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"Soft" Concepts in Economics: Essays on the Role of Non-Cognitive Skills and Cultural Values

Lenka Lauková

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Contents

Preface

In this dissertation, I build upon the psychology research and use established psychological scales developed to characterize personality traits and cultural preferences of individuals to explain their economic outcomes. In the first chapter, I use the Rosenberg scale measuring the level of self-esteem (Rosenberg, 1965) and the Rotter scale measuring the level of self-control (Rotter, 1966) to characterize the non-cognitive skills of 15 year old pupils. In turn, I examine their effect on secondary school application choice. In the second and the third chapters, I focus on the concept of cultural values developed to study cross-country differences in culture (Schwartz, 1992) and use it to characterize the extent to which a given culture can be considered traditional. Specifically, I examine the transmission of traditional values across generations and the role of traditional values on second-generation immigrants' female labor supply.

It is generally accepted that cognitive skills determine many economic outcomes, such as schooling or wages. On the other hand, until recently (e.g. Heckman, Stixrud and Urzua, 2006), the role of non-cognitive skills, i.e. personality traits has not been explored in any depth. The first chapter of this dissertation explores the role of personality traits in uncertain environment of secondary school choice in the Czech Republic in 2003. It is motivated by existing literature which shows that the schooling decisions of children from poorer backgrounds are affected not only by financial constraints (Cameron and Heckman, 1999), but also by the absence of parental motivating role models that are crucial for the development of skills and the willingness to pursue education (Cunha et al., 2005). Evidence from the Czech Republic suggests that pupils, especially students from poorer social backgrounds, exhibit a tendency to apply to a different type of school than the one they actually desire (Knot and Munich, 2006) and that these pupils do not even consider tertiary education (Burdová, Matějů and Procházková, 2004).

I draw upon unique data available in the Czech amendment survey to OECD's Programme for International Student Assessment (PISA) from 2003. This *Supplementary Pupil Questionnaire* contains information on the secondary school application decisions of 15 year old pupils in their ninth (last) year of elementary school and, importantly, includes two established psychological scales. These scales measure

levels of individual self-esteem and self-control – characteristics that may have an impact on individual decisions in an uncertain environment such as that which characterizes the admission process to secondary schools in the Czech Republic (in 2003). Crucially, applicants apply only to one school in the first round of the process. Failure to get into a preferred school implies a non-negligible probability of ending up at an undesirable and potentially low-quality secondary school, as most of the slots at better schools are taken after the first round of the admission process.

There are three types of Czech upper-secondary school programs: academic high schools, vocational schools and apprenticeships. These are ordered from the highest to lowest difficulty of admission, and from the most to least suitable for university preparation. Due to their characteristics I assume that pupils make a decision between an academic high school and a vocational school, or between a vocational school and an apprenticeship. I estimate a probit model in which, in addition to parental education, income, and cognitive skills, I control for non-cognitive abilities as measured by the psychological scales. Importantly, the data contain information on the district of residence of each pupil. For each district, I construct a measure of scarcity of places at academic high schools as the difference between the predicted demand for academic high schools (as expected based on district-level specific conditions such as population educational structure) and their actual supply. Similarly, I define a measure of excess supply of apprenticeships by subtracting the predicted district-level demand for apprenticeships from their actual supply. These measures represent the level of uncertainty associated with the admission process. Higher excess demand for academic high schools in the district is associated with a higher risk of failing the first round of the admission process and consequently of ending up at an undesired school. High excess supply of apprenticeships, potentially entailing more variety of apprentice programs, should be associated with a higher chance of finding an appropriate apprentice program in case of failure of admission to a vocational school.

I interact the measure of scarcity of places at academic high schools (excess supply of apprenticeships) in a district with the measures of cognitive and non-cognitive abilities of pupils. To assess the magnitude and significance of individual factors in presence of interaction effects, I compute marginal probabilities and corresponding z-statistics at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} percentile of excess demand, separately changing the values of income, parental education, cognitive skills, and non-cognitive

skills, while fixing the remaining factors at their means and assuming that both parents have attained a secondary education.

Results show that the education of parents and the cognitive skills of applicants strongly predict the probabilities of applying to academic high schools and to apprenticeships. The impact of non-cognitive skills is significant too, even though not as large as the impact of cognitive abilities. The analysis in this chapter reveals important gender differences in outcomes. The predicted probability of applying to an academic high school for girls is much higher than for boys with the same characteristics. For girls, with higher scarcity of places at academic high schools in a district, the effect of non-cognitive abilities increases in magnitude while the effect of cognitive skills weakens. For boys, however, the results are counter-intuitive: the effect of non-cognitive skills is not found to be statistically significant and the effect of cognitive abilities gets stronger as the measure of scarcity of academic programs increases. With respect to the estimation of the probability of applying for an apprenticeship, the predicted probability of applying to an apprentice program is much higher for a boy than for a girl with the same characteristics. As the measure of excess supply of apprenticeships decreases, i.e. as the uncertainty of the admission process gets higher, the role of non-cognitive skills becomes more important for females, but the opposite is true for males.

I discuss possible explanations for such results. The different outcomes for boys in terms of lower predicted probability of applying to academic high schools may be a result of their strategic behavior: vocational schools are likely to be a good alternative to academic high schools for males because of their technical orientation and subsequent chances of getting admitted to technical universities. When it comes to apprenticeships versus vocational schools, it is possible that those districts with high excess supply of apprenticeships are also characterized by a labor market biased towards male jobs, capable of absorbing the variety of apprenticeship programs.

Another possible explanation is that the differences in application choices may be due to societal perceptions about the suitability of specific school types for boys and girls. For instance, if parents consider an academic high school to be more appropriate for girls (Myslivecek and Knot, 2004), the boys may be discouraged from pursuing academic education, even though their skills are comparable to those of girls pursuing an academic type of education. The different gender outcomes with respect to non-cognitive skills may also be caused by the differing “quality” of these skills between

boys and girls. Alternatively, the psychological scales in the PISA amendment may measure them differently for males and females. I provide some evidence that this might be the case; namely I estimate a structural model of choice, in which the formation of skills is modeled as a function of the parents' education. While cognitive skills are found to be strongly determined by the education of both parents, the non-cognitive skills of girls are affected by the education of the mother while those of boys are significantly affected by the father's education.

The second and third chapters of the dissertation are inspired by a recent boom in economic literature that looks at the role of (traditional) culture on economic choices such as (female) labor market participation (Burda, Hamermesh and Weil, 2007) and fertility rate (Fernandez, 2007; Fernadez and Fogli, 2009); home production and mobility (Alesina and Giuliano, 2007), living arrangements (Giuliano, 2007) or work outcomes (Algan and Cahuc, 2005). In this literature, culture is represented indirectly by country dummies, labor participation rates, or fertility rates in a country of origin; or by answers to attitudinal questions from surveys. In this dissertation, I employ a specific concept of *cultural values* from cross-cultural psychology research (Inglehart, 1977; Schwartz, 1992) that is designed to directly study cross-country differences in cultures. The cross-cultural psychology research considers culture to be characterized by a set of shared goals describing what is important and desirable, i.e. as a set of *values*. Data on values used in the second and third chapters come from the *Portrait Value Questionnaire* (Schwartz, 1992) – an integral part of the European Social Survey (ESS) administrated regularly every 2 years. At the moment, ESS data are available for representative samples of a total of 34 countries from the years 2002, 2004, 2006 and 2008.

Schwartz's questionnaire contains 21 items. Motivated by existing economic research that focuses on the role of traditional and conservative beliefs, in the second chapter I restrict attention to one *value*, the so-called *tradition* that captures respect, commitment, and acceptance of familial or religious customs set in the past. In the questionnaire, for each value item there is a description of a person who considers a given value as important. The respondent selects how much he/she identifies with the person in the description. The tradition value is described as follows: "Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family". Similarly as for other values, this is a fairly broad

description not linked with a specific action or situation. Respondents identify himself/herself with the person in the description by choosing one of six options: 1. *very much like me,* 2. *like me,* 3. *somewhat like me,* 4. *a little like me,* 5. *not like me,* 6. *not like me at all* [1]. In these value questions, respondents might consider a whole range of situations in which traditional customs may play a role, with female labor market participation being just one of them. This contrasts with attitudinal questions, in which the respondent is asked to rate a specific claim, such as "the woman should cut down on paid work for family", where he/she is likely to draw on his/her own experience. Hence, data on *values* are less prone to endogeneity with respect to specific economic outcomes than are data on attitudes. Having a complete 21-item questionnaire in ESS allows us to assess data reliability and to exclude suspicious observations. It also allows us to correct for individual tendencies to over- or underemphasize their preferences, by centering responses to value items around their total average. Such rescaled responses are more comparable across individuals and across countries.

In the second chapter, I address the question of the "stability" of traditional values, motivated by the work of Guiso, Sapienza and Zingales (2006) who urge economists to work with stable cultural patterns, "transmitted fairly unchanged from generation to generation" (p.23). My main analysis is based on a native population i.e. people who were born in a given country to parents who were born there too. I concentrate on explaining the cross-country variation in tradition values with differences in individual characteristics as well as with differences in the values of ancestors. I analyze individual data on the tradition values of respondents born between 1946 and 1985 across European countries and estimate the country-specific (cultural) fixed effects, controlling for the impact of individual characteristics. I then analyze the extent to which variation in the fixed effects is explained by the average values of older generations born between 1936 and 1945, which is the proxy for the culture of ancestors. Results suggest that tradition values exhibit strong cross-generational stability, and are robust to accounting for the impact of various economic factors, geographical conditions or alternative value measurement. I also examine a sub-sample of first- and second-generation immigrants and find that to some extent, adaptation in cultural preferences occurs with migration with the effect being stronger the longer the

[1] In the original dataset, the rating is ordered by a number from 1 to 6. I change this scale from 1 (very much like me) to 6 (not like me at all) to its reverse so that the lower figure would indicate lower importance.

immigrants live in the country of residence. Specifically, for immigrants who live in their country of residence for more than 20 years and for second-generation immigrants, the culture of their ancestors becomes less relevant and their individual values appear to adapt to the prevailing cultural standard of the country of residence.

In the third chapter, I build upon the previous findings and examine the labor participation decisions of second-generation immigrant women. Existing literature on the topic shows that the (traditional) culture of origin matters for the decisions of (second-generation) immigrants in quantitatively important ways (Fernandez, 2007; Fernandez and Fogli, 2009) even though its impact is weakening across generations (Blau et al., 2008). I use data on tradition values to both assess the impact of culture-of-origin versus culture-of-residence on women's labor participation decisions and to examine the effect of *individual cultural assimilation.*

I employ a probit model for women's labor participation status and show that it is culture of residence, rather than culture of origin, that explains its cross-country variation, even if I control for other measures of economic/institutional environment in the country of residence. Distinguishing between common culture, i.e. both parents born in the same foreign country, vs. mixed culture, i.e. one parent born abroad and one in the country of the woman's residence, suggests that it is the mother's origin that drives the significance of culture of residence in explaining labor supply decisions of second-generation immigrant women. The culture of origin is found to be significant determinant of woman's labor participation status only in a separate analysis of women with both parents from the same origin.

The individual measure of tradition values is not found to have a statistically significant impact in explaining the variation in women's labor participation decisions. However, if it is expressed in terms of individual cultural assimilation/dissimilation, as captured by the *shift* from the representative culture in a country of origin relative to the cultural distance between the country of origin and of residence, it has a significant effect on female labor participation status. This suggests that even though cultural adaptation seems to be occurring, as reflected in almost no impact of the culture of origin on second-generation immigrant women's labor outcomes, the cultural heritage plays a role as a benchmark point for individual tradition preferences, which in turn affect women's labor force participation.

Chapter 1

Determinants of Secondary School Choice in the Czech Republic

Abstract
The admission process into secondary schools in the Czech Republic involves a high risk of ending up at an undesired school if failing to be admitted to one's preferred school. With future career outcomes largely dependent on the type of secondary school, the secondary school application decision is an important one. Empirical evidence gathered in this chapter is based on data on pupils participating in the OECD's PISA project and suggests that the education of parents and cognitive abilities matter for a pupil's application decision. A unique dataset available for the Czech Republic enables the examination of the role of non-cognitive skills in the admission process, and these are found to have an impact on a pupil's decision as well. The significance and the magnitude of the effect differs across districts characterized by the level of uncertainty associated with the admission process. The results of the analysis show important gender differences. One of them is that while non-cognitive skills of females operate in accordance with intuitive expectations: higher uncertainty associated with the outcome of the admission process in the district increases the importance of non-cognitive abilities with respect to decision-making; the opposite is true for males.

Abstrakt
Přijímací proces na střední školy se vyznačuje vysokým rizikem, že žák skončí na méně kvalitní a nežádoucí škole v případě, že neobstojí při přijímacím řízeni na prvotně vybrané škole. Jelikož výběr střední školy významně ovlivňuje budoucí kariérní uplatnění, je rozhodnutí, kam se žák přihlásí, klíčové. Empirické výsledky této kapitoly, získané analýzou dat z dotazníkového šetření PISA naznačují, že vzdělání rodičů a kognitivní schopnosti žáka sú hlavními faktory ovlivňující volbu žáka. Nekognitivní, čili osobnostní, schopnosti jsou taky důležité, přičemž jejich vliv se různí napříč okresy, které jsou charakterizovány různou mírou nejistoty přijímacího procesu. Výsledky analýzy ukazují významní rodové rozdíly: zatímco vliv osobnostních charakteristik u děvčat roste se zvyšující se nejistotou spojenou s přijímacím řízením, co je v souladu s intuicí; u chlapců je tomu opačně. V kapitole jsou rozvedené potenciální příčiny a jsou navrhnuté podněty pro další výzkum.

Keywords: non-cognitive skills, schooling choice, secondary education
JEL Classification: J24, I21

1.1 Introduction

This chapter contributes to a line of research that examines the determinants of education and career outcomes. It concentrates on the choice of secondary education among 15-year old elementary school pupils in the Czech Republic. This subject is of interest and importance for several reasons. From the individual point of view, due to the characteristics of the Czech education and labor market system, one's overall educational attainment and professional career are heavily dependent upon the type of secondary school one attends. There are three types of Czech upper-secondary school programs: academic high schools, vocational schools, and apprenticeships.[1] University access is restricted to secondary school graduates who have a *general certificate exam (GCE),* i.e., mostly to the students of academic high schools and vocational schools.[2] The former have the highest chances of getting admitted to universities. Students of the third type of secondary school − apprentice programs − cannot apply to the university unless they obtain a GCE. Future career outcomes and lifetime earnings are, therefore, dependent on having a tertiary degree, with university graduates' returns to education about 30% higher than those of others.[3] As the admission process to secondary schools involves a high risk of ending up at an undesired school after failing to be admitted to one's preferred school, the application decision is one of the most important life decisions pupils make.

In the bigger picture, individual outcomes have consequences for overall distribution of skills and human capital on the national level. Understanding the determinants of individual choice thus contributes to the assessment of whether this distribution is optimal or not.[4]

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[1] According to the Institute on Information on Education, in the year 2002/2003, 25% of students were enrolled in academic high schools, 38% in vocational schools and 37% in apprenticeships.

[2] A very small share of vocational school programs do not provide the GCE. According to the Institute on Information on Education, in the year 2002/2003, 1% of students in vocational schools were enrolled in programs that did not conclude with the GCE. On the other hand, 15% of students in apprenticeships were enrolled in GCE programs.

[3] Münich, Švejnar and Terrell, 2005; Campos and Jolliffe, 2003.

[4] E.g., research on social stratification examines the upward mobility of social groups and suggests that mobility is more restricted now than during the early 1990s (Katrňák and Fučík, 2010).

This chapter is distinctive in that it moves beyond standard determinants of educational outcomes, i.e. cognitive abilities and socioeconomic background, to looking at the role of non-cognitive abilities. It thus contributes to recent research showing that not only do cognitive skills, (i.e. thinking and reasoning abilities), but also non-cognitive skills, (i.e. personality traits), determine many economic outcomes, such as schooling or wages (e.g. Heckman, Stixrud and Urzua, 2006).

Non-cognitive skills in this analysis are represented by an individual's self-esteem (Rosenberg, 1965) and self-control (Rotter, 1966) scores taken from the complementary questionnaire administered together with the 2003 OECD PISA survey in the Czech Republic, which constitutes the data source for this chapter. These two scores are well-established measures in sociology and psychology research and have been employed in recent economic research with respect to labor market outcomes by Heckman, Stixrud and Urzua (2006) and Semykina and Linz (2007, 2009). Intuitively, non-cognitive abilities should be important in decision making given the uncertainty associated with secondary school admission process. The higher the uncertainty concerning the outcome, the stronger the relevance of one's self-esteem and/or self-control.

The results of the analysis suggest that this is indeed the case, but mostly for females. For example, with respect to probability of applying to academic high school, non-cognitive skills of females are more important in districts with higher scarcity of places at academic high schools. However, the opposite is true for males. Potential underlying causes and policy implications are discussed.

The chapter is organized as follows: the next section summarizes the evidence on the role of non-cognitive skills found in the literature and describes how this concept may fit into a school choice framework. Section 1.3 describes the system of secondary schools in the Czech Republic. In section 1.4, the estimation framework is introduced; this section also contains a detailed data description. The main results are discussed in section 1.5. Section 1.6 introduces an alternative way to estimate the probabilities of choosing an academic program/apprentice program. Section 1.7 summarizes the outcomes and discusses the possible implications.

1.2 Overview of Literature

The literature on school choice in the Czech Republic provides consistent evidence that a student's skills and background characteristics are important determinants of educational outcomes. Münich (2004) estimates academic high school admission probabilities when he deals with the question of differences in performance among students from different types of secondary schools. The first-stage selection equation of his model implies that in addition to a student's skills as measured by grades in Czech language and mathematics, the education of parents and local schooling supply conditions are important determinants of academic high school enrollment. Münich and Knot (2006a,b) elaborate on secondary school application choice in a matching framework and suggest that the education of parents and family income are significant predictors of the education choices of a child. Their results imply that the way the secondary school admission is set up contributes to the persistence of the existing gaps among social groups in society. There is an even larger amount of sociological literature dealing with access to education, especially among students with poorer social backgrounds. Burdová, Matějů, and Procházková (2004) emphasize the fact that children from socially poorer families do not even consider tertiary education. This also applies to those who outperform university applicants from better-situated families.

Evidence on the importance of one's background is also present in papers dealing with educational choices in Germany. In Germany, as in the Czech Republic, the choice of secondary education predetermines the career path of an individual to a large extent. University education in Germany is unique in the sense that only graduates from the highest secondary track schools are directly eligible to access universities. The secondary school decision may be made as early as at the age of 10. The decision is the result of parental choice and the primary teacher's recommendation and there are no entry tests. Despite the fact that there are no apparent barriers to access to the highest secondary track schools, Dustmann (2003) points to intergenerational immobility in educational achievements and relates it to a student's background, namely the education of parents, preferences, confidence, and tastes of parents.

A student's socioeconomic background is, according to Cunha et al. (2005), essential for the development of both cognitive and non-cognitive skills. While the former are generally acknowledged to affect labor market outcomes, the latter are likely to have an impact on decisions, too. For example, the US evidence by Heckman, Stixrud and Urzua (2006) suggests that non-cognitive abilities determine the level of subsequent schooling. This way, indirectly, non-cognitive skills affect productivity and wages, even though their direct impact is not confirmed, unlike the impact of cognitive skills. For children from poorer social backgrounds financial constraints are not found to play a main role in pursuing better education. Cunha et al. (2005) claim that a poorer background is generally associated with the absence of motivating "role models" represented by parents, and this is the main reason children from a socially weaker background do not develop sufficient skills nor a desire to pursue further education. Limited access to better quality primary and secondary schools due to financial constraints only exacerbates this. Indirectly, evidence that financial constraints are not the only obstacle for students with socially disadvataged backgrounds is documented by Cameron and Heckman (1999). They examine the recipients of President Clinton's Hope Scholarship funds, targeted to promote better access to higher education for students coming from low-income families. They estimate that an enormous fraction of funds (93%) was obtained by children who would have pursued higher education even without the existence of the program, suggesting that the funds should perhaps be targeted based on other than financial grounds.

1.3 Secondary Schools in the Czech Republic - Overview

There are three types of secondary education in the Czech Republic. Academic high schools, attended approximately by 20% of adolescents, provide a general education that is best suited for university entry tests. The other two types of secondary schools are both attended by around 40% of adolescents and are more practically oriented. Apprenticeship programs last from 2 to 4 years and prepare students to enter trades. Vocational schools are 4-year programs and prepare students for specific labor market professions, such as nursing or engineering. While academic high schools and the bulk

of vocational schools finish with a general certified exam (GCE), most apprentice programs provide their graduates with a vocational certificate. Since only those students who finish secondary school with the GCE are eligible for university studies, those who graduate from apprenticeships without the GCE cannot apply for tertiary education.

Each secondary school devises its own admission procedure. It is common for nearly all academic schools and some vocational schools to hold entrance exams. Applications are submitted in advance. In 2002/2003, pupils in the 9th year of elementary school had an option to submit two applications to public schools, one as the choice for the first round and one as the choice for the second round. They could also apply to an unlimited number of private secondary schools. In the first round of the admission process, some pupils were admitted to their first-choice schools. Those who were not participated in the second round of the admission process according to their second choice. However, if all places at second-choice school happened to be filled, a pupil had to wait for places that remained free after the second round of admissions, and could therefore end up at an undesired school. Private secondary schools normally served as a backup option for those who could afford to pay tuition. In 2004/2005, some changes were introduced into the system; however, uncertainty associated with the decision still remains.

The type of secondary school in the Czech Republic largely predetermines future career outcomes due to the selectivity of the university admission system (Jurajda and Münich, 2010, 2011). According to the OECD's *Education at a Glance 2005*, in 2003, the entry rate into tertiary education was only 33% of the population, the lowest among all European OECD members. In total population (age group 25-64), the fraction of those with a tertiary education averaged 12%. 1999 data as summarized in Münich (2004) imply that the shares of those applying to universities were 91%, 50% and 27% of graduates from academic high schools, vocational schools, and apprenticeships, respectively. The shares of those actually enrolling in universities were 58%, 18% and 10%, respectively.

In sum, the selectivity of the educational system in the Czech Republic, starting with the choice of secondary education, has a large degree of persistence reflected in (not)

attaining a university degree. This in turn affects wages: at the beginning of the 2000s, university graduates' returns to education were about 30% higher than those of others.[5]

1.4 Data and Analytical Framework

1.4.1. Outline of a Model of School Type Application Choice

In this section, I outline a theoretical utility maximization framework that describes the decision process of a pupil and that introduces the factors important for secondary school application choice. The section also explains the reasons why, in the rest of this chapter, I distinguish two cases for application decision: either pupils decide between an academic high school and a vocational school, or between a vocational school and an apprentice program.

As described in the previous section, there are three types of secondary schools in the Czech Republic: apprenticeships that typically do not culminate with general certified exams, vocational schools, and academic high schools.

An individual's i decision process is theoretically constructed as follows. He maximizes his expected utility, V_{ij}, of applying to a particular school type j:

$$\max_j V_{ij} = \max_j [P_{ij} U_{ij} + (1 - P_{ij}) \bar{U}_{ij}] \quad (1)$$

where U_{ij} is the utility associated with school type j, $\bar{U}_{ij}$ is the expected utility of ending up at some other school type if getting into type j is unsuccessful[6], and P_{ij} is the self-perceived probability of getting into school type j. I assume P_{ij} to be a

[5] Under communism, an individual's attained level of education played a relatively small role with respect to earnings. This changed with the change of political system. Education is now a major factor contributing to wages. Its role increased dramatically in the early period of transition. Returns to a year of education were 2-3% at the beginning of transition, but reached 6-9% by the end of the 1990s (Munich, Svejnar and Terrell, 2005; Campos and Jolliffe, 2003).

[6] A student can actually end up at the same type of school he did not get into in the first round. For example, ending up at a private academic high school after being rejected from a public academic high school.

function of an individual's socioeconomic characteristics: educational background of parents $\boldsymbol{EDU_i}$, family income $\boldsymbol{INC_i}$[7], and other individual unobserved characteristics τ_i; his level of cognitive skills $\boldsymbol{f_i^C}$, his level of non-cognitive skills $\boldsymbol{f_i^N}$, as well as a function of *scarcity*[8] of school type $\boldsymbol{j}$ in a given district $\boldsymbol{D}$, $\boldsymbol{Sc_j^D}$:

$$\boldsymbol{P_{ij} = P_{ij}(EDU_i, INC_i, \tau_i, f_i^C, f_i^N, Sc_j^D)} \quad (2)$$

The utility of an individual $\boldsymbol{i}$ associated with the choice of school $\boldsymbol{j}$ is a function of the level of cognitive and non-cognitive skills, since a better match of skills with a school type produces better schooling outcomes. It is also a function of school quality of type $\boldsymbol{j}$ in a district $\boldsymbol{Q_j^D}$ as well as some individual-specific, unobserved factor $\tilde{\tau}_i$.

$$\boldsymbol{U_{ij} = U_{ij}(f_i^C, f_i^N, Q_j^D, \tilde{\tau}_i)} \quad (3)$$

Given the different characteristics of academic high schools, vocational schools, and apprenticeships, it is likely that the utility associated with apprenticeships would be very low for an individual seeking a GCE or even a higher education. On the other hand, for pupils with (cognitive and/or non-cognitive) skills at the bottom part of the population distribution, the utility associated with academic high schools would be very low since the aptitude requirements at academic high schools would not be matched with their

[7] There are two possible effects of income on a pupil's decision. First, since academic high schools primarily prepare students for further studies at university, those who choose it opt to forgo a salary for several years to come. Hence, a child from a wealthy family that is able to support him/her during studies is more likely apply to an academic high school. On the other hand, low-income parents may want their children to get ready for the labor market faster, pushing them to apply for labor-market oriented apprenticeships or vocational programs. Second, family income is associated with a pupil's back-up option in the form of enrolling in a private school in the case of failing admission to a public school. Hence, a pupil from a family with higher income can consider the decision to apply to a highly demanded school less risky since he/she has an affordable alternative in the form of a private school. In 2003, private schools were not part of the classic admission process, i.e., pupils could apply there without constraints. The enrollment was mostly conditioned only on paying tuition. As noted by Filer and Munich (2002), the primary market for private schools are students not admitted to a public academic high school.

[8] By scarcity, I mean the difference between actual district supply of places at a given school type and the demand predicted based on the characteristics of a district, such as educational structure, presence of university, or labor market characteristics. See the Data section 1.4.3.

skills. For these pupils, the self-perceived probability of getting into an academic high school is likely to be very low.

Therefore, within the outlined theoretical framework, it is probable that one group of pupils would actually make a decision between an academic high school and a vocational school as:

$$\boldsymbol{V}_{Apprenticeship} << \boldsymbol{V}_{GrammarSchool} \text{ and } \boldsymbol{V}_{Apprenticeship} << \boldsymbol{V}_{VocationalSchool}.$$

The other group of pupils would decide between applying to a vocational school or an apprenticeship, as:

$$\boldsymbol{V}_{GrammarSchool} << \boldsymbol{V}_{Apprenticeship} \text{ and } \boldsymbol{V}_{GrammarSchool} << \boldsymbol{V}_{VocationalSchool}.$$

This is partially confirmed by examining the information provided in another supplementary questionnaire to the 2003 OECD PISA survey, by the parents of pupils already enrolled in the first year of a secondary program. The parents were questioned about their satisfaction with the type of school attended by their child. Most of those not satisfied with their child attending an apprenticeship without the GCE wished their child would attend a vocational school. Similarly, those not satisfied with their child attending a vocational school mostly wished their child would attend an academic high school.

1.4.2. Estimation Framework

To estimate the probabilities of applying to an academic high school, I use a standard probit model. I assume a linear-in-the-parameters specification.

Let $\boldsymbol{V}$ denote the total benefit to a pupil associated with the application to an academic high school in a district $\boldsymbol{D}$:[9]

$$\begin{aligned}\boldsymbol{V}_i^{\boldsymbol{D}} = \alpha &+ \beta^{\text{sec\_}m}\boldsymbol{EDU}_i^{\text{sec\_}m} + \beta^{ter\_m}\boldsymbol{EDU}_i^{ter\_m} + \beta^{\text{sec\_}f}\boldsymbol{EDU}_i^{\text{sec\_}f} + \beta^{ter\_f}\boldsymbol{EDU}_i^{ter\_f} \\ &+ \beta^{ED}\boldsymbol{Sc}_i^{\boldsymbol{D}} + \beta^{C}\tilde{\boldsymbol{f}}_i^{C} + \beta^{N}\tilde{\boldsymbol{f}}_i^{N} + \boldsymbol{Sc}_i^{\boldsymbol{D}}[\gamma^{\text{sec\_}m}\boldsymbol{EDU}_i^{\text{sec\_}m} + \gamma^{ter\_m}\boldsymbol{EDU}_i^{ter\_m} \\ &+ \gamma^{\text{sec\_}f}\boldsymbol{EDU}_i^{\text{sec\_}f} + \gamma^{ter\_f}\boldsymbol{EDU}_i^{ter\_f} + \gamma^{inc}\boldsymbol{INC}_i + \gamma^{C}\tilde{\boldsymbol{f}}_i^{C} + \gamma^{N}\tilde{\boldsymbol{f}}_i^{N}] + \boldsymbol{e}_i^{\boldsymbol{D}} \qquad (4)\end{aligned}$$

[9] In a very similar way I define the total benefit associated with application to apprenticeships.

where $EDU_i^{sec\_m}$ and $EDU_i^{ter\_m}$ are dummy variables characterizing highest the attained education of pupil's mother as secondary and tertiary, respectively (less than secondary education is omitted); similarly, $EDU_i^{sec\_f}$ and $EDU_i^{ter\_f}$ are dummies for the highest attained education of a pupil's father; family income is denoted by INC_i. Sc_i^D is the scarcity of places at academic high schools in a district D and $\tilde{f}_i^C$, $\tilde{f}_i^N$ represent an individual's measures of cognitive and non-cognitive skills. Error component e_i^D is assumed to be independent of explanatory variables.

Theoretically, with higher scarcity of places at academic high schools in a district, there should be more uncertainty associated with the admission process. Hence, non-cognitive skills may matter more for the application decision and cognitive abilities may matter less in this district than in a district where the uncertainty is lower. Therefore, in the estimation I include the interaction effects of the scarcity measure with cognitive and non-cognitive skills. Other interaction effects are included for consistency reasons as well.

Application to an academic high school is reflected in a binary variable G :

$$G = 1 \text{ if } V > 0$$
$$G = 0 \text{ otherwise} \quad (5)$$

The estimation equation is defined similarly for application to apprenticeships, with Sc_i^D representing an excess supply of apprenticeships in a district D.

1.4.3. Data

Most data on 15-year-old pupils finishing their last year of elementary school and applying to secondary schools come from the 2003 OECD PISA survey. Data on application choice and non-cognitive skills come from the Supplementary Pupil Questionnaire, the Czech amendment to the PISA survey. Data on the variable characterizing the scarcity of places at academic high schools in the region (or alternatively, on excess supply of places at apprenticeships) are predicted based on district-specific characteristics such as the educational structure of the district's

population. These data come from the Institute on Information on Education and from the Czech Statistical Office (see the specific subsection below). Table 1.1 in the Appendix summarizes the basic statistics of the estimation sample.

Cognitive and non-cognitive skills

To measure a student's cognitive skills, the results of mathematical, problem solving, reading, and natural science tests from the 2003 OECD PISA survey are used. Only a small fraction (7.5%) of children completed all 4 types of tests. All students participated in the math test. In order to use as much information as possible from these tests and give it a plausible interpretation, I construct a variable that reflects a standardized average of the test scores based on the tests completed.

To measure non-cognitive skills, I use data from the Supplementary Pupil Questionnaire – the unique Czech amendment to the PISA survey. Specifically, I measure individual self-esteem and self-control using a subset of questions in this survey belonging to the Rosenberg and Rotter scale. These scales are currently used in sociology and psychology research and have been adopted in economic research as well (see e.g. Heckman, Stixrud and Urzua, 2006; Semykina and Linz, 2007, 2009).

The *Rosenberg Self-Esteem Scale* (Rosenberg, 1965) is considered a reliable quantitative self-esteem assessment tool in sociology research. It is defined by a 10-item questionnaire and captures the positive or negative evaluation of one's selfworth. Question Q24 of the Supplementary Pupil Questionnaire contains six items of the 10-item scale. Pupils were asked to assess the extent to which they agree with the following statements using one of four possible answers: *I strongly agree*, *I agree*, *I disagree*, *I strongly disagree*, rated as 1-4.

a) I feel that I'm a person of worth, at least on an equal plane with others.
b) I feel that I have a number of good qualities.
c) I certainly feel useless at times.
d) I am able to do things as well as most other people.
e) I feel I do not have much to be proud of.
f) All in all, I am inclined to feel that I am a failure.

The score on self-esteem used in this chapter is defined similarly as the score on a complete Rosenberg scale: as the sum of the ratings for items c), e) and f) minus items a), b) and d); hence a higher score reflects higher self-esteem.

The *Rotter Locus of Control Scale* (Rotter, 1966) measures the extent to which individuals perceive they have control over their lives as opposed to the extent they believe chance or fate intervenes in their lives. It is generally measured by a 23-item questionnaire, though some alternatives exist. Question Q25 in the Supplementary Pupil Questionnaire contains seven items that are the same or very similar to the original items in the Rotter scale. Pupils were asked to assess the extent to which they agree with following statements. The possible answers are: *I strongly agree*, *I agree*, *I disagree*, *I strongly disagree*.

a) Sometimes I feel that in my life there is always someone who pushes me.
b) What happens to me is my own doing.
c) There are problems without solution.
d) I can do almost nothing about changing some important things in my life.
e) Facing my problems I often feel helpless.
f) Many times I feel that I have little influence over the things that happen to me.
g) I can achieve almost everything that I choose to.

The score on self-control used in this chapter is defined as the sum of the ratings for items a), c), d), e) and f) minus items b) and g); hence a higher score signifies higher self-control.

As a combined measure of non-cognitive skills in this chapter, I average the score on self-esteem and self-control and standardize the result to have a mean of 0 and a standard deviation of 1.

Figure 1.1 in the Appendix depicts the sample distribution of cognitive skills of boys and girls. Female distribution is more tightly concentrated around the mean. More males than females achieve exceptionally high scores. The distribution of non-cognitive skills of males is shifted slightly to the right of the female distribution; hence on average males achieve higher scores on scales measuring non-cognitive abilities.

Figures 1.2 and 1.3 in the Appendix depict the sample distributions of both types of skills based on the school type that pupils applied for in the first round of the admission process. The distribution of cognitive abilities of both males and females applying for apprenticeships is located to the left of the cognitive skills' distributions of those applying to vocational schools and academic high schools. The female sample distributions are more concentrated. In other words, female pupils apply to school types more consistently with respect to their cognitive skills than do males. Compared to the distributions of cognitive abilities, the distributions of non-cognitive skills are less divergent across application choices. For boys, the sample distribution of non-cognitive skills of those applying to academic high schools and those applying to vocational schools are very similar (see also Table 1.2 in the Appendix for means and standard deviations of the distributions).

In summary, girls with higher skills (of both types) apply to academic high schools while girls at the lower end of both distributions apply for apprenticeships. Boys sort themselves to school types somewhat less predictably.

Socioeconomic background: education of parents and family income

Sorting pupils to groups based on gender and secondary school application choice, figures 1.4 and 1.5 in the Appendixdisplay the percentages of pupils' mothers and fathers, respectively, according to their highest attained education: up to the secondary level without a general certified exam, a complete secondary education (with GCE), and a tertiary level of education.

Clearly, the highest share of university educated parents are among children applying to academic high schools, while lower attained education of parents is associated more frequently with their children applying to vocational schools or apprenticeships. The daughters of mothers with up to secondary education without GCE apply more frequently to apprenticeships than do the sons of mothers in this education group. On the other hand, once their mother has a secondary degree with GCE, girls are less likely to apply to secondary schools without a GCE and apprenticeships compared to boys. The share of boys applying to academic high school programs with a tertiary educated

mother is higher than the corresponding share of girls. With respect to fathers' education, the general outcomes valid for the education of mothers hold, even though the differences between boys and girls are less pronounced when applications to apprenticeships are considered. Out of those applying to academic high schools, 46% of boys have a father with a tertiary degree as compared to 36% of girls.

I define family income per member of the family as the total family income stated in the survey divided by the weighted sum of adults and children in a household, with children given a weight of ½ and adults given a weight of 1. Means and standard deviations of this per-capita income for sub-samples of boys and girls sorted according to their application choice are displayed in Table 1.3 in the Appendix. It is evident that on average, children applying to academic high schools come from families with higher income. On average, the family income of girls applying to vocational schools and academic high schools is lower than the family income of boys applying to these school types.

