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**The role of higher education stratification in the reproduction  
of social inequality in the labour market.  
A comparative study of recent European graduates**

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**Abstract**

This paper analyses the role of institutional stratification within higher education (course length, fields of study and institutional quality) in mediating the relationship between social origin and labour market outcomes (wage and occupational status) in a comparative perspective. In the first part, we develop our theoretical framework, relying on sociological and economic theories and knowledge on countries' institutional profiles. In the second part, we use data from the 2005 REFLEX survey on European graduates (2000) from 4 countries (Germany, Norway, Italy, and Spain). Results from binomial logistic regression models and the Karlson-Holm-Breen decomposition method indicate that those with tertiary educated parents have higher probabilities of entering in a highly rewarded occupation and this 'effect' varies according to level higher education expansion and strength of the institutional mechanisms which connect tertiary education with labour market. Furthermore, higher education stratification contributes to the reproduction on inequality but with a different importance according to the institutional context.

Keywords: higher education, occupational outcomes, social inequality, institutional stratification

## **Introduction**

One of the major findings from social stratification research is that in modern societies there is a positive significant association between social origin and status attainment and this is mostly mediated by educational attainment (Blau and Duncan 1967). More precisely, education has been found to be the most important predictor of occupational attainment; this means that it could represent an important vehicle of social mobility. Nevertheless, educational attainment is still affected by social background and thus it also constitutes a way of intergenerational reproduction of social inequality (Hout and DiPrete 2006). Several studies have been interested in establishing whether social origin has relevant effects over and above what is mediated by education, what is often referred to as ‘direct effects’ (Mastekaasa 2011). At the moment there is not a unique answer to this question and empirical evidence suggests the existence of cross-country variation. We address this issue focusing on recent tertiary graduates in several European countries using data from the Reflex survey, an harmonized survey on graduates in 2000, interviewed five years after graduation.

The first aim of the paper is to understand whether in recent cohorts the attainment of a tertiary degree represents a kind of ‘liberation’ from social background or, on the contrary, if systematic differences in labour market returns according to social origin exist even among graduates. Second, we aim to examine whether institutional arrangements of higher education mediate the relation between social origin and occupational outcomes, contributing to the intergenerational reproduction of social inequality. Since participation in higher education has rapidly expanded in the last decades, it is likely that differentiation of courses and degrees within this level becomes increasingly relevant for occupational outcomes. At the same time, people from better educated families could take advantage of institutional stratification to access the better quality and rewarded types of education, thus affecting the intergenerational reproduction of social inequality. This paper is organized as follows. In the next section we develop our theoretical framework, connecting and integrating several theories developed within the social stratification literature, whereas in the third section the main institutional characteristics of the selected countries are described. In the fourth section

we use the discussion in the above mentioned sections in order to formulate some research hypotheses. Fourth and fifth sections describe data, variables and methods used in the empirical analysis, while the sixth section presents results from the analysis and the last section concludes.

## **Theoretical framework**

Looking at the intergenerational transmission of social status, most of the studies in the United States concluded that the effect of social background on occupational standing is entirely indirect, operating through the effects of education and cognitive skills (Warren and Hauser 2002). Similar results have been found by de Graaf and Kalmijn (2001) and van de Werfhorst (2002) for the Netherlands. On the other hand, other studies found a significant, even if not strong, direct association between social origin and occupational attainment and earnings in several European countries, such as Great Britain, France, Ireland, Norway and Sweden (Erikson and Jonsson 1998; Hansen 2001; Breen 2004; Mastekaasa 2011).

Furthermore, it has been shown that the direct relation between social origin and the socioeconomic position attained varies across school levels, being significant among low-educated people but not among college graduates (Hout 1988). Therefore, there are no systematic differences in the occupational status gained between individuals coming from families from lower and higher socioeconomic status among college degree holders in the United States.

Several explanations have been elaborated to account for this phenomenon. The first one is that in the labour markets for tertiary graduates meritocratic recruitment criteria prevail. Employers in their screening of potential candidates for vacant positions do not take into consideration ascriptive characteristics or other resources potentially associated with social background, like cultural capital and social connections, but only their educational qualifications and skills (Hout 1988; Breen and Luijkx 2004; Breen and Jonsson 2007). This argument is in line with *modernization and liberal industrialism theses*, according to which the process of modernization should be followed by a general trend from ascription to achievement as the main principle of allocation of individuals in different social positions (Parsons 1949; Treiman 1970).

According to this perspective, one crucial aspect reducing reliance on ascriptive traits in the selection procedures is the increased bureaucratization, which contributed to shrink the scope of professions inheritance and the role of the family ties in the job search process. Nevertheless, this interpretation understates the fact that the null intergenerational direct association between social background and occupation does not mean the elimination of social inequality, because even in modern societies tertiary education attainment is heavily affected by individuals' social background. Students with highly educated parents, from upper classes and rich families have a higher probability of entering and successfully gaining a university degree compared to other students (Shavit and Blossfeld 1993). The implication is that college graduates are a highly selected population in terms of *unobserved characteristics*, like ability, motivations and occupational aspirations. If these attributes are valuable in the labour market, positive selection of lower class students may result in a weak or negligible association between social origin and occupational attainment among tertiary graduates (Boudon 1974; Mare 1981; Torche 2009).

The degree of selectivity of this population is affected by the overall participation in higher education and by the degree of inequality in educational opportunities at the lower educational levels. The impressive expansion of tertiary education that occurred in many European countries in recent decades had noticeable implications for the processes under discussion. Firstly, there has been an increase in the proportion of lower-class students who enter and complete higher education. This implies a reduction in the selectivity of tertiary studies and an increase in the heterogeneity of graduates in terms of unmeasured ability and aspirations. Secondly, the *credentialist thesis* (Collins 1979) argues that the labour market value of an educational degree will diminish as far as the number of people with that qualification increases. Consequently, an excessive educational expansion could lead to a process of credential inflation, according to which to obtain a given occupational position a superior qualification is needed compared to the past. Upper class families are particularly concerned about this issue, because since an increased number of people is able to acquire a higher education degree, this qualification is no longer a sufficient condition to achieve a high-ranked social position. Thus, it is reasonable to think that upper class families would try to maintain their offspring's advantages using different strategies and resources. The first one is

suggested by the *effectively maintained inequality thesis* (Lucas 2001) and refers to individuals' choices within the school system. According to this theory, socioeconomically advantaged people secure for themselves and their children some degree of advantage wherever advantages are commonly possible. If quantitative differences are common, the socioeconomically advantaged will obtain quantitative advantage; on the other hand, if qualitative differences are common the socioeconomically advantaged will obtain qualitative advantage. Thus, when there is an expansion of enrolments in higher education, upper class families will choose for their children the best educational options *within* this level in order to maintain their relative advantages.<sup>1</sup> Looking at higher education, there are two main axes of institutional stratification providing different resources and opportunities to their graduates (Charles and Bradley 2002). Vertical stratification refers to distinct course levels or cycles, which are arranged in a sequence; each cycle gives access to a higher degree and more years of education compared to the previous one. Horizontal stratification includes at least two kinds of differentiation. The first one refers to different types of institutions or educational sectors, that can be hierarchically classified on the basis of degree of selectivity, quality of instruction and academic prestige. The second one refers to academic disciplines, fields of study or majors, which vary in their organization, type of knowledge, selectivity, academic and economic prestige, retention rates, and economic payoffs (Clark 1983; Bourdieu 1996; van de Werfhorst and Kraaykamp 2001; Reimer et al. 2008). Given the existence of several lines of institutional stratification within European higher education systems (Teichler 1988) and the presence of differentiated occupational returns linked to different fields of study, course levels and types of institutions (Gerber and Cheung 2008; van de Werfhorst 2004; Reimer et al. 2008; Barone and Ortiz 2010; Chevalier and Conlon 2003; Brunello and Cappellari 2007; Holmlund 2009), individuals from upper social classes could take advantage of the best educational options to make the transition to the labour market with better rewarded credentials.

