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INTERGENERATIONAL EARNINGS AND INCOME MOBILITY IN SPAIN

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This paper contributes to the large number of studies on intergenerational earnings and income mobility by providing new evidence for Spain. Since there are no Spanish surveys covering long-term information on both children and their fathers' income or earnings, we deal with this selection problem using the two-sample two-stage least squares estimator. We find that intergenerational mobility in Spain is similar to that in France, lower than in the Nordic countries and Britain, and higher than in Italy and the United States. Furthermore, we use the Chadwick and Solon approach to explore intergenerational mobility in the case of daughters and we find similar results by gender.

JEL Codes: D31, J31, J62

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1. Introduction

Intergenerational mobility refers to the association between the socioeconomic achievements of parents and those of their children. A high degree of intergenerational mobility can be seen as an important indicator of health and success in a society because in that case the socioeconomic status of children from different families is not predetermined by their parents, and children have equal opportunities to achieve education and higher earnings (Behrman and Taubman, 1990).

Intergenerational mobility studies usually estimate the correlation between the socioeconomic status of parents and their offspring. On the one hand, a high correlation would imply that people born into disadvantaged families have a smaller chance of occupying the highest socioeconomic positions than those born into privileged families. On the other hand, a low correlation would imply a high degree of mobility and more equal opportunities. Sociologists explore the association measures between ordered categorical variables, such as social and economic class position. Meanwhile, the economics literature has primarily concentrated on the relationship between parents' and their offspring's permanent income or

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earnings.[1] In particular, the standard measure of intergenerational mobility used by economists is earnings or income elasticity.

In this paper, we contribute to the empirical literature by estimating the earnings and income mobility for Spain. In general, such papers estimate the elasticity only for sons to avoid the issues regarding employment selection by daughters. Here, we also estimate daughters' elasticity using family income rather than their individual earnings. Therefore, another important contribution of our paper is to explore the intergenerational earnings mobility of daughters.

The estimation of intergenerational mobility can be biased due to different sample selection problems. In an ideal world, to estimate the elasticity between parents' earnings and offspring's earnings we need information on the earnings of both in adulthood. Panel data are particularly useful for this purpose. Therefore, if we had a large enough panel to follow children into adulthood, we would have no problem. However, if we have a short panel, as we have in Spain, then we only have information on both when they live together in at least one wave; the probability of observing offspring living with their parents decreases as the children grow older. Therefore, in a short panel, it is impossible to follow children during their adult life. When we have information on the parents, the children are too young to observe a measure of their permanent income because they are still living with their parents or have only recently left the parental home, and when we have adults, we do not have information about their father's earnings.[2]

In order to overcome this selection problem, it is possible to estimate intergenerational earnings mobility using the two-sample two-stage least squares (TSTSLS) estimator.[3] This method combines information from two separate samples: a sample of adults (sons and daughters) with observations of their earnings and their parents' characteristics, and a sample of potential parents with observations on earnings and the same characteristics. The latter sample is used to estimate an earnings equation for parents using their characteristics as explanatory variables, while the former is used to estimate an intergenerational earnings equation by replacing the missing parents' earnings with its best linear prediction.

When studying intergenerational earnings mobility in the case of daughters, a second problem that arises is employment selection, wherein we only have earnings for adults who are employed. Since the decision to work or not is not random, especially in the case of women, estimating intergenerational earnings mobility only for those who are working gives us biased estimators. To provide some

[1]See Solon (1999), Björklund and Jäntti (2000), Bowles and Gintis (2002), and Erikson and Goldthorpe (2002) for a review.

[2]Nicoletti and Francesconi (2006) refer to this sample selection problem as co-residence selection. They analyze intergenerational mobility using an occupational prestige score. They find that the β coefficient (where β represents the elasticity between father's and offspring's occupational prestige scores) is underestimated when they only consider the pairs of children and parents who are cohabiting.

[3]Following the paper written by Angrist and Krueger (1992) on two-sample instrumental variables (TSIV) estimation, numerous empirical researchers have applied a computationally convenient TSTSLS variant to the study of intergenerational mobility, like Björklund and Jäntti (1997) in Sweden; Fortin and Lefebvre (1998) in Canada; Grawe (2004) in Ecuador, Nepal, Pakistan, and Peru; Lefranc and Trannoy (2005) in France; Nicoletti and Ermisch (2007) in Britain; and Mocetti (2007) in Italy.

intuition of what happens in the case of daughters, we deal with this selection problem following Chadwick and Solon (2002) and using family income rather than the daughter's individual earnings.

Why Spain? The literature on intergenerational earnings mobility has concentrated on the United States, Canada, and some European countries, including England, Scandinavian countries, Germany, and France. However, there is comparably less evidence for intergenerational mobility in southern European countries, probably due to the lack of long panels. The studies by Mocetti (2007) and Piraino (2007) are two exceptions, exploring intergenerational earnings mobility in Italy.

