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Stratification in Higher Education:
The Association Between Parental Education and Graduation in Prestigious Fields Across Eight European Countries, and the Moderating Role of Education-Related Macro Variables

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7. Limitations

7.1 Data limitations

7.2. Methodological limitations

Abstract

This study investigates the association between parental education and graduation in a prestigious field of study—measured through a continuous prestige scale—in tertiary education across eight European countries. It further explores the moderating effects of three macro-level, education-related variables. The analysis is conducted in two stages: in the first, using data from the REFLEX (Research into Employment and Professional Flexibility) survey, a linear regression model is estimated; in the second, the potential moderating effects of the macro-level variables are assessed using weighted least squares. The findings highlight the significant role of parental education in shaping the prestige score achieved by individuals in tertiary education, broadly confirming the patterns identified in previous research. At the micro level, the results show—as expected—that the higher the parental education background, the greater the advantage in terms of the prestige of the field of study attained. At the macro level, the analysis reveals differentiated moderating effects of the public–private expenditure ratio and tuition fees on the relationship between parental background and field-of-study prestige. While the moderating effect for individuals from medium-educated backgrounds aligns with expectations, the results for those from highly educated backgrounds contradict the anticipated patterns. Although these findings shed light on mechanisms of inequality in tertiary education, caution is advised in generalizing the results due to possible limitations related to data constraints and methodological choices.

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1. Introduction

The impact of social class differentiation on access to and success in higher education has been a longstanding topic of interest in the social sciences. Some research suggests that the influence of social class on educational selection has decreased over time (Shavit et al. 2007), while other studies argue that competition for educational credentials has intensified (Arnot et al. 1999).

This topic enriches the literature on social stratification in education, as the structure of higher education in industrialized nations has become less and less homogeneous, being characterized by more horizontal and vertical stratification, (Triventi 2013, Shavit et al. 2007). Evidence supporting this claim comes from findings that the expansion in student numbers has been accompanied by increased differentiation in course levels, fields of study, institutional types, and educational sectors (Teichler 1988).

Additionally, the relevance of this topic is closely connected to labor market outcomes. A stratified tertiary education system, by producing unequal educational experiences, tends to reinforce social stratification in employment opportunities. In this context, this research aims to examine whether and how the social class of origin affects graduation in the higher education field of study, and to identify the patterns characterizing this relationship. It is worth noting that the processes associated with social inequality in tertiary education do not emerge solely at the point of entry. In fact, inequality may particularly affect students throughout the course of their academic trajectory. Differences in dropout rates or changes in study programs are examples of such mechanisms, which inevitably influence graduation outcomes. As a result, these processes of cumulative disadvantage are likely to affect students from less privileged backgrounds more severely, thereby reinforcing existing inequalities (Breen & Goldthorpe, 1997; Boudon, 1974).

Previous research in countries such as Sweden and elsewhere shows that students from privileged backgrounds—typically from middle- or upper-class families—are more likely to choose long and prestigious academic programs. This pattern reflects an advantage for families who are able to support larger investments of time and financial resources. Fields such as medicine and law are classic examples of such prestigious fields (Bellamy & Guppy, Kivinen & Rinne 1991, Davies & Guppy 1997, Kivinen & Ahola 1999, Gustafsson et al. 2000, Kivinen & Ahola 2001, Ayalon & Yogev 2005). It also reveals stronger willingness of social status or social differentiation, and possibly better access to information that allow candidates to identify prestigious fields of study.

Moreover, state and private interventions are likely to play a critical role in shaping a basic relationship between university access or graduation, on the one hand, and social origin, on the other hand.. In systems where education is nearly free and heavily funded by the state, greater equality of opportunity tends to be observed. For instance, price reductions at community colleges based on residency have been shown to increase enrollment among disadvantaged students (Denning 2017). Similarly, generous subsidies provided by the state have had substantial positive effects on enrollment rates (Dynarski 2003, Lovenheim & Owens 2014). By contrast, in countries where private contributions account for a large share of tertiary education funding, lower-income and first-generation students face greater barriers to access (OECD 2020).

Thus, inequality in both access to and graduation from tertiary education can be either mitigated or exacerbated by the nature of public and private investment. This inequality can be stronger if we look at access to prestigious fields of study (Lucas 2001).

Moreover, the main contribution of this study is to extend the relatively underexplored line of research on inequalities in graduation from prestigious fields in tertiary education. It does so by incorporating variables that have rarely been considered in this context—namely, public and private investments in education and tuition fees—as potential moderating factors in the relationship between parental education (assumed as a proxy of socioeconomic class) and educational outcomes. In other words, the aim is to examine whether and how social class background influences the likelihood of graduating in a prestigious versus a non-prestigious field of study, and whether this relationship is moderated by the type of investment and the availability of financial support. Additionally, the novelty of the analysis lies in the use of a continuous scale to measure field-of-study prestige, rather than dichotomizing the outcome (e.g., Triventi, 2013), in order to avoid the loss of potentially valuable information.

Various criteria, such as their linkage to elite occupations (Davies & Guppy 1997), occupational prestige (Treiman 1977), lifetime earnings (Paglin & Rufolo 1990, OECD 2020), or employment stability and strong labor-market demand (Van de Werfhorst & Kraaykamp 2001, Altonji et al. 2012) have been used for classifying fields of study as prestigious. Drawing upon data from the REFLEX survey (2006), this study adopts a stepwise linear regression framework and a two-stage framework to explore the following research questions:

(a) To what extent does one's social class of origin influence graduation in a field of study with a high prestige score?

(b) Does this relationship vary according to the level and type of educational investment and the availability of financial aid?

2. Theoretical Framework, Previous Research, and Hypotheses

This study draws upon three complementary theoretical perspectives to explain why social origins influence the choice of the field of study:

2.1.1. Rational Action Theory (RAT)

Rational Action Theory (RAT) (Breen & Goldthorpe 1997) posits that families and students rationally evaluate educational opportunities through cost-benefit analyses, considering perceived probabilities of successful outcomes. Additionally, rational individuals exhibit relative risk aversion across all social classes, aiming to ensure that their children achieve higher employment status and social mobility, thus avoiding downward mobility (Breen & Goldthorpe 1997).

Distinct patterns emerge when analyzing different social classes: upper-class students strive to maximize their chances of securing high-status occupations, while middle-class students prioritize achieving at least lower white-collar employment (Breen & Goldthorpe 1997). Supporting this perspective, economists argue that female students typically prefer fields associated with occupations offering higher initial earnings and stable career trajectories, thereby minimizing potential costs related to career interruptions (Polachek 1981). Considering social origin (not gender), less prestigious fields of study, which might be less difficult to complete, imply a lower risk.

According to RAT, fields offering higher remuneration, such as technical or economic disciplines, are expected to be popular across all social classes due to their lucrative career outcomes. Conversely, fields such as medicine or law are more accessible to higher-class individuals who possess greater resources to mitigate potential educational setbacks. Thus, the probability of completion may be lower in prestigious fields of study, comporting a higher risk of non-completion for lower-income origin brackets.

2.1.2. Cumulative Advantage and the "Matthew Effect"

Another relevant theoretical framework is cumulative advantage theory (Merton 1973), further elaborated by DiPrete and Eirich (2005), who interpret advantages or disadvantages as mechanisms driving inequality. Merton's "Matthew effect" refers specifically to "the accruing of greater increments of recognition for particular scientific contributions to scientists of considerable repute and withholding such recognition from scientists who have not made their mark" (Merton 1973, p. 446). According to Merton, early-career success attracts additional resources, thereby facilitating continued success. In other words, individuals with initial advantages tend to accumulate further benefits, thus widening gaps over time.

Applying this concept to social stratification emphasizes the advantage of higher social classes, whose accumulated resources, including time and financial support, enable them to pursue riskier educational paths, such as medicine or law. Conversely, individuals from lower-class backgrounds face greater risks when choosing lengthy academic programs and thus often opt for shorter and less risky educational paths, such as technical degrees.

A related concept of cumulative advantage, originating from Blau and Duncan (1967), highlights differences between social groups rather than within-group inequalities. This version of cumulative advantage views the persistent, interactive effects of status variables as shaping group differences in socioeconomic returns, especially concerning educational opportunities and choices.

Accordingly, researchers argue that social background influences educational attainment through academic abilities, performance, and specific educational transitions (Boudon 1974). Additional evidence regarding the role of social background is provided by Bernardi (2012, 2014).

2.1.3. Effectively Maintained Inequality (EMI)

Lucas's (2001) concept of Effectively Maintained Inequality (EMI) highlights the persistent role of social background in determining educational outcomes. EMI posits that socioeconomically advantaged individuals actively secure advantages from a given level of education for themselves and their children whenever that level becomes widely accessible (Lucas 2001). They do so by prioritizing qualitative rather than merely quantitative distinctions relative to other social groups. Educational expansion thus has not eradicated social stratification but redirected inequalities toward horizontal

distinctions, such as fields of study or institutional prestige (Gerber & Cheung 2008, Lucas 2001). Students from highly educated families disproportionately choose prestigious fields like medicine and law, reinforcing existing social advantages (Davies & Guppy 1997, Triventi 2014). Thus, privileged individuals leverage their advantages by enrolling in high-quality institutions and prestigious academic fields.

Previous research consistently supports the association between social background and choice of field, indicating that upper-class students are more inclined toward prestigious and lucrative fields. Studies from the Netherlands and the UK demonstrate that economically advantaged families favor lucrative fields, while culturally elite families choose academically prestigious disciplines such as medicine and law (Van de Werfhorst & Kraaykamp 2001). Socioeconomic factors also account for between 14.9% and 34.6% of the variation in PISA math scores among European students (Martins & Veiga 2010). Additionally, evidence suggests that lower-class students typically select technical fields, like engineering. In Germany during the 1980s and 1990s, students with tertiary-educated parents disproportionately preferred fields like medicine and law over humanities and social sciences (Reimer & Pollak 2010). Consequently, students from socioeconomically advantaged backgrounds are expected to opt for prestigious fields over less remunerative disciplines, such as the humanities. It follows that in countries where higher education has become more accessible, one of the few remaining ways for individuals from higher social classes to distinguish themselves—and thus maintain or improve their status—is to enroll in prestigious fields.

H1: The higher the level of parental education, the higher the average prestige of the field of study in which individuals graduate.

2.2. Primary and secondary effects

Boudon's (1974) classic distinction between primary and secondary effects provides a valuable lens for understanding how social origin channels students into prestigious versus non-prestigious fields of study. Primary effects denote the indirect influence of social background on educational outcomes via class-based differences in academic performance (Schindler & Lörz 2012). In the context of field of study choice, primary effects imply that students from higher-status families typically reach the stage of tertiary education with stronger academic credentials (e.g. higher grades or test scores), making them more eligible for competitive elite programs. By contrast, due to earlier educational disadvantages, lower-SES students are less often in a position to meet the demanding entry

requirements of these prestigious fields. Secondary effects, on the other hand, refer to the direct influence of social origin on educational decisions among students who have similar academic performance (Schindler & Lörz 2012). In this analysis, both the grades and the tracking could mediate the main relationship, capturing the aforementioned primary effects.

H2: Attending general secondary education is positively associated with graduating in a field with higher levels of field of study prestige.

2.3. Public Investment, Cost Barriers, and Policy Interactions

Macro-level policies based on student support and funding play a crucial role in either reinforcing or reducing stratification in the choice of field of study in higher education (Bleemer & Mehta 2024). They can modify the estimation of costs, benefits and risk of success that candidates from different social background make when choosing a field of study at entry into higher education. In their working paper, Bleemer and Mehta (2024) analyze how restrictions in access to certain degrees disproportionately direct students from ethnic minorities—often with lower income—toward less lucrative fields. This phenomenon is critical as prestigious fields such as medicine and law (Van de Werfhorst & Kraaykamp 2001, Triventi 2013), this dynamic is particularly significant given that prestigious fields such as medicine and law (Van de Werfhorst & Kraaykamp 2001, Triventi 2013) typically involve longer study durations, especially when additional specializations are pursued. These fields also tend to be more academically demanding and financially burdensome due to higher tuition fees and material costs, thereby exacerbating existing financial barriers.

In scenarios where talented but low-income students aspire to careers in medicine, the feasibility of their pursuit heavily depends on the costs and available financial aid. Institutional reports by UNESCO and the OECD confirm that high tuition fees, unless offset by aid, disproportionately disadvantage students from low-SES backgrounds (OECD 2022, UNESCO 2023). As UNESCO (2023) highlights:

"Individuals from low-income households often face obstacles in pursuing higher education. This challenge is particularly amplified in countries with high tuition fees and limited financial support, including publicly funded scholarships and student loan programmes." (https://www.unesco.org/en/articles/equity-inclusion-and-transformation-higher-education, 2023).

In effect, as educational costs shift onto families, horizontal inequalities intensify; only those with financial means can access costly and prestigious fields.

2.3.1 Public and Private Investments in Tertiary Education

Public investment in tertiary education varies across the 12 nations considered in this analysis, reflecting both historical developments and policy choices. These countries can be clustered into different welfare regimes, which inevitably influence the extent and nature of public expenditure in education (Esping-Andersen 1990, Ferrera 1996, Castels & Mitchell 1998). For example, Mogstad et al. (2025) examined the Nordic countries—where higher education is free and heavily funded by the government—and found that this model fosters greater equality of opportunity, with minimal barriers to field-of-study choice. Finland, Norway, Denmark, and Sweden consistently rank among the most equitable countries in terms of access to education. However, even in these contexts, other forms of inequality persist, such as disparities in knowledge of the system or patterns of self-selection (OECD 2019).

