit. However, we will also make reference to broader definitions of economic status.

In the first stage, we constructed a sample by pooling data from four waves of SHIW (from 1977 to 1980), consisting of more than 4,900 observations of individuals aged between 30 and 50. We regressed the reported earnings of these individuals on dummies of education level, sector of activity, job qualification and geographical area.[12]

In the second stage, coefficients estimated from the first sample are used to predict fathers' earnings in the second sample. The latter consists of about 3,200 observations of employed males who are heads of household aged, once again, between 30 and 50, and the data source consists of the three most recent waves of the SHIW (2000, 2002 and 2004). For each individual in the second sample we have details of their earnings and reports about their fathers' education, occupation and sector of employment.

We have not included zero income-earners or unemployed individuals, in keeping with the accepted praxis.[13] See the appendix for the descriptive statistics.

3.2 Methodological framework

The two main references for the two-sample approach are Angrist and Krueger (1992) and Arellano and Meghir (1992). Both studies show that multiple data sets may be combined for the purposes of estimation «whenever a set of instruments is common to two data set, but endogenous regressors and the dependent variable are included in only one or the other data sets» (Angrist and Krueger, 1992, p. 328). Björklund and Jäntti (1997) were the first to apply this method to intergenerational mobility estimation.

In more detail, we used two-sample two-stage least squares procedure. In the first sample, we have information about (hypothetical) fathers' incomes and their socioeconomic characteristics, and we run the following regression:

$$y_t^f = y^f + A_t^f \gamma + \nu_t^f = Z\delta + A_t^f \gamma + \eta^f + \nu_t^f \qquad (2)$$

where current incomes y_t^f are a fluctuant proxy of permanent income y^f. A_t contains information about time-variant characteristics such as age, while ν_t are the usual disturbances. Permanent income, in turn, may be defined as the sum of time-invariant determinants, such as education and occupational

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[12] The results of the regression of fathers' earnings on their socioeconomic characteristics are fairly standard and in keeping with our expectations. There is an increasing return from getting a higher educational level. Agriculture "pay" less than industry, the public sector and the tertiary. The working class and the managers represent the bottom and the top of the income ladder, respectively. Incomes are higher in the north than in the south. All regressors used are statistically significant.

[13] This exclusion is a common practice because it is unlikely that zero euros can constitute a reliable measure of permanent income. Couch and Lillard (1998) and Minicozzi (2003) both argue that the relationship between a son's labor force participation and his parents' socioeconomic status can not be ignored. However, their evidence is ambiguous.

classification (included in the matrix Z), and time-invariant disturbances (η). Our determinants of permanent status also include the geographical area in which an individual lives and works.[14]

The second sample includes sons' incomes together with a set of variables providing retrospective information about parental background. We use $\widehat{\delta}$ obtained from the first sample to replace missing fathers' incomes with their best linear predictions. Therefore, what we are estimating at the second stage is the following:

$$y_t^s = \alpha + (Z\widehat{\delta})\beta + A_t^s + \omega_t \tag{3}$$

where $\omega_t = \varepsilon + v_t^s + \beta\eta^f + \beta Z(\delta - \widehat{\delta})$. The $\widehat{\beta}$ we obtain is the TS2SLS estimate of intergenerational income elasticity.

We control for age (A) because it is widely acknowledged that incomes are affected by age: they are usually low at the beginning of a person's career, rising with age albeit at a decreasing rate. However, as we previously mentioned, this is not enough to correct the bias in estimating intergenerational elasticity when age affects both mean and variance of incomes. Corak (2006), and Haider and Solon (2006), point out that measurement errors depending on life cycle are least important in the case of individuals in their 40s. According to the aforesaid studies, the mean age for both fathers and sons in our sample is 41. Our income measurements are not further complicated by the fact that we observe fathers' and sons' incomes at different points in their respective lives. In fact, the SHIW questionnaire asks the following: «what were the educational qualifications, employment status and sector of activity of your parents were when they were your current age?».

In order that the two-sample estimator be consistent, the variables common to both samples have to be identically and independently distributed.[15] Our samples are, in fact, two independent random samples, and the distribution of observable characteristics in the fathers' sample is rather similar to the distribution of fathers' characteristics reported by the sons.[16] Furthermore, as noted by Solon and Inoue (2005) point out, TS2SLS implicitly corrects for differences in the distribution of variables between the two samples. The properties of the two-sample estimator obviously depend also on the nature of the variables used.[17] If they have an independent effect on son's income besides their effect through father's permanent income, then the estimates we obtain will be upwardly biased. We know that father's education has a direct effect on son's income and the inclusion of father's professional condition, sector of activity and

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[14] We reasonably assume that the macro-region in which an individual is born is the same area in which the (hypothetical) father lives when adult.

[15] See also Angrist and Krueger (1992) and Arellano and Meghir (1992) for a description of the properties of the two-sample estimator.

