Università degli Studi di Bari
Dipartimento di Scienze Economiche e Metodi Matematici

Southern Europe Research in Economic Studies
S.E.R.I.E.S.

WORKING PAPER NO. 0030

Inequality of Opportunity in the Labour Market Entry of Graduates in Italy

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May 3, 2010

Abstract

The aim of the study is to test for equality of opportunity at the entry into the national labour market of Italian graduates. By using an Italian survey data on the transition from university to work, we focus on the probability to get a job within three years from the graduation, and we find significant differences across individuals with different family background. In an attempt to explain whether these differences reflect opportunity inequality, we adopt the Gomulka-Stern decomposition method. This method allows us to decompose differences in the probability to find a job between groups of people with different family background into two additive components. The first component can be attributed to differences between groups in the distribution of individuals' characteristics. The second component is a residual difference which can be attributed to opportunity inequality under the assumption that there is no unobserved heterogeneity between groups. In the presence of unobserved heterogeneity, this residual component gives us a biased estimation for the difference in probability explained by opportunity inequality.

JEL classification: D63, I2, C25
Keywords: Inequality of Opportunity, Higher Education, Gomulka-Stern Decomposition.

1 Introduction

The aim of this work is to test for equality of opportunity at the entry into labour market, and more precisely in the probability to find a job within three years from the graduation in Italy.

*I am especially grateful to Dr. Nicoletti for her encouragement, guidance and assistance. Thanks are also given to Prof. Peragine and Dr. Serlenga for their helpful suggestions and advices, and to participants at the Third Meeting of the Society for the Study of Economic Inequality, that was held in Buenos Aires in July 2009, for their useful comments. Remaining mistakes are my responsibility.

The basic idea of the Equality of Opportunity theory (EOp hereafter) is that individuals should be compensated for differences in outcomes due to characteristics for which they are not hold responsible (*circumstances*), while differences due to individuals' responsibility are considered "ethically acceptable" (for a more complete definition of EOp see Arneson R., 1989; Cohen G., 1989; Dworkin R., 1981a, 1981b; Rawls J., 1971; Roemer J., 1998; and Sen A., 1980). The most used approach to check for equality of opportunity consists in: *i)* divide the population into *types* according to their circumstances, and *ii)* checking whether there are differences in outcome between individuals who exert the same effort but belong to different types.

In this work we follow this common approach and divide new graduates into four types according to their family background (circumstances). But, contrary to the literature on EOp, we consider a different statistical method to check how much of differences in outcome between types is explained by inequality of opportunity. We adopt an extension of the Oaxaca-Blinder (1983) decomposition method[1] as proposed by Gomulka and Stern (1990). This method allows us to decompose differences in the probability to find a job (within three years from the graduation) between the four subgroups of the population, with different family backgrounds, into two additive components. The first component can be attributed to differences in the distribution of individual characteristics between the four subgroups. The second is a residual difference which can be attributed to opportunity inequality, under the assumption that there is no unobserved heterogeneity between the four groups. In the presence of unobserved heterogeneity, this residual component gives us a biased estimation of the proportion of differences in outcome explained by opportunity inequality[2].

A second difference with respect to the existing literature is in the outcome variable, which is usually the distribution of income or earnings. Clearly there are some exceptions, especially in the literature which focuses on equality of educational opportunities. For example, Bratti et al. (2008) analyze the impact of the expansion of higher education on the probability of obtaining an university degree for individuals with different family background. Other studies analyze the impact of family background on children schooling choices (Checchi et al., 2007). But also the literature on EOp in educational attainments uses the distribution of income (Checchi and Peragine, 2008; Peragine and Serlenga, 2008) or the distribution of scholastic achievements (Ferreira and Gignoux, 2009) as outcome variables, and neglects in this way the fundamental passage from school to the labour market. Here we test for EOp in (higher) educational attainment, but, as we said above, the outcome is the probability of being employed three years after the graduation. Testing for equality of opportunity at the entry into the labour market may help us also to verify if the education

[1] Blinder and Oaxaca developed a decomposition method to analyze wage differentials by using the classical regression method. Their decomposition technique is widely used to identify and quantify the separate contribution of groups differences in measurable characteristics, such as education, experience and marital status to racial and gender gaps in outcome.

[2] This concept will be better explained later on, when we introduce the decomposition method we use.

system plays its signaling role in the labour market and to understand how meritocratic the last is.

Assessing the meritocracy of the national labour market is especially of interest in the case of Italy, where about the 70 percent of new graduates declare they received help from relatives and/or friends to get their first job after graduation. Moreover, it seems worthwhile to test for EOp in a country, like Italy, with a low level of intergenerational mobility (Checchi et al. 2002, 2007a, 2007b), which is a concept strictly related to EOp. The rest of the paper is organized as follows: a brief review of the literature on the measurement of EOp is presented in section 2, together with a more complete definition of the concept of equality of opportunity; in section 3 we describe the decomposition method used to test for EOp; while data used and empirical and decomposition results are illustrated in sections 4 and 5; finally, section 6 concludes.

2 Inequality of Opportunity

2.1 Equality of Opportunity: definition

It is possible to define the Equality of Opportunity theory by comparing it with the Equality of Outcome (EO) theory. The difference between the two is in the answer to the following question: "equality of what?". The EO theory focuses on the equalization of individuals' outcomes, while the EOp theory is based on the so-called *"level the playing field"* ideal, which is on equalization of advantage and opportunity. This difference hides a deeper one, implied in the notion of *personal responsibility*. This concept is essential in the EOp theory, while it is absent in the EO theory, which doesn't hold individuals responsible for imprudent actions that may reduce the value of the outcomes they enjoy.

Initially, equality of opportunity was understood as the absence of legal bar in the access to education, to all position and jobs, and the fact that hiring was meritocratic. This way to define EOp was challenged firstly by Rawls (1971) and Sen (1980). They share the view that equality of opportunity requires compensating persons for a variety of circumstances whose distribution is morally arbitrary, but define equality in different ways. For Rawls it is attained when social class and family background do not affect people's opportunities for social position, whereas for Sen there is equality when the personal sets of functioning[3] are equals.

According to Roemer *"there is in the notion of equality of opportunity a "before" and an "after": before the competition starts opportunities must be equalized, ..., but after it begins, individuals are on their own."* (Roemer 1983, p.83). Thus, EOp levels the playing field in the sense of compensating persons for their deficits in circumstances.

[3] "Functionings represent part of the state of a person, in particular the various things that he or she manages to do or be in leading in life." (A. Sen, 1992, p.31) Sen calls a set of vectors of functionings a capability set, that is the combination of beings and doings that a person can achieve.

Summarizing, EOp is achieved when characteristics beyond individual control and for which they are not held responsible, do not prejudice the fulfilment of their objectives. According to this view individuals should be compensated for differences in outcomes due to characteristics for which they are not held responsible for (*circumstances*), while differences in outcomes related to characteristics under individual control (*effort*) are considered "ethically acceptable" and should not be compensated[4].

Several problems arise when we try to measure and evaluate EOp. The first one regards the definition of circumstances: which are the factors beyond individual control? Once an agreement on this issue is reached, another major issue remains: how can one observe and then measure individual's effort?

Roemer (1989) was the first one who tried to translate the philosophical idea of equality of opportunity into an economic framework, and to offer a solution to the problem related to the measurement of effort. He claims that there is equality of opportunity in a society when all those who exert the same degree of effort end up with the same outcome, regardless of their circumstances[5]. Thus EOp is reached when the *playing field* is levelled, meaning that people are compensated for their potential bad circumstances, so that only effort affects their outcomes.

2.2 Methods to measure EOp

In the last years several scholars presented different methods to measure opportunity inequality, by focusing on differences in income or earnings and, in some cases, in cognitive abilities. A common feature in this literature is the basic assumption that individuals' outcome is causally determined by a list of variables which is divided into two groups: characteristics for which they are not held responsible for (circumstances), and characteristics belonging to the sphere of individuals responsibility (effort).

As explained above, one of the difficulties arising in the evaluation of IOp consists in defining, and then measure, what constitutes circumstances and what effort.

As regard circumstances, the socioeconomic background is often used as a proxy for it, so we can say that it has been reached a kind of agreement in the literature. Agents' background is often measured by the education, income or occupational position of parents.

In particular, parents affect final individuals' achievements through different channels:

- provision of social connections;

[4] For a discussion about this topic see Arneson R., 1989; Choen G. A., 1989; and Dworkin R., 1981a, 1981b.

[5] He makes a distinction between the **level** and the **degree**of effort exerted by individuals. More precisely, he recognize that the level of effort an individual exerts could be affected by his circumstances, so he proposed to measure it by using the rank occupied by each individual in the outcome distribution of the type to which he belongs.

- formation of beliefs and skills in children, through family culture and investments;
- genetic transmission of native abilities;
- instillation of preferences and aspirations.