As in other southern European countries, Spain experiences stronger intergenerational family bonds compared to other countries outside the region. After leaving home, Spanish children maintain a close relationship with their parents. Therefore, it is valuable to explore how earnings mobility in Spain compares to that in other countries, and it is particularly interesting to compare our results to those obtained by Mocetti (2007) and Piraino (2007) for Italy.

The empirical literature on intergenerational mobility in Spain is relatively scarce and has primarily come from sociology, such as the study by Carabaña (1999) of occupational mobility. From an economic point of view, Sanchez-Hugalde (2004) analyzes intergenerational income and education mobility in Spain using the Family Expenditure Survey (Encuesta de Presupuestos Familiares) for 1980 and 1990; however, she only estimates the elasticity when children and their fathers live together. This generates biased results because in that case children are often still studying or do not have enough money to emancipate themselves, and their income therefore does not represent their permanent income. She finds that income mobility has increased and in particular observes elasticities of around 0.65 for 1980 and around 0.44 for 1990.

Another recent reference for Spain, which uses a totally different measure of intergenerational mobility to get around the absence of a long panel, is the paper by Güell *et al*. (2007). They use information contained in the surnames of the inhabitants of a large Spanish region (Catalonia) as indicative of the degree of intergenerational mobility in the economy. The idea is that surnames capture family links in such a way that they can be used to extract longitudinal information from census data. They find that the information contained in the surnames increases its importance and they use this result as an indicator of a decrease in intergenerational mobility, contradicting the results found by Sanchez-Hugalde (2004) which suggest greater mobility.

We present the first empirical paper to examine intergenerational earnings and income mobility for all adults in Spain using the TSTSLS estimator and find elasticities of around 0.40 for sons. When we analyze daughters following the Chadwick and Solon (2002) approach, we find almost the same elasticities as for sons. By comparing the elasticities obtained in Spain with the results for other countries, we find that intergenerational mobility in Spain is similar to mobility in France, lower than in Nordic countries and the U.K., and higher than in Italy and the United States.

The rest of the paper is organized as follows. In the next section, we describe how we implement the two-sample two-stage least squares estimator. In Section 3

we describe the data source, the selection sample, and the variables used in the empirical analysis. In Section 4 we report the results, and in Section 5 we offer some final remarks.

2. Estimation Method

2.1. *Estimation of Intergenerational Earnings Mobility for Sons*

As explained above, we focus on intergenerational mobility measured by the intergenerational elasticity of sons' earnings with respect to fathers' earnings. More precisely, we consider the following intergenerational mobility equation:

$$W_i^s = \alpha + \beta W_i^f + \mu_i \tag{1}$$

where W_i^s represents the sons' permanent earnings, and W_i^f is the fathers' permanent earnings, both expressed in log terms. The coefficient α is the intercept term representing the average change in the child's log earnings, and μ_i is a random error.

The coefficient β is the intergenerational elasticity of sons' earnings with respect to their fathers' earnings, and it is our parameter of interest. Note that if $\beta = 0$, then sons' earnings are not determined by their fathers' earnings. On the contrary, $\beta = 1$ represents a situation of complete immobility; that is, sons' earnings are fully determined by their fathers' earnings. Generally, the coefficient is between these two values and to adequately evaluate whether the coefficient is high or low, it is necessary to compare the results to those found for other countries.

If we had permanent income for successive generations in our sample, we could directly estimate equation (1) by the ordinary least squares estimator (OLS). Unfortunately, we do not have this information in one dataset.

The first problem we have is that most data-sets only provide measures of current earnings and fail to provide measures of individual permanent income. Solon (1992) and Zimmerman (1992) show that the use of current earnings as a proxy for permanent earnings leads to downward OLS estimates of β. Different solutions can be implemented to reduce or eliminate this bias. For instance, with panel data it is possible to calculate an average of current earnings over several years as a proxy of permanent income. Another possibility lies in using instrumental variables to estimate β. In this paper, in the case of the father's earnings, we estimate it using auxiliary variables. Therefore, the estimated earnings are an average that can be considered a proxy of the father's permanent earnings. In the case of children, we select adult ages as close as possible to the age at which earnings are similar to permanent income. In particular, Haider and Solon (2006) suggest the use of offspring around 40 years old.[4] Furthermore, given the panel

[4]Haider and Solon (2006) study the association between current and lifetime earnings, including its evolution over the life cycle; they find that the relationship between current and lifetime earnings departs substantially from the textbook model in ways that vary systematically over the life cycle. Their results can enable more appropriate analysis of and correction for errors-in-variables bias in a wide range of research that uses current earnings to proxy for lifetime earnings.

nature of our database, we obtain a better measure of permanent son's earnings by averaging the earnings for the years in which we can follow the individual.[5]

The second problem we face is that we only observe earnings for pairs of fathers and sons when they live together in at least one wave of the panel, which is not a random sample. On the contrary, we do not have information for sons who never co-reside with their parents during the panel. This selection problem could lead to a sub-estimation of the offspring's earnings, since they usually live in the parental household either because they are still students or because they do not have enough income to live alone. In general, this selection problem causes an overestimation of intergenerational mobility (an underestimation of the elasticity between parents' earnings and offspring's earnings).