[16] Compared to the fathers in the first sample, those described by their sons appear less well educated, a larger proportion of them working in blue-collar jobs and agriculture. See *table A2*.

[17] As Ermisch and Nicoletti (2006) point out, our variables are strongly correlated to the variable to be predicted (first stage regression).

geographical area may attenuate its potential bias.[18] Furthermore, our findings are robust to a number of specifications, even if we exclude education from the regressors. In each case, we have compared our results only with those international studies adopting the same methodology and variables. Finally, standard errors are properly estimated, using the bootstrap procedure, in order to take account of the fact that fathers' earnings in the second stage regression is an estimated value.

3.3 Results and international comparison

In this subsection we discuss our findings using different estimation rules.

We start with the most commonly used specification, the regression on father-son earnings pairs. The first result we get, in model (1), is $\beta = 0.50$ (all results are reported in *table 1*). This estimate is larger than the one found in other comparable studies and it is consistent with anecdotal evidence in the press that Italy is a strongly immobile society. Our result is robust to a number of different specifications. We control for household size, which emerge with a negative sign without having any great impact on intergenerational elasticity (Lindahl, 2002). We run the same regression without correcting for age or checking for a narrower range of age. Finally, we provide a rough adjustment for the excess of under-reporting.[19]

In models (2) to (4) we look at a different specification of the set of variables. In model (2) we add dummies obtained by interacting education and job sector. One weakness of the two-sample approach is that by assigning a common value to each individual whose parents share the same characteristics, one loses variation in incomes. Hence our decision to use a large set of variables, compared with other similar studies, when predicting parents' earnings. In model (3) the information used to predict parents' earnings regards education and social class.[20] In model (4) we have not taken education into consideration. The large degree of immobility in Italy is confirmed even after controlling different choices of variables.

In model (5) we consider disposable income rather than earnings.[21] By using labour income we manage to identify the opportunities available to earn a certain income from labour, whereas disposable income is a closer measure of the opportunity to achieve a certain living standard. The degree of intergenerational elasticity rises to $\beta = 0.61$. A similar increase is obtained in Björklund and Jäntti (1997), Corak and Heisz (1999), Osterberg (2000) and Mazumder (2005).

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[18] In Dearden et al. (1997), Ferreira and Veloso (2004) and Dunn (2004), elasticity rises when they only take education into account.

[19] Cannari and Violi (1995) analyzed the relationship between true and reported income in the SHIW. Following their study, we revised upwards self-employment income by 20 percent.

[20] Social classes are classified in a standard manner as follows: 1) agricultural labourers; 2) the non-agricultural working class; 3) the white-collar middle class; 4) the agricultural bourgeoisie; 5) the urban bourgeoisie; 6) lower and executive management.

[21] Disposable income is a broader measure of economic status, and includes both effective and imputed rents deriving from real assets. We have not taken capital gains into consideration as we have no data for it in the case of the first sample.

This is an expected result, since a broader measure of income generally indicates other ways in which sons' outcomes are affected. If parents transfer wealth directly to their children, there will be a strong intergenerational correlation in the components of income derived from it.[22]

Model (6) considers a broader measure of parental background than only father's earnings. Using information from both parents may provide a more accurate picture of the total resources available to a family, and hence provide a better proxy for the investment that can be made in a child. Studies of intergenerational economic mobility based on father-son pairs become increasingly inadequate as female labour market participation rate rises. Furthermore, the individual characteristics of fathers and mothers may affect children's outcome to a significantly different degree.[23] Intergenerational elasticity, calculated using family disposable income as the independent variable, is $\beta = 0.49$, and we therefore witness a stronger transmission mechanism between son-father income pairs than between son and parental income.[24] If we split the sample into those families where both parents work, and those where only the father works, then we find a stronger degree of association in those cases where the father is the only breadwinner.[25] These results emphasize the strong father-son relationship in Italian households, and show that an increase in female employment, implying that mothers' earnings make a larger contribution to family income, may lead to an attenuation of intergenerational persistence and wider opportunities for children.

[place *table 1* here]

Once we have a measure of intergenerational mobility, it is not immediately obvious what constitutes a high or low level of mobility. We can use international figures to provide the basis for a comparative analysis. However, the comparability of studies is somewhat problematic because estimates are sensitive to several different factors, such as the different measures of outcome considered, the accuracy of data sets, and the different sample selection rules and estimation methods followed. When we make such comparisons, therefore, we need to carefully consider whether differences are a consequence of fundamentals or of non-comparability across studies. For this reason, *table 2* provides a detailed

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[22] The distribution of wealth is far more unequal than that of income, and it affects several aspects of family well-being, especially homeownership and investment in children's education. It would seems reasonable to expect the disparity in wealth not only to persist between one generation and the next, but indeed to mushroom.

