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Simona Comi

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Istituto di Economia dell'Impresa e del Lavoro
Facoltà di Economia
Università Cattolica del Sacro Cuore
Largo Gemelli, 1 - 20123 Milano

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Simona Comi

University of Milan
and
CRELI - Università Cattolica del Sacro Cuore
Via Necchi 5 20123 Milano
comi@statistica.unimib.it

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Abstract
This paper looks at the relation existing between family income, university enrolment and gender in Italy. Using the Bank of Italy SHIW I investigate the relationship existing between university enrolment decision and family income to see whether an almost free University system can really ensure equality of opportunity. Furthermore I investigate if family income effect is gender based and I find that there exists more inequality in education for females than for males. Using different estimation approaches to solve potential endogenenity bias, I find that family income plays a role in the enrolment decision and that its effect is bigger for female. Finally I model the probability to enrol in university conditional on the completion of high school and I find that family income has a bigger effect in high school completion, in particular for females.

JEL I2
Keywords: Education, Family income, Intergenerational mobility, Parental investment

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1. Introduction

Italy is one of the country with the lowest level of tertiary educated people in OECD countries. That's why in 2001 a reform[1] of the university system has been introduced to deal with the main problematic aspect of our tertiary education system: the huge number of student who finished university far longer than the legal duration (so called fuori corso). The reform introduced the so called "3+2" formula, 3-year undergraduate degree followed by a 2 year master degree and it had the aim of increasing the access to education, increasing the efficiency of the university system and reducing drop-out rate. This reform took place in a period of increasing university enrolment obtaining as effect to increase even more enrolment. As it can be seen by figure 1, from the 1987/88 the absolute enrolment in tertiary education increased for both males and females. After 1993, it slowed down for males and eventually started to decrease in 1996, while it continued to growth for females and slowed down only in 1996.

FIGURE 1 ABOUT HERE

A clear pattern emerges: the evolution over time has been gender based, females being the sex with a still growing enrolment rate. The same figure emerges for example for the US where Kervin and Ming-Ching, documented that "the gender difference in educational attainment had vanished by the early 1950 birth cohort and vanished ever since". As regard Italy, Pisati (2000) shows that during the last century gender inequality in education access disappeared and that women belonging to younger cohorts tend to participate in all levels of education more than men. According to Checchi (2003) instead, while raw data show that females are more likely to enrol in college, when you control for many family as well as personal characteristics, the probability of attending college is lower for female. Nobody has ever studied the differences in gender enrolment together with the family resources.

The role of family income in college enrolment decision has been deeply analysed in countries like US and UK were college tuition fees are relevant. The importance of family income in educational attainment has been assessed (see Haveman and Wolfe, 1995 for a review), but only recently economists have tried to deal with the

[11] for a detailed description of the reform see Checchi 2002

econometric problems of the empirical measure of this causality (Blau, 1999; Cameron and Heckman, 1998; Shea, 2000; Acemoglu and Pischke, 2001[2]).

Measuring the true casual effect of family income on children educational attainment has a relevant importance in designing educational policies. But in a country like Italy, where (public) university education is almost free and students pay very low fees, the relation between family income and education decision has been very seldom investigated. Notwithstanding the hypothetical equality of the Italian education system, real equality of opportunity seems far to be reached. In fact Italy turns out to be one of the most immobile countries in Europe (Comi, 2004) and Pisati, 2000 show that tertiary education attainment has risen but there has not been a convergence by social class and inequality in tertiary education seems to be growing over time. Figure 2 plots the average enrolment rate of young people holding an high school diploma by (equivalised) family income quintile and gender in Italy from 1989 to 2002 using the Bank of Italy SHIW. It is not clear to what extent the expansion of higher education seen in the recent years in Italy benefited people from higher or lower income background. In figure 2 there appears to be only a small difference in the enrolment rate by family income quintile, males showing a systematic difference in access between the first and the fifth quintile. What strikes more is that the enrolment rate of boys and girls whose family belongs to the lower quintile of the income distribution is very high around 47 percent on average.

FIGURE 2 ABOUT HERE

It is not so clear from these preliminary statistics which role family income plays in tertiary education enrolment decision in Italy but its effect is different across sexes and also lower income quintile families can afford university enrolment. In such a contest an increase of university fees, as it is recently been suggested (Perotti,2004), would probably discourage people from lower quintile of the income distribution and favour upper quintiles families. Given the importance of this issue, deeper analysis are required to precisely measure of the pure effect of money against other (correlated to money) factors. What emerges clearly from previous Italian studies it's that "family income seems to favour university attendance when parental education is excluded, but it changes sign as soon as we introduce it" (Checchi 2003). Parents education and family income are highly correlated and both depend on family unobservable

[2] see Plug and Vijverberg, 2001 and Blanden et alii, 2002 for a methodological review.

characteristics, for which it is not possible to control, and so the estimations suffer of many potential biases The potential endogeneity of family income has been studied abroad but nobody has done it for Italy. Finally, it has been well documented that families behave differently in passing income and education to their offspring's according to their gender (Comi, 2003) and I will look whether a systematic difference of importance of family income between daughters and sons exists.