In a long panel, it is easy to observe young children living together with their parents and follow them until adulthood in order to find out their earnings, unless they leave the panel (attrition problems). Unfortunately, in Spain we only have short panels.

In our paper we deal with this selection problem by linking two samples and using the TSTSLS estimator. The TSTSLS estimator is a computationally easier variant of the two-sample instrumental variable estimator (TSIV) described by Angrist and Krueger (1992), Arellano and Meghir (1992), and Ridder and Moffit (2006).[6]

The idea is as follows. Although we have no information about W_i^f, we do have a set of instrumentals variables, Z_i, of W_i^f with which we can estimate equation (1) in two steps. We consider two different samples. The first, which we call the main sample, has data on sons' log earnings, W_{it}^s, and characteristics of their fathers, Z_i, when the sons were between 12 and 16 years old; the second, which we call the supplemental sample, has information on fathers' log earnings, W_{it}^f, and their education and occupational characteristics, Z_i. In the previous studies that estimated intergenerational mobility combining two different datasets, different variables were used to impute the missing father's earnings. In general, the variables used are dictated by the few available variables.[7]

In the first step, we use the supplemental sample to estimate a log earnings equation for pseudo-fathers. In this regression W_{it}^f are the fathers' earnings in the supplemental sample and can be seen as the sum of the fathers' permanent earnings W_i^f plus time-variant characteristics such as age, A_{it}^f, and a disturbance term, v_{it}^f. Furthermore, fathers' permanent earnings can be defined as the sum of permanent characteristics (Z_i) and a time-invariant disturbance (η_i^f) as follows:

$$W_{it}^f = W_i^f + A_{it}^f + v_{it}^f = Z_i\delta + A_{it}^f + \eta_i^f + v_{it}^f. \tag{2}$$

[5]Individuals stay in the sample a maximum of four years.

[6]For a detailed description of the properties of this estimator, see Arellano and Meghir (1992), Angrist and Krueger (1992), and Ridder and Moffit (2006).

[7]For example, Björklund and Jäntti (1997) use father's education and occupation, while Grawe (2004) uses only the education levels. Fortin and Lefebvre (1998), use 16 occupational groups. Lefranc and Trannoy (2005) instead use eight different levels of education, seven occupational groups, and age. In Nicoletti and Ermisch (2007), the set of candidates as instrumental variables is also quite large, and they try different combinations of the available instrumental variables.

In the second step, we estimate the intergenerational mobility equation (1) by using the main sample and replacing the unobserved father's permanent earnings W_i^f with their predictor:

$$\widehat{W_i^f} = Z_i\hat{\delta}, \tag{3}$$

where $\hat{\delta}$ represents the coefficients estimated in the first step, and Z represents the variables observed in the main sample. Thus, we estimate equation (1) using the fathers' imputed earnings:

$$W_{it}^s = \alpha + \beta(Z_i\hat{\delta}) + A_{it}^c + u_{it} \tag{4}$$

where W_{it}^c is the average sons' earnings for the years we can follow in the panel at ages of around 40 years old, A_{it}^c is the sons' age that is used to take into account the life-cycle profiles, and u_{it} is the error term which is the sum of $u_{it} = \mu_i + v_{it}^s + \beta\eta_i^f + \beta Z_i(\delta - \hat{\delta})$.

The $\hat{\beta}$ we obtain is the TSTSLS estimate of intergenerational earnings elasticity.

The observation of the error term shows us that the potential endogeneity problem is likely to affect most of the empirical papers on intergenerational mobility that apply the TSTSLS estimator. As Nicoletti and Ermisch (2007) point out, the TSTSLS estimator of the intergenerational elasticity could be under- or overestimated when the auxiliary variables are endogenous and do not perfectly explain the fathers' log earnings. Indeed, if this is the case, then we have omitted variables in the error term that are correlated with the auxiliary variables. Moreover, since the instruments used in empirical applications—paternal education and occupational characteristics—are likely to be positively related to the sons' earnings even after controlling for the fathers' earnings, the bias is probably positive.