[23] Ermisch and Francesconi (2001) showed a mother's level of education is a stronger factor than a father's education in educational choice and success at school.

[24] In the US (Solon, 1992; Mazumder, 2005) and Finland (Osterbacka, 2001), on the other hand, family income is more closely associated across generations than fathers' earnings.

[25] Intergenerational elasticity is 0.47 when both parents work, while it is 0.64 when the father is the only income recipient.

picture of the only studies that appear sufficiently similar to ours both in terms of the methodology used and in terms of the sample definition.[26]

[place *table 2* here]

We have data for English-speaking countries, Continental and Northern Europe, and a developing country. Our paper adds a representative of Mediterranean Europe to previous evidence. We may sum up the results in the following way. Sweden and Canada, as one would expect, show the lowest degree of intergenerational persistence across generations. France and the UK are characterised by a certain degree of immobility (even if results are slightly controversial in the case of UK[27]). The US, contrary to common belief is not the highly mobile society it may seem, with a considerable degree of intergenerational persistence. Finally, Brazil boasts the highest estimate of elasticity. Italy seems to be the most immobile of the developed nations[28]. Further analysis in the following sections may help us to get a better understanding of such strong persistence.

4   Non-linearities

In the previous section we estimated how earnings *on average* are transmitted across generations. In this section we want to see whether the explanatory power of fathers' incomes differs for those children who end up at the top of the income distribution than it is for those at the bottom.[29] To this end, we use quantile regression.

In quantile regression, the minimization problem concerns absolute deviations and not the squares of deviations. The theoretical literature on quantile regression and LAD estimators is extensive since Koenker and Basset (1978).[30] The use of quantile regression offers two potential advantages over the least squares. First of all, it is more robust to both outliers and deviations from normality. In other words, even if one is solely interested in a measure of central tendency, estimates of the conditional median, which minimize the sum of absolute errors, are less sensitive to outliers than estimates of the conditional

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[26] Grawe (2004a) gives results from a broader set of developing countries (Ecuador, Nepal, Pakistan and Peru); however, in some cases the samples are small, income definition is problematic and the two-sample approach is implemented by splitting the same data set.

[27] Note, however, that UK estimates concern different points in time and according to Ermisch and Nicoletti (2005) the transmission of economic status has weakened over time. Furthermore, the two studies have adopted a different estimation procedure.

[28] The fact that results from the two-sample approach are in line with standard methodology is an implicit confirmation of the goodness of this method.

[29] Corak and Heisz (1999), Couch and Lillard (2004) and Grawe (2004a) document the existence of non-linearities in the pattern of intergenerational mobility.

[30] See Koenker and Hallock (2001) for an introduction to quantile regression. See also Buchinsky (1998) and the special issue on *Empirical Economics* (2001) for recent advances in quantile regression estimation and its applications.

mean, which minimize the sum of squared errors. This robustness is important for the purposes of to the current study, since income distribution is highly skewed. Secondly, and most importantly from our point of view, it offers a fuller description of the manner in which fathers' earnings influence sons' earnings. Besides being important for descriptive purposes, non-linearities may provide evidence of mechanisms underlying intergenerational links: is upward mobility lower for those from the lower classes? Or does income persistence reflect parental provision of a safety net for the least able children born into high-income families? Mean regression cannot distinguish between these alternative explanations, whereas quantile regression can.

The estimation procedure consists of two steps and is called 2SQR (two-stage quantile regression). In the first stage, we apply least squares estimation, and in the second stage we use quantile regression with the predicted values.[31] Despite the growing interest on quantile regression, to the best of our knowledge, there is currently no reference that precisely addresses the issue discussed here. Amemiya (1982) have dealt with the two-stage least absolute deviations. Chen and Portnoy (1996) study two-stage quantile regressions where the first-stage estimators are trimmed least squares estimators and LAD estimators. More recently, Ribeiro (2001), referring to a simulation experiment, argues that there may be gains in efficiency in using 2SQR as opposed to 2SLS. Kim and Muller (2005) analyze bias transmission in a two-stage quantile regression framework when the first stage is based on least squares. However there is not an analog of the two-sample two-stage approach in a quantile framework, and this could represent an interesting issue for future research.

The estimation in the second stage is performed by minimizing the following equation:

$$\min_{\beta_\theta} \frac{1}{n} \left[\sum_{i:\, y_i^s \geq \widehat{y}_i^f \beta} \theta \left| y_i^s - \widehat{y}_i^f \beta_\theta \right| + \sum_{i:\, y_i^s < \widehat{y}_i^f \beta} (1-\theta) \left| y_i^s - \widehat{y}_i^f \beta_\theta \right| \right] \tag{4}$$

where θ is the quantile to be estimated, and β_θ is the coefficient, depending on the particular quantile in question.[32] *Figure 1* shows the graph of quantile estimates. At lower quantiles of sons' income distribution, there is no clear pattern and the confidence interval is substantial.[33] We are more confident of the results in the upper tail of sons' income distribution: above the median the magnitude of the coefficients increases as quantiles increase. The effect of fathers' income at the 9th decile of the sons' incomes is $\beta_{0.90} = 0.62$. Children from poorer families do have a lower likelihood of being upwardly mobile than

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[31] See also Andrade et al. (2003) and Grawe (2004a).