Secondary schools across districts: scarcity of places at academic high schools and excess supply of places in apprentice programs

The ratio of places in academic high schools to all places in secondary schools in the Czech Republic is only around 20%. It is important to understand that places in academic high schools include 4, 6 or 8-year academic programs; the particular ratio varies across districts. Therefore, for pupils in the 9th grade who are the subject of my study, only a portion of these places are available, since some places are already taken by pupils studying in 8- or 6-year academic programs (see Figure 1.6 in the Appendix). The shares of free places at each type of school that are available to 9th grade elementary students across districts are depicted in Figure 1.7 in the Appendix.

However, with respect to an individual's choice of education, it is not only supply matters. What is equally important is the overall scarcity of places at academic high schools in a district. To capture it, I first aim to obtain a district measure of predicted,

underlying, demand for academic high schools.[10] I regress the revealed demand for academic high schools across districts in 2002 (i.e. the year before the PISA survey), measured as a percentage of round 1 applications to academic high schools on the total number of round 1 applications, on the district's characteristics to obtain the district's predicted demand for academic high schools. For district characteristics, I consider the share of tertiary educated population in a district, the dummy variable characterizing the presence or absence of a public university in a district (to account for proximity and affordability of tertiary education in a district), and the share of places at the academic high schools not taken by students in 6- and 8- year academic high school programs.[11] Results of the regression are summarized in Table 1.4 in the Appendix. The share of the population with a university education is a significant positive factor in predicting demand for academic high schools. Further, districts with a higher share of academic programs still available for students in the 9th grade display a higher demand for such places, everything else being equal. Finally, the presence of a university has a small negative effect on demand, but this may be the result of the small number of districts with a university.

Consequently, *the measure of the scarcity of places at academic high schools* in a district is defined as the predicted demand minus the actual supply of these places in a district.

Regarding the choice of apprenticeship vs. vocational school, I estimate the underlying demand for apprenticeships using the share of the population with education without GCE in the district.[12] The coefficient is almost equal to one; hence, a one percent increase in the share of the population with at most incomplete secondary

[10] While the supply of places in a school is fixed and pupils know this in advance, the demand is observed only after applications are submitted. Pupils have an indication about the demand for individual schools in the form of data from previous years. They can also infer some information from the intended decisions of their peers. Because individuals assess their chances and strategize their choice in order not to end up at an undesired school, the revealed demand within a district is already a result of this strategizing and can be very different from the true underlying demand.

[11] The variables in the regression are as of year 2002. The shares of the tertiary educated population across districts come from the Czech Statistical Office. Data on the demand for academic high schools and on the share of places at 4-year academic high school programs come from the Institute on Information on Education.

[12] Source: Czech Statistical Office, 2002.

education is associated with a corresponding one percent increase in a predicted demand for apprenticeships (see Table 1.5 in the Appendix).[13]

I subtract the expected demand for apprenticeships from their actual supply to obtain *the measure of excess supply of places in apprentice programs* in a district.

It is worth noting that these measures are very different from the measures of excess demand one would obtain directly from revealed demand and supply numbers (see Figures 1.8 and 1.9 in the Appendix). Based on the district's characteristics, the estimated measures should more precisely capture the difficulty or ease of being admitted once one has applied to a specific school type. As such, they might be understood as representing the uncertainty associated with the admission process in a given district. In particular, the higher scarcity of places at academic high schools should imply the higher risk of ending up at an undesired, low-quality school. On the other hand, although less clearly, the higher excess supply of apprentice programs could in theory be associated with a lower risk of ending up at undesired school, if the excess supply of apprenticeships is associated with more variety of apprentice programs.[14] Therefore, in the case of failure to be admitted to a presumably higher-quality vocational school in such a district, pupils might have higher chances to find an appropriate, though possibly not particularly desired, apprentice program.

1.5 Results

1.5.1 Determinants of academic high school choice

To look broadly at the role of cognitive and non-cognitive skills, in Table 1.6 in the Appendix, columns 1 and 4, I display the basic results of a probit model of male and female academic high school application choice that does not include interaction effects

[13] When predicting demand for academic high schools (apprenticeships) I also included other explanatory variables, such as the presence of a private university in the district, the presence of an upper vocational school, the share of population living in cities, unemployment rates according to education status, and unemployment rates; total and partitioned according to the education of the unemployed. However, these determinants are not significant and including them does not change the predictions of demand.

[14] Unfortunately, no evidence is available for this claim as the data capturing the different varieties of apprentice programs at the district level is lacking.

between the district measure of scarcity of places in academic high schools and other explanatory variables.[15] For better interpretation, instead of coefficients I report the marginal effects of the variables at the mean values of remaining variables. Income and the measures of skills are standardized; the marginal effects comparatively capture the magnitude of a one-standard-deviation increase in these variables.

The marginal impact of cognitive skills is significant in both specifications. Non-cognitive skills significantly predict the choice of girls, even though the magnitude of the effect is much lower than the effect of cognitive abilities. For both genders, both types of skills are jointly significant. The effect of the measure of scarcity of places at academic high schools in a district is insignificant for both boys and girls, even though it has the expected negative sign. In Table 1.6, columns 2, 3, 5 and 6, I report the results for parsimonious specifications of the model, i.e. one without skills variables, the other without variables capturing parental education, hence providing upper bounds on the estimated effects of skills vs. education. The outcomes suggest that both types of skills and parental education affect a child's choice, since omitting either the pupil's skills or parental education from the equation leads to higher estimates of the remaining variables. The education of parents therefore has a direct effect on the application decision, likely in the form of "pushing" a child to a particular school. Also, the skills of a pupil, even though at least partially determined by the education of parents, have a direct effect on his/her choice. The estimated coefficient on income increases as well when education dummies are not included, which is a reflection of the correlation between education and income. I return to the direct and indirect effect of skills vs. education in section 1.6.

However, it is likely that the impact of skills, and potentially the impact of socioeconomic background variables, will be different across districts. Specifically, districts are characterized by different demand-supply conditions: with increasing scarcity of places at academic high schools, there is possibly a higher uncertainty

[15] I also estimate a linear probability model as a check for the distributional assumptions of the probit model. Coefficients and standard errors from the regression do not differ much from the marginal effects of a probit model at the mean values of variables.

associated with the admission process. Non-cognitive skills, that is the combination of one's self-esteem and self-control, may matter more, while cognitive abilities may matter less for the application decision in a more uncertain environment. Hence, in the next specification I include the interaction effects. Estimated coefficients and their significance are displayed in Table 1.7 in the Appendix. One has to bear in mind that the information included in this table is limited, as the coefficients on simple and interaction effects are not the marginal effects. For an appropriate representation of interaction effects one has to evaluate the derivation of interest and compute standard errors. As pointed out by Norton, Wang and Ai (2004), in the case of interaction effects, evaluating a cross-partial derivative with respect to both variables generally leads to different signs of marginal effects for different values of covariates, and to different significance. A similar issue arises if the same variable is included in several interaction terms, which in this analysis is the case of the variable capturing the scarcity of places at academic high schools that is interacted with socioeconomic background and skills.

Therefore, to assess the magnitude and significance of interaction effects, I compute marginal probabilities and corresponding z-statistics for the variable capturing the scarcity of places at academic high schools at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} percentiles, separately changing values of income, cognitive skills and non-cognitive skills; fixing remaining factors at their means; and assuming that both parents have attained a secondary education. I also examine how a change in the attained education of both parents from a secondary degree to a tertiary degree affects the probability of applying to an academic high school, fixing both types of skills and household income at their mean values.

Figures 1.10a)-d) and 1.11a)-d) in the Appendix display the marginal effects of background variables on academic high school application probability together with their z-statistics for five levels of the scarcity of places at academic high schools.[16] The marginal impact of family income on the tendency of males to apply (Figure 1.10a) is insignificant (both economically and statistically) in districts with high scarcity of

[16] The measure of scarcity of places in academic high schools is denoted as *excess demand* in the figures.

academic high schools (75^{th} and 90^{th} percentile of a distribution). On the other hand, in districts at the 10^{th}, 25^{th} and 50^{th} percentiles of the distribution, a marginal increase in family income has a positive effect on the probability of applying, but only at lower levels of per-capita family income (for high-income families, the effect is statistically insignificant). The magnitude of this effect decreases with increasing scarcity of academic high schools, but the differences are quite small. For females, the marginal effect of household income is completely insignificant (see Figure 1.11a in the Appendix).

Regarding the education of parents, the probability of a male applying to an academic high school when both parents have a tertiary degree increases by 22% compared to when both parents have a secondary degree (at the 50th percentile of scarcity of academic high schools across districts). The magnitude of the effect decreases with higher scarcity, with a difference of around 8% between the 10^{th} and 90^{th} percentile of excess demand (see Figure 1.10b in the Appendix). For females, the marginal effect of parental education is significant in districts with a scarcity of academic high schools around the 50^{th} and 75^{th} percentile, though it is not significant for lower as well as higher scarcity of places at academic high schools (see Figure 1.11b in the Appendix). The magnitude of the effect is small for females, amounting to around a 6% increase in female academic high school application probability when her parents attained a tertiary education as compared to when they attained a secondary education.

In sum, the role of family income in predicting the probability of applying to academic high schools is very small and does not change much across districts. The effect of tertiary education is much larger, and applies especially to boys. For girls, it is lower and insignificant at some levels of scarcity of places at academic high schools.

Regarding cognitive and non-cognitive skills, the findings are as follows. An increase in cognitive skills by one standard deviation has a positive and significant impact on the female probability of applying to an academic high school. Higher scarcity of academic high schools in a district is associated with a slightly lower magnitude of the effect, especially for moderate levels of cognitive abilities. In other words, with increased uncertainty of the admission process, the role of cognitive skills

becomes weaker (see Figure 1.11c in the Appendix). For males, the effect of cognitive skills on the probability of applying to an academic high school is positive and statistically significant in all districts except for those with the lowest values of excess demand for academic high schools. The effect is weaker than is the case for females. When moving from the lowest to the highest levels of cognitive skills, the magnitude of the effect increases (see Figure 1.10c in the Appendix). The magnitude of the effect is also higher in districts with higher scarcity of places at academic high schools, which means that the role of cognitive abilities in application probability becomes more important as the admission process becomes riskier. This is a counter-intuitive outcome and I elaborate on the possible causes of this outcome at the end of this section.

The effect of non-cognitive skills is insignificant for males independent of scarcity of places at academic high schools in a district (see Figure 1.10d in the Appendix). For females, non-cognitive skills are statistically unimportant when the difference between predicted demand for academic high schools in a district and their actual supply is low, hence when the risk of ending up at an undesired school in the case of failing the academic high school admission process is low (see Figure 1.11d in the Appendix: the 10^{th} and 25^{th} percentile of *excess demand*). In districts with higher scarcity of places at academic high schools, the effect of a one-standard-deviation increase in non-cognitive skills is positive and significant, but only at lower and moderate levels of non-cognitive skills. More importantly, the magnitude of the effect is highest in districts where the difficulty of being admitted is the highest. This is in accordance with the expectation that non-cognitive skills would become more important in a more uncertain environment.

The marginal effects and their significance provide information about the importance of the explanatory factors; however, in order to understand their effects better, it is useful to simulate the predicted probabilities of application to an academic high school. In what follows, I focus on the role of cognitive and non-cognitive skills since the results so far show some interesting gender differences. I fix the standardized income at its mean level and the education of both parents at the secondary level. For the 25^{th}, 50^{th} and 75^{th} percentiles of cognitive (non-cognitive) skills, I compute the predicted

probability of applying to an academic high school, while fixing non-cognitive (cognitive) skills at their mean, and varying the level of district scarcity of places at academic high schools. The general expectation is that for two pupils with the same characteristics, the probability of applying to an academic program should be lower for the one living in a district with higher scarcity of academic high school places. Regarding the role of cognitive and non-cognitive skills, the intuitively expected effect of non-cognitive skills should be stronger in districts with higher uncertainty of the admission process at the expense of the effect of cognitive skills.

Figure 1.12a) in the Appendix displays the predicted probability of applying to an academic high school for fixed values of non-cognitive skills. The predicted probability of applying to an academic high school in districts with a higher uncertainty of being admitted, as captured by the higher measure of scarcity of places at academic high schools, is decreasing for females, which is in accordance with the expectation that increased uncertainty of the admission process discourages students from applying. The difference between the probabilities of applying for females at the 25^{th} and 75^{th} percentile of cognitive skills' distribution (with fixed non-cognitive skills) decreases, albeit only slightly as they move to higher scarcity districts. On the other hand, the difference in application probabilities for females at the 25^{th} and 75^{th} percentile of non-cognitive skills (with fixed cognitive skills at the mean) increases as they move to higher scarcity districts, attaining as much as 10% in districts at the top of the scarcity distribution (see Figure 1.12b in the Appendix).

For males, however, the results do not follow intuition. First, the probability of applying increases with higher scarcity of places at academic high schools, at least for those with higher cognitive skills. Moreover, the level of cognitive skills becomes increasingly more important with increasing scarcity of places in academic programs, while non-cognitive skills appear to play no role at all. Overall, the levels of probabilities for males and females are very different, with the probability of a male applying to an academic high school being very low in comparison to a female with similar characteristics.

One possible explanation for this result may be that boys are more attracted to technical orientation of many vocational schools. Often, these schools (engineering, electrotechnics, telecommunications, and IT-oriented vocational programs) offer good chances of continuing on to tertiary education; therefore in this respect represent a good alternative to academic high schools. [17]

The counterintuitive result for boys, that the level of their cognitive skills becomes increasingly important with increasing scarcity of places at academic programs, may be explained if the increasing scarcity is associated with the higher quality of education at academic high schools than at vocational schools.

These hypotheses should not be difficult to test once appropriate district-level data are available.

1.5.2 Determinants of the choice of apprenticeship program

To estimate the probabilities of applying to an apprenticeship program, I follow a strategy similar to the one I use for academic high school choice. As a variable measuring the discrepancy between actual supply and predicted demand for apprentice programs, I use the *measure of excess supply* computed in section 1.4.3 that is equal to the actual supply of apprenticeships minus the predicted demand based on a district's education structure. Following the same estimation procedure as in the case of academic high schools, Table 1.8 in the Appendix displays the results from the probit model without interaction effects. The role of both types of skills is statistically significant for both genders; the coefficients on cognitive skills are of greater magnitude than the coefficients on non-cognitive skills. For both genders, both types of skills are jointly significant. The effect of excess supply of places in apprentice programs is significant only for males: It has a positive sign, which suggests that the probability of applying to an apprenticeship is higher in districts where the predicted demand for apprenticeships

[17] According to National Institute of Technical and Vocational Education (www.nuov.cz), in 2002/2003, about 50% of graduates from engineering programs and around 70% of graduates from electrotechnics, telecommunications, and IT programs applied to universities with high chances of enrolling (around 45% and 60% of graduates, respectively). Graduates from secondary schools with a focus on building construction also have high chances of getting into a university.

based on the educational structure of the population is much lower than actual supply. This is at odds with expectations. In districts with a large excess supply of apprenticeships, one would expect pupils to apply to vocational schools of presumably higher quality more frequently, especially when the excess supply of apprentice programs might also be associated with their variety, lowering the uncertainty of the admission process. However, as shown below, the inclusion of interaction effects changes the outcomes significantly.

In the next specification (see Table 1.9 in the Appendix), I include interaction effects to see how the importance of background factors and skills changes with varying excess supply of apprenticeships. Following the procedure used in estimating academic high school application probability, I fix the variable capturing oversupply of apprenticeships at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} percentiles, respectively. As outlined above, the *measure of excess supply* of places at apprentice programs can be thought of as representing the level of uncertainty associated with the admission process, so that a pupil would apply to a vocational school more frequently if the excess supply of apprenticeships is high. In that case, failing the vocational school admission process would likely lead to a relatively high number of remaining apprenticeship options. Given the level of discrepancy between apprentice programs' predicted demand and supply, I examine how the probability of applying for an apprenticeship changes as income, cognitive and non-cognitive skills change, fixing other values at their means and assuming that both parents have attained secondary education. I also examine how having parents who attained a tertiary level of education influences apprenticeship application probability, compared to having parents who both attained a secondary level of education, fixing both types of skills and per-capita household income at their mean values. Graphic illustrations of marginal effects and their z-statistics are in Figures 1.13a)-d) (boys) and 1.14a)-d) (girls) in the Appendix.

The marginal effect of family income on the probability of a boy applying to an apprentice program is negative. Its significance depends on the level of family income and on the level of apprenticeships' excess supply in a district. Overall, when significant, the effect of family income is negative, small in magnitude, with no important

differences across districts (see Figure 1.13a in the Appendix). For girls, the effect is significant for moderate levels of excess supply of apprenticeships in districts at moderate values of income. The magnitude of the effect reaches up to -1% only (see Figure 1.14a in the Appendix).

The magnitude of the negative effect of parental tertiary education decreases with excess supply of apprenticeships for both genders, but it is significant only for boys and only for low values of excess supply of apprenticeships. In other words, tertiary education of parents significantly decreases their son's probability of applying to apprentice programs, the effect being stronger with increasing uncertainty of the admission process. When the uncertainty is lower, i.e. there is larger excess supply, the education of the parents no longer affects the probability of boys applying to apprenticeships anymore (see Figures 1.13b and 1.14b in the Appendix).

In summary, the results for apprenticeship application probability with respect to the role of income and parental education are similar to those obtained for academic high school application probability. While family income has a minimum impact, the effect of tertiary education is slightly larger, albeit affecting mostly the male probability of applying. In what follows, I summarize how the impact of cognitive and non-cognitive abilities changes with excess supply of places in apprentice programs.

In general, for both males and females, the negative effect of cognitive skills on the probability of applying to an apprenticeship is significant for all but the highest values of cognitive abilities. This is expected, as most of the applicants to either vocational schools or apprentice programs are in the left part of the cognitive skills distribution. For females at the lowest levels of cognitive abilities, the effect is weaker in districts with lower excess supply of apprenticeships, i.e. with higher uncertainty of admission process. For males, the opposite is true along the distribution of cognitive abilities (see Figures 1.13c and 1.14c in the Appendix).

For females, the effect of non-cognitive abilities is significant and of non-negligible magnitude only at moderate levels of non-cognitive abilities in districts with apprenticeships' measure of excess supply being not very low and not very high (see Figure 1.14d in the Appendix). The magnitude of the effect decreases, though very

slightly, with increasing excess supply (lower risk), which is an expected outcome since intuitively the role of non-cognitive abilities should be stronger in a more uncertain environment. For males, non-cognitive skills do have a significant effect on the male application probability when the excess supply of apprenticeships is large: the 50^{th}, 75^{th} and 90^{th} percentiles (see Figure 1.13d in the Appendix). The effect is significant at higher levels of non-cognitive skills only. The magnitude of the effect is relatively low in magnitude, but increases with higher excess supply of places in apprenticeships. This means that a lower uncertainty of admission process strengthens the role of non-cognitive skills, which is contrary to expectations and contrary to the outcome obtained for females.

Just as for the probability of academic high school application, I simulate the predicted probabilities of application to apprenticeship. Within a complete range of values of excess supply of places in apprentice programs, I focus on the role of cognitive and non-cognitive skills. For the 25^{th}, 50^{th} and 75^{th} percentiles of cognitive (non-cognitive) skills, I compute the probability of applying to an apprentice program, while fixing non-cognitive (cognitive) skills at their mean values. I also fix standardized income at the mean level and the education of both parents at the secondary level. The general expectation is that for two pupils with the same background characteristics, apprenticeship application probability should be lower for pupils coming from a district with higher excess supply of places in apprenticeships as there is probably a lower risk associated with admissions to vocational schools in such a district.

Predicted probabilities of apprenticeship choice are displayed in Figures 1.15a-b in the Appendix. It is apparent that increased excess supply of apprenticeships which is likely to be associated with lower riskiness of the admission process, generally results in a decrease in the predicted probability of applying to an apprentice program for both females and males. Inclusion of interaction effects is thus very important to obtain an intuitively expected outcome also for males. A sharper decrease observed for females and the overall higher apprenticeship application probabilities of males suggest that there are other factors affecting the decision process differently for males and females. This is supported by another result: As the measure of excess supply decreases, hence as

admission process uncertainty goes up, non-cognitive skills become more important for females, but the opposite is true for males. It is possible that a variety of apprentice programs likely to be associated with their high excess supply in a district is sufficient incentive for boys to apply there. Also, society may consider apprenticeships to be more suitable for boys than for girls. These claims should be examined by more focused research.

1.6 Alternative Estimation Approach – Structural Equation Model with Latent Variables. Direct versus Indirect Effects of Parental Background

So far, in standard probit analysis, I assumed that the measures of cognitive and non-cognitive skills are perfect proxies for true abilities. However, in the case that these measures are imprecise, estimation results are biased, generally for all the parameters in the equations. A standard approach to errors in variables is to use instrumental variables. An instrument has to be found that is correlated with a true, imprecisely measured factor and at the same time is uncorrelated with errors in measurement. Having such instruments implies consistent estimation. However, within the framework of this work it is difficult to find adequate instruments, especially for non-cognitive skills. Moreover, the technique of instruments does not work in other than simple linear specifications. Therefore, I use a structural equation model approach with latent variables.[18]

Latent variables are variables that are not measurable but that are related to measurable factors (see Kmenta, 1971, for a broader introduction). In this case, it is likely that precise measures of cognitive and non-cognitive skills are not existent, but the outcomes of cognitive, psychological or intelligence tests do provide some information about the level of underlying skills. Because I have data on four types of cognitive tests available and data on two psychological scales, I can construct a structural model that relates latent skills to their respective measures and the stochastic disturbance.

[18] The model is originally known as LISREL (Linear Structural Relations) and can be thought of as a higher level of a MIMIC model (multiple-indicator multiple-cause). See Jöreskog (1973) and Jöreskog, Goldberger (1975).

I use a structural model representation, similar to one specified by Rabe-Hesketh, Skrondal and Pickles (2003). I specify an outcome model – a functional form for explaining the probability of applying to academic programs/apprenticeships. This model contains background characteristics, a variable measuring the scarcity of demand/excess supply of academic programs/apprenticeships and the two latent factors, for cognitive and non-cognitive skills, as explanatory variables. Further, I specify a measurement model: a functional form explaining the levels of the latent skills measures. Finally, the true covariate model is specified to explain the level of latent skills and is added to the outcome model and the measurement model to form a complete structural specification.

This framework allows me to distinguish between the direct effect of parental background, as education dummies are included in the outcome model for school choice, and the indirect effect of parental background mediated through the level of skills, as education dummies are included in the true covariate model.

1.6.1 Model specification

Outcome model

The outcome model is specified to reflect the relationship between the outcome variable − academic high school/apprenticeship application decision, the true latent cognitive and non-cognitive skills, $\boldsymbol{f}^{C}$, $\boldsymbol{f}^{N}$, and other background characteristics: individual-specific ones, $\boldsymbol{X}$, and district-specific scarcity of places at academic high schools/excess supply of places in apprenticeships, $\boldsymbol{Sc}^{D}$ in district $\boldsymbol{D}$.

$$\Pr(\boldsymbol{G}=1)=\Phi(\boldsymbol{X}\beta+\alpha\boldsymbol{Sc}^{D}+\beta^{C}\boldsymbol{f}^{C}+\beta^{N}\boldsymbol{f}^{N})$$

Measurement model

Four measures of cognitive skills are available from the 2003 OECD PISA survey ($\boldsymbol{M}_{j}^{C}$, measuring skills in mathematics, problem solving, reading literacy, and science); two measures of non-cognitive skills obtained from the Czech Supplementary Pupil

Questionnaire ($\boldsymbol{M}_{\boldsymbol{k}}^{\boldsymbol{N}}$, measuring the levels of self-esteem and self-control). In a measurement model, I assume that measures of cognitive skills are a function of latent cognitive skills and that the measures of non-cognitive abilities are a function of latent non-cognitive abilities.

$$\boldsymbol{M}_{\boldsymbol{j}}^{\boldsymbol{C}} = \delta_{\boldsymbol{j}}^{\boldsymbol{C}} + \lambda_{\boldsymbol{j}}^{\boldsymbol{C}} \boldsymbol{f}^{\boldsymbol{C}} + \varepsilon_{\boldsymbol{j}}^{\boldsymbol{C}} \quad \boldsymbol{j} = 1,2,3,4$$

$$\boldsymbol{M}_{\boldsymbol{k}}^{\boldsymbol{N}} = \delta_{\boldsymbol{k}}^{\boldsymbol{N}} + \lambda_{\boldsymbol{j}}^{\boldsymbol{N}} \boldsymbol{f}^{\boldsymbol{N}} + \varepsilon_{\boldsymbol{k}}^{\boldsymbol{N}} \quad \boldsymbol{k} = 1,2$$

The scales of the measurements are given by λ and the deviation by δ. A normalization of the mean and the scale of one measure of each skill to 0 and 1 respectively allows for identification. The errors associated with the measures of both skills are assumed to be normal and independent of true cognitive/non-cognitive skills.

True covariate model

The latent variables are assumed to be a function of a subset of all observed covariates, in this case a function of the education of the parents ($\boldsymbol{X}^{\boldsymbol{'C}} = \boldsymbol{X}^{\boldsymbol{'N}}$).

$$\boldsymbol{f}^{\boldsymbol{C}} = \gamma^{\boldsymbol{C}} \boldsymbol{X}^{\boldsymbol{'C}} + \xi^{\boldsymbol{C}}$$

$$\boldsymbol{f}^{\boldsymbol{N}} = \gamma^{\boldsymbol{N}} \boldsymbol{X}^{\boldsymbol{'N}} + \xi^{\boldsymbol{N}}$$

The errors are again assumed to be normal, with zero mean and constant variance. For identification purposes, it is assumed that cognitive and non-cognitive skills are independent. The same assumption is made by Cunha et al. (2005) and is supported by the correlations between individual measures of cognitive and non-cognitive skills (see Table 1.10 in the Appendix).

I estimate the specified model by the maximum likelihood method, using the program *gllamm*[19] incorporated in STATA. This software adopts adaptive quadrature to evaluate maximum likelihood. Reported results are from the estimation in which I assume the normality of underlined skills given the observed covariates. Because *gllamm* allows this normality assumption to be relaxed using a non-parametric maximum likelihood procedure, I also perform such estimations. However, as the results are very similar, I do not report them.

A drawback of the structural model is that the requirements for its identification do not permit the estimation of interaction effects. Attempting to resolve the problem by dividing observations into three groups according to the district measures of scarcity of places at academic high schools/district measures of apprenticeships' excess supply and estimating the effect of background and skills within these groups does not lead to comprehensible results in which the magnitude and significance of the effects not follow any pattern. Finer grouping cannot be done because of the small number of observations. The following results are hence based on the specification without interaction effects.

1.6.2 Structural equation model with latent variables: results

Table 1.11 in the Appendix summarizes the coefficients and standard errors from the structural model for academic high school application. For comparison, the coefficients from the previous probit analysis without interaction terms are also displayed. For boys, the significance as well as the signs of the effects in the main equation are the same for the structural model and the probit model. The magnitudes of the effects, however, differ. The coefficients on tertiary education of both parents are smaller in the structural model while the coefficient on cognitive skills is much greater than the coefficient from probit. This reflects the assumption embedded in the latent cognitive skill equation that cognitive skills are formed according to parental characteristics. The equation for latent

[19] Abbreviation *gllamm* stands for generalized linear latent and mixed models. The program combines features of generalized linear mixed models and structural equation modeling. The program can be downloaded at http://www.gllamm.org. For related literature, see e.g. of Rabe-Hesketh, Skrondal and Pickles (2002).

cognitive skills indeed confirms that the level of these skills depends on the education of the parents, with a positive impact of a secondary degree and an even larger positive impact of a tertiary degree attained by the parents.

For boys, non-cognitive skills are found to be positively affected by their father's education but not by the education of their mother. They are, however, not found to directly predict the choice to apply to an academic high school. In summary, sons of highly-educated parents are more likely to apply to academic high schools, and the effect is not only direct but also indirect due to affecting both the cognitive and non-cognitive skills of boys.

For girls, the education of the mother, unlike the father's education, seems to be a significant (direct and indirect) predictor of application choice. The father's education has a positive impact on the level of cognitive skills of girls, yet only a smaller significant direct impact of the father's secondary education on application probability is found. For girls, both cognitive and non-cognitive abilities are significant predictors of the choice to apply to an academic high school. Again, the magnitudes differ − they are larger than the ones found using the probit analysis.

The effect of family income is positive and significant for boys with almost the same magnitude as in the probit model, while the effect for girls is insignificant. Insignificance is found, again, for district measures of scarcity of places at academic high schools.

Overall, the findings suggest that the differences in estimated coefficients from the probit and structural models are caused by not accounting for the effect of background variables on the skills formation in the probit model. Once specifying the model for skills formation (as a function of the education of parents), the coefficient on parental education (direct effect) becomes smaller (or insignificant) and the magnitude of the effect of skills gets larger. Interestingly, it seems that the education of both mother and father is crucial for forming cognitive abilities. The non-cognitive skills of boys are found to depend on the education of their fathers, while the level of these skills in the case of girls is found to be affected by the education of their mothers. I return to these interesting findings in the concluding section.

Table 1.12 in the Appendix displays the coefficients and standard errors from the structural model for apprenticeship application along with the results from the probit model. The results for boys are consistent with the results for the choice of academic high school: the importance of parental education is lower in the structural model than in the standard probit. The opposite holds for both types of skills. The results for girls are similar. Concerning skills formation, again, while cognitive skills are significantly determined by the education of both parents, the non-cognitive skills of girls are affected by the mother's education, those of boys by the father's education.

1.7 Conclusion

In this chapter, I examine the determinants of secondary school application choice in the Czech Republic. Besides exploring the role of standard determinants of education choices, i.e. parental education, income, and cognitive skills, I focus on the role of non-cognitive abilities, namely self-esteem and self-control in the application decision. These are hypothesized to be relevant in the context of the admission system in the Czech Republic, as there is considerable uncertainty involved: getting into better schools is conditional on passing exams, and failing may lead to enrollment in an undesirable, low-quality school. In addition, I examine the impact of district-specific measures of scarcity of places at academic high schools (and of excess supply of apprenticeships) to account for the district-specific level of uncertainty associated with the admission process and to elaborate on the varying effect of background characteristics and skills across districts.

Generally, the results show that the probabilities of applying to academic high schools and apprenticeships are affected predominantly by the level of a pupil's cognitive skills and parental education. The impact of family income is only marginally important. The impact of non-cognitive skills is not as large as the effect of cognitive abilities. Most importantly, however, the effect of cognitive and non-cognitive skills changes with the district-specific level of uncertainty of ending up at an undesired school in an intuitively predictable ways for females, but not for males.

Overall, the analysis in this chapter points to important gender differences in secondary school application choices. The probability of applying to an academic high school for girls is generally much higher than it is for boys, given the same background characteristics. Analyzing further the probability to apply to an academic program as opposed to a vocational school, those districts with higher scarcity of places at academic high schools, measured as the difference between actual supply and predicted demand based on population characteristics in a district, are characterized by the strengthened importance of non-cognitive abilities and weakened importance of cognitive skills for females. This is in accordance with the hypothesis that greater uncertainty of the admission process associated with higher scarcity of places at academic high schools provides more space for non-cognitive skills to influence the application decision.

For males, however, the effect of non-cognitive skills is insignificant and the effect of cognitive abilities increases in magnitude with increased scarcity of academic high schools. Moreover, the predicted probability of applying to an academic high school among males with cognitive abilities at the top of the distribution increases with increased scarcity of academic high schools. One explanation for these outcomes is that vocational schools, many of them technically oriented, may be more attractive for boys. Alternatively, they may generally be a good alternative to academic high schools for males pursuing a tertiary education if they offer a good chance of getting into a university. Further research is needed to evaluate these propositions. Ideally, one needs district-level data on the percentage chances of getting into a university according to secondary school type. One has to evaluate whether the districts in which vocational school graduates have comparable chances of getting into a university as academic high school graduates are the districts characterized by a higher probability of males to apply to a vocational school. Similarly, those districts characterized by higher scarcity of places at academic high schools may be those in which the chances of getting into university from these programs are much higher than the chances vocational school graduates have. I such a case we should observe boys applying to academic high schools more frequently.

With respect to the estimation of the probability of applying for an apprenticeship, the decreasing pattern of predicted probability with increasing excess supply of apprentice programs is found for both males and females. This is in accordance with the intuition that a larger supply of apprenticeships is likely associated with more options in the case of failing the vocational school admission process, and this encourages pupils to apply to vocational schools instead of apprenticeships. However, there are also some important gender differences. The probability of applying to an apprentice program is much higher for a boy than for a similarly skilled girl with the same background. As the measure of excess supply decreases (admission process risk goes up) the role of non-cognitive skills becomes more important for females, which is intuitively expected, but the opposite is true for males. Again, further research is needed to address the potential explanations for this outcome. It is possible that a variety of apprentice programs that are likely to be associated with their high excess supply in a district is sufficient incentive for males to apply there. Or, it is possible that the districts with high excess supply of apprenticeships are also characterized by a labor market biased towards male jobs, capable of absorbing the variety of apprenticeship programs.

I was able to examine the subset of observations[20] that includes information on the success of a pupil in the first round of the admission process and the type of the school to which he/she was admitted. The outcomes suggest that a large majority of pupils in the sub-sample manage to get into the school type desired in the first round (see Table 1.13 in the Appendix). In other words, pupils very accurately assessed their chances for the type they applied to, even though this does not mean that pupils apply to the school actually preferred. Aside from the strategic reasons of boys (university admission chances, district labor market features), the gender differences observed in this chapter may partially reflect some social customs and norms about the suitability of specific

[20] This sub-sample is not representative of the population since there are 24%, 56%, 20% pupils in the sub-sample applying in the first round to academic high schools, vocational schools and apprenticeships, respectively, with very similar percentages getting into the given type. On a national level, according to the Institute on Information on Education, however, in 2003, 15%, 53%, and 32% applied to academic high schools, vocational schools and apprenticeships, respectively, in the first round, finally ending in the proportions 12%, 44% and 44% at academic high schools, vocational programs and apprenticeships, respectively.

school types for boys and girls in the Czech Republic. As argued by Myslivecek and Knot (2004), parents consider academic high school to be the most appropriate type of secondary school for girls. Societal perceptions may lead to discouraging a lot of boys from pursuing an academic or vocational school education, even though their skills are comparable to those of girls pursuing academic type of education or vocational schools. If this is the case, then policies advocating equal education chances should not only concentrate on children from disadvantaged families but also on encouraging highly-skilled boys to apply to schools of better quality.

Besides this, the outcome obtained for girls itself carries some policy implications. The results imply that the admission system set-up potentially discourages girls with lower self-esteem/self-control from applying to the school of their preference, as the non-cognitive skills of girls are found to affect the predicted application probability by as much as 10% in districts with higher uncertainty of admission process.[21] This warrants a reconsideration of the system set-up. In fact, some changes have been introduced into the system since 2004/2005, namely the introduction of more application choices in the first round of admission process; yet the uncertainty associated with decision-making still remains.

[21] The difference in predicted application probabilities for females at the 25th and 75th percentile of non-cognitive skills (with fixed cognitive skills at the mean, and parental education at the secondary level) in districts with the highest level of uncertainty associated with the admission process. See figures 1.12b and 1.15b in the Appendix.

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APPENDIX

Table 1.1
Descriptive statistics – individually specific variables

	Males					Females				
Variable	# Obs	Mean	Std. Dev.	Min	Max	# Obs	Mean	Std. Dev.	Min	Max
Secondary education of mother (dummy)	1162	0.46	0.50	0	1	1241	0.41	0.49	0	1
Tertiary education of mother (dummy)	1162	0.21	0.40	0	1	1241	0.17	0.38	0	1
Secondary education of father (dummy)	1162	0.33	0.47	0	1	1241	0.29	0.45	0	1
Tertiary education of father (dummy)	1162	0.18	0.38	0	1	1241	0.17	0.38	0	1
Income per HH member (CZK)	1162	7982	3795	2000	32000	1241	7754	3755	2000	32000
Standardized score on cognitive skills	1162	0.22	1.04	-3.58	3.06	1241	0.12	0.91	-3.33	3.48
Score on PISA test: Mathematics	1162	525.39	87.45	223.28	816.34	1241	506.54	80.78	170.11	816.34
Score on PISA test: Reading literacy	614	483.04	93.13	143.67	740.87	662	505.95	78.48	236.65	740.87
Score on PISA test: Problem solving	600	523.69	87.08	215.57	776.49	679	512.63	76.47	237.69	745.42
Score on PISA test: Science	656	527.58	95.85	197.04	818.40	656	517.75	87.45	200.19	841.53
Standardized score on non- cognitive skills	1162	0.16	1.03	-4.57	3.26	1241	-0.02	0.97	-3.70	3.26
Score on Rosenberg scale: Self-esteem	1150	12.01	2.53	1	18	1234	11.46	2.40	1	18
Score on Rotter scale: Self control	1146	12.74	2.72	2	21	1234	12.45	2.60	3	21
Number of observations according to the choice of secondary school										
High school	*180*					*330*				
Vocational school	*588*					*697*				
Apprenticeship	*394*					*214*				

Source: OECD's 2003 PISA Survey, The Czech Supplementary Pupil Questionnaire to OECD's 2003 PISA Survey

Notes: PISA scores: For each type of test, each student was given a subset of tasks from a broad pool of tasks. Consequently, a performance scale was constructed to associate each task with a point score on the scale according to its difficulty. Then, each student was assigned a point score on the same scale. To facilitate the interpretation of the scores assigned to students, final scale was constructed to have an average score among OECD countries of 500 points, with about two-thirds of students across OECD countries scoring between 400 and 600 points. (for more details, see OECD, 2004).