Depending on the channel one chooses to represent circumstances, different notions of EOp can be used. However, whatever the notion one decides to use, after this choice the population is divided into types, each one composed by individuals who share the same set of circumstances.

As regard effort, the first one who tried to give a solution to problems related to its measurement was Roemer (1989). He develops a statistical method to measure equality of opportunity which we can explain in the following. After dividing the population into types, according to individuals' circumstances, he derives the degree of effort exerted by each agent form the position they occupy in the outcome distribution of their own type. In this way, he affirms, it is possible to say that differences in outcome between individuals of different types, but in the same position of their own distribution, are due to inequality of opportunity. hence, according to the opportunity egalitarian ethic, differences within types have no influence on social welfare evaluation, only differences between types matter, particularly those between individuals in the same quantile of different types.

From a normative point of view the literature recently developed has shown that the concept of EOp can be disentangled into two distinct ethical principles: the **Compensation** and the **Reward** Principle. The former states that differences in outcomes due to characteristics beyond individuals' control should be compensated, as they are ethically unacceptable. The latter takes the view that differences due to characteristics on which individuals can exert a certain control have to be considered ethically acceptable and do not need any intervention. These two principles can be interpreted in different ways, giving rise to two approaches for the measurement of EOp: (i) the *ex-ante* approach and (ii) the *ex-post* approach, which differ also for the definition of EOp they use.

According to the ex-ante approach there is EOp if and only if all individuals face the same set of opportunities, regardless of their circumstances. In this case the Compensation Principle prescribes compensation for differences in the opportunity set faced by individuals, while the Reward Principle is intended as neutrality with respect to the outcome chosen by individuals from their opportunity sets. This approach looks at the opportunities offered to individuals and, consequently, focuses on differences between types.

For the ex-post approach EOp is achieved if and only if all those who have exerted the same degree of effort end out with the same outcome. Hence, the Compensation Principle is defined in terms of outcomes for individuals who exert the same effort, while the Reward Principle is intended as neutrality with respect to differences in outcome between groups of individuals with different degrees of effort. It follows that this approach is interested in inequalities within responsibility classes and, in order to measure EOp, the population is divided

in groups formed by individuals who have exerted the same degree of effort (*tranches*).

Within these two approaches it is possible to further distinguish the existing literature according to the method used for the measurement of EOp. In some cases EOp is tested by using the concept of stochastic dominance, as done in the studies of Lefranc et al. (2006a; 2006b) and Peragine and Serlenga (2008), both based on the ex-ante approach. There are then studies in which opportunity-egalitarian social welfare functions are used to obtain partial rankings of opportunity sets. Here we can find studies based on both the ex-ante (Peragine 2002, 2004a; Van de Gaer, 2003) or the ex-post approach (Peragine, 2004b). Finally, EOp can be measured by using inequality indices by which it is possible to obtain complete rankings of opportunity sets. In this case, when the ex-ante approach is used (Bourguignon et al., 2003; Checchi and Peragine, 2008; Ferreira and Gignoux, 2008; Pistolesi, 2008), overall inequality is decomposed into two parts, inequality between types, intended as opportunity inequality, and inequality within types, intended as effort inequality. When the approach used is the ex-post (Checchi and Peragine, 2008;Pistolesi, 2008) overall inequality is again decomposed into two components, the within tranche, intended as opportunity inequality, and the between tranche, intended as effort inequality.

3 Decomposition Method and Inequality of Opportunity

A way to measure inequality of opportunity is by adopting decomposition methods such as the Oaxaca-Blinder (1973) or the Gomulka-Stern (1990) method.

The first was developed by Oaxaca (1973) and Blinder (1973), and can be used to decompose differences in means of a continuous outcome (such as earnings or income) between two subgroups into two additive components. The first component reflects differences in the distribution of a set of controlled characteristics between two types, while the second is a residual component,which could reflect inequality of opportunity and/or unobserved heterogeneity. The Gomulka-Stern method (which gets its name from the first economists who applied it, Gomulka and Stern, 1990) is an extension of the Oaxaca-Blinder decomposition method adequate to decompose differences in the mean of a binary outcome (for example the probability of finding a job) between two subgroups.

Both methods are widely used in the non-discrimination literature. The Gomulka-Stern method, for example, has been used to study racial gap in self-employment rates (Fairlie, 2005), in female labour market participation rates (Yun, 2000) or in wage (Yun, 2007); to analyze gender differences in the probability of finding a job (Nielsen, 1998) or in the labour market participation rates (Booth et al. 1995); to study differences in job mobility patterns between countries (Heitmuller, 2004) or in school enrolment between different ethnic groups in India (Borooah and Iyer, 2005). But these methodologies are not used only in this literature. For example, Bourguignon et al. (2008) use a more general

version of the Oaxaca-Blinder decomposition method (they call it Generalized Oaxaca-Blinder) in order to compare income inequality in Mexico and in the United States.

We apply this method in order to test for inequality of opportunity at the entry into the labour market. More precisely, we check whether differences in the probability to find a job (within three years from the graduation) depend only on educational curricula and achievements of individuals or whether, instead, they depend also on their circumstances, proxied by family background.

3.1 Decomposition Method

In this section we describe how to test for inequality of opportunity in the probability of experiencing a specific event (in our empirical analysis the event is finding a job within three years from the graduation) by using the Gomulka-Stern decomposition method. The method proceeds in three steps:

1. dividing the population of individuals into four subgroups (*types*) with different circumstances (family background);

2. estimating a model for the probability of the specific event separately for each subgroup;

3. using the estimate from the second step to decompose the difference between types in the marginal probability, in the part due to differences in characteristics and in a residual part due to inequality of opportunity or unobserved characteristics.

Hereafter we will explain how to implement the above three steps when considering the probability to find a job within three years from the graduation (hereafter find a job). In this empirical case the population of interest is given by new graduates in a given year. Let T be a categorical variable defining different types of graduates based on their parental education (*circumstances*). In our empirical analysis we will divide the graduates in four types ($T = 1, 2, 3, 4$) by considering four levels of parental education (primary school, lower secondary school, upper secondary school, bachelor or higher degree). Let Y_{it} be a dummy variable taking the value one if the individual (new graduate) i belonging to type t find a job within three years from the graduation, and zero otherwise.

We assume that the outcome variable Y_{it} is equal to one if the latent variable Y_{it}^* (the unknown propensity to find a job) is positive, and it is 0 otherwise. We assume the following linear model for the propensity to find a job:

$$Y_{it}^* = Z_{it}\gamma_t + u_{it} \tag{1}$$

where Y_{it}^* is the latent variable, Z_{it} is a $k_m \times 1$ vector of characteristics, γ_t is a $k_m \times 1$ vector of parameters and u_{it} is a random error distributed as $N(0, 1)$.

If we denote with P_{it} the probability that the outcome variable is equal to one, and with $(1 - P_{it})$ the probability that Y_{it} is equal to zero,

$$E\left(Y_{it}\right) = P_{it} = \Phi\left(Z_{it}, \gamma_t\right) \tag{2}$$

where $E\left(Y_{it}\right)$ denotes the expected value and $\Phi\left(Z_{it}, \gamma_t\right)$ is the cumulative density function (CDF) from the standard normal distribution. Using the standard normal CDF it is possible to show that the following relationship between Y_t and P_t holds asymptotically:

$$\overline{Y_t} = \overline{\widehat{P}} = \overline{\Phi\left(Z_t, \widehat{\gamma}_t\right)} \tag{3}$$

where $\overline{Y_t} = \sum_{i=1}^{n_t} \frac{Y_{it}}{n_t}$ is the mean of the outcome variable in type t, $\overline{\widehat{P}}_t = \sum_{i=1}^{n_t} \frac{\widehat{P}_{it}}{n_t}$ is the average of the estimated probabilities, $P_{it} = \Phi\left(Z_{it}, \gamma_t\right)$ for individual i in type t, and $\overline{\Phi\left(Z_{it}, \widehat{\gamma}_t\right)} = \sum_{i=1}^{n_t} \frac{\Phi(Z_{it}, \widehat{\gamma}_t)}{n_t}$.

Differences of the average of computed probability between **type 1** and **type 2** $(\overline{Y}_1 - \overline{Y}_2)$ are given by

$$\left(\overline{Y}_1 - \overline{Y}_2\right) = \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_1\right)} - \overline{\Phi\left(Z_2, \widehat{\gamma}_2\right)}\right] \tag{4}$$

By adding and subtracting from the right hand side (RHS) of equation [4] the term $\overline{\Phi\left(Z_1, \widehat{\gamma}_2\right)}$ we obtain:

$$\overline{Y}_1 - \overline{Y}_2 = \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_1\right)} - \overline{\Phi\left(Z_1, \widehat{\gamma}_2\right)}\right] + \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_2\right)} - \overline{\Phi\left(Z_2, \widehat{\gamma}_2\right)}\right] \tag{5}$$

where the first term in brackets on the RHS represents the effect of a change in the value of the estimated coefficients, given the distribution of the explanatory variables, while the second represents the effect of a change in the distribution of the explanatory variables for given values of the coefficients. Roughly speaking, the second term represents differences in the probability to find a job due to a different distribution of individual characteristics between type 1 and type 2, while the first term represents the effect of different probit "coefficients" between the two types.