Thus, while strong public support substantially narrows opportunity gaps, it does not fully eliminate them. For instance, OECD (2019) data from Education at a Glance show that first-generation students have higher participation rates in countries with no or low tuition fees (such as Finland) compared to high-tuition countries (like the United States), although these students still remain underrepresented relative to their share of the population.

In contrast, in countries where private contributions account for a large share of tertiary education funding, lower-income and first-generation students face more significant barriers. Across OECD nations, on average, about 32% of tertiary education expenditure comes from private sources (households or private entities) as of the mid-2010s, and this share has been rising (OECD 2020). Moreover, there is considerable heterogeneity within OECD countries: nations like Japan and the United States rely more heavily on private funding models characterized by high tuition fees and widespread use of student loans, whereas countries like Germany and Austria combine free or low tuition with moderate fees for specific programs (OECD 2020).

The burden of high private costs can discourage low-SES students from pursuing lengthy and prestigious professional degrees. A stark illustration of this phenomenon is seen in the United States: according to an analysis by the Institute for Higher Education Policy (IHEP 2023), students from the

lowest income backgrounds must cover, on average, 150% of their household income to afford the full-time cost of a four-year college education—even after accounting for grants and scholarships. As a result, individuals from disadvantaged backgrounds may choose either not to enroll in higher education at all or to select less costly alternatives, such as shorter programs or part-time study options (IHEP 2023).

Although the United States represents an extreme case, similar affordability gaps can be observed, albeit in milder forms, in other countries. Fields like medicine and law, in particular, pose significant financial challenges: costly entry exams, preparatory courses, and extended study periods (five to six years or longer, including specialization exams to become a lawyer, judge, or medical specialist) create barriers for students who cannot afford years of foregone earnings.

The evidence thus points to an important micro–macro interaction effect: the impact of parental education on the likelihood of choosing a prestigious field of study is expected to be smaller in countries where the state intervenes substantially in educational funding, and larger in countries where private contributions dominate the financing of higher education.

Furthermore, public investments in education may be categorized as tax-based funding and fee capping (Barr 2004, Johnstone 2006), scholarships and grants (Dynarski 2003, Deming & Dynarski 2009), or income-contingent loans (Barr & Crawford 2005, Chapman & Ryan 2002). However, to simplify the analysis, this study aggregates all such instruments under a single "public investment" category (Slaughter & Rhoades 2004, McMahon 2009, Carnoy et al. 2012, Marginson 2016, Barr 2020).

H3. The higher the public/private investment ratio in tertiary education, the weaker the association between parental education and the prestige of the field of study in which individuals graduate.

2.3.2. Financial aids and supportive policies for students

As a particular form of public investment in higher education, financial aid and supportive policies can counteract these barriers. There is extensive evidence in education economics that grants and subsidies positively affect college enrollment and persistence for disadvantaged students (e.g. Dynarski & Scott-Clayton 2013). Regarding the context of field of study, targeted scholarships can attract more diverse students, covering the entire spectrum of income origin. For instance, some countries have introduced scholarships or lower tuition for under-represented groups in STEM or

medical fields as a way to broaden participation (OECD 2021). Australia's HECS scheme (income-contingent student loans) is often cited as a policy that reduced upfront cost barriers and thus enabled students to consider fields based on interest and ability rather than immediate ability to pay. After Australia moved to income-contingent loans in 1989, enrollment from lower-SES students in expensive programs improved modestly (Chapman & Ryan 2002, OECD reports). Similarly, many European countries have kept tuition fees low (or zero) for public universities to ensure that choosing a prestigious field like medicine is not exclusively a luxury for the rich (Mogstad et al. 2025). Furthermore, Garritzman (2016) in his work "Four Worlds of Student Finance" usefully reduces the complexity in the heterogeneity of financial aid and tuition systems in nations by clustering 33 nations with a rich data with more than 70 characteristics about the tuition-subsidy formation into macro-level clusters, in a similar fashion as Esping-Andersen's (1990) work in "The Three Worlds of Welfare Capitalism". As a result, he recognized 4 major macro-level clusters characterized by the level of tuition and subsidy:

"Low-tuition-low subsidy world (e.g. Germany), a low-tuition-high subsidy world (e.g.Finland), a high-tuition-low-subsidy world (e.g., the USA), and a high-tuition-low subsidy world (e.g. Japan)" (Garritzman 2016, p. 92).

Furthermore, despite such efforts, by only reducing the costs of education and by allowing more people to access higher education, informal barriers are not eliminated, and these mechanisms can interact with policy. For instance, when looking at medicine, if the admission process is competitive, families with more resources can invest in private tutoring to prepare their child. Moreover, if loans are available but students are debt-averse or lack information, students might still self-select out. Thus, regarding the lack of information in students, financial aid is not the only misunderstood group. The literature points out a misconception in high school students regarding tertiary education in overestimating the earnings after graduation (Avery & Kane 2004, Barone et al. 2017). There is a consistent tendency among high school students to overestimate higher education costs (Avery & Kane 2004, Loyalka et al. 2013, Barone et al. 2017), but a bigger overestimation occurs among students from disadvantaged classes of origin (Usher 2005, Grodsky & Jones 2007). Thus, the literature also points to the importance of informational and cultural support alongside financial support (e.g., career counselling in high school for under-represented groups, mentorship programs in universities, etc., see Stephens et al. 2014). As a result, students may overestimate the difficulty of higher education and the economic returns of a university degree (Erikson & Jonsson 1996). Consequently, individuals from higher-income backgrounds may possess additional information,

transmitted intergenerationally by their parents, which allows them to navigate higher education and, subsequently, the labour market more effectively. In contrast, those from lower-income backgrounds may be discouraged from pursuing prestigious higher education programmes due to the perceived difficulty of such courses. In this context, social class origin may encapsulate this mechanism, as individuals inherit—by virtue of belonging to a particular class—a set of norms and varying degrees of exclusive information. Thus, in an empirical review involving 71 policy interventions which aimed at decreasing the inequality in enrolment, Herbaut and Geven (2019) did not find any positive effect of the outreach interventions, similarly to what the study conducted by Barone et al. (2017) found.

Moreover, those aforementioned insights reveal an important micro-macro interaction effect, the effect of parental education on choosing a prestigious field of study will likely be smaller in countries where lower cost barriers occur and where there are heavy investments in broad access, and larger in countries that place more of the burden on families. UNESCO, for instance, notes that in high-tuition, low-aid systems, family income (and by proxy parental education) sharply stratifies who can pursue higher education (UNESCO 2023). Conversely, the Nordic model suggests that generous welfare states can compress (though not eliminate) these inequalities (Mogstad et al. 2025).

Consequently, following Garritzmann's typology, it is expected that in more generous finance regimes, with lower fees charged, there will be lower inequality in accessing higher education in general, and specifically in more prestigious fields. In line with what was found by Ortiz-Gervasi and Palomo Lario (2024), where inequality of university graduation by social origin was found to be reduced in systems of tertiary education characterized by low fees and high subsidies and increased with income inequality. Similarly, in the empirical review conducted by Herbaut & Geven (2019), they found that need-based grants do not increase enrollment rates but significantly improve the completion rates from lower brackets students, while merit-based grants act in the opposite way, reinforcing inequalities. Consistently, for instance, Germany and Denmark was found an increase in fees lowered the enrollment rate percentage points (Hubner 2012 for Germany, and Nielsen et al. 2010 for Denmark). Moreover, further evidence of the usefulness of financial aid is found in the work of Broton et al. (2016), which reduces the amount students work and increases the quality of their study career. Consequently, a reduction in hours worked can possibly affect positively degree completion (Goldrick-Rab et al. 2015).

H4: The lower the level of tuition in a country, the weaker the association between parental education and the prestige of the field of study in which individuals graduate.

3. Data and Variables

3.1. Data

Regarding the micro-level of the analysis, the data is drawn from the "Research into Employment and Professional Flexibility" (REFLEX) survey, a harmonized cross-sectional survey conducted in 2005/2006. The survey targeted individuals who graduated in 2000 from various European regions. The majority of the sample (approximately 75%) responded via a written questionnaire, while the remaining 25% were interviewed by telephone.

This dataset is particularly valuable for the present analysis due to its uniqueness in providing information on tertiary education rarely available in other sources. However, there are certain limitations in the implementation of this dataset. Firstly, it is not possible to distinguish between graduates from vocational and academic programs (corresponding to ISCED 5B and 5A, respectively). Secondly, the dataset includes only graduates, which implies a selection of individuals who have already accessed higher education (Triventi 2013).

Moreover, only eight countries are included in this analysis: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Norway, and the United Kingdom (UK). Individuals who were over 35 years old at the time of graduation have been excluded in order to ensure a more homogeneous sample (Triventi, 2013). The final analytical sample, for the micro analysis consists of 13866 observations.

Moving to the macro level, data was extracted from the "OECD Education at a Glance 2000" (OECD 2000) report. Using Chart B1.2, it was possible to retrieve macro-level indicators related to public and private expenditure in tertiary education. The final analytical sample for the macro-level analysis consists of 8 observations.

3.2. Variables

The key independent variable is "Prestigious Index". It captures horizontal stratification and refers to differences within fields of study. Following a similar approach to Triventi (2013), it is assumed here that the average level of prestige associated with each programme is more strongly linked to parental education. Consequently, this variable is not treated as a qualitative one.

The indicator is constructed based on Triventi's framework (2013), by aggregating at the "field of study × country" level two components: the average perceived academic prestige reported by

individuals (on a 1-to-5 scale), and the average gross monthly earnings, used here as a proxy for occupational outcomes—analogous to the use of ISEI in Triventi's study.

For each country-field pair, the mean of both components was computed and then standardized within each country. These standardized values were summed to create a composite prestige index.[12]

The main independent variable is "Father's Education", used as a proxy for parental education due to its prominent use in the literature (e.g., Vandenberghe 2007, Ciommi et al. 2023). The use of father's education as a reliable proxy is further justified by findings from previous studies showing that, when controlling for income, the effect of mother's education tends to disappear, whereas father's education remains significant. This suggests that it serves as a robust proxy not only for parental education, but also for household income, independently of the mother's educational background (Chevalier et al., 2013). Moreover, the exclusive use of father's education as a proxy can also be justified by the temporal context in which the survey was conducted (late 1990s). Several European studies have identified paternal attributes—particularly education—as strong predictors of both social mobility and educational outcomes (Erikson & Goldthorpe 1992, Shavit & Blossfeld 1993, West 1997, Esping-Andersen 1999). In the survey, respondents were asked to indicate the highest educational level attained by their father. This variable was recoded into three categories: 1 = "ISCED 1+2," 2 = "ISCED 3+4," and 3 = "ISCED 5+6."

Remaining at the individual level, the variable "General Education" is used as a mediator (Z) while also examining its direct effect on the outcome (Y). Respondents were asked which type of secondary school they attended. This attribute was then recoded into a binary variable that reflects this information, where 0 = "Non-General" (which means non-general or vocational secondary education) and 1 = "General" (general secondary education).[3]

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[1] Originally, the plan was to follow Triventi's approach by creating a dichotomous variable, in which fields falling within the top 75th percentile nationally would be classified as prestigious—resulting in a dummy variable where 0 = "Non-Prestigious" and 1 = "Prestigious." This operationalization would have enabled the identification of within-country differences in the social valuation of various fields of study. Unfortunately, however, this method would have resulted in the loss of too much valuable information. Therefore, it was decided to rely solely on the index instead.

[2] Refer to the index to identify which fields, following Triventi's approach, could be classified as prestigious by falling within the top 75th percentile.

[3] In addition, it was initially intended to add a second moderator which reflected the "Average Final Examination Grade in Secondary Education". Respondents reported their average grade in the final examination following secondary school. This variable was then recoded into a categorical form as follows: 1 = "Low" (grades between 6 and 7), 2 = "Medium" (grades between 7.5 and 8.5), and 3 = "High" (grades equal to or higher than 9). Unfortunately, including this variable in the model would have significantly reduced the sample size—by approximately 3,500 observations. As a result, it was decided to exclude this variable from the analysis in order to preserve statistical power and cross-country comparability.

The model also includes several control variables: "Female" (0 = "Male", 1 = "Female"); "Age", with individuals who graduated after the age of 35 excluded to ensure a more homogeneous sample (e.g., Triventi 2013). This choice was made since the chosen threshold helps to mitigate potential biases or distortions in the analysis by excluding older individuals who might significantly differ in their historical and social backgrounds. Thus, the analysis focuses on graduates who do not substantially deviate from the typical graduation age, providing additional relevant insights into the group expected to enter the labor market for the first time. Additional controls are: "At Least One Parent Born Abroad" (0 = "Both born in home country", 1 = "At least one foreign-born"); and "Living in Home Country at Age 16" (0 = "Abroad at 16", 1 = "In home country at 16").