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<sup>1</sup> This theoretical formulation is in agreement with the 'diversion hypothesis' elaborated by Brint and Karabel (1989), which states that the existence of different routes in higher education (for example, universities and community colleges in the United States) produces a diversion of lower class students into the less prestigious and lower quality institutions and courses.

The second mechanism through which the upper class individuals could try to maintain their advantages refers to social capital and social networks (Bourdieu 1979; Granovetter 1973). There is a large body of literature which showed that social origin is related to the available social resources (resources accessed in social networks) and, in turn, social resources are associated with several outcomes, like the attainment of a high-ranked social position (Lin 1999). For example, people from upper classes could have more information on job opportunities and their parents could mobilize their social contacts in order to smooth the transition to the labour market or to facilitate job change in order to access to a better occupational position.

### **The main institutional features of the selected higher education systems**

We chose to focus the attention on four European countries, which have been selected on the basis on two main institutional features: higher education participation and non-institutionalized links between higher education and the labour market. The four European countries are Germany, Spain, Italy and Norway and their main institutional features are reported in table 1.

The percentage of Isced 5A graduates among 25-34 years old in 2006, derived from Oecd (2008), is used as a proxy of higher education participation. The percentage of recent graduates who found the first job through social contacts (like parents, family or friends), derived from the Reflex survey, is used as a proxy of the degree of non-institutionalized links between higher education and the labour market. Each of the four countries considered in this work has a different combination of these two features. Germany is characterized by a relative low graduation rate and a low proportion of tertiary graduates who finds the first job through social contacts. Italy is similar if we look at the graduation rates, which is lower than 20%, but there is a higher percentage of graduates who find the first job thanks to the help of family or friends. Norway is in the opposite situation compared to Italy, because it has a high percentage of graduates and a low proportion finds the first job through social networks. At the end, in Spain there is both a large students' participation, because the percentage of graduates exceeds 30%, and there is also a large proportion of graduates who mobilize their social resources to find a job.

[table 1 here]

In order to have a more complete picture of the institutional differences in the higher education systems of these four countries, we report in table 1 two additional indicators, which can be useful in the interpretation of the main findings: social selectivity in higher education completion and the degree of differentiation in tertiary studies. The first indicator is derived from the European Social Survey (pooled 4 waves), focusing on people born between 1969 and 1979 (approximately the birth years of graduates considered in this study). It is the odds ratio of the probability of gaining a tertiary degree versus attaining a lower educational qualification comparing people with tertiary educated parents and those with lower secondary educated parents. The value of this indicator of relative inequality is higher in Germany, at a medium level in Italy and Norway, whereas it is relatively lower in Spain.

It is rather difficult to empirically measure the degree of differentiation in higher education, both because of the lack of agreed definitions and appropriate data (Triventi 2011). In this work we measure the degree of higher education stratification comparing the academic prestige of the best educational options (in terms of course length, fields of study and universities) with that of the lower-level programmes and institutions. Academic prestige is derived from a question in the Reflex survey in which graduates indicated, on a 5-point scale, their perception about the academic prestige of the course they attended.<sup>2</sup> The stronger degree of stratification is found in Norway, where on average the best educational options are considered 64% more prestigious than the others. It is followed by Spain with a medium-high level (34%) and Germany with a medium-low level of institutional stratification (22%), while Italy is in the last position (11%). This last finding is coherent with the fact that Italian higher education system is considered as ‘unitary’ by Shavit and colleagues (2007) and with the existence the ‘legal value’ of the university degree, irrespective of the field and institution in which it has been attained (Triventi and Trivellato 2009).

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<sup>2</sup> We averaged the results on the relative advantage over the different lines of stratification, regarding courses, fields and institutions.



## **Research hypotheses**

After the discussion of the theoretical framework and the description of the main institutional features of the countries under scrutiny we are now able to formulate several hypotheses on the expected results in a comparative perspective. First of all, we have to bear in mind that we focus on recent cohorts, where the graduation rates in tertiary education are sensibly higher than in the past. Hence, we expect that there is a significant heterogeneity within graduates in terms of social background and that the simple tertiary degree is no longer a sufficient condition to achieve a high-ranked occupation. Therefore, it is likely that upper class families mobilize their resources to help their children to obtain a prestigious and well remunerated occupation, giving them an additional comparative advantage over graduates from lower social backgrounds. Therefore, we hypothesize the existence of a significant total effect of social background on occupational returns among graduates in most of the European countries (*hypothesis 1*), even if it should be relatively small, because previous research showed that the effect of education on status attainment is larger than that of social origin (Breen 2004).

Nevertheless, we expect a certain amount of heterogeneity in the strength of the relation between social background and occupational returns across countries. As discussed before, following the credentialist theory, it is likely that in countries with a larger participation in higher education there is a stronger competition among graduates to access the best positions in the labour market and, consequently, in this situation social origin could constitute an additional resource in the job search process. Moreover, it is likely that social background can play a more relevant role where the way of finding a job through social contacts is relatively widespread. Therefore, we expect that the association between social background and occupational returns is stronger where there is a higher graduation rate and more people rely on personal contacts to find job (Spain); on the contrary this association should be lower where there is a low graduation rate and social contacts are less important in the job search process (Germany), with the other two institutional contexts (Italy and Norway) placed somewhat in the middle (*hypothesis 2*). As a third step we also examine the relation between different forms of

stratification and occupational outcomes, in order to understand which are more important for labour market outcomes and where institutional stratification matters more in the labour market. Existing research focused more on fields of study rather than institutional quality and course length, assuming that the first is more important for labour market returns. Several factors making the role of fields of study more or less prominent have been suggested: educational expansion, occupational specificity of university studies, employment protection legislation, business cycle, degree of transparency of competences, and welfare state (van de Werfhorst 2004; Reimer et al. 2008). Since the small number of countries considered in this work does not allow for a systematic test of these hypotheses, the effect of different forms of stratification will be assessed in an explorative way.

The last step is to assess to what extent the choice of different routes within higher education accounts for differentiated labour market outcomes between graduates from highly educated and lowly educated families. Institutional stratification could be a relevant mediator if, at the same time, social background significantly affects graduation from the best educational courses and institutions, and if higher education qualifications are differently rewarded in the labour market. We expect that in most of the countries institutional stratification has a relevant role in moderating the relation between social origin and occupational outcomes (*hypothesis 3*), because previous research showed that social origin affects the choice of fields of study and course level (Berggren 2008; Reimer and Pollak 2010; Triventi 2011) and graduates from different fields of study also have heterogeneous occupational returns in several European countries (Reimer et al. 2008). Nonetheless, it is likely that the importance of higher education differentiation in the reproduction of social inequality in the labour market among graduates varies according to several institutional characteristics. First, following the effectively maintained inequality thesis and the diversion argument, the horizontal differences within tertiary education will become more relevant as far as access to higher education increases. As previously argued, students from well educated families could be more aware of the institutional differences and opt for the educational routes considered as more prestigious or remunerative. Second, it is likely that the role of the institutional stratification is stronger where social contacts have a minor importance in the job search process and other institutionalized channels prevail (concourses, public and private

agencies, etc.). Therefore, we expect that the role of institutional stratification as mediator of the relation between social origin and occupational outcomes is larger in countries with a higher proportion of tertiary graduates and where the connections between tertiary education and labour market are more institutionalized (Norway). On the contrary, its role should be smaller in Italy, where the institutional differentiation within the higher education system is negligible, graduation at tertiary level is still not widespread and where social networks are more important than in other countries in finding a job (*hypothesis 4*).