2. Tertiary education enrolment decision, family resources and gender.

In order to have a better understanding of the empirical results, I briefly outline some relevant theoretical prescription from individual as well as family point of view. Individuals maximise their utility and the decision to invest in further education depends on whether benefits are higher than costs. As costs one should consider both direct as well as indirect (opportunity) costs. While benefits are both monetary and non – monetary. Family income matters when there are imperfect credit markets and one should experience some difficulties or higher costs if she wants to borrow some money to finance her investment in further education. So anything else equal and in a world with imperfect credit markets, an individual with less family resources could potentially be constrained and decide not to go to university. Male and female enrolment rate are different because they observe rewards in the labor market. In fact, returns to years of education, to level of education and to fields are different across sexes. (Brunello, Comi and Lucifora, 2000). In particular, yearly returns to education are often higher for women than for men and so anything else equal, women have a greater incentive to invest in further education.

Turning to family models, families maximize their utility allocating their resources between present consumption and offspring's investment in education. The basic model is Becker and Thomes, 1986. When we consider one child family, the decision is taken, again, comparing the (anticipated) costs and benefits of the investment. If they are credit constrained, family resources matter. And we observe differences among males and females because rational families precisely anticipate the differences in labour market conditions for their son or daughter and behave accordingly. Things are a little more complicated when we consider two (or more) children family. The gender wage differential in the labor market is anticipated by parents and affect the relative parental investments in human capital (exactly in the

same way of differences in endowment). But in this case also parental preferences play a crucial role. If they are Rawlsian (concerned only with equality) they devote the greater part of their resource to the child for whom the combination of relative wage differentials and endowments is worse until equality among the children is achieved. If they care equally about equality and efficiency, (Cobb-Douglas preferences case) the human capital investment is proportional to the gender wage differential. If parental concerns for efficiency are greater than those for equality, the investment in education increase gender wage inequality.

Another possible theoretical context to study gender differences in enrolment is provided by Kerwin and Ming-Ching (2002). In their model uncertainty about the future income play a crucial role and affect the decision of college enrolment. According to the authors, females of the younger cohorts have an higher tertiary educational attainment because college wage premium was greater for female (and this is a world wide common fact, see Dougherty (2003)) while the future earnings was more uncertain for male.

3. Data and estimation approaches

The data used in this paper are 7 waves of the Bank of Italy SHIW, a repeated cross-section of Italian households, from 1989 to 2002[3]. To address the issue of university enrolment I select a sample of Italian young boys and girls aged 19 to 24 that have already completed secondary school. Drop out from university can be a problem but it cannot be solved with the data I use. The higher rate of drop out is typically during the first years of university (Checchi, 2000). In my analysis I consider drop-out as if they never enrolled.

A child is enrolled if she declares to be a student[4], she is aged 19 to 24, she has finished high school and if she is coded as a child[5]. In Italy children tend to cohabit with their parents longer than in the rest of Europe (Iacovuo, 2000) and I am able to use on average 90 percent of the sample of children aged 19 to 24, which should exclude

[3] 1989-1991-1993 1995 1998 2000 and 2002

[4] Variable nonoc equal to 6 in waves from 1989 to 1998 and if apqual equal to 17 in waves 2000 and 2002

[5] I exclude household heads and spouses because information about father and mother education and age is available from 1993.

problems of sample selection. To get an overview of my samples, table A1 shows the means of the samples.

My interest in this paper is the casual link between tertiary education and family income, and I measure family income as log equivalised income (equivalised using the standard OECD scale)[6]

Following Blanden et alii (2002), I can assume that the decision to invest in further education is a function of family observed (parent education, family size birth order etc) and unobserved (parents and children ability) characteristics Z_{it} as well as of family income Y_{it} and of some indicator of the labour market condition, M_{it}

$$S_{it} = f(Z_{it}, Y_{it}, M_{it})$$

If you estimate directly the equation omitting Z:

$$S_i = \phi Y_i + \varepsilon_i \qquad [1]$$

You will get an upward biased ϕ because Y_i is a function of Z_i and the parameter suffers of omitted variable bias, given that the same characteristics that are likely to determine the investment decision affect family income and so $cov(Z_i, Y_i) \neq 0$. But if you control also for Z and estimate:

$$S_i = \gamma_i Z_i + \phi_i Y_t + \varepsilon_i \qquad [2]$$

ϕ will be bias again, this time due to unobserved heterogeneity, because there exist some family characteristics which are unobservable and affect income that now are in the error term. $cov(Y_i, \varepsilon_i) \neq 0$.

To deal with the econometric problem outlined, I will use three different approaches trying to measure the casual effect of family income on college enrolment decision.

