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Individuals' Choice of Academic Field in Higher Education: Empirical Evidence from Greece

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Abstract

The academic field chosen by individuals is undoubtedly of crucial importance for their future careers and therefore they should have access to appropriate information and guidance that would help facilitate a more optimal decision. An analysis of the factors that contribute to such decisions would provide policy makers in education and economics with valuable data on how, and to what extent, the choice of academic field by individuals determines their future income and shapes different access opportunities as well as their professional development in the labour market.The decision an individual makes as to whether or not they should pursue higher education studies is closely linked with the choice of academic field that students wish to follow in their professional careers. This study focuses on the influence of the expected returns and the effectiveness of education on the choice of academic field that individuals make in order to maximize their utility. In the context of Greece's difficult economic situation and heavy economic recession, there has been an increase in the number of students seeking higher education qualifications (more so in the last few years), pressing the Greek State to review the structure and functionality of higher education in the country. Based on the above, the purpose of this paper is, through empirical investigation, to identify factors that influence individuals' decisions regarding their choice of scientific field in higher education. Based on the collection of primary source data and the development of binary regression models, this study investigates the influence of personal characteristics, family background and expectations on individuals' preferences in educational choices.

Keywords: choice; expectations; higher education

1. Aims of the Study

The academic field chosen by individuals is undoubtedly of crucial importance for their future careers and therefore they should have access to appropriate information and guidance that would help facilitate a more optimal decision. An analysis of the factors that contribute to such decisions would provide policy makers in education and economics with valuable data on how, and to what extent, the choice of academic field by individuals determines their future income and shapes different access opportunities as well as their professional development in the labour market.

Educational choices by individuals may be explained through three main hypotheses (Sianou-Kyrgiou, 2010): First, individuals' choices in education are deemed rational as they consider the costs and benefits of various alternatives before selecting the optimal combination for their budget; second, individuals' choices are within a common framework that has been determined by the structure of each educational system; and third, individuals' choices depend on the personal abilities, perceptions and motives that are formed within their social environment. These hypotheses allow for considerable doubt as to whether or not these choices of academic field in higher education are actually rational since they may lead to a profession with low returns. An investigation into the factors that influence individuals' decisions in their choice of academic field in higher education would help to remove the uncertainty.

In the context of Greece's difficult economic situation and heavy economic recession, there has been an increase in the number of students seeking higher education qualifications (more so in the last few years), pressing the Greek State to review the structure and functionality of higher education in the country. Although higher education in Greece has been expanded, inequalities in terms of individual social characteristics still exist. The distribution of people (students) among higher education institutions is of great interest since the competition for induction into specific academic fields, mainly those which enjoy social recognition and higher wages in the labor market, is more intense (Gouvias, 1998; Psacharopoulos & Papakonstantinou, 2005; Saiti & Prokopiadou, 2008; Sianou-Kyrgiou & Tsiplakides, 2009; Sianou-Kyrgiou, 2010; Tsakloglou & Antoninis 1999). The main induction system of higher education institutions in Greece is a public good which is free and grants equal access to all people since access to higher education depends solely on the success of individuals in the entrance exams during the final year of high school. However, in the Greek labor market there is a substantial wage differential (mainly in terms of gender) that can be attributed to an individual's choice of scientific field (Papapetrou, 2004, 2007; Livanos & Pouliakas, 2009).

Based on the above, the purpose of this paper is, through empirical investigation, to identify factors that influence individuals' decisions regarding their choice of scientific field in higher education. Based on the primary source data collected and on the binary regression models developed, this study investigates the influence of personal characteristics, family background and expectations on individuals' preferences in educational choices.