Table 1.2
Cognitive and non-cognitive skills: means and standard deviations of standardized averages according to gender and the choice of secondary school

	Means and standard deviations of standardized averages of cognitive and non-cognitive skills							
	Males				**Females**			
	Cognitive skills		**Non-cognitive skills**		**Cognitive skills**		**Non-cognitive skills**	
1st choice of a pupil	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Apprenticeship	-0.55	0.86	-0.16	1.01	-0.76	0.76	-0.54	0.88
Vocational school	0.49	0.84	0.29	0.97	0.06	0.77	-0.03	0.96
Academic high school	1.02	0.90	0.41	1.05	0.80	0.72	0.28	0.95

Source: OECD's 2003 PISA Survey, The Czech Supplementary Pupil Questionnaire to OECD's 2003 PISA Survey

Table 1.3
Household income per capita - means and standard deviations according to gender and the choice of secondary school. Czech crowns.

	Males		Females	
1st choice of a pupil	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Apprenticeship	6566	2672	6328	3138
Vocational school	8098	3674	7412	3408
Academic high school	10366	4737	9211	4464
Total	7895	3758	7675	3791

Source: OECD's 2003 PISA Survey, The Czech Supplementary Pupil Questionnaire to OECD's 2003 PISA Survey

Table 1.4
Estimation of demand for academic high schools in round 1 of admission process for 9th grade elementary school graduates

Dependent variable: Demand for academic high schools in a district [1]		
	Coef.	SE
District share of population with tertiary degree	**0.62** **	0.24
Presence of public university in a district (dummy)	**-0.03** **	0.01
District share of places at 4-year academic high schools on all places at academic high schools	**0.20** ***	0.03
Constant	-0.01	0.02
Adjusted R-sq	0.50	
# Obs	72	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%. [1] Demand for academic high schools is measured as a percentage of round 1 applications to academic high schools on the total number of round 1 applications in 2002.*
Sources: District share of population with tertiary degree: Czech Statistical Office, 2002. Demand for academic high schools in a district, District share of places at 4-year academic high schools on all places at academic high schools: Institute on Information on Education, 2002.

Table 1.5
Estimation of demand for apprentice programs in round 1 of admission process for 9th grade elementary school graduates

Dependent variable: Demand for apprenticeships in a district[1]		
	Coef.	SE
District share of population with education without GCE	**0.99** ***	0.25
Constant	-0.23	0.16
Adjusted R-sq	0.18	
# Obs	72	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%. [1] Demand for apprenticeships is measured as a percentage of round 1 applications to apprentice programs on the total number of round 1 applications in 2002.*
Sources: District share of population with education without GCE: Czech Statistical Office, 2002. Demand for apprenticeships in a district: Institute on Information on Education, 2002.

Table 1.6
Determinants of academic high school application choice.
Marginal effects from a probit model.

Dependent variable: Secondary school application choice being an academic high school (dummy)												
	Males						Females					
	(1)		*(2)*		*(3)*		*(4)*		*(5)*		*(6)*	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):												
less than secondary (omitted)												
secondary	0.03	0.05	0.04	0.05			**0.12** ***	0.04	**0.16** ***	0.04		
tertiary	**0.13** **	0.06	**0.17** ***	0.06			**0.27** ***	0.06	**0.34** ***	0.06		
Education of pupil's father (dummies):												
less than secondary (omitted)												
secondary	-0.04	0.04	-0.01	0.04			**0.09** **	0.04	**0.11** ***	0.04		
tertiary	**0.17** ***	0.06	**0.20** ***	0.06			**0.11** *	0.06	**0.18** ***	0.06		
Standardized income per HH member	**0.04** **	0.02	**0.04** **	0.02	**0.08** ***	0.02	0.02	0.02	0.03	0.02	**0.06** ***	0.02
Scarcity of places at academic high schools in a district (predicted demand - actual supply)	-0.94	0.80	-0.68	0.75	-1.03	0.80	-0.11	1.07	0.59	0.97	-0.36	0.92
Standardized score on cognitive skills	**0.09** ***	0.03			**0.11** ***	0.03	**0.22** ***	0.02			**0.25** ***	0.02
Standardized score on noncognitive skills	0.00	0.01			0.01	0.01	**0.03** *	0.02			**0.04** **	0.02
Pseudo R-sq	0.16		0.12		0.10		0.21		0.11		0.17	
# Obs	768		768		768		1027		1027		1027	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.7
Determinants of academic high school application choice.
Coefficients from a model with interactions of scarcity of places at academic high schools with background characteristics and skills

Dependent variable: Secondary school application choice being an academic high school (dummy)				
	Males		Females	
	(1)		*(2)*	
	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):				
less than secondary (omitted)				
secondary	-0.08	0.20	**0.33** **	0.14
tertiary	**0.38** **	0.18	**0.83** ***	0.18
Education of pupil's father (dummies):				
less than secondary (omitted)				
secondary	-0.14	0.15	**0.29** **	0.14
tertiary	**0.63** ***	0.19	0.10	0.20
Standardized income per HH member	**0.25** ***	0.08	0.07	0.09
Scarcity of places at academic high schools in a district (actual supply - predicted demand)	**-12.51** **	6.14	-3.07	4.34
Standardized score on cognitive skills	**0.27** ***	0.09	**0.67** ***	0.08
Standardized score on noncognitive skills	0.02	0.06	0.05	0.06
Secondary education of mother * Scarcity of places at academic high schools	**11.04** *	6.08	1.58	4.81
Tertiary education of mother * Scarcity of places at academic high schools	4.42	5.95	-2.60	6.59
Secondary education of father * Scarcity of places at academic high schools	2.07	5.99	-3.00	4.84
Tertiary education of father * Scarcity of places at academic high schools	-3.75	6.84	**13.59** *	7.18
Standardized income per HH member * Scarcity of places at academic high schools	**-5.68** *	2.91	-2.04	3.38
Standardized score on cognitive skills * Scarcity of places at academic high schools	**6.00** **	2.61	-0.06	2.88
Standardized score on noncognitive skills * Scarcity of places at academic high schools	-0.16	1.98	2.37	1.88
Pseudo R-sq	0.17		0.22	
# Obs	768		1027	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.8
Determinants of apprenticeship application choice.
Marginal effects from a probit model.

Dependent variable: Secondary school application choice being an apprenticeship (dummy)				
	Males		Females	
	(1)		*(2)*	
	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):				
less than secondary (omitted)				
secondary	**-0.13** ***	0.05	**-0.14** ***	0.03
tertiary	**-0.12** *	0.06	**-0.18** ***	0.02
Education of pupil's father (dummies):				
less than secondary (omitted)				
secondary	**-0.15** ***	0.05	-0.02	0.03
tertiary	**-0.26** ***	0.05	**0.11** *	0.08
Standardized income per HH member	**-0.08** ***	0.03	**-0.05** **	0.02
Excess supply of apprenticeships (actual supply - predicted demand)	**1.06** ***	0.41	-0.28	0.26
Standardized score on cognitive skills	**-0.27** ***	0.05	**-0.18** ***	0.02
Standardized score on noncognitive skills	**-0.05** **	0.02	**-0.05** ***	0.02
Pseudo R-sq	0.30		0.28	
# Obs	982		911	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.9
Determinants of apprenticeship application choice.
Coefficients from a model with interactions of oversupply of places at apprenticeships with background characteristics and skills

Dependent variable: Secondary school application choice being an apprenticeship (dummy)				
	Males		Females	
	(1)		*(2)*	
	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):				
less than secondary (omitted)				
secondary	**-0.44** ***	0.13	**-0.60** ***	0.16
tertiary	**-0.35** *	0.18	**-1.50** ***	0.35
Education of pupil's father (dummies):				
less than secondary (omitted)				
secondary	**-0.42** ***	0.13	**-0.28** *	0.14
tertiary	**-0.92** ***	0.22	0.33	0.26
Standardized income per HH member	**-0.23** ***	0.08	-0.13	0.09
Oversupply of apprenticeships	**4.53** **	1.79	0.15	1.88
Standardized score on cognitive skills	**-0.74** ***	0.09	**-0.82** ***	0.10
Standardized score on noncognitive skills	**-0.12** **	0.05	**-0.20** ***	0.07
Secondary education of mother * Excess supply of apprenticeships	**-4.75** **	1.95	2.28	2.20
Tertiary education of mother * Excess supply of apprenticeships	1.80	2.89	1.57	3.94
Secondary education of father * Excess supply of apprenticeships	-0.34	2.52	**-6.40** ***	2.19
Tertiary education of father * Excess supply of apprenticeships	5.54	4.74	-2.46	4.34
Standardized income per HH member * Excess supply of apprenticeships	-0.88	1.40	2.35	1.50
Standardized score on cognitive skills * Excess supply of apprenticeships	-1.25	1.99	-1.35	1.29
Standardized score on noncognitive skills * Excess supply of apprenticeships	0.34	0.94	1.08	1.22
Pseudo R-sq	0.31		0.29	
# Obs	982		911	

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.10
Correlations between measures of cognitive and non-cognitive skills for those participating in all cognitive tests and the two particular cognitive tests

	Mathematics	Reading literacy	Problem solving	Science	Self-esteem	Self control
226 observations - Those participating in all tests						
Mathematics	1.00					
Reading literacy	0.61	1.00				
Problem solving	0.69	0.64	1.00			
Science	0.61	0.66	0.58	1.00		
Self-esteem	0.27	0.26	0.17	0.25	1.00	
Self control	0.16	0.26	0.17	0.19	0.56	1.00
1447 observations - Those participating in mathematics and reading literacy tests						
Mathematics	1.00					
Reading literacy	0.54	1.00				
Self-esteem	0.26	0.23			1.00	
Self control	0.22	0.24			0.58	1.00
1429 observations - Those participating in mathematics and problem solving tests						
Mathematics	1.00					
Problem solving	0.66		1.00			
Self-esteem	0.28		0.20		1.00	
Self control	0.24		0.20		0.60	1.00
1463 observations - Those participating in mathematics and science tests						
Mathematics	1.00					
Science	0.56			1.00		
Self-esteem	0.25			0.21	1.00	
Self control	0.23			0.23	0.59	1.00

Note: Participation in two specific cognitive tests does not exclude participation in other cognitive tests. All correlations are significant at the 1% level.

Table 1.11
Determinants of academic high school application choice.
Coefficients from a structural model with latent variables, comparison with probit.

Dependent variable: Secondary school application choice being an academic high school (dummy)								
	Males				Females			
	gllamm (1)		*probit* (2)		*gllamm* (3)		*probit* (4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	0.06	0.17	0.10	0.17	**0.28** **	0.13	**0.35** ***	0.13
tertiary	**0.38** **	0.18	**0.44** **	0.18	**0.65** ***	0.18	**0.75** ***	0.17
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	-0.20	0.15	-0.13	0.14	**0.21** *	0.13	**0.25** **	0.12
tertiary	**0.51** ***	0.18	**0.55** ***	0.17	0.18	0.19	**0.30** *	0.18
Standardized income per HH member	**0.17** ***	0.06	**0.16** ***	0.06	0.06	0.06	0.05	0.06
Scarcity of places at academic high schools in a district (actual supply - predicted demand)	-3.42	3.02	-3.44	2.08	-0.56	3.40	-0.34	3.21
Standardized score on cognitive skills	**0.48** ***	0.12	**0.35** ***	0.09	**1.01** ***	0.11	**0.65** ***	0.07
Standardized score on noncognitive skills	0.02	0.06	0.01	0.05	**0.13** *	0.08	**0.10** *	0.05
Regression of latent cognitive variable on covariates								
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	**0.31** **	0.12			**0.27** ***	0.08		
tertiary	**0.44** ***	0.14			**0.43** ***	0.10		
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	**0.32** ***	0.11			**0.19** ***	0.06		
tertiary	**0.39** ***	0.13			**0.44** ***	0.09		
Regression of latent noncognitive variable on covariates								
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	-0.01	0.09			0.06	0.05		
tertiary	-0.04	0.12			**0.14** **	0.08		
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	**0.28** ***	0.09			0.03	0.05		
tertiary	**0.39** ***	0.13			0.11	0.08		

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.12
Determinants of apprenticeship application choice.
Coefficients from a structural model with latent variables, comparison with probit.

Dependent variable: Secondary school application choice being an apprenticeship								
	Males				Females			
	gllamm (1)		*probit* (2)		*gllamm* (3)		*probit* (4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	**-0.29** **	0.14	**-0.36** ***	0.13	**-0.60** ***	0.16	**-0.66** ***	0.14
tertiary	-0.26	0.20	**-0.32** *	0.18	**-1.53** ***	0.35	**-1.52** ***	0.30
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	**-0.33** **	0.14	**-0.40** ***	0.13	-0.06	0.15	-0.09	0.13
tertiary	**-0.74** ***	0.23	**-0.81** ***	0.21	**0.57** **	0.27	**0.41** *	0.24
Standardized income per HH member	**-0.23** ***	0.08	**-0.22** ***	0.08	**-0.19** *	0.10	**-0.19** **	0.10
Excess supply of apprenticeships (actual supply - predicted demand)	**2.96** **	1.18	**2.80** ***	1.09	-1.16	1.21	-1.19	1.11
Standardized score on cognitive skills	**-1.04** ***	0.20	**-0.71** ***	0.12	**-1.30** ***	0.17	**-0.76** ***	0.08
Standardized score on noncognitive skills	**-0.28** ***	0.10	**-0.13** **	0.05	**-0.29** ***	0.10	**-0.22** ***	0.07
Regression of latent cognitive variable on covariates								
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	**0.31** ***	0.07			**0.35** ***	0.07		
tertiary	**0.38** ***	0.09			**0.36** ***	0.12		
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	**0.47** ***	0.09			**0.14** **	0.06		
tertiary	**0.57** ***	0.13			**0.37** ***	0.09		
Regression of latent noncognitive variable on covariates								
Education of pupil's mother (dummies):								
less than secondary (omitted)								
secondary	0.01	0.05			**0.20** ***	0.08		
tertiary	0.08	0.07			**0.22** **	0.11		
Education of pupil's father (dummies):								
less than secondary (omitted)								
secondary	**0.09** *	0.05			**0.13** *	0.08		
tertiary	**0.18** **	0.09			0.15	0.15		

*Notes: *** significant at 1% ** significant at 5% * significant at 10%.*

Table 1.13
School application choice in the first round vs. the outcome of the first, second and the third or higher round.

	Applied to in the first round:		
Admitted to:	Apprenticeships	Vocational schools	Academic high schools
In round 1 - males			
Apprenticeships	177	9	
Vocational schools	3	329	7
Academic high schools		2	111
In round 2 - females			
Apprenticeships	77	14	1
Vocational schools	1	372	12
Academic high schools		2	188
In round 2 - males			
Apprenticeships	14	7	
Vocational schools	2	24	7
Academic high schools		1	11
In round 2 - females			
Apprenticeships	11	10	
Vocational schools	1	47	12
Academic high schools		1	13
In round 3 or higher - males			
Apprenticeships	2	4	1
Vocational schools		10	
Academic high schools		1	
In round 3 or higher - females			
Apprenticeships	8	2	
Vocational schools	1	6	
Academic high schools		1	1

Figure 1.1
Sample distribution of standardized average measure of cognitive and non-cognitive skills for males and females.

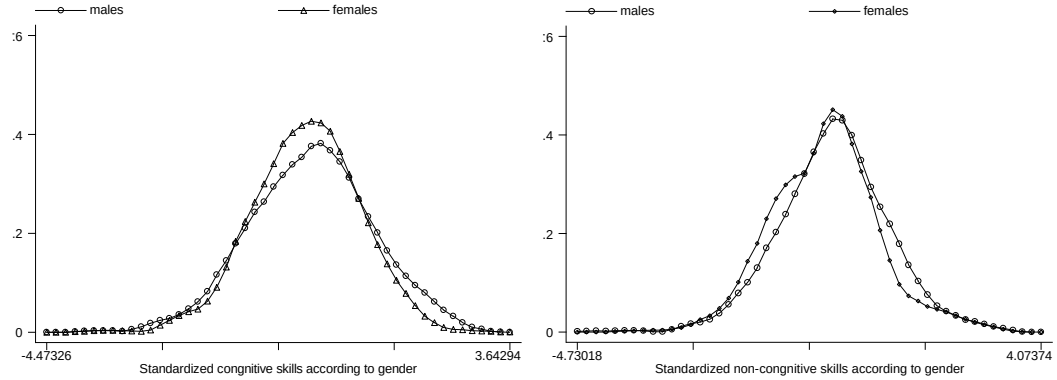


Figure 1.2
Sample distribution of standardized average measure of cognitive skills for males and females according to secondary school application choice.

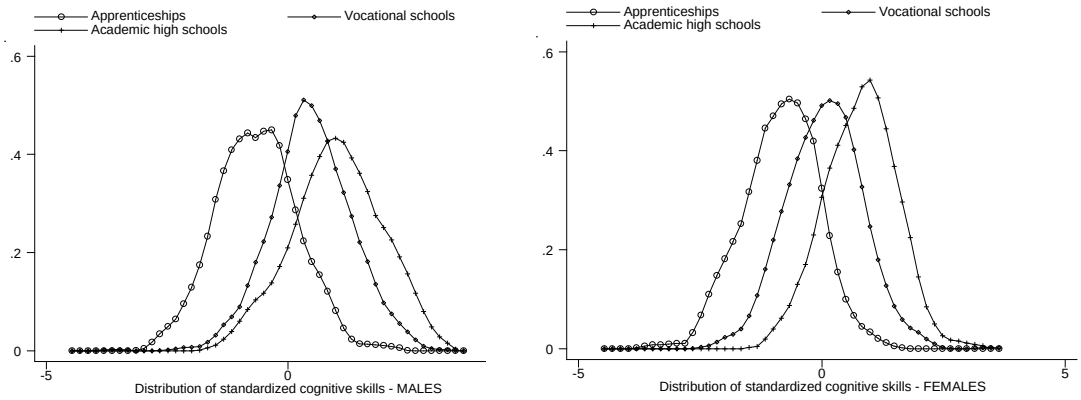


Figure 1.3
Sample distribution of standardized average measure of non-cognitive skills for males and females according to secondary school application choice.

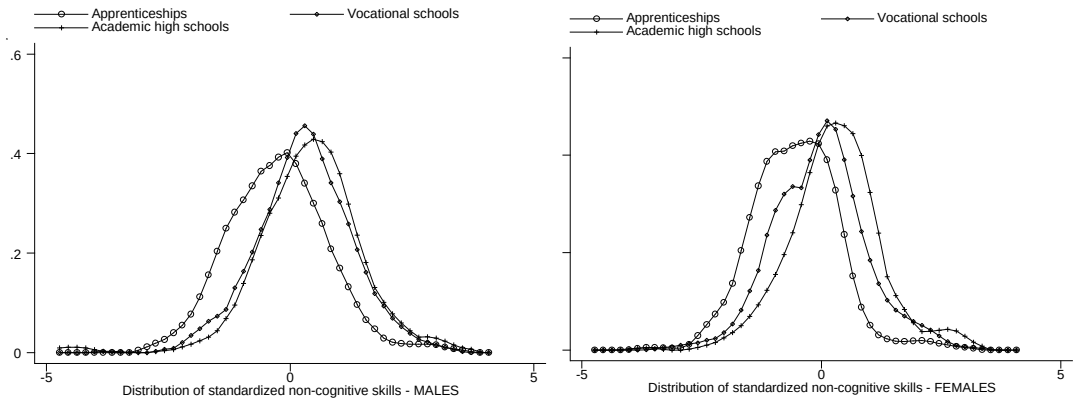


Figure 1.4
Pupils' mothers: highest attained education. Combinations of pupil's gender and secondary school application choice.

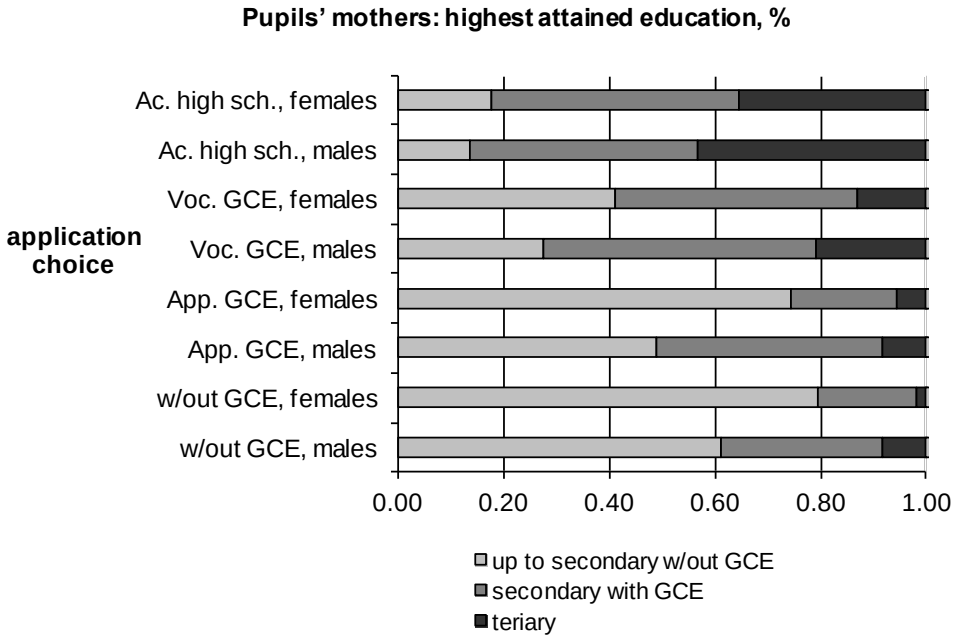


Figure 1.5
Pupils' fathers: highest attained education. Combinations of pupil's gender and secondary school application choice.

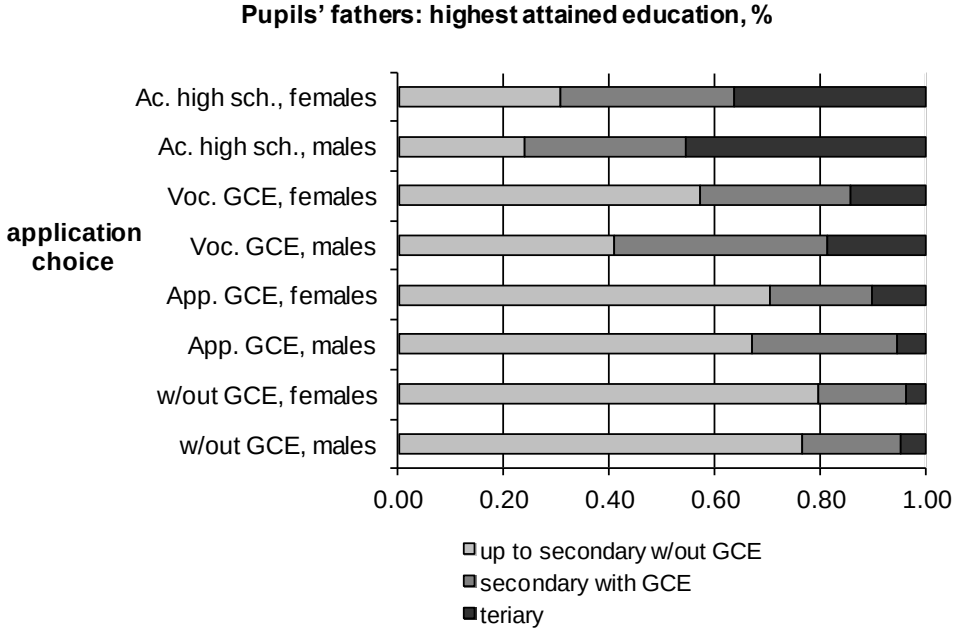
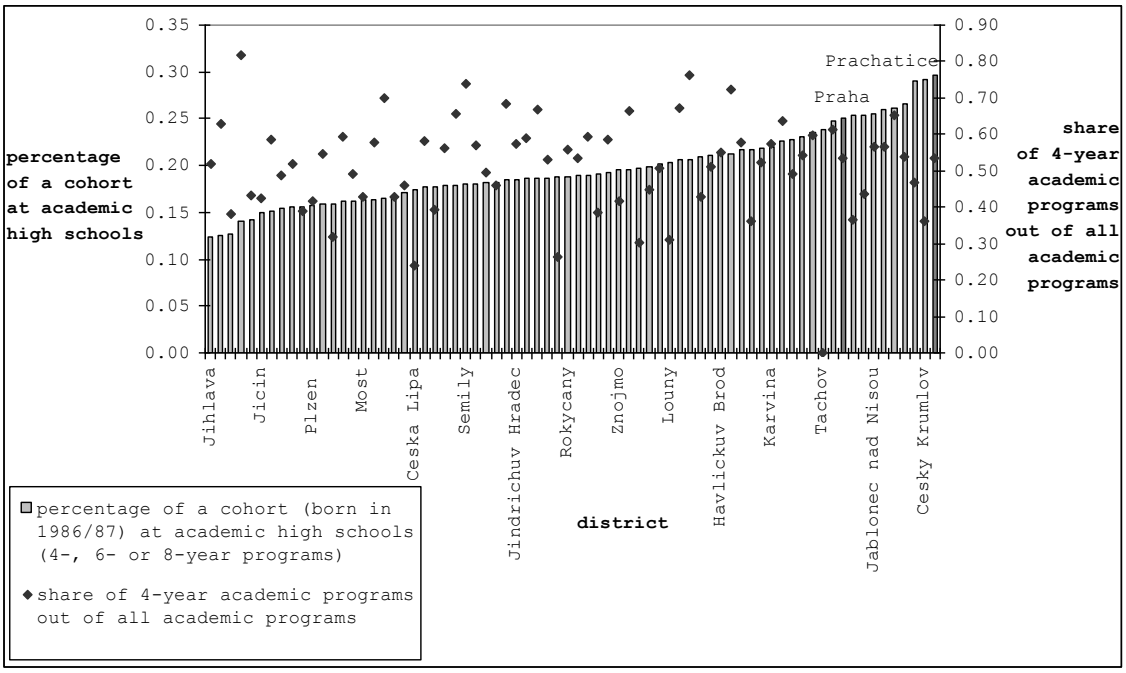
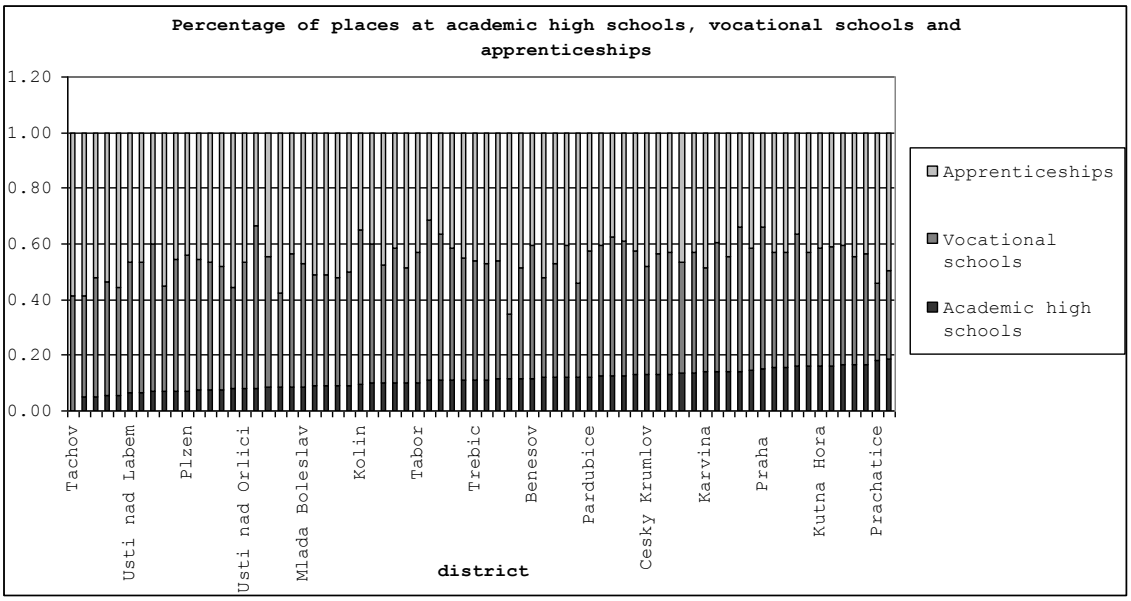


Figure 1.6
The ratio of places in academic high schools to all places in secondary schools. Percentage of 4-year academic high school programs out of all academic high school programs.



Source: Institute on Information on Education. Yearly report 2002/2003.

Figure 1.7
Share of the places available to 9th grade elementary school graduates at particular secondary school type.



Source: Institute on Information on Education. Yearly report 2002/2003.

Figure 1.8
Predicted scarcity of places at academic high schools vs. the difference between revealed demand and actual supply data.

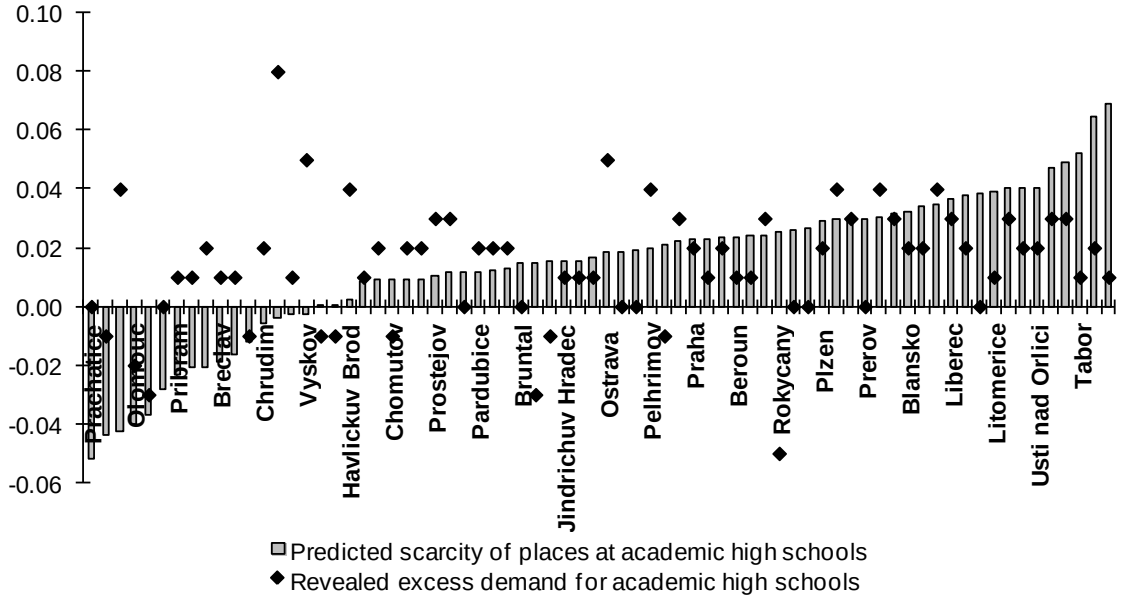


Figure 1.9
Predicted oversupply of places at apprenticeships vs. the difference between the actual supply and revealed demand data

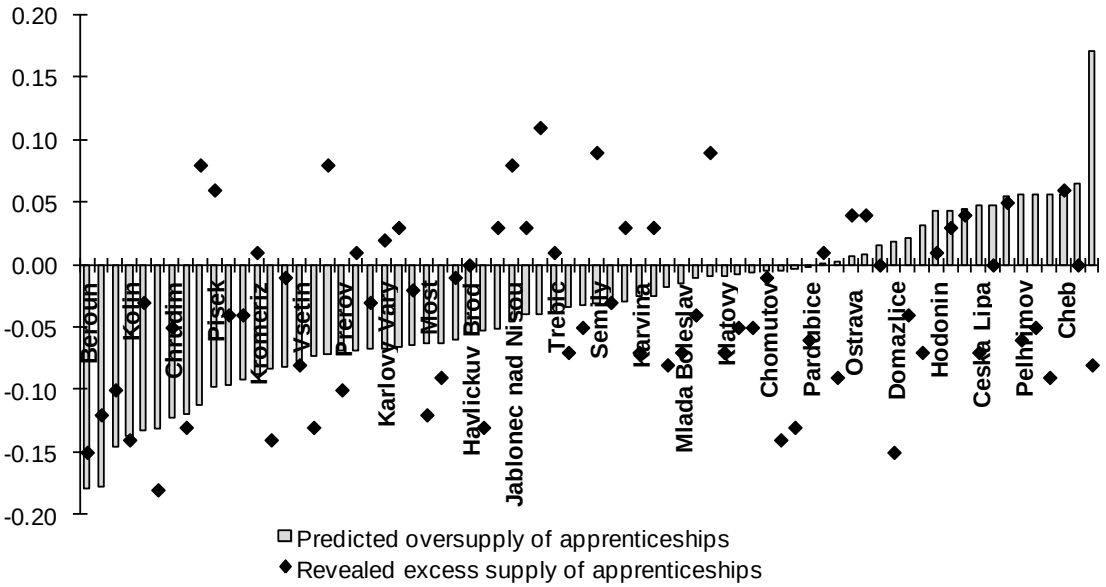
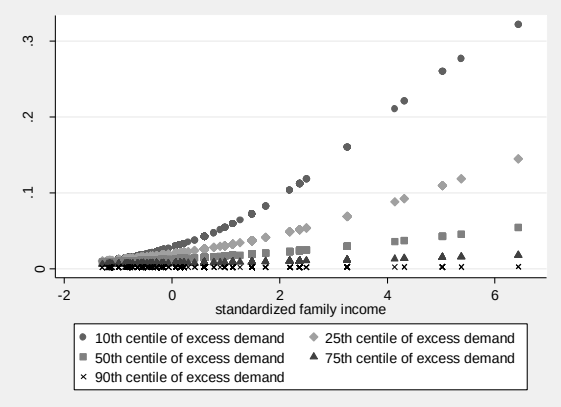
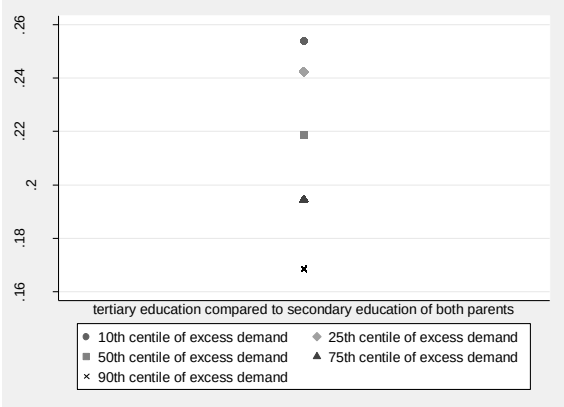


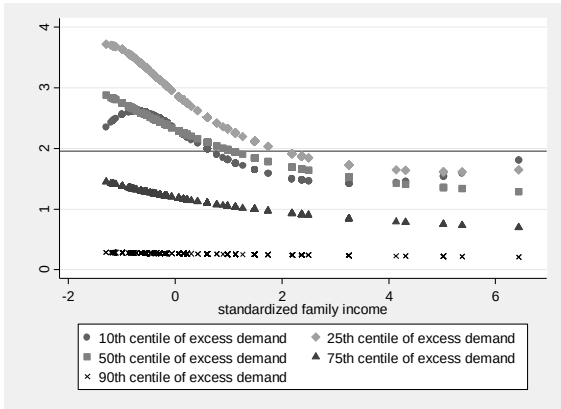
Figure 1.10a)-d)
Marginal effects and z-statistics of income per capita, education, cognitive and non-cognitive skills on probability of applying to academic high school for different values of district scarcity of academic high schools (i.e. of predicted district demand minus actual district supply).
Males.