### **Data and variables**

Data from the ‘Research into Employment and professional FLEXibility’ survey is used. REFLEX is an harmonized cross–section survey carried out in 2005/2006 among individuals of fifteen European countries who had graduated from Isced 5A courses in the year 2000. Most of graduates answered a written questionnaire (around 75%), whereas a minority has been interviewed by telephone. The sampling design is stratified, where the strata include categories such as region and sector of higher education, depending on the national context. Survey weights that re–proportionate the sample according to the population figures are used in all estimations.<sup>3</sup> The REFLEX dataset is employed because it contains unique information on social origin, higher education qualifications and labour market outcomes in comparative perspective, which are not all available in standard population surveys. Four countries are included in the present analysis: Germany (DE), Spain (ES), Italy (IT), Norway (NO). Individuals over 35 years old at the moment of graduation have been excluded from the analysis to make the sample more homogeneous. After listwise deletion of missing values the analytical sample is constituted by approximately 8,000 cases.<sup>4</sup>

The main dependent variables are occupational status and monthly wage related to the occupation hold by graduates 5 years after graduation. Contrary to previous studies, we are not interested to examine whether social origin has a direct effect on *mean*

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<sup>3</sup> More information are available on the project website: <http://www.fdewb.unimaas.nl/roa/reflex/>.

<sup>4</sup> For control variables with a relatively high proportion of missing data (>5%) a dummy indicator is included in the estimation in order to preserve the sample size and to check whether non–respondents are different from others.

occupational status or earnings; instead we decided to focus the attention on the top part of the distribution of occupational returns. This focus allows to address this issue: do individuals with a different social background have the same probability to enter the most prestigious and remunerative occupations available to tertiary graduates? We use the International Socio-Economic Index developed by Ganzeboom et al. (1992) to measure occupational status and the gross monthly wage (in US dollars, harmonized using the purchasing power parity) in order to measure economic returns. For both variables we created corresponding dummy variables which indicate if the graduate falls in the highest quartile of the distribution in her country.

The first variable accounting for institutional stratification is *course length*, which indicates whether the graduate received her degree from a long or a short programme. The first type of courses allows access to a doctoral programme while the second type does not allow it; the formal duration of the first type of course ranges from 4 to 6 years, whereas the duration of the second ones ranges from 3 to 4 years. The length of programme implies a ‘vertical choice’ in those systems in which short and long programmes are arranged in a sequence (Norway and Spain), while it corresponds to an ‘horizontal choice’ in those countries where short and long programmes are parallel courses (Germany and Italy).<sup>5</sup>

The second variable is *institutional quality*. The concept of quality at the institutional level could be measured in different ways and there is no homogeneous consensus on the best indicator. Moreover, in Europe it is hard to find a common criterion that accounts for prestige and quality differences across institutions, because each country seems to have its own criteria. To overcome this problem a composite index of institutional ‘quality’ is constructed on the basis of previous literature and available information. It accounts for three components: the degree of selectivity at entrance, the quality of student intake and the quality of occupational outcomes.<sup>6</sup> These three sub-dimensions of institutional quality are constructed as additive indexes summarizing the variables presented in table A1. All these variables are measured at the institutional

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<sup>5</sup> Short degrees are *Diplom Fachhochschule* and *Diplom I an Gesamthochschule* in Germany, *Diploma Universitario* in Italy, *Diplomatura* in Spain and *3-4 års Hogskoleutdanning* in Norway.

<sup>6</sup>The additive index is built using standardized variables within each country.

level as aggregation of individuals' answers.<sup>7</sup> The final version of this variable indicates whether the respondent graduated from a university ranked in the highest quartile of the quality rank.<sup>8</sup> The third variable is field of study, articulated in six categories: Humanities (Literature, Arts, Teacher training, Education), Social sciences (Social sciences, Economics, Business and Administration), Law, Sciences (Physics, Mathematics, Biology, Chemistry, Computing), Technical disciplines (Engineering, Architecture), Health.<sup>9</sup>

The main independent variable is a combination of the highest educational level attained by graduates' parents, classified in four categories: a) no more than one parent with an Isced 3 qualification; b) both parents with Isced 3; c) one parent with an Isced 5 degree; d) both parents with an Isced 5 degree. This classification accounts for the distribution of parental educational qualifications across countries, in order to have a sufficient number of cases in each category.<sup>10</sup> Unfortunately, in the REFLEX dataset no variables of social class of origin or occupational background are available. For this reason parental education is considered in this work as a general indicator of social background. Additional control variables included in the models are gender, age,

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<sup>7</sup> Since some institutions in the sample have a low number of students (< 5 units), the cluster-mean values of these indicators are estimated through random-intercept models; this method allows to reduce the uncertainty around the estimates through a shrinkage procedure. When the dependent variable is metric linear random-intercept regression models are applied, while when it is binary logistic random-intercept regression models are instead used. The mean values of interest for each institution are derived from Empirical Bayes Predictions estimated using procedures suggested by Rabe-Hesketh and Skrondal (2005: 80–83, 269–271).

<sup>8</sup> This variable gives a plausible classification of institutions compared to existing knowledge on university rankings. For example, top institutions are in Italy private and high-ranked universities (Bocconi, Luiss, etc.), whereas in Germany the majority of top quality institutions are universities and only one *Fachhochschule* enters in this category.

<sup>9</sup> We are forced to use this highly aggregated classification, because of the relative small sample sizes in some countries. Otherwise, it would be interesting to separate graduates in Economics and Business from those in other Social sciences, because it is likely that former have higher economic returns in the labour market than the latter.

<sup>10</sup> An alternative classification considering graduates whose both parents have less than Isced 3 as a separate category has been used in previous analysis. Results are rather similar, but the percentage of cases in this additional category is too small for some countries, especially for Germany (2%).

whether at least one parent is born abroad, whether the graduate maintained the same job that she was doing before graduation, and a dummy variable that indicates whether respondents have gained an upper secondary qualification in the academic track or not.

## **Methods**

Binomial logistic regression models are used in order to estimate the partial association between parental education and the outcomes of interest (top quarter occupational status and wage). Two models for each dependent variable are estimated: the first one contains only parental education and the basic control variables (sex, age, parents born abroad, maintained the same job), the second adds the three variables of institutional differentiation in higher education (course length, top institution, field of study) and secondary track in upper secondary education. The first model allows to estimate the total effect of social origin on the outcomes under scrutiny, while the second models estimate the residual effect of social origin, once controlled for type of education attended. Moreover, they give information on the effects of higher education qualifications, net of relevant antecedent variables. These last results should be interpreted as mainly descriptive, because in this work we do not formally address issues of endogeneity (students self-select themselves into different higher education routes) and sample selection bias (not all graduates are employed five years after graduation). Since we compare results of logistic models in different countries, logit coefficients or odds ratio derived from them could lead to misleading conclusions if models widely differs in their residual variability (Allison 1999). In order to partially tackle this issue, we use as main measure of association the average partial effects, which indicates the average difference between two categories in the probability of interest, net of other control variables (Long 1997).