2. Review of Relevant Literature

Human capital theory is mainly the theoretical base for explaining the choice of scientific field in higher education since the income differentials among graduates is clearer across different fields. In the empirical investigation of human capital theory, the relevant literature considers Freeman's study of 1971 as a starting reference point. It was the first to focus on the

demand for education and attempted to explain professional choices of mechanics, chemists and mathematicians in the U.S.A. He considered that the expected salary of an individual at a given time can influence their decisions regarding studies in specific fields and hence may shape the supply of labor in these fields years later. In his analysis he introduced the present value of expected return as an independent variable while he confirmed empirically the influence of non-monetary factors in the individuals' decisions for professional choice. Sloan (1971) attempted to explain the demand for medical schools in the U.S.A. with the development of a model (least square) which was based on the demand for education as an investment activity. Within the same framework, Alexander & Frey (1984) showed the positive influence of graduates' relative initial wages and the negative influence of direct and indirect costs on the demand for business administration. By using data on individuals' abilities in different sciences among final year students in two universities of Oregon in the U.S.A., Paglin & Rufolo (1990) showed that the distribution of individuals in different fields is closely linked to their abilities. The same researchers investigated the choice of scientific field as a function of the maximum expected utility or future value of returns, based on individuals' information regarding the levels of wages of different professions. Results showed that individual choices not only depend on the levels of initial wages but more so on the possibility of success in each scientific field. The same conclusion was reached by Turner & Bowen (1999). In another analysis of the choice of scientific field, Rochat & Demeulemeester (2001) included the element of risk (considering it as the possibility of success) and, with the use of multinomial logistic regression, the socio-economic characteristics of individuals were confirmed to be an influential factor affecting choice in seven categories of scientific field. Montmarquette, et.al. (2002) used cross section data of 562 students in different scientific fields where results showed the positive influence of expected income while this influence was stronger in men compared to women. Arcidiacono (2004) developed a dynamic model of choice of scientific field and showed the strong correlation between returns and scientific fields, and that abilities explained the initial choice of scientific field as well as the movement of students in different scientific fields (during their student life). Saks & Shore (2005) also included the dimension of risk regarding the possibility of achievement in future returns in the choice of scientific field. Their analysis showed that individuals from high-income families are more likely to take the risk (mostly pursuing scientific fields of the mechanical, medical and new technologies professions) compared to those coming from lower income families.Van Langen, et.al. (2006) reached the conclusion that parental educational level positively influences the attendance of specific scientific fields (such as mathematics, etc.). Varga (2006) reached the conclusion that expected returns and the possibility of induction into higher education are determinant factors in the choice of scientific field. Moreover, professional prospects (i.e. extrinsic motives) are also a determinant factor in the educational choice while people with higher expected returns are more likely to choose studies in technology, economics or physics as their first preference (rather than the humanities). Boudarbat & Montmarquette (2009) attempted to determine the factors that influence scientific field selection. Results showed that expected income has a huge impact on the choice of scientific field, particularly when the parental educational level is low, prompting people to give greater priority to potential economic benefits (e.g. choosing economics instead of sociology) while those who choose pedagogical, economic or medical studies are more concerned about how their studies are linked with their profession. Zafar (2009) used primary source data from second year students of Northwestern University to analyze their preferences and professional expectations regarding their choice of scientific field. Results showed that preferences (intrinsic motives) are a significant determinant factor that influences the choice of scientific field. Caner & Okten (2010) found that family

income has a positive impact on the choice of scientific field while the father's profession (mainly those who were self-employed) positively influenced the choice of economic studies. Ma (2011) found that having mathematical and language abilities had a statistically significant influence on the choice of scientific field and that, when all the other characteristics are stable, people are more likely to choose physics/technical-related studies, which tend to lead to professions where employees have the same demographic characteristics (nationality). Befly, et.al. (2012) found that certain personal characteristics (gender, nationality, place of birth) do not statistically influence the choice of scientific field. However, the age of individuals was found to be an influence. For instance, people who graduate from high school when they are above 17 years old are less likely to choose economics/law studies and those who enter university immediately after their graduation from high school are less likely to choose the social sciences and humanities. Moreover, parental educational level was found to have an impact on the choice of scientific field. Arcidiacono, et.al. (2012) found that abilities and expected returns are the main determinant factors in the choice of scientific field. In particular, they found that the influence of individual abilities is stronger than the expected returns.