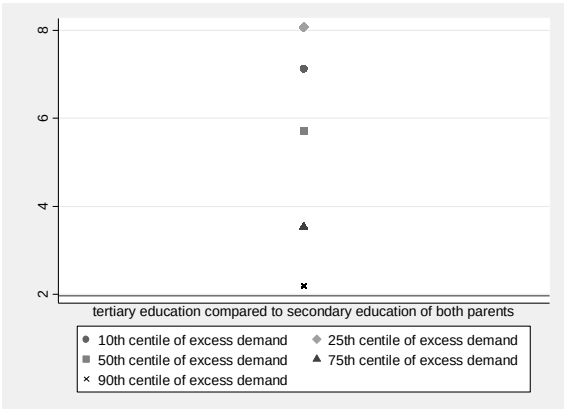
1.10a)
Marginal effect of income



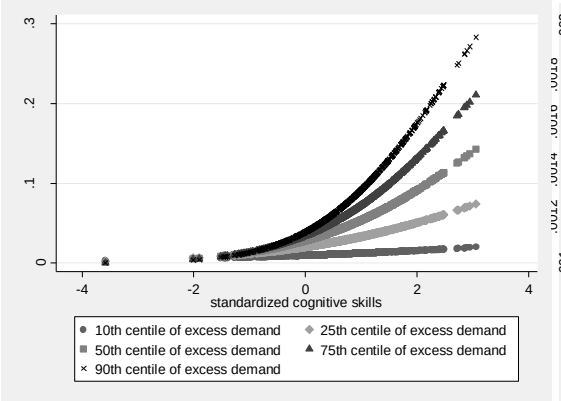
1.10b)
Marginal effect of tertiary education of parents as opposed to secondary education of parents



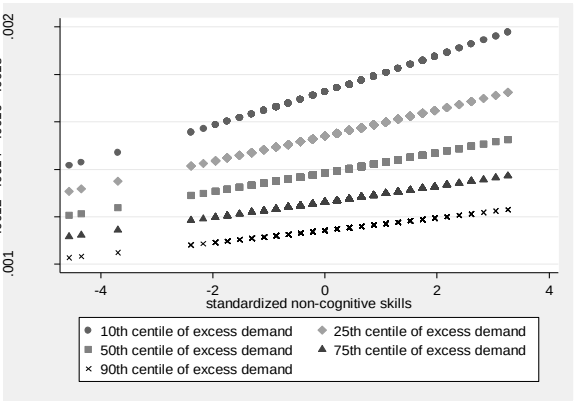


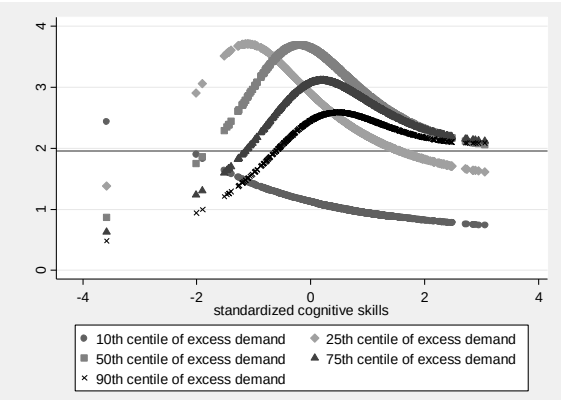


1.10c) Marginal effect of cognitive skills



1.10d) Marginal effect of non-cognitive skills





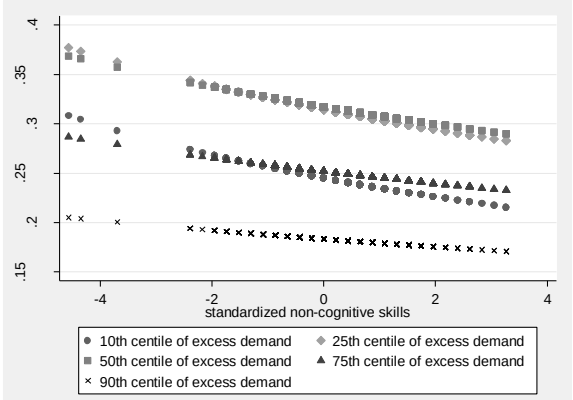
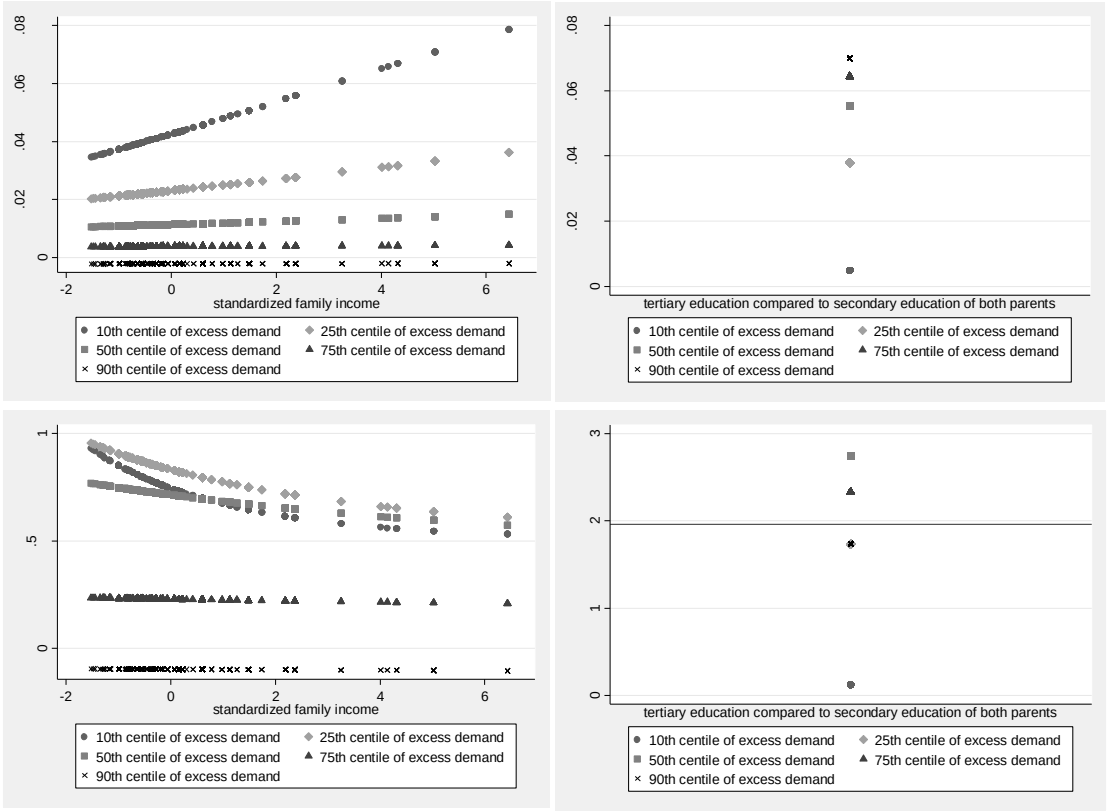


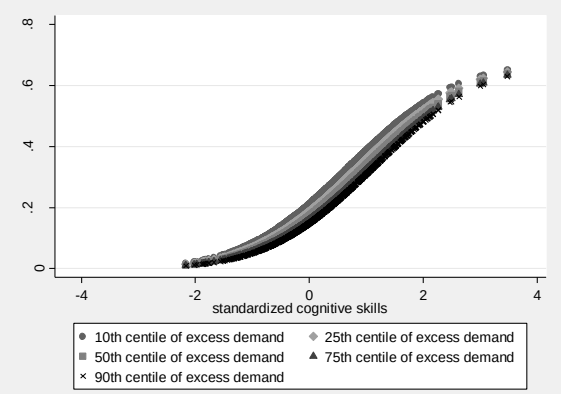
Figure 1.11a)-d)
Marginal effects and z-statistics of income per capita, education, cognitive and non-cognitive skills on probability of applying to academic high school for different values of district scarcity of academic high schools (i.e. of predicted district demand minus actual district supply).
Females.

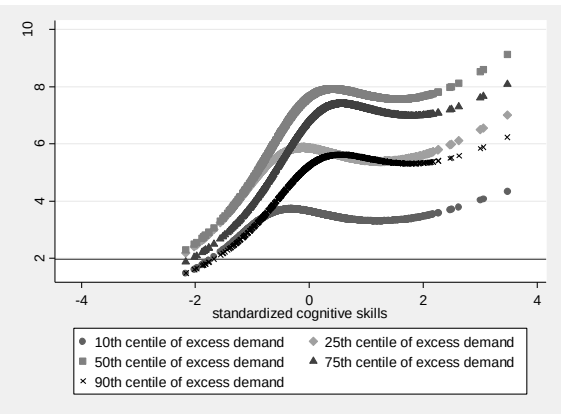
1.11a)
Marginal effect of income

1.11b)
Marginal effect of tertiary education of parents as opposed to secondary education of parents

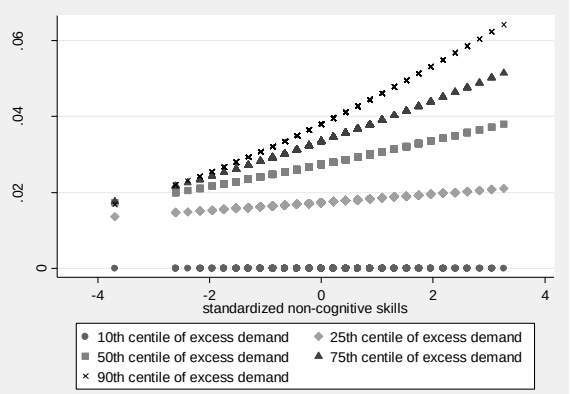


1.11c)
Marginal effect of cognitive skills





1.11d)
Marginal effect of non-cognitive skills



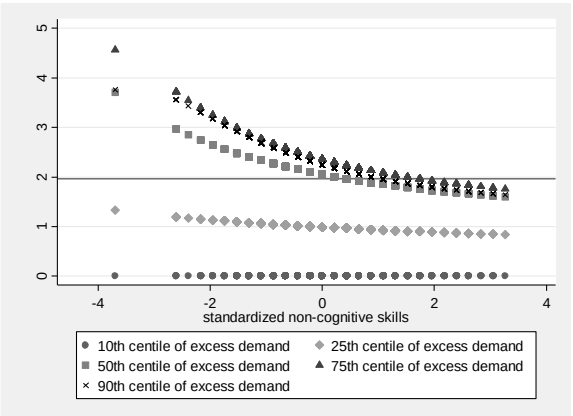
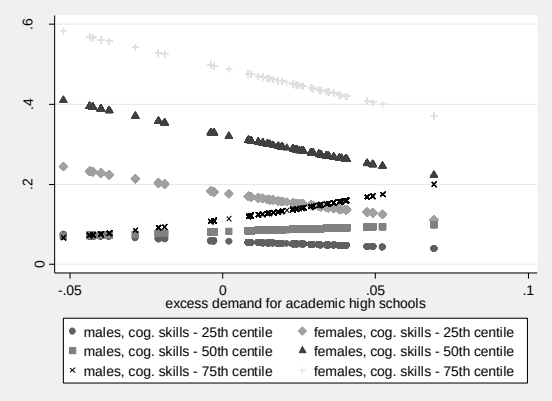


Figure 1.12a), b)
Predicted probability of applying to academic high school for males and females with different levels of cognitive and non-cognitive skills whose parents have both attained the secondary education

1.12a)
Fixed non-cognitive skills



1.12b)
Fixed cognitive skills

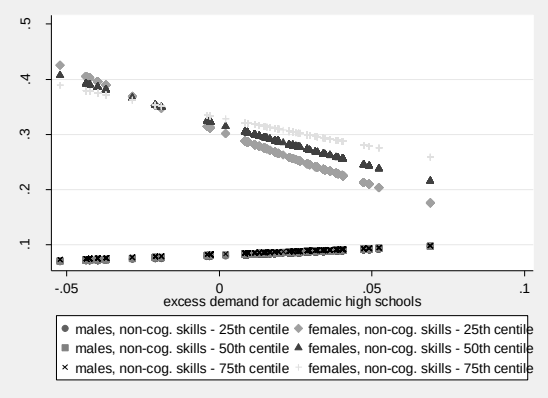
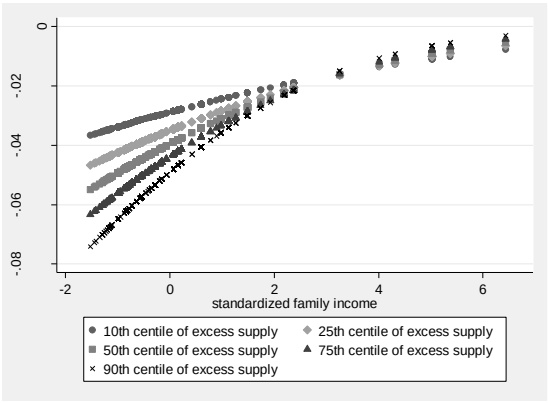
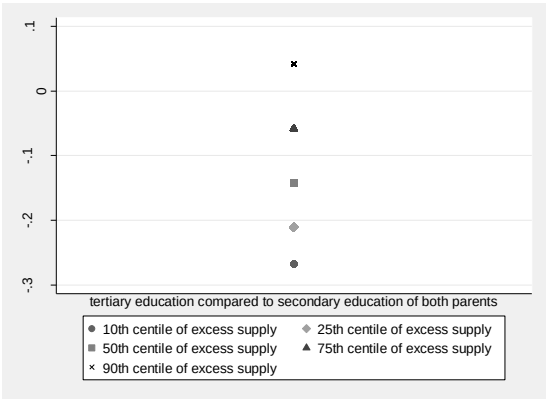


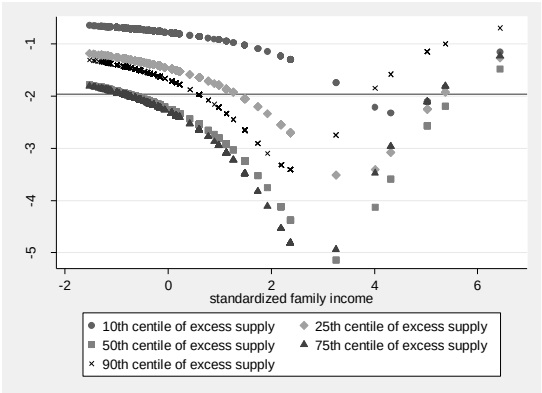
Figure 1.13a)-d)
Marginal effects and z-statistics of income per capita, education, cognitive and non-cognitive skills and education on probability of applying to apprenticeships for different values of excess supply of apprenticeships in a district.
Males.

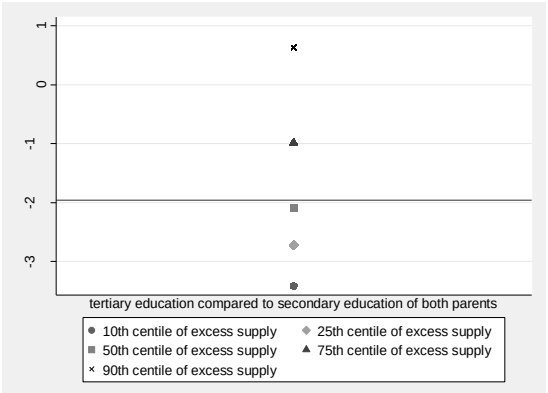
1.13a)
Marginal effect of income



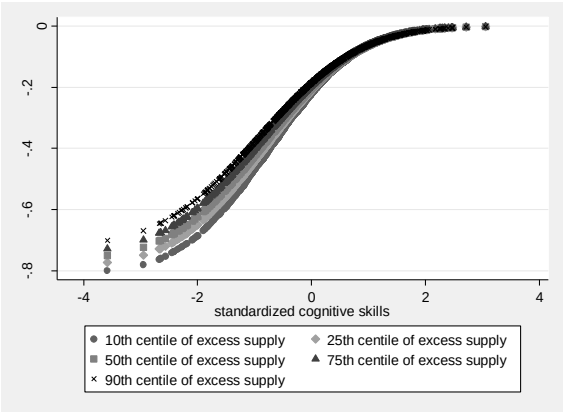
1.13b)
Marginal effect of tertiary education of parents as opposed to secondary education of parents



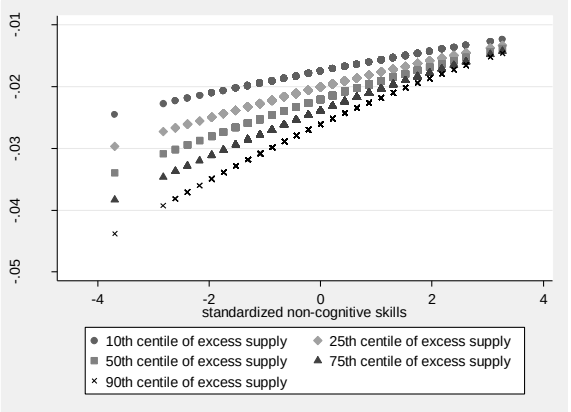


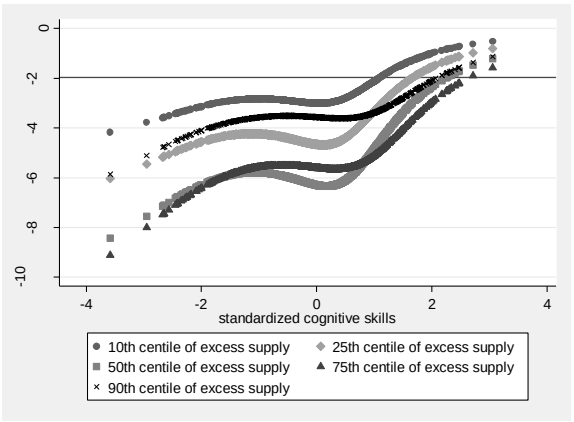


1.13c)
Marginal effect of cognitive skills



1.13d)
Marginal effect of non-cognitive skills





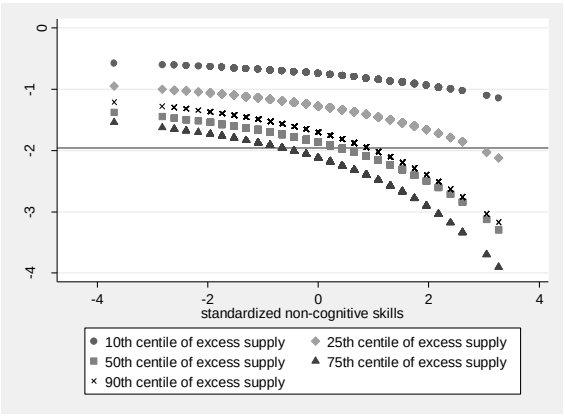
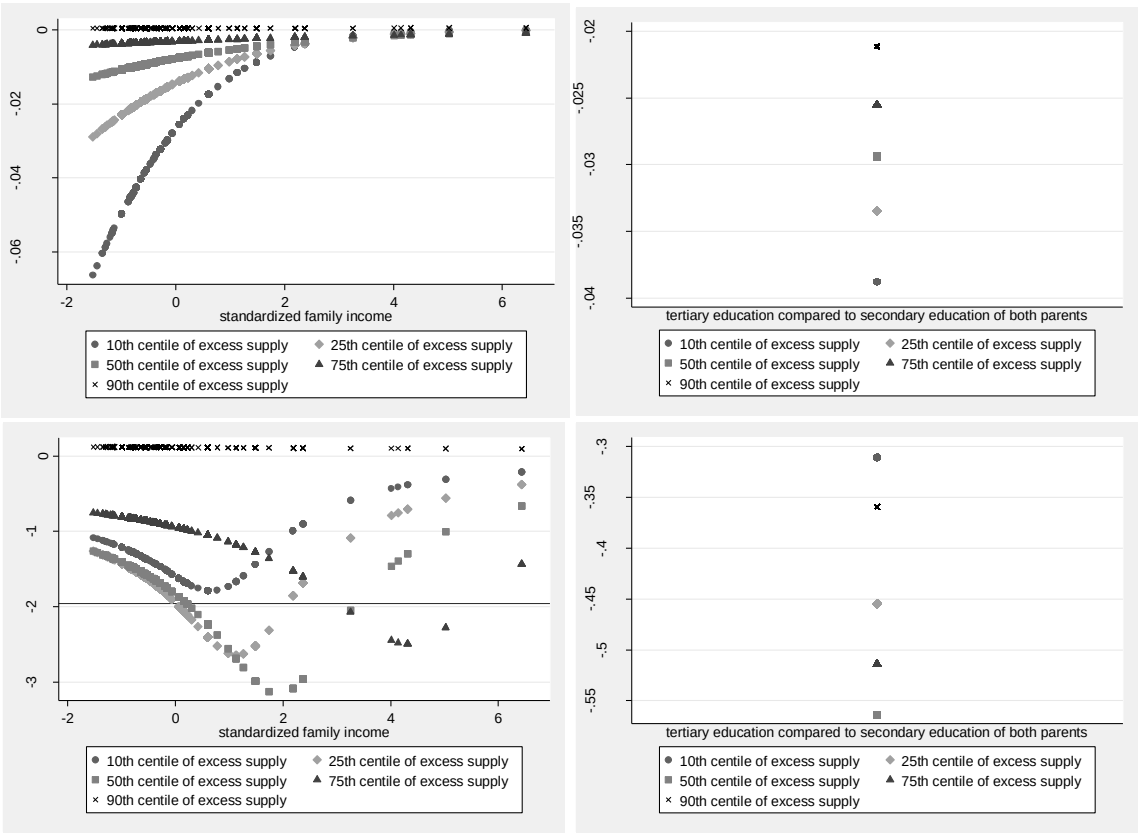


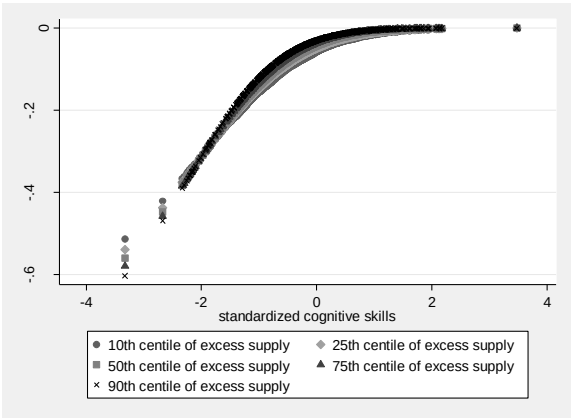
Figure 1.14a)-d)
Marginal effects and z-statistics of income per capita, education, cognitive and non-cognitive skills and education on probability of applying to apprenticeships for different values of excess supply of apprenticeships in a district.
Females.

1.14a)
Marginal effect of income

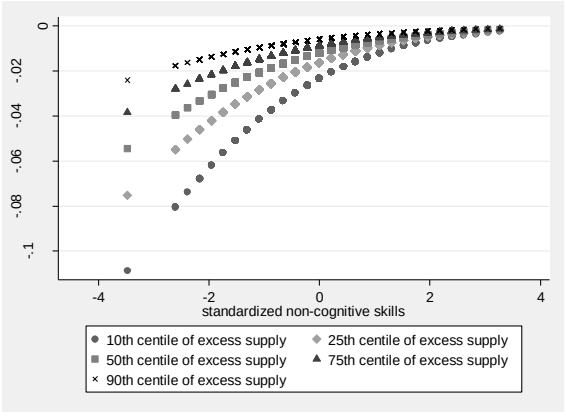
1.14b)
Marginal effect of tertiary education of parents as opposed to secondary education of parents

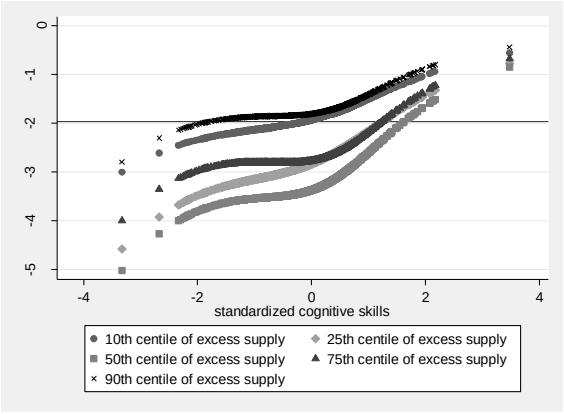


1.14c)
Marginal effect of cognitive skills



1.14d)
Marginal effect of non-cognitive skills





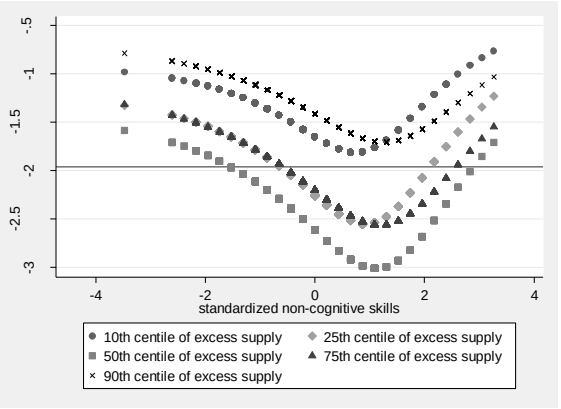
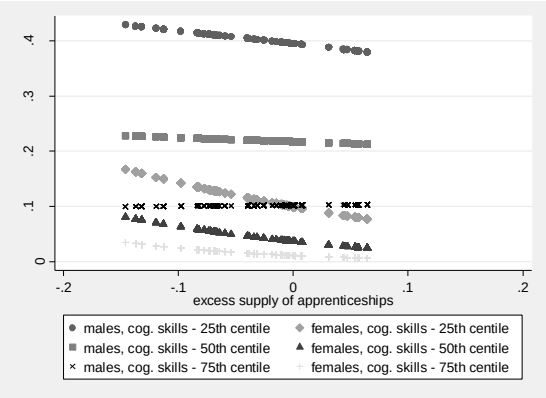
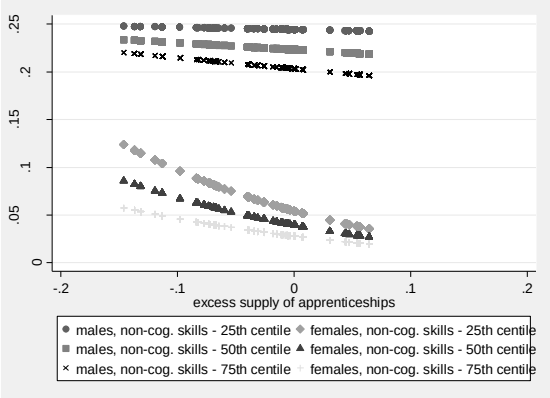


Figure 1.15a),b)
Predicted probability of applying to apprenticeship for males and females with different levels of cognitive and non-cognitive skills whose parents have both attained the secondary education.

1.15a)
Fixed non-cognitive skills



1.15b)
Fixed cognitive skills



Chapter 2

Assessment of Inter-Generational Transmission of Cultural Values

with Jan Hanousek

Abstract

In this chapter, we employ the concept of *values* from psychology research and a *tradition value*, specifically, to capture national culture as "the importance of tradition and customs handed down by one's religion or family" to examine the determinants of cross-country cultural variation. In particular, we use a unique data set from the European Social Survey to explore the variation in individual preference for tradition value in a sample of people born from 1946-1985 in 34 countries. Controlling for individual socioeconomic characteristics, we find that cross-country variation in the importance of tradition is largely explained by the cross-country variation in average preference for tradition of the older generation, i.e. of people born between 1936 and 1945, suggesting a high degree of cultural stability across countries over time.

Our results are robust to accounting for potential alternative channels of inter-generational transmission of tradition value, namely for economic factors and for geographical and institutional differences across countries, confirming strong cultural persistence on the national level despite new economic realities.

We also analyze the impact of cross-country migration by looking at a sample of immigrants, and find that the impact of the culture of origin on the immigrants' culture is weakening with more time passed since migration. For those who migrated more than twenty years ago and for second-generation immigrants, the culture of their country of residence is found to be more relevant in explaining their individual preference for tradition than their culture of origin, although the impact is lower than it is for non-immigrants. This suggests that the individual importance of tradition gradually succumbs to the influence of the majority and that existing differences across nations are likely to remain significant for some time to come.

Abstrakt

V téhle kapitole používáme *koncept hodnot* s oboru psychologie a, specificky, hodnotu *tradice*, abychom vyjádřili národní kulturu jako „důležitost tradicí a zvyků předávaných mezi generacemi". Pomocí dat z dotazníkového šetření European Social Survey analyzujeme kulturní rozdíly mezi krajinami: zkoumáme variaci ve tradičních

preferencích jednotlivců ve vzorce lidí narozených v letech 1946-1985 ve 34 zemích. Se zřetelem na socioekonomické rozdíly, naše analýza ukazuje, že variace v důležitosti tradice mezi zeměmi jsou způsobeny variací v průměrech tradičních preferencí starší generace, tj. lidí narozených v letech 1936-1945. Naše výsledky tedy naznačují vysokou míru kulturní stability v čase a to i když vezmeme v úvahu jiné faktory, které na tradiční preference mohou působit, jmenovitě ekonomické a institucionální charakteristiky v zemích.

Separátně se věnujeme datům se vzorky imigrantů a ukazujeme, že vliv jejich původní kultury časem slábne: tradiční preference těch, kteří imigrovali před více než dvaceti lety a těch ze druhé generace imigrantů, jsou ve větší míre vymezené kulturou v zemi jejich pobytu, než kulturou v jejich zemi původu. Celkově tedy můžeme říct, že původní tradiční preference migrantů časem ustupují a existující kulturní rozdíly mezi zeměmi pravděpodobně budou po nějaký čas přetrvávat.

Keywords: values, Schwartz's human value scale, culture and economics
JEL Classification: A12, A13, I21, Z10

2.1 Introduction

Do cultural differences imply differences in economic outcomes? Intuitively, they should: for instance, prevailing perceptions of a woman's role in society are likely to affect women's labor participation decision, which may have consequences in terms of output on the national level. In general, however, economists do not account for culture when studying economic decisions. The main reason is that cultural patterns are likely to be endogenous, being affected by economic factors too. Broadness of the term *culture* is a contributing factor as well. Guiso, Sapienza and Zingales (2006) therefore advocate that economists should work with particular, well defined and stable cultural patterns, "transmitted fairly unchanged from generation to generation", as this should eliminate the possibility of a backward link from economic outcomes to culture.

In recent years, economists have addressed these problems by focusing on particular cultural domains – especially on traditional and conservative beliefs and social norms. They capture these either indirectly through economic variables or directly using various cross-country surveys.[1] To overcome the causality problem, economists study the differences in economic outcomes of second-generation immigrants coming from differing cultural backgrounds who face the same economic and institutional environment in a given country. The impact of culture is found to be quantitatively and statistically important with respect to various economic choices: (female) labor market participation (Burda, Hamermesh and Weil, 2007) and fertility rate (Fernandez, 2007; Fernandez and Fogli, 2009); home production and mobility (Alesina and Giuliano, 2007); or living arrangements (Giuliano, 2007).

Nevertheless, this research is not based on well-established measures of traditional and conservative beliefs. It also does not address the question of inter-generational transmission of these beliefs even though the results would suggest that traditional beliefs are transmitted fairly strongly.

[1] Examples include questions on the role of women vis-à-vis work and household (Fernandez, 2007), on the eligibility of men to have a right to scarce jobs (Burda, Hamermesh and Weil, 2007), on the role of the family and the respect of children towards parents (Alesina and Giuliano, 2007) or on traditional marriage concepts (Goksel, 2009).

In this chapter, we use the measure of traditional beliefs coming from cross-cultural psychology research and empirically assess the extent to which these beliefs are transmitted across generations. Our aim is to determine whether this particular measure of traditional beliefs can be considered stable, i.e. as "transmitted fairly unchanged from generation to generation" as required by Guiso, Sapienza and Zingales (2006) so as to be potentially employed directly in economic research.

Cross-cultural psychology research (Inglehart, 1977; Schwartz, 1992) characterizes culture as a set of shared goals describing what is important and desirable, i.e. as a set of *values*. Our focus on the *values* concept (Schwartz, 1992, 2005) is motivated by the availability of unique data on values in the European Social Survey (ESS), a survey administered in European countries regularly every 2 years. This paper uses detailed data available for representative samples of a total of 34 countries from rounds in years 2002, 2004, 2006 and 2008.

Schwartz's questionnaire for cultural values assessment administered by the ESS contains 21 items (see more details in Section 2.3.2 and in the Appendix). Motivated by existing economic research that focuses especially on the role of traditional and conservative beliefs, we restrict our attention to one item: a *tradition value* that captures respect, commitment and acceptance of the customs set in the past, handed down by religion or family. The extent of preference for tradition should be related to gender roles, work participation decisions, occupation choices, marriage decisions, decisions about having children, propensity to divorce, etc. We suppose that these are the concepts the ESS respondents across Europe consider when reading the prompt: "Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family".[2]

In our analysis, we concentrate on explaining the cross-country variation in individual values with the differences in individual characteristics as well as with the

[2] For robustness, we also performed our analysis also on a "control" value that directly captures the importance of own independent choices: *freedom*, which is defined in the ESS in the following way: "It is important to her/him to make her/his own decisions about what she/he does. She/he likes to be free and not depend on others." The results strongly support the conclusion of this chapter and are available upon request.

representative values of ancestors. We use a specific analytical approach: motivated by the work of Algan and Cahuc (2005), we analyze the variation in tradition value of individuals born from 1946-1985 across European countries and, controlling for the impact of individual characteristics, we estimate the country-specific (cultural) fixed effects. A simple correlation of the estimated fixed effects and the raw means of values computed for each country provides a hint about the extent to which individual values are shaped by national cultural specificities. Overall, we find this correlation to be considerably high. We analyze the variation in the estimated country fixed effects to show that it is largely explained by the variation in values of the older generation, that is people born between 1936 and 1945, which is our proxy for the culture of ancestors. Our results thus suggest that tradition value exhibits a great extent of cross-generational stability, and are robust to accounting for the impact of various economic factors, geographical conditions, or to an alternative value measurement.

Examining a sub-sample of immigrants shows that adaptation in cultural preferences occurs: the impact of the culture of origin on the immigrants' culture is weakening with more time passed since migration. For those who migrated more than twenty years ago and for second-generation immigrants, the culture in their country of residence is found to be more relevant in explaining their individual preference for tradition than their culture of origin, even though the results are not as strong as for non-immigrants. This outcome challenges somewhat the results of the above-mentioned research that finds a significant impact of the culture of origin on economic decisions. Whether the actual economic choices of second-generation immigrants follow their proclaimed preferences is addressed in the third chapter of this dissertation.

The chapter is organized as follows. The next section summarizes the literature to date that deals with explaining economic outcomes by differences in culture or attitudes. Section 2.3 describes the estimation framework and the data. Section 2.4 elaborates on the results of the analysis. Section 2.5 contains robustness checks, and Section 2.6 concludes.

2.2 Overview of Literature

For a long time, economists avoided the inclusion of culture as an explanatory factor for economic phenomena.[3] Ambiguity associated with the notion of culture − how to define and "measure" it − was one of the main reasons for the reluctance. But recently, economists have started to concentrate on specific culture domains, often using surveys as a measurement tool in empirical studies. However, practical problems still exist with examining the impact of culture in an economic context.

One problem relates to the issue of causality. Does culture affect the economy or can economic conditions shape culture? Culture, in a broad sense, is generally considered to change only slowly. Some researchers, however, suggest that the occurrence of a significant event may cause shifts in cultural preferences (Dahl, 2000a). Others claim that culture has changed more rapidly over the several past decades (Inglehart and Baker, 2000). Given this ambiguity about the pace of cultural change, economists deal differently with the possible lack of an exogenous relationship between culture and economic outcomes. Algan and Cahuc (2005) do not reject the possibility of identifying the correlation instead of causality when they examine the relationship between attitudes towards the family and employment patterns in OECD countries. One way of dealing with the potential endogeneity of culture is to use the instruments for cultural variables that do not affect current economic outcomes. For example, Fortin (2005) includes lagged country-level mean work attitudes to control for a spurious relationship between current average work attitudes and current labor participation. Fernandez and Fogli (2009) choose an indirect approach: through country-of-ancestry economic variables, they explain variation in the outcomes of immigrants to a particular country.

[3] The relationship between cultural values and economic development has been the subject of elaboration in other areas. Political science researchers, for example, suggest that specific cultural attitudes do have an impact on economic growth (Granato, Inglehart and Leblang, 1996). On the other hand, Inglehart and Baker (2000) show that the process of industrialization significantly affects culture even though distinctive cultural traditions persist. Inglehart (1997) points to the presence of inter-generational value change that is associated with economic development and societal change. He argues, for example, that when a society attains high levels of economic growth, higher priority is put on environmental protection or tolerance for others. Subsequently, according Inglehart, once such values become widespread, low subsequent growth occurs.

Another problem of economic research on the impact of culture is to disentangle the effect of culture from other possible determinants of economic outcomes, possibly correlated with culture, such as institutions or unobserved human capital. Related to this, cultural proxies do not necessarily have to capture culture in the countries of origin, but may carry different information.