Therefore, as Nicoletti and Ermisch (2007) express, the properties of the two-sample estimator depend on the nature of the instrument used, which should have the least correlation with the error in the main equation—the intergenerational mobility equation—and maximum correlation with the variable to be instrumented, that is, the fathers' earnings. Choosing instruments with minimum correlation with the error, but with low correlation with the fathers' earnings (or, vice versa, with maximum correlation with the fathers' earnings, but high correlation with the error) generates a biased estimator.

As Mocetti (2007) points out, consistency requires the error term in the intergenerational mobility equation to be independent of the instrumental variables, or for the instrumental variables to explain perfectly the fathers' missing earnings. Furthermore, consistency of the estimator also requires the variables common to both samples to be identically and independently distributed.[8]

[8]Although Inoue and Solon (2010), deriving and comparing the asymptotic distributions of the two estimators, find that the commonly used TSTSLS estimator is more asymptotically efficient than the TSIV estimator because it implicitly corrects for differences in the distribution of variables between the two samples. Therefore, they explain that although computationally simplicity was the original motive that drew applied researchers to use the TSTSLS estimator instead of the TSIV estimator, it turns out that the TSTSLS estimator is also theoretically superior.

Finally, standard errors are estimated as proposed by Murphy and Topel (1985) and Inoue and Solon (2010).

2.2. *Estimation of Intergenerational Earnings Mobility for Daughters*

We also want to provide some insight into intergenerational earnings mobility for daughters.

Ideally, we would estimate the following equation:

$$W_i^d = \alpha + \beta W_i^f + \mu_i \tag{5}$$

where W_i^d represents the daughters' permanent earnings, and W_i^f is the fathers' permanent earnings, both expressed in log terms. Here the coefficient β is the intergenerational elasticity of the daughters' earnings with respect to their fathers' earnings, and is our parameter of interest.

The problem is that, in addition to the selection problems we have for sons, in the case of daughters the averaged W_{it}^d we use instead of W_i^d involves a problem with employment selection since the working daughters are not a random sample. We deal with the selection problem by following a similar approach to Chadwick and Solon (2002). The idea is very simple; we use the log of daughter's family income or the log of the couple's earnings rather than daughter's individual earnings as dependent variable. Therefore my dependent variable is exactly the same one that Chadwick and Solon (2002) use. However, the main explanatory variable is not exactly the same. Chadwick and Solon (2002) can use family income of parents because they have a very long panel. However, I use the father's earnings and the father's income. This is because I have a short panel and I have to impute the father's earnings or income and the characteristics that I have are better for imputing individual income or earnings and not total family income.[9] Furthermore, the interpretation of β is a bit different from the β we obtained when we used individual earnings both as dependent and explanatory variable: first, because incomes are less volatile than earnings and also are better predictors of permanent income and the standard of living of individuals. This is why, in other to compare intergenerational mobility for sons and daughters, we perform this new exercise for daughters and sons. Second, this new β can also be related to assortative mating as Chadwick and Solon (2002) do.

3. Data Sources and Sample Selection Rules

We combine two separate samples to estimate intergenerational earnings mobility, a main sample and a supplemental sample.

In our case, the main sample is the Survey of Living Conditions (Encuesta de Condiciones de Vida (ECV)), that is, the Spanish component of the European Union Statistics on Income and Living Conditions (EU-SILC).[10]

[9]Chadwick and Solon (2002) use this approach to analyze the role of assortative mating in the intergenerational economic mobility in the United States.

[10]The EU-SILC is an instrument that aims to collect timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion, and living conditions. This instrument is anchored in the European Statistical System (ESS).

The ECV has annually interviewed a sample of about 14,000 households that are representative of those in Spain, and has kept each household in the sample for four years. Personal interviews are conducted at approximately one-year intervals with adult members of all the households.

From this sample, we have information about our dependent variable, the sons' log earnings and parental characteristics.

To select our sample of sons, we use the ECV for the year 2005 because this was when the database contained retrospective information; all adults are asked about the characteristics of their parents when they were between 12 and 16 years old. Our main sample is composed of sons born between 1955 and 1975; they were therefore aged between 30 and 50 years in 2005. We consider only those for whom there is information on their father's characteristics. We are missing 13.12 percent of our sample due to the lack of parental information. Table A.1 in the Appendix compares the characteristics of the remainder of the sample with the part of the sample that we lost. Although the average age is similar, we find some differences in the two samples. In particular, children who do not declare parental information are slightly less educated, have unskilled jobs, and have lower earnings. Since the relationship between individuals at different educational levels or different levels of earnings and intergenerational elasticity can be non-linear and different in each country, we also present in (Table A.2 in the Appendix) the intergenerational earnings elasticity between parents and children for different educational levels and different parts of earnings distribution. We can observe, for education, that there is a non-linear relationship but the intergenerational elasticity is significantly higher at the extremes of education levels, especially for the less-educated. Regarding earnings elasticities, it appears that these are decreasing as we move toward the richer percentiles, indicating lower mobility for those with lower earnings. Therefore we can conclude that, in our case, this restriction probably generates an upwardly biased in the intergenerational mobility (downwardly biased of the intergenerational elasticity).[11]