In the context of the Greek reality, research on the choice of scientific field in higher education appears to be very limited. Many Greek researchers such as Patrinos, 1995; Psacharopoulos & Tassoulas, 2004; Psacharopoulos & Papakonstantinou, 2005, etc. have focused on the influence of families' socio-economic background in gaining access to higher education, whereas researchers converged on the conclusion that people coming from wealthy families are more likely to enter higher education, having attained greater achievements at school. However, there was a study conducted by, Sianou-Kyrgiou & Tsaplakides (2009) that attempted to show the impact of families' socio-economic background on their choice to go to medical school. According to their results, medical students tend to come from high-income and well-educated families. Moreover, Sianou-Kyrgiou (2010) examined distributions across five scientific fields and found that a father's high socio-economic status encourages the choice of technological sciences while when it is low then the choice tends to turn towards the humanities or economic studies. The influence of socio-economic characteristics in the choice of scientific field is more apparent when individuals who are driven by their interests usually come from families with a high income and social status and, as a consequence, aim for more ambitious choices. On the contrary, people coming from families of low income and social status prefer to choose a scientific field that is more likely to secure a profession with a stable income.

3. Methodology

The theoretical framework and empirical approaches support the view that an individual's choice of scientific field depends upon factors relevant to gender, school achievement and their comparative advantage regarding their abilities in mathematics and language. At the same time, the socio-economic characteristics of the family background (educational level, family income, etc.) have a positive influence on such a choice. These influences apart, individuals ultimately shape their rational expectations regarding the future income associated with each alternative according to their choice of scientific field – a choice which they consider would maximize their utility.

The relationship between the various factors can be expressed mathematically as follows, where U^*_m is the individual utility that a person (i) enjoys by choosing a scientific field (m), depending on personal characteristics (Z_i), family background characteristics (F_i), wages' expectations (W_{im}) and benefits (M_{im}) linked with the specific choice:

$$U^*_m = \alpha'(Z_i) + \beta'(F_i) + \gamma' (W_{im}) + \delta'(M_{im}) + e_{im}$$

In order to investigate the choice of scientific field, multinomial logistic regression was employed. Given that students choose a scientific field (Ψ) from a number of fields only according to their preferences, the possibility of choosing a field (m) that maximizes their utility can be calculated through the following equation:

$$\Pr (m^*= m) = \exp \{(\alpha'(Z_i) + \beta'(F_i) + \gamma' (W_{im}) + \delta'(M_{im})\} / \Sigma_{je\Psi} \exp \{\{(\alpha'(Z_i) + \beta'(F_i) + \gamma' (W_{im}) + \delta'(M_{im})\}$$

Since each person chooses only one field among other alternatives (j) then the possibilities will be equal to 1. This limitation defines a field as a reference base (m_0). Hence, in relation to this reference base, coefficients can be defined as the degree of influence over the possibility of choosing a specific group field (m) / the possibility of choosing the reference group m_0[1].

This research uses the primary source data generated by a questionnaire that was administered to 1,259 first year higher education students in the metropolitan area of Athens.

According to the Greek educational system, when individuals finish high school they are allowed to participate in the national entrance exams for higher education. After these examination results are announced, successful candidates can fill in an application and select their preferred scientific field. The fields offered are divided into five categories: humanities, social and law sciences (field 1), physics (field 2), medical and health studies (field 3), technological sciences (field 4) and economical studies and business administration (field 5). The same categorization is followed in this research.

The regression model estimates the possibility of choosing each group of scientific field by using the scientific field of humanities social and law studies (field 1) as the reference group. The explanatory variables used in the regression model are presented in Table 1.

Table 1 Definition of Independent Variables included in the regression model

Personal Characteristics	
Gender	Woman = 0 if man = 1
School Achievement	Graduation degree from high school
Verbal ability	Values from 1 = bad achievement up to 5 = excellent
Math Ability	Values from 1 = bad achievement up to 5 = excellent
Family Characteristics	
Family income	Monthly net family income, low = 1, mean = 2, high = 3
Family residence	Prefecture of Attiki (metropolitan area of Athens), rural area = 1, semi-urban area = 2, urban = 3
Father's education	University graduate = 1, high school graduate = 0
Mother's education	University graduate = 1, high school graduate = 0
Father's profession	High prestige profession = 1, other profession = 0
Mother's profession	High prestige profession = 1, other profession = 0
Siblings university education	Older siblings graduated from university =1 other = 0
Wage expectations	
G mean_of expected_earnings	The g mean of expected earnings (initial, after 10 years and after 20 years of working life)
Motives	
Extrinsic motives	Adding accumulation of variables that describe extrinsic motives
Intrinsic motives	Adding accumulation of variables that describe intrinsic motives

The Research hypotheses of this study are the following:

H1: There are differentiations between the two genders regarding the choice of scientific field (Befly, et.al. 2012; Blackmore & Low 1984; Boudarbat, 2008; Boudarbat & Montmarquette, 2009; Cai, 2003; Eide & Waehrer, 1998; Montmarquette, et.al., 2002; Paglin & Rufolo, 1990; Rochat & Demeulemeester, 2001; Sianou-Kyrgiou, 2010; Turner & Bowen, 1999).