4. Results

First of all I will estimate a classical probit and get a biased ϕ due both to the omission of variables and to unobserved heterogeneity to have some benchmarks for the other estimates. The enrolment decision is regressed on a set of family characteristics, like father and mother age, the number of sisters and brothers and on a set of personal

[6] The household head count 1, each adult (aged more than 13) 0,7 and each children 0,5.

characteristics such as gender, age, region of residence and if she lives in a big city. And then, in column (2) father and mother education are added. Table 1 shows the biased coefficients. In line with previous Italian studies, family income is positive and significant both for daughters and sons without parents' education and turns to negative when I add it. As Black and Sufi (2002) suggested, "this may be due to the idea that a "more successful" (i.e. higher income) less educated parent may suggest to a child that there is no need for education, as is the case with a "less successful" (i.e. lower income) well-educated parent"[7] As it can be seen, the dummy female is negative and decreases when I add family education: anything else equal, daughters are less likely to enrol than males. All the included variables have the expected signs in particular, the older you are and the higher the number of siblings the less likely you are enrolled.

TABLE 1 ABOUT HERE

The cohort approach.

As a first strategy to account for this potential bias, I follow the procedure used by Acemoglu and Pischke (2001) which exploits the change in income distribution to estimate how family income affects the investment in education decision. I aggregate data according to the quintile of family income distribution, gender, region and time and estimate the following model:

$$s_{igqjt} = \delta_g + \delta_q + \delta_j + \delta_t + \alpha_q r_{gjt} + \beta_{qg} \ln y_{igqjt} + \varepsilon_{igqjt} \qquad [3]$$

where s_{igqjt} is a dummy variable equal to one if the individual i of sex g who lives in region j, year t and quintile of (equivalised) family income distribution q who finished high school[8] is enrolled in college, $\ln y_{giqjt}$ is the log equivalised income of his family, r_{gjt} is the college wage premium for gender g in region j at time t measured as the average college high school gap among workers with 1-5 year of labor market experience[9] and ε_{iqjt} is an individual specific error term. Equation [3] can be aggregated across individual and becomes:

$$S_{gqjt} = \delta_g + \delta_q + \delta_j + \delta_t + \alpha_q r_{gjt} + \beta_{qg} \ln y_{qjt} + \varepsilon_{qjt} \qquad [4]$$

where S_{gqjt} is the fraction of students attending university of gender g, in region j ,income quintile q and time t and $\ln y_{gqjt}$ is the average income of families in region j,

[7] Black and Sufi (2002) pag 10.
[8] The same exercise has been run not condition on high school completion. The estimated effect of family income is even larger.
[9] divide by 5, the average lenght of college before the last reform, to have a yearly return

whose child if of gender g , income quintile q and time t . I will present results whit $\alpha_{qg}=\alpha_g$ and $\beta_{qg}=\beta_g$, and let the split coefficients in Appendix [10]. As a main difference from Acemoglu and Pische I always present estimation with a separate coefficient for males and females and include in each specification the percentage of father and mother with a tertiary degree. Sample means can be found in table A1 in appendix[11].

As explained, family income is potentially correlated with the error term as in equation [2] but controlling for the relative position in income distribution (i.e. introducing quintile dummies), which is a good measure of unobservable parents characteristics, reduces the bias. This procedure is very close to an IV estimation of equation [2] in which "identification is then achieved from the variations in $\ln y_{gqjt}$ conditional on this rank." (Acemoglu and Pischke, 2001)

In equation [4] time effect captures aggregate conditions like the 2001 reform and the return to college is allowed to vary by region and time, implying that individuals infer their future relative payoff observing their local labor market conditions.

FIGURE 3 ABOUT HERE

In Italy the evolution of earnings inequality has some distinctive features from other OECD countries. In fact, earnings differentials fell between the late 1970s and mid. 1980s and rose thereafter. But there is a wide consensus in the literature about the fact that starting from the early 80ties income inequality started to rise and it is still rising. I use the SHIW from 1989 to 2002. Figure 3 plots the distribution of the log equivalised real family income by quintile of all the family with children and it can be seen that all quintiles are rising while the first one decreased sharply up to 1993 and increased afterwards, but the resulting distribution is widening.

TABLE 2 ABOUT HERE

Table 2 shows the estimated coefficients of equation [4] in which I add progressively different dummies sets. The first four columns show estimation results without control for family income quintile, while the last four include such a control. Estimations without family income quintile controls are very stable and suggest that a 10 percent increase in family income causes an 8 percent increase in sons tertiary education enrolment and a 13 percent in daughter's. Family income is always more important in female enrolment decision than in male. When quintile dummies are added to control for the all the family unobserved characteristics that determine the relative

[10] Available upon request from the author
[11] See note 10.

family position in income distribution and I am able to isolate the true effect of income on enrolment, they double their coefficients. The return to college is never statistically significant and this seems to suggest that families and individuals do not care for returns to education in deciding whether to go to university or not or that there may exists other sources of incentives to invest in tertiary education. As expected, parents tertiary education plays a very important role in all the specifications. When I add all the second order time, gender, region and quintile interactions (column 4 and 8), the income effect estimation becomes less precise since I am eliminating much of the variation in the data.

