2016

Essays in Economics of Institutions and Culture

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ESSAYS IN ECONOMICS OF INSTITUTIONS AND CULTURE

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Economics

by
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August 2016

ACKNOWLEDGMENTS

Foremost, I have been incredibly fortunate to have the support and guidance of my advisor and co-author Dr. Naci Mocan during my studies at Louisiana State University. I would like to express my sincere gratitude to him for being a great mentor and always having plenty of optimism, patience and encouragement to keep me going.

I would like to thank my dissertation committee members, Dr. Robert Newman and Dr. Briggs Depew for their valuable comments and suggestions. I would also like to thank the Dean's Representative, Dr. Timothy Chandler, for serving on my committee.

I am grateful to my dear friends and colleagues Elif Filiz, Clara Baek, Bahadir Dursun, Satadru Das, Devjit Roy Chowdhury and Ting Wang for their friendship and encouragement. I am happy I have had an opportunity to know them.

Finally, I owe a debt of gratitude to my family, and especially to my husband Adam, for their unwavering support, unconditional love, and faith in me.

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ABSTRACT

In this dissertation, I present two distinct essays in economics of culture and institutions that can be read independently from one another. In Chapter 2, using the European Social Survey data, I investigate the impact of increased educational attainment, induced by compulsory schooling reforms, on religiosity and superstitious beliefs. I find consistently negative effects of education on religiosity, superstitious beliefs, social religious acts (attending religious services) and solitary religious acts (the frequency of praying). In Chapter 3, I examine the impact of "culture of leisure" and tax rates on labor force participation and hours worked of second-generation immigrants residing in 26 European countries. The results show that for women, both taxes and culture of leisure impact participation and hours worked. For men, taxes influence labor supply both at the intensive and the extensive margins, but culture of leisure has no impact.

CHAPTER 1. INTRODUCTION

This dissertation consists of two distinct essays within the broad field of economics of culture and institutions. In Chapter 2, I investigate the impact of increased educational attainment, induced by compulsory schooling reforms, on religiosity outcomes such as reported religiosity, frequency of church attendance, and prayer. I then extend the analysis to study the impact of increased schooling on superstitious beliefs. In the following chapter, I examine the impact of "culture of leisure" and tax rates on labor force participation and hours worked of second-generation immigrants residing in 26 European countries. Chapter 4 summarizes the findings of these two essays.

1.1. Compulsory Schooling Laws and Formation of Beliefs: Education, Religion and Superstition

The long-standing secularization hypothesis suggests that as education and standards of living increase, the individuals should have less need to rely on supernatural forces, both in the form of organized religion and superstitious beliefs. In Chapter 2, I put this theory to test. Specifically, I examine whether increased educational attainment reduces individuals' religiosity, frequency of church attendance, and prayer, as well as superstitious beliefs.

An individual's education and the level of his or her religiosity are likely to be correlated with a number of unobserved individual characteristics, making it difficult to disentangle the causal impact of educational attainment on the outcomes of interest. I address this problem by using exposure to compulsory schooling reforms as a source of exogenous variation in the individuals' years of completed education.

To pinpoint the effect of education on religiosity and associated behaviors, I employ micro data from the European Social Survey (ESS) and analyze individuals residing in 14 European countries, greatly expanding the geographic coverage of the previous literature. The ESS data also allows me to investigate the impact of education on various dimensions of religiosity, ranging from solitary religious acts (praying) to social religious acts (attending religious services) in a unified framework, further advancing the existing studies. I find large negative effects of schooling on self-reported degree of religiosity, the frequency of praying, and the frequency of attending religious services.

I further contribute to the existing literature by utilizing the 1999 and 2008 waves of the European Values Study and investigating the impact of an increase in education on superstitious beliefs, prompted by the same compulsory education reforms in Europe. I find that additional years of schooling reduce individuals' propensity to

believe in the protective power of lucky charms, as well as decrease people's tendency to consult horoscopes and to take horoscopes into account in daily life. The fact that education reduces both the superstitious beliefs of individuals and their affiliation with the organized religion suggests that improved cognition and ability for critical thinking may be one of the main channels through which educational attainment affects the outcomes of interest.

In the models, I include country-specific cohort trends, controlling for the general secularization trend in Europe. Chapter 2 and Appendix A show that my results are robust to a variety of specification tests. Furthermore, I conduct several placebo tests. Specifically, I create fake reform dates by moving the actual dates of the reforms back and forth a couple of years. The placebo results reveal that there is no impact of the fake schooling reforms on individuals' educational attainment. Similarly, there is no impact of being exposed to a fake reform on the outcomes of interest, which supports the validity of my main results.

1.2. Impact of Taxes Rates and Culture of Leisure on Labor Supply in Europe

Recent macroeconomic literature has suggested a number of potential explanations for the observation that there are substantial differences between countries in average annual hours worked per working age population. Among other factors, these explanations have underlined the importance of tax rates on labor and consumption (Prescott 2004, Ohanian et al. 2008, McDaniel 2011) and the role of preferences for leisure (Blanchard 2004, Alesina et al. 2006). In Chapter 3, I complement the existing macroeconomic studies and offer the first estimates of the impact of tax rates and culture of leisure on individual labor supply in the same framework.

I focus on second-generation immigrants who reside in 26 European countries. These individuals are born in Europe and are exposed to the institutional structures, labor market conditions and tax burdens of their residence countries. Their fathers had migrated from up to 47 countries of origin. I assume that culture of leisure is transmitted from the fathers to the offspring and use average responses in the fathers' countries of origin to questions such as "How important is leisure in your life?" as measures of culture of leisure.

The models control for individual attributes, as well as for a variety of country of origin and country of destination characteristics, such as the unemployment rate, per capita income, legal origin, and religious make-up. I find that both tax rates and culture of leisure are significant determinant of female labor supply, both at the extensive and the intensive margin. On the other hand, for men, culture of leisure has no impact on their labor supply, but tax rates negatively influence both labor force participation and hours usually worked in a week. These results are

robust to excluding countries representing the largest Muslim immigrant groups, as well as analyzing tax rates and culture of leisure variables separately, while controlling for country-of-origin and country-of-residence fixed effects.

Chapter 4 summarizes the findings of these two studies.

CHAPTER 2. COMPULSORY SCHOOLING LAWS AND FORMATION OF BELIEFS: EDUCATION, RELIGION AND SUPERSTITION

"The state … derives no inconsiderable advantage from [the instruction of uneducated citizens]. The more they are instructed the less liable they are to the delusions of enthusiasm and superstition, which, among ignorant nations, frequently occasion the most dreadful disorders."
Adam Smith. *The Wealth of Nations*; V.1.189

2.1. Introduction

A long line of philosophers and social scientists, ranging from Durkheim to Weber, have argued that increased levels of education would diminish the need for religious adherence. Along the same lines, as summarized by Becker, Nagler and Woessmann (2014), increased education and advances in scientific knowledge are assumed to be leading sources of secularization of societies in Europe during the late 19th and the early 20th centuries. If education improves cognition and the ability for critical thinking, more educated people should be less likely to believe in supernatural forces. On the other hand, it can be argued that an increase in educational attainment can increase religiosity, especially at lower levels of education. For example, an increase in education may increase individuals' literacy which would allow them to read complicated religious texts, which in turn may lead to enhanced religiosity.[1]

At the country level, education, the degree of religiosity, the level of economic development and the extent of democracy are correlated. More educated countries on average tend to be less religious. They also have stronger democracies as well as higher per capita incomes. It is, of course, not possible to draw cause-and-effect inference from such cross-country data regarding the impact of education on religiosity and other outcomes. This is because the extent of religiosity of a country and its level of economic and democratic development are endogenous, potentially influencing each other. Thus, a credible empirical design necessitates some exogenous change in education that can be used to analyze the relationship between education and religion.