Table 1. Descriptive statistics for the variables used at the micro level

Variable	Obs	Mean	Std. Dev.	Min	Max
prestige_index	14659	. 046	1.164	-3.95	10.046
father's education	14232	2.063	.847	1	3
age	14660	30.269	2.288	25	35
female	14660	.597	.491	0	1
parent_migrant	14520	.074	.262	0	1
urban16	14463	.987	.113	0	1
general	14577	.825	.38	0	1

Turning to the macro level of the analysis, each macro-level variable is examined separately in distinct models to test their moderating effect on the key micro-level relationship. Due to the limited number of observations, it is not feasible to include all macro variables simultaneously or to control for additional macro-level factors. Treated as continuous variables, the following indicators are considered: "Public/Private Expenditure ratio in Tertiary Education" and "Fees in Tertiary Education"[4]. The ratio of public to private spending is meant to capture the relative effort that families should do in order to fund their members' investment in higher education. It is meant to be a more accurate indicator of the effort of families than just private or public spending alone[5]. All macro data is drawn from the "OECD Education at a Glance 2000" (OECD 2000) report, which refers to the year 1997. It is assumed that these figures remained constant from the year of enrolment to the completion of the educational cycle.

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[4] Initially, the analysis included the variable "Public Subsidy in Tertiary Education" in tertiary education. However, given the limited, if not absent, internal variation of this variable, it was decided to exclude it from further consideration. For details on the distribution of this variable, please refer to Figure 9 in the appendix.

[5] The measure of the private or public funding is also relative to the number of students who are enjoying this expenditure in each country. Enrollment rate in higher education in country x may not be as high as in country y.
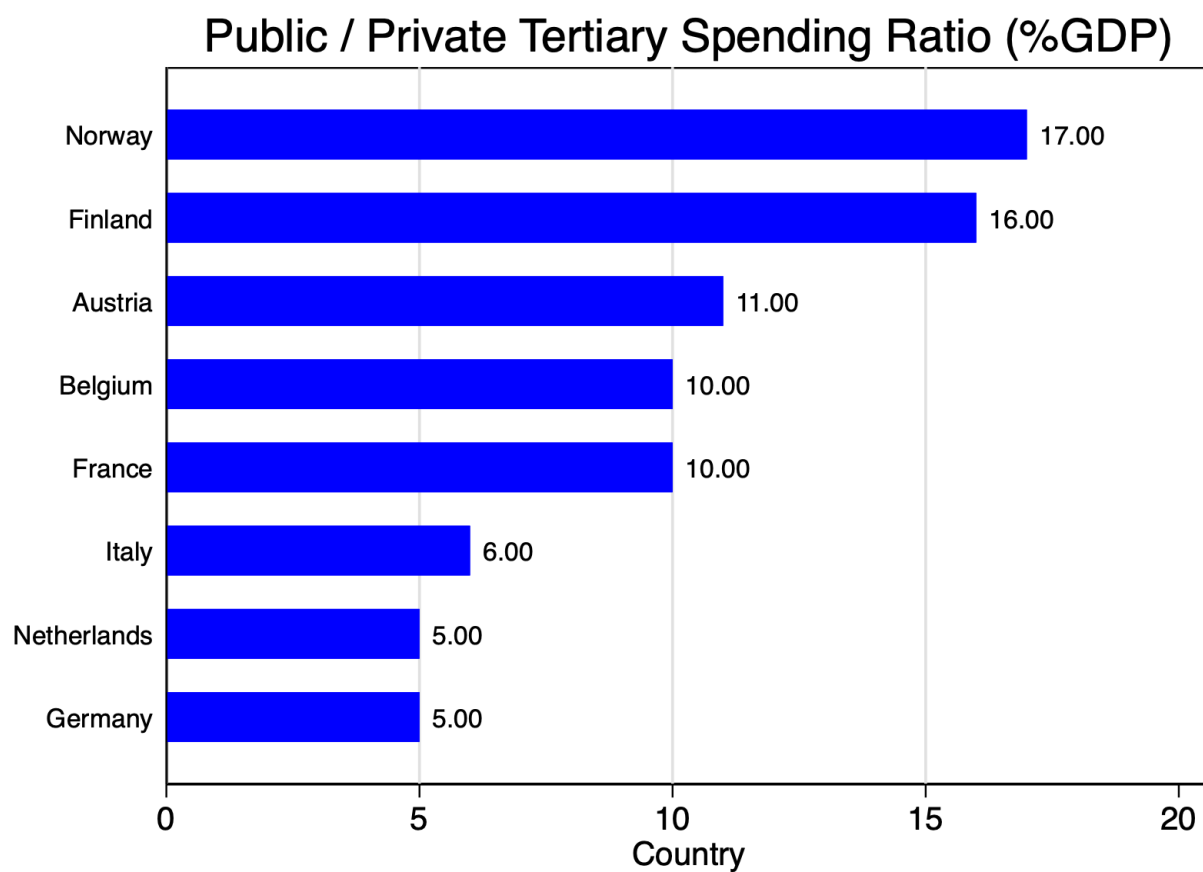
Figure 1. Ratio of public to private spending on tertiary education across countries as a percentage of GDP, by country. Bars show the proportion of government expenditure relative to private expenditure in tertiary education.
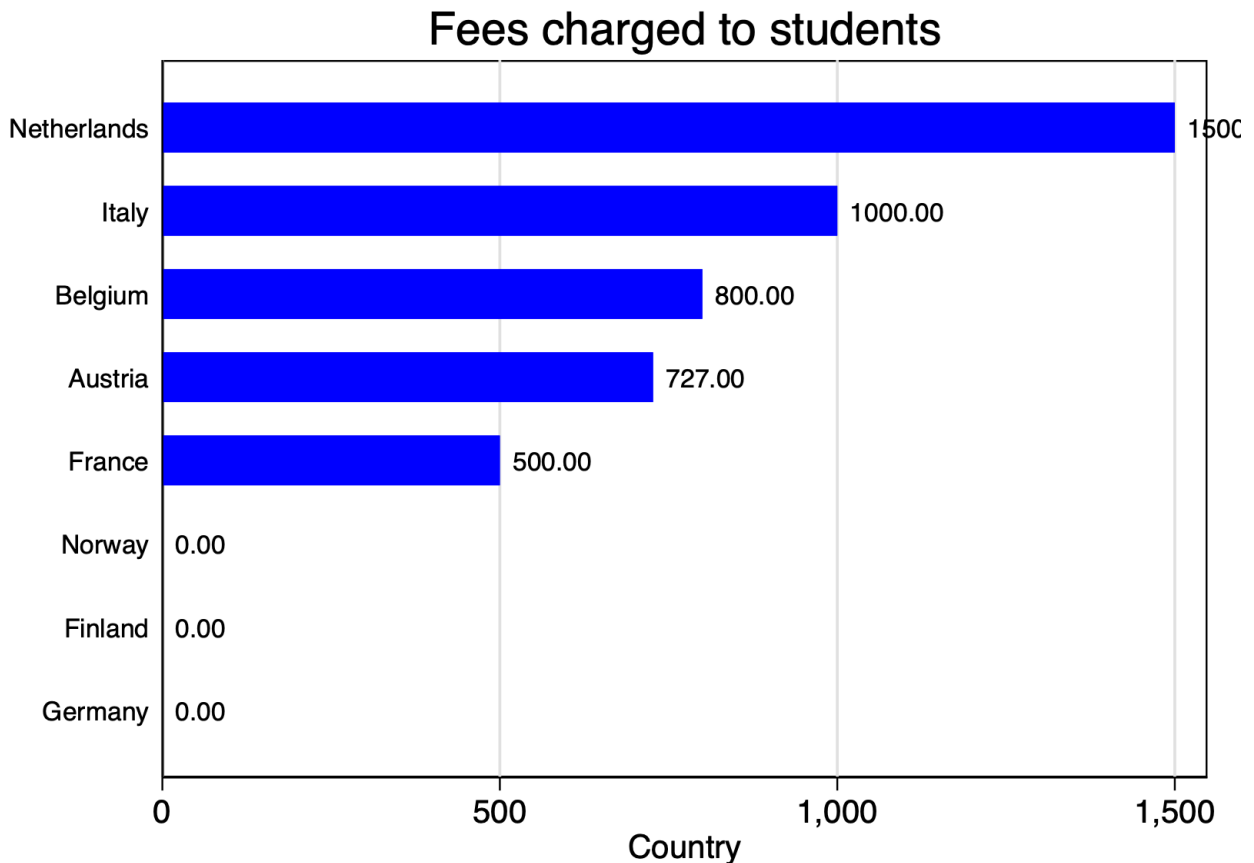
Figure 2. Average tuition fees charged per student in tertiary education, by country (in Euro). Bars show the mean annual tuition fess faced by students.

4.Analytical Strategy

This study adopts a two-step approach, which is particularly well suited to the structure of the available data. The use of this method is justified by the limited number of countries included in the analysis, which would not allow for robust results using multilevel modeling. In particular, there is insufficient information to reliably estimate country-level effects—whether these refer to fixed parameters on country variance or to the variance of random intercepts (Bryan & Jenkins 2016). Moreover, similar two-step research designs have been widely employed in the field of social stratification to examine cross-national estimates of inequality of educational opportunity (Arum et al., 2007, Pfeffer 2008), educational returns (Müller & Shavit 1997), and ethnic penalties in the labour market (Heath & Cheung 2007). This approach is especially appropriate when a large number of level-1 observations are nested within a small number of level-2 units, as is the case in the present study. Under such conditions, two-step models have been shown to perform as well as hierarchical linear models (Bernardi & Ballarino 2014, Lewis & Linzer 2005).

In the first step, stepwise linear regression models are employed to estimate the partial associations. In the first model, the relationship between parental education and the level of prestige of the chosen field of study is examined, capturing the gross effect of the independent variable on the dependent one. In the second model, all control variables are included. The third model adds academic tracking to assess how the introduction of this variable alters the effect of parental education. Finally, the fourth model includes all individual-level variables simultaneously, in order to assess the net effect of parental education.

The second step of the analysis also adopts a two-step approach using weighted least squares. Each macro-level indicator is tested separately to evaluate its moderating effect on the main micro-level relationship. Robust standard errors are used throughout this part of the analysis, as the dependent variable is derived from estimates, and robust estimation helps to account for potential heteroskedasticity.

5. Results

5.1. Results: Micro Analysis

Table 2. Distribution of the dependent variable by country, including percentiles

Country	Count	Mean	Sd	Min	p25	p50	p75	Max
Italy	2585	0.10	0.48	-2.00	-0.24	0.20	0.41	0.80
France	1515	-1.00	0.71	-3.95	-1.55	-1.10	-0.40	1.04
Austria	1310	0.16	1.01	-1.47	-0.66	0.17	0.91	2.63
Germany	1313	0.58	1.27	-1.33	-0.40	0.39	1.52	3.75
Netherlands	2888	-0.92	0.67	-2.16	-1.39	-1.02	-0.61	1.24
Finland	2126	0.14	0.81	-1.24	-0.55	0.44	0.85	4.03
Norway	1660	1.42	1.40	-1.58	0.34	0.89	2.33	10.05
Belgium	1262	0.77	0.63	-1.94	0.56	0.77	1.26	1.84
Total	14659	0.05	1.16	-3.95	-0.66	-0.01	0.80	10.05

Table 2 illustrates the distribution of the dependent variable, the "Prestige Index", across different countries. It is evident that the distribution varies considerably depending on the country, indicating substantial variation both within and between nations. This variation pertains to both central tendency and dispersion. Notably, the overall mean of the dependent variable is very close to zero, with a value of 0.05 (SD = 1.16). However, when disaggregated by country, the mean values differ significantly. The highest average value is observed in Norway (1.42), while the lowest is found in France (-1.00).

Moreover, the variation in standard deviations suggests significant within-country differences. Again, Norway exhibits the highest dispersion (SD = 1.40), whereas the Netherlands shows the lowest (SD = 0.63), indicating a more concentrated distribution. It is also noteworthy that the range of values for the dependent variable is quite wide, extending from a minimum of -3.95 (France) to a maximum of 10.05 (Norway).

Additionally, the division into percentiles provides further insights into the distribution of the variable. For instance, in Finland, the 75th percentile exceeds a value of 0.80, while in France it remains negative. This suggests distinctive differences in the distribution of the Prestige Index across the countries under analysis.

Table 3. Distribution of the independent variable by country

Country	Low Educatio	Low Educatio	Middle Education	Middle Education	High Education	High Education	Total	Total
	No.	%	No.	%	No.	%	No.	%
Italy	1,032	40.81	998	39.46	499	19.73	2,529	100.00
France	580	40.79	224	15.75	618	43.46	1,422	100.00
Austria	684	53.73	249	19.56	340	26.71	1,273	100.00
Germany	30	2.34	412	32.19	838	65.47	1,280	100.00
Netherlands	995	35.73	538	19.32	1,252	44.96	2,785	100.00
Finland	750	36.13	791	38.10	535	25.77	2,076	100.00
Norway	436	26.86	393	24.21	794	48.92	1,623	100.00

Belgium	177	14.23	367	29.50	700	56.27	1,244	100.00
Total	4,684	32.91	3,972	27.91	5,576	39.18	14,232	100.00

Table 3 illustrates the distribution of the independent variable "Father's Education" across the different countries. It can also be observed that the distribution varies significantly depending on the country, indicating substantial within- and between-country variation. Furthermore, the highest percentage of parents with low education is found in Austria (approximately 50%), the highest percentage of parents with medium education is observed in Italy (around 40%), and the highest percentage of parents with high education is recorded in Germany (approximately 55%).