From this approach I can conclude that family income plays an important role in college enrolment decision, and its effect is gender based.

The IV approach

A good instrument for family income is hard to be found because we would like a variable that is strongly correlated with family income but affect the enrolment decision of children only through its effect on income. Shea (2000) uses as instruments the union status and industry of parents aiming that working in a unionised firm as well as some particular industry generates an income differential but do not directly affect enrolment decision while Blunden et alii (2002) uses the changes in tax system as instrument for family income.

In line with previous Italian literature (Cappellari, 2003), I assume that second order intergenerational transmission of education is weak and that grand parents education and culture impact mainly on parents socio-economic status i.e. I use grand-parents education and region of residence at parents birth to instrument family income. Furthermore, I use as instrument a dummy indicating whether the house where the family live was inherited, because this do not affect directly the enrolment decision, but a family with an inherited house is able to save more money to afford tertiary education costs and this may reduce borrowing constraints. Information about grand-parents are available in the SHIW since 1995, so I restrict the period of this analysis to 1995-2000.

TABLE 3 ABOUT HERE

The quality of the instruments is tested by computing the F-statistics on the instruments in the log family income wage equation (Bound test). I estimate equation [2] separately on males and females and table 3 shows the results. As it can be seen (log equivalised) family income is negative and significant in the baseline estimation for female and almost zero and not statistical insignificant for male. The first stage for both

sexes (in column 2 and 5) seems to explain fairly well the log family income and the Bound test strongly reject that the instruments are all jointly insignificant. Column 3 and 6 show the IV probit estimates as outlined by Newey[12]. The estimated effect of family income on enrolment decision is positive for both sexes, greater for female and insignificant for male. According to this estimates, family income has a huge and positive effect on daughters enrolment decision. As argued by Blanden et alii (2002), IV estimates may still be upward biased because of the unobserved heterogeneity across families that is correlated with both family income and parents education.

Conditioning explicitly on high school completion

All the results presented so far are obtained conditioning implicitly on completion of high school because I estimate all the specification on the sub-sample of individual with an high school diploma. This hypothesis makes much more sense when high school is compulsory and only a minority drop-out of school. In 2000 in Italy only about 57 percent of boys and 70 percent of girls aged 19 to 24 held an high school diploma and disregarding gender, about 56 percent of them enrols in tertiary education and so the sample of high school graduated is a self-selected sample. I can try to control for this selection modelling the probability of finishing high school with an Heckman two steps procedure. Previous work by Cameron and Heckman (1998) suggests to control for selection estimating a dynamic model. To do so, one needs personal information for every steps of the education system, which is not available in a cross-section data like SHIW. The best I can do with my data is to correct for the probability of finishing high school.

To control for selection, I estimate a first step equation explaining the probability of getting an high school diploma h_i as a function of a set of familiar and personal characteristics X_i, letting the individual error term u_i being correlated with ε_i of equation [2], the correlation being $\rho=corr(\varepsilon_i, u_i)$:

$$h_i=\alpha_i+\beta X_i+u_i \qquad [5]$$

From this first stage, I compute the inverse Mill's ratio λ_{it} that will be added to equation [2] as regressor and estimated at the second stage. When modelling selection, one must be aware from where identification arises. For instrumental variables estimation I require variables that are correlated with family income, uncorrelated with

[12] The STATA routine for this estimation was freely available from Joe Harkness, John Hopkins University to whom I am very gratefull.

the error term, and do not affect the probability of enrol conditional on the included regressors, identification in sample selection is something different. Because the IMR is a non-linear function of the variables X_i included in the first-stage probit model, then the second-stage equation is identified — because of this non-linearity — even if Z=X. However, the source of identification is clearer if I have a variable in X that is not also included in Z. So I include as identifications variables, the individual region of residence to proxy local labor market condition as well as parents' region of birth to capture cultural habits.

TABLE 4 ABOUT HERE

Table 4 shows the results. The selection model is able to explain only female self selection and interestingly the estimated ρ are negative, i.e an increase in the probability to finishing high school decreases the probability to be enrolled. Family income turns out to be very important in determine female decision to finish high school while it have a negative coefficient in the second stage: once the high school diploma is achieved, family economic resources are no more crucial in deciding whether to continue. Parents education becomes even more important for university enrolment once I control for selectivity both for female and for male. Cameron and Heckman (1998) find that in the US family income play a more important role in finishing high school rather than on the decision to attend college conditional on high school completion, and the same pattern emerges also for Italy: family income is more important in deciding to finish high school than, once high school is completed, in deciding whether to go to university.

5. Overall importance of Socio Economic Status

I would like to sum up the evidence presented so far using a slightly different approach which can be helpful to get an overall measure of the relative importance of the Socio Economic Status (SES). Following Black and Sufi (2002) I define the Socio-Economic Status of a family according to the family propensity to send a child to university measured (estimating a probit and) predicting the probability that children aged 19 to 14 are enrolled in tertiary education on parents education, log equivalised family income, age and gender in every year. The sample was then divided in quintile according to this index (the predicted probability) which can be considered a measure of the overall SES. Table 5 shows the probit estimates in which I control for SES quintiles.