Recently, researchers have tended to work with individual data and control for the culture-level variable along with other relevant characteristics. This approach works well for (second-generation) immigrants living in the same country but coming from different parts of the world; it is possible to study the effect of differing cultural background on individuals who face the same economic and institutional environment.[4] For example, Fernandez and Fogli (2009) study fertility and labor market outcomes only for those women whose parents were not born in the USA. The authors use past fertility rates and labor force participation of women in countries-of-ancestry as the cultural proxies to predict these outcomes for second-generation immigrant women in the USA. Estimation of the cultural effect is based on the assumption that economic and institutional conditions in the country-of-ancestry are no longer relevant for children of immigrants, and hence only cultural information contained in past female labor force participation and fertility rates should be relevant. Alesina and Guiliano (2007) use this methodological approach to study the impact of the structure of family relationships on various outcomes (e.g. labor force participation of women, home production). They use data from the World Value Survey to infer the level of family ties in countries from which parents of US second-generation immigrants come. Fernandez (2007) incorporates World Value Survey data to examine the answers to the attitudinal questions on women's work to obtain the marginal effects associated with the country of residence of respondents. Subsequently, she examines the impact of these marginal effects (as the proxy for conservative and traditional views) on the hours worked of second-generation American women. A similar approach is used by Algan and Cahuc

[4] Using a sample of immigrants to infer the cultural impact on an individual's outcomes is not without problems. As stated by Alesina and Giuliano (2007), immigrants do not represent a random sample from the population of the country they come from, and the selection problem persists also in the case of their children, even though to a smaller extent.

(2005), who estimate the country fixed effects in a regression explaining individual family attitudes by individual characteristics and by dummy variables reflecting countries of residence. In one of their specifications, these fixed effects serve to explain the employment of individuals residing but not born in the US.

Another way to incorporate culture into economic research is by restricting attention only to those cultural aspects that can be treated as invariant, to eliminate the possibility of a backward link from economic outcomes to culture. As suggested by Guiso, Sapienza and Zingales (2006), economists should work with stable cultural patterns. We assess how much *tradition value* can be considered as being "transmitted fairly unchanged across generations".

2.3 Data and Analytical Framework

2.3.1 Estimation framework

In this section, we outline the framework for examining the transmission of *tradition value* across generations. We should clarify at the outset that we are not studying the direct cultural transmission from parents to children but rather we observe the different generations at a point in time.

We start with an assumption that the tradition preferences of individuals living in the same country contain a specific component of national culture. We examine whether the cross-country variation in individual importance of tradition can be explained by a variation in this component. We define this component as the average preference for *tradition* of the older generation in a given country: i.e. of people born in the years 1936-1945, whose parents were born in the same country.

We are aware that these average values of the older generation embrace a range of influences such as religion or education, thereby reflecting culture in a complex manner. We believe that these influences are embedded in the values of the older generation and are difficult to extract by running a regression explaining the individual values of the older generation by several socio-demographic variables and country dummies. Therefore, we believe that the national averages of value preferences represent more

adequately the culture of the older generation than do the country fixed effects obtained from the above-mentioned regression. To rationalize our choice, we show that the tradition preferences of the older generation can be considered stable and not changing over time.

We approach the assessment of the transmission of cultural values across generations by evaluating the impact of the average values of the older generation on the values of younger generations. In the estimation itself, we adopt the 2-step procedure outlined in Wooldridge (2003), since we are evaluating a country-specific effect with relatively small number of countries, 34. In such cases, the standard cluster methods to account for correlation within group may not provide accurate inference. In the first step, we estimate the country fixed effects associated with individual values. Effectively, this step enables us to assess the significance of the country fixed effects and the extent to which individual values are shaped by national specificities in values. As explained in Algan and Cahuc (2005), who examine family attitudes, the cross-country differences in attitudes captured as country-specific mean replies to attitudinal questions may reflect some specific national features or simply just the heterogeneity in individual characteristics across countries. Hence, applied to this work, the correlation[5] between the country fixed effects obtained after controlling for individual characteristics and the country average values gives a more reliable indication of how much individual values are shaped by national (cultural) specificities.

In the second step the estimated fixed effects are regressed on mean values of the older generation, using the first-step asymptotic variances of country-specific intercepts as weights. The second step serves to assess the cross-generational transmission of values, as it addresses how much of the variation in the country fixed effects is explained by the variation in average values of the older generation.

Our main analysis is based on those respondents who were born in a country where they were surveyed, and their parents were born in the same country. This restriction

[5] In working with a small number of countries, instead of using classic Pearson correlation we use Spearman rank correlation. Unlike the former, Spearman correlation is non-parametric, is not influenced by outliers, unequal variances, non-normality, and nonlinearity. It is obtained by applying the Pearson correlation formula to the ranks of the data rather than to the actual data values themselves.

follows from the fact that people who were not born (or whose parents were not born) in a given country are likely to exhibit different cultural preferences. Those who were not born in a given country and those who were born in a given country but whose parents were not, are examined separately in section 5.5.

2.3.2 Data on values

Values are defined as personal beliefs, desirable goals and the principles that guide the selection or evaluation of actions, people or events (Schwartz, 2005). Values are abstract goals; they do not refer to specific actions or situations. This distinguishes them from norms or attitudes (see the Appendix for more detailed elaboration on the theory).

As mentioned in the introduction, we use data on values from the European Social Survey, administered in 4 rounds, 2002, 2004, 2006 and 2008. The list of countries surveyed in each round is displayed in Table A.1 in the Appendix. In total, 34 countries participated in at least one round of the ESS.

The European Social Survey contains the Portrait Value Questionnaire, a 21-item questionnaire developed by Shalom H. Schwartz, describing 21 *value goals*. We analyze one value goal: *tradition*. The ESS describes tradition as follows: "Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family". Respondents assess the personal importance they place on all goals by selecting how much they identify themselves with the person in the description. There are 6 possible answers: 1. *very much like me,* 2. *like me,* 3. *somewhat like me*, 4. *a little like me,* 5. *not like me,* 6. *not like me at all*. In the original dataset, the rating is ordered by a number from 1 to 6. We start by changing the original scale from 1 (very much like me) to 6 (not like me at all) to its reverse so that a lower figure indicates a lower importance of a value.

We also transform the original data to account for the possible tendencies of different individuals to over- or underemphasize their preferences. We believe that this is an important step to take before analyzing the data across countries, as these differ significantly in terms of scale use: for instance, compared to other nations, respondents in Greece or Turkey use the "like me" part of the scale more frequently, while

respondents in Norway or Sweden use the "not like me" side of the scale more often. We rescale individual responses by centering them around the individual average of all 21 responses.[6] This way, positive figures represent the goals that are important for an individual, in relative terms, as opposed to negative figures representing less important or unimportant goals. By rescaling, we obtain a smooth distribution of the value items as opposed to the original discrete scale.

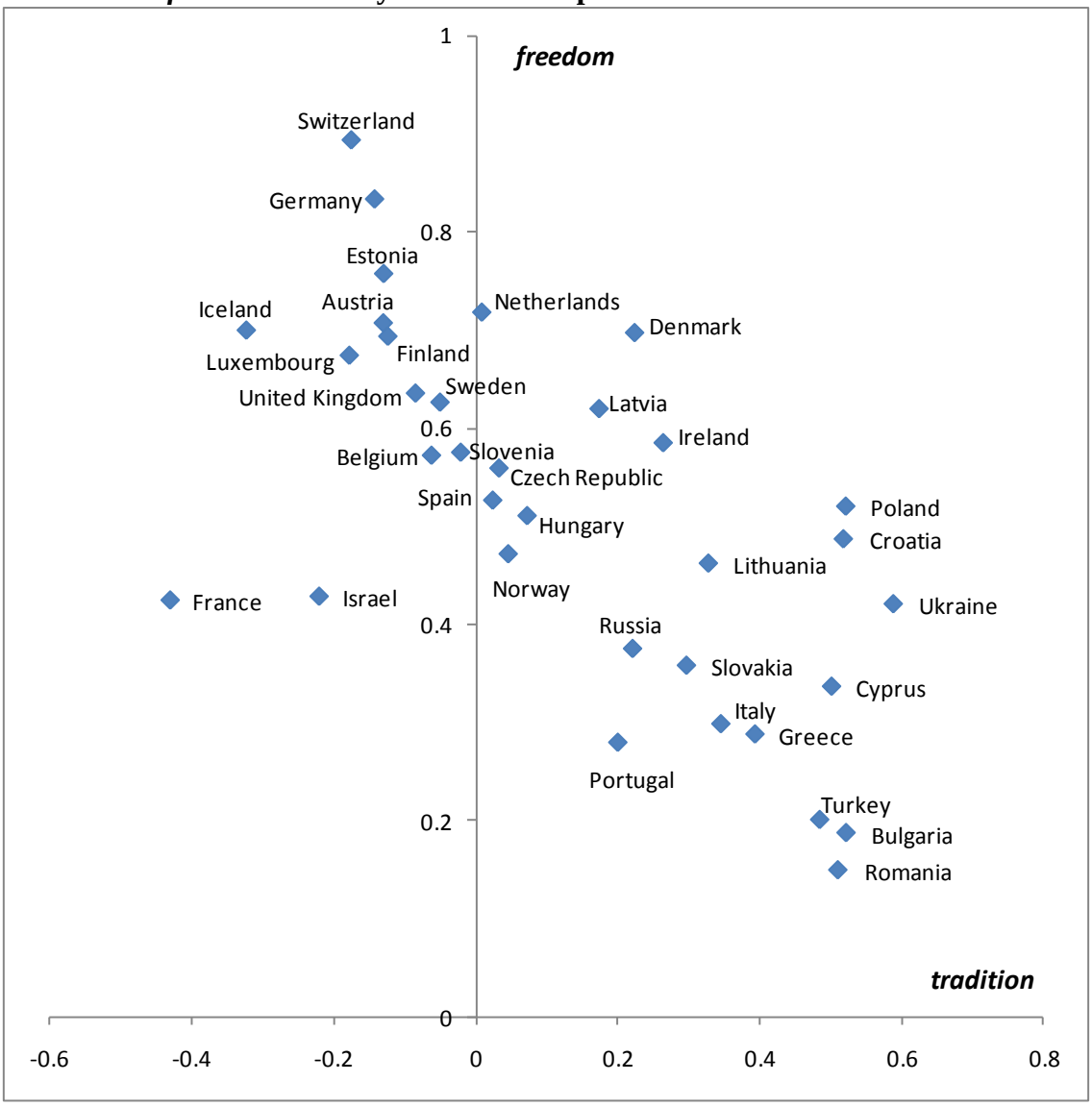
On the country level, averaging the individual relative importance of tradition provides a measure of how much, in relative terms, tradition is considered important on the national level. Again, positive figures represent goals that are, on average, important for individuals living in a given country, while negative figures reflect less important goals. Figure 2.1 illustrates the pattern of country-level relative preference for tradition as opposed to preference for freedom, another value, that theoretically opposes tradition.

Clearly, an inverse relationship exists between the theoretically opposing values: more emphasis on tradition is accompanied by less emphasis on freedom. In general, those countries with a weaker economy and/or former communist countries are characterized by a stronger importance of tradition, which is illustrated by the positive national-level average for this cultural value. On the other hand, for stronger economies, the national-level average for tradition is mostly negative, reflecting its relative unimportance. Regarding the average national preferences for freedom, it appears to be important in relative terms in all European countries. Yet, important cross-country differences do exist, with rich and stronger economies putting much more relative importance on freedom compared to poorer countries.

Our new scale has one disadvantage: it is difficult to interpret. Besides reflecting relative importance/unimportance, it is difficult to say what, for example, 0.5 as a particular *value* measurement represents. Therefore, in our analysis, we express the results in terms of the impact of a one standard deviation change.

[6] We considered only the responses of the individuals who responded to at least 19 out of 21 items (approx. 90%). We also exclude those who chose the same answer for 16, 17 and 18 responses, respectively while filling 19, 20 and 21 items, respectively.

Figure 2.1
***Tradition* vs. *freedom*: country-level relative preferences**



**Note: The plot is based on the value preferences of respondents who were born in a given country and whose parents were born there as well.*

As a robustness check, in section 2.5.1 we use a different transformation of responses, i.e. we define individual value preference by 1 if the respondent selects *1. Very much like me* or *2. Like me*, to rate his/her preference for tradition; otherwise we assign 0. This has an interpretation advantage, insofar as the country value average corresponds

to the percentage of individuals strongly or moderately identifying themselves with a description of tradition.

As outlined in the estimation framework, we examine whether the cross-country variation in tradition value can be explained by a variation in a specific national culture component, which we choose to be represented by average preferences for tradition among the older generation[7]. This choice is motivated by an assumption that the values of people above a certain age are stable and no longer affected by the current individual or economic circumstances. Schwartz in his theory postulates that individual values are largely affected by his/her background characteristics and stabilize by the time one reaches adulthood. Other literature also suggests that the values of individuals do not change significantly after reaching adulthood (e.g. Baker, Dalton and Hildebrandt, 1981; Inglehart 1997). Moreover, some research suggests that value acquisition occurs largely during childhood and early adolescence (Knafo and Schwartz, 2004). To some extent, the economic literature supports this assumption as well, e.g. Cunha et al. (2005) stress that early periods in life are crucial for the development of cognitive (i.e. reasoning abilities) and non-cognitive (i.e. personality traits) skills.

We examine proposition that values remain stable by testing the null hypothesis that the means of the tradition value are equal when computed using data from round 1 (administered in 2002) as opposed to round 4 (administered in 2008) of the European Social Survey, in each country that participated in both of these rounds[8], for respondents divided into 5 intervals based on their year of birth: 1936-1945, 1946-1955, 1956-1965, 1966-1975 and 1976-1985. The choice of the intervals is to some extent arbitrary: we take into account a minimum and maximum year of birth in all countries in round 1 and round 4 to have observations in both rounds for all countries for all years of birth considered. This leads to a minimum considered age in round 1 to be 17 (hence 25 in round 4), which implies the upper boundary on year of birth to be 1985. We impose the

[7] In computation of mean values probability and population, weights provided in the ESS are used.

[8] Apart from 19 countries participating in rounds 1 and 4, we also perform the test on countries that participated in rounds 1 and 3, but not in round 4 (Austria), and on countries that participated in rounds 2 and 4, but not in round 1 (Estonia, Slovakia, Turkey and Ukraine).

maximum age to be 72 in round 4 (hence 64 in round 1)[9], i.e. the lower boundary on year of birth is 1936. Then we divide the years of birth into 5 equal intervals. It is worth noting that modifications to the age span of respondents and to the number of intervals (4 instead of 5) leads to similar outcomes of the tests below.

We perform a series of tests for equality of means of the tradition value for all respondents within an interval and, in the case of rejection of the null hypothesis, separately for males and females. Table 2.1 summarizes the results of these tests. For each year-of-birth interval, the table includes the p-value of the test for equality of means applied to all respondents when the rejection of the null hypothesis is confirmed also by performing the test for males and/or females separately. Hence, a blank cell indicates that the null hypothesis is not rejected at the 5% level of significance and the means of tradition value can be considered equal across ESS rounds. Indeed, the series of tests confirms that with more detailed specification of the group according to gender and age, the less frequent is the rejection of the null hypothesis of values' means being the same in rounds 1 and 4, for a particular country. More importantly, with a higher age group of the respondents, rejection of the null hypothesis is less frequent, which supports the claim that cultural preferences are likely to stabilize over time. For an age group of individuals born between 1936 and 1945, the null hypothesis is rejected only for Austria and Spain, but it is worth noting that the tests performed separately for Spanish men and Austrian women do not reject the null hypothesis of means being equal between rounds 1 and 4 of the ESS. Additionally, for people born between 1936 and 1945, we test the equality of means for rounds 1 vs. 2, 2 vs. 3 and 3 vs. 4. The results in Table 2.2 show a very low rate of rejection, suggesting that the values of the "oldest" generation do not change over time.

[9] The maximum age for which we have observations in both round 1 and round 4 of the ESS is 87 in 2008 (hence 79 in 2002). However, the overall number of observations for respondents of this and similar age is very low. The final decision on maximum age of respondents being 72 in round 4 (hence 66 in round 1) was determined by the decision to restrict maximum the age (in 2008) to be around 70, by choosing equal age intervals of 10-15 years and by a requirement to have at least 15 observations per country per round in the oldest age group.

Table 2.1
Importance of tradition: Mean equality tests. Round 1 vs. 4*. By year-of-birth intervals. P-value in case of rejection of null hypothesis at 5%.

	Importance of tradition					
	1936-1945	**1946-1955**	**1956-1965**	**1966-1975**	**1976-1985**	***1936-1985***
Austria	0.01			0.00	0.00	0.00
Belgium						0.00
Czech Republic				0.02		0.04
Denmark						
Estonia						0.03
Finland						
France						
Germany		0.00	0.00		0.00	0.00
Greece			0.00	0.00	0.00	0.00
Hungary			0.00		0.00	0.00
Ireland						
Israel						0.01
Netherlands						
Norway						
Poland						
Portugal						
Slovakia						
Slovenia						
Spain	0.00					0.01
Sweden						
Switzerland						
Turkey		0.04		0.00		0.00
Ukraine				0.04		0.01
United Kingdom		0.00	0.00		0.01	0.00
Total # rejections	*2*	*3*	*4*	*5*	*5*	*12*

**Austria: test for equality of means computed for rounds 1 and 3. Estonia, Slovakia, Turkey and Ukraine: test for equality of means computed for rounds 2 and 4.*

Table 2.3 shows a summary of the mean tradition preferences of the older generation by country. We see that, with the exception of Israel, tradition is mostly on the "important" part of the relative preference scale, represented by positive figures, with important differences across countries.

Table 2.2
Importance of tradition: Mean equality tests. People born between 1936-1945. Round 1 vs. 2, round 2 vs. 3, round 3 vs. 4*. P-value in case of rejection of null hypothesis at 5%.

	Importance of tradition		
	Round 1 vs 2	**Round 2 vs 3**	**Round 3 vs 4**
Austria	0.02		n/a
Belgium			
Bulgaria	n/a	n/a	
Cyprus	n/a	n/a	0.00
Czech Republic		n/a	n/a
Denmark			
Estonia	n/a		
Finland			
France			
Germany			
Greece		n/a	n/a
Hungary			
Ireland			
Italy		n/a	n/a
Latvia	n/a	n/a	
Netherlands			
Norway			
Poland			
Portugal			
Romania	n/a	n/a	
Russia	n/a	n/a	
Slovakia	n/a		
Slovenia			
Spain	0.02		
Sweden			
Switzerland			
Ukraine	n/a		
United Kingdom			
Total # rejections	*2*	*0*	*1*

**n/a represents the non-existence of a country survey in at least one of the relevant ESS rounds.*

Table 2.3
Mean tradition values of people born in 1936-1945, by country.

Importance of tradition					
Austria	0.34	Greece	0.86	Poland	0.89
Belgium	0.39	Hungary	0.49	Portugal	0.60
Bulgaria	0.87	Iceland	0.20	Romania	0.90
Croatia	1.01	Ireland	0.80	Russia	0.71
Cyprus	**1.03**	Israel	***-0.06***	Slovakia	0.82
Czech Republic	0.41	Italy	0.84	Slovenia	0.48
Denmark	0.54	Latvia	0.60	Spain	0.59
Estonia	0.12	Lithuania	0.91	Sweden	0.23
Finland	0.21	Luxembourg	0.21	Switzerland	0.10
France	0.06	Netherlands	0.34	Turkey	0.84
Germany	0.23	Norway	0.36	Ukraine	0.84
				United Kingdom	0.47
Average	*0.54*				
Std.dev.	*0.31*				

Table 2.4
Estimation sample. Summary of individual characteristics across countries. All rounds of the European Social Survey.

	Number of obs.	Importance of tradition	Gender	Age	Married	Child	Domicile	Respondent - education		Mother - education		Father - education		Religion dummies					
								Sec.	Tert.	Sec.	Tert.	Sec.	Tert.	Catholic	Protestant	Eastern	Other	Jewish	Muslim
Austria	3407	-0.26	0.54	40.11	0.54	0.65	3.00	0.73	0.11	0.42	0.02	0.53	0.07	0.65	0.03	0.00	0.01	0.00	0.00
Belgium	3261	-0.19	0.50	40.00	0.60	0.65	3.36	0.41	0.39	0.26	0.15	0.30	0.19	0.37	0.00	0.00	0.01	0.00	0.00
Bulgaria	1857	0.44	0.59	44.98	0.69	0.82	2.33	0.55	0.26	0.33	0.11	0.36	0.11	0.00	0.00	0.62	0.01	0.00	0.15
Croatia	653	0.51	0.57	42.91	0.65	0.68	2.76	0.61	0.28	0.32	0.09	0.44	0.16	0.76	0.00	0.02	0.00	0.00	0.00
Cyprus	1236	0.41	0.51	41.41	0.70	0.71	2.42	0.47	0.35	0.15	0.04	0.20	0.06	0.00	0.00	0.56	0.00	0.00	0.00
Czech Republic	2856	-0.07	0.51	41.84	0.59	0.71	2.79	0.81	0.13	0.69	0.05	0.77	0.09	0.16	0.02	0.00	0.01	0.00	0.00
Denmark	3307	0.14	0.50	41.51	0.58	0.66	2.90	0.42	0.45	0.31	0.22	0.43	0.24	0.01	0.55	0.00	0.01	0.00	0.00
Estonia	1573	-0.17	0.55	40.02	0.46	0.73	2.90	0.48	0.40	0.48	0.14	0.40	0.15	0.00	0.08	0.03	0.01	0.00	0.00
Finland	4218	-0.26	0.51	41.07	0.52	0.67	3.10	0.44	0.39	0.23	0.14	0.21	0.17	0.00	0.66	0.01	0.01	0.00	0.00
France	3011	-0.55	0.53	41.27	0.53	0.72	2.94	0.43	0.39	0.23	0.09	0.29	0.13	0.38	0.01	0.00	0.01	0.00	0.00
Germany	5404	-0.33	0.50	41.40	0.57	0.66	2.84	0.64	0.29	0.63	0.09	0.65	0.27	0.21	0.27	0.00	0.01	0.00	0.00
Greece	3578	0.26	0.56	40.08	0.63	0.63	2.15	0.39	0.26	0.09	0.05	0.10	0.08	0.00	0.00	0.90	0.00	0.00	0.01
Hungary	3257	-0.07	0.53	40.31	0.59	0.71	2.87	0.44	0.18	0.25	0.07	0.31	0.09	0.40	0.13	0.00	0.02	0.00	0.00
Iceland	298	-0.38	0.52	38.85	0.51	0.78	2.68	0.36	0.43	0.22	0.12	0.51	0.10	0.00	0.42	0.00	0.03	0.00	0.00
Ireland	3004	0.17	0.57	40.62	0.56	0.64	3.45	0.26	0.44	0.19	0.10	0.13	0.11	0.79	0.02	0.00	0.00	0.00	0.00
Israel	865	-0.18	0.46	32.84	0.62	0.59	2.59	0.39	0.35	0.20	0.21	0.20	0.24	0.06	0.00	0.01	0.00	0.33	0.47
Italy	1174	0.20	0.37	40.35	0.55	0.54	3.04	0.45	0.13	0.13	0.02	0.16	0.05	0.76	0.00	0.00	0.00	0.00	0.00
Latvia	1289	0.15	0.61	41.69	0.57	0.77	2.70	0.56	0.32	0.48	0.14	0.40	0.12	0.18	0.17	0.04	0.04	0.00	0.00
Lithuania	870	0.30	0.52	43.04	0.67	0.79	2.66	0.31	0.58	0.20	0.31	0.19	0.22	0.82	0.01	0.02	0.01	0.00	0.00
Luxembourg	377	-0.23	0.46	39.97	0.55	0.58	3.42	0.51	0.24	0.16	0.05	0.46	0.10	0.52	0.00	0.00	0.18	0.00	0.00
Netherlands	3943	-0.14	0.54	41.50	0.58	0.63	3.00	0.39	0.31	0.12	0.07	0.20	0.15	0.17	0.15	0.00	0.03	0.00	0.00
Norway	3772	-0.02	0.48	40.67	0.53	0.73	3.13	0.51	0.41	0.36	0.16	0.38	0.21	0.00	0.47	0.00	0.02	0.00	0.00
Poland	4194	0.47	0.52	38.30	0.65	0.68	2.84	0.69	0.18	0.45	0.05	0.51	0.07	0.90	0.00	0.00	0.01	0.00	0.00
Portugal	3673	0.01	0.59	40.89	0.65	0.68	2.70	0.19	0.15	0.03	0.03	0.04	0.04	0.81	0.00	0.00	0.01	0.00	0.00
Romania	2144	0.51	0.53	42.29	0.72	0.59	2.83	0.62	0.16	0.27	0.05	0.36	0.07	0.05	0.04	0.82	0.01	0.00	0.00
Russia	2071	0.19	0.59	41.78	0.58	0.78	2.42	0.30	0.65	0.21	0.41	0.19	0.38	0.00	0.00	0.43	0.00	0.00	0.06
Slovakia	2661	0.23	0.53	40.88	0.66	0.73	3.07	0.77	0.15	0.52	0.04	0.59	0.07	0.62	0.08	0.01	0.05	0.00	0.00
Slovenia	2404	-0.17	0.52	38.69	0.63	0.68	3.39	0.62	0.23	0.37	0.09	0.53	0.10	0.46	0.00	0.00	0.00	0.00	0.00
Spain	3938	-0.20	0.52	39.41	0.61	0.61	2.99	0.31	0.24	0.06	0.04	0.08	0.09	0.67	0.00	0.00	0.01	0.00	0.00
Sweden	3009	-0.19	0.49	41.03	0.47	0.71	3.00	0.36	0.32	0.09	0.17	0.10	0.19	0.00	0.25	0.00	0.01	0.00	0.00
Switzerland	2927	-0.33	0.51	41.04	0.53	0.60	3.49	0.57	0.31	0.47	0.04	0.55	0.20	0.29	0.33	0.00	0.01	0.00	0.00
Turkey	2357	0.43	0.55	37.92	0.79	0.68	2.11	0.19	0.09	0.02	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.95
Ukraine	2020	0.46	0.60	41.22	0.67	0.74	2.81	0.30	0.65	0.26	0.33	0.26	0.32	0.11	0.02	0.60	0.01	0.00	0.00
United Kingdom	3342	-0.25	0.54	41.21	0.52	0.68	2.95	0.13	0.45	0.05	0.19	0.06	0.25	0.04	0.15	0.00	0.01	0.00	0.00
Average		*0.03*	*0.53*	*40.62*	*0.60*	*0.68*	*2.87*	*0.46*	*0.31*	*0.27*	*0.11*	*0.32*	*0.14*	*0.30*	*0.11*	*0.12*	*0.02*	*0.01*	*0.05*
Std.dev.		*0.30*	*0.05*	*1.95*	*0.07*	*0.07*	*0.34*	*0.17*	*0.15*	*0.17*	*0.09*	*0.19*	*0.08*	*0.31*	*0.18*	*0.26*	*0.03*	*0.06*	*0.18*
Total number of obs.:	*87950*											*Number of obs. if religion dummy=1:*		*26583*	*12209*	*9137*	*1020*	*329*	*3130*

Notes: Gender equals 1 for females, 0 for males; Married equals 1 if respondent is married, 0 otherwise; Child equals 1 if respondent has at least one child, 0 otherwise; Domicile is represented as 1 for big city, 2 for suburbs or outskirts of big city, 3 for town or small city, 4 for country village and 5 for farm or home in countryside; Education dummies equal 1 for a specific category, 0 otherwise. Religion dummies equal 1 if respondent belongs to a particular religion, 0 otherwise.

2.4 Results

2.4.1 Main results - Respondents born in 1946-1985 in the country of their residence, whose both parents were born in the same country

Formally, we estimate the effect of the country-specific cultural component, represented by the mean tradition values of people born in 1936-1945, $\boldsymbol{x}_c$, on the tradition values of individuals born in 1946-1985 interviewed in year $\boldsymbol{t}$ in country $\boldsymbol{c}$, $\boldsymbol{y}_{itc}$, assuming linear structure:

$$\boldsymbol{y}_{itc} = \alpha + \beta_c \boldsymbol{x}_c + \boldsymbol{z}_{ic}\gamma + \eta_t \boldsymbol{v}_t + \boldsymbol{u}_{ic}$$

where $\boldsymbol{z}_{ic}$ represents individual specific characteristics and $\boldsymbol{v}_t$ is a full set of dummies capturing the particular ESS round. The estimation procedure entails an alternative equation with an added restriction:

$$\boldsymbol{y}_{itc} = \delta_c + \boldsymbol{z}_{ic}\gamma + \eta_t \boldsymbol{v}_t + \boldsymbol{u}_{ic}$$
$$\delta_c = \alpha + \beta_c \boldsymbol{x}_c$$

Hence, the first step of the estimation serves to isolate values' fixed effects, δ_c, associated with living in a particular country, controlling for individual-specific characteristics $\boldsymbol{z}_{ic}$ (see Table 2.4 for a summary of the estimation sample). Consequently, the restriction put on intercepts δ_c amounts to explaining the variation in country-specific effects associated with values using country-specific average *values* of "older" generation $\boldsymbol{x}_c$. The necessary assumptions for a two-step procedure are random sampling within group, independent sampling across groups, and large group sizes. These assumptions are satisfied by the design of the European Social Survey. According to Wooldridge (2003), the first step can be performed as a pooled regression with group

(country) dummy variables. In the second step, minimum distance method is used. An efficient minimum distance estimator is computed from weighted OLS regression:

$$\delta_c \text{ on } 1, \boldsymbol{x}_c$$

where the observations from country $\boldsymbol{c}$ are weighted by $1/\boldsymbol{SE}[\delta_c]^2$ (i.e. inverse of the asymptotic variance of the intercept estimated in the first round).

Table 2.5 summarizes the results of the two-step estimation based on individual data from all countries and all rounds of the European Social Survey. In the first specification (column 1), we do not include any individual variables, only the country dummies.[1] The estimated coefficients on country dummies are jointly, and in almost all cases individually, highly significant. In the second step, we regress these country fixed effects on the mean tradition values of the older generation. The estimated coefficient is positive and significant. Quantitatively, a one standard deviation increase in the mean tradition value of people born in 1936-1945 is associated with an increase corresponding to 94% of the variation in the fixed effects. If represented in terms of overall variation in individual preferences for tradition, a one standard deviation increase in the mean values of people born in 1936-1945 corresponds to an increase equal to 23% of the variation in individual tradition preferences.

The fixed effects estimated in the first specification are highly correlated with the country means of tradition value (97%), suggesting that individual values are largely shaped by national specificities in preferences for tradition. However, as suggested by Algan and Cahuc (2005), the fixed effects may instead capture cross-country heterogeneity in individual characteristics, which may have an impact on tradition preferences. Hence, in the second specification, we control for basic demographic characteristics: sex, age, age squared, marital status, and a dummy indicating whether

[1] Switzerland is the omitted country. We also include dummies to distinguish between ESS rounds.

Table 2.5
Impact of individual-specific variables and of mean tradition values of people born in 1936-1945 on the importance of tradition of respondents born in 1946-1985.

	Dependent variable: Importance of tradition							
	(1)	*(2)*		*(3)*		*(4)*	
Estimation: STEP 1		Coef.	SE	Coef.	SE	Coef.	SE
Gender (dummy, female=1)		**0.229** ***	0.008	**0.229** ***	0.008	**0.191** ***	0.000
Age		**0.008** ***	0.003	**0.010** ***	0.003	**0.014** ***	0.000
Age^2		**0.0001** ***	0.000	**0.0001** ***	0.000	0.0000	0.766
Marital status (dummy, married=1)		**0.193** ***	0.009	**0.199** ***	0.009	**0.150** ***	0.000
Having at least one child (dummy, at least one		**0.088** ***	0.010	**0.074** ***	0.010	**0.075** ***	0.000
Domicile (dummies):							
big city		**-0.351** ***	0.019	**-0.300** ***	0.019	**-0.217** ***	0.000
suburbs or outskirts of big city		**-0.248** ***	0.020	**-0.210** ***	0.020	**-0.141** ***	0.000
town or small city		**-0.223** ***	0.018	**-0.197** ***	0.018	**-0.146** ***	0.000
country village		**-0.104** ***	0.018	**-0.098** ***	0.018	**-0.080** ***	0.000
farm or home in countryside (omitted)							
Education (dummies):							
up to secondary (omitted)							
upper (post) secondary, not tertiary				**-0.076** ***	0.011	**-0.082** ***	0.000
tertiary				**-0.148** ***	0.012	**-0.170** ***	0.000
Education of respondent's mother (dummies):							
up to secondary (omitted)							
upper (post) secondary, not tertiary				**-0.054** ***	0.011	**-0.031** ***	0.004
tertiary				**-0.067** ***	0.016	**-0.052** ***	0.001
Education of respondent's father (dummies):							
up to secondary (omitted)							
upper (post) secondary, not tertiary				**-0.043** ***	0.011	**-0.035** ***	0.001
tertiary				**-0.062** ***	0.014	**-0.044** ***	0.002
Religion (dummies):							
catholic						**0.653** ***	0.000
protestant						**0.580** ***	0.000
eastern orthodox						**0.387** ***	0.000
other christian						**0.410** ***	0.000
jewish						**0.509** ***	0.000
muslim						**0.641** ***	0.000
none / other (omitted)							
Country fixed effect (sig.)	***	***		***		***	
Number of observations	87950	87950		87950		87950	
Adj R-sq	0.06	0.12		0.12		0.17	
Spearman correlation of country fixed effects with the mean values of those born in 1946-1985	*0.97 (***)*	*0.96 (***)*		*0.95 (***)*		*0.81 (***)*	
Estimation: STEP 2							
Mean values of people born in 1936-1945	**0.906** ***	**0.923** ***	0.095	**0.884** ***	0.095	**0.655** ***	0.115
Spearman correlation of mean values of those born in 1946-1985 vs. residuals	*0.35***	*0.36***		*0.34**		*not sig.*	
Quant. impact of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]							
As a fraction of 1 std. dev. in country FE associated with values of those born in 1946-1985[2]	**0.94**	**0.94**		**0.91**		**0.72**	
As a fraction of 1 std. dev. in values of those born in 1946-1985[3]	**0.23**	**0.24**		**0.23**		**0.17**	
Number of observations	34	34		34		34	
R-sq	0.83	0.79		0.75		0.47	

Notes:[1]Standard deviation in the mean values of people born in 1936-1945: 0.310; [2]Standard deviation in the estimated fixed effects, 0.299, 0.305, 0.300, 0.281 for specification (1)-(4), respectively; [3]Standard deviation in values of people born in 1946-1985: 1.197

the respondent has any children.[2] In addition, we include the variable *domicile,* which defines the size of the area where the respondent lives. Originally, we wanted to account for detailed geographical areas across Europe using regional dummies available in the ESS. However, these are defined differently for different countries, where only a small number of regions may represent a large country (e.g. France) while quite detailed differentiation is available for small countries (e.g. Switzerland) making it impossible to use meaningfully. Nevertheless, the results obtained when incorporating the variable capturing such cross-country regional differentiation are presented in section 2.5.4.

The results of the second specification are shown in column (2). Including individual characteristics is indeed important as reflected in improved R-squared of the first step of the estimation. Being a woman is associated with an increased individual preference for tradition by 0.23, which corresponds to 19% of the individual variation in the tradition value. The coefficient on the dummy variable capturing marital status is also sizable, 0.19; however, it is potentially biased upwards. The effects of age and having a child are significant, and positive, albeit small in magnitude. The coefficients on dummies reflecting the size of the respondent's domicile are all significant and negative: individuals living in villages, small cities, suburbs of big cities and in big cities consider tradition to be progressively less important than do respondents living in farms or homes in the countryside. Yet, the estimated country fixed effects are very similar to the ones from the first specification, leading to a similar effect of the mean tradition preferences of the older generation on the tradition preferences of younger cohorts. Hence, it is not the cross-country heterogeneity in demographic characteristics that drives the result of the first specification.

Nevertheless, this estimated positive and sizable impact of the mean tradition values of the older generation may not be related to their cultural persistence if the values reflect (or are correlated with) other (economic or institutional) sources of systematic

[2] There is a potential problem with endogeneity of the married dummy and the children dummy. Indeed, the choice of getting married and having children may be affected by one's preferences for traditional values: adherence to customs and ideas of traditional culture and religion is likely to influence the decision to get married and have children. The effects of these dummies are not the main concern of our analysis, but we acknowledge that they may be biased upwards.

variation across countries, potentially also transmitted across generations. Systematic and persistent differences in attained education across countries may affect the values of younger generations. Therefore, in the third specification (column 3) we include dummies for the respondents' level of education as well as their parents' education to proxy for the environment in which one has been raised, thereby controlling for unobserved human capital that may also differ systematically across countries.[3]

We see that by doing so, the coefficients on domicile dummies decrease in absolute values, which is probably the result of the positive correlation between attained education and the size of the town/city where one lives. The coefficients on all education dummies capturing secondary and tertiary level of education are significant and negative, with the magnitude of the effect more sizable for tertiary education. The results are in accordance with intuition: with higher attained education, one is less likely to be tethered to traditional rules and norms. Nevertheless, in the second step, the estimated impact of the traditional values of older people is very similar to the previous specifications. This suggests that it is not the systematic cross-country variation in education that drives the variation in importance of tradition across countries. It is worth noting that the Spearman correlation between the mean tradition values of people born in 1946-1985 and the residuals from the second estimation step is still significant at 5% in specifications (1) and (2) and at 10% in specification (3), which indicates that there is part of the variation in obtained fixed effects is not explained by the mean tradition preferences of people born between 1936-1945.