Table 4. Regression Estimates for the dependent variable Prestige Index for each micro model

	(1)	(2)	(3)
	Model 1	Model 2	Model 3
Prestige_index			
Medium Education	0.299***	0.267***	0.242***
	(0.0249)	(0.0238)	(0.0240)
High Education	0.354***	0.357***	0.307***
	(0.0228)	(0.0219)	(0.0224)
age		0.134***	0.140***
		(0.00410)	(0.00413)
female		-0.333***	-0.353***
		(0.0191)	(0.0192)
At least one foreign-born		-0.101**	-0.105**
		(0.0377)	(0.0377)
In home country at 16		0.0111	-0.0000492
		(0.0862)	(0.0874)
General			0.260***
			(0.0255)
Constant	-0.167***	-4.025***	-4.373***
	(0.0168)	(0.158)	(0.161)
Observations	14231	13949	13869

Standard errors in parentheses

$^{*}\,p < 0.05$, $^{**}\,p < 0.01$, $^{***}\,p < 0.001$

Moving to the multivariate analysis, the results from the first model indicate that individuals whose father has a medium level of education score 0.299 points higher on the Prestige Index compared to those whose father has a low level of education. The gap is even larger for individuals with a highly educated father, who score 0.354 points higher. Both coefficients are statistically significant.

The second model introduces several control variables to isolate the net association of the independent variable. In this model, the coefficient for the medium education category decreases, indicating that part of the initially observed association was confounded. One possible interpretation is that individuals with a moderately educated father may benefit from the attributes accounted in the model. Surprisingly, the coefficient for the high education category increases. This may suggest a suppression effect: once the control variables are accounted for, the true magnitude of the positive association between father's education and the Prestige Index becomes more apparent. However, it cannot be ruled out that the included controls are insufficient to fully capture the true nature of the relationship, potentially leaving out unobserved or unmeasured factors. Specifically, individuals from a medium educational background score 0.267 points higher, and those from a high educational background score 0.357 points higher on the Prestige Index compared to individuals from a low educational background. Both coefficients are statistically significant. Furthermore, Model 2 shows that each additional year of age is associated with a 0.134-point increase in the Prestige Index. A possible explanation is that respondents were interviewed five years after graduation, and since some prestigious fields of study require a longer time to complete, age might reflect this delayed entry into the labor market. Being female is negatively associated with the Prestige Index, with women scoring 0.333 points lower than men. Similarly, having at least one foreign-born parent is associated with a 0.101-point decrease. The last three associations described show significance in the model.

Lastly, the third model introduces the mediator related to the type of secondary education institution attended by individuals. In this case, a further reduction in the association coefficients is observed for both main parental education categories. Individuals with a medium educational background score 0.242 points higher on the prestige index compared to those from a low educational background, while individuals from a high educational background score 0.307 points higher. Both coefficients remain statistically significant. In addition, Model 3 confirms the significance of the control variables related to age, gender, and having at least one foreign-born parent, all showing slightly increased coefficients. A one-year increase in age corresponds to a 0.140-point increase in the prestige index, while being female is associated with a 0.353-point decrease. Similarly, having at least one foreign-born parent is associated with a 0.105-point decrease. Furthermore, the mediator itself explains part

of the main association, displaying a significant association: individuals who attended a general secondary education institution score 0.260 points higher on the prestige scale. Moreover, figure 4 shows graphically the difference between the models described.[6]
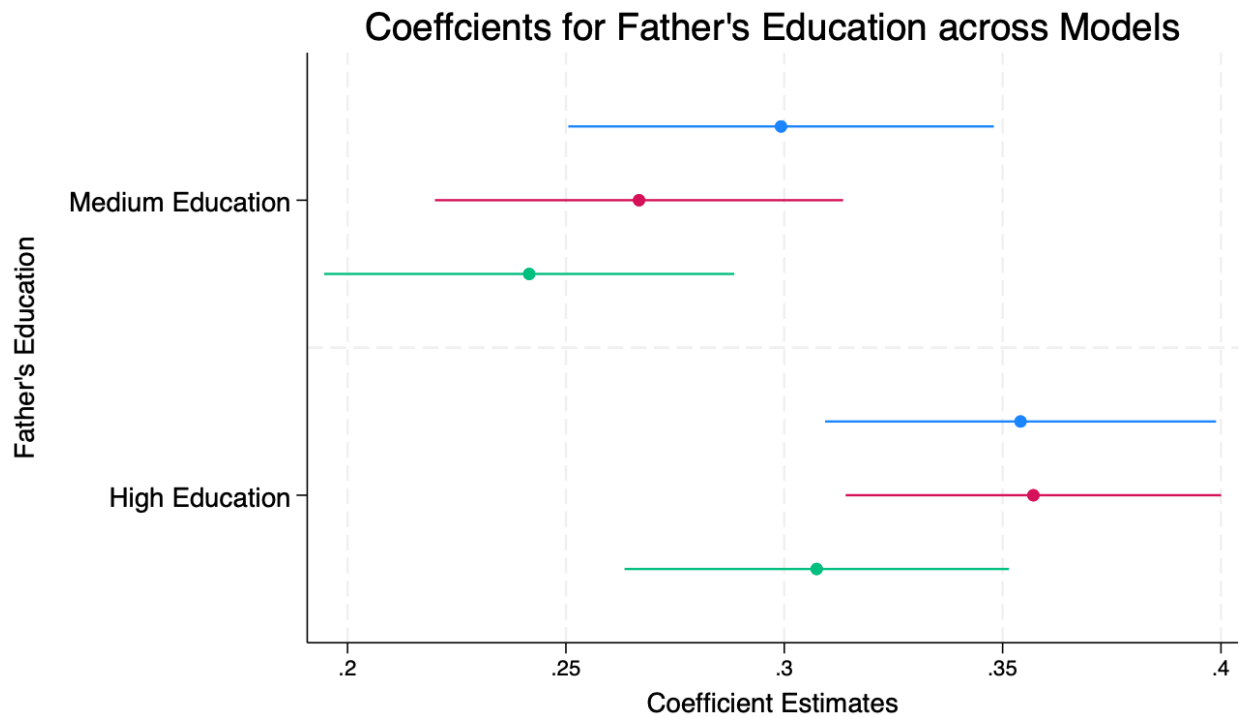

Figure 3. Linear regression models analyzing the Prestige Index by parental education, averaged across eight countries, using low father's education as the reference category. Estimates are net of controls and mediating variables.

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[6] However, differences in coefficients across models should not be overestimated, since the analytical sample is not constant across models.
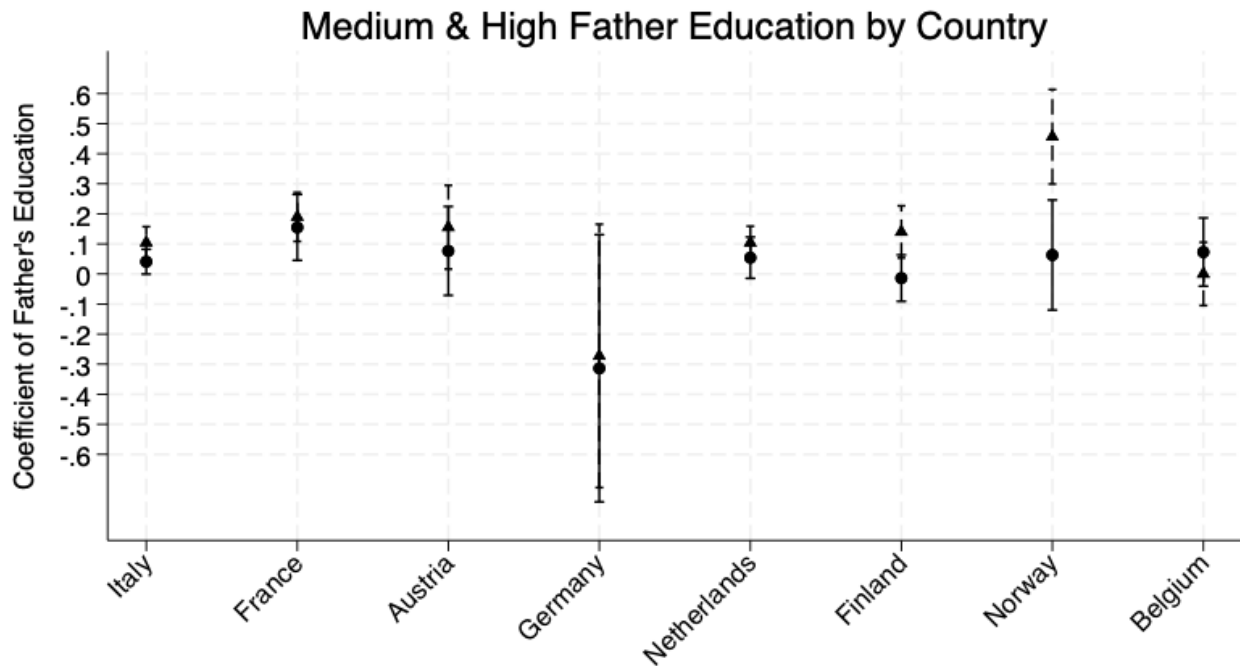
Figure 4. Linear regression models analyzing the Prestige Index by parental education, using low father's education as the reference category, in each of the eight countries. Estimates are net of control and mediating variables.

Moreover, Figure 5 presents the estimated Prestige Index scores for individuals who graduated in each of the countries considered, based on both the full model and Model 3. Circles represent the coefficient difference between medium and low parental education, while triangles represent the difference between high and low parental education.

The results indicate that not in all countries is there a statistically significant association between the father's education and the dependent variable. Specifically, the association between medium parental education and the Prestige Index is statistically significant only in France, where the largest gap between medium and low parental education is observed, amounting to an increase of 0.15 points.

Moreover, in every country analyzed, individuals with highly educated parents show a significant advantage over those with low-educated fathers—with the only exception being Germany, where the association between high father's education and the dependent variable is not statistically significant. The greatest advantage associated with high parental education is observed in Norway, with a difference of 0.456 points compared to the low category, while the smallest is found in Belgium, with only a 0.0002-point difference.

5.2. Results: Macro Analysis

The second part of the analysis considers macro-level variables, each of which is used as a moderator in the main micro-level relationship. Given that the analysis includes only eight observations (countries), it is not possible to draw conclusions regarding the statistical significance of the observed relationships. Consequently, conclusive tests and definitive explanations cannot be provided. Nevertheless, regression analysis can still serve as a useful tool for identifying potential macro-level factors that may relate to the micro-level dynamics observed.
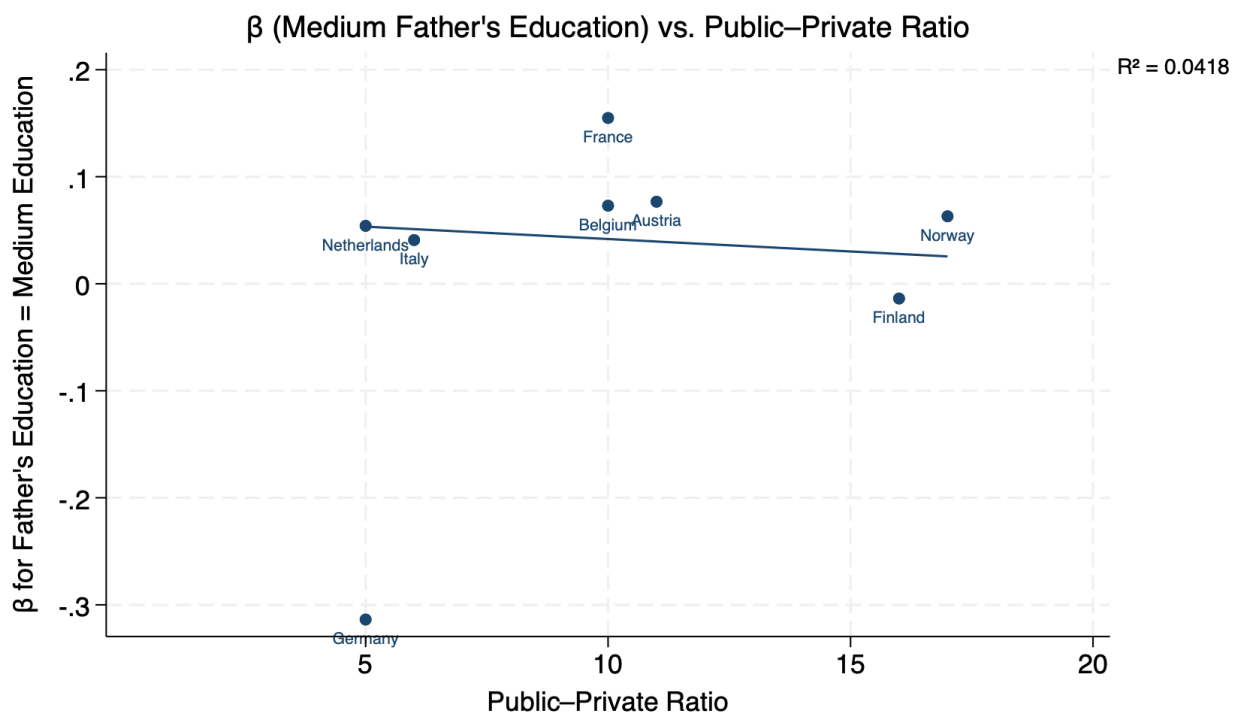

Figure 5. Scatterplot, for each country of the estimated coefficient (β) on Medium Father's Education (relative to low education) from country-specific first-stage models predicting entry into a prestigious field of study, plotted against the country's Public/Private ratio. Each marker represents one country, and the solid line is the ordinary least squares fit.