TABLE 5 ABOUT HERE

In the first column I estimate the usual specification for males and females together including quintiles dummies. All other variables have the expected signs and level of significance. As it can be seen by period dummies, anything else equal, university enrolment increased over time. The probability of enrol increases with SES of the family: switching from the first to the fifth quintile increases the probability to enrol of about 23 percent. In the second column I split the areas and quintiles coefficient for the two gender. Very interestingly, women are more likely to enrol in the South of Italy than in the North, while the reverse is true for males. Women show greater inequality than men. In particular a big difference in enrolment can be observed simply switching from the first SES quintile to the second, and the differential increases with SES quintile and is about 32 percent when comparing first and fifth quintile. For male, inequality is more compressed and there is no significant difference among the first three quintiles. switching from the first quintile to the fourth increases the probability to enrol by only 8 percent, and to the fifth by 22 percent.

6. Conclusion

In this paper I examined the relationship existing between family income and tertiary education enrolment decision. The analysis aims at finding also whether this casual link is different among sexes. Analysing the impact of a Socio economic index which depends both on parents education and on family income, I find that there is more inequality in tertiary education enrolment for females than for males.

From raw data, it seems that the enrolment decision do not depends by family income but more sophisticate approaches reveals that this is not fully true. In fact, aggregate analysis shows that family income have a positive effect on enrolment decision which is greater for female than for males. I then tried to instruments family income using grand parents education and region of residence at parents birth. I found a positive effect but significant only for females. This approach do not seems to be able to control for all the unobserved heterogeneity. Finally I conditioned the enrolment decision on the decision to finish high school and I find that the selection model is able to explain only female self selection. Family income turns out to be very important in determine (female) decision to finish high school while it have a negative coefficient in

the second stage: once the high school diploma is achieved, family economic resources are no more crucial in deciding whether to continue.

Finally using an overall index for Socio-Economic status which consider parents education and family income together, I find that females experience greater inequality than males.

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Table 1: Probit estimates of college enrolment conditional on high school completion. 1989-2002

(standard errors in parentheses with p<0.10=^, p<0.05 = ~, p<0.01 = *,)

# obs :	8299	8299
Depvar:	univ	univ
intcpt	14.348*	2.576*
	(2.623)	(0.371)
fem	-0.116	-0.171*
	(0.315)	(0.306)
mlinc	0.30*	-0.114~
	(0.047)	(0.050)
flinc	0.333*	-0.059
	(0.052)	(0.052)
eta	-1.389*	-0.132*
	(0.244)	(0.010)
city	0.148~	0.032
	(0.068)	(0.067)
faage	0.010	0.016~
	(0.005)	(0.006)
moage	-0.004	-0.008
	(0.006)	(0.006)
nsib	0.011*	-0.058*
	(0.024)	(0.024)
mocol		0.884
		(0.645)
mohs		0.163
		(0.462)
facol		0.959
		(0.506)
fahs		0.599
		(0.443)
Year dummies	YES	YES
Region dummies	YES	YES
Interact parents'edu and age	YES	YES
R-sq	0.045	0.121

Table 2 : Fixed Effect estimations of aggregate models of the probability of attending college for within 5 years from high school. 1989-2002

(standard errors in parentheses with p<0.10=^ p<0.05 = ~, p<0.01 = *)

Model :	WITHOUT QUINTILE EFFECTS				WITH QUINTILE EFFECTS			
# obs :	210	210	210	210	210	210	210	210
Depvar:	univ	univ	univ	univ	univ	univ	univ	univ
mlincome	0.073*	0.083*	0.083*	0.084*	0.097	0.178~	0.177^	0.234
	(0.018)	(0.017)	(0.017)	(0.017)	(0.085)	(0.090)	(0.090)	(0.174)
flincome	0.121*	0.129*	0.129*	0.130*	0.148	0.226~	0.225~	0.076
	(0.017)	(0.016)	(0.016)	(0.016)	(0.083)	(0.088)	(0.088)	(0.144)
mocol	0.296^	0.105	0.103	0.061	0.498*	0.346~	0.344~	0.258
	(0.155)	(0.155)	(0.155)	(0.162)	(0.149)	(0.152)	(0.152)	(0.167)
facol	0.310~	0.369*	0.371*	0.390*	0.587*	0.606*	0.608*	0.222
	(0.128)	(0.123)	(0.123)	(0.128)	(0.131)	(0.125)	(0.125)	(0.195)
return			0.107	0.214	0.132		0.110	
			(0.140)	(0.269)	(0.111)		(0.131)	
gender effects	YES	YES	YES	YES	YES	YES	YES	YES
region effects	YES	YES	YES	YES	YES	YES	YES	YES
time effects	NO	YES	YES	YES	NO	YES	YES	YES
Income quintile effect	NO	NO	NO	NO	YES	YES	YES	YES
region x time effect	NO	NO	NO	YES	NO	NO	NO	YES
income quintile time effect	NO	NO	NO	YES	NO	NO	NO	YES
gender x time effect	NO	NO	NO	YES	NO	NO	NO	YES
region x gender eff.	NO	NO	NO	YES	NO	NO	NO	YES
region x income quint. eff.	NO	NO	NO	YES	NO	NO	NO	YES
gender x income quint. eff	NO	NO	NO	YES	NO	NO	NO	YES
R-sq	0.621	0.668	0.669	0.717	0.681	0.718	0.719	0.84