In relation to our dependent variable, one problem that can bias intergenerational mobility studies is measurement error with regard to permanent earnings. Theoretically, our aim is to consider intergenerational elasticity in long-run permanent earnings, but we can observe earnings in only a single or a few specific years. Here, given the panel nature of the database, to obtain a better measure of permanent sons' earnings, for each son we average his gross annual earnings for the years we can follow him. As each individual was kept in the sample for a maximum of four years, we make this average using information from the ECV for the years 2004 (first year of the panel) to 2008. Furthermore, following Haider and Solon (2006), we select sons of around age 40, which is when their current earnings provide the closest measure of permanent earnings.

We suppose that our selected sons were between 12 and 16 years during the 1969–89 period. This is why we use the Family Expenditure Survey of 1980–81 (Encuesta de Presupuestos Familiares) as the supplemental sample with which to

[11]We would like to thank a referee who drew our attention to this point.

TABLE 1

Descriptive Statistics: Characteristics of Sons in the Main Sample

Variable	Mean	S.D.	Minimum	Maximum
Son's age in 2005	39.36	5.64	30	49
Son's log earnings 2005	9.77	0.62	5.70	11.92
Son's log family income 2005	10.06	0.63	0.87	12.29
Father's age in 1981	45.84	5.08	37	57
Imputed father's log earnings	13.2	0.36	12.34	14.11
Imputed father's log income	13.24	0.33	12.46	14.13
Sample size	3520			

TABLE 2

Descriptive Statistics: Characteristics of Daughters in the Main Sample

Variable	Mean	S.D.	Minimum	Maximum
Daughter's age in 2005	39.55	5.66	30	49
Daughter's log earnings 2005	9.25	0.90	4.91	11.49
Daughter's log family income 2005	10.02	0.66	4.09	12.05
Father's age in 1981	45.89	4.97	37	57
Imputed father's log earnings	13.21	0.36	12.34	14.11
Imputed father's log income	13.24	0.34	12.46	14.13
Sample size	3995			

estimate paternal earnings.[12] Here we have information regarding annual gross earnings or annual income, occupation, and the education level of the head of the household. So, in this sample we have data on the pseudo-fathers' earnings and the same set of their characteristics that are available in the main sample.

Although we have the same characteristics in both samples, we have to recode some variables in order to obtain a homogenous classification across surveys. In particular, with respect to education we take into account the changes in the Spanish educational system, and with respect to occupation we use the transformation codes between the codes of the National Occupation Classification of 1979 (CNO-79) that were used in the supplemental sample, and the codes of the CNO-94 that were used in the main sample.[13]

Furthermore, we also suppose that when the children were 12 or 16 years old, their fathers were between 35 and 55 years old. Thus, when we estimate the fathers' earnings regression (and the fathers' income regression) we select males who were fathers between those ages.

For the sample of daughters we follow the same sample selection, but instead of daughters' earnings we use log family income and log couples' earnings as dependent variables.

After the exclusions, we end up with a sample of 3520 son/father pairs and 3995 daughter/father pairs. Tables 1 and 2 present the principal descriptive statistics of our sample of sons and daughters, respectively.

[12]This survey was designed to estimate consumption and weigh the different goods used in the consumer price index.

[13]For a detailed description of the distribution of the different characteristics in the main and supplemental samples, see Table A.3 in the Appendix.

4. Results

4.1. *Intergenerational Earnings Mobility for Sons*

In order to compare our results with the empirical literature on intergenerational mobility, we begin this subsection with the estimation of intergenerational earnings mobility for sons. We use a two-sample two-stage estimation, whose first step consists of the estimation of the paternal earnings regression using the supplemental sample; the results of this regression are presented in Table A.4 in the Appendix. Then, in the second step, using the coefficients of the permanent characteristics from the supplemental sample and the characteristics of the main sample, we impute permanent earnings for each father in the main sample.

Table 3 reports the second step, that is, the coefficients of the intergenerational regression between annual sons' earnings and the fathers' imputed earnings. In all columns, the father's predicted log earnings have a significant positive effect on child's earnings.