Lastly, following the same concept of examining another important source of systematic variation across countries that may drive our result, we include dummies reflecting an individual's religion into the fourth (*full*) specification. By definition, tradition value as the commitment and acceptance of the ideas of culture or religion that were set in the past is linked to religion. In column (4), we summarize the results. The

[3] This is in line with Fernandez and Fogli (2009) who in order to ensure that the significant impact of labor force participation rates in a country of origin on hours worked by second generation American women represents the effect of culture and is not driven by unobserved human capital, argue that it is necessary to control for the education of a woman's parents or a woman's own education- to account for the unobserved component of human capital that depends on the human capital of the parents which may differ systematically by country of origin.

coefficients on domicile dummies decrease in magnitude, which is likely to be the result of a correlation between religiosity and the size of the town/city in which the respondent lives: living in larger cities is associated with less religiosity, so in the absence of religion dummies the effect of domicile dummies is overestimated.

The coefficients on religion variables are significant, positive and of large magnitude. Belonging to any religion implies a much stronger preference for traditional values than not being religious, with the highest coefficient (0.653) associated with catholicism and the smallest coefficient (0.387) associated with eastern orthodoxy. The differences between individual religion categories are statistically significant in most cases, but we abstain from speculating on the meaning of the differences. What we consider important is that the R-squared of the first step of the estimation increases from 12% (in the third specification) to 17%; including religion preferences is therefore indeed very important in explaining individual variation in preferences for tradition.

Nevertheless, the estimated fixed effects remain individually and jointly significant and even though in the second step of the estimation, the coefficient of average tradition preferences of the older generation decreases in magnitude compared to previous specifications, it still accounts for 72% of the variation in fixed effects (compared to 91% in the third specification). This corresponds to 17% of the variation in individual importance of tradition (compared to 23% in the third specification). The correlation between the mean tradition values of people born in 1946-1985 and the residuals from the second estimation step is not significant anymore, indicating that the variation in the mean tradition preferences of people born between 1936-1945 is sufficient to explain the variation in the estimated fixed effects.

In summary, it seems that in the first three specifications, the country fixed effects associated with the importance of tradition pick up some relevant systematic variation in religion. Consequently, variation in the fixed effects is largely, even though not completely, explained by variation in the mean tradition preferences of the older, generation as that one is also likely to include some systematic religion component. However, religion alone is not sufficient to explain the variation in the individual importance of tradition− after including individual religion dummies in the first step of

the estimation, the estimated country fixed effects remain significant and their variation is still strongly determined by the mean tradition preference of the older generation.

2.4.2 Respondents born in 1946-1985 in the country of their residence, whose both parents were born in the same country, divided into subgroups according to the year of birth

In our full specification, we assess the impact of the values of the older generation on the values of respondents born in a wide interval, 1946-1985. Indeed, it is likely that the observed impact of the values of the oldest generation is strongest for the next generation and fades with following generations. To determine how quickly cultural values in a country change over time, we divide the sample into 4 subgroups: respondents born between 1946-1955, 1956-1965, 1966-1975, 1976-1985 and inspect the effect of mean values of the generation of 1936-1945 on the values of respondents within these subgroups.

Table 2.6 summarizes the results of the second step of the *full* specification estimation. We see that the effect of the values of the older generation is strongest for respondents born in 1946-1955 and gets progressively weaker for younger respondents. In terms of quantitative impact, the mean values of people born between 1936-1945 explain 80% of variation in the country fixed effects associated with the tradition preferences of the 1946-1955 generation and 61% of variation associated with the tradition preferences of the 1976-1985 generation. Therefore, in a span of 30-40 years the explanatory power of the values of the older generations weakens, by approximately one quarter, but remains sizable.

Indeed, the pace with which the effect weakens is unclear having only 4 subsequent generations, but assuming a linear decrease pattern, within 100 years the projected estimated coefficient on mean values of people born in 1936-1955 would be 0.19, which, assuming the variation in the estimated fixed effects and in individual values as in Table 2.5 (i.e. 0.281 and 1.197, respectively), would imply a non-negligible 21% of estimated fixed effects' variation and 5% of individual variation in the importance of tradition

Table 2.6
Impact of average tradition values of people born between 1936-1945 on country fixed effects associated with individual importance of tradition estimated for respondents born in 1946-1955, 1956-1965, 1966-1975 and 1976-1985, respectively.

	Dependent variable: Importance of Tradition									
	Result from spec. (4) in Table 5		*Respondents born in years:*							
			1946-1955		*1956-1965*		*1966-1975*		*1976-1985*	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE		
Estimation: STEP 2										
Mean values of people born in 1936-1945	**0.655** ***	0.115	**0.756** ***	0.099	**0.660** ***	0.129	**0.648** ***	0.134	**0.553** ***	0.129
Quant. impact of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]										
As a fraction of 1 std. dev. in country FE associated with values of respondents in a sample	**0.72**		**0.80**		**0.71**		**0.65**		**0.61**	
As a fraction of 1 std. dev. of values of respondents in a sample	**0.17**		**0.21**		**0.18**		**0.17**		**0.14**	
Number of observations, estimation step 1	87950		22355		23559		22347		19689	
Adj R-sq, estimation, step 1	0.17		0.14		0.15		0.15		0.15	
Number of observations, estimation step 2	34		34		34		34		34	
Adj R-sq, estimation, step 2	0.47		0.61		0.43		0.40		0.32	

Notes: [1]Standard deviation in the mean values of people born in 1936-1945: 0.310; [2]Standard deviation in the estimated fixed effects, full specification, sample 1946-1985, 1946-1955, 1956-1965, 1966-1975, 1976-1985: 0.281, 0.294, 0.289, 0.309, 0.282, respectively; [3]Standard deviation in values of people born in 1946-1985, 1946-1955, 1956-1965, 1966-1975, 1976-1985: 1.197, 1.141, 1.167, 1.190, 1.221, respectively

explained by the variation in the mean tradition preferences of people born in 1936-1945. This supports a rather slow change in the preferences for tradition value over time.

2.5 Robustness Analysis

2.5.1 An alternative measure of the importance of tradition

As mentioned earlier in this chapter, the quantitative representation of *values* (relative, based on centered individual responses to value items) has an interpretative disadvantage when it is difficult to say what, for instance, 0.5 as a particular value measurement represents.

In this section, we adopt a different representation of values. We define the individual importance of tradition by 1 if the respondent selects *1. Very much like me* or *2. Like me* to rate his/her importance of a tradition goal; otherwise we define it by 0. This new representation of values has an advantage insofar as the country value average

corresponds to the percentage of individuals strongly or moderately identifying themselves with the descriptions of a given value. This new representation is likely to be more robust, but on the other hand, it ignores the differences in scale use across countries.

Table A.4 in the Appendix shows, by country, the percentage of people for whom the importance of tradition is rated as 1, i.e. for whom it is strongly or moderately important, for people born between 1946-1985 and for the older generation born between 1936-1946, taken over all 4 rounds of ESS.[4] The countries are ordered based on the average importance of tradition among those born in 1946-1985. We see that on average across countries, tradition is considered important for 66% of the population born in 1936-1945, and for 51% of those born in 1946-1985.

For the new representation of values, we run a 2-step estimation for the *full* specification, where in the first stage of the estimation we assume both a linear probability model as well as a probit estimation with the standard errors corrected at the country level. Table A.5 contains the marginal effects from the estimation. For 0-1 representation of values, the results show a sizable and significant effect of the older generation's preference for tradition on the individual importance of tradition among people born in 1946-1985. In terms of explained variation in the estimated country fixed effects, the impact is of slightly bigger magnitude than the one obtained from the full specification in Table 2.5.

With the new representation of values, the coefficient on mean values of the older generation can be interpreted as the marginal change in the predicted probability: with a one standard deviation increase in the mean tradition preferences of the older generation, the predicted probability that tradition is considered important for an individual born in 1946-1985 increases by approximately 9%. We obtain a similar result from the probit model, when we compare the average predicted probabilities as we increase the average

[4] Similar to the "relative" representation of values, we test for the means of the tradition preference being the same in round 1 and round 4, for 5 year-of-birth groups. The tests reveal a very low rejection rate of the null hypothesis, for all year-of-birth groups. In addition, for people born between 1936 and 1945, we tested the equality of values' means for rounds 1 vs. 2, 2 vs. 3 and 3 vs. 4. The results show that rejection of the null hypothesis is very rare.

values of the older generation from their mean level minus 1/2 of the standard deviation to their mean level plus 1/2 of the standard deviation. Hence, the analysis based on 0-1 representation of values also shows a very strong inter-generational transmission of tradition preferences.

2.5.2 Alternative measure of national culture component

We explained in the introduction that we choose the average of tradition preferences of the older generation as the national culture component even though this is likely to reflect not only the cultural element but also various influences such as education or religion that likely affected the formation of tradition preferences of the older generations. We surmise that these other sources of variation are embedded in the preferences so that it is difficult to extract purely cultural elements; moreover, we believe that culture is a mixture of all these various influences. Nevertheless, in this section, we construct a different measure of national culture, by regressing the tradition preferences of people born in 1936-1945 on the same set of variables as the one used in the first step of our full specification in Table 2.5. We estimate the associated country fixed effects and subsequently use these country fixed effects to explain the variation in the values of younger generations. The results of the second step of the estimation are summarized in Table A.6 in the Appendix. The results suggest an even stronger impact of values of the older generation on the values of individuals born in 1946-1985. In other words, the country fixed effects associated with individual tradition preferences estimated for the older and for the younger generations are highly correlated, suggesting a strong inter-generational transmission of tradition values.

2.5.3 Accounting for economic factors

In the section 2.4.1, we show that the mean tradition preferences of the older generation have a strong explanatory power with respect to the individual importance of tradition across European nations. We observe that accounting for individual education and religion characteristics somewhat lowers this effect.

Our main concern remains whether we are missing some other channel, correlated with the older generation's cultural beliefs, through which the cultural preferences of younger generations may actually be formed. Economic or institutional features in a given country that are also transmitted across generations (Fernandez and Fogli, 2009) may represent such a channel. The current economic and institutional environment may also have an impact. It is indeed difficult to separate the effects of culture, economic environment and institutions as they are likely to reinforce each other, but examining the relevant estimated coefficients after accounting for these other channels may give us an indication of their importance.

In this section we present the results of the estimation specifications, in which we control for three indicators of economic conditions across European countries (see Table A.7 in the Appendix for their summary). As these variables only vary on the country level, we include them in the second step of the estimation, together with the mean tradition preferences of the older generation. We account for GDP per capita in 1970 and for average years of education of people aged 65-74 in 2010 (which corresponds to people born between 1936-1945) to capture the economic conditions of decades ago and, potentially, the cross-country differences in human capital. Second, we control for GDP per capita in the year 2000 to capture the impact of recent variation in economic development across countries and for female labor force participation in 2000 to partially capture the institutional environment. All variables are significantly correlated with the mean tradition preferences of the generation of people born in 1936-1945. We test how the estimated effect of the mean tradition values of the older generation changes as we control for these additional variables in the second step.[5] As some of the "testing" variables are not available for all 34 countries, the results in this

[5] In addition to these factors, we experimented with other economic indicators correlated with the mean tradition values of the older generation, such as unemployment rates, inflation rates or GINI coefficient capturing inequality in society. None of these turned out to have a significant impact. We also tried to capture cross-country differences in institutional environment by accounting for the strength of legal rights- a measure available from the World Bank, Doing Business project. However, this turned out to have no predictive power, alone or including the average tradition preferences of "old" people, not altering their explanatory power for values of younger generations.

section also provide a robustness check of how the country sample composition affects the estimated impact of the mean tradition preferences of the older generation.

GDP per capita in 1970

Accounting for GDP per capita is roughly equivalent to accounting for unobserved human capital that is likely to be transmitted across generations. We consider GDP per capita in 1970 to capture the level of human capital for older generations. We would ideally like to use even a previous decade's GDP, but insufficient data is available for that period. Looking at the correlation between the average values of respondents born in 1936-1945 and GDP per capita in 1970, we see that this correlation is negative (-0.59) suggesting that better economic conditions are associated with a lower preference for tradition.

For 1970, we have data on GDP per capita (constant 2000 US$) for 22 countries. Therefore, we first rerun the 2-step procedure for our *full* specification using data on 22 countries. The results for the second step are reported in Table A.8, block (2), in the Appendix. Compared to the original results (block 1), we see that the coefficient on mean tradition values of the older generation is lower than the results of the estimation with all countries. This follows from the constrained sample, in which there is a lower cross-country variation in preference for tradition than the full sample. Consequently, the quantitative impact (i.e. the fraction of variation in the fixed effects explained by a 1 standard deviation change in mean values of the older generation) is also somewhat lower albeit still sizable: 56%.

When we include 1970 GDP per capita as the only explanatory variable in the second step, its estimated impact is insignificant. Adding the measure of tradition values for the older generation, the coefficient on GDP per capita remains insignificant. Therefore, we conclude that the differences in human capital across countries, when captured in the form of past economic performance, does not represent the missing alternative channel of formation of tradition preferences of younger generations.

Mean years of schooling of people whose age in 2010 is 65-74

Another way to control for the human capital of older generations is to control for the mean years of education of people born in 1936-1945. Again, we first rerun the 2-step procedure for our full specification using available data on 31 countries. Rerunning the full specification on this subset of countries leads to similar results as when using all 34 countries (see block 3 in Table A.8).

The effect of the education variable when examined alone is negative and insignificant. Once we include the variable capturing the cultural values of the older generation, the insignificant effect of mean education years of older people turns out to be significant and unexpectedly positive. At the same time, the coefficient on average values of the older generation increases. This is due to the strong negative correlation between the years of schooling and the average preference for tradition of the older generation, which renders the estimation of the separate effects to be imprecise.

It is possible that the education of older generations represents a transmission channel for tradition values. However, the cross-country variation in education of the older generation alone does not explain the cross-country variation in the values of younger generations.

GDP per capita in 2000

When we include GDP per capita in 2000 alone to explain the variation in the country fixed effects associated with traditional beliefs, its explanatory power is significant (see Table A.8, block 4): higher GDP per capita is associated with lower preference for tradition. This is in accordance with intuition: increased prosperity and less economic insecurity should be associated with lower reliance on norms and traditions set in the past and with more choice and control over an individual's life.

Once we account for the mean tradition preferences of the older generation, the impact of the GDP per capita in 2000 becomes insignificant. The effect of the mean values of the older generation, both in terms of estimated coefficient and explained variation, decreases slightly after including GDP per capita in 2000, reflecting its negative correlation with mean values of people born in 1936-1945. Therefore, in this

case, without accounting for current economic conditions reflected in recent GDP per capita, we may slightly overestimate the effect of the "historical" tradition values; nevertheless, these remain the main (and statistically significant) determinant of the tradition preferences of younger generations.

Female labor force participation in 2000

Working decisions of mothers are likely to be determined by the institutional setup in a given country- financial incentives, legislation, or feasibility of daycare. Therefore, we employ the measure of female labor force participation in 2000 as a variable reflecting the institutional features of countries. However, we keep in mind that women's participation in the labor market is partially determined by the traditional values of society, which are likely to encourage women to constrain their labor market participation after having children.

The effect of female labor participation, when examined alone is negative and significant at 10% (see Table A.8, block 5). Once the mean values of the older generation are included, the effect of labor force participation becomes positive and the coefficient on mean tradition preferences of the older generation increases in magnitude. This is again due to the strong negative correlation between the explanatory variables in the second step of the estimation.

To summarize, the results in this section confirm there to be strong impact of a national culture component, as captured by mean values of the older generation, on the value formation of younger generations. Economic and institutional conditions may provide a channel for the inter-generational transmission of values, but there are never found to explain a significant portion of variation in tradition preferences alone.

2.5.4 Controlling for geographical variation

In this section, we present the results of an analysis accounting for geographical variation, i.e. accounting for potentially differing economic conditions and institutions across regions. We use the regional dummies available in the European Social Survey.

The complication, however, is that the regions are defined differently for different countries: a small number of regions may represent a large country (e.g. France), while quite detailed differentiation is available for small countries (e.g. Slovenia). Moreover, while for some countries the differentiation seems purely geographical, for some others the distinction is made for specific urban communities. We constrain the number of observations in any regional unit to be at least 30. The results are reported in Table A.9 in the Appendix.

First, we report the results without including regional dummies, as the sample is now smaller than the one in the original specification. The results of both steps are very similar to the results reported in Table 2.5.

After including regional dummies (always jointly significant), the variation of the estimated country fixed effects increases, which leads to a slight decrease in the share of variation explained by values of the older generation. This is possibly caused by a non-uniform impact of including regional dummies on the estimated country fixed effects. Most likely, the extent to which the regional dummies capture additional variation in individual values associated with a region of residence varies across countries. This is reflected in increased variation in the estimated fixed effects. The quality of our regional dummies may not be the only problem; a potentially variable heterogeneity of beliefs within countries may be another one. Nonetheless, we show that our measure of the national culture component – the mean tradition values of people born in 1936-1945 − remains strong, explaining 66% of the variation in the estimated country fixed effects associated with the individual importance of tradition.

2.5.5 Immigrants and second-generation immigrants

The previous analysis of this chapter is based on respondents who were born in a given country and their parents were born there as well. We measure the national cultural component by the average tradition values of people born in 1936-1945 and use it to explain the tradition preferences of people born in 1946-1985. Therefore, even though our measure of culture comes from a different time than the analyzed sample of individuals, it comes from the same countries. An appropriate consistency check is to

look at immigrants or at second-generation immigrants[6] to see whether their values are affected by the specific cultural component of the country in which they live. Immigrants face the same economic and institutional environment as native citizens but are likely to honor the elements of a different culture. Examining the economic outcomes of (second-generation) immigrants has become good practice in the economic literature (Fernandez and Fogli, 2009; Fernandez, 2007; Alesina and Giuliano, 2007; Algan and Cahuc, 2005).

Looking at the data from the European Social Survey, we are able to identify 6957 first-generation immigrants and 7899 second-generation immigrants, born in 1946-1985, for whom we have data on characteristics needed in our full specification. To obtain an indication on how the values of (first-generation) immigrants compare with those of non-immigrants, we look at the average tradition values of immigrants based on their country of origin as well as based on their country of residence.[7] Table A.10 in the Appendix shows that the country-of-origin average tradition preferences of first-generation immigrants are highly correlated with those of non-immigrants in a country of origin (0.65). For second-generation immigrants, the Spearman rank correlation with non-immigrants in the country of ancestry is much lower (0.14) and insignificant. On the other hand, the average country-of-residence tradition preferences of first-generation immigrants are to some extent correlated with values of non-immigrants in a country of residence (0.47); for second-generation immigrants, their average country-of-residence values are highly correlated with values of non-immigrants in residence countries (0.65). This simple comparison suggests that adaptation of tradition preferences is taking place with migration.

In subsequent analysis, we divide the first-generation immigrants further, based on how long ago they came to live in the country. We construct three groups: those who came to the particular country less than 10 years ago, those who have been living there

[6] While the sample of immigrants cannot be considered a random sample of individuals coming from a particular country, the sample of second-generation immigrants suffers less from a selection problem.

[7] The country of origin is defined for first-generation immigrants as the country which both parents come from, for second-generation immigrants as the country which both parents come from. We only considered origins with more than 20 observations.

between 10 and 20 years and those who have been living there for more than 20 years. We run our full specification on these sub-samples of immigrants and inspect the estimated coefficients to see if their tradition preferences are formed by the culture in the country of residence, represented by the mean tradition values of the older non-immigrant generation.

Table A.11 in the Appendix summarizes the results. For comparison, column (1) contains the results of non-immigrants from Table 2.5. Columns (2) – (4) contain the results for first-generation immigrants, column (5) for second-generation immigrants. Clearly, for immigrants, individual characteristics are less significant predictors of tradition preferences compared to non-immigrants. This is especially valid for domicile dummies which turn out to be entirely insignificant. Religion dummies remain significant in all specifications, which confirms the crucial role of religion in the formation of traditional values.

For first-generation immigrants, we obtain low and insignificant rank correlation of estimated country-of-residence fixed effects with country mean values based on people born in a given country together with their parents. Hence, it seems that the relation of immigrants' values to the country of residence is relatively weak. For second-generation immigrants, the correlation becomes significant, which suggests some extent of value adaptation, but it is still lower than the one obtained for the sample of non-immigrants.

The quantitative impact of the mean tradition values of the older generation in a country-of-residence on the values of younger (immigrant) generations as a fraction of the variation in estimated country fixed effects is always lower for immigrants than for non-immigrants. More importantly, the mean values of the older generation in a country of residence have higher explanatory power as we move from a sample of first-generation immigrants living in a country less than 10 years to a sample of second-generation immigrants. For second-generation immigrants, the cultural component of the country of residence explains 57% of variation in the individual preferences for

tradition. Nevertheless, this effect is still lower than the one obtained for the sample of non-immigrants.[8]

Lastly, we examine whether, in addition to country of residence, we can find any impact of country of origin on the values of immigrants. We use data from the ESS rounds 2, 3 and 4, as the data from the first round of ESS only allow tracking of continent, not particular country of origin. We limit the countries of origin only to ESS countries. For first-generation immigrants we define origin as that country where the respondent as well as his parents were born; for second-generation immigrants we consider origin as that country both parents come from.

We are able to track the country of origin for 2730 first-generation immigrants and 1000 second-generation immigrants. We run a one-step estimation, including the variables reflecting the mean tradition preferences of older people in the country of residence and in the country of origin.[9] The results in Table A.12 in the Appendix show that the mean values of the older generation in the country of origin are significant in predicting the formation of tradition preference of first-generation immigrants living in a country less than 10 years as well as of those living in a country between 10 and 20 years. For those living in a country for more than 20 years and for second-generation immigrants, we find a significant effect only for the mean values of the older generation in the country of residence, which again, suggests some level of value adaptation. Nonetheless, the quantitative impact of the average tradition preferences in the country of residence on the importance of tradition among second-generation immigrants (0.09% of individual variation) is still two times lower than the impact obtained for non-immigrants.

Overall, the results suggest that the preference for tradition is slowly changing with migration and adapts, at least to some extent, to the prevailing "cultural standard" of the

[8] For a sample of second-generation immigrants, we also controlled for GDP per capita in 2000 and for women's labor force participation in 2000 to see whether the economic/institutional conditions in the country of residence shape their values rather than the values of the older generation in a country of residence. We did not find a significant impact of these variables, employed alone or together with the mean values of the older generation in the country of residence.

[9] Indeed, we are mixing the immigrants across the different countries in Europe. The sample of countries in specifications changes based on available observations. Therefore, our results are constrained by these data limitations.

country of residence. Despite this, for first-generation immigrants we still observe a significant effect of the culture of the country of origin and the results for second-generation immigrants are not entirely comparable to those of non-immigrants.

2.6 Conclusion

In this chapter, we address inter-generational transmission of cultural *values* across generations. We focus on *tradition value*, as defined in cross-cultural psychology research (Schwartz, 1992, 2005), as we believe it to be particularly relevant in an economic context.

We use data from the European Social Survey and our approach is based on examining cross-country variation in the individual importance of tradition value (of people born in 1946-1985) and assessing how well it is explained by differing individual socio-demographic characteristics and by differences in the national culture as captured by the average tradition preferences of people born in 1936-1945.

Working with a sample of respondents born in a country of residence together with their parents, we find that the variation in country fixed effects associated with the individual importance of tradition value after controlling for a range of individual characteristics is to a large extent (72%) explained by the variation in the mean tradition preferences of the older generation. Dividing the estimation sample into four groups based on year of birth shows that the explanatory power of the average tradition values of older generations is lower for younger respondents, yet still explaining 61% of variation in the country fixed effects associated with the tradition preferences of the youngest respondents born in 1976-1985. This strong relationship between the tradition values of older and younger generations is robust to alternative measure of values, alternative measure of values of the older generation and to accounting for detailed geographical (and economic/institutional) variation. We also account for other potential channels of transmission of cultural values: GDP per capita and educational attainment in 1970 to proxy for human capital differences across countries in the past. We also control for current economic and institutional conditions (captured by GDP per capita in 2000) that may affect the formation of individual preferences. Finally, we control for

female labor force participation in 2000 to capture institutional conditions that might affect the importance of tradition values related to the women's role. None of these variables is found to explain a significant portion of variation in tradition preferences. We acknowledge that they might provide a complementary channel for inter-generational transmission of tradition value, but the coefficient on average tradition preferences of the older generation remains significant and sizable after inclusion of these additional country-level variables.

We also analyze subsamples of first- and second-generation immigrants. We find that the longer the first-generation immigrants live in their country of residence, the more their cultural preferences adapt to the prevailing "cultural standard" of the country of residence. Nevertheless, for first-generation immigrants living in a country less than 20 years we observe a significant impact of the average tradition values of the country-of-origin's older generation. For second-generation immigrants, the impact of the mean tradition preferences of the country-of-residence's older generation is much lower than for non-immigrants.

In summary, our results show that even though tradition preferences are very persistent when analyzing the sample of people born in a country together with their parents, they are likely to adapt with migration. Because we find that the impact of economic/institutional variables is limited, it is possible that the adaptation occurs because of interaction with "native" residents rather than being an outcome of the economic/institutional environment. However, our evidence is limited and this claim would require further research. In addition, even though we see some adaptation in tradition preferences for immigrants, further research along the lines of existing research could examine whether the actual economic choices of (second-generation) immigrants follow their proclaimed preferences.

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APPENDIX

Table A.1
European Social Survey, participation by round.

	ESS Round					ESS Round			
	1	2	3	4		1	2	3	4
Austria	●	●	●		Latvia			●	●
Belgium	●	●	●	●	Lithuania				●
Bulgaria			●	●	Luxembourg	●	●		
Croatia				●	Netherlands	●	●	●	●
Cyprus			●	●	Norway	●	●	●	●
Czech Republic	●	●		●	Poland	●	●	●	●
Denmark	●	●	●	●	Portugal	●	●	●	●
Estonia		●	●	●	Romania			●	●
Finland	●	●	●	●	Russia			●	●
France	●	●	●	●	Slovakia		●	●	●
Germany	●	●	●	●	Slovenia	●	●	●	●
Greece	●	●		●	Spain	●	●	●	●
Hungary	●	●	●	●	Sweden	●	●	●	●
Iceland		●			Switzerland	●	●	●	●
Ireland	●	●	●	●	Turkey		●		●
Israel	●			●	Ukraine		●	●	●
Italy	●	●			UK	●	●	●	●

Notes: Italian data on values for Round 1 available only for males. Value questionnaire was not administered in Luxembourg for Round 1.

Concept of Values – Schwartz's value system

This section is intended to make an interested reader familiar with the theoretical structure of the complete value system defined by Schwartz (1992, 2005). Schwartz defines values as desirable goals that serve as guiding principles and vary in importance.[10]

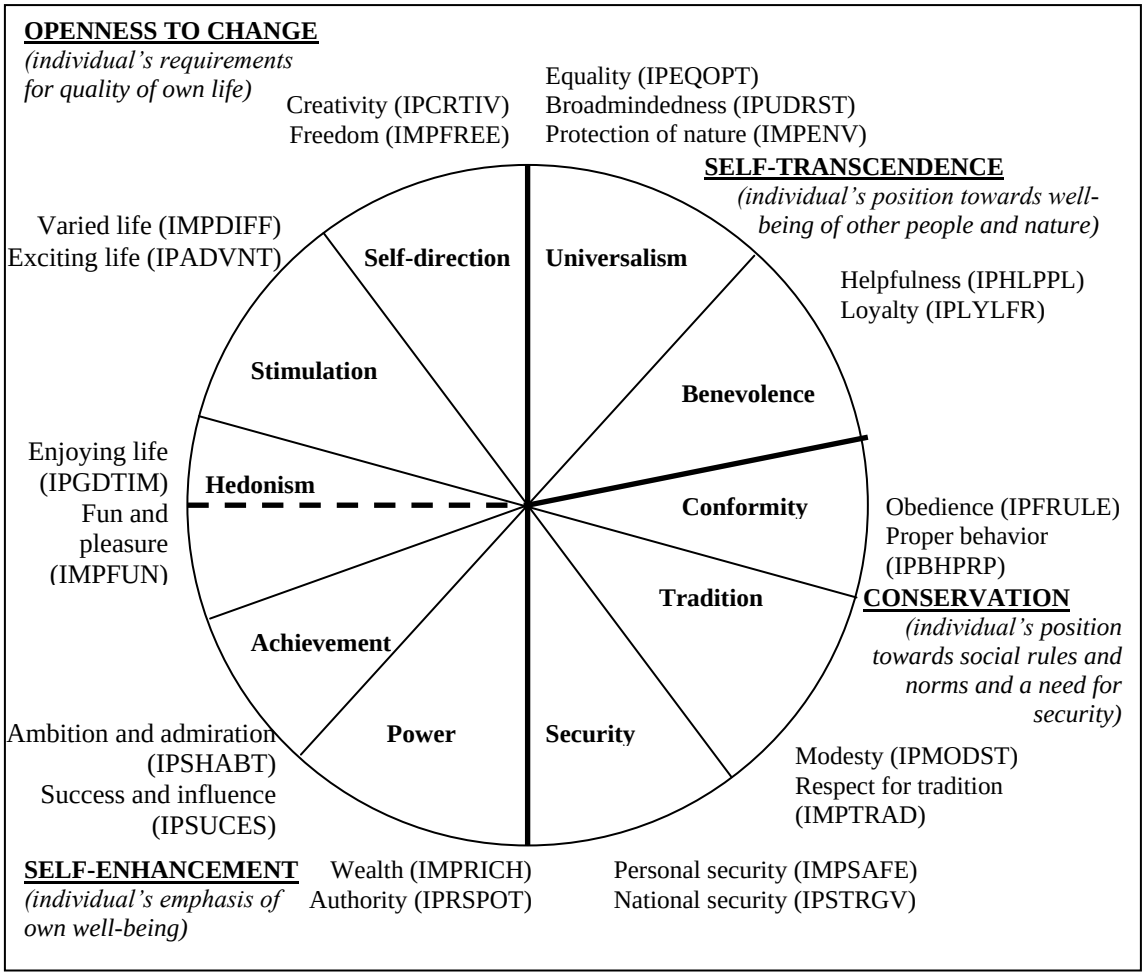
His theory distinguishes ten motivationally distinct values. Table A.2 summarizes basic values along with a description of the motivational goal they reflect. Schwartz's theory assumes a relationship among values. In particular, the theory states that there are values that are motivationally similar and values that are motivationally distinct. Figure A.1 displays a "value circle", in which similar values are close to each other in the circle. On the other hand, motivationally different values are situated more distant/opposite to each other in the circle. The importance of a particular value for an individual is likely to be accompanied by the importance of values that are close on the value circle and unlikely to be accompanied by an emphasis on values more distant in the value circle.

Starting from the upper right side of the circle, there are values belonging to the *self-transcendence* group. These values capture the extent of an individual's concern for the well-being of other people and for nature. People who promote these values emphasize equality and tolerance towards all people in general and towards nature (*universalism*) and consider it important to care for relatives, friends and those with whom they are in frequent personal contact (*benevolence*). Opposing self-transcendence values are the values belonging to the *self-enhancement* group. These are located in the bottom left part of the circle and describe the importance of one's own well-being. Pursuing *power* values is equivalent to emphasizing one's own social status and dominance in general, whereas pursuing *achievement* values corresponds to valuing individual success fairly achieved due to personal abilities.

[10] Values are present in many disciplines such as psychology (Rokeach, 1973; Schwartz, 1992), sociology (Williams, 1968) or political science (Inglehart, 1997). For an overview of other systems of values, see e.g. Dahl (2000b).

The bottom right part of the circle represents *conservation* values that capture an individual's stance towards social rules and norms and the importance of security. Assigning significance to these values is equivalent to demanding a safe environment (*security*) and to conforming to social rules and norms that are currently in place (*conformity*) or were set in the past (*tradition*). Finally, the upper left part of the circle contains values that are part of the *openness to change* group. These values define an individual's emphasis on the quality of one's own life: "having a good time" (*hedonism*), having a varied life (*stimulation*), and being creative and independent (*self-direction*).

Figure A.1
A *value* circle.



Motivational similarity/dissimilarity of values implies that values belonging to the *self-enhancement* group and values that are part of the *self-transcendence* group form one orthogonal dimension, in which self-interests oppose interests for others. The second orthogonal dimension is formed by *openness to change* and *conservation*, in which valuing pleasure, excitement, novelty or creativity in life opposes valuing tradition, norms, customs and security.

Table A.2
Ten basic values according to Schwartz's theory. Based on their central distinct motivational goal.

Dimension ***Value***	**Central motivational goal**	**Exemplary value items included in the European Social Survey (ESS NOTATION)**
Self-Transcendence		
Universalism	Understanding, appreciation, tolerance and protection for the welfare of all people and for nature	Equality (IPEQOPT), Broadmindedness (IPUDRST), Protection of nature (IMPENV)
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	Helpfulness (IPHLPPL), Loyalty (IPLYLFR)
Conservation		
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms	Obedience (IPFRULE), Proper behavior (IPBHPRP)
Tradition	Respect, commitment and acceptance of the customs and ideas of traditional culture or religion	Modesty (IPMODST), Respect for tradition (IMPTRAD)
Security	Safety, harmony and stability of society, of relations, of oneself	Personal security (IMPSAFE), National security (IPSTRGV)
Self-Enhancement		
Power	Social status and prestige, control or dominance over people and resources	Wealth (IMPRICH), Authority (IPRSPOT)
Achievement	Personal success through demonstrating competence according to social standards	Ambition and admiration (IPSHABT), Success and influence (IPSUCES)
Hedonism	Pleasure and sensuous gratification for oneself	Enjoying life (IPGDTIM), Fun and pleasure (IMPFUN)
Openness to Change		
Stimulation	Excitement, novelty, and challenge in life	Varied life (IMPDIFF), Exciting life (IPADVNT)
Self-direction	Independent thought and action – choosing, creating, exploring	Creativity (IPCRTIV), Freedom (IMPFREE)

Table A.3
Item included in a questionnaire on values in the European Social Survey characterizing tradition value.

Value	A phrase defining a particular value item in the ESS questionnaire
Tradition (IMPTRAD)	*Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family.*

Note: Before completing the questionnaire, the respondent is given the following instruction: "Now I will briefly describe some people. Please listen to each description and tell me how much each person is or is not like you: 1 Very much like me 2 Like me 3 Somewhat like me 4 A little like me 5 Not like me 6 Not like me at all 7 Refusal 8 Don't know 9 No answer.

Table A.4
Summary of the new *values* representation: percentage of people who select *1. Very much like me* or *2. Like me* to rate their importance of tradition value.

	Importance of tradition	
	born between 1936-1945	born between 1946-1985
France	***0.45***	***0.28***
Iceland	0.48	0.31
Sweden	***0.45***	0.31
Finland	0.47	0.33
Estonia	***0.45***	0.36
Germany	0.57	0.36
Norway	0.50	0.38
Lithuania	0.60	0.40
Netherlands	0.57	0.40
United Kingdom	0.66	0.40
Luxembourg	0.63	0.41
Switzerland	0.53	0.41
Portugal	0.56	0.43
Czech Republic	0.54	0.43
Belgium	0.66	0.43
Austria	0.61	0.44
Slovenia	0.75	0.47
Spain	0.73	0.49
Denmark	0.65	0.51
Hungary	0.69	0.52
Russia	0.71	0.54
Slovakia	0.70	0.55
Ireland	0.79	0.57
Latvia	0.69	0.57
Ukraine	0.66	0.58
Israel	0.65	0.62
Bulgaria	0.75	0.66
Croatia	0.86	0.66
Romania	0.78	0.68
Italy	0.88	0.70
Poland	0.84	0.70
Greece	0.88	0.74
Cyprus	**0.91**	0.74
Turkey	0.82	**0.80**
Minimum (country level)	*0.45*	*0.28*
Maximum (country level)	*0.91*	*0.80*
Average (country level)	*0.66*	*0.51*
Std. dev. (country level)	*0.14*	*0.14*

Table A.5
Impact of mean tradition values of people born in 1936-1945 on the importance of tradition of respondents born in 1946-1985. 0-1 representation of *values*.