A similar procedure can be applied to decompose differences between **type 1** and **type 3**:

$$\overline{Y}_1 - \overline{Y}_3 = \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_1\right)} - \overline{\Phi\left(Z_1, \widehat{\gamma}_3\right)}\right] + \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_3\right)} - \overline{\Phi\left(Z_3, \widehat{\gamma}_3\right)}\right] \tag{6}$$

between **type 1** and **type 4**

$$\overline{Y}_1 - \overline{Y}_4 = \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_1\right)} - \overline{\Phi\left(Z_1, \widehat{\gamma}_4\right)}\right] + \left[\overline{\Phi\left(Z_1, \widehat{\gamma}_4\right)} - \overline{\Phi\left(Z_4, \widehat{\gamma}_4\right)}\right] \tag{7}$$

between **type 2** and **type 3**

$$\overline{Y}_2 - \overline{Y}_3 = \left[\overline{\Phi\left(Z_2, \widehat{\gamma}_2\right)} - \overline{\Phi\left(Z_2, \widehat{\gamma}_3\right)}\right] + \left[\overline{\Phi\left(Z_2, \widehat{\gamma}_3\right)} - \overline{\Phi\left(Z_3, \widehat{\gamma}_3\right)}\right] \tag{8}$$

between **type 2** and **type 4**:

$$\overline{Y}_2 - \overline{Y}_4 = \left[\overline{\Phi\left(Z_2, \widehat{\gamma}_2\right)} - \overline{\Phi\left(Z_2, \widehat{\gamma}_4\right)}\right] + \left[\overline{\Phi\left(Z_2, \widehat{\gamma}_4\right)} - \overline{\Phi\left(Z_4, \widehat{\gamma}_4\right)}\right] \tag{9}$$

and, finally, between **type 3** and **type 4**:

$$\overline{Y}_1 - \overline{Y}_3 = \left[\overline{\Phi\left(Z_3, \widehat{\gamma}_3\right)} - \overline{\Phi\left(Z_3, \widehat{\gamma}_4\right)}\right] + \left[\overline{\Phi\left(Z_3, \widehat{\gamma}_4\right)} - \overline{\Phi\left(Z_4, \widehat{\gamma}_4\right)}\right] \tag{10}$$

that are obtained in the same way we get equation [5].

What we are interested in are the first terms on the RHS of these equations. Under the assumption that there is no unobserved heterogeneity, they represent the part of differences in the probability to find a job due to inequality of opportunity. More in general, in the presence of unobserved heterogeneity this kind of decomposition allows us to estimate how much of the total differences is explained by differences among types in the distribution of the explanatory variables. The residual component can then represents differences in the probability of being employed due to differences in unobserved individuals' characteristics. Then our estimate can be a lower or an upper bound of IOp depending on the fact that the unobserved characteristics represent circumstances (lower bound) or effort (upper bound). As we do not know, and considering also that the unobservable variables could be a mix of effort and circumstances, if there is unobserved heterogeneity we obtain a biased estimation of IOp.

4 Data and Variable Description

4.1 Data

As we said before, the outcome variable is a dummy, indicating whether an individual has found a job within the first three years from the graduation. This probability differs for individuals belonging to different types, where each type is formed by individuals whose parents have the same education level. There are several channels through which parents can affect the outcome reached by their children, and the notion of equality of opportunity changes depending on which one of these channels is assumed to represent circumstances. Here we assume that the channels influencing the probability of finding a job after the graduation are two: (i) provision of social connections and (ii) instillation of preferences and aspirations. They represent what we call family background and are both proxied by the level of parental education, which we measure by the highest educational attainment in the couple of parents. According to this criterion the population is divided into 4 types: the first one is formed by individuals whose more educated parent has at the most a primary school degree; the second is formed by individuals whose more educated parent has a lower secondary school degree; in the third one there are those whose more educated parent has an upper secondary school degree; and, finally, the fourth

is formed by individuals who have one or both parents with a bachelor or an higher degree. We have 2,710 individuals in the first type, 5,143 in the second, 8,153 in the third and 5,976 in the fourth.

The data we use are taken from "Indagine sull'Inserimento Professionale dei Laureati (IIPL)", a survey on the transition from university to work of a representative sample of Italian graduates, conducted by ISTAT (Italian National Statistical Office) in 2004. This survey is conducted 3 years after the graduation, and the collection method is the C. A. T. I. (Computer Assisted Telephone Interview). The sample is composed by 26,006 individuals (47 percent men and 53 percent women) graduated in 2001 in all the Italian universities. The survey contains informations about the individuals' academic curricula, labour market experience in the 3 years after the graduation, household and individual informations.

We drop out from the sample individuals who, at the date of the interview, declare they are not interested in finding a job. Most of them declare they are not looking for a job because they are already engaged in formative activities. Anyway, at the end, the sample is reduced to 21,982 individuals (49.7% men and 50.3% women).

4.2 Variables Description

The outcome variable is a dummy indicating if an individual has found a job within three years from the graduation. Three years after the graduation 18,913 individuals, about the 86 percent of the whole sample, work.

The variables we use in the model are the following:

1. course programme (course programme attended by individuals);
2. additional qualification (1 if the graduate gets an additional qualification in the three years after the graduation, 0 otherwise);
3. mark [6];
4. institutional time (1 if the graduate received the degree in the institutional time established for the course programme he or she attended, 0 otherwise):
5. working student (1 if the individual worked while attending the university, 0 otherwise);
6. North[7] (1 if the current region of residence is situated in the Centre-North, 0 if it is in the South or in the islands);

[6] In the Italian universities the final mark ranges from 66 to 110, but more than the 70 percent of the population has a mark greater than 100.

[7] The variable "North" is equal to 1 if individuals live in one of the following regions: Piemonte, Valle d'Aosta, Lombardia, Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Liguria, or Emilia Romagna.

7. age[8];
8. country (1 if the individual would accept to move abroad in order to get a job, 0 otherwise);
9. city (1 if the individual would accept to move in another city in order to get a job, 0 otherwise).

The first group of variables (1-5) contains informations about the academic curricula and attainments of individuals, with information about the course programme chosen and the graduation mark. As regard the last, it does not represent a good indicator of individual's academic ability, as shown by Biggeri et al. (2001). The average mark is equal to 106, and the 26 percent of the population has a mark equal to 110. This is why we also use the variable institutional time, probably more proper when one wants to evaluate the academic ability of individuals. This variable is equal to one only if individuals received their degree in the institutional time established for the course programme they attended. The average institutional time is equal to one only for the 23 percent of individuals in the sample , and this percentage increases by 6 percentage points in the North, while falls to 18 percent in the Centre-South of Italy (see tables in the Appendix).

As regard the variable "course programme", we divide the population into seven groups on the basis of the course programme they attended: the first one includes individuals with a degree in Human Faculties (Literature, Psychology, etc.); the second includes individuals with a degree in Socioeconomic Faculties (Political Science, Statistics, Economics, etc.); the third one includes those individuals with a degree in Scientific Faculties (Chemistry, Biology, etc.); the fourth includes individuals with a degree in Engineering and Architecture; and, finally, the remaining three groups include, respectively, individuals with a degree in Medicine, Law or Sports Faculties.

These variables could be influenced by the parental level of education. The different distribution of final marks between types, for example, is in part visible when we look at descriptive statistics (see tables in the Appendix). The same happens if we look at the distribution of the variable "Institutional Time", or at those related to the course programme chosen by individuals with different family background.

Our intuition, supported also by previous studies (Checchi et al. op. cit), seems to be confirmed when we test whether there is independence between the variables in the first group (1-5) and the level of parental education. To test for independence we use the Chi-Squared statistics (Pearson's Test)[9]. The results allow us to reject the null hypothesis, i. e. that there is no correlation

[8] This variable is divided in 4 classes, it is equal to 1 if the individual is less than or equal to 24, it is equal to 2 if he is 25 or 26 years old, it is equal to 3 if hi is aged between 27 and 29, and, finally, it is equal to 4 if he is 30 years old or more.

[9] The Pearson's chi square can be used as a test of goodness of fit or as a test of independence, as we do here. In this case, it assesses whether a paired observations on two variables are independent of each other. The null hypothesis is that the occurrence of two outcomes is statistically independent. Each outcome is allocated to one cell of a contingency table,

between the first group of variables and the family background (see the Appendix). Nevertheless, we decide to use these as explanatory variables because we are interested in testing for inequality of opportunity at the labour market entry within three years from the graduation net to the effect family background exerted in earlier stages (i. e. on graduation mark, subject of the first degree and time taken to get the degree)[10]. So, variables related to individuals' academic curricula and attainments are used to obtain a measure of inequality of opportunity not affected by the influence exerted by the family background in a previous stage.