I employ data from the European Social Survey (ESS) and use schooling reforms in 14 European countries as a source of exogenous variation. Specifically, I use an individual's exposure to a compulsory schooling reform as an instrument for his or her level of education and show that such an exposure increases years of completed education. I analyze how individuals' propensity to identify themselves as religious and the extent of their religious activities are impacted by their education levels. The ability to analyze both religiosity and the extent of religious

[1] Similarly, if education improves the aptitude for foreign languages, people can read religious texts in their original language such as Hebrew, Arabic or Latin, which could have a positive impact on their religiosity.

activity (e.g. attending religious services and praying) is important. This is because some previous research reported a positive association between education and church attendance, which can be attributed to the premise that education increases the returns to social activities. According to this hypothesis, the more educated attend religious services more often not because education enhances religiosity but because the more educated benefit more from attending religious services due to its network benefits (Glaeser and Sacerdote 2008). Because I have data on the frequency of attending religious services as well as data on various measures of religiosity and the frequency of praying, I can investigate the impact of education on various dimensions of religiosity, ranging from solitary religious acts (praying) to social religious acts (attending religious services).

I also utilize data from the European Values Study (EVS) for the years 1999 and 2008 to investigate the impact of an increase in education on superstitious beliefs, prompted by the same compulsory education reforms in Europe. I analyze whether additional years of schooling alter individuals' beliefs in horoscopes and lucky charms and the extent to which people take into account horoscopes in their daily lives.

The origins of superstitious beliefs have been investigated by psychologists, sociologists and anthropologists since the late 19th century. As summarized by Vyse (2014), theories have been developed to explain the reasons behind superstitious beliefs and practices, ranging from the significance of uncertainty about the future to the impact of a society's culture and collective psychology. Religion and superstition are related in that both involve believing in supernatural forces and there is overlap between the two. In many societies the practice of superstitious acts has religious connotations, and organized religions have ceremonies that are borrowed from superstitious rites (also called magic) of pagan cultures. For example, Vyse (2014, p. 13) writes that:

> During the 16th and much of the 17th centuries, religious objects were the source of much magic. To encourage converts to a new religious order, the priests of the medieval church in England found it necessary to incorporate a large measure of pagan supernaturalism. Anglo-Saxons commonly worshipped wells, trees, and stones; eventually a wide variety of powers were attributed to the consecrated objects of the church. Holy water was a particularly versatile agent. To avail themselves of its reputed curative powers, parishioners often drank it, sprinkled it on children's cradles or on ailing cattle, and splashed it on their houses to ward off evil spirits and protect against lightning.[2]

It is, of course, the case that a particular religion's beliefs and practices can be perceived as superstition by another religion. In this chapter I consider such behaviors as believing in fortune-telling or in horoscopes, or having

[2] Another example of superstition intermingling with religion is the practice of "faith healing" which has a long tradition in the Roman Catholic Church. Over the centuries thousands of Catholics have traveled all over the world to be healed by miracle cures, and as detailed in Woodward (1990), to this day, to be declared as a saint by the Vatican, the candidate is required to have performed some miracle which is generally the magical treatment of a medical condition (Vyse 2014, p. 7).

faith in the powers of lucky charms as indicators of superstitious beliefs. Such actions also involve reliance on supernatural forces, but they are outside of the belief structure of mainstream religions.[3]

Using exposure to education reforms as an instrument for years of education, I find large negative effects of schooling on religiosity, the frequency of praying and attending religious services. For example, one additional year of schooling reduces individual's propensity to pray at least once a month day by almost 9 percentage points. Likewise, an additional year of full-time education reduces the propensity to attend religious services at least once a week by about 9 percentage points. I also find that schooling reduces the propensity to believe in the protective power of lucky charms, and it decreases the tendency to consult horoscopes and to take into account horoscopes in daily life.

My identification strategy is based on the comparison of individuals who are four years apart in age. I assume that the intensity of religious beliefs would not have changed during this relatively short time period absent the impact of increased mandatory education. My models include country-specific cohort trends, thus controlling for the country-specific secular tendencies. Additionally, I conduct several placebo tests. If religiosity has a strong time trend and a tendency to change rather rapidly over the course of a few years, then moving the actual dates of the reforms back and forth a couple of years (creating fake reform dates) would produce a negative impact of the reform on religiosity and superstition, when in fact none exists. The placebo tests reveal that this is not the case.

2.2. Existing Literature

It has long been argued that as standards of living go up and people become more educated and more analytically oriented, the need to rely on supernatural forces should diminish, both in the form of believing in superstition and participating in organized religion. This view dates back to the works of Hume, Marx, and Weber, among others. Recent laboratory experiments support the hypothesis that analytic processing can promote religious and psychic disbelief (Gervais and Norenzayan 2012, Pennycook et al. 2014, Gray and Gallo 2016).[4] Nonetheless, empirical evidence in support of negative effect of education on religiosity is mixed.

[3] I thank an anonymous referee for this insight.
[4] In addition to potentially influencing individual beliefs and preferences, education increases the opportunity cost of time and accessibility of social activities that are substitutes to organized religious activities. Relatedly, Gruber and Hungerman (2008) show that church attendance and going to the mall are two competing, substitute activities.

Earlier studies often documented a positive relationship between education and religious activity (Iannaccone 1998). Similarly, in their cross-country analysis McCleary and Barro (2006) found that religiosity was positively associated with education. Using the World Values Survey data over 80 countries from 1981 to 2001 as well as other data sets covering longer periods, Norris and Inglehart (2004) described the evolution of religious participation, religious values and beliefs by country. They presented evidence that while advanced industrial societies, which have high average education, have generally trended away from religiosity, the same was not true for developing countries that have low education levels.

Franck and Iannaccone (2013) analyzed a panel of 10 developed countries, for which a measure of church attendance was created in five-year intervals between the 1920s and the 1990s. While they could not find an impact of country education on average church attendance, they reported a negative relationship between average school spending and church attendance. Becker et al. (2014) used data from 61 German cities over eight waves between 1890 and 1930. Controlling for city fixed-effects, they found that an increase in advanced-school enrollment in those cities was negatively related to Protestant church attendance.

Using micro data of the British National Child Development Study, Brown and Taylor (2007) reported a positive relationship between church attendance and individuals' education. Arias-Vazques (2012) employed data from the Monitoring the Future survey in the U.S. and used child labor and compulsory attendance laws as an instrument for schooling. He found a negative impact of education on religiosity. Hungerman (2014) ran province-year level regressions for Canada and reported that the fraction of people with no religious affiliation in a province went up if average education was higher (due to province-level education reforms, enacted mostly in the 1950s and 1960s). Cesur and Mocan (2013), which is similar to this work in design, employed individual-level data from Turkey. They investigated the impact of increased education due to an education reform that changed the compulsory years of schooling from 5 to 8 years. They found that an increase in educational attainment decreased women's propensity to identify themselves as religious, lowered their tendency to wear a religious head cover (head scarf, turban or burka), increased the tendency for modernity, and decreased their propensity to vote for an Islamic party.

Since the late 1960s, researchers have been investigating the predictors of superstition. These studies typically use surveys of beliefs, based on small samples. For example, Jahoda (1968) surveyed 280 male students from the University of Ghana to analyze the relationship between the strength of their supernatural beliefs and the

type of coursework taken and the length of residence at the University. He could not find a significant relationship between any particular type of course taken or the tenure at the university and magico-mythical beliefs of the students. On the other hand, using a sample of 113 students, 352 university professors and 251 members of the general public, Otis and Alcock (1982) reported that university professors are significantly more skeptical than students and members of the general public regarding paranormal phenomena. Pennycook et al. (2012) conducted two analyses based on 223 and 267 people, respectively, and reported that an analytic cognitive style was negatively associated with religious and paranormal beliefs.[5] In a study that used a larger sample, Aarnio and Lindeman (2005) examined the responses of 3,141 Finnish students from 14 universities and six vocational schools and found that university students had weaker paranormal beliefs than vocational students and that those majoring in medicine and psychology had the weakest and those in education and theology had the strongest paranormal beliefs. In summary, these studies, generally suggest that education is negatively correlated with beliefs in superstition and paranormal forces. Another regularity reported by previous work is that women have stronger religious and superstitious beliefs than men.