The aim of the second part of the analysis is to establish to what extent the association between parental education and occupation outcomes is mediated by the type of qualification acquired in tertiary education. In nonlinear regression models, decomposing the total effect of a variable of interest into direct and indirect effects is not as straightforward as in linear regression models. It is not simply possible to compare the estimated coefficient of the variable of interest between a reduced model without the mediator variables and a full model with these mediator variables (Karlson

and Holm 2011). In fact, the estimated coefficients of these models are not comparable between different models, because of a rescaling of the model induced by a property of nonlinear regression models: the coefficients and the error variance are not separately identified (Allison 1999; Mood 2009). In order to overcome this issue, a recent method which solves this problem, the KHB-method, is applied (Breen et al. 2010). This method allows the decomposition of total effects into direct and indirect effects for several types of generalized linear models; it compares the full model with a reduced model that substitutes the mediators by the residuals of the mediators from a regression of the mediators on the key independent variable. It consequently allows the separation of the change in the coefficient that is due to confounding (what is of substantive interest) and the change that is due to rescaling.<sup>11</sup>

### **Results: social origin and institutional effects on occupational outcomes**

Table 2 provides descriptive statistics for the main variables. First of all, the two dependent variables (top ISEI and top wage) and graduation from a top institution show small cross-country variability by design, because they include approximately the highest quartile of graduates in each country.<sup>12</sup> On the contrary, the distribution of parental education is highly differentiated across systems; the proportion of individuals whose parents have no more than one Isced 3 qualification exceeds 60% in Spain and 50% in Italy, while it is around 36% in Norway and less than 10% in Germany. Conversely, the proportion of graduates whose both parents have a tertiary degree is higher in Germany and Norway, followed by the other two Mediterranean countries. This variability is due both to the distribution of educational qualifications in the cohorts of graduates' parents and to the social selection of students at earlier school stages.

[table 2 here]

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<sup>11</sup> Please refer to Breen, Karlson and Holm (2011) and to Kohler, Karlson and Holm (forth.) for a detailed explanation and application.

<sup>12</sup> Deviations from the precise quartile (25%) are due to rounding and to the idiosyncratic distribution of cases on specific values.

There is also great cross-country variability in the proportion of graduates which attained a long programme degree: it exceeds 90% in Italy, it is between 58% and 69% in Spain and Germany, while it is lower than 30% in Norway, where the large majority of graduates received a bachelor degree. Looking at the distribution of fields of study across countries, we note that the incidence of Humanities is larger in Norway and lower in Italy, while the opposite is found for Law, with Spain and Germany placed in the middle. In Germany there is a larger proportion of graduates in Technical fields, while in Spain more than 30% of the sample graduated in Social sciences. In Norway almost one quarter graduated in Health subjects, a very high proportion compared to that of the remaining countries (12%).

Results of the multivariate analysis are shown in graphical form in order to facilitate the interpretation of the main findings, while results in tabular forms can be found in the Appendix. Figure 1 presents the estimates of the average partial effects and 95% confidence intervals from binomial logistic regression models predicting the probability of attaining a top ISEI occupation (upper graph) and top wage occupation (lower graph) in each country. The estimates correspond to average differences in predicted probabilities between those categories represented in the graphs compared with individuals whose parents have no more than one upper secondary diploma (omitted reference category). Full dots represent the estimates obtained only controlling for socio-demographic variables (Model 1), while hollow circles refer to estimates from models that include also the type of higher education acquired (Model 2).

[figure 1 here]

The main results are as follows. In three out of four countries considered there is a statistically significant and substantially relevant association between parental education and the likelihood of being in the top quarter of the status and the wage distribution. Germany is the only country where there is no direct association between social background and labour market outcomes: no comparisons between social categories is statistically significant nor substantially relevant, considering both types of returns. In the other three countries, instead, there is an association between social origin and the two outcomes of interest. Graduates with highly educated parents (at least one or both



parents with a tertiary degree) have a higher probability of attaining a high-status and highly paid occupation compared to students from less educated families. Looking at the largest average partial effects, it is possible to note that the advantage linked to social origin is larger in Italy, followed by Spain and Norway. Furthermore, in all these countries the association between social background and occupational status is stronger than the association with wage. This could be due to the use of parental education as unique indicator of social background. It is likely that its impact is higher on outcomes related to symbolic rewards in the labour market, while family income could be more linked to economic returns.<sup>13</sup>

The second models show that controlling for the detailed type of qualification acquired in higher education sensibly reduces the magnitude of the average partial effects, making all the comparisons between social categories not significant in Norway and Spain. In Italy, the average difference between those with both parents graduated and those coming from the less educated families is still significant, even if it is mostly reduced and not larger than 10 percentage points (for both outcomes). This is a preliminary sign that differentiation in higher education could mediate, at least partially, the relation between social background and occupational outcomes, but we will formally test this hypothesis shortly.

[figure 2 here]

We look now at the association between different types of degrees and occupational outcomes, in order to understand whether graduates from different courses, institutions and disciplines are differently rewarded in the labour market, five years after graduation. When we consider the effect of course length and graduation from a top institution a clear ranking of countries is identifiable and it is consistent across the two occupational returns: it is larger in Norway, followed by Spain and Italy. Germany is placed in the last position, and no significant association is detected, neither for occupational status nor for monthly wage. It is needed to say that even if looking at

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<sup>13</sup> This interpretation agrees with the notion of differentiated hierarchies of power outlined by Bourdieu (1979; 1996), in particular those related to the distinction between cultural and economic capital.

point estimates some cross-country variation is visible, most of the differences between systems are not statistically significant, because their confidence intervals are partially overlapped.

[figure 3 here]

As expected, course length is more important for labour market outcomes than graduation from an institution of top quality. This is consistent with the fact the degree of institutional differentiation in European higher education systems is lesser than differentiation in United States or Japan. In fact, only in recent years universities have received more autonomy from the central governments and university rankings have been published at the national level (OECD 2008). The effects of course length and institutional quality are stronger on entering in a top ISEI occupation compared to a top wage occupation. Therefore, educational stratification seems to matter more for the symbolic side of occupational returns than for the economic one.

To examine the role of fields of study we use Humanities as the reference category, because graduates from these disciplines are often those with the lower occupational attainment. Similarly to the other institutional characteristics, the effect of field of study is stronger on occupational status than on wage. Moreover, the field of specialization seems the most important axis of stratification for labour market returns, among those considered in this work.

[figure 4 here]

Even if it is hard to find a common pattern of association with the two occupational outcomes across countries, in general graduates from Health disciplines are those with better rewards both in terms of occupational status and monthly wage. Law graduates instead have better occupational returns in terms of status than of wage<sup>14</sup>, while the

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<sup>14</sup> This could be due to the fact that in several European countries Law is a discipline with postponed high earning returns. Their transition to the labour market is longer than that of other graduates, because they usually have to attend an additional period of ‘training on the job’ in a lawyer’s office, characterized by a lot of working hours and a relatively low wage.

contrary holds for graduates from Technical disciplines. Both Social sciences and Sciences graduates usually are better rewarded in the labour market than graduates from Humanities, with the exception of Spanish. Among them Social Science graduates have a slightly lower probability to enter in a prestigious occupation compared to those from Humanities, while the opposite holds if we look at economic rewards. In order to understand in which countries field of study is more important in the labour market, we developed a summary measure consisting in the simple mean of the average partial effects presented in figure 4. This measure can be read as the average advantage of graduates in Social sciences, Law, Sciences, Technical subjects and Health compared to graduates from Humanities in the probability of being in a highly status and highly paid occupation. The result of this exercise is presented in figure 5; standard errors around this measure have been estimated using the ‘delta method’.<sup>15</sup> Looking at entrance in the top quartile of the occupational status distribution, field of study is better rewarded in Germany, followed by Italy and Norway, and Spain. On the contrary, there are no significant differences among countries in the average association between fields of study and entrance into a top wage occupation.