The second group of variable (6-10) provides other personal information about individuals in the sample, such as age and current area of residence. We decide to control also for them considering the effect of individuals' age on the probability of finding a job and the differences in the labour market between the North and the Centre-South of Italy.

The variable North is introduced to take into account differences in terms of economic development - which also affect the labour market - between northern and southern Italian regions. In fact, in 2004 the unemployment rate was around the 15 percent in the South and the 4,5 percent in the North (ISTAT, Rilevazione sulle Forze Lavoro, 2004). The correlation between the probability of finding a job and the current area of residence is confirmed also by the Chi-Square statistics (Pearson's Test). The result of this test (tab. 9) allows us to reject the null hypothesis of independence between the two variables. Given this result, after testing for equality of opportunity at a national level, we split the sample into two parts (Centre-North and South) according to individuals' area of residence and we conduct separate estimations in order to take into account the existence of regional disparities. Moreover, considering the differences between men and women in labour market participation, we conduct separate estimations for men and women.

5 Empirical Results

We begin our empirical analysis by testing whether there is independence between the probability of finding a job within three years form the graduation

according to the value of the two outcomes. The value of the test statistic is:

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{j} \frac{(O_{ij} - E_{ij})}{E_{ij}} \tag{11}$$

where r and c denotes, respectively, the number of rows and columns.

E: theoretical frequencies for a cell, given the hypothesis of independence;

O: observations, which in this case consists of the values of the two outcomes.

A chi-squared probability of less than or equal to .005 justify the rejection of the null hypothesis.

[10] The way in which to consider higher education is quite controversial. It could be argued that young adults should be held, at least partially, responsible for this kind of choice (subject of the first degree) or outcome (mark, etc.). Anyway, we do not consider these variables as a proxy for the level of effort as parental education could have an indirect impact on them.

and individuals' family background. We use the Chi-Squared statistic (Pearson's Test) which tests whether the two variables are independent. The Pearson's chi-square value is 66.3775 for women and 66.8032 for men, with a p-value of .000 for both. Therefore we can reject the null hypothesis of independence between the probability of finding a job and the level of parental education.

Given this result it is of interest to analyze inequality of opportunity in the probability of finding a job after the graduation across groups with different parental background, measured by parental education.

The probit equation was estimated by using the maximum likelihood (ML) method. After the estimation,we also compute marginal effects. As it is well known, in a binary choice model, like the one we use here, the estimated parameters do not represent the marginal effects (Greene, 2003). So we have to compute them separately, and in the probit model the computation of marginal effects is the following:

$$\frac{\partial E\left[Y \mid Z\right]}{\partial Z} = \phi\left(Z\gamma\right)\gamma \tag{12}$$

where ϕ is the standard normal density function. But in our case the independent variables are dummy, so the formula we have to use is:

$$\text{Marginal Effect } = \Pr\left[Y = 1 \mid \overline{Z}_d, d = 1\right] - \Pr\left[Y = 1 \mid \overline{Z}_d, d = 0\right] \tag{13}$$

where $\overline{Z}_d$ represents the mode of the other variables in the model, and d is the independent dummy variable for which we want to calculate the marginal effect.

5.1 Estimation Results

We estimate 8 probit models for the probability of finding a job, one for each type and separately for men and women. We use as explanatory variables the set of characteristics defined in section 4: six dummies for course programme in Human Faculties, Socioeconomic Faculties, Scientific Faculties, Medicine, Law and Engineering and Architecture (the reference category is "Sport Faculties"); a variable indicating the graduation mark, a variable indicating individuals' age when they get the degree and a dummy indicating if individuals get an additional qualification in the three years after the graduation; a dummy for individuals graduated without delays; a dummy for people working while attending the university; a dummy for people resident in the North of Italy; and two dummies which consider individuals' willingness to change country or city in order to get a job.

We check for the significance of the variables used in the model and we find that final mark has no impact on the probability of finding a job within three years from the graduation. The same is true for the variable indicating if individuals have an additional qualification. These results hold for each type and for both men and women, so we drop the two variables from final regressions.

In conclusion our model considers two groups of explanatory variables: a first group describing individuals' academic curricula and attainments (dummies for different types of course programme and time taken to get the first degree) and a second group capturing other socioeconomic features (age, working while attending the university, are of residence and willingness to move abroad or to change city in order to get a job).

After the partition of the population according to family background and gender, we compute coefficients and marginal effects for the entire country. All the variables indicating the course programme chosen by individuals are strongly significant, and all of them increase the probability of being employed within three years from the graduation (the reference category is "Sports Faculties"). As regard men, the impact is almost constant among types, with one exception: a degree in one of the Human Faculties increases the probability of being employed by the 8% for an individual in type 1 and by the 22% for one in type 4. As regard women, the impact of the course programme chosen on the probability of finding a job increases as the level of parental education increases. For example, a degree in Architecture increase the probability of being employed by the 27% (with respect to a degree in "Sports Faculties") for a women in type 1 and by the 41% for a women in type 4. Working while attending the university negatively affects the probability of being employed, for all types and for both men and women. In the first case, the impact of this variable "increases with types", in the sense that the higher the type to which individuals belong, the higher the influence of the variable (from -6% for type 1, to -12% for type 4), while the opposite happens for women (from -7% for women in type 1, to -3% for those in type 4).

Differently from what we would expect, willingness to move abroad or change city in order to get a job has a negative impact on the probability of being employed 3 years after the graduation, for both men and women, and for all types. While results about age at graduation and area of residence are in line with what we expected. The higher the age at graduation, the lower the probability of being employed three years later. The impact decreases as the level of parental education increases and is higher for women than for men (from -17% for men in type 1 to -8% for those in type 4, and from -19% for women in type 1 to -12% for those in type 4). The variable indicating individuals current area of residence has the same trend but opposite sign for men. For example, the probability of being employed is 13% higher for a men belonging to type1 who lives in the North of Italy than for one, belonging to the same type but living in the Centre or in the South. As regard women, the impact of the area of residence on the probability of finding a job increases with the level of parental education. Living in the North increases the probability of being employed by the 14% for a women belonging to type 4 and by the 12% for one belonging to type 1.

Tables from 3 to 6 report the result we get when we split the sample in two macroareas, North (tab. 3 and 4) and Centre-South (tab 5 and 6). Variables indicating the course programme chosen by individuals are still strongly significant, but not for women in type1, both in the North and in the Centre-South.

Working while attending the university has a negative impact on the probability of finding a job within three years from the graduation both in North and in Centre-South, even if here the variable is not statistically significant for women, whatever the type to which they belong.

Again, results about willingness to move abroad or to change city in order to get a job are different from what we would expect, as they have a negative impact on the probability of being employed, and their impact "increases with types", in the sense that the higher the type, the higher the impact of those variables, ad this hold for as for men as for women in both the macroareas, even if it is higher in the Centre-South.

Summarizing, the most significant coefficients, among those related to academic curricula and attainments, are those indicating the course programme chosen by individuals, and differences between types are visible when we look at the marginal effects associated to these variables. For example, with respect to a degree in "Sport Faculties", a degree in Economics increases the probability of finding a job within three years from the graduation by the 22% for a men belonging to type 1 and by the 29% for a men in type 4. As regard women, the same degree increases the probability of being employed by the 12% for a woman in type 1 and by the 39% for one in type 4. It seems interesting to notice that these results holds also when we split the sample into two macro-areas. The differences between the North and Centre-South emerge clearly when one looks at the marginal effects. Individuals with the same degree face different perspectives in the labour market, and these differences can be attributed not only to family background but also to area of residence. Individuals with the same degree have different probabilities of finding a job if they live in the North or in the Centre-South of Italy, even if they belong to the same type, that is if they have the same family background.

Time taken to get the first degree is significant at national level, but when we split the sample the result holds in the Centre-South but not in the North. More precisely, in the latter it is not significant for men in type 1 and 4 and for women in type 1 and 2. The most "surprising" results are those related to individuals willingness to move abroad or to change city in order to get a job. We expected these variables to have a positive impact on the probability of being employed within three years from the graduation, while this is not the case. The other results, about age and current area of residence, are in line with what we expected. Living in the North increases the probability of being employed, but it acts differently for men and women, the impact of the variable "decreases with type" for men (the probability is increased by the 13% for a men in type 1 and by the 8% for one in type 4), while the opposite happens for women (from 12% for a woman in type 1 to 14% for one in type 4).