	Dependent variable: Importance of tradition			
	2-step estimation STEP 1		Probit marginal effects	
	Coef.	SE	Coef.	SE
Gender (dummy, female=1)	**0.059** ***	0.003	**0.065** ***	0.011
Age	0.000	0.001	-0.001	0.002
Age^2	**0.0000** ***	0.000	**0.0001** ***	0.000
Marital status (dummy, married=1)	**0.046** ***	0.004	**0.050** ***	0.005
Having at least one child (dummy, at least one child=1)	**0.024** ***	0.004	**0.035** ***	0.006
Domicile (dummies):				
big city	**-0.051** ***	0.008	**-0.051** ***	0.018
suburbs or outskirts of big city	**-0.042** ***	0.008	**-0.049** ***	0.015
town or small city	**-0.033** ***	0.007	**-0.031** **	0.015
country village	-0.012	0.007	-0.009	0.014
farm or home in countryside (omitted)				
Education (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	**-0.024** ***	0.004	-0.011	0.010
tertiary	**-0.047** ***	0.005	**-0.041** ***	0.013
Education of respondent's mother (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	-0.005	0.005	0.008	0.009
tertiary	-0.006	0.007	0.008	0.012
Education of respondent's father (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	-0.007	0.005	-0.001	0.011
tertiary	-0.008	0.006	-0.010	0.009
Religion (dummies):				
no religion (omitted)				
catholic	**0.204** ***	0.005	**0.167** ***	0.014
protestant	**0.176** ***	0.006	**0.183** ***	0.015
eastern orthodox	**0.163** ***	0.009	**0.229** ***	0.018
other christian	**0.130** ***	0.015	**0.128** ***	0.015
jewish	**0.136** ***	0.032	**0.232** ***	0.018
muslim	**0.258** ***	0.018	**0.301** ***	0.024
none / other (omitted)				
Country fixed effect (sig.)	***			
Number of observations	87950		87950	
Adj R-sq	0.13		0.09	
	Estimation: STEP 2			
Mean values of people born in 1936-1945	**0.694** ***	0.079	**0.755** ***	0.077
Quant. Impact/predicted probability change of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]	**0.094**		**0.102**	
As a fraction of 1 std. dev. in country FE associated with values of those born in 1946-1985[2]	**0.81**			
As a fraction of 1 std. dev. in values of those born in 1946-1985[3]	**0.19**			
Number of observations	34			
R-sq	0.69			

Notes: [1]Standard deviation in the mean values of people born in 1936-1945: 0.13; [2]Standard deviation in the estimated fixed effect: 0.116; [3]Standard deviation in values of people born in 1946-1985: 0.500.

Table A.6
Impact of country fixed effects associated with the tradition values of people born in 1936-1945 on the importance of tradition of respondents born in 1946-1985.

Estimation: STEP 2	**Dependent variable: Importance of tradition**	
	Coef.	SE
Mean values of people born in 1936-1945	**1.026 *****	0.069
Spearman correlation of mean values of those born in 1946-1985 vs. residuals	*not sig.*	
Quant. impact of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]		
As a fraction of 1 std. dev. in country FE associated with values of those born in 1946-1985[2]	**0.95**	
As a fraction of 1 std. dev. in values of those born in 1946-1985[3]	**0.22**	
Number of observations	34	
R-sq	0.81	

Notes: [1]Standard deviation in the fixed effects associated with values of people born in 1936-1945: 0.259; [2]Standard deviation in the estimated fixed effect: 0.281; [3]Standard deviation in values of people born in 1946-1985: 1.199.

Table A.7
Economic and institutional factors accounted for in the second step of the estimation.

	GDP per capita in thousand $, 1970 (constant 2000 US$) [1]	GDP per capita in thousand $, 2000 (constant 2000 US$) [1]	Mean years of total schooling, people aged 65-69 in 2010 [2]	Female labor force participation (%) [3]
Austria	11.35	23.87	11.32	62
Belgium	11.39	22.67	9.77	57
Bulgaria		1.60	10.25	64
Croatia		4.82	6.80	56
Cyprus		13.42	7.65	57
Czech Republic		5.52	9.00	64
Denmark	16.39	29.99	11.73	75
Estonia		4.14	11.04	65
Finland	11.01	23.51	12.42	74
France	11.54	21.91	7.87	62
Germany	11.86	23.11	12.70	64
Greece	6.75	11.50	7.00	54
Hungary	2.34	4.69	10.24	52
Iceland	13.68	30.95		**86**
Ireland	7.28	25.38	8.55	56
Israel	9.64	19.84		58
Italy	9.46	19.27	7.10	46
Latvia	2.09	3.30	11.44	62
Lithuania		3.27	9.82	68
Luxembourg	17.44	**46.46**	8.84	52
Netherlands	12.76	24.18	10.32	66
Norway	14.89	37.47	**12.78**	76
Poland		4.45	8.71	59
Portugal	4.42	11.44	5.45	64
Romania		1.65	7.93	64
Russia		1.78	9.16	65
Slovakia		5.33	8.78	63
Slovenia		10.00	10.38	63
Spain	6.84	14.42	5.56	52
Sweden	16.53	27.88	9.99	75
Switzerland	**25.47**	34.79		72
Turkey	***2.08***	4.01	***3.15***	***28***
Ukraine		***0.64***	9.21	63
United Kingdom	13.06	25.09	8.23	68
Average	*10.83*	*15.95*	*9.13*	*62.12*
Std.dev.	*5.66*	*12.27*	*2.22*	*10.16*
# Observations	*22*	*34*	*31*	*34*
Correlation with tradition	*-0.59*	*-0.61*	*-0.49*	*-0.39*

Sources:
[1]*World Bank national accounts data and OECD National Accounts data files.*
[2]*International Institute for Applied Systems Analysis.*
[3]*Percentage of female population aged 15-64. International Labor Organization.*

Table A.8
Impact of mean tradition values of people born in 1936-1945 on the importance of tradition of respondents born in 1946-1985. Accounting for historical economic factors.

Estimation: STEP 2	**Dependent variable: Importance of tradition**					
	Coef.	SE	Coef.	SE	Coef.	SE
(1)						
Original results - all countries						
Mean values of people born in 1936-1945	**0.655** ***	0.115				
*quantitative impact:**	*0.72*					
Number of observations	34					
R-sq	0.47					
(2)						
Mean values of people born in 1936-1945	**0.427** **	0.162			**0.620** ***	0.149
*quantitative impact:**	*0.56*				*0.81*	
GDP per capita in 1970			0.003	0.010	0.018	0.011
*quantitative impact:**			*0.09*		*0.49*	
Number of observations	22		22		22	
R-sq	0.22		0.00		0.35	
(3)						
Mean values of people born in 1936-1945	**0.659** ***	0.133			**0.832** ***	0.130
*quantitative impact:**	*0.68*				*0.85*	
Mean educ. years of people born in 1936-1945			-0.001	0.027	**0.049** ***	0.016
*quantitative impact:**			*0.01*		*0.39*	
Number of observations	31		31		31	
R-sq	0.43		0.00		0.55	
(4)						
Mean values of people born in 1936-1945	**0.655** ***	0.115			**0.550** ***	0.156
*quantitative impact:**	*0.72*				*0.61*	
GDP per capita in 2000			**-0.012** ***	0.004	-0.005	0.004
*quantitative impact:**			*0.54*		*0.20*	
Number of observations	34		34		34	
R-sq	0.47		0.27		0.49	
(5)						
Mean values of people born in 1936-1945	**0.655** ***	0.115			**0.764** ***	0.139
*quantitative impact:**	*0.72*				*0.84*	
Female LFP in 2000			**-0.008** *	0.004	**0.006** *	0.003
*quantitative impact:**			*0.28*		*0.23*	
Number of observations	34		34		34	
R-sq	0.47		0.26		0.49	

Notes: **Quantitative impact of a 1 std. dev. increase in mean values of those born in 1936-1945 / in GDP per capita in 1970 / in mean years of education of people born in 1936-45 / in GDP per capita in 2000 / in female LFP in 2000. As a fraction of one std. dev. in country fixed effects associated with tradition values of those born in 1946-1985.*

Table A.9
Impact of mean tradition values of people born in 1936-1945 on the tradition values of those born in 1946-1985. Accounting for regional differences.

	Dependent variable: Importance of tradition			
	without regional dummies		with regional dummies	
Estimation: STEP 1	Coef.	SE	Coef.	SE
Gender (dummy, female=1)	**0.188** ***	0.008	**0.188** ***	0.008
Age	**0.013** ***	0.003	**0.014** ***	0.003
Age^2	0.0000	0.000	0.0000	0.000
Marital status (dummy, married=1)	**0.151** ***	0.010	**0.151** ***	0.010
Having at least one child (dummy, at least one child=1)	**0.076** ***	0.011	**0.073** ***	0.011
Domicile (dummies):				
big city	**-0.204** ***	-0.020	**-0.182** ***	0.021
suburbs or outskirts of big city	**-0.137** ***	0.021	**-0.112** ***	0.022
town or small city	**-0.141** ***	0.019	**-0.134** ***	0.019
country village	**-0.078** ***	0.019	**-0.076** ***	0.019
farm or home in countryside (omitted)				
Education (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	**-0.082** ***	0.011	**-0.083** ***	0.011
tertiary	**-0.171** ***	-0.013	**-0.173** ***	0.013
Education of respondent's mother (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	**-0.031** ***	0.011	**-0.037** ***	0.011
tertiary	**-0.051** ***	0.017	**-0.056** ***	0.017
Education of respondent's father (dummies):				
up to secondary (omitted)				
upper (post) secondary, not tertiary	**-0.038** ***	0.011	**-0.036** ***	0.011
tertiary	**-0.049** ***	0.015	**-0.047** ***	0.015
Religion (dummies):				
catholic	**0.654** ***	0.012	**0.658** ***	0.012
protestant	**0.584** ***	0.014	**0.589** ***	0.014
eastern orthodox	**0.363** ***	0.025	**0.350** ***	0.026
other christian	**0.411** ***	0.036	**0.411** ***	0.036
jewish	**0.395** ***	0.083	**0.312** ***	0.103
muslim	**0.609** ***	0.048	**0.646** ***	0.050
none / other (omitted)				
Country fixed effect (sig.)	***		***	
Regional dummies (sig.)			***	
Number of observations	78335		78335	
Adj R-sq	0.17		0.18	
Spearman correlation of country fixed effects with the mean values of those born in 1946-1985	*0.80 (***)*		*0.68 (***)*	
Estimation: STEP 2				
Mean values of people born in 1936-1945	**0.655** ***	0.117	**0.773** ***	0.134
Spearman correlation of mean values of those born in 1946-1985 vs. residuals	*not sig.*		*not sig.*	
Quant. impact of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]				
As a fraction of 1 std. dev. in country FE associated with values of those born in 1946-1985[2]	**0.71**		**0.66**	
As a fraction of 1 std. dev. in values of those born in 1946-1985[3]	**0.17**		**0.20**	
Number of observations	34		34	
R-sq	0.46		0.45	

Notes: [1]Standard deviation in the mean values of people born in 1936-1945: 0.310; [2]Standard deviation in the estimated fixed effects without regional dummies and with regional dummies: 0.284, 0.361; [3]Standard deviation in values of individuals in estimation sample: 1.199.

Table A.10
Average tradition values of first- and second-generation immigrants compared with non-immigrants. According to the country of origin and country of residence.

	Importance of tradition				
		country of origin		country of residence	
	non-immig.	1st gen. immig.	2nd gen. immig.	1st gen. immig.	2nd gen. immig.
Austria	-0.15	0.27	0.09	0.02	-0.04
Belgium	-0.06	-0.15		0.13	0.23
Bulgaria	0.54	0.23	0.21		0.66
Croatia	0.55	0.28			
Cyprus	0.52			0.38	
Czech Republic	0.08	-0.07	-0.21	0.53	-0.16
Denmark	0.22	-0.17		-0.29	-0.08
Estonia	-0.13			0.21	-0.18
Finland	-0.12	-0.14	-0.43	0.22	
France	-0.41	-0.41	-0.09	-0.18	0.03
Germany	-0.16	-0.26	0.16	0.33	0.03
Greece	0.45	0.29	0.47	0.42	0.86
Hungary	0.07	-0.06	0.47	0.22	
Iceland	-0.32				
Ireland	0.33	0.72	0.47	0.00	
Israel	-0.14			-0.68	-0.54
Italy	0.35	0.11	-0.03	0.40	
Latvia	0.17				0.17
Lithuania	0.33	0.15		0.13	
Luxembourg	-0.10			0.11	-0.07
Netherlands	0.03	-0.17		0.12	0.48
Norway	0.06	0.13		-0.38	
Poland	0.52	0.29	-0.05		0.64
Portugal	0.20	0.21	-0.02	-0.23	
Romania	0.52	0.03	-0.15		
Russia	0.27	0.25	-0.04	0.33	
Slovakia	0.32	0.16	0.01	0.22	0.30
Slovenia	-0.02			0.23	
Spain	0.03	-0.29	-0.20	0.07	
Sweden	-0.05	-0.39		-0.19	-0.29
Switzerland	-0.14			-0.10	-0.23
Turkey	0.41	0.52	0.50	0.80	0.67
Ukraine	0.57	0.11	-0.13	0.48	0.39
United Kingdom	-0.04	-0.31		0.35	0.56
Rank correlation with average values of non-immigrants		*0.65****	*0.14*	*0.47***	*0.65****
Average of differences between average value preferences of non-immigrants and immigrants		*0.14*	*0.15*	*-0.04*	*-0.08*

Table A.11
Second-generation immigrants. Impact of mean tradition values of people born in 1936-1945 in a country of residence on the importance of tradition of first- and second-generation immigrants (born in 1946-1985).

	Dependent variable: Importance of tradition									
	(1) Results from Table 2.5 - Respondents born in a country, their parents too		*(2) 1st generation immigrants living in a country for up to 10 years*		*(3) 1st generation immigrants living in a country between 10 to 20 years*		*(4) 1st generation immigrants living in a country over 20 years*		*(5) 2nd generation immigrants*	
Estimation: STEP 1	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Gender (dummy, female=1)	**0.191** ***	0.000	**0.126** ***	0.048	**0.103** *	0.057	**0.115** **	0.046	**0.142** ***	0.027
Age	**0.014** ***	0.000	0.004	0.019	-0.025	0.021	0.007	0.022	-0.014	0.009
Age^2	0.0000	0.766	0.0000	0.000	0.0004	0.000	0.0000	0.000	**0.0003** **	0.000
Marital status (dummy, married=1)	**0.150** ***	0.000	**0.232** ***	0.056	**0.168** **	0.071	**0.199** ***	0.052	**0.114** ***	0.032
Having at least one child (dummy, at least one child=1)	**0.075** ***	0.000	**0.125** **	0.058	**0.260** ***	0.079	-0.010	0.066	**0.188** ***	0.037
Domicile (dummies):										
big city	**-0.217** ***	0.000	0.035	0.139	-0.184	0.231	-0.153	0.152	0.075	0.087
suburbs or outskirts of big city	**-0.141** ***	0.000	0.090	0.144	-0.298	0.236	-0.079	0.157	0.107	0.089
town or small city	**-0.146** ***	0.000	0.121	0.137	-0.294	0.230	-0.138	0.152	0.069	0.086
country village	**-0.080** ***	0.000	0.038	0.143	-0.188	0.234	-0.164	0.155	0.117	0.087
farm or home in countryside (omitted)										
Education (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	**-0.082** ***	0.000	**-0.219** ***	0.068	**-0.234** ***	0.077	**-0.144** **	0.062	**-0.103** **	0.041
tertiary	**-0.170** ***	0.000	**-0.447** ***	0.073	**-0.322** ***	0.090	**-0.280** ***	0.068	**-0.258** ***	0.044
Education of respondent's mother (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	**-0.031** ***	0.004	-0.091	0.072	-0.135	0.085	**-0.205** ***	0.068	**-0.079** **	0.036
tertiary	**-0.052** ***	0.001	-0.021	0.082	-0.032	0.109	**-0.261** ***	0.094	**-0.127** ***	0.049
Education of respondent's father (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	**-0.035** ***	0.001	-0.005	0.072	0.006	0.081	0.108	0.075	-0.001	0.036
tertiary	**-0.044** ***	0.002	-0.070	0.078	-0.155	0.098	0.068	0.082	-0.024	0.045
Religion (dummies):										
catholic	**0.653** ***	0.000	**0.473** ***	0.066	**0.589** ***	0.081	**0.568** ***	0.067	**0.760** ***	0.041
protestant	**0.580** ***	0.000	**0.605** ***	0.095	**0.811** ***	0.123	**0.604** ***	0.115	**0.564** ***	0.056
eastern orthodox	**0.387** ***	0.000	**0.685** ***	0.097	**0.573** ***	0.112	**0.540** ***	0.082	**0.564** ***	0.060
other christian	**0.410** ***	0.000	**0.593** ***	0.133	**0.298** *	0.178	**0.578** ***	0.164	**0.746** ***	0.105
jewish	**0.509** ***	0.000	**0.667** ***	0.172	**0.709** ***	0.172	**1.275** ***	0.184	**0.953** ***	0.102
muslim	**0.641** ***	0.000	**0.831** ***	0.080	**0.987** ***	0.095	**0.877** ***	0.092	**0.968** ***	0.085
none / other (omitted)										
Country fixed effect (sig.)	***		***		***		***		***	
Number of observations	87950		2447		1788		2722		7899	
Adj R-sq	0.17		0.15		0.18		0.12		0.15	
Spearman correlation of country fixed effects with the mean values of those born in 1946-1985	*0.81 (***)*		*not sig.*		*not sig.*		*not sig.*		*0.53 (***)*	
Estimation: STEP 2										
Mean values of people born in 1936-1945	**0.655** ***	0.115	**0.386** **	0.163	**0.452** **	0.180	**0.662** ***	0.217	**0.476** ***	0.159
Spearman correlation of mean values of those born in 1946-1985 vs. residuals	*not sig.*		*not sig.*		*not sig.*		*not sig.*		*not sig.*	
Quant. impact of an increase in mean values of those born in 1936-1945 by 1 std. dev.[1]										
As a fraction of 1 std. dev. in country FE[2] associated with values of those born in 1946-1985[2]	**0.72**		**0.26**		**0.25**		**0.34**		**0.57**	
As a fraction of 1 std. dev. in values of those born in 1946-1985[3]	**0.17**		**0.10**		**0.11**		**0.17**		**0.11**	
Number of observations	34		34		33		32		34	
R-sq	0.47		0.18		0.17		0.32		0.28	

Notes:[1]Standard deviation in the mean values of people born in 1936-1945: 0.310; [2]Standard deviation in the estimated fixed effects, 0.281, 0.462, 0.568, 0.609, 0.257 for specification (1)-(5), respectively; [3]Standard deviation in values of individuals in estimation sample for specification (1)-(5): 1.197, 1.248, 1.277, 1.236, 1.288, respectively.

Table A.12
Immigrants. Impact of mean tradition values of people born in 1936-1945 in a country of residence vs. country of origin on the importance of tradition of first- and second-generation immigrants (born in 1946-1985).

	Dependent variable: Importance of tradition									
	(1)		*(2)*		*(3)*		*(4)*		*(5)*	
	Respondents born in a country, their parents too		*1st generation immigrants living in a country for up to 10 years*		*1st generation immigrants living in a country between 10 to 20 years*		*1st generation immigrants living in a country over 20 years*		*2nd generation immigrants*	
Estimation: STEP 1	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE		
Gender (dummy, female=1)	**0.192** ***	0.029	**0.205** ***	0.064	**0.122** *	0.062	**0.189** ***	0.055	**0.175** *	0.089
Age	**0.011** ***	0.003	**0.045** *	0.024	-0.022	0.037	-0.004	0.036	-0.014	0.024
Age^2	0.0000	0.000	-0.0004	0.000	0.0003	0.000	0.0001	0.000	**0.0003**	0.000
Marital status (dummy, married=1)	**0.143** ***	0.014	0.130	0.087	**0.198** *	0.114	**0.209** ***	0.070	**0.179** **	0.078
Having at least one child (dummy, at least one child=1)	**0.106** ***	0.021	0.129	0.103	0.187	0.151	0.035	0.094	0.144	0.091
Domicile (dummies):										
big city	**-0.235** ***	0.047	**0.314** **	0.128	-0.043	0.265	0.010	0.165	**-0.454** *	0.229
suburbs or outskirts of big city	**-0.166** ***	0.039	0.077	0.220	-0.138	0.303	0.179	0.192	**-0.425** *	0.219
town or small city	**-0.149** ***	0.040	**0.374** **	0.158	-0.146	0.283	0.068	0.176	**-0.418** *	0.223
country village	**-0.083** **	0.040	0.180	0.148	-0.088	0.266	0.075	0.181	-0.301	0.222
farm or home in countryside (omitted)										
Education (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	-0.028	0.022	-0.206	0.177	-0.161	0.166	**-0.135** *	0.076	-0.111	0.093
tertiary	**-0.117** ***	0.029	-0.283	0.186	**-0.287** *	0.164	**-0.206** **	0.093	**-0.315** ***	0.109
Education of respondent's mother (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	0.007	0.024	0.041	0.095	-0.150	0.142	**-0.201** **	0.094	**-0.144** **	0.066
tertiary	0.018	0.033	**0.286** **	0.137	0.075	0.153	-0.097	0.131	-0.076	0.143
Education of respondent's father (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	-0.010	0.026	-0.021	0.069	0.006	0.145	0.027	0.074	-0.009	0.083
tertiary	-0.033	0.024	-0.199	0.174	**-0.353** **	0.157	-0.102	0.139	0.138	0.113
Religion (dummies):										
catholic	**0.487** ***	0.042	**0.554** ***	0.092	**0.652** ***	0.103	**0.616** ***	0.102	**0.536** ***	0.132
protestant	**0.581** ***	0.044	**0.872** ***	0.095	**0.957** ***	0.105	**0.581** ***	0.186	**0.347** ***	0.105
eastern orthodox	**0.500** ***	0.056	**0.424** ***	0.138	**0.624** ***	0.117	**0.614** ***	0.133	**0.393** ***	0.135
other christian	**0.375** ***	0.047	**0.910** ***	0.195	0.006	0.339	**0.823** ***	0.122	**0.229**	0.372
jewish	**0.632** ***	0.061	-0.111	0.261	0.223	0.194	0.018	0.138	**-0.119**	0.126
muslim	**0.642** ***	0.084	**1.053** ***	0.195	**0.884** ***	0.248	**0.764** ***	0.126	**0.759** ***	0.154
none / other (omitted)										
Mean values of people born in 1936-1945 in a country of residence	**0.6867** ***	0.087	**0.407** *	0.204	0.1808	0.186	**0.4093** **	**0.153**	**0.3729** **	0.139
Impact of 1 std. dev. change in values of "old" people in a country of residence as a % of variation in individual values	0.18		0.10		0.04		0.10		0.09	
Mean values of people born in 1936-1945 in a country of origin			**0.702** ***	0.140	**0.5131** **	0.254	0.2832	0.190	-0.111	0.254
Impact of 1 std. dev. change in values of "old" people in a country of origin as a % of variation in individual values			0.18		0.13		0.07		0.03	
Number of observations	87950		830		651		1249		1000	
Number of countries of residence in a sample	34		30		30		30		27	
R-sq	0.15		0.21		0.21		0.13		0.12	

Chapter 3

Traditional Values vs. Female Labor Force Participation

Abstract
In this chapter, I use data from the European Social Survey to look at the role of traditional culture in explaining variation in the labor supply of second-generation immigrant women. I show that it is the culture of the country of residence rather than the culture of the country of origin that affects the labor participation decision of daughters of immigrants, which suggests that cultural assimilation occurs with migration. Measures of individual tradition preferences are not statistically significant in explaining the variation in labor force participation decisions. When, however, these are expressed in terms of an individual cultural shift from the representative culture in a country of origin relative to the cultural distance between country of origin and of residence, they have a statistically significant impact on the labor participation status of second-generation immigrant women.

Abstrakt
V téhle kapitole jsou použity data z dotazníkového šetření European Social Survey na analýzu faktorů ovlivňujících účast žen z druhé generace imigrantů na trhu práce, s důrazem na určení vlivu kultury. Výsledky ukazují, že rozhodnutí těchto žen je ovlivněno hlavně kulturou země, ve které žijí a ne kulturou země, ze které pocházejí. Individuální měřítko jejich tradičních preferencí není statisticky průkazné pro vysvětlení variace v účasti na trhu práce, což ale neplatí v případě, kdy jsou individuální tradiční preference vyjádřeny ve smyslu „individuálního posunu od původní kultury“, tj. jako rozdíl individuálního měřítka od reprezentativního měřítka původní kultury, relativně vůči rozdílu mezi měřítkami kultury země původu a země pobytu.

Keywords: values, Schwartz’s human value scale, cultural assimilation, culture and economics
JEL Classification: A12, A13, I21, Z10

3.1 Introduction

In this chapter, I use data from the European Social Survey to look at the role of traditional values in explaining variation in the labor participation decisions of second-generation immigrant women. The work is motivated by other literature on the topic which shows that a culture of origin matters for the decisions of (second-generation) immigrants in a quantitatively important way (Fernandez 2007, Fernandez and Fogli, 2009) even though its impact is weakening across generations (Blau et al., 2008). Unlike the existing literature that represents (traditional) culture by country dummies, answers to attitudinal questions from surveys, labor participation rates, or fertility rates, I employ the specific the concept of *cultural values* from cross-cultural psychology research (Schwartz, 1992) that is designed to study cross-country differences in cultures. These data allow me to extend the scope of the analysis: besides assessing the impact of culture-of-origin versus culture-of-residence on women's labor participation decisions, I also examine the effect of *individual cultural assimilation.*

This chapter complements the findings from the previous chapter (Chapter 2), in which we show that for immigrants who have lived relatively briefly in their country of residence, the representative traditional values of the country of origin[1] explain a significant portion of the variation in individual traditional values of immigrants. However, for immigrants who live in their country of residence for more than 20 years and for second-generation immigrants, representative traditional values in the country of origin become less relevant and their individual traditional preferences appear to adapt to the prevailing "cultural standard" of the country of residence.

The results of this chapter imply that the labor market outcomes of second-generation immigrant women are not affected by the culture of origin, but rather by the culture of residence.[2] The latter effect is significant even when controlling for other measures of economic/institutional environment in the country of residence. Distinguishing between women with both parents of the same origin and women with

[1] The representative traditional values of a country are defined as the average of the tradition preferences of the generation of people born between 1936-1945.

[2] The culture of origin is found to be a significant determinant only in a separate analysis of women with both parents coming from the same origin.

parents of different origins − one native and one from abroad − I find that the effect of culture of residence is significant for women with parents of mixed origins. Distinguishing even further according to the country of origin/residence of a woman's mother and father, I find that the culture of residence matters if the woman's mother comes from the country of residence while her father is born elsewhere and not vice versa, which suggests that a woman's mother is likely to play a more important role than her father in the transmission of culture. Individual measures of the importance of tradition are not found to be statistically significant in explaining the variation in individual labor participation decisions. When, however, these individual measures of tradition preferences are expressed in terms of an individual *shift* from the representative traditional culture in a country of origin relative to the cultural distance between country of origin and of residence, they have a statistically significant impact on the labor participation status of second-generation immigrant women. A one standard deviation difference in a respondent's *indicator of cultural shift* corresponds to a 2.5% change in the probability of being in the labor force.

This chapter is organized as follows. The next section provides brief overview of the existing literature. Section 3.3 describes the estimation framework and the data. Section 3.4 discusses the results of the analysis, and Section 3.5 concludes.

3.2 Overview of Literature

Studying the economic outcomes of (second-generation) immigrants to evaluate the effect of culture has become good practice in the economic literature. In this way it is possible to study the effect of differing cultural backgrounds for individuals who face the same economic and institutional environment and thereby to identify the effect of culture.

Among the first studies to use this approach were Carroll, Rhee, and Rhee (1994, 1999) who looked at the saving rates of immigrants to Canada and the US, respectively, to examine whether the heterogeneity in saving rates can be explained by cultural heritage. In the first study, they capture culture by dummy variables associated with the

regions, not countries, of origin and do not find them to have a significant impact on the saving rates of immigrants to the US. The authors attribute the results to data restrictions. In the latter study of immigrants to Canada, they find that their cultural background, as captured by dummies for countries of origin, has an effect on saving rates, but the impact does not correspond to the differences in saving rates across countries of origin. Carroll, Rhee, and Rhee (1999) suggest that there are various mechanisms of selection-into-immigration responsible for this result.

The largest fraction of the literature, however, studies the outcomes of women. Fernandez (2007) and Fernandez and Fogli (2009) study fertility and the labor market outcomes of second-generation immigrants in the US. The authors use past fertility rates and the labor force participation of women in countries of ancestry as the cultural proxies to predict hours of work and fertility for second-generation immigrant women in the US. Given that the economic and institutional conditions in a country of ancestry are no longer relevant for children of immigrants, the authors infer that only cultural information contained in the past female labor force participation rates and fertility rates should be relevant. They find that cultural origin is indeed an important determinant of women's labor supply and fertility. Alesina and Guiliano (2007) study the impact of the structure of family relationships on outcomes such as the labor force participation of women or home production. They use data from the World Value Survey to infer the level of family ties in ancestries of US second-generation immigrants. Their results show that stronger family ties imply lower labor force participation and higher home production. Algan and Cahuc (2005) explain the employment status of individuals residing but not born in the US by the fixed effects associated with family attitudes across countries of origin.

Several studies also look at the strength of the cultural effect if culture of origin is represented by both parents rather than by one parent. Gevrek, Gevrek and Gupta (2010) follow the estimation strategy employed by Fernandez and Fogli (2009) and use labor force participation and total fertility rate in the country of ancestry as the cultural proxies to explain hours per week worked by second-generation immigrant women. Their analysis shows that the impact of cultural proxies is larger for women whose

mother and father come from the given origin than for those with intermarried parents. Distinguishing between a mother's and a father's country of origin, the authors also find that a father's culture play more important role than a mother's culture. Blau, Kahn, Liu and Papps (2008) analyze time series data and find that the fertility, education levels, and labor supply of second-generation immigrants are strongly affected by those of their parents. They find that for individual labor supply, mothers' labor supply has a larger effect than that of fathers. On the other hand, for education outcomes, a father's education is found to have a stronger effect that that of the mother. Analyzing the persistence of schooling, labor supply, and fertility, the authors conclude that considerable assimilation toward native levels of schooling and labor supply occurs while the fertility patterns appear to be more stable.

3.3 Data and Analytical Framework

I use data on female respondents in the European Social Survey (ESS) - a survey administered in European countries regularly every 2 years. Survey respondents are asked whether their mother and father were born in the country of the respondent's residence or abroad and if the latter, from which country they came from. Respondents in the first round of ESS were only asked about the continent of birth of their parents; therefore I use rounds 2-4, administered in 2004, 2006 and 2008, to construct the sample. Based on the parents' country of birth I distinguish the second-generation immigrant women whose both parents were born abroad, and those who had one parent born abroad and one in the woman's country of residence. I constrain the age of women to be 25-55 years, as most of the women in this age range have finished their education but have not retired yet.

In the baseline model, the country of origin of a woman is assigned predominantly as her mother's country of birth if she was born abroad. If a woman's mother was born in the country of the woman's residence, the woman's origin is assigned based on her father's country of birth. In further analysis I reverse this definition and also define countries of origin according to a woman's mother and father separately.

To define the labor force participation status of a woman, I construct the 0/1variable based on a description of her main activity in the last 7 days. The variable is coded as 1 if she chose as her main activity either "In paid work (or away temporarily) (employee, self-employed, working for your family business)"; or "Unemployed and actively looking for a job"; the variable is coded as 0 if she chose "Unemployed, wanting a job but not actively looking for a job", or "Doing housework, looking after children or other persons" as the main activity.[3]

To "measure" culture, I use the *Portrait Value Questionnaire* (Schwartz, 1992) − a 21-item questionnaire included in the ESS designed to study cross-country differences in cultures. For the purpose of this chapter, I focus on one item, *tradition*, which captures respect, commitment and acceptance of customs set in the past, handed down by religion or family. In the questionnaire, it is described as follows: "Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family". Indeed, this is a fairly general description not related to a specific action or situation.[4] In answering, a respondent identifies himself/herself with the person in the description by choosing one of six options: 1. *very much like me*, 2. *like me*, 3. *somewhat like me*, 4. *a little like me*, 5. *not like me*, 6. *not like me at all*.[5] The respondent might consider a whole range of situations in which traditional customs may play a role[6], with female labor market participation being just one of them. This contrasts with attitudinal questions, in which the respondent is asked to rate the specific claim, such as "the woman should cut down on paid work for family" where she is likely to draw on fer own experience. Therefore, I argue that data on tradition preferences are less prone to endogeneity with respect to work decisions.

[3] I do not include observations where the main activity in the last 7 days was education, retirement, being sick or disabled, community or military service, or other. The number of such observations, in any case, is limited (8% of all observations) given the constraints on the age of the women in the sample.

[4] According to Schwartz (1992), values are defined as personal beliefs, desirable goals, principles that guide the selection or evaluation of actions, people, events. Values are abstract goals; they do not refer to specific actions or situations. This distinguishes them from norms or attitudes.

[5] In the original dataset, the rating is ordered by a number from 1 to 6. I change this scale from 1 (very much like me) to 6 (not like me at all) to its reverse so that the lower figure would indicate lower importance.

[6] These situations may include marriage decisions, church attendance, labor market participation, occupation choices, decisions about having children, propensity to divorce, etc.

Another advantage of having the complete 21-item questionnaire on values is the possibility to account for individual tendencies to over- or under-emphasize their preferences.[7] By using the whole coherent 21-item questionnaire, it is possible to determine the scale use of the respondent as the average over all responses in the questionnaire. Consequently, by centering individual response to tradition item around this average, I obtain the relative importance of tradition. This way, a positive figure implies that tradition is important for an individual, in relative terms, while a negative figure indicates that tradition is less important or unimportant for an individual. Such rescaled responses are more meaningful for comparison across individuals and across countries.[8] On a country level, averaging the individual relative preferences of tradition provides a measure of how important, in relative terms, is tradition considered to be on the national level. Again, a positive figure indicates that the tradition value is, on average, important for individuals living in a given country. Finally, with rescaling, I obtain a smooth distribution of the tradition preferences as opposed to the original discrete scale.

For each country, I define the representative traditional culture as the average tradition preferences of the native older generation, i.e. of individuals born in a country in 1936-1945, whose parents were also born in the same country. For the sample of second-generation women, I utilize these averages to characterize her culture of origin as well as her culture of residence. As the European Social Survey is administered in the European countries only, the sample of second-generation immigrants include only those whose parents come from another European country. Although European countries differ from one another in cultural respects, the variation may not be as big as if I were to account for other, non-European countries.

[7] Looking at all 21 responses per individual, I was able to assess data reliability. I took into account only those individuals who responded to at least 19 out of 21 items (approx. 90%). I also excluded those who chose the same answer for 16, 17 and 18 responses, respectively, while filling 19, 20 and 21 items, respectively.

[8] Raw data across countries differ significantly in terms of scale use. For instance, on a national level, respondents in Greece or Turkey use the "like me" part of the scale more frequently, while respondents in Norway or Sweden use the "not like me" side of the scale more often.

The maximum number of observations in this study is 1764.[9] However, the analysis is always performed first on the subsample, in which there are at least 10 observations for a given combination of country of origin and country of residence, i.e. on 1238 observations. This subsample is also used for cross-country comparison of the importance of tradition preferences and of female labor outcomes. Using the full sample does not alter the results.

To analyze the determinants of the labor force participation decisions of a second-generation immigrant woman $\boldsymbol{i}$ from origin $\boldsymbol{O}$ residing in a country $\boldsymbol{R}$, $\boldsymbol{LFP_{iOR}}$, I estimate the following probit model, assuming a linear-in-the parameters specification:

$$\boldsymbol{LFP_{iOR}} = \Phi(\alpha + \beta_O \boldsymbol{T_O} + \beta_C \boldsymbol{T_C} + \boldsymbol{z_I}\gamma + \boldsymbol{u_{iOC}})$$

where $\boldsymbol{T_o}$ represents the culture of the country of origin, defined as the mean importance of tradition for people born in 1936-1945 in the country of origin and residing there, $\boldsymbol{T_R}$ represents the culture of the country of residence as the mean importance of tradition for people born in 1936-1945 in the country of residence and residing there; and $\boldsymbol{z_I}$ represent individual socio-demographic characteristics, varying with the specifications.

The standard errors are corrected for clustering for combinations of country of origin vs. country of residence. For comparability reasons, in the analysis I always standardize cultural variables $\boldsymbol{T_o}$ and $\boldsymbol{T_R}$ to have a mean of 0 and a standard deviation of 1 and I report the results in terms of a one standard deviation change.

Table 3.1 shows the distribution of 1238 observations of second-generation women based on the combinations of country of origin vs. country of residence. In total, there are 21 countries of origin and 23 countries of residence.

[9] Out of the total of 1764 observations, 395 women have both parents born in the same foreign country, 82 women have both parents born in different foreign countries, 653 women have their father born abroad, while their mother is born in the country of the respondent's residence, 634 women have their mother born abroad and their father born in the country of residence.

Table 3.1
Second-generation immigrant women according to country of origin and country of residence. Number of observations.