2.3. Empirical Strategy

The relationship of interest between education and religiosity or superstition is given by Equation (2.1).

$$R_{ikct} = \beta_0 + \beta_1 \text{Education}_{ikct} + X'_{ikct}\Omega + \mu_c + \eta_t + \lambda_k \times \text{Birthyear} + \epsilon_{ikct}, \quad (2.1)$$

where R_{ikct} denotes a particular outcome, such as religiosity, the frequency of attendance to religious services, the frequency of praying, or various indicators of superstitious beliefs, for individual i, born in year k and country c; interviewed in country c and year t. Education_{ikct} stands for the number of completed years of full-time education of the individual, μ_c and η_t represent fixed effects for the individual's country of residence and year of survey, respectively, and λ_{ck} stands for country-specific cohort trends. The vector X'_{ikct} includes personal characteristics such as age, sex, self-perceived ethnic minority status, an indicator for whether the respondent lives in a city, and the immigration and employment status of the mother of the respondent.[6] [7]

[5] Paranormal beliefs are those hypothetical occurrences and processes that are considered as impossible by current scientific knowledge. These include extrasensory perception such as psychic ability. Some analysts include beliefs in magic, superstition, astrology, and religion into this category (Irwin 1993).

[6] The results, not reported here in the interest of space, are robust to excluding the potentially endogenous variables City, Mother Working, and Mother Immigrant from the models.

[7] The vector X does not contain ethnic minority status and mother's immigration and employment statuses in superstition models because these variables are not consistently available in the EVS data.

The error term ϵ_{ikct} in Equation (2.1) contains unobserved individual attributes that influence both the individual's education and religiosity, which induces bias in the coefficient on education in a straightforward OLS estimation. To uncover the causal relationship between education and religiosity, I use individuals' exposure to a compulsory schooling reform as an instrument for reported years of full-time education completed.

The European countries I examine have implemented education reforms that increased the mandatory years of schooling by one or more years, mostly in the 1960s and the 1970s. As are result, in these countries, children who were different in age merely by 1-2 years were exposed to different levels of compulsory schooling, which had an impact on their educational attainment.

The first stage regression below specifies the impact of exposure to the reform on completed schooling.

$$\text{Education}_{ikct} = \gamma_0 + \gamma_1 \text{Reform}_{kc} + X'_{ikct}\Omega + \mu_c + \eta_t + \lambda_k \times \text{Birthyear} + \xi_{ikct}, \quad (2.2)$$

where Reform_{kc} is an indicator for whether the individual born in year k was treated by a compulsory schooling reform in country c. It takes the value of one if the person was born after the birth year of the first cohort potentially affected by the reform, and zero if the person was born before the cut-off. I omit individuals who were at the age cut-off of the law when the law was enacted (the pivotal cohort) because the extent of this cohort's exposure to the education reform is unclear.[8] I select individuals born up to four years before the pivotal cohort and up to four years after the pivotal cohort as control and treatment groups, respectively. This window is small enough to avoid the potentially confounding effects of other societal changes that may have taken place, but large enough to provide sample sizes that allow the models to be estimated with power.[9] The estimated standard errors are clustered at the regional level, which provides 131 clusters.[10] I also report bootstrapped standard errors clustered at the country level, which does not alter the inference.[11]

Because the respondents cannot choose the date of their birth, it is plausible to assume that their exposure to an education reform is uncorrelated with their unobserved personal characteristics that would determine both

[8] As described in the Robustness section 2.7.3 and Appendix A, Table A.4, treating the pivotal cohorts as part of the treatment group did not alter the results appreciably.
[9] My results are robust to using the bandwidths of 5, 6, 7, 8 and 9 years around the pivotal cohort. These results are not reported in the interest of space.
[10] The ESS data report the region of the interview in each country, although this variable is not always consistent across rounds of the ESS surveys. For example, in the first four rounds ESS divides Belgium into three regions: Flemish, Brussels, and Walloon. For rounds 5 and 6, Belgium is divided into 11 smaller regions that correspond to the NUTS 2 classification. I aggregated these 11 regions into Flemish, Brussel, and Walloon to be compatible with the first four rounds.
[11] For Germany these standard errors are clustered at the state level as the education reform is implemented at the state level in Germany.

religiosity and the length of acquired schooling. However, by construction of the sample, individuals in the control group are a few years younger than those in the treatment group. In the analyses, the average age difference between the treatment and control groups is four years in the ESS sample, and seven years in the EVS sample, suggesting that any detected impact of education is unlikely due to cohort differences. Furthermore, the models control for age and its quadratic[12], and country-specific cohort trends. Nevertheless, one cannot rule out the possibility that cohorts that are a few years apart can be different in their religious and superstitious beliefs not because of differential years of mandated schooling they were exposed to, but because of a general trend towards secularism. In other words, it is possible for the exclusion restriction to be invalid. To address this concern, I create placebo reforms by moving the reform dates in each country two and three years back, and two and three years forward in comparison to the actual dates. As explained later in the chapter, using these placebo dates eliminates significance in the first-stage regressions and in the reduced form regressions, supporting the hypothesis that the results are not an artifact of general trends toward secularity.

2.4. Education Reforms in Europe

The information on education reforms was collected from several sources, initially from the tables and data appendices of recent papers that use European compulsory education reforms as a source of identification.[13] I have also consulted other sources, including the Education Reforms Database compilation by Garrouste (2010) and the Eurydice database on education systems in Europe. The choice of countries included in the analysis was limited by two concerns. First, because the European Social Survey (ESS) was administered from 2002 to 2013, I cannot use the reforms that were implemented in the early 20th century because even older people in the sample would not have been born yet. Second, I chose the compulsory schooling laws for which I could clearly identify the first potentially affected cohort.[14] I provide details on information sources for each of the reforms and the explanation of choice for the year of birth of the first potentially affected cohort in Appendix B.

[12] The results are robust to using age dummies instead of a quadratic in age. These results are not reported in the interest of space.
[13] Examples are Brunello et al. (2009), Brunello et al. (2013), Borgonovi et al. (2010), Fort et al. (2011), Grenet (2013), Pischke and Wachter (2008), Clark and Royer (2013).
[14] As described by previous researchers (Bratti and Braga 2013, Meghir and Palme 2005, Sousa et al. 2015) some countries implemented these reforms in ways that make it difficult to clearly isolate the cohorts exposed to the reform. Three examples are Italy, Portugal, and Sweden (see Appendix B). Dropping these countries from the analysis had no impact on the results.

A model proposed by Azzi and Ehrenberg (1975) predicts that people will invest more in religious capital when they are close to the end of their life cycle, because the gains of religious investment are only realized after death. Alternatively, religiosity can increase with age as a result of habit or taste formation (Iannaccone 1998). Thus, I restrict the sample to people who are younger than 65. However, as part of the sensitivity analyses, I re-estimated the models by using everybody surveyed as long as they are in the relevant birth cohorts, which did not alter the results. These results are reported in Appendix A, Table A.2.

Table 2.1 presents the countries that are included in the analysis along with key information on their education reforms. For each country, I report the date of the reform, the year of birth of the first cohort affected by the reform, as well as the change in the number of years of compulsory schooling and the change in the minimum school leaving age. The reforms have increased compulsory education by 1 to 4 years and the first affected cohorts were born as early as 1942 (Schleswig-Holstein, Germany) and as late as 1970 (Belgium). The overwhelming majority of the individuals in the sample (98 percent), however, are born after World War II.