H2: The choice of studies in physics/technology and economics is reinforced by higher achievements in mathematics.

H3: The choice of humanities, pedagogical, law and social sciences is positively influenced by the individual's language abilities (Arcidiacono, 2004; Arcidiacono, et.al. 2012; Blackmore & Low 1984; Davies & Guppy, 1997; Eide & Waehrer, 1998; Ma, 2011; Montmarquette, et. al. 2002; Paglin & Rufolo, 1990; Saks & Shore, 2005; van de Werfhost, et. Al. 2003).

H4: Individuals with higher achievements tend to choose high-status scientific fields (such as law and medical studies), with higher returns (Rochat & Demeulemeester, 2001; Varga, 2006).

H5: Individuals from higher income families are less likely to choose social/pedagogical sciences and humanities but are more likely to choose a scientific field with better career prospects (Caner & Okten, 2010; Montmarquette, et.al., 2002; Saks & Shore, 2005).

H6: Individuals from an urban (or semi-urban) social environment are more likely to choose scientific fields with greater risks (Befly, et.al. 2012; Montmarquette, et.al. 2002).

H7: A father having a high educational level (university education) is expected to have a positive influence in choosing the humanities, law or social sciences (Befly, et.al. 2012;Boudarbat, 2008; Boudarbat & Montmarquette, 2009; Eide & Waehrer, 1998; Rochat & Demeulemeester, 2001; Sianou-Kyrgiou, 2010; van Langen, et.al. 2006).

H8: A mother having a high educational level is a positive influence in choosing medical, physics and technological studies and reduces the likelihood of choosing economic studies (Befly, et.al. 2012; Boudarbat, 2008; Rochat and Demeulemeester, 2001).

H9: The presence of older siblings that have already succeeded in higher education create a positive framework that encourages the choice of higher-risk scientific fields compared to humanities, law and social sciences (Befly, et.al. 2012; Montmarquette, et.al. 2002).

4. Results

Table 2 presents the results from the econometric model.

Table 2

Variables	Physics, Biology, Agricultural, Information Technology , Statistics	Health Sciences	Technological Sciences	Business Administration and Economic Studies
Constant	-0.264 (2.876)	-17.834*** (7.389)	-19.887*** (4.066)	-11.855*** (2.800)
Gender	-1.514*** (0.254)	0.679 (0.441)	-1.033*** (0.303)	-0.483* (0.256)
School Achievement	0.050 (0.123)	1.843*** (0.326)	0.887*** (0.177)	0.260** (0.117)
Verbal ability	-1.317*** (0.164)	-1.720*** (0.254)	-1.639*** (0.198)	-1.615*** (0.164)
Math Ability	2.201*** (0.177)	3.187*** (0.552)	2.606*** (0.264)	1.590*** (0.151)
Family income	0.027 (0.209)	0.449 (0.330)	0.132 (0.251)	0.559*** (0.205)
Family residence	0.528*** (0.167)	0.079 (0.238)	0.405** (0.196)	0.382** (0.159)
Father's education	0.414 (0.270)	0.853** (0.436)	0.216 (0.332)	0.522** (0.266)
Mother's education	0.053 (0.265)	-0.551 (0.446)	-0.022 (0.322)	0.578** (0.262)
Father's profession	-0.567*** (0.258)	-0.066 (0.409)	-0.648** (0.305)	-0.581** (0.255)
Mother's profession	0.073 (0.323)	-0.534 (0.473)	-0.237 (0.370)	-0.301 (0.309)
Siblings university education	-0.626*** (0.231)	-0.802** (0.356)	-0.846*** (0.274)	-0.691*** (0.226)
G mean_of expected_earnings	-1.492* (0.771)	4.354*** (1.091)	2.680*** (0.886)	1.770** (0.740)
Extrinsic motives	0.198*** (0.039)	0.142** (0.058)	0.359*** (0.049)	0.356*** (0.041)
Intrinsic motives	-0.195*** (0.035)	-0.120** (0.055)	-0.232*** (0.042)	-0.214 (0.035)