Figure 5 shows a negative association between the public/private expenditure ratio and the estimated coefficient (β) for Medium Father's Education (relative to low education). This indicates that the higher a country's public/private ratio, the weaker the association between medium paternal education and graduation from a prestigious field of study, with an observed decrease of 0.002 in the coefficient. Interestingly, Germany stands out as an outlier. Despite having one of the lowest public–private ratios among the countries analyzed, Germany shows a strong negative moderation coefficient (approximately -0.3). This indicates that individuals from a medium parental education background loose part of the advantage to those from a low parental education background—contradicting the

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pattern observed in the other countries. This anomalous result may be linked to the deeply rooted stratification of the German education system, particularly driven by early tracking and strong vocational pathways. It is also worth noting that, in the micro-level analysis, the coefficients for both categories of the main independent variable were already non-significant. Therefore, the pattern observed in the macro-level analysis may be inflated by these underlying non-significant micro coefficients.
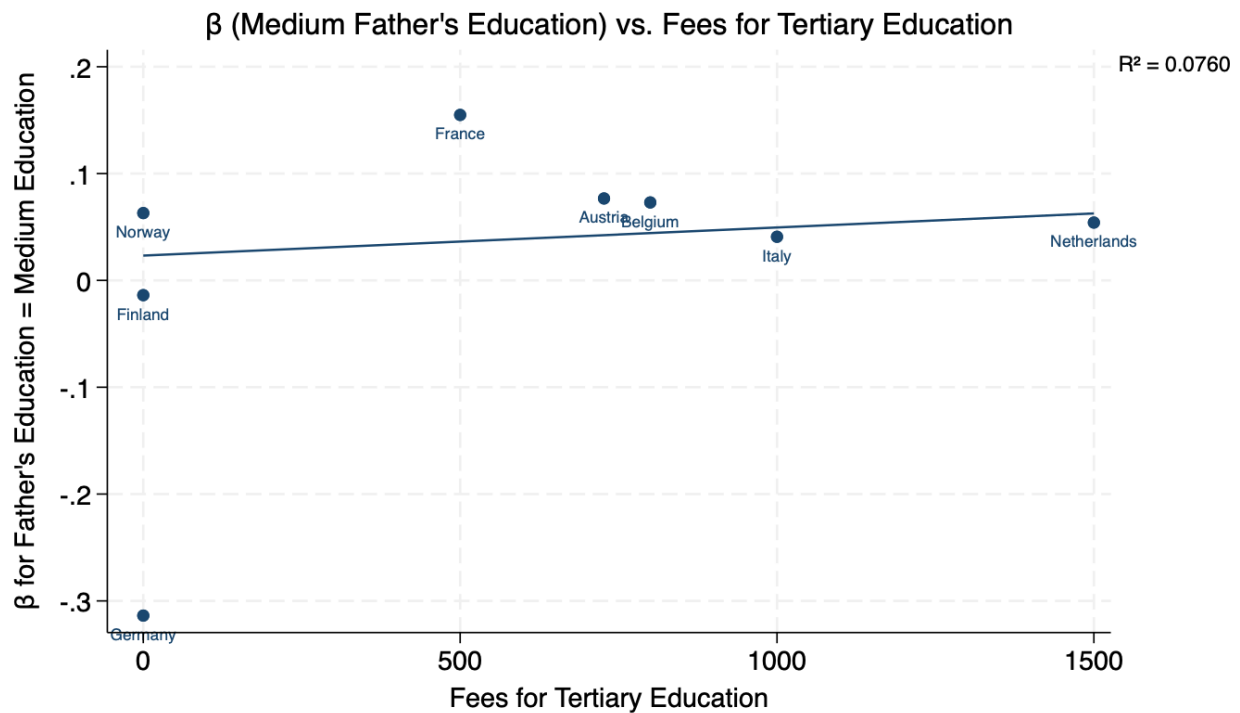

Figure 6. Scatterplot, for each country of the estimated coefficient (β) on Medium Father's Education (relative to low education) from country-specific first-stage models predicting entry into a prestigious field of study, plotted against the country's fees for tertiary education. Each marker represents one country, and the solid line is the ordinary least squares fit.

Figure 6 shows a positive association between fees for tertiary education and the estimated coefficient (β) for Medium Father's Education (relative to low education). This indicates that the more a country charges fees to students, the stronger the association between medium paternal education and graduation from a prestigious field of study, with the coefficient increasing by 0.00003—thus amplifying the existing advantage relative to individuals from low educational origin. Also, in this case, Germany stands out as an outlier, presumably because of the abovementioned data and theoretical aspects.
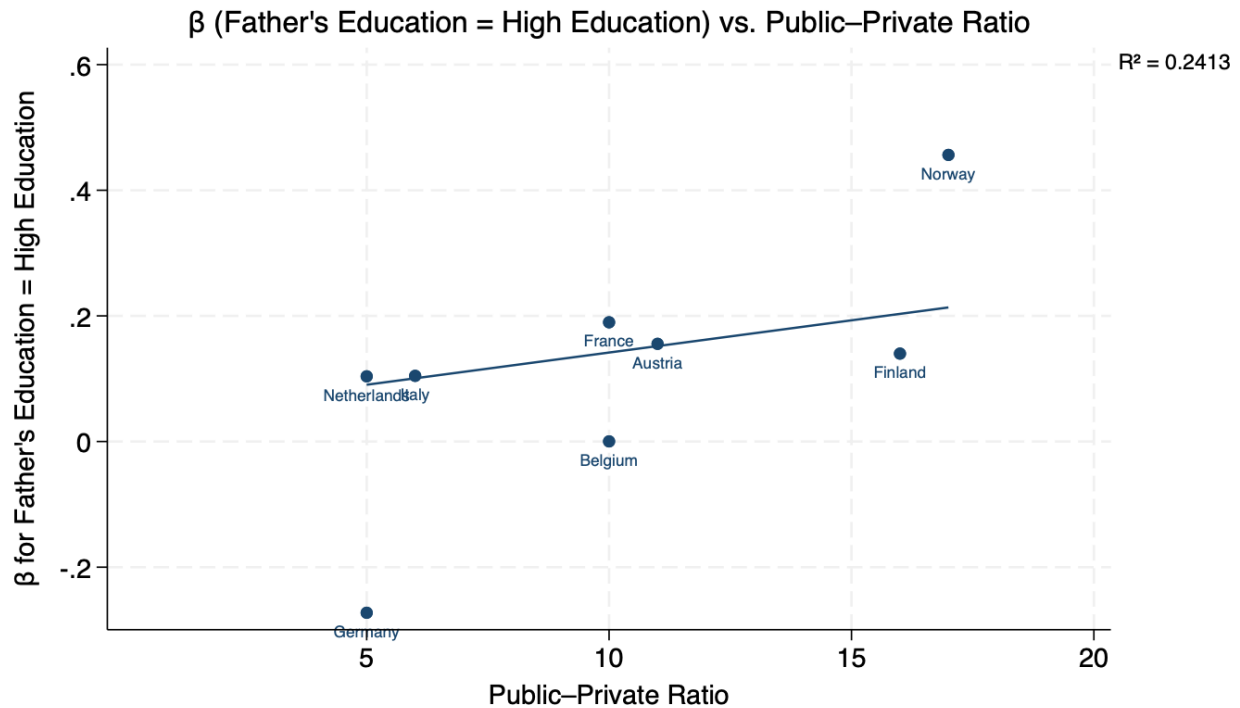
Figure 7. Scatterplot, for each country of the estimated coefficient (β) on High Father's Education (relative to low education) from country-specific first-stage models predicting entry into a prestigious field of study, plotted against the country's Public/Private ratio. Each marker represents one country, and the solid line is the ordinary least squares fit.

Figure 7 shows, surprisingly, a positive association between the public/private expenditure ratio and the estimated coefficient (β) for High Father's Education (relative to low education). This indicates that the higher a country's public/private ratio, the stronger the association between high paternal education and prestige, with the coefficient increasing by 0.0103. This counterintuitive finding may suggest that children of highly educated parents are more likely to benefit from publicly funded programs (e.g., merit-based scholarships, international mobility opportunities), or that, by being more familiar with the structure of higher education—thanks to having university-educated parents—they are better able to navigate the system and capitalize on available opportunities. Notably, also in this case, Germany stands out as an outlier.
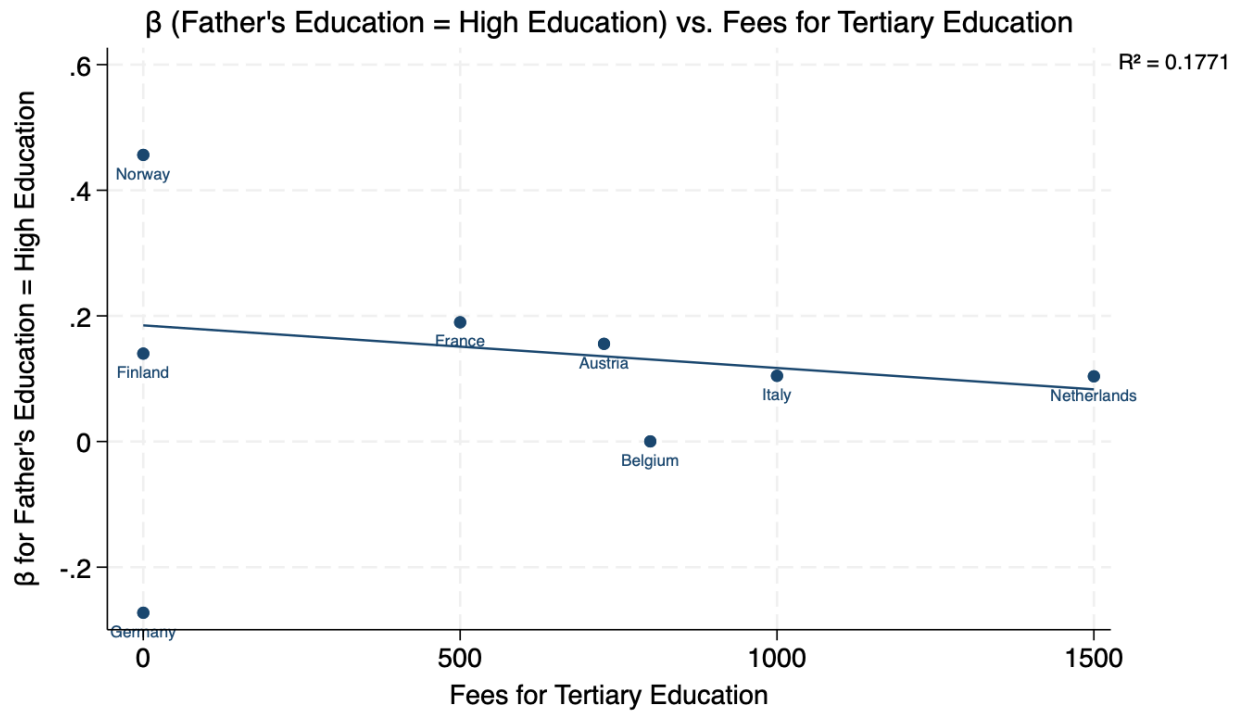
Figure 8. Scatterplot, for each country of the estimated coefficient (β) on High Father's Education (relative to low education) from country-specific first-stage models predicting entry into a prestigious field of study, plotted against the country's fees for tertiary education. Each marker represents one country, and the solid line is the ordinary least squares fit.

Figure 8 shows, surprisingly, a negative association between fees for tertiary education and the estimated coefficient (β) for High Father's Education (relative to low education). This indicates that the more a country charges fees to students, the weaker the association between high paternal education and graduation from a prestigious field of study, with the coefficient decreasing by 0.00007 —thus reducing the existing advantage in this case as well. In this case, alongside Germany, Norway also emerges as an outlier. Germany displays a strong negative coefficient, indicating that the previously observed advantage for individuals with highly educated parents significantly decreases in favor of those from low parental education backgrounds. Conversely, Norway shows the highest positive coefficient, suggesting that the advantage already held by individuals from highly educated families is further amplified. Interestingly, although these two countries share similar levels of tertiary education fees, the divergent patterns observed may suggest that factors beyond tuition costs interact with the mechanisms under analysis and influence the outcomes. These may include the structure of academic and tertiary education institutions, labor market dynamics, or cultural processes related to the intergenerational transmission of values, symbols, and knowledge.

6. Conclusions and Discussion

The aim of this research was to examine how inequalities are redistributed in higher education and how they relate to educational stratification. This topic—particularly from a comparative perspective—has historically attracted the attention of both international organizations and academic scholars (Shavit et al. 2007, OECD 2008), and has similarly been explored across various European countries (Van de Werfhorst & Kraaykamp 2001, Triventi 2013). The main contribution of the present study lies in extending a relatively underexplored line of research on inequalities in graduation from prestigious fields in tertiary education. It does so by incorporating macro-level attributes that, to the best of current knowledge, have not been extensively examined. Additionally, the study examines the moderating effect of these macro-level factors on the individual-level relationship between parental education and graduation from a prestigious field of study as an educational outcome. The inclusion of public and private investments in education and tuition fees has provided valuable insights.

Firstly, the findings regarding the first step of the analysis confirm the initial hypotheses, revealing results that align with most of the existing literature (e.g., Van de Werfhorst & Kraaykamp 2001, Triventi 2013). Thus, the individual-level analysis shows that—both in terms of gross and net associations (i.e., after controlling for covariates)—the strongest association on average across the eight countries analyzed, is found among individuals with a high level of parental education. This advantage is also evident within each country when examining the association, individuals from a high parental education background exhibit the largest gap compared to those from a low background, thereby confirming the first hypothesis (H1). Furthermore, when testing for a mediating effect of general versus vocational educational tracking in the third model, the effect of parental education decreases, thereby supporting the theoretical assumptions of Boudon's theory (1974). As a result, the second hypothesis (H2) is confirmed.