Table 2.1
Compulsory Schooling Reforms for the Countries in the Analysis

Country	Reform date	First cohort fully affected by the reform	Change in years of compulsory schooling	Change in minimum school leaving age	Age at school entry
Austria	1966	1953	8 to 9	14 to 15	6
Belgium	1983	1970	8 to 12	14 to 18	6
Denmark	1971	1958	7 to 9	14 to 16	7
France[15]	1959	1953	8 to 10	14 to 16	6
Greece	1976	1965	6 to 9	12 to 15	6
Hungary	1961	1948	8 to 10	14 to 16	6
Ireland	1972	1959	8 to 9	14 to 15	6
Italy[16]	1963	1951	5 to 8	11 to 14	6
Poland[17]	1961	1953	7 to 8	14 to 15	7
Portugal	1964	1957	4 to 6	12 to 14	8
Spain[18]	1970	1958	6 to 8	12 to 14	6
Sweden[19]	1949-1962	1952	7 to 9	14 to 16	7

[15] The reform was implemented in 1967 and affected all those born after January 1, 1953. Source: Grenet (2013).
[16] I follow d'Hombres and Nunziata (2015) and Bratti and Braga (2013) and code the first potentially affected cohort as those born in 1950.
[17] According to Joanna Jung-Miklaszewska (2003), the 8th grade (Form VIII) was organized in the school year 1966/67, which makes those born in 1952 the pivotal cohort.
[18] I follow Brunello et al. (2009), Gathmann et al. (2014), Pons and Gonzalo (2002) and code the first potentially affected cohort as those who were 13 years old or younger in 1970, i.e. those born in 1957.
[19] The reform was implemented gradually across municipalities. I follow Borgonovi et al. (2010) and d'Hombres and Nunziata (2015) and code the first potentially affected cohort as those born in 1951.

Table 2.1 (Continued)

Country	Reform date	First cohort fully affected by the reform	Change in years of compulsory schooling	Change in minimum school leaving age	Age at school entry
United Kingdom					
England and Wales	1972	1958	10 to 11	15 to 16	5
Scotland[20]	1976	1959	10 to 11	15 to 16	5
Northern Ireland	1972	1958	10 to 11	15 to 16	5
Germany[21]					
Schleswig-Holstein	1956	1942	8 to 9	14 to 15	6
Niedersachsen	1962	1948	8 to 9	14 to 15	6
Bremen	1958	1944	8 to 9	14 to 15	6
Nordrhein-Westphalia	1967	1954	8 to 9	14 to 15	6
Hessen	1967	1954	8 to 9	14 to 15	6
Rheinland-Pfalz	1967	1954	8 to 9	14 to 15	6
Baden-Wurtenberg	1967	1954	8 to 9	14 to 15	6
Bayern	1969	1956	8 to 9	14 to 15	6
Saarland	1964	1950	8 to 9	14 to 15	6

In the case of Germany, the increase in the years of compulsory schooling from 8 to 9 years took place at different points in time in ten different regions of West Germany. I used the coding of the reforms and of the first cohorts affected from Pischke and Wachter (2005). Since neither the birth region of the respondent nor the region of residence at the time of schooling is reported in the ESS, I use the current region of residence as a proxy for region of residence at the time of schooling. This introduces measurement error, possibly attenuating the effect of the exposure to the reform on years of completed full-time education.[22]

Other researchers have investigated the impact of these European education reforms on some health outcomes. For example, Brunello, Fabbri and Fort (2013) used the same design and analyzed the impact of education on body mass index in selected European countries. They determined the reform date in Austria as 1962. Fort, Schneeweis and Winter-Ebmer (2011), however, write that the reform law in Austria was passed in 1962, but it

[20] Fort (2006), Gathmann et al. (2014), and Brunello et al. (2013), report 1976 as the date of the reform. However, Gathmann et al. (2014) and Fort (2006) still suggest those born in 1958 as the first potentially affected cohort; I follow them and code those born in 1958 as the pivotal cohort for Scotland.
[21] Pischke and Wachter (2005) also report 1949 reform in Hamburg; I cannot use this reform because no individuals in the sample were born early enough. Moreover, neither the birth region of the respondent nor the region of residence at the time of schooling is reported in the ESS. I use the current region of residence as a proxy.
[22] The extent of this concern can be gauged by using the following question from the first round of the ESS: "How long have you lived in this area?" Only 18% of German respondents in the first round stated that they lived in the area since age 14. Still, this number may be overestimating regional migration because the exact meaning of "area" in the question is unclear. Dropping Germany from the sample did not alter the results.

was implemented on September 1, 1966 (Fort et al. 2011, p. 39). Thus, I chose 1966 as the effective date of the reform in Austria. However, estimating the models using 1962 as the reform date in Austria did not change the results.

2.5. Religiosity Data

I use six currently available rounds of the European Social Survey (ESS). These six rounds of the ESS were conducted in various years between 2002 and 2013 and cover 35 European countries, 14 of which are included in the sample. These 14 countries are Austria, Belgium, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Spain, Sweden, and the United Kingdom. The core module of the survey is administered in all rounds and asks the respondents about their socio-economic circumstances, health, well-being, human values, and political engagement, as well as about their religiosity. I restrict the sample to non-immigrants, who are citizens of the country of the interview, who do not report being in school as their main activity in the last seven days.

The ESS asks its respondents the following question: "How religious are you?", with possible answers ranging from 0 "Not at all religious" to 10 "Very religious." I create dummy variables that classify people as religious if their reported religiosity is above the value of 7 (or, alternatively, above 8 or 9). In addition, I calculate country-specific distributions of religiosity and create indicators of whether the respondent belongs to the top 30, top 20 or top 10 percent of religiosity distribution in his/her own country.

The ESS also contains several questions pertaining to religious activities of the respondents. Measures of religious service attendance are based on the following question: "How often do you attend religious services apart from special occasions?" Possible answers include seven categories of frequency, ranging from 1 "Every day" to 7 "Never."[23] I convert these responses into two dummy variables. The first one takes the value of one if the respondent attends religious services at least once a week, and zero otherwise. The second dummy variable takes the value of one if the individual attends religious services at least once a month, and zero otherwise.

The third set of indicators of religious behavior is based on individuals' frequency of praying, corresponding to the ESS question "How often do you pray apart from the times at religious services?" Possible answers range from 1 "Every day" to 7 "Never." I convert the original categorical variable into four different dichotomous variables that take the value of one (respectively) if the respondent reports praying: 1) at least once a

[23] The full set of possible answers includes 1 "Every day", 2 "More than once a week", 3 "Once a week", 4 "At least once a month", 5 "Only on special holy days", 6 "Less often", and 7 "Never."

month, 2) at least once a week, 3) more than once a week, and 4) every day. As I explain later in the paper, I also classify each variable into three categories and run ordered probit models.

Table 2.2.A reports the descriptive statistics of the outcome variables regarding religiosity. The top panel of Table 2.2.A shows that the extent of religiosity is lower in the treatment group (those with more education) in comparison to those who are in the control group, although the differences are not substantial. The middle panel of Table 2.2.A reveals that about 20 percent of the control group attends religious services at least weekly, while 17 percent do so in the treatment group. The proportion of people who go to a temple (church, synagogue, mosque, etc.) at least once a month is lower for the treatment group as well.

The bottom panel of Table 2.2.A shows that people report praying more frequently than attending religious services. This is expected as praying is a less time-intensive activity. The difference between the treated and the non-treated groups is also evident for prayer: about 24 percent of the former group pray every day, while about 21 percent of the latter group do so. Similarly, as shown in the top panel of Table 2.2.A, individuals in the treatment group are less likely to belong to the top 30, 20, or 10 percent of religiosity distribution in their own country.[24]

Table 2.2.B displays descriptive statistics of the control variables of the ESS data. The treatment group has higher education: about 12.5 completed years of full-time education on average, in comparison to average education of about 11.8 years in the control group. I present, in Figures 2.1 to 2.14, the average years of completed full-time education by year of birth for each country. Because the education reform in Germany was implemented in different years in different regions of the country, I re-origined each region, stacked them together and plotted the graph for Germany such that the horizontal axis measures the distance in years from the year of the reform's implementation. The vertical line marks the birth year of the first cohort potentially affected by the reform in the country (the pivotal cohort, not included in the regressions).[25] It is evident from the figures that average schooling has increased after the reforms. In Table 2.2.B, I also document that 79 percent of individuals had completed the new compulsory level of education before it was effective, while the proportion of people who completed the compulsory level of education rose to 89 percent in the cohorts who were impacted by the reforms.