[figure 5 here]

As we have seen, data from Reflex survey suggests that different dimensions of institutional stratification in higher education matter for labour market returns. Moreover, their introduction into the regression models substantially reduced the associations between parental education and the occupational outcomes, making them mostly not significant. This comparison, however, it is not sufficient if we aim to measure to what extent the types of higher education qualifications account for differences in occupational returns between graduates with different social origins. To tackle this issue we applied the KHB method, which is able to quantify how much of the differences in occupational outcomes between graduates with different levels of parental education can be (statistically) explained by the choice of programme length, institution and field of study. Figure 6 reports the most significant results of this decomposition

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<sup>15</sup> See this web page for some references and a clarification: <http://www.stata.com/support/faqs/stat/deltam.html>.

exercise, showing the proportion of the gap in occupational outcomes accounted for by institutional stratification in higher education, comparing the ‘extreme’ categories of the parental education variable: those with both parents graduated and those whose parents have no more than one upper secondary diploma. We focus on this comparison because it has been found to be statistically significant in most of the countries for both outcomes. Since in Germany there is not an association between parental education and labour market returns among recent tertiary graduates, we excluded it from this analysis.

[figure 6 here]

The main results are as follows. First, the type of qualification acquired in tertiary education has a significant effect in mediating the association between parental education and both occupational outcomes. This suggests that institutional stratification could matter for social inequality reproduction also among the highly educated people in recent years. Second, as anticipated, there is cross-country variability in the extent by which institutional stratification mediates this relation. Looking at both outcomes, we observe the same ordering of countries: the importance of institutional stratification is higher in Norway, followed by Spain and, in the last position, by Italy. Nevertheless, it seems that higher education differentiation is more important in the reproduction of social inequality as far as status attainment is concerned. In fact, it accounts for all the gap between social categories in Norway and for about 50% in Italy. On the contrary, higher education differentiation is able to explain a smaller portion of the gap in the probability of being in the highest quartile of the wage distribution: in Spain and Norway its contribution is around 60-70%, while in Italy is sensibly lower (17%) and not statistically significant.

## **Discussion and conclusion**

The main aim of this paper was to examine whether, among recent tertiary graduates, social origin is related to different labour market returns, both in terms of occupational prestige and monthly wage. Differently from previous works, we focused on entrance into the top status and top wage occupations available to graduates instead of examining

mean occupational returns. We also aimed to understand whether graduation in different programmes, fields of study and institutions is able to account for differences in occupational outcomes among individuals with different social backgrounds. Furthermore, adopting a comparative perspective we tried to understand whether these phenomena vary across countries characterized by heterogeneous institutional settings, as far as higher education structure and relation with labour market are concerned.

First of all, data from the Reflex survey indicates that among recent graduates (2000) people with a different social backgrounds have not the same likelihood of being in the top distribution of occupational status and wage. Those with tertiary educated parents have sensibly higher probabilities of entering in a highly rewarded occupation (both in terms of status and wage) than those with less educated parents. This results holds for all the countries examined (Norway, Spain and Italy), with the exception of Germany.

Moreover, we showed that the strength of the social origin effect vary across countries characterized by specific institutional contexts. In particular it seems the role of social background varies according to the extent of the competition among graduates in the labour market (proxied by the proportion of graduates in recent cohorts) and the strength of the institutional mechanisms which connect tertiary education with labour market (proxied by the proportion of graduates who found the first job thanks to social networks). Results partially corroborate our second hypothesis, because the lowest association between parental education and occupational returns is found in Germany, a country with a low percentage of graduates and with relative more institutionalized connections between higher education and labour market. On the other side, we predicted that social inequality would be at the highest level in Spain, because of both a great competition of graduates in the labour market and a more important role of social connections to find a job. This is partially true, because Spain shows a relatively high association between parental education and occupational outcomes, but this is slightly higher in Italy. Nevertheless, as predicted, Norway, with a high proportion of graduates and a low relevance of social networks in the job search process, is placed in a middle position between Mediterranean countries and Germany.

As expected following previous studies, institutional differentiation within higher education has an important role in structuring occupational outcomes. We found that field of study has the strongest association with both occupational status and wage, and

it is followed respectively by course length and institutional quality. In all countries all these lines of stratification affect more occupational status than wage, suggesting that being in the highest quartile of remuneration is only partially determined by educational attainment. The exception is still Germany, where both course length and institutional quality do not play a relevant role neither for ISEI nor for monthly wage, while field of study has the strongest effect on occupational status among the countries considered here.

In the last part of the analysis, as expected, we found that institutional stratification plays a significant role in the mediation of the association between social origin and occupational outcomes, especially if we look at the gap between graduates from the highest and lowest educated families. This means that people from better educated families tend to choose the best educational options within higher education in order to maintain their advantages in the labour market, as predicted by the effectively maintained inequality thesis. However, the importance of institutional stratification in the reproduction of social inequality varies in different countries, and the main findings corroborate our fourth hypothesis. In fact, the choice of field of study, course length, and type of institution accounts for most of the social origin effect in Norway, where there is a high percentage of graduates, but a low reliance on social networks in the job search. The contribution of institutional differentiation is at a medium level in Spain, while it is lower in Italy, where there is a low competition among graduates in the labour market, but a high reliance on social networks in job finding and a relatively low level of differentiation in tertiary education.

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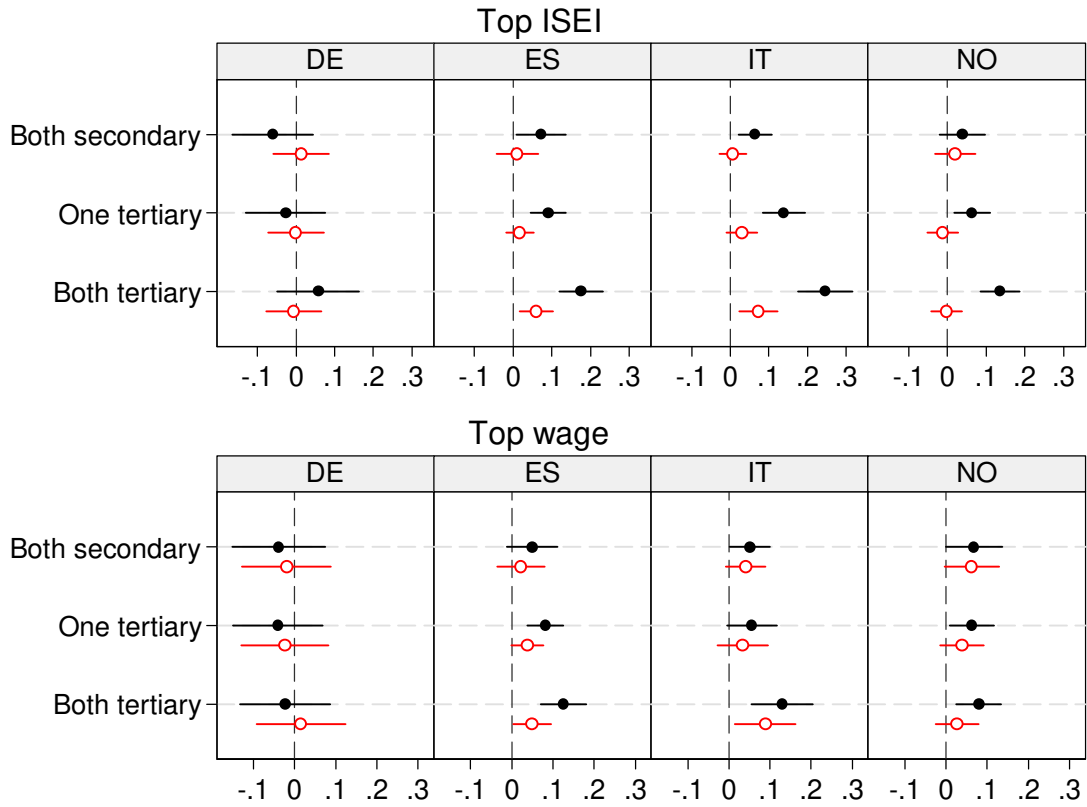
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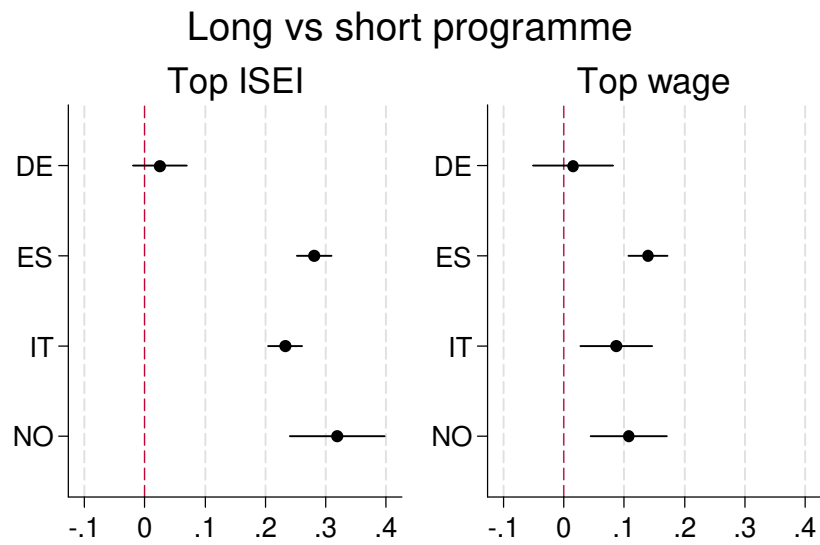