Turning to the macro-level analysis, an intriguing pattern emerges. Starting with the association between medium father's education and the Prestige Index, the moderating role of the public–private expenditure ratio appears to reduce the pre-existing advantage of individuals from medium-educated backgrounds compared to those with low-educated fathers. In contrast, when examining the association between high father's education and prestige, the public–private ratio instead amplifies the existing advantage over individuals from low educational backgrounds. As a result, the third hypothesis (H3) is partially confirmed. This unexpected result may, at least in part, be explained by

the Matthew Effect (Merton, 1973): children of highly educated parents may be better positioned to take advantage of public resources offered by universities, partly due to greater familiarity with the system and access to informal information networks. Additionally, another explanation may lie in the fact that middle- and high-income students tend to be the main beneficiaries of merit-based scholarships (Scott-Clayton 2011, Sjoquist & Winters 2015, Binder & Ganderton 2004), thereby capitalizing more effectively on public investments. Finally, when considering the moderating role of tertiary education fees, a differentiation emerges in the association depending on the parental education level. In the case of medium father's education, and in line with expectations, the advantage increases as tuition fees rise. In contrast, for individuals with highly educated fathers, the advantage decreases as fees increase. This novel result may point to an unexpected equalizing effect of tuition fees, which in certain contexts might play a more effective role in reducing social inequality. This could be particularly relevant considering that the dataset only includes university graduates, suggesting a possible self-selection effect: students from low parental education backgrounds who manage to pay high tuition fees may be highly motivated, and thus perform better. As a result, this finding partially confirms the fourth hypothesis (H4).

These results shed light on important mechanisms. First, the greatest advantage is observed among individuals whose parental education is high, confirming the pre-existing observed pattern in the literature. Additionally, the mediating role of the general education ably absorbs part of this association, possibly being a result of the abovementioned advantage.

What is particularly interesting about these findings is the role played by contextual variables, which behave in ways opposite to initial expectations. In particular, with regard to the public/private expenditure ratio for individuals having a high educational origin, the results suggest that countries should reflect on the actual effectiveness of the policies implemented in the year under analysis and evaluate whether they have truly contributed to reducing inequalities in access to prestigious fields of study. Additionally, the growing privatisation of higher education—such as the expansion of private universities where access to fields of study is not regulated by public admission criteria—may grant students from higher social backgrounds greater freedom in choosing prestigious academic programmes that remain largely inaccessible to their less privileged peers. In this context, private institutions may serve as a compensatory mechanism, amplifying the influence of social origin on field of study choices. Surprisingly, it appears that tuition fees may function as a genuine equalizing factor in some contexts. Furthermore, the heterogeneity in the equalising effect of different

types of public financial support (e.g. merit-based scholarships or need-based scholarships) may explain the relatively weak effect of the public/private ratio variable.

Moreover, another important finding is the identification of substantial heterogeneity in what is considered a prestigious field of study[7] and in the prestige score of fields of study. In many countries, prestige is not limited to traditionally dominant fields such as law, medicine, and engineering (Triventi, 2013), highlighting critical national differences in how academic prestige is defined and valued.

In sum, this research—through its methodological originality in applying a continuous measure of field-of-study prestige rather than a dichotomous variable (e.g., Triventi, 2013), and by employing a two-step analytical approach (Bernardi & Ballarino, 2014)—provides findings that are consistent with the existing body of research on educational inequalities, particularly within the context of tertiary education, thus corroborating the results of previous studies. The findings also align with key theoretical frameworks such as Rational Action Theory (RAT), Cumulative Advantage, and Effectively Maintained Inequality (EMI). In line with the assumption of progressively linear advantages across social classes, the results show that the higher the level of parental education, the higher the individual's score on the theoretical prestige index.

In addition, the incorporation of macro-level variables has shed new light on the phenomenon, offering essential implications for policy-making. These findings underscore the complexity of how inequalities in funding and expenditure are distributed within tertiary education, revealing distinct patterns based on parental education. Specifically, public investment in higher education appears to serve as the most effective equaliser for individuals from low-educated backgrounds compared to those from medium-educated families. In contrast, when comparing individuals from low-educated families to those from highly educated backgrounds, tuition fees seem to play a more prominent role.

These results point to the need for careful and context-sensitive educational policy design. Some of the findings are counterintuitive—for example, the suggestion that increasing tuition fees, rather than expanding public investment, could function as a social equaliser in certain contexts. This may imply that higher fees enhance student commitment or that increased funding through fees improves

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[7] See Table 5 in the appendix, where, by applying Triventi's (2013) dichotomous approach, it is possible to identify which prestigious fields fall within the top 75th percentile in each country.

institutional quality—by enabling better equipment, resources, and infrastructure—which in turn may attract a broader and more diverse student body.

Despite the novel insights provided by this study, particularly regarding the methodological construction of variables, which significantly enriches existing literature, this analysis represents merely an initial exploration of a phenomenon that warrants deeper investigation. Further research is essential to thoroughly examine this topic and validate, challenge, or refine the findings presented here. Future studies should also explicitly address and seek solutions to the limitations identified in this work.

Ultimately, this research generates more questions than answers, emphasizing the critical necessity for thoughtful reflection on education-related policies and the effectiveness of possible social equalizers aimed at reducing inequalities. Consequently, this opens new theoretical avenues for understanding and studying educational stratification and its implications.

7. Limitations

Several limitations affect the present study, including data constraints, methodological challenges, theoretical scope, and the generalizability of the findings. As a result, the reported outcomes may be subject to inflation or may contain various sources of error.

7.1. Data limitations

The REFLEX survey data may not adequately represent the overall population of graduates. In addition to the age survey, which was conducted in 2005/2006 and referred to graduates from 1999/2000, the overall response rate was relatively low, with only around 30% of respondents participating (HEA 2015). Moreover, response rates varied significantly across countries (HEA 2015). This high level of nonresponse may result in the underrepresentation of specific groups of graduates, such as those from lower socio-economic backgrounds or individuals with less favourable outcomes. Although adjustments were made to correct for under- or over-sampling in specific fields (HEA 2015), the possibility of residual bias cannot be entirely excluded. As a result, the representativeness of the graduate sample may be substantially compromised.

Additionally, there is limited coverage of relevant variables. For example, the dataset lacks measures that directly capture pre-university academic performance or aspirations (Jacob & Klein 2019). The only available indicators are general or vocational education and final secondary education grades; however, the latter suffers from a very low response rate, rendering it unusable for cross-national comparisons. This limitation weakens the ability to distinguish between primary and secondary effects of social background—whether differences in field choice are due to unequal preparation or to decisions shaped by perceived academic ability (Jacob & Klein 2019). Consequently, the analysis relies heavily on proxies, which may attenuate the actual influence of socio-economic background.

Furthermore, many variables in the REFLEX dataset are self-reported by the respondents. This data collection method is susceptible to error and social desirability bias (Hassan 2006). For instance, respondents may have misreported key variables in this study, such as income or parental education, potentially biasing the estimates. As a result, findings must be interpreted cautiously, as retrospective data collection poses validity challenges (Hassan 2006). Additionally, the retrospectiveness used to collect the data, since the graduates were surveyed a few years after graduation, can suffer from recall bias, in which respondents may recall incorrect information or forget precious details (Hassan 2006).

Another limitation is that the REFLEX dataset includes only individuals who attained a higher education degree, introducing selection bias. Students from lower-class backgrounds are statistically less likely to access tertiary education in the first place—a well-established pattern referred to as Maximally Maintained Inequality (Raftery & Hout 1993). Since the sample consists exclusively of university graduates, the full effect of social origin may be underestimated, as the most disadvantaged individuals are excluded. Consequently, the findings may only apply to a selective subset of the population—those who succeeded in entering higher education—thereby violating assumptions of random sampling and overlooking unobserved factors that influence both access to tertiary education and field of study choice.

Moreover, when considering Germany, it becomes evident that this country consistently emerges as an outlier throughout the analysis. This could be attributed to the unfortunate inability, within the dataset used, to distinguish between ISCED 5B and ISCED 5A programs. Such a limitation may have compromised the analytical framework and consequently inflated the observed results, although the findings related to Germany do not appear statistically significant.

Finally, an important limitation concerns using the OECD Education at a Glance 2000 report (OECD 2000). Since expenditure and fees data were extracted from a graphical chart rather than from raw data tables, these indicators are used only as proxies. Furthermore, the analysis assumes that these data—collected in reference to 1997—remained stable at the time students applied for tertiary education (approximately 1995, given that the REFLEX cohort graduated in 1999/2000). This assumption may not hold in all country contexts.

7.2. Methodological Limitations

One key limitation concerns the operationalization of social origin, which relies solely on the father's educational attainment. This approach may lead to an overestimation of the effect of parental education on students' university choices. For instance, Ayalon and McDoss (2019), building on Van de Werfhorst's (2001) distinction between economic and cultural elites, investigated how high-income but non-academic families in Israel shaped their children's educational trajectories. Their findings indicate that daughters from economically privileged but culturally less established backgrounds were more likely to pursue lucrative fields, while sons tended to enrol in law or business programs at private institutions. These results highlight the importance of economic capital, beyond educational background, in shaping higher education decisions. Therefore, by relying exclusively on educational attainment to define social origin, the present study may capture only a partial view of a broader and more nuanced reality.

Likewise, the operationalization of the main dependent variable—prestige, expressed through an index—may oversimplify a multidimensional concept. Tertiary education systems are highly complex, and such reduction can obscure important nuances. For example, variation within so-called "prestigious" fields or institutions is not captured (Triventi 2013), nor are the interactions between institutional prestige and specific fields of study. Furthermore, the use of a continuous scale, rather than a dichotomous variable, represents a novel approach that, to the best of current knowledge, has not yet been applied in the existing literature.

Another methodological concern relates to the definition of the main independent variable. Using only the father's education neglects both the mother's educational level—which could be equally or even more informative—and the potential combined influence of both parents. In a cross-national study, Terschuur (2023) found that in 17 out of 30 countries, the mother's education exerted the strongest influence on children's educational outcomes. Terschuur also demonstrated that higher

income inequality correlates with lower social mobility, a relationship known as the "Educational Great Gatsby Curve". Using a refined measure of Inequality of Opportunity (Income IoP), he confirmed that this correlation strengthens further. This finding can be interpreted through the latent status perspective (Stuhler 2023), which suggests that highly educated parents transmit not only economic capital but also human capital, social prestige, networks, and expectations—consistent with Bourdieu's (1990) theory of habitus and multiple forms of capital. As a result, in contexts where access to higher education is less equitable, reducing inequality becomes challenging without simultaneously addressing broader economic disparities. Similarly, drawing on human capital theory, Espinoza et al. (2018) showed that in Chile, maternal education and salary significantly influenced graduation rates, the prestige of secondary schools attended, and university enrollment. Moreover, students from elite universities received higher compensation in the labor market, reinforcing inequalities through the educational stratification system.

As an observational, cross-national study, the present analysis is unable to establish causal relationships. The study identifies associations, but unobserved variables—such as student motivation, university admissions criteria, or labor market conditions—may be driving the observed correlations. In addition, while appropriate given the small number of countries, the two-step modelling strategy used in this study does not allow for control over other macro-level variables that could influence the results (e.g., GDP per capita, Gini index, employment or unemployment rates). With only eight countries included, statistical power to detect robust cross-level interactions remains limited (Bryan & Jenkins 2016). Although the two-step approach helps avoid the pitfalls of applying multilevel models to a small number of level-2 units (Bryan & Jenkins 2016), the results must be interpreted as indicative rather than definitive. Moreover, this approach treats the estimated effects from the first step as observed values in the second step, without fully accounting for their estimation error—potentially leading to an overestimation of macro-level moderation effects.

In addition, the study does not employ any experimental or quasi-experimental design nor benefit from a temporal ordering in the data that would allow for stronger causal inference. Thus, any causal interpretations must rely solely on theoretical reasoning (Jacob & Klein 2019).

It was also assumed that the concept of "prestige" is comparable across countries. However, this assumption may overlook local nuances. It is plausible that in different contexts, other criteria beyond top academic percentile or post-graduation earnings contribute to how prestige is constructed.

Therefore, the index used in this analysis might fail to capture culturally specific understandings of prestige.

Further, the cross-national comparison adopted in this study may obscure important country-specific dynamics. For example, Vergolini and Vlach (2017) found that in Italy, parental education significantly influences children's educational outcomes. Horizontal inequalities appear prominently in the pursuit of more advantageous educational tracks, especially with respect to labor market returns. High-performing students from lower socio-economic backgrounds often opt for vocational education as a form of risk aversion, while their wealthier counterparts tend to pursue more ambitious university tracks. Similarly, Espadafor and García-Sierra (2025) found that in Spain, educational expansion enabled disadvantaged families to achieve higher minimum attainment levels (at least upper-secondary education). However, it also introduced new layers of stratification, as the relative value of educational credentials declined. These findings echo patterns observed in the Netherlands (De Graaf & Ganzeboom 1993) and are consistent with broader literature on intergenerational transmission of inequality (Breen & Goldthorpe 1997, Lucas 2001, Arum et al. 2007, Van de Werfhorst & Hofstede 2007, Ballarino et al. 2009, Holm & Jaeger 2008, Breen et al. 2009, Triventi 2013, Chesters 2015). Nevertheless, in the present analysis, countries are treated mainly as providers of financial structures, without adequately accounting for qualitative differences in educational systems—such as admissions policies or cultural attitudes toward specific fields of study.