[32] If $\theta = 0.90$ is the decile in question, then quantile regression essentially asks: to what degree do the earnings of an 90th centile son (conditional on his father's earnings) increase as the earnings level of the father increases?

[33] Standard errors are obtained bootstrapping both stages of the regression with 1000 replications. Arias et al. (2001) and Garcia et al. (2001) use bootstrap in a two stage quantile regression framework.

the average level of mobility would suggest.[34]

[place *figure 1* here]

Table A4 shows, to the best of our knowledge, the only studies (and the only countries) that use quantile regression when studying intergenerational elasticity.[35] Developed countries, with the exception of the UK, exhibit a lower degree of income persistence in the upper quantiles than in the lower quantiles.[36] Canada and Norway reveal a high degree of mobility, and intergenerational elasticity decreases as quantiles increases. In the said two countries, the substantial level of public investment in education and the wage setting schemes, which increases the left tail of earnings distribution, have attenuated the upward constraints on those children from the bottom of the income ladder. The US has a somewhat higher degree of income persistence, but once again this decreases with quantiles (see also Fertig, 2004), indicating that upward mobility in the income ladder does not depend very much on social origin.[37] In the UK, Brazil and Ecuador, on the other hand, we observe a positive difference in the coefficients of the upper quantiles compared with those of the lower ones. This means that the outcomes for those children who are at the top of the income ladder depend more on parents' socioeconomic status than the outcomes of those children who are at the bottom of the ladder.

5 Social inheritance: causes and implications

In the previous sections we compared our findings with those of comparable international studies. The degree of intergenerational income mobility in Italy is lower than that observed in other developed countries. Secondly, and more importantly, we witnessed the modest degree of upward mobility of those coming from low-income families. There seems to be an invisible ceiling that impedes

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[34] Grawe (2005) expressed very significant reservations about testing credit constraints with quantile regression because of heteroschedasticity in the error term. Therefore we refer to the following section for a discussion of the reasons underlying low upward mobility in Italy.

[35] Grawe (2004a) provides some additional results for other countries, but we believe that the samples used are too small and problematic for the purpose of a reliable comparison.

[36] In this case, we are more interested in the pattern of elasticity with respect to quantiles rather than in its absolute levels. The papers cited in *table A4* use a variety of different methods, and thus the degree of comparability suffers as a consequence. Andrade et al. (2004) and Grawe (2004a) use two-sample technique while in Eide and Showalter (1999) and Bratberg et al. (2007) earnings are measured using time-averages.

[37] We believe that these findings may also help explain the differences in perceived mobility. If we compare Italy and the US, for example, we notice that the critical difference is not average income mobility but intergenerational elasticity at the 9th decile. In Italy, the upper quantiles elasticity coefficients confirm the view that the lower classes represent a trap which it is hard to escape from, and that family and privileges play a highly significant role. In the US, on the other hand, efforts at becoming upwardly mobile are much more rewarding, and Americans perceive success as the outcome of individual merit and entrepreneurial spirit.

reaching the top starting from the bottom. In this present section, we are going to examine those institutional specificities that may explain educational and occupational immobility. This may help us understand the mechanisms underlying intergenerational mobility, and contribute towards a discussion of the policy implications.

Education obviously plays a crucial role in explaining social outcomes and in accounting for long term mobility. However, the way in which education translates into greater social mobility is a more complex issue. Italy certainly represents an interesting case in point. *Table 3* shows the education transition matrix, where the rows represent sons' educational attainment given father's level of education. The probability of a son graduating if he has a graduated father is 54.5 percent. On the other hand, if a father has had no education, then there is a 70.1 percent probability that his child will only finish compulsory schooling.

[place *table 3* here]

One explanation for strong educational immobility may lie in early tracking. Education proceeds in stages, and early decisions have a strong effect on the choices available at later stages (Dustmann, 2004). School decisions are affected, at least in part, by family background (Ermisch and Francesconi, 2001), and this effect is stronger at earlier key transitions stages, getting weaker at later stages. The impact had by family background therefore depends on the age at which these decisions are taken, and on how heavily they affect future opportunities. In Italy, the first age of selection is relatively early (at the age of 14), and a large proportion of individuals leave school at this stage.[38] Those who continue at school may essentially choose from the more academically-orientated high schools (*licei*), the technical schools (*istituti tecnici*) and the vocational schools (*istituti di formazione professionale*). The choice of secondary schools leads to very different educational careers, since later options are heavily conditioned by earlier choices. Almost all who attend a *liceo* go to university, while the majority of those who attend technical or vocational schools choose to go to work after the *diploma*. Parental education and socioeconomic status appear to be the main determinants of educational choice, and this reinforces intergenerational immobility.[39] An increase in the school-leaving age, and the postponement

[38] In Nordic and Anglo-Saxon countries first age of selection is higher (see Oecd, 2006). Furthermore, in Italy, the percentage of population that has finished high school is substantially lower than the percentage observed in other developed countries (Oecd, 2006). In our sample the proportion of early school leavers is 45.9 percent.