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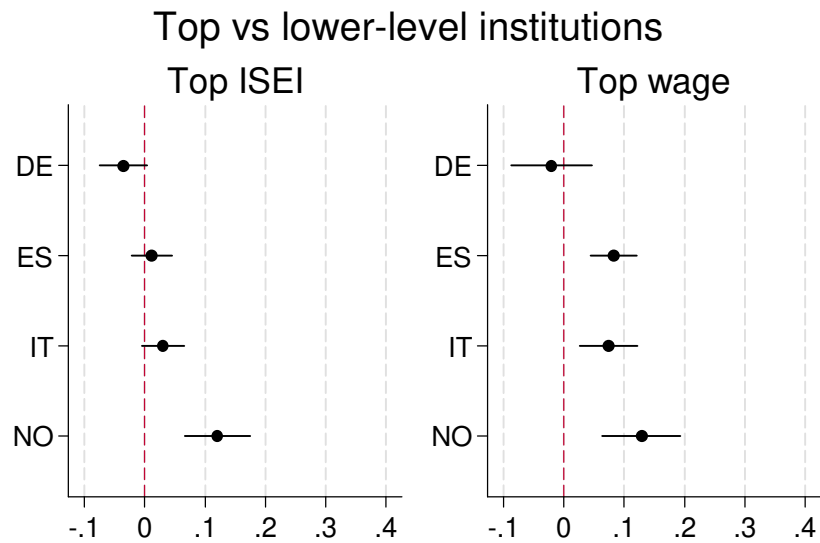
Figures



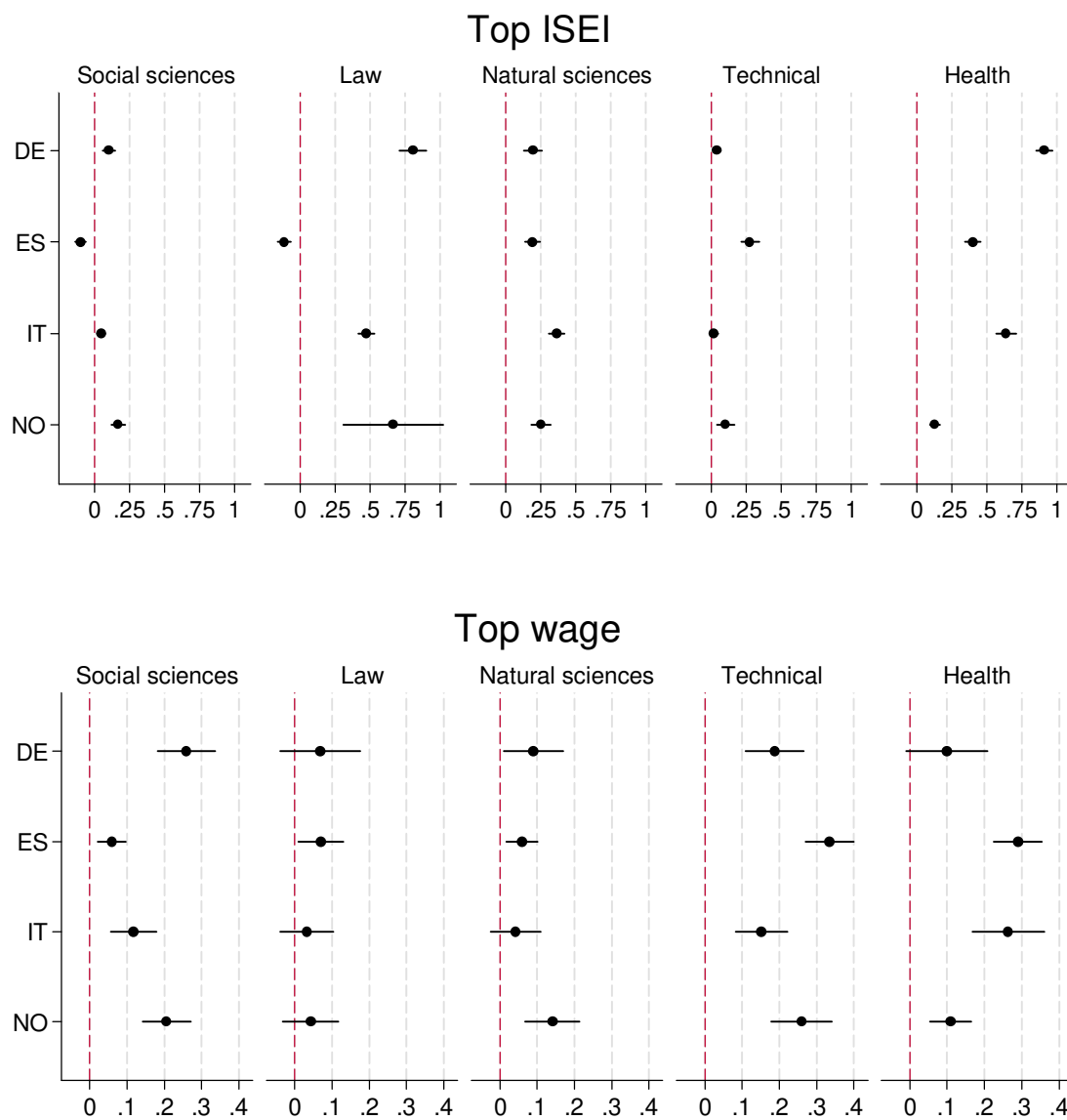
**Figure 1 – Binomial logistic regression models predicting entrance into a top status occupation (upper graph) and in a top wage occupation (lower graph): average partial effects and 95% confidence intervals related to parental education. Full dots indicate estimates from models with only socio-demographic controls; hollow circles indicate estimate from models which also control for types of higher education qualification.**