Table 3: IV probit and probit estimate of enrolment decision by gender. 1995-2002

	Females			Males		
	Probit	first stage: ln family inc.	IVprobit	Probit	first stage: ln family inc.	IV Probit.
log family income	-.140~	-	.367~	.004	-	.121
	(.066)		(.222)	(.066)		(.212)
mother college	.027	-.377	.177	1.59^	.084	1.57^
	(.824)	(.281)	(.945)	(.918)	(.302)	(.938)
father college	.272	-.07	.443	.232	-.438	.282
	(.842)	(.266)	(.882)	(.795)	(.270)	(.821)
mother high school	-.968	-1.06*	-.512	.867	.041	.798
	(1.06)	(.335)	(1.12)	(1.01)	(.341)	(1.02)
father high school	.758	.025	.881	.245	.184	.216
	(1.009)	(.332)	(1.05)	(.960)	(.328)	(.978)
# siblings	-.110*	-.117*	-.044	-.039	-.140*	-.018
	(.040)	(.013)	(.049)	(.041)	(.014)	(.052)
age	-.152*	.011^	-.156*	-.139*	.017*	-.137*
	(.020)	(.006)	(.021)	(.019)	(.006)	(.020)
granpa college	-	.400*			.132*	
		(060)			(.053)	
granma college	-	.042			.144	
		(.157)			(.089)	
granpa high school		.095~			.056	
		(.041)			(.037)	
gramma high school		-.009			.060	
		(.055)			(.046)	
granpa noschool		-.105*			-.022	
		(.035)			(.034)	
granma noschool		-.043			-.138*	
		(0.34)			(.034)	
house inherited		-.027			.032	
		(.027)			(.027)	
father and mother age	yes	yes	yes	yes	yes	yes
interaction father and mother age and education	yes	yes	yes	yes	yes	yes
Live in a city	yes	yes	yes	yes	yes	yes
time dummies	yes	yes	yes	yes	yes	yes
region dummies	yes	yes	yes	yes	yes	yes
Bound test- p value		.000			.000	
Nobs	1888	1888	1888	1841	1841	1841
R2/PseudoR2	.142	.48		.123	.46	

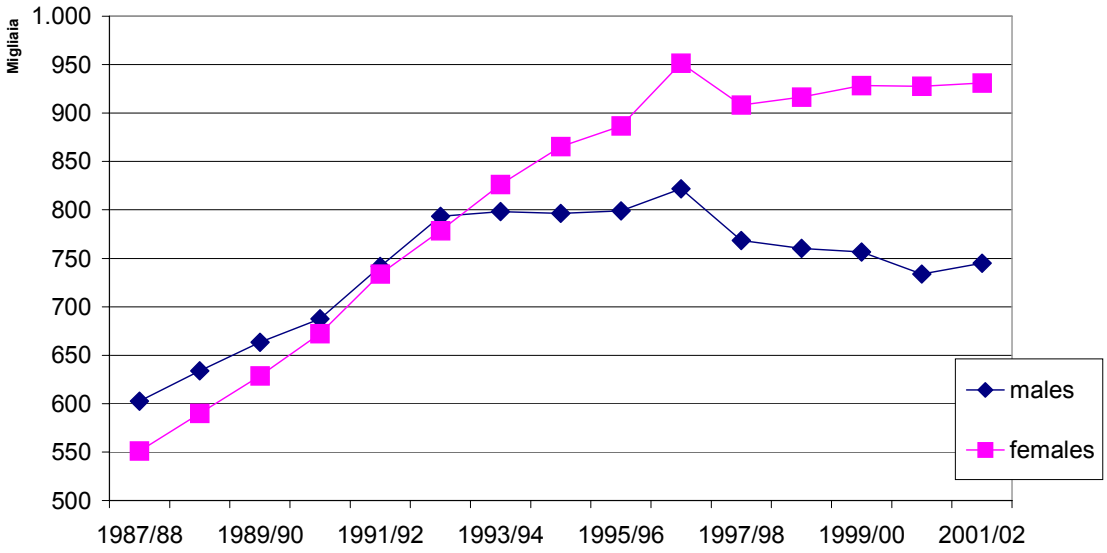
Table 4: Heckman two steps estimation of enrolment decision by gender. 1989-2002