Additionally, due to data constraints, the present study does not account for a potentially relevant mediator—grades obtained in secondary education—which could attenuate the main individual-level association. Another important omitted variable concerns the distinction between merit-based and need-based financial aid. In particular, within the framework of public investments, different forms of financial support may play distinct roles and should be considered separately in future research since the literature reports divergent effects on inequality depending on the modality of aid provision. Broadly, one may distinguish between merit-based and need-based assistance. With respect to merit-based aid, Scott-Clayton (2011) examined West Virginia's PROMISE Scholarship and observed that, despite an overall rise in college enrollment, the principal beneficiaries were students from middle- and upper-income backgrounds; low-income students frequently failed to qualify due to grade-point-average requirements, thereby intensifying preexisting disparities. Likewise, Sjoquist and Winters (2015) analyzed Georgia's HOPE Scholarship and found that wealthier students—predominantly white—were disproportionately advantaged by higher academic performance, itself underpinned by greater resource endowments. Binder and Ganderton (2004) offer corroborating evidence from New

Mexico, where a merit-based aid program boosted enrollment but proved inaccessible to low-income students, who were unable to maintain requisite academic standards in light of work–study conflicts. Concerning the influence of merit-aid on field-of-study selection, Cohodes and Goodman (2014) evaluated Arkansas's Workforce Grant—a STEM-targeted scholarship—and reported that it increased STEM enrollment unevenly, favoring graduates of elite high schools whose stronger academic preparation conferred a pronounced advantage. Similar patterns have been documented in Europe; for example, Vossensteyn (2009) demonstrated that Dutch merit-based scholarships disproportionately rewarded students from affluent families.

In contrast, need-based aid appears to operate differently. Carruthers and Ozek (2016) investigated Tennessee's need-based grant program and determined that it not only raised overall enrollment but also significantly improved participation among low-income students, thereby narrowing equity gaps in higher-education access. In Germany, the Federal Student Financial Aid Program (BAföG) provides partially repayable grants to low-income students, facilitating their continuation in postsecondary study (Lörz et al. 2018). Also, in France, means-tested grants have reduced access inequalities, although they have not alleviated stratification between general institutions and elite grandes écoles (Gary-Bobo & Trannoy 2008).

Finally, this study overlooks important micro-level interactions with other social dimensions that could offer meaningful insights into the core relationship—such as gender or immigrant background. For example, Kraaykamp et al. (2013) identified persistent gender differences in field-of-study preferences, with men more likely to choose economics and women more often selecting medical, educational, and socio-cultural fields. They also highlighted the strong role of parental education in shaping academic attainment and demonstrated intergenerational transmission of field preferences. This pattern aligns with neo-Weberian perspectives, which suggest that competition for high-status positions prompts families to mobilize resources to maximize their children's educational and occupational outcomes.

As a consequence, future research should address these limitations more thoroughly in order to provide more robust and reliable estimates, and to better isolate the mechanisms underlying social inequality in field of study choice.

Appendix

Table 5. Prestigious field of study for every nation considered in the analysis.

country	field_name
Italy	law
Italy	physical science
Italy	mathematics and statistics
Italy	engineering and engineering trades
Italy	health
Italy	personal services
France	business and administration
France	computing
France	engineering and engineering trades
France	agriculture, forestry and fishery
France	veterinary
France	health
France	environmental protection
Austria	physical science
Austria	engineering and engineering trades
Austria	veterinary
Austria	health
Austria	environmental protection
Germany	business and administration
Germany	computing
Germany	engineering and engineering trades
Germany	manufacturing and processing
Germany	veterinary
Germany	environmental protection
Netherlands	law
Netherlands	life science
Netherlands	physical science

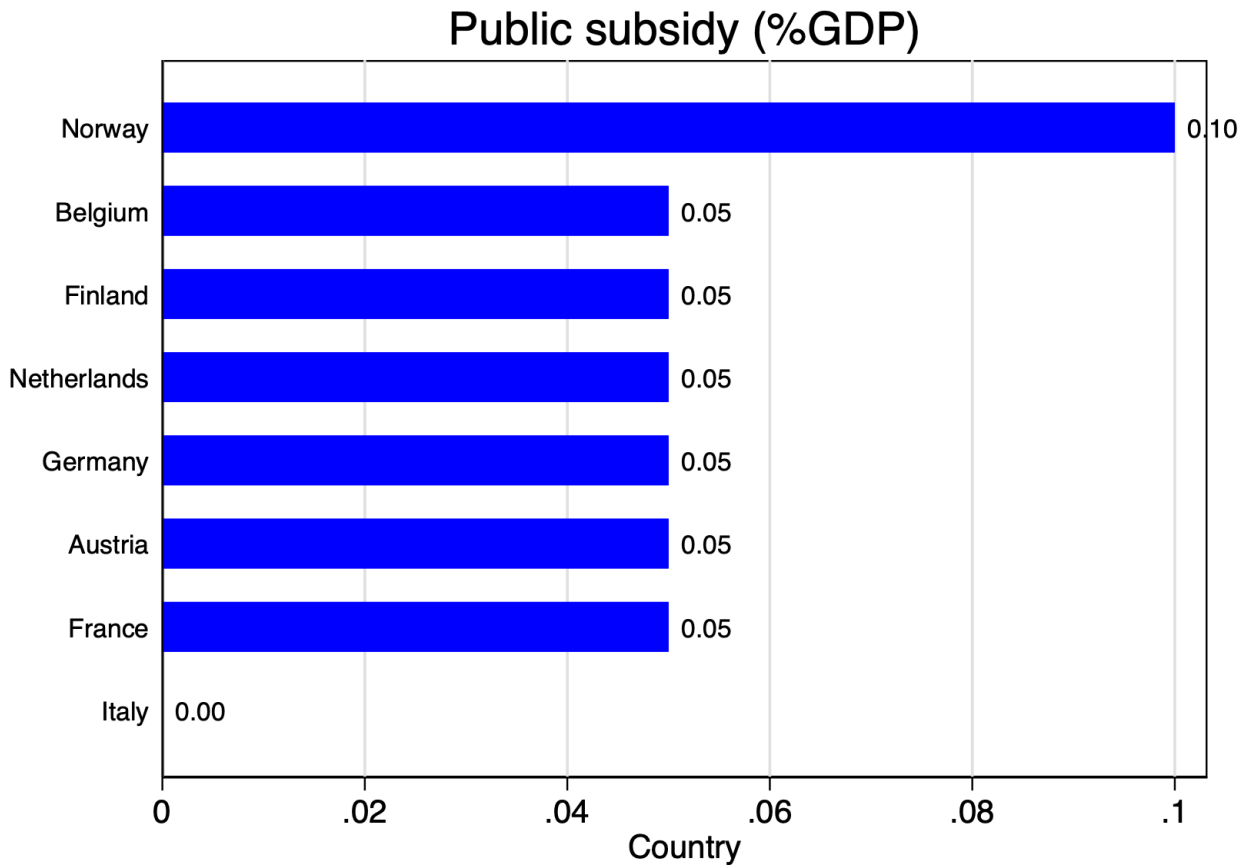|	
Netherlands	mathematics and statistics
Netherlands	engineering, manufacturing and construction
Netherlands	veterinary
UK	science, mathematics and computing
UK	mathematics and statistics
UK	engineering, manufacturing and construction
UK	engineering and engineering trades
UK	health
UK	social services
Finland	law
Finland	physical science
Finland	mathematics and statistics
Finland	engineering and engineering trades
Finland	architecture and building
Finland	veterinary
Norway	social and behavioural science
Norway	journalism and information
Norway	law
Norway	science, mathematics and computing
Norway	engineering, manufacturing and construction
Norway	architecture and building
Belgium	law
Belgium	mathematics and statistics
Belgium	computing
Belgium	engineering, manufacturing and construction
Belgium	architecture and building
Belgium	health

Figure 9. Public subsidies for tertiary education

References

Altonji, J. G., Blom, E., & Meghir, C. (2012). Heterogeneity in human capital investments: High school curriculum, college major, and careers. Annu. Rev. Econ., 4(1), 185-223.

Arnot, M., David, M. and Weiner, G. (1999) *Closing the Gender Gap. Postwar Education and Social Change*. Cambridge: Polity.

Arum, R., Gamoran, A., & Shavit, Y. (2007). More inclusion than diversion: Expansion, differentiation, and market structure in higher education. *Stratification in higher education: A comparative study*, 1-35.

Avery, C., & Kane, T. J. (2004). Student perceptions of college opportunities. The Boston COACH program. In College choices: The economics of where to go, when to go, and how to pay for it (pp. 355-394). University of Chicago Press.

Ayalon, H., & Mcdossi, O. (2019). Economic achievements of nonacademic parents and patterns of enrollment in higher education of their children: the case of Israel. Higher Education, 77, 135-153.

Ayalon, H., & Yogev, A. (2005). Field of study and students' stratification in an expanded system of higher education: The case of Israel. European sociological review, 21(3), 227-241.

Barone, C., Schizzerotto, A., Abbiati, G., & Argentin, G. (2017). Information barriers, social inequality, and plans for higher education: Evidence from a field experiment. European Sociological Review, 33(1), 84-96.

Bellamy, L. A., & Guppy, N. (1991). Opportunities and obstacles for women in Canadian higher education. Women and education (2nd ed.). Calgary: Detselig Enterprises Ltd.

Bleemer, Z., & Mehta, A. (2024). College major restrictions and student stratification (No. w33269). National Bureau of Economic Research.

Ballarino, G., Bernardi, F., Requena, M., & Schadee, H. (2009). Persistent inequalities? Expansion of education and class inequality in Italy and Spain. European Sociological Review, 25(1), 123-138.

Barr, N. (2004). Higher education funding. Oxford review of economic policy, 20(2), 264-283.

Barr, N. (2020). The economics of the welfare state. Oxford university press.

Barr, N., & Crawford, I. (2005). Financing higher education. London: Routledge.

Bernardi, F. (2012) Unequal Transitions: Selection Bias and the Compensatory Effect of Social Background in Educational Careers. Research in Social Stratification and Mobility, 30, pp. 159–174.

Bernardi, F. (2014) Compensatory Advantage as a Mechanism of Educational Inequality: A Regression Discontinuity Based on Month of Birth. Sociology of Education, 87, pp. 74–88.

Bernardi, F., & Ballarino, G. (2014). Participation, equality of opportunity and returns to tertiary education in contemporary Europe. European Societies, 16(3), 422–442. https://doi.org/10.1080/14616696.2012.750729

Binder, M., & Ganderton, P. T. (2004). The New Mexico lottery scholarship: Does it help minority and low-income students. *State merit scholarship programs and racial inequality*, 101-122.

Blanden, J., Gregg, P., & Machin, S. (2003). *Changes in educational inequality*. Leverhulme Centre for Market and Public Organisation, University of Bristol, Department of Economics.

Blau, P. and Duncan, O. (1967) The American Occupational Structure. New York: Wiley.

Boudon, R. (1974) Education, Opportunity, and Social Inequality: Changing Prospects in Western Society. New York: Wiley-Interscience.

Breen, R., & Goldthorpe, J. H. (1997). Explaining educational differentials: Towards a formal rational action theory. Rationality and society, 9(3), 275-305.

Breen, R., & Jonsson, J. O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility. Annu. Rev. Sociol., 31(1), 223-243.

Breen, R., Luijkx, R., Müller, W., & Pollak, R. (2009). Nonpersistent inequality in educational attainment: Evidence from eight European countries. American journal of sociology, 114(5), 1475-1521.

Bryan, M. L., & Jenkins, S. P. (2016). Multilevel modelling of country effects: A cautionary tale. *European sociological review*, *32*(1), 3-22.

Carnoy, M., Loyalka, P. K., Androushchak, G. V., & Proudnikova, A. (2012). The economic returns to higher education in the BRIC countries and their implications for higher education expansion. Higher School of Economics Research Paper No. WP BRP, 2.

Carruthers, C. K., & Özek, U. (2016). Losing HOPE: Financial aid and the line between college and work. Economics of education review, 53, 1-15.

Castles, F. G., & Mitchell, D. (1993). Worlds of welfare and families of nations. In F. G. Castles (Ed.), Families of nations: Patterns of public policy in Western democracies. Aldershot: Dartmouth Publishing Company.

Chapman, B., & Ryan, C. (2002). Income-contingent financing of student charges for higher education: assessing the Australian innovation. Wales Journal of Education, 11(1).

Chesters, J. (2015). Maintaining Inequality Despite Expansion: Evidence of the Link between Parents' Education and Qualitative Differences in Educational Attainment. *Higher Education Quarterly*, *69*(2), 138–157. https://doi.org/10.1111/hequ.12060

Chevalier, A., & Harmon, C. (2013). *The impact of parental income and education on the schooling of their children*.

Ciommi, M., Mariani, F., Recchioni, M. C., Polinesi, G., & Lamonica, G. R. (2023). Like Father Like Son? An Analysis of Opportunity and Discrimination in Tertiary Education for OECD Countries. In *Urban Transformations, Land-use, and Environmental Change: Quantitative Approaches for Territorial Data* (pp. 95-119). River Publishers.