[39] The strong correlation between generations in the frame of the instruction level acquired is partly due to some cultural and information background: parents with higher educational level are in a better position to cover any lacks on which the school system may incur in regarding the orientation and support to the student when it comes to make an educational choice. Furthermore, poorer parents may prefer to see their children become independent earlier on, thus tracking them into quick, or more vocationally oriented, educational lines. The Pisa

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of track choice may mitigate the impact of family background on education opportunities.

Lower-income students are also less likely to go into tertiary education, despite the existence of a publicly-funded system designed to provide all families, regardless of income, access to education of a relatively uniform character. To help explain these patterns, we should clearly identify the incentives and costs underlying such a decision.

The main factors encouraging lower-income students to go on to university include the belief that higher education will then improve their employability and earnings. However, in Italy getting a higher education is not particularly rewarding since it does not significantly reduce the probability of being unemployed, and returns to tertiary education are lower than in many other developed countries (Oecd, 2006). Returns to education are also poorly correlated to academic performance, and significantly differentiated by family background.[40] These facts, together with the strong role played by social ties in getting a job, may lower incentive to invest in education. In other words, education does not constitute a substantial signalling function, thus depriving poorer children of a means with which to compete with children from richer families (Checchi et al., 1999). Furthermore, private industry in Italy has traditionally been characterised by small firms that rely on internal training rather than on formal education, and productive system is not traditionally fully developed on the areas requiring highly qualified job profiles.

Cost dimension is also important and often under-estimated. In Italy, the equality of opportunities in higher education has been pursued through a drastic and wide decrease on enrolment fees, while not offering a real tuition waiving to those students coming from low-income families. Government intervention in support of students with less affluent parents means only a limited benefit provided that, being exempted from paying university fees matters only marginally in the overall, and scholarships are granted to a very reduced portion of students.[41] Therefore, university fees only represent a small proportion of annual expenditure on going to university, whereas the major cost for those who study away from home is that of accommodation.[42] In addition to the direct

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survey suggests that the clustering of students with given socio-economic characteristics in certain schools is greater in those school systems in which school types are highly differentiated (Oecd, 2006).

[40] In our sample those who are graduated earn, on average, 32,500 euros per year if they come from the top quartile of the fathers' earnings distribution, and 19,700 euros if they come from the lowest quartile.

[41] Istat (2005) conducted a survey of family expenditures on the education for their children. Average annual expenditure does not vary according to family background, but students from low-income families are undoubtedly more sensitive to such cost. More paradoxically, tuition and enrolment fees are low because universities are financed by public taxation, but at the same time, the population who reach the degree are largely from high-income classes.

[42] In 2002, university fees represented 15 percent and cost of accommodation 63 percent of annual expenditure for those studying at a university in a different town from their own (Istat, 2005). The percentage of students studying at university away from home varies according to the geographical areas, being higher in the South (33 percent) and lower in North-West (8 percent). The higher percentage of southern Italian students can be accounted for by the

costs mentioned above, there is also the opportunity cost of not working, which can be particularly high given the duration of tertiary education in Italy. A proposal for a change could consist on establishing an alignment trend between university fees and actual costs of the service itself, in order to use the resources which are gained to create more scholarships and student loans for those students eligible to this kind of benefits. A direct link between university fees and costs would also help provide the incentives to enhance academic results. As immediate consequences, we would witness a decrease on the number of *fuori corso* (those who are still enrolled for a number of years after the standard period of their degree course) students and on the percentage of students withdrawing before graduation, both of these are actually widespread situations in the Italian university system.

[place *table 4* here]

Table 4 shows a mobility matrix for occupation. A summary indicator of mobility is inappropriate in this particular case, since categories are not clearly ranked, but the matrix does provide details of those occupations that are linked across generations, and the extent to which they are linked. In almost every case, a higher proportion remains in the same occupation as their parents: if a father is a blue-collar worker, then there is a 47.6 percent probability that his child do the same job, and, generally speaking, those whose fathers were payroll employees (the first three rows in the table) are largely payroll employees themselves. Occupation persistence is also high among the self-employed; 47.3 percent of children of entrepreneurs or free lancers, for example, follow in their fathers' footsteps. In some cases, occupational immobility is linked to the existence of entry barriers limiting access to certain professions, or to the intergenerational handing-down of control of the family firm. In other cases, it is the natural outcome of educational stratification.