We estimate the elasticity for sons for different age ranges. The ranges considered are 30 to 40, 40 to 50, 30 to 50 (the whole sample), and a narrower range around 40 (those who are between 35 and 45). All the coefficients obtained are around 0.42 for all age specifications. We obtain a somewhat smaller elasticity for the younger sons. However we do not have enough information to know whether this is due to a change in the trend toward greater mobility or whether this is only a matter of age in the sense that when these young sons grow older they will become more correlated with their parents.

As explained above, the TSTSLS estimator of intergenerational elasticity could be under- or overestimated when the auxiliary variables are endogenous. In Table 4, as a sensitivity test, we present the results of using different variables to predict fathers' earnings. As shown in the table, the coefficients do not change much, all being around 0.43 for earnings and, as we expected, slightly higher for intergenerational income elasticity.

Having estimated our β for sons, it is not immediately evident whether the figure we obtain means high or low mobility. We can compare the figures with those reported in other studies. However, comparability between studies is problematic and very difficult since the estimates are sensitive to different factors, such as the income measure used, the adequacy of the database, the different

TABLE 3

Second Step: Intergenerational Regression in Annual Earnings in the Main Sample for Sons

	Sons 30–40	Sons 40–50	Sons 30–50	Sons 35–45
$\hat{\beta}$	0.39	0.46	0.42	0.44
	(0.043)	(0.043)	(0.031)	(0.040)
Obs.	1336	1324	2660	1501
R^2	0.06	0.09	0.08	0.08

Notes: The dependent variable is the log of annual labor earnings. The independent variable is the log of father's annual labor earnings. Standard errors (in parentheses) are corrected using the Murphy and Topel (1985) and Inoue and Solon (2010) procedures.

TABLE 4

INTERGENERATIONAL MOBILITY FOR SONS 30–50 USING DIFFERENT PREDICTING VARIABLES

	Model				
	1	2	3	4	5
$\hat{\beta}$	0.42	0.41	0.46	0.47	0.46
	(0.031)	(0.040)	(0.039)	(0.036)	(0.044)
Obs.	2660	2660	3520	3520	3520

Notes: Dependent variable: sons' earnings in Models (1) to (2) and sons' income in Models (3) to (5). Explanatory variable: fathers' earnings in Models (1) to (2) and fathers' income in Models (3) to (5). The set of precting variables are: Model (1) education and occupation; Model (2) education, ocupation, and geographical area; Model (3) education and occupation; Model (4) education, occupation, and activity situation; Model (5) education, occupation, activity situation, and geographical area.

criteria for sample selection, and the different estimation methods followed. Therefore, we must be careful and choose the studies that are most similar to ours in terms of choice of sample, using a two-sample approach.[14]

Fortunately, there are some studies that seem very close to our analysis because they use similar methodologies and sample selection rules, allowing us to make an international comparison. However, it is very important to take into account the possible biases arising from this method. Given the instruments used in the different studies, the elasticities would probably be upwardly biased. Therefore, the results can be seen to be upperbound in relation to intergenerational earnings mobility for the different countries.

One of these papers is Björklund and Jäntti (1997) for Sweden and the U.S., which finds an elasticity of 0.52 for the U.S. and 0.28 for Sweden. Likewise, Lefranc and Trannoy (2005) for France, find an elasticity of 0.40 for sons. Furthermore, Mocetti (2007) and Piraino (2007) show Italy to be a highly immobile society, where they find elasticities of around 0.50.

Intergenerational mobility in the U.K. has been extensively studied by several authors. In fact, together with the U.S., the U.K. has been one of the countries where it has been studied most, probably because of the existence of long panels and databases with retrospective information. Nicoletti and Ermisch (2007), applying the same methodology that we use, obtain elasticities ranging from 0.20 to 0.25 for sons. However, Dearden, *et al*. (1997) and Blanden *et al*. (2004, 2007), using different databases and specifications, find higher elasticities of around 0.5. Furthermore, in a more recent paper, Blanden *et al*. (2007) analyzing income persistence in Britain, find elasticities of around 0.50 and 0.33 for sons and in the region of 0.55 and 0.63 for daughters.

[14]For example, in the U.S., depending on the study considered, we can observe a wide range of elasticities, from 0.13 to 0.61. Solon (1999) provides an extensive survey of the U.S. results obtained in the 1990s and concludes that a reasonable guess of the intergenerational elasticity in long-run earnings for men in the U.S. is 0.4 or higher. This conclusion is obtained in studies using multi-year averages of father's and child's earnings, computed from panel data, as a measure of individual permanent income.

Evidence available for other countries and surveyed by Solon (2002) suggests a rather high degree of intergenerational mobility in Finland (Österbacka, 2001) and Canada (Corak and Heisz, 1999), where the elasticity is around 0.2 or lower. There is some empirical evidence for Germany (see Couch and Dunn, 1997) that expresses a similar correlation to the United States.