Tab. 1: Italy: Coefficients Estimation & Marginal Effects (Men)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.
Work. Stu.	$-.168$	$-.063$	$-.251^{**}$	$-.083^{**}$	$-.365^{***}$	$-.111^{***}$	$-.368^{***}$	$-.120^{***}$
	(.109)	(.040)	(.081)	(.025)	(.061)	(.017)	(.064)	(.020)
Inst. Time	$-.351^{**}$	$-.137^{**}$	$-.462^{***}$	$-.169^{***}$	$-.273^{***}$	$-.092^{***}$	$-.226^{**}$	$-.078^{**}$
	(.136)	(.053)	(.090)	(.034)	(.077)	(.027)	(.079)	(.028)
Age	$-.462^{***}$	$-.176^{***}$	$-.361^{***}$	$-.125^{***}$	$-.308^{***}$	$-.099^{***}$	$-.242^{***}$	$-.080^{***}$
	(.057)	(.021)	(.042)	(.014)	(.035)	(.011)	(.037)	(.012)
Country	$-.360^{**}$	$-.141^{**}$	$-.604^{***}$	$-.225^{***}$	$-.684^{***}$	$-.244^{***}$	$-.822^{***}$	$-.303^{***}$
	(.114)	(.045)	(.084)	(.032)	(.065)	(.024)	(.075)	(.028)
City	$-.415^{**}$	$-.163^{**}$	$-.667^{***}$	$-.252^{***}$	$-.734^{***}$	$-.269^{***}$	$-.808^{***}$	$-.304^{***}$
	(.135)	(.053)	(.099)	(.038)	(.088)	(.034)	(.101)	(.039)
Hum. Fac.	.215	.080	$.523^{**}$	$.157^{**}$	$.691^{***}$	$.176^{***}$	$.870^{**}$	$.219^{**}$
	(.266)	(.096)	(.208)	(.052)	(.197)	(.037)	(.266)	(.045)
Economics	$.653^{**}$	$.228^{**}$	$.893^{***}$	$.256^{***}$	1.050^{***}	$.268^{***}$	1.188^{***}	$.294^{***}$
	(.257)	(.079)	(.200)	(.045)	(.191)	(.037)	(.261)	(.043)
Science	$.974^{***}$	$.314^{***}$	$.994^{***}$	$.275^{***}$	1.181^{***}	$.272^{***}$	1.105^{***}	$.272^{***}$
	(.261)	(.065)	(.199)	(.041)	(.191)	(.029)	(.260)	(.042)
Law	.321	.116	$.490^{**}$	$.147^{**}$	$.563^{**}$	$.149^{**}$	$.869^{**}$	$.221^{**}$
	(.300)	(.101)	(.226)	(.056)	(.205)	(.042)	(.268)	(.047)
Medicine	$.812^{***}$	$.259^{***}$	$.465^{**}$	$.140^{**}$	$.526^{**}$	$.140^{**}$	.373	.113
	(.273)	(.066)	(.215)	(.055)	(.197)	(.042)	(.259)	(.070)
Eng. & Arc.	1.207^{***}	$.408^{***}$	1.257^{***}	$.371^{***}$	1.491^{***}	$.396^{***}$	1.569^{***}	$.419^{***}$
	(.254)	(.071)	(.195)	(.047)	(.187)	(.040)	(.256)	(.052)
North	$.365^{***}$	$.138^{***}$	$.200^{**}$	$.069^{**}$	$.220^{***}$	$.070^{***}$	$.254^{***}$	$.084^{***}$
	(.087)	(.032)	(.065)	(.022)	(.053)	(.017)	(.060)	(.019)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

Tab. 2: Italy: Coefficients Estimation & Marginal Effects (Women)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.	C. E.	M. Eff.
Work. Stu.	−.195**	−.077**	−.201**	−.077**	−.108**	−.038**	−.087	−.033
	(.093)	(.036)	(.068)	(.025)	(.053)	(.019)	(.063)	(.024)
Inst. Time	−.401**	−.158**	−.056	−.022	−.317***	−.118***	−.180**	−.069**
	(.132)	(.051)	(.082)	(.032)	(.063)	(.023)	(.076)	(.029)
Age	−.485***	−.193***	−.341***	−.132***	−.344***	−.125***	−.311***	−.119***
	(.050)	(.019)	(.036)	(.014)	(.030)	(.011)	(.037)	(.014)
Country	−.465***	−.183***	−.509***	−.200***	−.713***	−.274***	−.856***	−.331***
	(.120)	(.045)	(.090)	(.035)	(.067)	(.026)	(.080)	(.029)
City	−.687***	−.265***	−.749***	−.292***	−.780***	−.300***	−.714***	−.278***
	(.112)	(.040)	(.078)	(.029)	(.065)	(.024)	(.085)	(.032)
Hum. Fac.	−.205	−.081	.844***	.299***	.431**	.148**	.829***	.283***
	(.281)	(.111)	(.228)	(.070)	(.156)	(.050)	(.200)	(.058)
Economics	.319	.125	1.191***	.400***	.749***	.239***	1.326***	.389***
	(.282)	(.109)	(.230)	(.061)	(.158)	(.044)	(.206)	(.040)
Science	.244	.096	1.173***	.373***	.828***	.254***	1.251***	.374***
	(.291)	(.112)	(.232)	(.053)	(.160)	(.040)	(.205)	(.042)
Law	.117	.046	.739**	.251**	.405**	.135**	.846***	.275***
	(.303)	(.119)	(.242)	(.067)	(.168)	(.051)	(.211)	(.054)
Medicine	−.250	−.099	.534**	.188**	−.000	−.000	.388*	.139*
	(.316)	(.124)	(.252)	(.077)	(.172)	(.062)	(.203)	(.067)
Eng. & Arc.	.757**	.276**	1.292***	.378***	1.089***	.305***	1.460***	.413***
	(.302)	(.093)	(.238)	(.043)	(.162)	(.032)	(.204)	(.036)
North	.307***	.121***	.308***	.119***	.409***	.147***	.394***	.149***
	(.084)	(.033)	(.060)	(.022)	(.048)	(.017)	(.059)	(.022)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

Tab. 3: North: Coefficients Estimation & Marginal Effects (Men)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	**M. E.**	**C. E.**	**M. E.**	**C. E.**	**M. E.**	**C. E.**	**M. E.**
Work. Stu.	$-.353^{*}$	$-.114^{*}$	$-.217^{*}$	$-.067^{*}$	$-.524^{***}$	$-.135^{***}$	$-.409^{***}$	$-.116^{***}$
	(.193)	(.057)	(.115)	(.034)	(.093)	(.021)	(.099)	(.026)
Inst. Time	$-.260$	$-.093$	$-.398^{**}$	$-.135^{**}$	$-.359^{***}$	$-.109^{***}$	$-.133$	$-.040$
	(.192)	(.070)	(.117)	(.041)	(.101)	(.032)	(.114)	(.035)
Age	$-.537^{***}$	$-.185^{***}$	$-.367^{***}$	$-.118^{***}$	$-.339^{***}$	$-.096^{***}$	$-.256^{***}$	$-.076^{***}$
	(.087)	(.029)	(.060)	(.019)	(.050)	(.014)	(.058)	(.017)
Country	$-.036$	$-.012$	$-.356^{**}$	$-.123^{**}$	$-.413^{***}$	$-.130^{***}$	$-.500^{***}$	$-.166^{***}$
	(.196)	(.069)	(.120)	(.043)	(.100)	(.034)	(.119)	(.043)
City	$-.297$	$-.108$	$-.644^{***}$	$-.235^{***}$	$-.572^{***}$	$-.192^{***}$	$-.548^{**}$	$-.188^{**}$
	(.241)	(.092)	(.160)	(.062)	(.141)	(.053)	(.168)	(.063)
Hum. Fac.	.585	.175	$.644^{**}$	$.169^{**}$	$.916^{**}$	$.179^{**}$	1.151^{**}	$.218^{**}$
	(.397)	(.100)	(.271)	(.056)	(.288)	(.035)	(.455)	(.046)
Economics	$.905^{**}$	$.253^{**}$	1.022^{***}	$.258^{***}$	1.134^{***}	$.244^{***}$	1.425^{**}	$.282^{**}$
	(.386)	(.083)	(.263)	(.050)	(.281)	(.045)	(.452)	(.055)
Science	1.307^{**}	$.317^{**}$	1.145^{***}	$.274^{***}$	1.259^{***}	$.239^{***}$	1.286^{**}	$.252^{**}$
	(.403)	(.062)	(.262)	(.044)	(.281)	(.034)	(.450)	(.052)
Law	.570	.165	.433	.120	$.695^{**}$	$.146^{**}$	1.273^{**}	$.226^{**}$
	(.456)	(.105)	(.316)	(.073)	(.304)	(.043)	(.464)	(.040)
Medicine	1.291^{**}	$.289^{**}$	$.584^{**}$	$.154^{**}$	.458	.108	.524	.131
	(.400)	(.049)	(.274)	(.056)	(.280)	(.054)	(.443)	(.090)
Eng. & Arc.	1.479^{***}	$.429^{***}$	1.259^{***}	$.343^{***}$	1.547^{***}	$.359^{***}$	1.825^{***}	$.418^{***}$
	(.386)	(.091)	(.256)	(.058)	(.273)	(.052)	(.444)	(.078)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