Occupation persistence may also depend on more intangible assets: rich and poor parents differ in the attitudes and norms they instill in their children, and in the family ties they provide. Most Italian young men live with their parents.[43] Unfavourable conditions (including high youth unemployment and low unemployment benefits) force children to live at home until they gain independence and certain stability in their lives. The family furnishes the support and insurance that the welfare state fails to provide. Manacorda and Moretti (2006) argue that parents also benefit from the companionship and other services their children provide, and they are willing to 'bribe' their children into living at home in exchange for some monetary transfers. In Northern Europe, for example, there is a weaker vertical relationship between generations: people are not so reliant

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lower number and poorer quality of southern universities, and student's desire to pursue the better job opportunities available in the North.

[43] According to Manacorda and Moretti (2006), more than 80 percent of Italian men aged 18-33 live with their parents. This percentage is much higher than in the US (43 percent), Germany (45), France (45), the UK (53) or Spain (65).

on their children in old age, and young people detach themselves from their parents at a relatively early age. Cohabitation may represent a further factor strengthening intergenerational persistence, since living with one's parents can affect the nature of one's beliefs and the transmission of preferences. Individuals may feel forced, or may prefer, to choose occupations similar to those of their relatives in order to comply with social convention, or family tradition. Any policy that reduces youth unemployment and the uncertain nature of work may contribute towards mitigating the interdependency of parents and children, and may encourage young people to detach themselves from the family and build their own life.[44]

Italian labour market is traditionally characterized by a strong development of internal market, associated to long-work relationship, and conversely poor external market.[45] This means that first job often has a strong effect on individual life-career. However, given two individuals, both equally risk-averse, differences in economic security and stability (exactly what characterizes advantages and disadvantages of different social class of origin) will translate into a pronounced difference in risk taking. People from lower classes show a higher willingness to accept low-wage jobs, and this entails important consequences later in life.

A further channel through which persistence works is that of family ties. In Italy a considerable share of jobs (more than in other developed countries) are filled through the mechanism of social referral. This system of informal contacts has two sides to it, however: on the one hand, personal contacts constitute a better channel of information between job applicants and potential employers than do more formal methods. They convey a wealth of reliable information, they may be a source of peer monitoring, and they provide a cheaper way of finding the likely candidate. On the other hand, those labour markets based strongly on informal links are likely to impede intergenerational mobility, and may be a source of persistent inequality. They may also be a source of inefficiency when they involve the enjoyment of rent positions. Given the above, it is not clear whether the reliance on social ties is a highly productive, cheap search method, or whether, on the contrary, it represents a potential source of both inefficiency and persistent inequality. Our point is that in a non-competitive, closed labour market the second channel is more effective. Social ties are then used to inherit occupation more easily, leading to a stronger degree of intergenerational occupational mobility. Greater openness and competition in the labour market may help reduce the inefficiencies of the social referrals mechanism.

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[44] The Italian welfare state is substantially skewed towards the older generations, with a great deal spent on pensions and very few welfare benefits for young people.

[45] Occupational (external) market is said to exist when workers have access to jobs of a particular type in many firms. In contrast, an internal labour market exists when the employer regularly seeks to fill vacancies within the firm by recruiting among its existing employees. In the latter hiring from outside involves mainly filling lower positions in the corporate structure.

6 Conclusion

There is a growing interest in economic studies in calculating intergenerational income mobility and in making international comparisons thereof. We feel we have contributed to this field of research by computing a measure of intergenerational elasticity for Italy. In order to overcome the absence of a suitable data set, we have used the two-sample two-stage least squares approach. Our first sample contains (hypothetical) fathers' incomes together with information about their socioeconomic status. The second sample contains figures for sons' incomes, together with retrospective information about their parental background (consisting of the same series of variables). We regress incomes on such variables in the fathers' sample, then we use the estimates to predict fathers' income in the sons' sample. Finally, we run the standard regression in order to obtain a measure of intergenerational income elasticity. Our results depict Italy as a strongly immobile society, indeed the least mobile of all the developed countries we have compared.

We then looked for non-linearities in the relationship between parents and their children, and to this end we used quantile regression approach. Quantile regression can provide a more complete statistical analysis of the intergenerational relationship across the distribution of sons' income. We have found evidence of a stronger persistence among the upper quantiles of sons' income distribution, and this highlights the inadequacy of the institutional setting in guaranteeing opportunities of upwards mobility for individuals from low-income families.