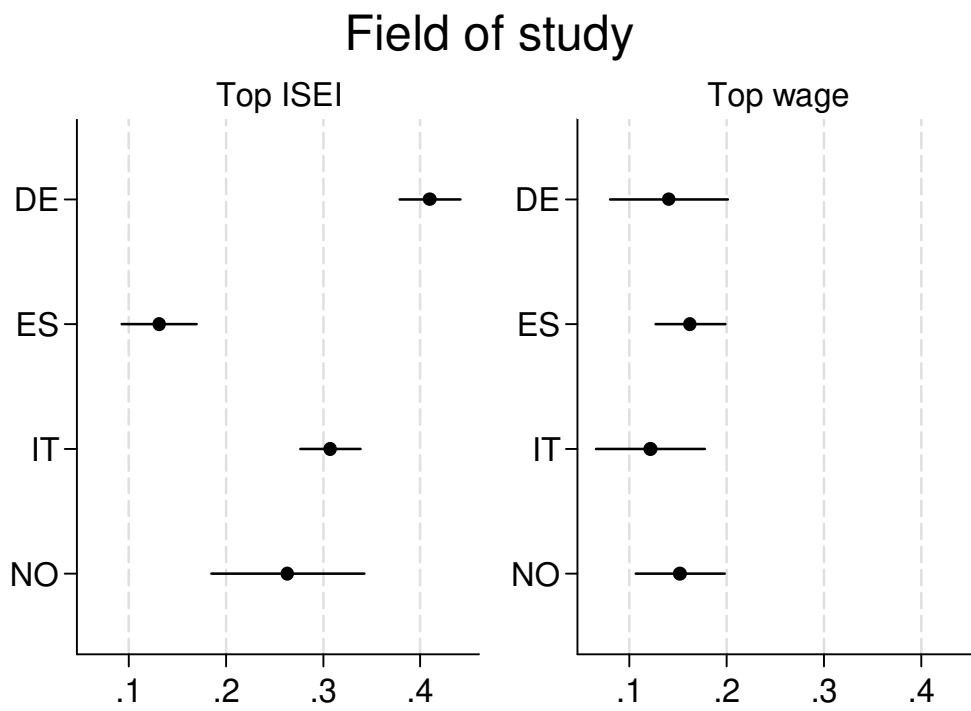
**Figure 2 - Binomial logistic regression models predicting entrance into a top status occupation (left graph) and in a top wage occupation (right graph): average partial effects and 95% confidence intervals related to course length.**



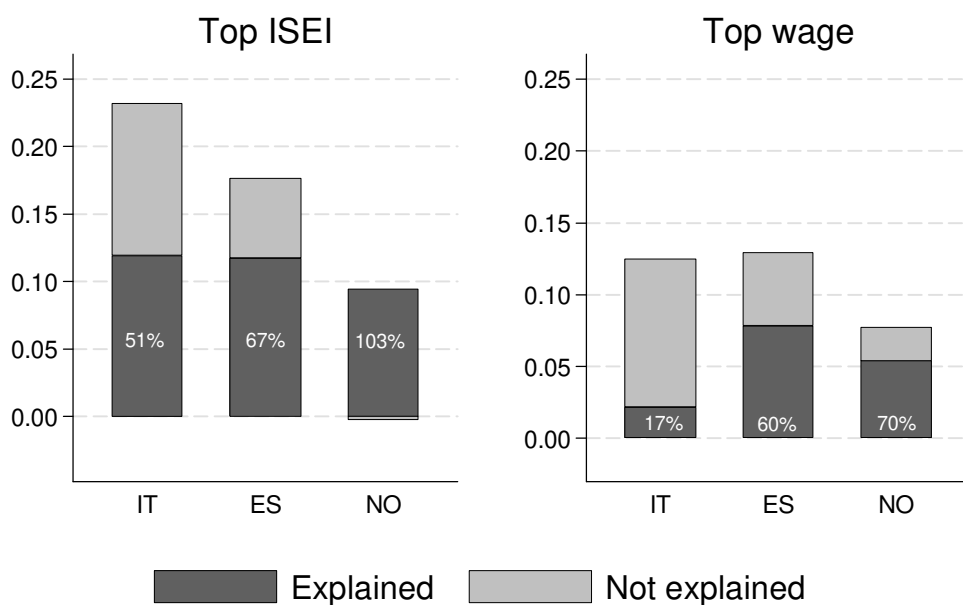
**Figure 3 - Binomial logistic regression models predicting entrance into a top status occupation (left graph) and in a top wage occupation (right graph): average partial effects and 95% confidence intervals related to institutional quality.**



**Figure 4 - Binomial logistic regression models predicting entrance into a top status occupation (left graph) and in a top wage occupation (right graph): average partial effects and 95% confidence intervals related to fields of study.**



**Figure 5 – Summary measure of the association between field of study and top ISEI (left graph) and top wage (right graph).**



**Figure 6 – Decomposition of the differential in the probability of being in a top ISEI occupation (left graph) and in a top wage occupation (right graph) between graduates whose parents are both graduates and those from the lowly educated families. The dark bar indicates the amount of the average partial effect accounted for by the type of qualification acquired in higher education (course length, top institution, field of study).**

Tables

**Table 1 – Main institutional characteristics of the selected countries**

<i>Concept</i>	<b>Higher education size</b>	<b>Non-institutional connections with labour market</b>	<b>Social selectivity in higher education graduation</b>	<b>Higher education stratification</b>
<i>Source</i>	Oecd (2006)	Reflex (2005)	European Social Survey (4 waves pooled)	Reflex (2005)
Germany	Low (<20%)	Low (<10%)	High (11)	Medium-Low (22%)
Italy	Low (<20%)	High (>20%)	Medium (9)	Low (11%)
Norway	High (>30%)	Low (<10%)	Medium (8)	High (64%)
Spain	High (>30%)	High (>20%)	Low (5)	Medium-High (34%)

Note: **Higher education participation:** % of Isced 5A graduates among 25-34 years old. **Non-institutional connections with labour market:** % of graduates who find the 1st job through family and friends. **Social selectivity in higher education graduation:** Odds ratio tertiary education graduation vs less than tertiary comparing people with tertiary educated parents and those with lower secondary (people born between 1969-1979). **Higher education stratification:** Relative academic prestige of the best educational options compared to the others.

**Table 2 - Distribution of the main dependent and independent variables according to country (column %)**

	DE	ES	IT	NO	Total
<i>ISEI</i>					
Lower ISEI	79.4	75.2	77.3	80.7	77.5
Top quarter ISEI	20.6	24.8	22.7	19.3	22.5
<i>Wage</i>					
Lower wage	73.4	77.2	77.0	75.2	76.2
Top quarter wage	26.6	22.8	23.0	24.8	23.8
<i>Social origin</i>					
	DE	ES	IT	NO	
One secondary or less	6.3	62.2	53.3	32.8	45.6
Both secondary	25.6	8.0	23.3	14.2	16.2
One tertiary	35.3	17.5	14.0	26.7	21.0
Both tertiary	32.8	12.3	9.4	26.3	17.2
<i>Course length</i>					
Short programme	30.7	41.3	10.6	73.7	37.3
Long programme	69.3	58.7	89.4	26.3	62.7
<i>Institution quality</i>					
Medium-Low level institutions	74.5	79.5	75.9	79.2	77.7
Top institutions	25.5	20.5	24.1	20.8	22.3
<i>Field of study</i>					
Humanities	21.5	21.3	13.5	28.4	20.5
Social sciences	24.9	31.7	30.5	19.9	28.1
Law	6.7	6.8	13.3	2.9	7.8
Sciences	13.6	14.3	11.1	10.4	12.6
Technical	25.2	15.3	20.3	12.9	17.7
Health	8.2	10.7	11.2	25.6	13.3
Sample size	1,175	2,907	2,192	1,475	7,749