[24] Note that in Table 2.2.A the mean values of these variables are not equal to 0.3, 0.2, and 0.1 because of the rounding necessitated by the discrete nature of the religiosity variable.
[25] According to Grenet (2013), the French reform of 1959 affected all people born on or after January 1, 1953. Therefore, for France I code the 1953 cohort as part of the treatment group and do not omit it from the regressions. Thus, the vertical line in Figure 4 is between 1952 and 1953. Re-estimating the models by omitting the 1953 cohort of France does not change the results, which are reported in Appendix A, Table A.3.

Table 2.2.A
Descriptive Statistics of Religiosity Variables

Outcome	All	Treatment Group	Control Group
Religiosity			
==1 if in on a scale 0 to 10 individual's religiosity is 8, 9, or 10, and 0 otherwise	0.188	0.179	0.198
	(0.391)	(0.384)	(0.399)
==1 if in on a scale 0 to 10 individual's religiosity is 9 or 10, and 0 otherwise	0.084	0.077	0.092
	(0.277)	(0.266)	(0.288)
==1 if in on a scale 0 to 10 individual's religiosity is 10, and 0 otherwise	0.042	0.038	0.047
	(0.201)	(0.191)	(0.211)
==1 if individual belongs to the top 30% of religiosity distribution in her country, 0 otherwise	0.382	0.368	0.397
	(0.486)	(0.482)	(0.489)
==1 if individual belongs to the top 20% of religiosity distribution in her country, 0 otherwise	0.259	0.246	0.273
	(0.438)	(0.431)	(0.445)
==1 if individual belongs to the top 10% of religiosity distribution in her country, 0 otherwise	0.157	0.146	0.168
	(0.363)	(0.353)	(0.374)
N	16323	8439	7884
Frequency of Attending Religious Services			
==1 if individual attends religious services (apart from special occasions) at least once a month, 0 otherwise	0.313	0.297	0.331
	(0.464)	(0.457)	(0.471)
==1 if individual attends religious services (apart from special occasions) at least once a week, 0 otherwise	0.188	0.174	0.203
	(0.391)	(0.380)	(0.402)
N	16337	8448	7889
Frequency of Praying			
==1 if individual prays (apart from religious services) at least once a month, 0 otherwise	0.460	0.448	0.473
	(0.498)	(0.497)	(0.499)
==1 if individual prays (apart from religious services) at least once a week, 0 otherwise	0.400	0.387	0.415
	(0.490)	(0.487)	(0.493)
==1 if individual prays (apart from religious services) several times a week or more, 0 otherwise	0.330	0.319	0.343
	(0.470)	(0.466)	(0.475)
==1 if individual prays (apart from religious services) every day, 0 otherwise	0.223	0.209	0.239
	(0.417)	(0.407)	(0.427)
N	16163	8355	7808

The data is from the ESS survey and covers years from 2002 to 2013. The treatment group consists of individuals born up to four years after the first cohort potentially affected by an education reform. The control group consists of those born up to four years before this cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. The sample is restricted to non-immigrants, citizens of the country of the interview, who do not report being in school as their main activity in the last 7 days. Survey weights are used. The mean values of the last three variables in the top panel are not equal to 0.3, 0.2, and 0.1 because of the rounding necessitated by the discrete nature of the reported religiosity variable.

Table 2.2.B
Descriptive Statistics of Independent Variables: ESS Sample

Variable	Variable Definitions	All	Treatment Group	Control Group
Years of schooling	Number of years of full-time education completed	12.208 (4.030)	12.545 (3.869)	11.841 (4.169)
Proportion of people who have completed the new compulsory level of education or higher		0.841 (0.366)	0.888 (0.315)	0.789 (0.408)
Age	Age of the respondent	51.384 (6.661)	49.208 (6.302)	53.758 (6.216)
Male	==1 if male, 0 otherwise	0.467 (0.499)	0.466 (0.499)	0.468 (0.499)
Ethnic minority	==1 if belongs to minority ethnic group in country	0.018 (0.132)	0.019 (0.137)	0.017 (0.127)
City	==1 if respondent lives in a big city, 0 otherwise	0.160 (0.367)	0.166 (0.372)	0.154 (0.361)
Mother working	==1 if mother was working when the respondent was 14 years old, 0 otherwise	0.436 (0.496)	0.463 (0.499)	0.405 (0.491)
Mother immigrant	==1 if mother is an immigrant, 0 otherwise	0.036 (0.187)	0.036 (0.187)	0.036 (0.186)
N		16404	8485	7919

The data is from the ESS survey and covers years from 2002 to 2013. The treatment group consists of individuals born up to four years after the first cohort potentially affected by an education reform. The control group consists of those born up to four years before the pivotal cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. The sample is restricted to non-immigrants and citizens of the country of the interview who do not report being in school as their main activity in the last 7 days. I do not report minimum and maximum values because all but two variables are dummy variables; years of completed education (min. 0 and max. 25) and age (min. 29 and max. 65). Survey weights are used.

Figure 2.1.
Austria. Average Completed Years of Full-Time Education.

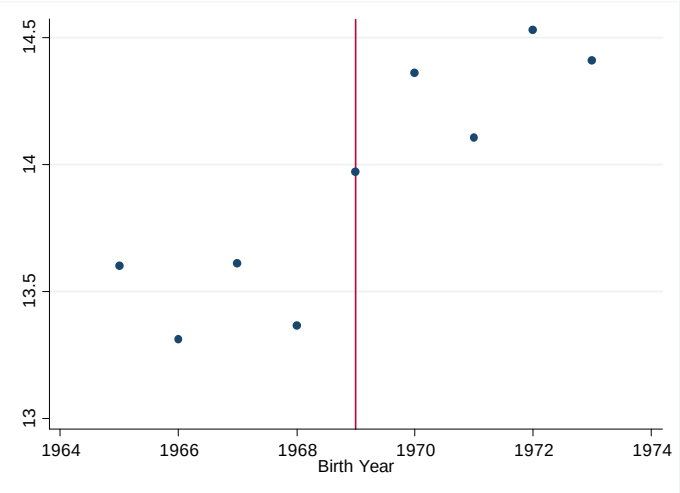

Figure 2.2.
Belgium. Average Completed Years of Full-Time Education.

Figure 2.3.
Denmark. Average Completed Years of Full-Time Education.

Figure 2.4.
France. Average Completed Years of Full-Time Education.

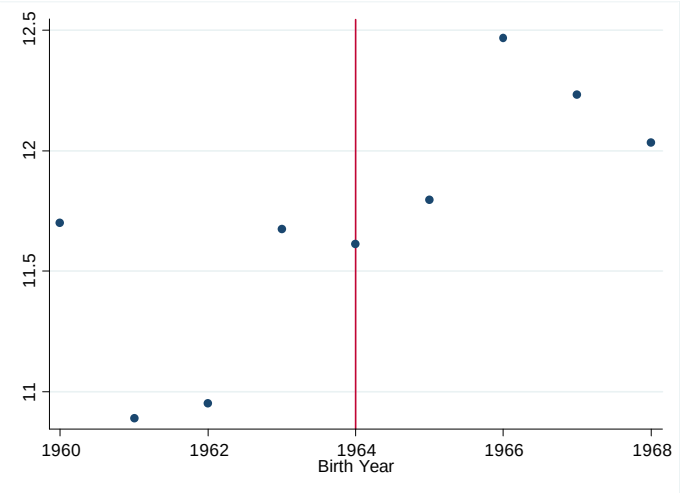

Figure 2.5.
Greece. Average Completed Years of Full-Time Education.