Finally, we examined the mechanisms behind social inheritance. We found a strong degree of persistence, both in educational attainment and chosen occupation, and we then speculated on the underlying reasons for this persistence. The education system tends to perpetuate educational stratification across generations, and thus educational policies ought to be rethought. An increase in the age of early selection may mitigate the impact of family background. A new equilibrium between costs and benefits in higher education may facilitate the access for those from low-income families. The labour market is traditionally characterized by a sorting mechanism that rations access to good jobs, and by the intergenerational transmission of occupations. Removing the barriers to certain professions, and stiffening competition within the productive system may lead to a more efficient and mobile society.

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Table 1: Intergenerational elasticity measures

model:	(1)	(2)	(3)	(4)	(5)	(6)
β	0.50	0.50	0.57	0.49	0.61	0.49
	(0.049)	(0.051)	(0.057)	(0.052)	(0.047)	(0.034)
Number of obs.	3,198	3,198	3,198	3,198	3,198	3,166

Bootstraps standard errors are in parentheses.

Models from (1) to (6) are described in the text.

Table 2: Comparable international evidence

Studies	Country	$\widehat{\beta}$	Set of instruments	age^{son}	age^{father}
Bjorklund and Jantti (1997)	Sweden	0.28	Education, occupation	30-39	43
Bjorklund and Jantti (1997)	US	0.42	Education, occupation	28-36	45
Dearden *et al.* (1997)	UK	0.42	Education, social class	33	47
Fortin and Lefebvre (1998)	Canada	0.21	Occupation	30-39	-
Lefranc and Trannoy (2005)	France	0.41	Education, social class	30-40	55-70
Dunn (2004)	Brazil	0.69	Education	25-34	30-50
Ferreira and Veloso (2004)	Brazil	0.58	Education, occupation	25-64	25-64
Ermisch and Nicoletti (2006)	UK	0.29	Occupational prestige social class	37	53

The estimated elasticity concerns father-son pairs. The dependent variable is predicted sons' earnings in Dearden et al. (1997) and log annual earnings in all other studies.

Table 3: Mobility matrix by educational attainment

Origin:	Destination: son's education				
father's education	none	primary school	lower secondary	upper secondary	university degree
none	3.5	19.0	47.6	28.3	1.6
primary school	0.1	6.0	50.0	38.3	5.6
lower secondary	0.0	1.3	26.2	56.7	15.8
higher secondary	0.0	1.0	6.8	59.2	33.0
university degree	0.0	0.4	9.2	35.8	54.5
	0.4	6.2	39.3	42.5	11.6

Values expressed in percentages.

Table 4: Mobility matrix by occupational attainment

Origin:	Destination: son's occupation				
father's occupation	blue-collar worker	office worker teacher	manager official	member of profession	entrepreneur free lance
blue-collar worker	47.6	24.4	5.1	3.2	19.8
office worker, teacher	13.8	43.3	14.9	13.3	14.7
manager, official	5.1	31.1	32.1	16.1	15.6
member of profession	5.5	17.5	17.3	25.9	33.7
entrepreneur, free lance	21.4	17.1	6.1	8.2	47.3
	32.1	26.0	8.9	7.1	25.9

Values expressed in percentages.
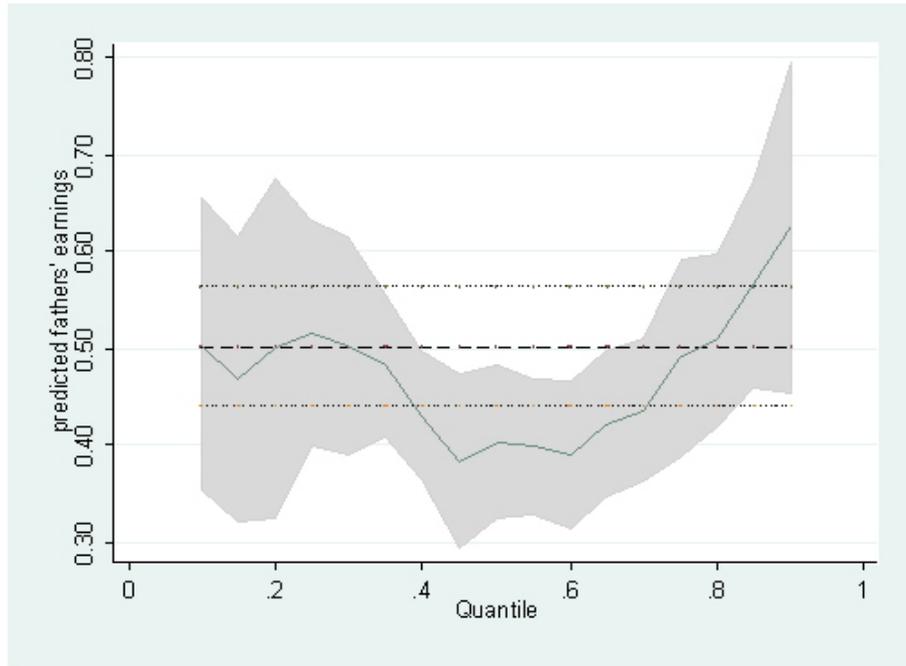
The solid line represents the quantile estimates with the shaded grey area depicting a 90 percent pointwise confidence band. The dashed line represents the OLS estimate of the mean effect with the two dotted lines representing, once again, a 90 percent confidence interval for this coefficient.