*Appendix*

**Table A1 Dimensions of institutional quality and original variables used to build the composite index**

Dimension	Variable	Cronbach's alpha
1. Selectivity	1a. Proportion of graduates that entered after taken a special entrance exam	0.77
	1b. Average number of selection criteria applied to select students	
2. Intake quality	2a. Proportion of graduates with upper secondary school 'high' grades	0.65
	2b. Proportion of graduates from an academic track in upper secondary school	
	2c. Proportion of graduates with both parents with tertiary education	
3. Quality of occupational outcomes	3a. Average monthly wage from main contract 5 years after graduation	0.58
	3b. Average ISEI score from occupation 5 years after graduation	
	3c. Proportion of graduates who entered a doctorate programme	

Note: employment variables refer to the job hold five years after graduation

**Table A2 – Binomial logistic regression models predicting entrance into a *top status occupation* according to parental education: average partial effects, standard errors and statistical significance at 95%.**

	DE		ES		IT		NO	
	APE	SE	APE	SE	APE	SE	APE	SE
One secondary or less	.	.	.	.	.	.	.	.
Both secondary	-0.060	(0.053)	0.073*	(0.032)	0.064**	(0.022)	0.039	(0.030)
One tertiary	-0.027	(0.052)	0.091***	(0.023)	0.139***	(0.028)	0.064**	(0.024)
Both tertiary	0.057	(0.054)	0.176***	(0.028)	0.245***	(0.036)	0.136***	(0.026)
<i>N</i>	1175		2907		2192		1475	

Note: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Control variables: gender, age, at least one parent born abroad, continued the same job started before graduation.

**Table A3 – Binomial logistic regression models predicting entrance into a *top status occupation* according to parental education and type of qualification: average partial effects, standard errors and statistical significance at 95%.**

	DE		ES		IT		NO	
	APE	SE	APE	SE	APE	SE	APE	SE
One secondary or less	.	.	.	.	.	.	.	.
Both secondary	0.013	(0.036)	0.011	(0.027)	0.006	(0.018)	0.020	(0.026)
One tertiary	-0.000	(0.036)	0.017	(0.018)	0.030	(0.020)	-0.012	(0.020)
Both tertiary	-0.005	(0.036)	0.060**	(0.022)	0.072**	(0.025)	-0.001	(0.020)
Short course	.	.	.	.	.	.	.	.
Long course	0.025	(0.023)	0.281***	(0.015)	0.233***	(0.015)	0.319***	(0.040)
Low institution	.	.	.	.	.	.	.	.
Top institution	-0.036	(0.020)	0.012	(0.017)	0.030	(0.018)	0.121***	(0.028)
Humanities	.	.	.	.	.	.	.	.
Social sciences	0.101***	(0.022)	-0.101***	(0.020)	0.045**	(0.016)	0.168***	(0.025)
Law	0.805***	(0.049)	-0.113***	(0.024)	0.472***	(0.030)	0.665***	(0.182)
Natural sciences	0.194***	(0.034)	0.192***	(0.027)	0.363***	(0.029)	0.252***	(0.036)
Technical	0.039*	(0.016)	0.278***	(0.033)	0.019	(0.017)	0.103**	(0.032)
Health	0.911***	(0.029)	0.401***	(0.028)	0.639***	(0.037)	0.131***	(0.018)
<i>N</i>	1175		2907		2192		1475	

Note: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Control variables: gender, age, at least one parent born abroad, academic track in secondary education, continued the same job started before graduation.

**Table A4 – Binomial logistic regression models predicting entrance into a *top wage occupation* according to parental education: average partial effects, standard errors and statistical significance at 95%.**

	DE		ES		IT		NO	
	APE	SE	APE	SE	APE	SE	APE	SE
One secondary or less	.	.	.	.	.	.	.	.
Both secondary	-0.039	(0.057)	0.050	(0.031)	0.051*	(0.025)	0.068	(0.035)
One tertiary	-0.041	(0.055)	0.082***	(0.022)	0.056	(0.031)	0.063*	(0.027)
Both tertiary	-0.023	(0.056)	0.126***	(0.028)	0.130***	(0.038)	0.080**	(0.028)
<i>N</i>	1114		2860		1693		1481	

Note: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Control variables: gender, age, at least one parent born abroad, continued the same job started before graduation.

**Table A5 – Binomial logistic regression models predicting entrance into a *top wage occupation* according to parental education and type of qualification: average partial effects, standard errors and statistical significance at 95%.**

	DE		ES		IT		NO	
	APE	SE	APE	SE	APE	SE	APE	SE
One secondary or less	.	.	.	.	.	.	.	.
Both secondary	-0.020	(0.055)	0.022	(0.029)	0.040	(0.025)	0.063	(0.034)
One tertiary	-0.024	(0.054)	0.038	(0.020)	0.033	(0.031)	0.039	(0.027)
Both tertiary	0.015	(0.055)	0.049*	(0.023)	0.089*	(0.038)	0.027	(0.027)
Short course	.	.	.	.	.	.	.	.
Long course	0.015	(0.034)	0.140***	(0.016)	0.087**	(0.030)	0.108***	(0.032)
Low institution	.	.	.	.	.	.	.	.
Top institution	-0.020	(0.034)	0.082***	(0.019)	0.074**	(0.024)	0.129***	(0.033)
Humanities	.	.	.	.	.	.	.	.
Social sciences	0.259***	(0.040)	0.059**	(0.019)	0.118***	(0.031)	0.206***	(0.033)
Law	0.068	(0.055)	0.070*	(0.031)	0.032	(0.036)	0.043	(0.038)
Natural sciences	0.090*	(0.041)	0.059**	(0.021)	0.042	(0.034)	0.141***	(0.037)
Technical	0.187***	(0.040)	0.334***	(0.033)	0.152***	(0.035)	0.260***	(0.041)
Health	0.099	(0.056)	0.290***	(0.033)	0.264***	(0.049)	0.109***	(0.028)
<i>N</i>	1114		2860		1693		1481	

Note: Standard errors in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Control variables: gender, age, at least one parent born abroad, academic track in secondary education, continued the same job started before graduation.

**Table A5 – Average partial effects on the probability of being a top status occupation and top wage occupation from basic and full models and their difference, estimated with the KHB method.**

	Top ISEI			Top wage		
	ES	IT	NO	ES	IT	NO
<i>Both secondary vs one secondary</i>						
Basic model	0.076** (0.029)	0.049** (0.018)	0.038 (0.025)	0.053 (0.030)	0.052* (0.025)	0.066* (0.033)
Full model	0.011 (0.027)	0.015 (0.018)	0.024 (0.027)	0.022 (0.030)	0.045 (0.024)	0.058 (0.034)
Difference	0.064** (0.022)	0.034 (0.023)	0.014 (0.021)	0.030* (0.015)	0.007 (0.012)	0.008 (0.017)
<i>One tertiary vs one secondary</i>						
Basic model	0.090*** (0.020)	0.130*** (0.022)	0.033 (0.019)	0.087*** (0.022)	0.045 (0.030)	0.059* (0.026)
Full model	0.014 (0.018)	0.068** (0.021)	-0.009 (0.020)	0.042* (0.021)	0.040 (0.030)	0.035 (0.027)
Difference	0.076*** (0.022)	0.062** (0.023)	0.042* (0.021)	0.045** (0.015)	0.005 (0.013)	0.024 (0.017)
<i>Both tertiary vs one secondary</i>						
Basic model	0.176*** (0.024)	0.232*** (0.030)	0.092*** (0.021)	0.129*** (0.025)	0.125*** (0.037)	0.077** (0.026)
Full model	0.059** (0.022)	0.113*** (0.026)	-0.003 (0.020)	0.051* (0.023)	0.103** (0.037)	0.023 (0.027)
Difference	0.117*** (0.023)	0.119*** (0.023)	0.094*** (0.022)	0.078*** (0.016)	0.021 (0.014)	0.054** (0.018)
N	2907	2192	1475	2860	1693	1481