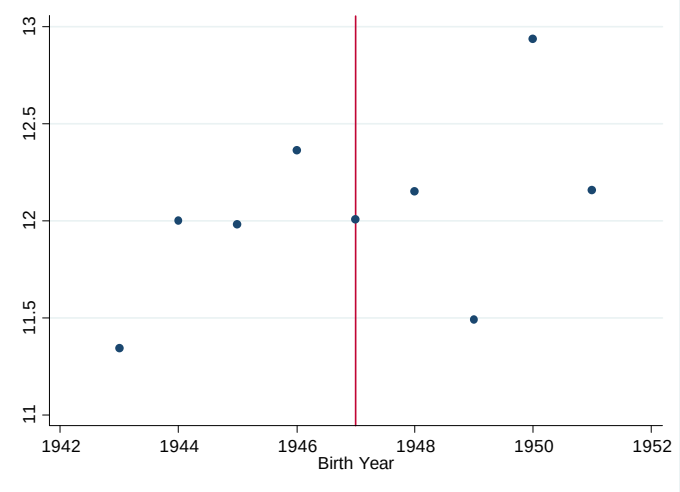

Figure 2.6.
Hungary. Average Completed Years of Full-Time Education.

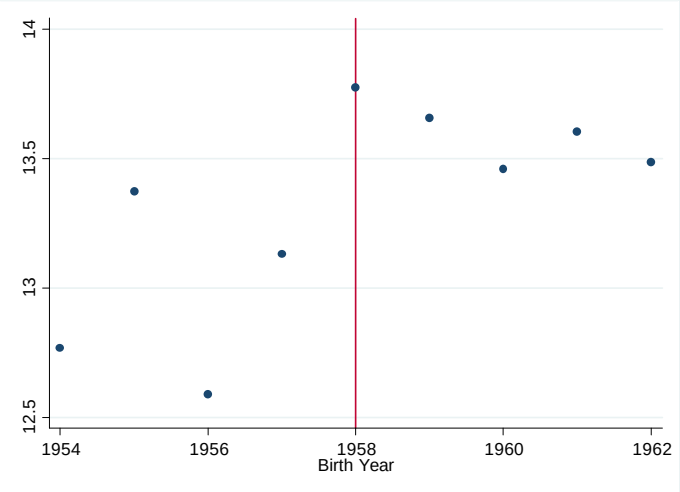

Figure 2.7.
Ireland. Average Completed Years of Full-Time Education.

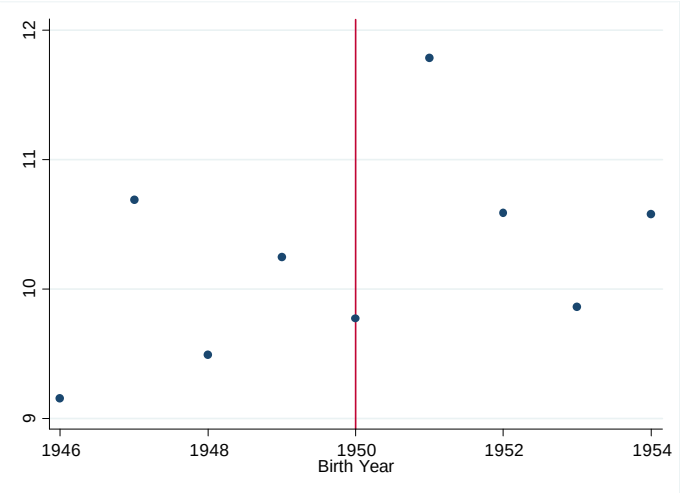

Figure 2.8.
Italy. Average Completed Years of Full-Time Education.

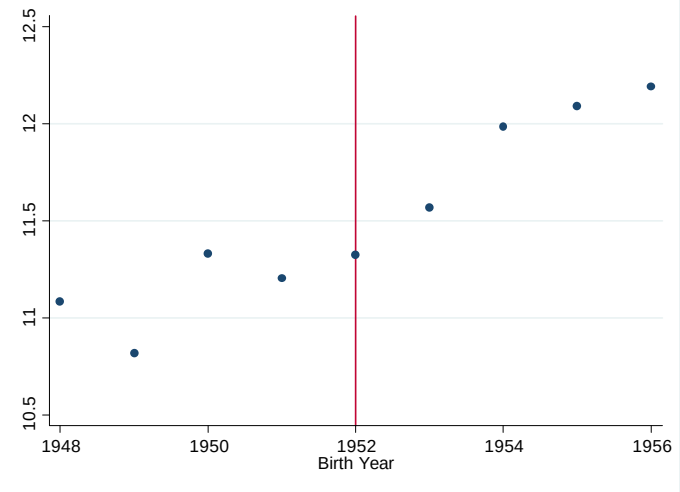

Figure 2.9.
Poland. Average Completed Years of Full-Time Education.

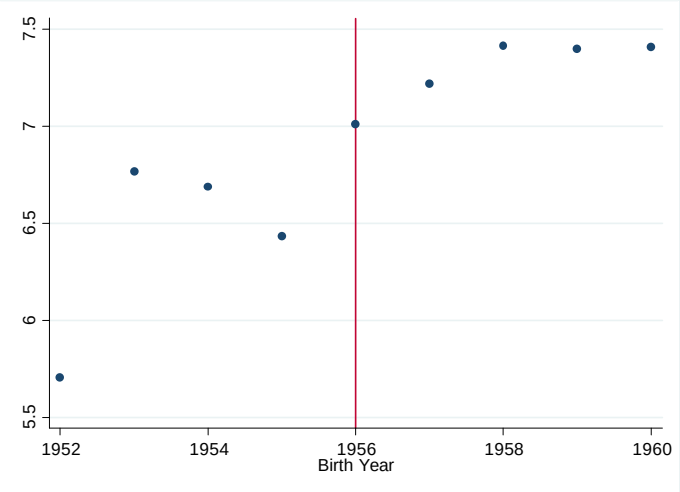

Figure 2.10.
Portugal. Average Completed Years of Full-Time Education.

Figure 2.11.
Spain. Average Completed Years of Full-Time Education.

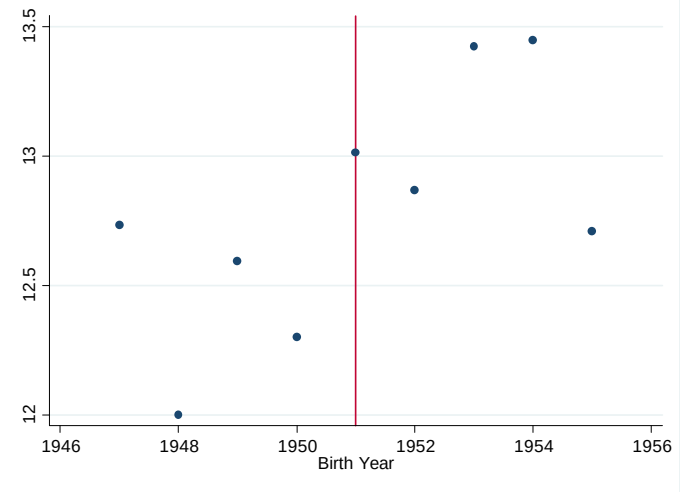

Figure 2.12.
Sweden. Average Completed Years of Full-Time Education.

Figure 2.13.
United Kingdom. Average Completed Years of Full-Time Education.