Tab. 4: North: Coefficients Estimation & Marginal Effects (Women)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.
Work. Stu.	$-.484^{**}$	$-.172^{**}$	$-.486^{***}$	$-.158^{***}$	$-.204^{**}$	$-.062^{**}$	$-.217^{**}$	$-.072^{**}$
	(.164)	(.053)	(.115)	(.033)	(.084)	(.024)	(.100)	(.032)
Inst. Time	$-.377^{**}$	$-.145^{**}$	$-.154$	$-.055$	$-.354^{***}$	$-.115^{***}$	$-.361^{***}$	$-.126^{***}$
	(.177)	(.069)	(.108)	(.039)	(.087)	(.029)	(.113)	(.040)
Age	$-.469^{***}$	$-.176^{***}$	$-.413^{***}$	$-.146^{***}$	$-.401^{***}$	$-.126^{***}$	$-.346^{***}$	$-.118^{***}$
	(.074)	(.028)	(.053)	(.018)	(.046)	(.014)	(.061)	(.020)
Country	$-.008$	$-.003$	$-.138$	$-.050$	$-.632^{***}$	$-.225^{***}$	$-.804^{***}$	$-.302^{***}$
	(.187)	(.070)	(.141)	(.052)	(.098)	(.037)	(.126)	(.048)
City	$-.218$	$-.084$	$-.562^{***}$	$-.214^{***}$	$-.591^{***}$	$-.210^{***}$	$-.554^{***}$	$-.206^{***}$
	(.217)	(.085)	(.131)	(.051)	(.106)	(.040)	(.142)	(.055)
Hum. Fac.	$-.405$	$-.155$	$.752^{**}$	$.238^{**}$	$.439^{**}$	$.128^{**}$	1.159^{***}	$.316^{***}$
	(.385)	(.148)	(.304)	(.083)	(.211)	(.056)	(.332)	(.070)
Economics	.170	.063	1.154^{***}	$.339^{***}$	$.699^{**}$	$.187^{**}$	1.761^{***}	$.372^{***}$
	(.386)	(.140)	(.306)	(.070)	(.216)	(.047)	(.346)	(.041)
Science	.092	.034	1.118^{***}	$.310^{***}$	$.846^{***}$	$.212^{***}$	1.519^{***}	$.343^{***}$
	(.401)	(.147)	(.311)	(.061)	(.219)	(.041)	(.341)	(.046)
Law	$-.126$	$-.048$	$.943^{**}$	$.254^{**}$	$.533^{**}$	$.141^{**}$	1.191^{***}	$.278^{***}$
	(.434)	(.168)	(.330)	(.060)	(.236)	(.050)	(.353)	(.049)
Medicine	$-.504$	$-.197$	.461	.144	$-.158$	$-.052$	$.685^{**}$	$.191^{**}$
	(.426)	(.167)	(.331)	(.089)	(.232)	(.079)	(.338)	(.073)
Eng. & Arc.	$.764^{*}$	$.246^{*}$	1.113^{***}	$.292^{***}$	$.965^{***}$	$.230^{***}$	1.734^{***}	$.379^{***}$
	(.430)	(.109)	(.316)	(.053)	(.218)	(.036)	(.335)	(.043)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

Tab. 5: Centre - South: Coefficients Estimation & Marginal Effects (Men)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	**M. E.**	**C. E.**	**M. E.**	**C. E.**	**M. E.**	**C. E.**	**M. E.**
Work. Stu.	$-.079$	$-.031$	$-.282^{**}$	$-.100^{**}$	$-.238^{**}$	$-.083^{**}$	$-.369^{***}$	$-.132^{***}$
	(.137)	(.054)	(.114)	(.039)	(.084)	(.028)	(.086)	(.030)
Inst. Time	$-.522^{**}$	$-.204^{**}$	$-.573^{***}$	$-.221^{***}$	$-.134$	$-.048$	$-.319^{**}$	$-.119^{**}$
	(.206)	(.077)	(.146)	(.057)	(.122)	(.045)	(.113)	(.043)
Age	$-.396^{***}$	$-.157^{***}$	$-.370^{***}$	$-.136^{***}$	$-.276^{***}$	$-.098^{***}$	$-.214^{***}$	$-.077^{***}$
	(.077)	(.030)	(.062)	(.022)	(.049)	(.017)	(.050)	(.018)
Country	$-.571^{***}$	$-.223^{***}$	$-.839^{***}$	$-.322^{***}$	$-.891^{***}$	$-.336^{***}$	-1.050^{***}	$-.397^{***}$
	(.146)	(.054)	(.120)	(.045)	(.088)	(.033)	(.098)	(.035)
City	$-.484^{**}$	$-.190^{**}$	$-.708^{***}$	$-.273^{***}$	$-.846^{***}$	$-.324^{***}$	$-.973^{***}$	$-.373^{***}$
	(.165)	(.063)	(.127)	(.048)	(.113)	(.043)	(.129)	(.046)
Hum. Fac.	$-.347$	$-.137$	.315	.108	.453	.144	$.722^{**}$	$.216^{**}$
	(.376)	(.146)	(.335)	(.107)	(.277)	(.077)	(.335)	(.077)
Economics	.241	.095	$.705^{**}$	$.230^{**}$	$.960^{***}$	$.287^{***}$	1.059^{**}	$.304^{**}$
	(.358)	(.139)	(.322)	(.090)	(.266)	(.063)	(.326)	(.067)
Science	.526	.201	$.777^{**}$	$.249^{**}$	1.083^{***}	$.299^{***}$	1.045^{**}	$.296^{**}$
	(.357)	(.128)	(.319)	(.085)	(.267)	(.052)	(.325)	(.065)
Law	$-.114$	$-.045$	.400	.135	$.469^{*}$	$.148^{*}$	$.660^{**}$	$.204^{**}$
	(.409)	(.163)	(.345)	(.104)	(.283)	(.077)	(.334)	(.084)
Medicine	.199	.078	.286	.098	$.732^{**}$	$.208^{**}$	.335	.113
	(.390)	(.150)	(.353)	(.113)	(.294)	(.061)	(.326)	(.101)
Eng. & Arc.	$.763^{**}$	$.290^{**}$	1.178^{***}	$.379^{***}$	1.436^{***}	$.432^{***}$	1.443^{***}	$.430^{***}$
	(.351)	(.123)	(.315)	(.084)	(.263)	(.062)	(.320)	(.073)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

Tab. 6: Centre - South: Coefficients Estimation & Marginal Effects (Women)

Variables	Type 1		Type 2		Type 3		Type 4	
	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.	C. E.	M. E.
Work. Stu.	−.096	−.038	−.060	−.024	−.063	−.024	−.009	−.003
	(.117)	(.046)	(.088)	(.035)	(.071)	(.027)	(.083)	(.033)
Inst. Time	−.507**	−.189**	.060	.024	−.268**	−.106**	−.026	−.010
	(.212)	(.072)	(.131)	(.052)	(.093)	(.037)	(.104)	(.041)
Age	−.498***	−.197***	−.269***	−.107***	−.293***	−.115***	−.288***	−.114***
	(.069)	(.027)	(.051)	(.020)	(.041)	(.016)	(.048)	(.019)
Country	−.793***	−.283***	−.785***	−.294***	−.774***	−.299***	−.898***	−.338***
	(.166)	(.050)	(.121)	(.039)	(.094)	(.033)	(.105)	(.034)
City	−.879***	−.318***	−.895***	−.336***	−.888***	−.341***	−.774***	−.296***
	(.133)	(.042)	(.098)	(.033)	(.083)	(.029)	(.107)	(.037)
Hum. Fac.	−.092	−.036	.810**	.309**	.298	.115	.458*	.178*
	(.430)	(.169)	(.360)	(.125)	(.238)	(.090)	(.267)	(.099)
Economics	.403	.159	1.137**	.418**	.657**	.242**	.901***	.326***
	(.432)	(.169)	(.363)	(.113)	(.241)	(.080)	(.272)	(.083)
Science	.362	.143	1.092**	.390**	.671**	.243**	.926***	.333***
	(.442)	(.173)	(.364)	(.104)	(.243)	(.078)	(.272)	(.082)
Law	.253	.100	.493	.191	.198	.076	.479*	.184*
	(.451)	(.179)	(.376)	(.137)	(.251)	(.095)	(.277)	(.100)
Medicine	−.014	−.005	.503	.193	.016	.006	.031	.012
	(.497)	(.196)	(.403)	(.143)	(.264)	(.103)	(.271)	(.107)
Eng. & Arc.	.744	.285	1.339***	.437***	1.067***	.350***	1.154***	.394***
	(.456)	(.159)	(.375)	(.080)	(.249)	(.060)	(.274)	(.070)

*** significant at the 1%; ** significant at the 5%; * significant at the 10%

5.2 Decomposition Results

Results of the decomposition analysis are presented in tables 7 (Italy), 8 (North) and 9 (Centre-South). When we apply the decomposition method we do not consider the variables we drop in the estimation of the probability of finding a job (mark and additional qualification).