Overall, we find an intergenerational correlation for Spain that ranks between a group of more mobile societies, including the Nordic countries, Canada, and the U.K., if we consider Nicoletti and Ermisch's (2007) elasticities, and a group of less mobile countries, which includes the United States and Italy. We find an elasticity that is similar to France for sons.

Why does Spain have these degrees of persistence in earnings between parents and children?

First, it is important to note that in Spain, as in other Southern European countries, children leave the parental home at a very late age. Therefore, most of the school and occupation decisions are taken when they still live with their parents, something which reinforces the influence of parents on children. Aparicio-Fenoll and Oppedisano (2012) show how over the past three decades, Southern European countries have witnessed a sharp increase in the fraction of young people living with their parents.[15]

Second, strong persistence in occupations is a key factor in understanding Spanish intergenerational immobility. In Spain there is a strong correlation between the occupations of children and parents in comparison with other countries, as the study of Carabaña (1999) explains. Furthermore, Pablos and Gil (2011), comparing educational and occupational mobility in Spain, find that occupational immobility between parents and children is greater than education immobility, indicating that in Spain children have a high probability of "inheriting" their father's line of work.[16] Furthermore, in our sample we find that 51 percent of children have the same occupational category as their parents, unlike the percentage of children with the same educational level as their parents, which is 18.1 percent. Corak and Piraino (2011), in an analysis for Canada, find that 40 percent of young Canadians have the same occupational category as their parents.

Third, another element that reinforces intergenerational immobility in Spain is the large proportion of jobs that are filled through social referral. In a recent paper, Bachmann and Baumgarten (2013) compare the job search methods in different European countries and find that Latvia and the Mediterranean countries, except Portugal, are the countries that use more informal methods (friends and family) to search for a job compared to more formal methods (public employment offices, private employment agencies, interviews, competitions, etc.).[17] Why is that? Because the former countries have stronger family ties. For example, Bentolila and Ichino (2008) show that households affected by

[15]In 2010, almost 60 percent of young people in the 18–34 age bracket still lived in their parental homes in Italy, Spain, Portugal, and Greece, whilst that statistic is below 40 percent in France, the U.K. and the Netherlands, and as low as 20 percent in Norway, Sweden, and Finland.

[16]For men, this is mainly in occupations such as agriculture, operators, or manufacturers on the one hand and management positions at the other end. Instead, women have greater immobility in technical or administrative posts.

[17]At the other extreme they find countries like Germany, Belgium, and the Nordic countries, where formal methods are more important.

unemployment are more likely to receive financial support from their (extended) family in Italy and Spain than in Britain. The authors also suggest that in Mediterranean countries, family members are more likely to live in the same geographical area. In particular, Spain is a country that, despite having high unemployment rates and large differences in regional unemployment rates, has been characterized by low inter-regional mobility, as has been suggested in Bentolila (1997), Jimeno and Bentolila (1998), and Bover *et al.* (2002). Moreover, Wright *et al.* (2003), comparing regional mobility in the U.K. and Spain, find that inter-regional migration rates in the U.K. are around six times greater than in Spain. Even so, rates in the U.K. are probably not very high by international standards.

Finally, regarding the role of education, although education is an important factor in understanding the high persistence in all countries, we observe some elements in the Spanish education system that promote some degree of intergenerational mobility and perhaps explain why we observe more intergenerational mobility in Spain than in Italy. On the one hand, Spain, like the Scandinavian countries, is one of the European countries in which the separation of education in stages happens later: at the age of 16. This is recurrently cited in the literature as an element that improves intergenerational mobility.[18] On the other hand, public education in Spain has extended in recent decades. However, to really evaluate the effect of these circumstances on intergenerational mobility, we have to verify whether some children have benefited more from them. Furthermore, Güell *et al.* (2007) show how children born into richer families have benefited more.

4.2. *Intergenerational Earnings and Income Mobility for Daughters*

As explained above, the empirical literature on intergenerational earnings mobility has concentrated on the analysis of sons to avoid the employment selection problem. The increase in female participation in the Spanish worforce began in the late 1970s, but this participation is still lower than that of men. We can make the intuitive claim that full-time women workers are probably more common in some types of household (highly educated households or very poor households).

However, in this subsection we aim to provide some insight into the intergenerational earnings mobility of daughters. As we explained above, we deal with this selection problem following Chadwick and Solon (2002) and using log of family income or log of couple's earnings rather than daughter's individual earnings.

In Table 5 we reproduce the Chadwick and Solon (2002) approach and we estimate the elasticity between daughters' (using different dependent variables) and fathers' earnings. In order to compare these results, we repeat the same exercise for sons in Table 6.

In the first rows in Tables 5 and 6, we consider the log of family income as a dependent variable. In the second row, we restrict the sample to those who are married and we consider the log of the couple's combined earnings.