	Country of residence																						
Origin	**AT**	**BE**	**CH**	**CZ**	**DE**	**DK**	**EE**	**FR**	**GB**	**GR**	**IE**	**IL**	**LT**	**LU**	**LV**	**NL**	**NO**	**PL**	**RU**	**SE**	**SI**	**SK**	**UA**	**Total**
AT			28																					28
CZ	15				24																	27		66
DE	16		54			12								13		22		11		17				145
DK																	13							13
ES			11					13																24
FI																				34				34
FR		20	29																					49
GB											20													20
HR																					18			18
HU	10																					12		22
IE									31															31
IT	15	21	77					28						11										152
NL		12																						12
PL					34							30											13	77
PT								12																12
RO	10											14												24
RU							176						10		80								116	382
SE																	12							12
SK				42																				42
TR										20														20
UA							24								11				20					55
Total	66	53	199	42	58	12	200	53	31	20	20	44	10	24	91	22	25	11	20	51	18	39	129	1238

Note: At least 10 observations per combination of country of origin, country of residence

Before proceeding with the analysis I look at the labor force participation and tradition preferences of second-generation immigrant women according to the country of origin and the country of residence and compare it with the data on native women, aged 25-55, in the particular country of origin/residence (see Table 3.2). Looking at the averages and standard deviations across all individuals, both the labor force participation outcomes and tradition preferences are, on average, similar between second-generation immigrants and non-immigrants. Looking at the comparison by country, however, for most origins, second-generation immigrant women have on average lower tradition preferences and higher labor force participation than their counterparts in their country of origin. The correlation between the average tradition preferences of second-generation immigrants and those of their counterparts in the country of origin (0.22) is much lower than the correlation between the average tradition preferences of second-generation immigrants and those of non-immigrants in a country

Table 3.2
Second-generation immigrants across countries of origin and residence- comparison.

		2nd generation Immigrants		Natives				2nd generation Immigrants		Natives	
Origin	**Observations**	**Tradition preference**	**Labor force participation**	**Tradition preference**	**Labor force participation**	**Residence**	**Observations**	**Tradition preference**	**Labor force participation**	**Tradition preference**	**Labor force participation**
Austria	28	-0.21	0.89	-0.11	0.77	Austria	66	-0.18	0.77	-0.11	0.77
Croatia	18	-0.27	0.89	0.57	0.79	Belgium	53	0.07	0.79	-0.11	0.80
Czech Republic	66	-0.04	0.73	0.11	0.80	Czech Republic	42	0.13	0.81	0.11	0.80
Denmark	13	-0.23	1.00	0.45	0.92	Denmark	12	0.31	0.75	0.45	0.92
Finland	34	-0.44	1.00	-0.03	0.89	Estonia	200	-0.04	0.89	0.01	0.84
France	49	-0.39	0.69	-0.55	0.86	France	53	-0.01	0.85	-0.55	0.86
Germany	145	-0.17	0.73	-0.28	0.75	Germany	58	-0.26	0.83	-0.28	0.75
Hungary	22	-0.03	0.82	0.01	0.74	Greece	20	0.49	0.70	0.35	0.63
Ireland	31	0.22	0.58	0.20	0.62	Ireland	20	-0.59	0.50	0.20	0.62
Italy	152	-0.18	0.74	0.22	0.70	Israel	44	-0.94	0.84	-0.09	0.55
Netherlands	12	0.36	0.83	-0.06	0.66	Latvia	91	0.21	0.87	0.30	0.85
Poland	77	-0.38	0.86	0.68	0.74	Lithuania	10	0.00	1.00	0.47	0.85
Portugal	12	0.15	0.83	0.05	0.81	Luxembourg	24	0.45	0.63	0.03	0.65
Romania	24	-0.62	0.75	0.54	0.70	Netherlands	22	-0.12	0.45	-0.06	0.66
Russia	382	0.17	0.85	0.26	0.85	Norway	25	-0.18	0.88	0.21	0.86
Slovakia	42	0.13	0.81	0.32	0.80	Poland	11	0.71	0.91	0.68	0.74
Spain	24	-0.61	0.88	-0.16	0.70	Russia	20	0.55	0.85	0.26	0.85
Sweden	12	-0.13	0.75	0.01	0.96	Slovakia	39	0.11	0.69	0.32	0.80
Turkey	20	0.49	0.70	0.49	0.15	Slovenia	18	-0.27	0.89	-0.09	0.81
Ukraine	55	0.09	0.85	0.60	0.73	Sweden	51	-0.44	1.00	0.01	0.96
United Kingdom	20	-0.59	0.50	-0.30	0.76	Switzerland	199	-0.45	0.74	-0.28	0.69
						Ukraine	129	0.43	0.78	0.60	0.73
						United Kingdom	31	0.22	0.58	-0.30	0.76
Total	1238					*Total*	1238				
Average [1]		*-0.06*	*0.80*	*0.09*	*0.75*	*Average* [1]		*-0.06*	*0.80*	*0.09*	*0.75*
Std.dev. [2]		*1.21*	*0.40*	*1.18*	*0.43*	*Std.dev.* [2]		*1.21*	*0.40*	*1.18*	*0.43*
Correlation [3]		*0.22*	*0.34*			*Correlation* [3]		*0.51*	*0.60*		

Notes: [1,2]Average and standard deviation from individual data; [3]Correlation of tradition preferences between second-generation immigrant women and non-immigrant women living in a country of origin and non-immigrant women living in a country of residence.

of residence (0.51). Similarly, for labor market outcomes, the correlation of labor market status averages of the second-generation immigrant women and their counterparts in a country of origin is 0.34, while the correlation is as high as 0.60 when the comparison is based on country of residence. This suggests that assimilation occurs both on a cultural and an economic level.

3.4 Results

3.4.1 Culture of country of origin versus culture of country of residence

I run the probit model, explaining a woman's labor force participation status with two cultural variables: the average tradition preferences of the older generation in her country of origin, and the average tradition preferences of the older generation in her country of residence; and with a range of additional factors added gradually to the specification.[10] These factors include the woman's educational background and that of her parents and her partner, the woman's mother's employment status when the respondent was 14 years old, and a dummy to control for the presence of a child less than 6 years old in the household.

Table 3.3 shows that over all specifications, the variable reflecting traditional culture of the country of origin is not found to have a significant impact on the labor participation status of second-generation immigrant women, while the variable capturing culture in the country of residence has a stable, negative effect on labor force status, significant at the 5 or 10% level. Columns (1) and (2) capture the partial correlation between the probability of participating in the labor force and the representative measures of tradition value in countries of origin and of residence[11],

[10] For better comparison, the cultural variables (average tradition preferences of the older generation in the country of origin and in the country of residence, individual tradition preferences) have been standardized to have a mean of 0 and a standard deviation of 1.

[11] Apart from culture variables I control for a respondent's age and for an indicator of whether the woman resides in a big city or not. Ideally, one would control for regional characterisitcs by including regional dummies. Because of the limited number of observations, I control for the size of the area where the woman lives. Original data contain 5 categories for the size of the area of residence: big city, its suburbs, small city, country village, and farms. Except for the first category, none of the others is significant in various specifications, therefore I keep only one category (big city) to define the size of residence area.

respectively: a one standard deviation increase in the mean tradition preferences of the older generation in a country of residence is associated with a 2.8% decrease in the probability of participating in the labor force. Column (3) contains the specification with both country of origin and country of residence measures of tradition preferences, with the coefficients unchanged from (1) and (2).

To account for the variation in female labor outcomes that is due to her background, in column (4) I include dummies for the level of attained education of the respondent's parents. The coefficients on both secondary and tertiary education of the respondent's mother are significant and of similar magnitude: having a mother with higher than primary education increases the probability of her daughter's labor force participation by 6-7%. The effect of parental education, when included alone, should capture both the direct effect of a woman's background that may affect her daughter's probability of working, for instance through her personality traits, and the effect operating through the daughter's own education. After including the dummies capturing the woman's level of education into the specification, (see column 5), the coefficients on the mother's education decrease and become insignificant, suggesting that it is predominantly the direct effect of a woman's education that affects her labor market outcomes. Secondary and tertiary education is associated with a 13% and 20% increase in the probability of being in the labor force.

In columns (6) and (7), I include two additional factors that are likely to affect a woman's working decisions. In column (6), I control for the mother's employment status when the respondent was 14 years old. The effect of this proxy is significant: having a working mother increases the daughter's probability of participating in the labor force by 10%, everything else equal. In column (7), I control for the presence of a child less than 6 years old as this is likely to affect labor force participation. The effect of this dummy is strong; having a child less than 6 years old decreases the probability of working by 33%. Nevertheless, the effect of culture in the country of residence remains of the same size. In the *full* specification (column 8), I control for the standardized measure of individual traditional values. Perhaps surprisingly, it is not found to be significant in explaining the labor force participation status of a woman.

Table 3.3

The impact of traditional culture of country of origin versus culture of country of residence on the labor participation status of second-generation immigrant women.

	Dependent variable: female labor force participation status probit model- marginal effects											
	(1)		(2)		(3)		(4)		(5)		(6)	
	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE
Average mean tradition preference of those born in 1946-1985 in a country of origin	0.012	0.018			0.014	0.019	0.014	0.019	0.011	0.019	0.005	0.018
Average mean tradition preference of those born in 1946-1985 in a country of residence			**-0.028** *	0.015	**-0.029** *	0.015	**-0.029** **	0.014	**-0.031** **	0.015	**-0.031** **	0.014
Respondent's tradition preference												
Age	**0.004** **	0.002	**0.004** **	0.002	**0.004** **	0.002	**0.005** ***	0.002	**0.005** ***	0.002	**0.005** ***	0.002
Domicile (dummy, big city=1):	**0.085** ***	0.028	**0.098** ***	0.028	**0.093** ***	0.029	**0.085** ***	0.030	**0.078** **	0.030	**0.072** **	0.029
Education (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary									**0.128** ***	0.044	**0.120** ***	0.043
tertiary									**0.196** ***	0.041	**0.185** ***	0.041
Education of respondent's father (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary							0.025	0.037	-0.005	0.029	-0.003	0.029
tertiary							0.020	0.036	-0.026	0.036	-0.017	0.036
Education of respondent's mother (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary							**0.075** **	0.032	0.041	0.030	0.023	0.032
tertiary							**0.059** *	0.035	0.002	0.041	-0.023	0.045
Mother's employment status when respondent is 14 years old											**0.102** ***	0.027
Presence of a child aged less than 6 years in a household												
Education of respondent's partner (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary												
tertiary												
Number of observations	1238		1238		1238		1238		1238		1238	
Pseudo R-sq	0.02		0.02		0.02		0.03		0.05		0.06	

Notes: For dummy variable, dF/dx corresponds to discrete change from 0 to 1. The cultural indicators have been standardized to mean 0 and standard deviation 1. Specifications (1)-(6): at least 10 observations for a combination of country of origin and country of residence.

Table 3.3, cont.

	Dependent variable: female labor force participation status probit model- marginal effects									
	(7)		(8)		(9)		(10)		(11)	
	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE
Average mean tradition preference of those born in 1946-1985 in a country of origin	-0.003	0.019	-0.002	0.019	0.006	0.029	0.003	0.028	-0.013	0.014
Average mean tradition preference of those born in 1946-1985 in a country of residence	**-0.031** **	0.015	**-0.028** *	0.015	**-0.031** *	0.017	**-0.030** *	0.016	**-0.030** **	0.013
Respondent's tradition preference			-0.017	0.014	-0.010	0.020	-0.011	0.020	-0.015	0.011
Age	-0.001	0.001	-0.001	0.002	-0.003	0.002	-0.003	0.002	0.000	0.001
Domicile (dummy, big city=1):	**0.070** **	0.028	**0.069** **	0.028	**0.075** *	0.044	**0.079** *	0.042	**0.050** **	0.024
Education (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	**0.110** ***	0.038	**0.110** ***	0.038	**0.106** **	0.054	**0.102** *	0.055	**0.091** ***	0.030
tertiary	**0.181** ***	0.040	**0.179** ***	0.039	**0.201** ***	0.048	**0.217** ***	0.050	**0.183** ***	0.033
Education of respondent's father (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	0.009	0.028	0.009	0.028	0.019	0.043	0.021	0.043	-0.024	0.024
tertiary	-0.024	0.037	-0.025	0.037	-0.063	0.069	-0.048	0.068	-0.010	0.031
Education of respondent's mother (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	0.025	0.033	0.024	0.034	0.041	0.050	0.044	0.050	0.039	0.025
tertiary	-0.015	0.047	-0.014	0.048	0.004	0.073	0.017	0.071	-0.013	0.037
Mother's employment status when respondent is 14 years old	**0.102** ***	0.027	**0.101** ***	0.027	**0.095** ***	0.038	**0.093** **	0.038	**0.109** ***	0.022
Presence of a child aged less than 6 years in a household	**-0.320** ***	0.034	**-0.317** ***	0.035	**-0.338** ***	0.046	**-0.334** ***	0.047	**-0.287** ***	0.028
Education of respondent's partner (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary							0.028	0.039		
tertiary							-0.042	0.042		
Number of observations	1238		1238		746		746		1764	
Pseudo R-sq	0.14		0.14		0.14		0.14		0.14	

Notes: For dummy variable, dF/dx corresponds to discrete change from 0 to 1. The cultural indicators have been standardized to mean 0 and standard deviation 1. Specifications (2)-(8): at least 10 observations for a combination of country of origin and country of residence. (9), (10): observations for which parent's education is available. (11): all available observations.

Up to this point I did not control for the characteristics of a woman's partner. The ESS survey does not contain information on partners' income; only information on his education is available, but for a much smaller size of the sample. Nevertheless, as the characteristics of a woman's partner are likely to influence woman's labor force participation, I evaluate the effect of his education. Because of the associated sample reduction, I first rerun the "full" specification on the constrained sample (746 observations) for which I have information on the partner's education. Column (9) shows that the results are very similar to the ones obtained previously. After including dummies for the partner's education (column 10), which turn out to be insignificant, only the coefficient on tertiary education of the woman increases slightly, which suggests that in the absence of a partner's characteristics, a woman's education picks up the negative effect of his education (and income), as more educated women are likely to be matched with more educated men.[12]

The results in columns (1)-(10) are all based on a sample in which there are at least 10 observations for a given combination of country of origin and country of residence. Finally, I run the *full* specification probit on the unconstrained sample and obtain very similar results (column 11). In summary, for second-generation immigrants, regardless of their country of origin, a one standard deviation increase in average tradition preferences in a country of residence, holding all other variables at their mean, is associated with a 3% decrease in the probability of being in the labor force.

3.4.2 Other possible country-of-residence determinants of labor market outcomes

The significance of the effect of culture in the country of origin in explaining the labor force participation decision of second-generation immigrant women may be caused by other than cultural factors, possibly correlated with culture, such as specific economic or institutional conditions in the country of residence. In this section, I examine the impact of three macroeconomic indicators of the countries of residence in the year shortly

[12] I also accounted for a woman's partner's labor force participation dummy defined in the same way as a woman's LFP. Additionally, I also accounted for a variable capturing whether the partner currently works or not. None of these has proven to be significant in explaining a woman's LFP status.

preceding the administration of waves the 2-4 of European Social Survey: GDP per capita in 2000, female labor force participation in 2000, and the difference between male and female labor force participation in 2000.

Table 3.4 summarizes the results. Not controlling for the measure of traditional culture in a country of residence, the effect of GDP per capita in 2000 is not significant (see column 1). After accounting for both the measure of traditional culture and GDP per capita in 2000, the effect of the cultural factor remains significant. The rate of female labor force participation in a country of residence (columns 3 and 4) shows no impact on the probability of being in the labor force among second-generation immigrants. This supports the suggestion of Blau et al. (2008) to work with the difference between male and female labor force participation rates instead. Indeed, this variable is more likely to accurately reflect the economic and institutional conditions related to labor markets that second-generation immigrant women are facing. The results in columns (5) and (6) show its significant negative effect: a one standard deviation increase (approximately 3.5 percentage points) in the difference between male and female labor force participation is associated with a decrease in the probability of participating in the labor market by 6%. Nevertheless, traditional culture in a country of residence remains a significant determinant of labor force participation: a one standard deviation increase in the tradition preferences of the older generation across countries of residence accounts for a 3.6% increase in the probability of being in the labor force, everything else equal.

3.4.3 Common culture vs. mixed culture and mother's vs. father's culture

In the previous analysis, a woman's country of origin is defined, when available, based on her mother's country of birth. This means that for women with a mother born in the country of residence and a father born abroad, the country of origin is assigned based on the woman's father's country of birth. Inverting the definition, hence attributing country of origin predominantly to the father, does not affect the results (see column 1 in Table 3.5). Intuitively, if both parents were born abroad in the same country, the values of the culture of origin are more likely to get transmitted from parents to their daughter. Also,

Table 3.4
Culture in the country of origin vs. economic/institution variables.

	Dependent variable: female labor force participation status probit model- marginal effects											
	(1)		(2)		(3)		(4)		(5)		(6)	
	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE
Average mean tradition preference of those born in 1946-1985 in a country of origin	-0.006	0.018	-0.014	0.018	-0.003	0.017	-0.003	0.018	-0.006	0.013	-0.005	0.014
Average mean tradition preference of those born in 1946-1985 in a country of residence			**-0.046** ***	0.014			**-0.029** **	0.014			**-0.033** **	0.017
GDP per capita in 2000, country of residence	-0.010	0.018	**-0.038** **	0.015								
Female labor force participation in 2000, country of residence					0.002	0.015	-0.005	0.016				
Male minus female labor force participation in 2000, country of residence									**-0.056** ***	0.015	**-0.058** ***	0.015
Respondent's tradition preference	**-0.023** *	0.013	-0.015	0.011	-0.022	0.014	-0.017	0.014	**-0.025** *	0.014	-0.019	0.014
Age	-0.001	0.002	-0.001	0.002	-0.001	0.002	-0.001	0.002	-0.001	0.002	-0.001	0.002
Domicile (dummy, big city=1):	**0.060** **	0.027	**0.058** **	0.028	**0.064** **	0.027	**0.068** **	0.027	**0.055** **	0.027	**0.061** **	0.028
Education (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	**0.108** ***	0.039	**0.103** ***	0.038	**0.110** ***	0.039	**0.111** ***	0.038	**0.106** ***	0.033	**0.106** ***	0.032
tertiary	**0.174** ***	0.041	**0.172** ***	0.040	**0.176** ***	0.042	**0.180** ***	0.040	**0.156** ***	0.041	**0.158** ***	0.039
Education of respondent's father (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	0.015	0.030	0.008	0.028	0.014	0.030	0.010	0.028	0.022	0.029	0.015	0.027
tertiary	-0.024	0.036	-0.019	0.036	-0.027	0.036	-0.023	0.036	-0.021	0.036	-0.021	0.036
Education of respondent's mother (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	0.023	0.034	0.015	0.033	0.025	0.034	0.025	0.034	0.021	0.033	0.019	0.033
tertiary	-0.029	0.049	-0.020	0.048	-0.026	0.050	-0.012	0.049	-0.058	0.050	-0.045	0.051
Mother's employment status when respondent is 14 years old	**0.096** ***	0.027	**0.085** ***	0.026	**0.099** ***	0.029	**0.103** ***	0.028	**0.072** ***	0.026	**0.072** ***	0.026
Presence of a child aged less than 6 years in a household	**-0.314** ***	0.036	**-0.317** ***	0.035	**-0.314** ***	0.036	**-0.318** ***	0.036	**-0.321** ***	0.034	**-0.323** ***	0.034
Number of observations	1238		1238		1238		1238		1238		1238	
Pseudo R-sq	0.14		0.15		0.14		0.16		0.16		0.16	

Notes: For dummy variable, dF/dx corresponds to a discrete change from 0 to 1.

Table 3.5
Common culture vs. mixed culture and mother's vs. father's culture – impact on labor force participation.

	Dependent variable: female labor force participation status probit model- marginal effects											
	(1)		(2)		(3)		(4)		(5)		(6)	
	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE
Average mean tradition preference of those born in 1946-1985 in a country of origin	0.001	0.019										
origin = mother's or father's country of birth			-0.017	0.018								
origin = mother's and father's country of birth			-0.011	0.019	-0.009	0.019					**-0.041** **	0.022
origin = mother's country of birth					-0.021	0.020	-0.009	0.022				
origin = father's country of birth					-0.010	0.020			-0.006	0.020		
Average mean tradition preference of those born in 1946-1985 in a country of residence	**-0.030** ***	0.016										
residence =father's or mother's country of birth			**-0.033** **	0.013								
residence = respondent's country of birth			-0.019	0.016	-0.019	0.016					**-0.042** **	0.021
residence = father's country of birth					-0.014	0.014	-0.012	0.017				
residence = mother's country of birth					**-0.041** ***	0.015			**-0.046** **	0.020		
Respondent's tradition preference	-0.014	0.015	-0.014	0.010	-0.014	0.010	-0.026	0.017	-0.020	0.016	0.011	0.018
Age	-0.001	0.002	0.000	0.001	0.000	0.001	-0.001	0.002	0.002	0.002	0.000	0.002
Domicile (dummy, big city=1):	**0.064** **	0.028	**0.055** ***	0.020	**0.055** ***	0.020	**0.078** **	0.033	0.028	0.034	**0.059** *	0.033
Education (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	**0.100** ***	0.038	**0.094** ***	0.027	0.091 ***	0.027	0.056	0.049	**0.108** **	0.043	**0.102** **	0.048
tertiary	**0.173** ***	0.041	**0.182** ***	0.031	**0.182** ***	0.031	**0.173** ***	0.057	**0.191** ***	0.048	**0.174** ***	0.054
Education of respondent's father (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	-0.001	0.029	-0.024	0.027	-0.022	0.027	-0.054	0.042	0.040	0.044	-0.057	0.050
tertiary	-0.022	0.038	-0.013	0.032	-0.010	0.032	**-0.108** **	0.054	**0.096** *	0.048	-0.048	0.078
Education of respondent's mother (dummies):												
up to secondary (omitted)												
upper (post) secondary, not tertiary	0.041	0.033	0.045	0.024	**0.043** *	0.024	**0.067** *	0.038	0.034	0.039	0.017	0.049
tertiary	-0.013	0.046	-0.010	0.036	-0.014	0.036	0.039	0.050	-0.081	0.065	0.011	0.074
Mother's employment status when respondent is 14 years old	**0.101** ***	0.026	**0.106** ***	0.024	**0.108** ***	0.024	**0.095** ***	0.032	**0.155** ***	0.045	0.065	0.047
Presence of a child aged less than 6 years in a household	**-0.309** ***	0.038	**-0.289** ***	0.028	**-0.291** ***	0.028	**-0.284** ***	0.041	**-0.319** ***	0.044	**-0.288** ***	0.073
Number of observations	1210		1682		1682		653		634		395	
Pseudo R-sq	0.14		0.14		0.14		0.13		0.17		0.15	

Notes: For dummy variable, dF/dx corresponds to discrete change from 0 to 1. Specification (1): Origin is based on the country of origin of the father, whenever available, otherwise based on mother's origin. (2)-(6): Observations with both parents coming from different, non-residence countries are excluded.

such cultural heritage is likely to affect the economic outcomes of a woman more than when only one parent represents the culture of origin, while the other comes from the woman's country of residence.

To examine this, I exclude those observations where both parents were born abroad but in different countries to compare the effect of a woman's "full" vs. "half" exposure to the values of her ancestors. To maximize the number of observations, I perform the analysis based on all remaining observations, i.e. without a constraint on the number of observations for a given origin/residence combination.[13] Column (2) in Table 3.5 shows that culture in the country of residence is a statistically significant predictor for the labor participation status of women of "mixed" culture, i.e. one parent was born in the country of residence. For women whose parents were both born abroad in the same country, the effect of the country of residence is insignificant. One would expect that the culture of origin would matter for these women, yet the effect is found insignificant.

Distinguishing further between women whose mother was born in another country while their father was born in the woman's country of residence and vice versa (column 3) suggests that the culture of residence matters only for women whose father was born abroad and whose mother comes from the country of the woman's residence.

A separate analysis of women with mother born abroad and father born in the country of residence and vice versa confirms the previous results. Columns (4) and (5) show that culture in the country of residence has a statistically significant impact only for women whose mother was born in the country of residence. For women with mother born abroad and father born in the country of residence, the effect of the cultures of origin and residence is not significant. Finally, I separately analyze the subsample of women with both parents born abroad. Column (6) shows that for these, both origin and residence appear to affect labor participation decisions, with the impacts being almost identical. However, the sample size is quite small (395 observations) to draw firm conclusions.

[13] Constraining the sample to have at least 10 observations per combination of country of origin and country of residence leads to similar results.

3.4.4 Individual value preference relative to cultures of origin and residence

The previous analysis shows that the labor participation status of a second-generation immigrant woman depends on the culture in her country of residence and, with the exception of a separate analysis of women with parents from the same origin, not on the culture in her country of origin. This suggests that cultural adaptation occurs with migration. This outcome is in accordance with the findings of the previous chapter (Chapter 2), in which I show that variation in the individual cultural preferences of second-generation immigrants is explained by variation in the average cultural values of the older generation in their country of residence, even though to a lower extent than in the case of non-immigrants. In this section, I analyze the impact of the extent of adaptation of individual traditional values vis-à-vis cultures of origin and destination on the probability of being in the labor force. The idea is to represent the individual importance of tradition in terms of its *shift* from the representative culture in a country of origin relative to the cultural distance between country of origin and of residence. I construct an "indicator of the cultural shift" that reflects how much the individual importance of tradition has "shifted" from the representative value in her country of origin.

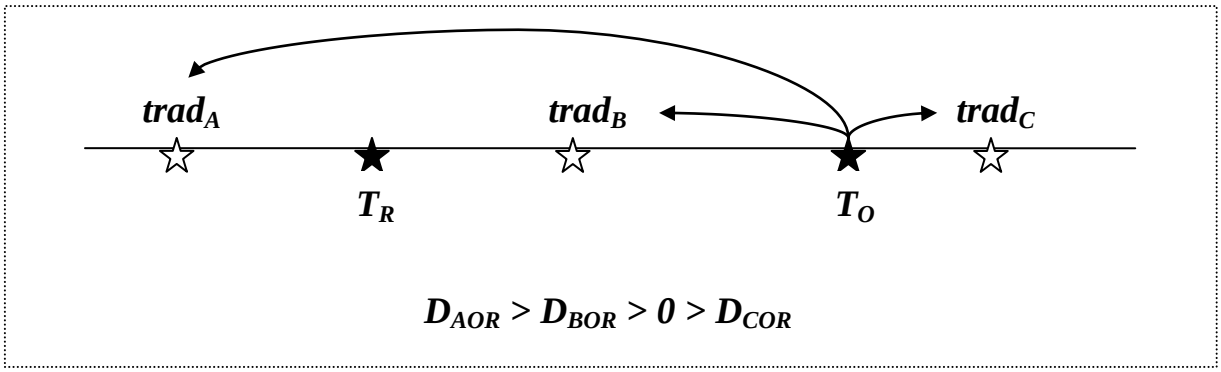
Specifically, if the country of origin is more traditional than the country of residence (represented by higher average tradition preferences of the older generation in the country of origin), see Diagram 3.1a for illustration), the indicator of the cultural shift or cultural distance is defined by $\boldsymbol{D_{IOR}}$:

$$\boldsymbol{D_{IOR}} = \frac{\boldsymbol{T_o} - \boldsymbol{trad}_{\boldsymbol{I}}}{\boldsymbol{T_o} - \boldsymbol{T_R}} \quad \text{if} \quad \boldsymbol{T_o} > \boldsymbol{T_R}$$

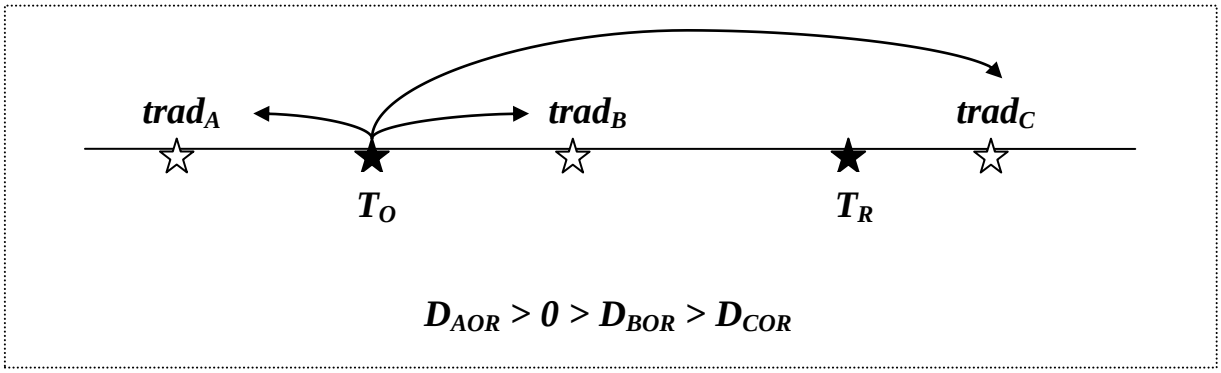
where $\boldsymbol{T_o}$ and $\boldsymbol{T_R}$ is the mean tradition preference in a country of origin and destination, respectively, and $\boldsymbol{trad}_{\boldsymbol{I}}$ is the own preference for tradition of a respondent. The more distant the woman's individual tradition preference is from the representative traditional

Diagram 3.1
Indicator of the cultural shift – illustration.

a)



b)



values in a country of origin and closer to the country of residence, the more the indicator of cultural shift D increases. If a woman's individual tradition preference is higher than the representative value for the country of origin, then her indicator of the cultural shift takes on a negative value to reflect that this woman is more likely to withdraw herself from the labor market than the woman whose traditional values are representative of her country of origin.

If a woman's culture of origin is less traditional than her culture of country of residence, then the indicator of the cultural shift is defined as:

$$D_{IOR} = \frac{T_o - trad_I}{T_R - T_O} \quad \text{if} \quad T_o < T_R$$

As a woman's individual preference for tradition increases and therefore moves in the direction from the country of origin towards the country of residence (see Diagram 3.1b), $\boldsymbol{D}$ decreases to reflect the shift towards more traditional culture. In summary, for a fixed country of origin and residence, the indicator of the cultural shift takes on higher values with lower individual preference for tradition. I assume that the probability of participating in the labor market is affected proportionally to this indicator and I estimate the full specification model in which, instead of using a woman's tradition preference, I use the indicator of a woman's cultural shift as defined above.

Table 3.6 displays the results. I perform the estimation for the full specification on the sample constrained by at least 10 observations per pair country of origin/ country of residence. Again, for ease of comparison and interpretation, all cultural variables are standardized to a mean of 0 and a standard deviation of 1. The estimated coefficients on other than the cultural variables are almost identical to those in Table 3.3. The indicator of cultural shift is significant at the 10% level. A one standard deviation difference in the respondent's indicator of cultural shift corresponds a to 2.5% change in the probability of being in the labor force (see column 1).

Indeed, the indicator of cultural shift reveals a big variation. This is because the individual importance of tradition shows much higher variation than the country-level averages of the tradition preferences of the older generation. This is accentuated when cultures of origin and residence are close: the denominator in the expression for $\boldsymbol{D}$ is very small, resulting in large values of the indicator. As a robustness check I excluded cultures that are similar, i.e. that are different from each other by less than 1 standard deviation. Nevertheless, the impact of the indicator of the cultural shift remains significant, and of the same magnitude (see column 2).

Up to this point I analyzed immigrants across several countries together, which involves the risk of not properly identifying the effect of culture as there are other economic/institutional factors that might be correlated with the cultural variables.

Analyzing the immigrants in one country of residence is the "real" method of separating the effects of culture. In what follows, I examine women living in

Table 3.6
Impact of the indicator of cultural shift

	Dependent variable: female labor force participation status probit model- marginal effects									
	(1)		(2)		(3)		(4)		(5)	
	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE	df/dx	SE
Average mean tradition preference of those born in 1946-1985 in a country of origin	-0.002	0.015	-0.015	0.015	-0.001	0.033	0.018	0.030	0.020	0.029
Average mean tradition preference of those born in 1946-1985 in a country of residence	**-0.031** **	0.012	**-0.027** *	0.016						
Respondent's indicator of cultural shift	**0.025** *	0.001	**0.025** *	0.015	**0.043** **	0.020	**0.045** ***	0.017	**0.041** ***	0.011
Age	-0.001	0.001	0.001	0.002	**-0.010** ***	0.003	**-0.010** ***	0.003	**-0.008** ***	0.002
Domicile (dummy, big city=1):	**0.069** **	0.028	**0.079** **	0.037	0.062	0.060	0.043	0.058	0.053	0.051
Education (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	**0.109** ***	0.038	**0.138** ***	0.036	0.007	0.069	0.009	0.072	-0.013	0.060
tertiary	**0.179** ***	0.040	**0.188** ***	0.031	0.172	0.184	0.184	0.177	0.161	0.146
Education of respondent's father (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	0.010	0.028	0.017	0.043	-0.040	0.080	-0.052	0.094	-0.057	0.075
tertiary	-0.023	0.037	0.004	0.061	**-0.238** ***	0.095	**-0.249** ***	0.107	**-0.186** *	0.118
Education of respondent's mother (dummies):										
up to secondary (omitted)										
upper (post) secondary, not tertiary	0.024	0.033	0.035	0.047	0.043	0.085	0.037	0.075	0.050	0.055
tertiary	-0.018	0.047	-0.037	0.103	0.207	0.114	0.192	0.123	0.200	0.070
Mother's employment status when respondent is 14 years old	**0.100** ***	0.027	**0.109** ***	0.034	0.055	0.055	0.049	0.059	0.045	0.050
Presence of a child aged less than 6 years in a household	**-0.318** ***	0.034	**-0.315** ***	0.046	**-0.344** ***	0.096	**-0.324** ***	0.109	**-0.311** ***	0.094
Number of observations	1238		707		199		199		223	
Pseudo R-sq	0.14		0.19		0.14		0.16		0.18	

Notes: For dummy variable, dF/dx corresponds to discrete change from 0 to 1. Specification (1): at least 10 observations for a combination of country of origin and country of residence. (2): at least 10 observations for a combination of country of origin and country of residence, excluding "close" cultures (by less than one standard deviation different). (3): Switzerland as the country of residence, at least 10 observations per country of origin. (4): Switzerland as the country of residence, at least 10 observations per country of origin, estimated with regional dummies. (5): Switzerland as the country of residence, all observations, estimated with regional dummies.

Switzerland for which I have relatively enough observations that exhibit variation as to the country of origin. When constraining the sample to have at least 10 observations per country of origin, the second-generation immigrants in Switzerland have ancestors in 5 countries: Austria, Germany, Spain, France, and Italy.[14] The results in Table 3.6, column (3), show that the representative culture of the country of origin is not a significant predictor of the labor market status of second-generation immigrants, unlike the extent of cultural adaptation represented by the indicator of cultural shift, which is highly significant. In column (4), I include regional dummies to further account for differences in external factors potentially affecting labor outcomes. The results are unchanged. Finally, I perform the estimation on data on all second-generation immigrant women in Switzerland, increasing the total sample to 223.[15] Column (5) shows similar results. One standard deviation in the value of the indicator of cultural shift is associated with a 4% increase in the probability of participating in the labor force.[16]

3.5 Conclusion

This chapter is a follow-up to Chapter 2, in which I show that the cultural values of immigrants who are relatively recent arrivals in their country of residence are largely explained by the representative values of their country of origin. On the other hand, for immigrants living in their country of residence for more than 20 years and for second-generation immigrants, the culture in their country of origin becomes less relevant while the culture in their country of residence more relevant for the formation of their

14 As summarized in Chapter 2, Italy exhibits one of the highest preferences for tradition value among European countries (0.84), while France is one of the countries with the lowest average preference for traditional values (0.06). Germany, Austria and Spain score on average 0.23, 0.34 and 0.59, respectively, while Switzerland 0.10.

15 This means that women with the following ascestries are included in the estimation: Belgium, Denmark, UK, Greece, Croatia, Hungary, Netherlands, Poland, Portugal, Romania and Turkey.

16 I also analyzed subsamples for other countries of residence. The impact of culture of origin is never found to be significant. For 4 countries (Austria, Germany, France and UK) I find a positive and statistically significant impact of the indicator of cultural shift. However, due to data limitations I do not report the results here.

individual values, which suggests that cultural assimilation is occurring over time after migration.

In this chapter, I employ the same cultural concept − the concept of values − to evaluate the impact of tradition preferences on female labor force participation decisions. For the sample of second-generation immigrants, I show that the culture of origin does not help to explain variation in women's labor market outcomes, unlike the culture of residence, which does. Distinguishing between common culture, i.e. both parents born in the same foreign country, vs. mixed culture, i.e. one parent born abroad and one in the country of a woman's residence, suggests that it is the mother's origin that drives the significance of culture of residence in explaining the labor supply decisions of second-generation immigrant women. The culture of origin is significant only when examining the subsample of women with common culture separately.

The individual measure of traditional values is not found to have a statistically significant impact in explaining the variation in individual labor participation decisions. However, if it is expressed in terms of individual cultural assimilation/dissimilation, as captured by the *shift* from the representative culture in the country of origin relative to the cultural distance between the country of origin and of residence, it has a significant effect on female probability of being in the labor force. Therefore, even though cultural adaptation seems to be occurring, cultural heritage appears to play a role as a benchmark point for individual tradition preferences, which in turn affect labor force participation decisions.

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