	Males		Females	
	Probit	first stage:.	Probit	first stage.
log family income	-.120^ (.066)	.135* (045)	-.112* (.058)	-. 298* (.048)
mother college	.881* (.132)	.496* (.093)	.728* (.120)	.644* (.117)
father college	.582* (.221)	.963* (.083)	.589* (.130)	.710* (.095)
mother high school	.495* (.115)	.477* (.070)	.323* (.093)	.527* (.090)
father high school	.442* (.20)	.830* (.060)	.232~ (.107)	.647* (.077)
# siblings	-.056 (.040)	-.117* (.013)	-.033 (.031)	-.09* (.02)
age	-.125* (.020)	.098* (.011)	-.132* (.014)	.028* (.012)
Region of residence	-	.yes	-	.yes
Mother region of birth	-	.yes	-	.yes
Father region of birth	-	yes	-	yes
father and mother age	yes	yes	yes	yes
Live in a city	yes	yes	yes	yes
time dummies	yes	yes	yes	yes
region dummies	yes	yes	yes	yes
Rho		.068 (.460)		-.55 (.241)
Nobs	2675	6698	1579	5689

Table 5: University enrolment probit estimates with SES index. 1989-2002. Marginal effects

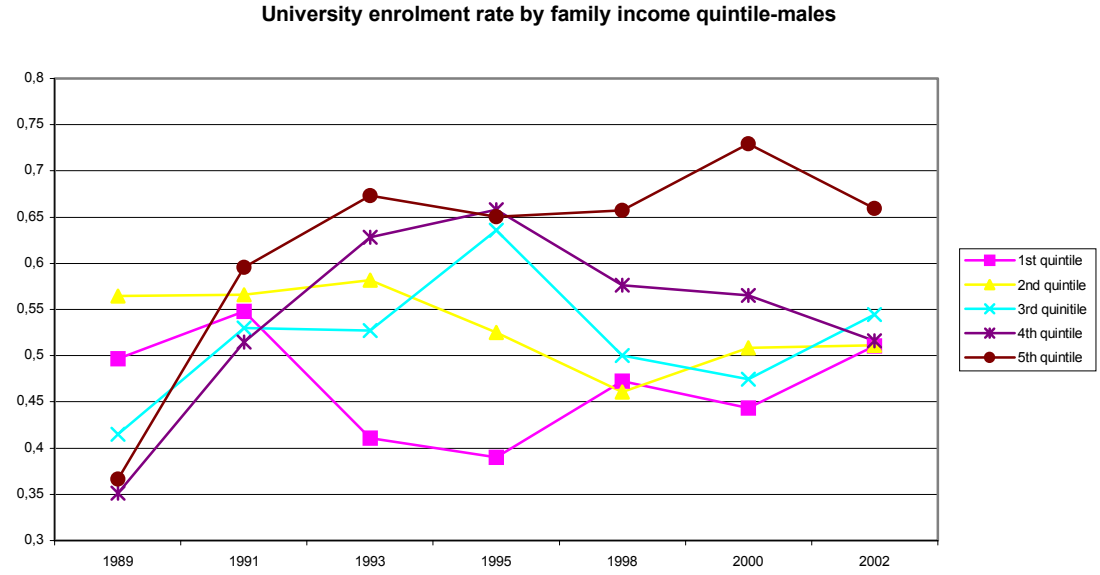
Female	-.266 (.216)	-.683* (.162)
log family income	-.054* (.019)	-.070* (020)
log family income*female	.029 (.023)	.064~ (.027)
mother college	.191* (.029)	.191* (.029)
father college	.116* (.032)	.117* (.032)
mother high school	.088* (.026)	.087* (.027)
father high school	.055 ~ (.028)	.057~ (.028)
Centre	-.009 (.020)	-
South	.012 (.019)	-
Centre*male	-	.002 (.028)
South *male	-	-.045^ (.025)
Centre*female	-	-.019 (.029)
South*female	-	.07* (.025)
Period 1993-1998	.07* (.017)	.07* (.017)
Period 2000-2002	.106* (.019)	.105 (.019)
Low/middle SES (2nd quintile)	.012 (.024)	-
Middle SES (3rd quintile)	.027 (.027)	-
Middle/high SES (4th quintile)	.097* (.033)	-
High SES (5th quintile)	.237* (.046)	-
Low/middle SES (2nd quintile) *male	-	-.004 (.027)
Middle SES (3rd quintile)*male	-	-.003 (.041)
Middle/high SES (4th quintile)*male	-	.080~ (.039)
High SES (5th quintile)*male	-	.233* (.047)
Low/middle SES (2nd quintile) *male	-	.142^ (.073)
Middle SES (3rd quintile)*male	-	.157~ (.074)
Middle/high SES (4th quintile)*male	-	.219* (.070)
High SES (5th quintile)*male	-	.325* (.066)
Age,Father and mother age, #sibling, whether he lives in a city	yes	yes
Nobs	8289	8289