[18]For example, Mocetti (2007) points out the education procedure in stages and the early decisions that students have to take in Italy, as one possible explanation for the strong educational immobility in Italy.

TABLE 5

Intergenerational Elasticity for Daughters with Respect to Their Father's Earnings

Dependent Variable	Full Daughters Sample	Married Daughters
Log family income	0.386	0.384
	(0.028)	(0.033)
Log couple's earnings		0.497
		(0.044)
Sample size	3995	1904

Notes: Standard errors are corrected using the Murphy and Topel (1985) and Inoue and Solon (2010) procedures.

TABLE 6

Intergenerational Elasticity for Sons with Respect to Their Father's Earnings

Dependent Variable	Full Sons Sample	Married Sons
Log family income	0.404	0.388
	(0.027)	(0.032)
Log couple's earnings		0.565
		(0.042)
Sample size	3520	1940

Notes: Standard errors are corrected using the Murphy and Topel (1985) and Inoue and Solon (2010) procedures.

As we explained above, the interpretation of β is a little bit different from the β we obtained when we used individual earnings both as dependent and explanatory variable because incomes are less volatile than earnings and also are better predictors of permanent income. Furthermore, this new β can also be related to assortative mating.

Concretely, we present the results of the estimation of equation (5) by the TSTSLS estimator with different dependent variables and samples. We begin (in the first row, first column of Table 5) with the estimation of the elasticity of the daughter's family income with respect to her father's earnings for our full sample of 3995 daughters and we obtain an elasticity of 0.38. As shown in Table 6, for the full sample of 3520 sons, we find an elasticity of 0.40. Therefore, the elasticities between daughters' and fathers' earnings are slightly smaller than the sons' elasticity, but not statistically different.[19]

When we do the same, but considering only married daughters (first row, second column) with respect to paternal earnings in Table 5, we obtain a very similar elasticity of 0.384.[20] For sons we estimate an elasticity of 0.388. Again, the results obtained are very similar by gender.

[19]The t-ratio for the contrasts between these two coefficient is 0.46, so the contrast is not statistically significant at conventional significance levels.

[20]We consider married daughters as those who are legally married and those who live in a couple.

For married daughters and sons we also analyze the role of couples' earnings. Therefore, in the second row of each table we estimate the elasticity between earnings of couples (the log of the sum of the daughter's earnings and her husband's earnings) and paternal earnings. In this case, the elasticities increase to 0.50 for married daughters and 0.57 for married sons. The figure of 0.57 may seem relatively high compared to 0.50—higher mobility for daughters is also found in Chadwick and Solon (2002) and Ermisch *et al.* (2006)—but the t-ratio of 1.12 again prevented us from rejecting the null hypothesis of equal coefficients.

In Tables A.5 and A.6 of the Appendix, we present the same exercise using paternal income as an explanatory variable. Again we obtain results in the same direction.

5. Final Remarks

In this paper, we contribute to the empirical literature that has calculated the intergenerational mobility for different countries by estimating the earnings and income elasticity for Spain. Using the two-sample two-stage least squares estimator, we find elasticities for sons of around 0.42. Using the Chadwick and Solon (2002) approach and comparing the estimates for sons and daughters, our results suggest that elasticities for both genders are nearly the same.

Where does Spain fit into the larger picture of intergenerational mobility? In some ways, it lies in the middle. It is similar to France, lower than the Nordic countries and the U.K., and higher than the United States. Compared to other developed countries, Spain is relatively immobile, but it is more mobile than Italy, the only other southern European country for which we have evidence.

When analyzing the reasons why Spain has this degree of persistence in earnings between parents and children, we find that in Spain, as in other southern European countries, children leave the parental home at a very late age, which reinforces the influence of parents on children. Furthermore, there is strong persistence in occupations and many jobs are filled through social referral. Finally, although education is an important factor for explaining the high persistence of income in Spain, we observe some elements in the Spanish education system that promote some degree of intergenerational mobility and perhaps explain why we observe more intergenerational mobility in Spain than in Italy. On the one hand, Spain, like the Scandinavian countries, is one of the European countries in which the separation of education into stages occurs at a later age, 16. On the other hand, public education in Spain has been extended in recent decades.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table A.1: Comparison of the 30–50 years old sons' sample with parental information and sample without parental information

Table A.2: Intergenerational elasticity for 30–50 years old sons' by level of education and earnings

Table A.3: Distribution of father's education and occupation as well as coincidences between supplemental and main sample

Table A.4: First step: estimates of father's earnings equation with the supplemental sample

Table A.5: Intergenerational elasticity for daughters with respect to their father's income

Table A.6: Estimated intergenerational elasticity for sons and daughters with respect to their father's income