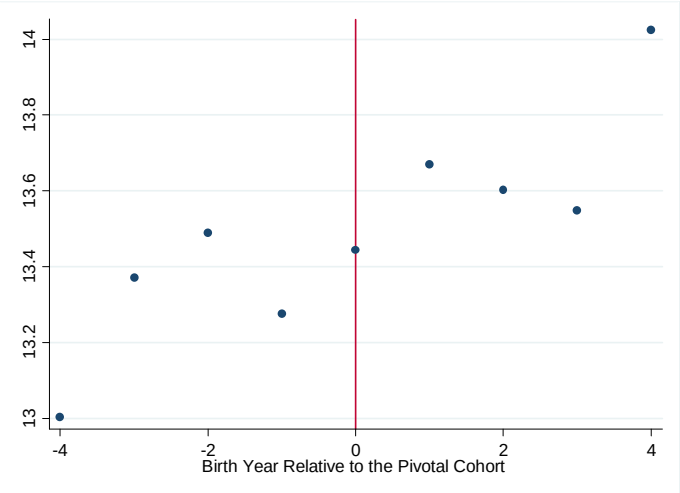

Figure 2.14.
Germany. Average Completed Years of Full-Time Education.

Table 2.2.B shows that the treatment group is younger by about 4 years, which is a consequence of the empirical design. In order to avoid potentially confounding effects of ageing on religiosity, I restrict the sample to those 65 years old or younger.[26] The mean age of 51 in the sample reflects the fact that the education reforms in the analysis took place no later than 1983 and that some respondents are observed 20 to 30 years after the reform. The youngest individuals in the sample are 29 years of age: they were born in 1973 (four years after the first cohort potentially affected by the 1983 Belgium education reform) and interviewed in 2002. Only two percent belong to an ethnic minority group and about four percent have mothers who were born outside the country. The majority of the sample (66 percent) are Christians, about 33 percent report having no religious denomination, and only 0.8% report having a non-Christian religion.[27] Forty-four percent of the respondents had working mothers when they were 14 years old. Because this rate is different between the treatment and control groups (46 percent and 40 percent, respectively) I include the indicator for working mother in the regressions, although dropping this variable had no impact on the results.

[26] Lifting this restriction did not alter the results (see Appendix A, Table A.A.2).
[27] For the 16,404 observations in Table 4, denomination information is available for 16,291 respondents. Finer breakdown of the Christian population into specific denominations (Protestant, Catholic, etc.) was not possible due to data limitations. Please, see Appendix C for details.

2.6. Superstition Data

The questions on superstitious beliefs are asked in the European Values Study (EVS), which consists of four waves of cross-sectional surveys conducted in various years from 1981 to 2008. The question of "Do you believe that a lucky charm, such as a mascot or a talisman, can protect or help you?" was asked in the 1999 and 2008 waves. All of the countries that are used in the analysis of religiosity based on the ESS survey are also in the sample of lucky charm analysis.[28]

Possible answers to the question on lucky charm range from 1 ("Definitely not) to 10 ("Definitely yes"). About 56 percent of all respondents indicated that they definitely do not believe in lucky charms (by choosing 1 on the scale from 1 to 10), and about four percent chose 10, indicating that they definitely believed that lucky charm protects them. Using this question, I created two dummy variables that measure whether the individual believes in the protective power of a lucky charm. The first variable takes the value of 1 if the person chose a value of 4 or higher as his/her answer, and zero otherwise. The second variable takes the value of 1 if the person chose 5 or higher. As Table 2.3.A shows, the means of these variables are slightly higher in the treatment group.

The 1999 wave of the EVS included two questions about horoscopes. The question "How often do you consult your horoscope to know about your future?" has five potential answers: "Every day," "At least once a week," "At least once a month," "Less often," and "Never." The second question asks "How often do you take horoscopes into account in your daily life?" Potential answers are: "Always," "Most of the time," "Sometimes," "Not very often," and "Never." Because the horoscope questions were asked only in Austria, France, Greece, Italy, and Germany, sample sizes are small (1,650 for the former question and 1,416 for the latter). About 42 percent of the respondents indicated that they never consult their horoscope and about 70 percent indicated that they never take horoscope into account in daily life. I created a dichotomous variable that takes the value of 1 if the respondent indicated that he/she consults horoscopes at least monthly. Table 2.3.A shows that about 35 percent of the sample

[28] The number of observations for Northern Ireland is very small for the ESS (57 observations in the main regressions) because Northern Ireland is not treated by the ESS survey design as a separate country but as a region – either a part of Great Britain (Rounds 1 to 6) or Ireland (Round 4 only). Using this information, I treated Northern Ireland as a separate country. It has a separate country fixed effect in the regressions, but it is not presented in the graphs, because the number of observations in Northern Ireland is small. Omitting these observations or treating them as a part of Great Britain does not alter the results. In the EVS data, however, Northern Ireland enters as a separate country and has more observations (164 in the current sample).

Table 2.3.A
Descriptive Statistics of Superstition Variables

Variable	All	Treatment	Control
"Do you believe that a lucky charm, such as a mascot or a talisman, can protect or help you?" (Question was asked in Austria, Belgium, Denmark, France, Great Britain, Greece, Hungary, Ireland, Italy, Northern Ireland, Poland, Portugal, Spain, Sweden and West Germany).			
==1 if on a scale from 1 to 10 the individual's belief in lucky charm is 4 or greater; 0 otherwise	0.279	0.285	0.273
	(0.449)	(0.452)	(0.446)
==1 if on a scale from 1 to 10 the individual's belief in lucky charm is 5 or greater; 0 otherwise	0.246	0.249	0.243
	(0.431)	(0.433)	(0.429)
N	6969	3668	3301
"How often do you consult your horoscope to know about your future?" (Question was asked in Austria, France, Greece, Italy and West Germany)			
==1 if the individual consults her horoscope at least monthly	0.354	0.338	0.373
	(0.479)	(0.473)	(0.484)
N	1650	886	764
"How often do you take horoscopes into account in your daily life?" (Question was asked in Austria, France, Greece, Italy and West Germany)			
==1 if individual takes into account horoscope in daily life sometimes, most of the time, or always	0.147	0.140	0.156
	(0.355)	(0.347)	(0.363)
N	1416	752	664

The data is from the EVS survey. The treatment group consists of individuals born up to seven years after the first cohort potentially affected by an education reform. The control group consists of those born up to seven years before the pivotal cohort. The first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. The sample is restricted to individuals between 25 and 65 years old, citizens of the country of the interview, who do not report being a student. Survey weights are used.

does this, but that the rate is lower among the treatment group.[29] Another dummy variable measures whether the respondent takes into account his/her horoscope in daily life (sometimes, most of the time, or always.) About 15 percent of the sample behaves this way.

Table 2.3.B displays the personal attributes of the EVS respondents in the superstition samples. The top section of the table, pertaining to the lucky charm sample, contains a larger number of observations because it involves more countries.

Table 2.3.B
Descriptive Statistics of Independent Variables: EVS Sample

Variable	Variable Definitions	All	Treatment	Control
Lucky Charm Sample (Austria, Belgium, Denmark, France, Great Britain, Greece, Hungary, Ireland, Italy, Northern Ireland, Poland, Portugal, Spain, Sweden and West Germany).				
Years of schooling	Constructed number of years of full-time education completed	11.971	12.356	11.540
		(3.974)	(3.834)	(4.082)

[29] It is possible that more educated individuals may feel embarrassed about their superstitious beliefs and they may underreport the extent of their superstition.