We first consider the entire country. The most disadvantaged individuals, in terms of observed differences in the probability of finding a job within three years from the graduation, are those in type 1. For example, the difference between type 1 and type 3 is about 12 percentage points, both for men and for women, while differences between the others types are significantly lower.

Differences between type 1 on one side and type 3 and 4 on the other are explained for one half by a different distribution of individuals characteristics, and this is true both for men and for women. Women appear more disadvantaged when we consider differences between the other types. In all these cases,

the portion of differences in the probability of finding a job explained by what we call "differences in coefficients" is more than one half for women, while for men this happens only when one looks at differences between type 3 and type 4.

When we split the sample the results are slightly different. In the North (tab. 8) IOp is higher for women than for men, except when we consider differences between type 1 and type 2, which are almost equal. In all other cases, more than one half of the differences between types is due to IOp. As regard men, we have that the great part of the difference in the probability of being employed within three years from the graduation is explained for more than one half by a different distribution of individual characteristics among types. In the Centre-South (tab. 9) IOp is higher for men than for women, even if the difference is not so great, except when we consider differences between type 1 and type 4 (the percentage of the difference explained by IOp is, respectively, 57% for men and 27% for women).

Summarizing, at national level the most disadvantaged individuals, in terms of probabilities of finding a job within three years from the graduation, are those in type 1. Most of the differences in the probability of being employed between the lowest type and all the others are explained by what is called "differences in coefficients" which, in absence of unobserved heterogeneity, in our interpretation represents IOp. Looking at differences between type 1 on one side and type 2, 3 and 4 on the other we can notice that there are not significant differences between men and women. While if we consider differences between type 2 and 3 and type 2 and 4, then women suffer a greater level of opportunity inequality.

At regional level, we observe a greater level of IOp for women than for men in the North, only differences between type 1 and type 2 are almost equal, while we get the opposite results in the Centre-South.

We should remind that the decomposition method we use permit us to correctly quantify IOp only under the assumption that there is no unobserved heterogeneity. If it is not the case, part of the observed differences in coefficients may be explained by the fact that we do not control for all possible variables determining the probability of finding a job. Nevertheless it seems reasonable to conclude that at least part of the difference in coefficients is attributable to the presence of opportunity inequality in the Italian labour market. Our results show that the family background does not exert its effect just through favouring the educational attainment of individuals or through the instillation of preferences and skills. This is because we observe differences between types in the probability of finding a job even if we control, for example, for the course programme chosen by individuals. It is more probable that, in this case, parents affect the outcome of their children through the provision of social connection, that is, it seems reasonable to assume that social connections are "greater" or "better" for individuals in type 3 or 4 than for those in type 1 or 2.

In conclusion, our first regressions show a scarcely meritocratic labour market, where the final mark or other academic individuals' ability, seems to have no impact on the chance one have to be employed after the graduation. And this result hold in the North as well as in the Centre-South of Italy.

When we consider differences in the probability of being employed between men and women, we find that great part of these differences are explained, for men, by a different distribution among types of individuals' characteristics, while the opposite happens for women, i. e. IOp is higher for women than for men.

But when we compare the results between the two macroareas, we find that IOp is higher in the Centre-South than in the North, but only for men. We find that most of the differences between types are attributable to inequality of opportunity, and that the most disadvantaged individuals, in terms of probability of being employed, are those with a poorer family background, i. e. those in type 1 and 2. It seems that the role exerted by parents on final achievements of their children is not limited to the formative years of individuals, when it is reasonable to assume that parents influence the choice of the pupils. The family background seems to play an important role also later on, probably, as we suppose, through the provision of social connections. It seems a reasonable assumption when we consider that about the 75% of individuals in the whole sample declare they were helped in find a job by relatives or friend.

Tab. 7: Decomposition Results (Italy)

	Diff. in Char.		**Diff. in Coeff.**		**Total**	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Type 1-Type 2	−.0302	−.0459	−.0513	−.0163	−.0815	−.0623
	(37.05%)	(73.67%)	(62.95%)	(26.33%)	(100.00%)	(100.00%)
Type 1-Type 3	−.0639	−.0603	−.0534	−.0631	−.1173	−.1234
	(54.47%)	(48.86%)	(45.53%)	(51.14%)	(100.00%)	(100.00%)
Type 1-Type 4	−.0551	−.0438	−.0423	−.0347	−.0974	−.0785
	(56.57%)	(55.79%)	(43.43%)	(44.21%)	(100.00%)	(100.00%)
Type 2-Type 3	−.0342	−.0162	−.0017	−.0450	−.0359	−.0612
	(95.26%)	(26.47%)	(4.74%)	(73.53%)	(100.00%)	(100.00%)
Type 2-Type 4	−.0297	.001	.0139	−.0170	−.0158	−.0162
	(68.12%)	(5.85%)	(31, 88%)	(94, 15%)	(100.00%)	(100.00%)
Type 3-Type 4	−.0031	.0120	.0169	.0329	.0138	.0449
	(15.50%)	(26.73%)	(84, 50%)	(73, 27%)	(100.00%)	(100.00%)

Tab. 8: Decomposition Results (North)

	Diff. in Char.		Diff. in Coeff.		Total	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Type 1-Type 2	−.039	−.0382	−.0166	−.0198	−.0475	−.0580
	(65.05%)	(65.86%)	(34.95%)	(34.14%)	(100.00%)	(100.00%)
Type 1-Type 3	−.0704	−.0463	−.0221	−.0741	−.0925	−.1204
	(76.11%)	(38.45%)	(23.89%)	(61.55%)	(100.00%)	(100.00%)
Type 1-Type 4	−.0655	−.0315	−.0143	−.0516	−.0798	−.0832
	(82.08%)	(37.86%)	(17.92%)	(62.14%)	(100.00%)	(100.00%)
Type 2-Type 3	−.0399	−.0090	−.0050	−.0534	−.0449	−.0624
	(88.86%)	(14.42%)	(11.14%)	(85.58%)	(100.00%)	(100.00%)
Type 2-Type 4	−.0421	.0034	.0099	−.0285	−.032	−.0251
	(80.96%)	(10.65%)	(19.04%)	(89.35%)	(100.00%)	(100.00%)
Type 3-Type 4	−.0032	.0039	.0159	.0339	.0127	.0372
	(16.75%)	(10.48%)	(83.25%)	(89.52%)	(100.00%)	(100.00%)

Tab. 9: Decomposition Results (Centre-South)

	Diff. in Char.		Diff. in Coeff.		Total	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Type 1-Type 2	−.0277	−.0296	−.0768	−.0210	−.1045	−.0479
	(26.51%)	(56.16%)	(73.49%)	(43.84%)	(100.00%)	(100.00%)
Type 1-Type 3	−.0433	−.0491	−.0837	−.0558	−.1270	−.1049
	(34.09%)	(46.80%)	(65.91%)	(53.20%)	(100.00%)	(100.00%)
Type 1-Type 4	−.0492	−.0484	−.0655	−.0176	−.1147	−.0660
	(42.89%)	(73.33%)	(57.11%)	(26.67%)	(100.00%)	(100.00%)
Type 2-Type 3	−.0173	−.0226	.0049	−.0344	−.0124	−.0570
	(77.93%)	(39.64%)	(22.07%)	(60.36%)	(100.00%)	(100.00%)
Type 2-Type 4	−.0281	−.0175	.0178	−.0006	−.0103	−.0181
	(61.22%)	(96.68%)	(38.78%)	(3.32%)	(100.00%)	(100.00%)
Type 3-Type 4	−.0105	.0037	.0229	.0352	.0124	.0388
	(31.44%)	(9.54%)	(68.56%)	(90.46%)	(100.00%)	(100.00%)

6 Conclusion

Our main purpose in this work was to test for Equality of Opportunity in the entry to the labour market in Italy. More precisely, we tested for the influence of parental background on the probability to find the first job within 3 years from the completion of the first degree, using a representative sample of Italian graduates who received their degree in 2001.

Previous studies on inequality of opportunity focus almost exclusively on cognitive abilities and monetary outcomes and paying no attention to the fundamental passage from school to the labour market. As far as we know, there

are no papers which test for EOp at the entry to the labour market and with this work we have tried, at least partially, to fill this gap.

We assume that there are two channel through which parents affect children' outcomes and ultimately their probability to find a job within three years from the graduation: instillation of preferences and aspirations, and provision of social connections. To divide individuals in groups with similar circumstances, proxied by their parental background, we consider four different level of parents' education.