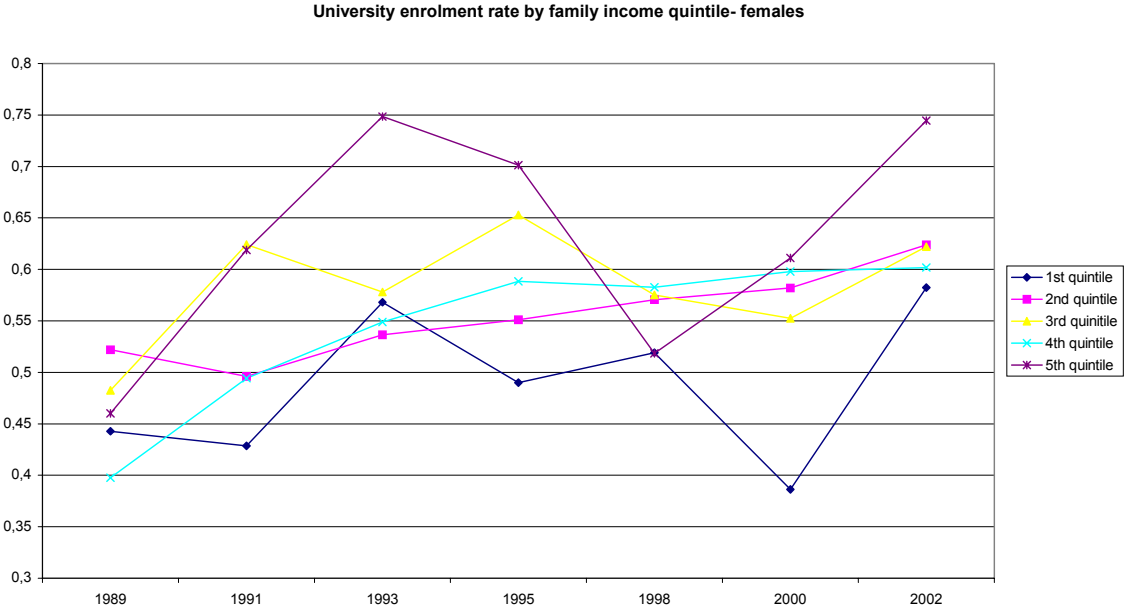
Figure 1 : Absolute enrolment in tertiary education by gender



Source: MIUR web site, 2004

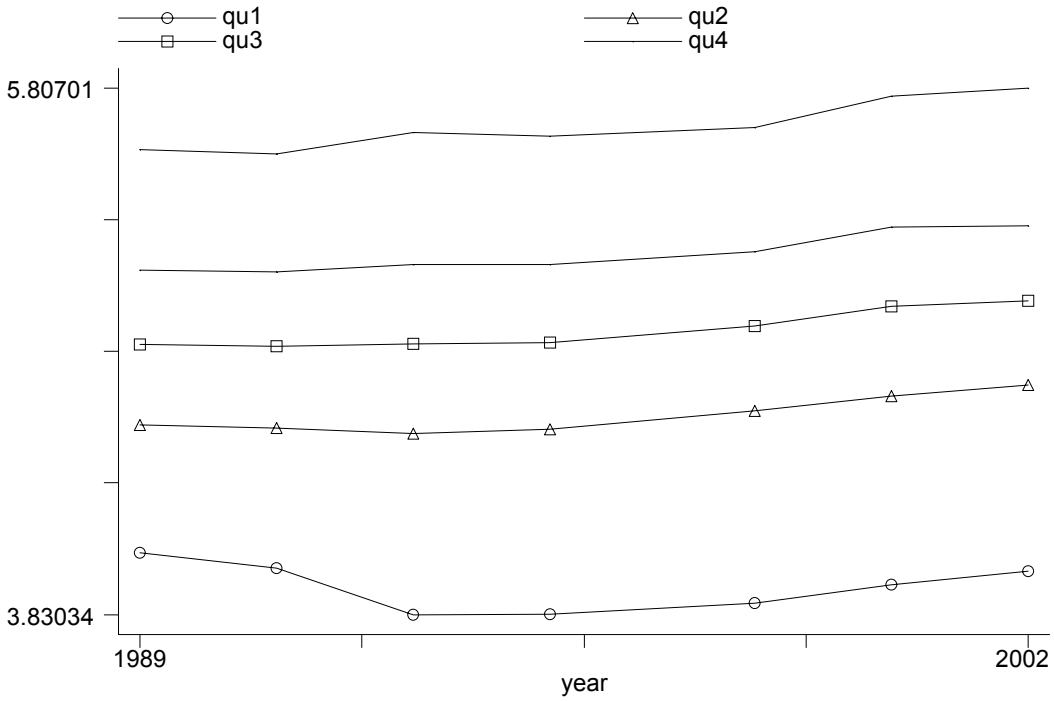
Figure 2: males and females enrolled by quintile of family income distribution.





Source: SHIW

Figure 3: evolution over time of equivalised family income distribution (quintile)



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