APPENDIX

Table A1: Descriptive statistics

	sons	fathers
observations	3,198	4,903
mean log earnings	9.533	9.613
	(0.651)	(0.546)
mean age	41.0	41.1

Standard deviations in parentheses.

Table A2: Variables used to predict fathers' incomes

	fathers in the first sample	fathers described by sons
age	41.1	41.0
education level:		
no education	5.9	15.2
primary school	42.2	49.9
lower secondary school	27.4	20.6
higher secondary school	16.9	10.0
university degree	7.5	4.3
occupational qualification:		
blue-collar worker	41.6	52.7
office worker / teacher	22.9	16.3
manager	3.0	4.8
member of the professions	2.9	3.5
entrepreneur	1.2	2.2
free lance	28.4	20.5
sector of activity:		
agriculture	9.3	19.4
industry	44.0	28.7
general government	15.9	15.2
other (commerce, artisan, services...)	30.8	36.7

Frequencies are weighted using sampling weights.

Table A3: Quantile estimates for Italy

10th	0.50 (0.092)
25th	0.51 (0.073)
median	0.40 (0.048)
75th	0.49 (0.052)
90th	0.62 (0.084)
sample size	3,198

Bootstrapping standard errors are in parentheses.

Table A4: International evidence on quantile regressions

	United States	Canada	Norway
	Eide and Showalter (1999)	Grawe (2004a)	Bratberg *et al.* (2007)
OLS	0.45 (0.05)	0.15 (0.004)	0.13 (0.007)
10th	0.67 (0.14)	0.26 (0.011)	0.22 (0.023)
25th	0.49 (0.06)	0.21 (0.007)	0.17 (0.007)
median	0.44 (0.05)	0.16 (0.004)	0.10 (0.004)
75th	0.35 (0.04)	0.11 (0.004)	0.09 (0.005)
90th	0.26 (0.07)	0.09 (0.005)	0.09 (0.009)
sample size	612	47,115	23,892
	United Kingdom	Brazil	Ecuador
	Grawe (2004a)	Andrade *et al.* (2004)	Grawe (2004a)
OLS	0.58 (0.069)	0.60 (0.008)	1.13 (0.294)
10th	0.34 (0.197)	0.45 (0.012)	1.06 (0.270)
25th	0.46 (0.125)	0.52 (0.011)*	1.10 (0.268)
median	0.58 (0.069)	0.64 (0.009)	1.13 (0.294)
75th	0.70 (0.099)	0.67 (0.010)*	1.17 (0.316)
90th	0.81 (0.167)	0.63 (0.014)	1.21 (0.335)
sample size	1,945	25,927	1,461

Standard errors are in parentheses.

* Estimates are referred to 20th and 70th quantiles, respectively.

Figure A1: Summary of international empirical evidence
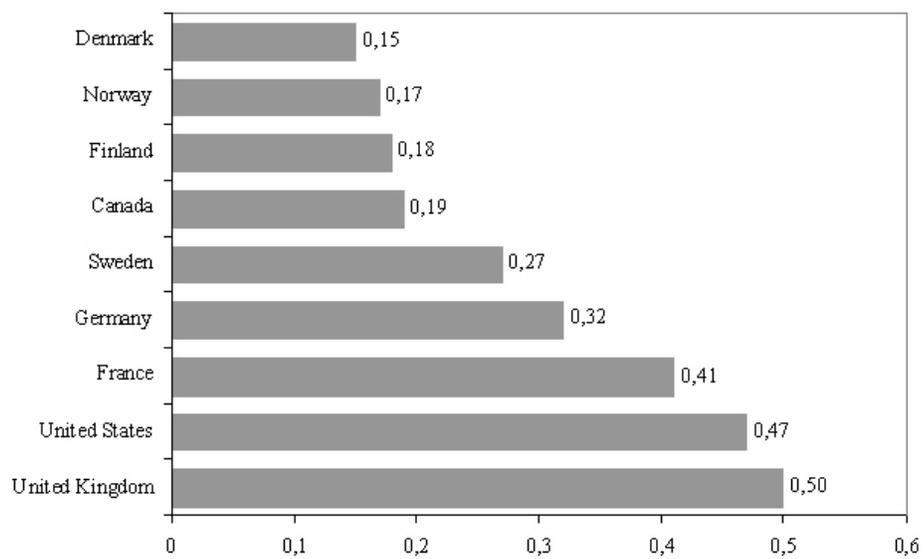
The value of elasticity reported is the one considered more reliable according to Corak (2006).