Our main aim is to measure inequality of opportunity in finding the first job net to the effect of academic choices and attainments tacking place during the university. For this reason we compare the probability to find a job between individuals with different parental education by controlling for final mark at the graduation and academic curricula choices. In other words, even if these variables could be related to parental education and could reflect inequality of opportunity operating at an earlier stage, we do not treat them as circumstances. In this work we are interested in testing for inequality of opportunity at the entry into the labour market within three years after the graduation net to the effect the family background exerted in earlier stages (i. e. on graduation mark, subject of the first degree and time taken to get the degree). So variables related to individuals' academic curricula and attainments are used to obtain a measure of opportunity inequality not affected by the influence exerted by the family background in a previous stage.

After the estimation of the probability of finding a job, conducted using the maximum likelihood (ML) method and separately for each type, we measure inequality of opportunity by using the decomposition method proposed by Gomulka and Stern (1990). This method allows us to decompose difference in the probability to find a job between types (individuals with different parental education) into two parts: one attributable to a different distribution of individuals' characteristics across types (*differences in characteristics*) and a residual part due to *differences in coefficients*. If, after controlling for individuals' characteristics (final mark, course programme, time taken to get the first degree, working while attending the university, area of residence and age) there is no unobserved heterogeneity across types, we can interpret the residual part as the difference due to inequality of opportunity. On the contrary, in the presence of unobserved heterogeneity, this residual part provides a biased estimation of the difference due to opportunity inequality.

Our results show that the most significant variables explaining the probability to find a job are those related to the course programme chosen by individuals and to the area of residence, and this holds for any type of parental background. On the opposite, final mark does not have any significance in explaining the probability to find a job.

The decomposition results seem to confirm our hypothesis, i. e. that the probability to find a job does not depend solely to individuals' effort. They show that most of the differences in the probabilities of finding a job between individuals with different background depends on opportunity inequality. More than one half of the difference between types are due to "differences in coeffi-

cients". It means that, even if the assumption on individual heterogeneity does not hold, it is reasonable to think that these difference are, at least in part, due to opportunity inequality. As expected, the most disadvantaged types are those with parents with low education (type 1 and 2). These individuals have lower probability to find a job compared to individuals with parents with an upper secondary school degree or a bachelor (type 3 and 4).

Given the differences between the North and the Centre-South of Italy, after testing for independence between the area of residence and the probability of being employed within three years from the graduation, we decide to split the sample into two parts. Not surprisingly, we find significant differences between the two areas. First of all we find that individuals with the same degree face different perspective in the labour market, the probability of finding a job within three years from the graduation differs between individuals belonging to the same type and with the same degree if they live in the North or in the Centre-South. We also conduct separate estimations for men and women, considering the difference between them in labour market participation. At national level, we find that great part of the difference in the probability of being employed is explained, for men, by a different distribution of individuals' characteristics among types, while the opposite happens for women, i. e. IOp is higher for men than for women.

We can use our result on inequality of opportunity to draw some final conclusion on the level of meritocracy in the Italian labour market and to verify if the educational system really plays its signaling role. Unfortunately, our results are not encouraging. We cannot consider meritocratic a labour market where the probability of being employed after the graduation seems to be independent form the final mark or other academic individuals' ability. Moreover, the decomposition results show that the family background have a direct effect on the probability to find a job as well as an indirect effect through the channel of educational attainments and curricula choices. The direct effect reflects probably another channel through which parents affect their children outcome, that is the provision of social connection. It seems reasonable to assume that social connections are "greater" or "better" for individuals in type 3 or 4 than those provided by parents for individuals in type 1 or 2.

Appendix

Tab. 1: Variables Description

Variables	Mean	
	Men	**Women**
Working Student	.675	.667
Institutional Time	.220	.253
Age	2.808	2.571
Country	.173	.131
City	.091	.150
Human Faculties	.107	.256
Economics	.193	.213
Science	.191	.201
Law	.063	.098
Eng. & Arc.	.331	.133
Medicine	.084	.065
Sport	.027	.029
North	.500	.482

Tab. 2 Age

Age (classes)	Freq.		Perc.		Cum	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
≤ 24	486	1,021	5.72	11.21	5.72	11.21
25 & 26	2,670	3,459	31.40	37.98	37.12	49.19
≥ 27 & ≤ 29	3,330	3,033	39.16	33.30	76.28	82.49
≥ 30	2,017	1,595	23.72	17.51	100.00	100.00
Total	8,503	9,108	100.00	100.00		

Tab. 3 Year of starting work & family background (Men)

Inst. Time	Type 1	Type 2	Type 3	Type 4	Total
0	545	779	1,117	971	3,412
	(40.37)	(31.20)	(28.47)	(30.72)	(31.21)
1	805	1,718	2,806	2,190	7,519
	(59.63)	(68.80)	(71.53)	(69.28)	(68.79)
Total	1,350	2,497	3,923	3,161	10,931
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 4 Year of starting work & family background (Women)

Inst. Time	Type 1	Type 2	Type 3	Type 4	Total
0	644	1,080	1,498	1,095	4,317
	(47.35)	(40.82)	(35.41)	(38.90)	(39.06)
1	716	1,566	2,732	1,720	6,734
	(52.65)	(59.18)	(64.59)	(61.10)	(60.94)
Total	1,360	2,646	4,230	2,815	11,051
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 5: Course Programme & Family Background (Men)

Course Prog.	Type 1	Type 2	Type 3	Type 4	Total
Hum. Fac	194	285	397	302	1,178
	(14.37)	(11.41)	(10.12)	(9.55)	(10.78)
Economics	249	470	852	544	2,115
	(18.44)	(18.82)	(21.72)	(17.21)	(19.35)
Science	254	534	737	573	2,098
	(18.81)	(21.39)	(18.79)	(18.13)	(19.19)
Law	62	132	228	269	691
	(4.59)	(5.29)	(5.81)	(8.51)	(6.32)
Eng. & Arc.	444	824	1,349	1,005	3,622
	(32.89)	(33.00)	(34.39)	(31.79)	(33.14)
Medicine	91	160	261	413	925
	(6.74)	(6.41)	(6.65)	(13.07)	(8.46)
Sport	56	92	99	55	302
	(4.15)	(3.68)	(2.52)	(1.74)	(2.76)
Total	1,350	2,497	3,923	3,161	10,931
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 6: Course Programme & Family Background (Women)

Course Prog.	Type 1	Type 2	Type 3	Type 4	Total
Hum. Fac	404	695	1,105	634	2,838
	(29.71)	(26.27)	(26.12)	(22.52)	(25.68)
Economics	354	690	868	449	2,361
	(26.03)	(26.08)	(20.52)	(15.95)	(21.36)
Science	257	540	866	566	2,229
	(18.90)	(20.41)	(20.47)	(20.11)	(20.17)
Law	111	241	419	320	1,091
	(8.16)	(9.11)	(9.91)	(11.37)	(9.87)
Eng. & Arc.	130	295	597	456	1,478
	(9.56)	(11.15)	(14.11)	(16.20)	(13.37)
Medicine	70	122	239	297	728
	(5.15)	(4.61)	(5.65)	(10.55)	(6.59)
Sport	34	63	136	93	326
	(2.50)	(2.38)	(3.22)	(3.30)	(2.95)
Total	1,360	2,646	4,230	2,815	11,051
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 7: Institutional time & Family Background (Men)

Inst. Time	Type 1	Type 2	Type 3	Type 4	Total
0	1,123	1,993	3,058	2,345	8,519
	(83.19)	(79.82)	(77.95)	(74.19)	(77.93)
1	227	504	865	816	2,412
	(16.81)	(20.18)	(22.05)	(25.81)	(22.07)
Total	1,350	2,497	3,923	3,161	10,931
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 8: Institutional time & Family Background (Women)

Inst. Time	Type 1	Type 2	Type 3	Type 4	Total
0	1,156	2,074	3,092	1,933	8,255
	(85.00)	(78.38)	(73.10)	(68.67)	(74.70)
1	204	572	1,138	882	2,796
	(15.00)	(21.62)	(26.90)	(31.33)	(25.30)
Total	1,360	2,646	4,230	2,815	11,051
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

(Percentage in brackets)

Tab. 9: Chi Square Test (family background)

Variables	Pearson's chi-square		P-value	
	Men	Women	Men	Women
Empl 3	66.8032	66.3775	0.000	0.000
Course Prog.	232.5585	256.8251	0.000	0.000
Mark	88.7426	119.9044	0.000	0.000
Inst. Time	52.6193	155.2752	0.000	0.000

The Pearson's chi-square test is used to test for independence between the variables related to individuals' academic curricula and attainments and the family background

Tab. 10: Chi Square Test (North)

Variables	Pearson's chi-square		P-value	
	Men	Women	Men	Women
Empl 3	149.0396	267.4316	0.000	0.000
Course Prog.	50.4231	80.7619	0.000	0.000
Mark	206.4596	118.5498	0.000	0.000
Inst. Time	155.7651	240.6500	0.000	0.000

The Pearson's chi-square test is used to test for independence between the variables related to individuals' academic curricula and attainments and the variable North.

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