N=1,259, Model Fitting criteria (-log likelihood): 2.072, Model chi-square statistic (degree freedom): 1.381*** (56)

*** denote significance at 1% statistical level (p-value < 0.01), ** denote significance at 5% statistical level (p-value < 0.05) and * denote significance at 10% statistical level (p-value < 0.10)

The model explains 66.1% of the individuals' distribution across all alternative fields, which is much greater than 37.7% of the random distribution, and thus fulfills the classification accuracy criteria. Furthermore, from the standard errors of the variables' coefficients there are no

multicollinearity symptoms. Moreover, the p-value (=0.000 <0.05) of model fitting criteria for a likelihood ratio of 2.072 and chi-square value of 1.381 suggest a rejection of the null hypothesis H_0, i.e. there is no difference between the model with independent variables and the model without them. Hence the hypothesis H_1 is accepted, namely, that there is a relationship between the independent and the dependent variable.

Influence of gender and abilities

Regarding the influence of gender, according to the results, women are more likely to choose field 1 (humanities, pedagogical and law studies) compared to the other scientific fields, whereas in the particular case of health sciences there is no differentiation between men and women. Specifically, women are 78% less likely than men to choose physics, 64.4% less likely to choose technological sciences and 38.3% less likely to choose economic and business administration studies. The relevant coefficients are statistically significant at the 1% statistical level whereas only with economic and business administration studies is the significance is at the 10% level. Moreover, people with higher language achievements seem to be more likely to choose humanities, social and law studies (perhaps not surprisingly, since these scientific fields require considerable language skills). In particular, an increase of 1% in language achievement reduces the likelihood of individuals choosing physics by 73%, health sciences by 82%, technological sciences by 81% and economic and business studies by 80%. On the contrary, individuals with high mathematical abilities seem to be more likely to choose all scientific fields, except those included in field 1 (humanities, social sciences and law studies) (at the 1% level of statistical significance). However, an interesting result is that those who have generally high achievements (good students) seem to be less likely to choose a scientific field that belongs to field 1. Those individuals seem to have a greater likelihood of choosing the health and technological sciences as well as the economic and business studies at the 1% level of statistical significance than at the 5% level, whereas for physics there was no important statistical differentiation.

Influence of family background

From the characteristics of family background it seems that family income has a statistically significant influence on the choice of economic and business studies in relation to field 1. Moreover, the degree of urbanization of the area that a family lives in increases the chance of physics being chosen (at the 1% statistical level of significance), but also of technological sciences and economic studies (at the 5% level) rather than those in field 1.

With regard to fathers' educational level, it seems that when a father has received a university education, the individual is less likely to choose health or economic studies than the humanities, social sciences and law studies. On the other hand, when a father has a high-prestige profession (with a great degree of specialization) there is an increased likelihood for the individual to choose physics, or technological or economic studies (at the 5% level of significance). In particular, those individuals whose father has a highly prestigious profession are 43% more likely to choose physics or economic studies and 47% more likely to choose technological sciences. When a mother has received a university education it is less likely that the individual will choose economic studies instead of humanities, social sciences or law studies, whereas it seems to reinforce the choice for the health and technological sciences (although the coefficients are not statistically significant). The same happened in the case of the mother's profession.

Finally, those who have older siblings (that have entered higher education) then they seem more likely to choose any other scientific field other than those in field 1 (humanities, social sciences and law studies). In particular, the possibility of choosing physics is increased by 46%, technological sciences by 57% and economic studies by 50%, all at the 1% level of significance. In the particular case of health sciences the chance is increased by 55% (at the 5% statistical level).