Cohodes, S. R., & Goodman, J. S. (2014). Merit aid, college quality, and college completion: Massachusetts' Adams scholarship as an in-kind subsidy. American Economic Journal: Applied Economics, 6(4), 251-285.

Czarnecki, K. (2018). Less inequality through universal access? Socioeconomic background of tertiary entrants in Australia after the expansion of university participation. *Higher Education*, *76*(3), 501–518. https://doi.org/10.1007/s10734-017-0222-1

Davies, S., & Guppy, N. (1997). Fields of study, college selectivity, and student inequalities in higher education. Social forces, 75(4), 1417-1438.

Deming, D., & Dynarski, S. (2009). Into college, out of poverty? Policies to increase the postsecondary attainment of the poor (No. w15387). National Bureau of Economic Research.

Denning, J. T. (2017). College on the cheap: Consequences of community college tuition reductions. American Economic Journal: Economic Policy, 9(2), 155-188.

De Graaf, P. M., & Ganzeboom, H. B. (1993). Family background and educational attainment in the Netherlands of 1891-1960 birth cohorts. In *Persistent inequality: Changing educational attainment in thirteen countries* (pp. 75-100). Westview Press.

DiPrete, Thomas A. and Eirich, Gregory M. (2006) Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments. *Annual Review of Sociology*, 32 (1), pp. 271–297. https://doi.org/10.1146/annurev.soc.32.061604.123127.

Dynarski, S. M. (2003). Does aid matter? Measuring the effect of student aid on college attendance and completion. American Economic Review, 93(1), 279-288.

Dynarski, S., & Scott-Clayton, J. (2013). Financial Aid Policy: Lessons from Research. NBER Working Paper No. 18710. National Bureau of Economic Research.

Erikson, R., & Jonsson, J. O. (1996). Can education be equalized?: The Swedish case in comparative perspective. (No Title).

Erikson, R., & Goldthorpe, J. H. (1992). The CASMIN project and the American dream. *European Sociological Review*, *8*(3), 283-305.

Espadafor, M. C., & García-Sierra, A. (2025). The intergenerational effect of educational expansion: Evidence from a natural experiment in Spain. *European Sociological Review*, jcaf003. https://doi.org/10.1093/esr/jcaf003

Esping-Andersen, G. (1990). The three worlds of welfare capitalism. Princeton University Press.

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford university press.

Espinoza, O., González, L. E., McGinn, N., Castillo, D., & Sandoval, L. (n.d.). *Family background, secondary school and university prestige: Contributors to income inequality in Chile*.

Ferrera, M. (1996). The'Southern model'of welfare in social Europe. Journal of European social policy, 6(1), 17-37.

Gary-Bobo, R. J., & Trannoy, A. (2008). Efficient tuition fees and examinations. Journal of the European Economic Association, 6(6), 1211-1243.

Garritzmann, J. L. (2016). The political economy of higher education finance: The politics of tuition fees and subsidies in OECD countries, 1945–2015. Springer.

Gerber, T. P., & Cheung, S. Y. (2008). Horizontal stratification in postsecondary education: Forms, explanations, and implications. Annu. Rev. Sociol, 34(1), 299-318.

Goldrick-Rab, S., Broton, K., & Eisenberg, D. (2015). Hungry to learn: Addressing food and housing insecurity among undergraduates. Madison, WI: Wisconsin HOPE Lab.

Graduate Surveys: Review of International Practice—October 2015. (n.d.).

Grodsky, E., & Jones, M. T. (2007). Real and imagined barriers to college entry: Perceptions of cost. Social Science Research, 36(2), 745-766.

Gustafsson, J.-E., Andersson, A., and Hansen, M. (2000) Prestationer och Prestationsskillnader i 1990-talets Skola [Achievements and Differences in Achievements in 1990s Education]. In J. Palme (ed.), SOU (No. 2000:39) Välfärd och skola [Welfare and Education]. Stockholm: Fritzes, pp. 135–211.

Hassan, E. (2006). Recall Bias can be a Threat to Retrospective and Prospective Research Designs. Internet Journal of Epidemiology. 3. 4. https://doi.org/10.5580/2732.

Heath, A., & Cheung, S. Y. (2007). Unequal chances: Ethnic minorities in Western labour markets.

Herbaut, E., & Geven, K. M. (2019). What works to reduce inequalities in Higher Education. A systematic review of the (quasi-) experimental literature on outreach and financial aid. The World Bank.

Holm, A., & Jæger, M. M. (2008). Does relative risk aversion explain educational inequality? A dynamic choice approach. Research in Social Stratification and Mobility, 26(3), 199-219.

Hübner, M. (2012). Do tuition fees affect enrollment behavior? Evidence from a 'natural experiment' in Germany. *Economics of Education Review*, *31*(6), 949–960. https://doi.org/10.1016/j.econedurev.2012.06.006

IHEP. (2023). The cost of college: Financing a degree in the United States. Institute for Higher Education Policy. Retrieved from https://www.ihep.org/research/publications/cost-of-college

Jacob, M. & Klein, M. (2019). Social origin, field of study and graduates' career progression: does social inequality vary across fields?. The British Journal of Sociology. 70. 1850-1873. https://doi.org/10.1111/1468-4446.12696.

Johnstone, D. B. (2006). Financing higher education: Cost-sharing in international perspective (Vol. 3). Brill.

Kivinen, O. and Ahola, S. (1999) Higher Education as Human Risk Capital – Reflections on Changing Labour Markets. Higher Education, 38 (2), pp. 191–208.

Kivinen, O. and Rinne, R. (1991) Mapping the Field of Stratification in Higher Education: The Finnish Experience. *Higher Education*, 21 (4), pp. 521–549.

Kivinen, O. and Ahola, S. (2001) Expanding Education and Improving Odds? Participation in Higher Education in Finland in the 1980s and 1990s. *Acta Sociologica*, 44 (2), pp. 171–181.

Kraaykamp, G., Tolsma, J., & Wolbers, M. H. J. (2013). Educational expansion and field of study: Trends in the intergenerational transmission of educational inequality in the Netherlands. *British Journal of Sociology of Education*, *34*(5–6), 888–906. https://doi.org/10.1080/01425692.2013.816622

Lewis, J. B., & Linzer, D. A. (2005). Estimating regression models in which the dependent variable is based on estimates. Political analysis, 13(4), 345-364.

Lörz, M., Netz, N., & Quast, H. (2016). Why do students from underprivileged families less often intend to study abroad?. Higher Education, 72, 153-174.

Lovenheim, M. F., & Owens, E. G. (2014). Does federal financial aid affect college enrollment? Evidence from drug offenders and the Higher Education Act of 1998. Journal of Urban Economics, 81, 1-13.

Loyalka, P., Song, Y., Wei, J., Zhong, W., & Rozelle, S. (2013). Information, college decisions and financial aid: Evidence from a cluster-randomized controlled trial in China. Economics of Education Review, 36, 26-40.

Lucas, S. R. (2001) Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects. *American Journal of Sociology*, 106 (6), pp. 1642–1690. https://doi.org/10.1086/321300

Marginson, S. (2016). The worldwide trend to high participation higher education: Dynamics of social stratification in inclusive systems. *Higher Education*, *72*(4), 413–434. https://doi.org/10.1007/s10734-016-0016-x

Martins, L., & Veiga, P. (2010). Do inequalities in parents' education play an important role in PISA students' mathematics achievement test score disparities? *Economics of Education Review*, *29*(6), 1016–1033. https://doi.org/10.1016/j.econedurev.2010.05.001

McMahon, W. W. (2009). Higher learning, greater good: The private and social benefits of higher education. JHU Press.

Merton, R. K. (1973) The Matthew Effect in Science. In N. Storer (Ed.), *The Sociology of Science*, pp. 439–459. Chicago: The University of Chicago Press.

Merton, R. K. (1988) The Matthew Effect in Science, II: Cumulative Advantage and the Symbolism of Intellectual Property. Isis, 79 (4), pp. 606–623. https://doi.org/10.1086/354848.

Mogstad, M., Salvanes, K. G., & Torsvik, G. (2025). *Income Equality in The Nordic Countries: Myths, Facts, and Lessons* (No. w33444). National Bureau of Economic Research.

Müller, W., & Shavit, Y. (1997). The Institutional Embeddedness of the Stratification Process A Comparative Study of Qualifications and Occupations in Thirteen Countries. From school to work, 1-48.

Nielsen, H. S., Sørensen, T., & Taber, C. (2010). Estimating the Effect of Student Aid on College Enrollment: Evidence from a Government Grant Policy Reform. American Economic Journal: Economic Policy, 2(2), 185–215. https://doi.org/10.1257/pol.2.2.185

OECD (2008). Tertiary Education for the Knowledge Society. Paris: Organization for Economic Cooperation and Development.

OECD. (2019). Education at a glance 2019: OECD indicators. OECD Publishing. https://doi.org/10.1787/f8d7880d-en

OECD. (2020). Education at a glance 2020: OECD indicators. OECD Publishing. https://doi.org/10.1787/69096873-en

OECD. (2020). Education at a glance 2020: OECD indicators. OECD Publishing.

Ortiz-Gervasi, L., & Palomo Lario, C. (2024). Inequality at the top. Educational expansion, financial constraints and opportunities of university graduation by social origin. *European Societies*, *26*(5), 1472–1509. https://doi.org/10.1080/14616696.2024.2327549

Paglin, M., & Rufolo, A. M. (1990). Heterogeneous human capital, occupational choice, and male-female earnings differences. Journal of labor economics, 8(1, Part 1), 123-144.

Pfeffer, F. T. (2008). Persistent inequality in educational attainment and its institutional context. European sociological review, 24(5), 543-565.

Polachek, S. W. (1981) Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *The Review of Economics and Statistics*, 63 (1), pp. 60. https://doi.org/10.2307/1924218.

Raftery, A. E., & Hout, M. (1993). Maximally Maintained Inequality: Expansion, Reform, and Opportunity in Irish Education, 1921-75. *Sociology of Education*, *66*(1), 41. https://doi.org/10.2307/2112784

Reimer, D., & Pollak, R. (2010). Educational expansion and its consequences for vertical and horizontal inequalities in access to higher education in West Germany. European sociological review, 26(4), 415-430.

Schindler, S., & Lörz, M. (2012). Mechanisms of social inequality development: Primary and secondary effects in the transition to tertiary education between 1976 and 2005. European Sociological Review, 28(5), 647-660.

Scott-Clayton, J. (2011). On money and motivation: A quasi-experimental analysis of financial incentives for college achievement. Journal of Human resources, 46(3), 614-646.

Shavit, Y., & Blossfeld, H. P. (1993). Persistent Inequality: Changing Educational Attainment in Thirteen Countries. Social Inequality Series. Westview Press, 5500 Central Avenue, Boulder, CO 80301-2847.

Shavit, Y. (Ed.). (2007). Stratification in higher education: A comparative study. Stanford University Press.

Sjoquist, D. L., & Winters, J. V. (2015). State merit-based financial aid programs and college attainment. Journal of Regional Science, 55(3), 364-390.

Slaughter, S., & Rhoades, G. (2004). Academic capitalism and the new economy: Markets, state, and higher education. Jhu press.

Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social-class achievement gap: A difference-education intervention improves first-generation students' academic performance and all students' college transition. Psychological science, 25(4), 943-953.

Stuhler, J. (2023). Educational inequality.

Teichler, U. (1988). Changing Patterns of the Higher Education System: The Experience of Three Decades. London: Jessica Kingsley.

Terschuur, J. (2023). *Educational Inequality of Opportunity and Mobility in Europe* (arXiv:2212.02407). arXiv. https://doi.org/10.48550/arXiv.2212.02407

Treiman, D. J. (1977). Occupational prestige in comparative perspective. Academic Press.

Triventi, Moris. (2013) Stratification in Higher Education and Its Relationship with Social Inequality: A Comparative Study of 11 European Countries. European Sociological Review, 29 (3), pp. 489–502. https://doi.org/10.1093/esr/jcr092.

Triventi M. (2014), Does working during higher education affect students' academic progression?, Economics of Education Review, 41, 1-13. https://doi.org/10.1016/j.econedurev.2014.03.006

UNESCO. (2022). Global education monitoring report 2022: Gender report. UNESCO Publishing.

UNESCO. (2023). Reimagining higher education: Toward a sustainable future. UNESCO Publishing.

Usher, A. (2005). A Little Knowledge is A Dangerous Thing: How Perceptions of Costs and Benefits Affect Access to Education. Online Submission.

Vandenberghe, V. (2007). Family Income and Tertiary Education Attendance across the EU: An empirical assessment using sibling data.

Van de Werfhorst, H. G., & Hofstede, S. (2007). Cultural capital or relative risk aversion? Two mechanisms for educational inequality compared 1. The British journal of sociology, 58(3), 391-415.

Van de Werfhorst, H. G. and Kraaykamp, G. (2001). Four field-related educational resources and their impact on labor, consumption and sociopolitical orientation. Sociology of Education, 74, 296–317.

Vergolini, L., & Vlach, E. (2017). Family background and educational path of Italian graduates. *Higher Education*, *73*(2), 245–259. https://doi.org/10.1007/s10734-016-0011-2

Vossensteyn, H. (2009). Challenges in Student Financing: State Financial Support to Students – A Worldwide Perspective. *Higher Education in Europe*, 34(2), 171–187. https://doi.org/10.1080/03797720902867294

West, J. (1997). *Fathers' Involvement in Their Children's Schools*.