Influence of wage expectations and preferences

The influence of wage expectations seems to be positive in choosing those scientific fields in the health sciences, technological sciences and economic and business studies, whereas it seems a negative influence in the case of physics. So when the wage expectation of a scientific field in which an individual hopes to work in future increases, there is less likelihood of them choosing a scientific field in field 1 or in field 2 (physics). This may be explained by the fact that those two fields include scientific fields that are chosen by individuals with different characteristics. Generally, when there is an increased preference for the greater economic and professional benefits of education (extrinsic motives) it is less likely that a scientific field in humanities, social sciences or law studies will be chosen and more likely that one of the other scientific fields will be. The influence of extrinsic motives is statistically significant for all scientific fields (except humanities, social sciences and law studies) at the 1% and 5% levels of significance. On the contrary, when people give greater attention to intrinsic motives (linked with the non-monetary benefits of education) then the likelihood of choosing humanities, social sciences and law studies is increased (at 1% and 5% level of significance in relation to all other scientific fields).

5. Conclusions

This study deals with the examination of the factors that influence individuals' decisions regarding their choice of scientific field in higher education. Although this study analyses a large sample from the area of Athens (Prefecture of Attiki) perhaps further investigation is required that includes the gathering of data from other Greek prefectures with different socio-economic characteristics, so as to confirm the results of this research.

In the present study, the reference group for the scientific fields was the humanities, social sciences and law studies since individuals who choose these scientific fields have more diverse personal characteristics as well as diverse learning abilities and preferences compared to the other groups of scientific fields (Arcidiacono, et al., 2012; Befly, et.al. , 2012; Blakemore & Low, 1984; Boudarbat, 2008; Cai, 2003; Caner & Okten, 2010; Eide & Waehrer, 1998; Ma, 2011; Montmarquette, et.al., 2002; Paglin & Rufolo, 1990; Rochat & Demeulemeester, 2001; Saks & Shore, 2005; Turner & Bowen, 1999; Varga, 2006).

Results have shown that individuals' abilities are a determinant factor in the choice made since they reinforce the possibility of successfully entering higher education in the desired scientific field. Hence, people with a high level of language skills are more likely to choose a scientific field among the humanities, social sciences and law studies (H2) while they are less likely to choose a scientific field that requires a high level of mathematics. Conversely, people accomplished in mathematics will have a greater likelihood of choosing a scientific field in physics, technological sciences or economic studies (H3) but are less likely to choose one from the humanities, social sciences and law studies. This result has been confirmed by previous

studies (Arcidiacono, 2004; Arcidiacono, et al., 2012; Blakemore & Low, 1984; Boudarbat, 2008; Davies & Guppy, 1997; Eide & Waehrer, 1998; Ma, 2011; Montmarquette, et.al., 2002; Rochat & Demeulemeester, 2001; Saks & Shore, 2005; Varga, 2006).

Therefore, although it was expected that individuals will choose a scientific field based on their competitive advantage in language or mathematics, the analysis in this study has shown that those who have high learning achievements ("good students") and come from high-income families tend to choose scientific fields that secure high wages (H4). This result is supported by previous relevant studies (Montmarquette et al., 2002; Rochat & Demeulemeester, 2001; Varga, 2006).

Moreover, the current research attempted to show the influence of socio-economic family background in an individual's choice of scientific field. Previous empirical studies on the same subject have shown that family background is a determinant factor despite the characterization of education as a consumable or an investment. (Kodde & Ritzen, 1988). Among the variables that characterize the family background there is a group of interactions that shape individuals' abilities and preferences (Caner & Okten, 2010; Montmarquette et al., 2002; Rochat & Demeulemeester, 2001; Saks & Shore, 2005). Indeed, the relative distributions have shown that family income is lower for those who have chosen a scientific field in the humanities compared to all the other scientific fields. Moreover, people who have chosen economic studies, health sciences, law studies, political sciences or technological sciences tend to have a greater mean family income. This result confirms H5.

In the particular case of Greece, the influence of family income has one more dimension that is linked with the structure of the educational system. In Greece, higher education is a public good and is provided free by the State, whereas access to higher education institutions depends on the success of students in passing national entrance exams. However, competition for gaining entry into higher education (the number of places available in each institution is determined by the Greek State) is really very high and as a consequence this process has led to the development of a 'parallel' educational system of evening classes that prepares students for the entrance exams and so gives them a greater chance of success in higher education. Hence, families with students that have the potential for entering higher education can face high educational expenditures, a fact that has raised questions about the 'free' character of Greek higher education (Kanellopoulos & Psacharopoulos, 1997; Psacharopoulos & Tassoulas, 2004; Psacharopoulos & Papakonstantinou, 2005; Stamoulas, 2005). This implies that the entrance system for higher education may not be providing equal access to it but, on the contrary, it may be creating social inequalities. These inequalities may be compounded since families who have the economic means to cover the cost may pay for their children to have extra tuition that will boost their chances of entering higher education specifically in scientific fields that will lead them to higher economic benefits (Gouvias, 1998; Psacharopoulos & Papakonstantinou, 2005; Saiti & Prokopiadou, 2008; Sianou-Kyrgiou, 2008, 2010).

Family background is determined by the area where a family lives, the parents' educational level, their profession and of course family income. In particular, results have shown that individuals who come from an urban environment are more likely to choose economic studies rather than the humanities or social sciences. It is also more likely that they will choose physics or technological sciences rather than the reference group, a fact that confirms H6 (Befly et al., 2012; Montmarquette et al., 2002). Given that the sample of this study has been taken from the metropolitan area of Athens, results about the influence of income and the interactions of

individuals' abilities and preferences that cause the distribution of scientific fields across society is perhaps not surprising. However, it does provide evidence to suggest that the family is a determinant factor in influencing individuals' educational choices.

The influence of fathers' educational level is also evident in this study and encourages the choice of humanities, social sciences and law studies, a fact that confirms H7. On the contrary, a mother's high educational level has a positive influence on the choice of health sciences and technological studies, which confirms H8. These results have being confirmed by other relevant studies such as Befly et al. (2012), Rochat & Demeulemeester, (2001) and Boudarbat, (2008). Analysis has also shown that when parents (especially fathers) exercise a high-prestige profession then individuals are more likely to choose scientific fields of high social status and recognition, or those with a reputation for having a high income such as health sciences, technical and economic studies. The result has been supported by other previous studies such as Caner & Okten (2010). Finally, when individuals have older siblings that have previously entered higher education it is more likely that they will choose economic studies, physics, or technological sciences rather than the humanities and social sciences. This result confirms H9 and is also supported by other studies in the past such as Befly et al. (2012) and Montmarquette et al., (2002). .

Therefore, it is clear that an individual's choice of scientific field is influenced by family variables. Indeed those who have followed highly prestigious (elite) scientific fields tend to have had their choice influenced by their parents. Moreover, when parents have the perception that a specific scientific field enjoys an elevated status and recognition, the pressure on the individual to choose that field is even more intense, especially when the family has a relatively high income (Saiti & Prokopiadou, 2008).

The impact of family background on an individual's choice is also evident from their wage expectations which are shaped by the family income. Results have shown that the influence of expected income during an individual's working life has a significant impact on the initial expected salary. Therefore, it seems that positive expectations about the expected income reinforce the likelihood that they will choose any scientific field except the humanities and social sciences. The relevant coefficients were found to have a statistically positive influence on likelihood, and previous studies (Arcidiacono, 2004; Berger, 1988) support this view. The only exception for the influence of expected income was the choice of physics. Hence, wage expectations and economic (extrinsic) motives encourage the choice of high-prestige scientific fields (and related professions) such as health sciences. On the contrary, individuals who are motivated more by intrinsic motives choose scientific fields in the humanities or social sciences.

A high socio-economic family background limits the alternatives of their children's educational choices since their choice is considered to be 'acceptable' only when it serves to sustain the family's same socio-economic status into the next generation. On the other hand, it seems that the Greek education system induces limitations on entry into higher education since individuals in many cases end up following a scientific field that is not their own choosing. This phenomenon is more the case for individuals coming from lower income families and expectations since they consider their 'choice' to be better than nothing. As a result, the choice of a scientific field in Greece often has little or no bearing on the choice of future profession. However, if the country desires to boost the level of development in terms of both economic and social quality, the Greek education system should put emphasis not only on theoretical guidance but equally on improving young people's skills and abilities − two necessary conditions for

improving productivity, without which the latter cannot be guaranteed (Psacharopoulos & Papakonstantinou, 2005; Saiti & Prokopiadou, 2008). Only the equal development of supply and demand in the work force and greater cohesion between economic and educational policy will bring the desired symmetry into the labour market and so lead the country (and indeed any country) towards lower levels of unemployment and faster economic development.

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