Table 2.3.B (Continued)

Variable	Variable Definitions	All	Treatment	Control
Lucky Charm Sample (Austria, Belgium, Denmark, France, Great Britain, Greece, Hungary, Ireland, Italy, Northern Ireland, Poland, Portugal, Spain, Sweden and West Germany).				
Proportion of people who have completed the new compulsory level of education or higher		0.735 (0.441)	0.794 (0.404)	0.669 (0.471)
Age	Age of the respondent	47.487 (8.440)	44.373 (7.732)	50.977 (7.811)
Male	==1 if male, 0 otherwise	0.500 (0.500)	0.498 (0.500)	0.503 (0.500)
Working	==1 if the respondent is working, 0 otherwise	0.546 (0.498)	0.596 (0.491)	0.489 (0.500)
Married	==1 if married, 0 otherwise	0.688 (0.463)	0.679 (0.467)	0.698 (0.459)
Child at Home	==1 if a person under 18 lives at home, 0 otherwise	0.542 (0.498)	0.639 (0.480)	0.433 (0.496)
City	==1 if the respondent lives in a town with population bigger than 20,000, 0 otherwise	0.528 (0.499)	0.527 (0.499)	0.529 (0.499)
N		6969	3668	3301
Horoscope Sample (Austria, France, Greece, Italy and West Germany).				
Years of schooling	Constructed number of years of full-time education completed	12.180 (4.189)	12.690 (3.999)	11.600 (4.325)
Proportion of people who have completed the new compulsory level of education or higher		0.712 (0.453)	0.768 (0.422)	0.648 (0.478)
Age	Age of the respondent	44.808 (6.890)	40.869 (5.749)	49.295 (5.109)
Male	==1 if male, 0 otherwise	0.448 (0.497)	0.446 (0.497)	0.450 (0.498)
Working	==1 if the respondent is working, 0 otherwise	0.564 (0.496)	0.596 (0.491)	0.528 (0.500)
Married	==1 if married, 0 otherwise	0.710 (0.454)	0.690 (0.463)	0.733 (0.443)
Child at Home	==1 if a person under 18 lives at home, 0 otherwise	0.565 (0.496)	0.706 (0.456)	0.404 (0.491)
City	==1 if the respondent lives in a town with population bigger than 20,000, 0 otherwise	0.637 (0.481)	0.641 (0.480)	0.634 (0.482)
N		1650	886	764

The data is from the EVS survey. The treatment and control groups consist of individuals born up to 7 years after and up to 7 years before the pivotal cohort, respectively. The pivotal cohort is omitted, because the extent of their exposure to an education reform is unclear. The sample is restricted to those between 25 and 65 years old, citizens of the country of the interview, who do not report being a student. I do not report minimum and maximum values because all but two variables are dummy variables: 1) years of completed education (min. 0 and max. 25 in the lucky charm sample and min. 2 and max. 25 in the horoscope sample); 2) age (min. 25 and max. 65 in the lucky charm sample and min. 28 and max. 63 in the horoscope sample). Survey weights are used.

2.7. Results

2.7.1. The Impact of Education on Religiosity

Estimating Equation (2.2) provides the average effect of an education reform, which is reported in Table 2.4. Being exposed to a compulsory schooling reform increases educational attainment by about 0.4 years.[30] This estimate is close to that reported by Borgonovi et al. (2010), who also use ESS data and find the effect to be approximately half a year. Similarly, Gathmann et al. (2014) list the first stage coefficients for a number of European countries and report the average estimate to be about 0.4. Although my sample of countries is different from those employed in these papers, the estimated impacts of the reform on educational attainment are similar.

Table 2.4
The Impact of Exposure to an Education Reform on Completed Years of Full-time Education: ESS Sample

	(1)
Exposure to reform	0.410***
	(0.122)
Age	0.304*
	(0.165)
Age squared	-0.000
	(0.001)
Male	0.404***
	(0.094)
Ethnic minority	-0.157
	(0.326)
City	1.311***
	(0.123)
Mother immigrant	0.354*
	(0.196)
Mother working	0.029
	(0.079)
N	16404

The treatment group consists of individuals born up to 4 years after the first cohort potentially affected by an education reform. The control group consists of those born up to 4 years before the pivotal cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. Standard errors clustered at the regional level are in parentheses. The estimation uses sampling weights and includes survey year and survey country dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

[30] The effect of being exposed to an education reform is likely to be heterogeneous across countries. The change in years of compulsory schooling, the timing of the reforms, the quality of their implementation, and political and social circumstances differ from country to country. Small sample sizes, however, prevent me from estimating the first stage regressions for each country separately. However, I estimated the models by dividing the countries into two sub-samples based on the dominant religion in the country. The first group included countries where the dominant religion is something other than Catholicism. Denmark, Greece, Sweden and the United Kingdom are in this group. The rest of the sample constitutes Catholic countries. The results remained the same in the Catholic country sample, although the standard errors were inflated in the religiosity regressions. The sample size of the four non-Catholic countries was small (ranging from 294 observations in horoscope regressions to 5,002 in religiosity regressions); thus most of the coefficients other than religiosity were not estimated with precision.

Table 2.5 presents the impact of education on religiosity, obtained from instrumental variable regressions. In all specifications, the dummy for the exposure to an education reform serves as an instrument for completed years of full-time education. The F-values for the instrument in first stage are around 11, and they are displayed, along with their p-values, in the bottom rows of each panel. Table 2.5 also reports the reduced form coefficients which display the impact of the exposure to the reform on religiosity, on attending religious services and on praying.

The top panel of Table 2.5 reports the impact of education on attending religious services and on praying. The standard errors of the estimated coefficients, clustered at the regional level are reported in parentheses. The p-values associated with the bootstrapped standard errors, clustered at the country/state level are reported in {curly brackets}. Column (1) shows that one additional year of full-time education reduces the propensity to attend religious services at least once a month by about 13 percentage points. Similarly, column (2) shows that one year of extra schooling decreases the propensity to attend religious services at least weekly by about 9 percentage points. When I employ indicators of attending religious services very frequently (several times a week or every day) or very infrequently (only on special holy days or less often) as dependent variables, the impact of education was close to zero and statistically insignificant. This implies that schooling on the margin has an impact on religious practices if the person is in the interior of the behavior space.

In columns (3) to (6) of the top panel of Table 2.5, the religiosity outcome is the reported frequency of praying. The negative effect of additional education is about 9 percentage points when the dependent variable is the propensity to pray at least once a month (column 3); and it is 10 to 12 percentage points when the outcomes is the propensity to pray more than once a week (columns 4 and 5). Column (6) shows that education has a negative but statistically insignificant effect on praying every day.

Panel B of Table 2.5 displays the results where the outcome is religiosity. Columns (1) to (3) present the impact of education on individuals' propensity for being above the cut-offs of 7, 8, and 9, respectively, on the scale of religiosity from 0 "Not at all religious" to 10 "Very religious." Column (1) shows that an additional year of schooling reduces the propensity of being religious (defined as being in categories of 8, 9 or 10) by about 8 percentage points. Column (2) of Panel B shows that an additional year of full-time education decreases the likelihood of the individual being in the top two categories of religiosity by about 6 percentage points. The coefficient in column (3) is also negative, but small and not different from zero indicating that education has no statistically significant impact on self-declaration of being extremely religious.

Table 2.5
The Impact of Education on Religiosity, IV Results

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
Years of schooling	-0.130**	-0.094**	-0.087**	-0.123**	-0.096**	-0.053
	(0.057)	(0.041)	(0.041)	(0.052)	(0.048)	(0.034)
	{0.003}***	{0.028}**	{0.067}*	{0.015}**	{0.032}**	{0.204}
Reduced Form coefficient	-0.052***	-0.037***	-0.035**	-0.049***	-0.038**	-0.021*
	(0.014)	(0.012)	(0.014)	(0.014)	(0.015)	(0.012)
	{0.005}***	{0.034}**	{0.082}*	{0.017}**	{0.033}**	{0.191}
N	16337	16337	16163	16163	16163	16163
Sample Mean	0.313	0.188	0.460	0.400	0.330	0.223
1st Stage F-test	10.791	10.791	10.395	10.395	10.395	10.395
P-value	0.001	0.001	0.002	0.002	0.002	0.002

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
Years of schooling	-0.082**	-0.061**	-0.018	-0.058	-0.087**	-0.072**
	(0.039)	(0.026)	(0.015)	(0.042)	(0.042)	(0.036)
	{0.041}**	{0.018}**	{0.255}	{0.186}	{0.060}*	{0.075}*
Reduced Form coefficient	-0.034***	-0.025***	-0.007	-0.023	-0.036***	-0.030**
	(0.012)	(0.009)	(0.006)	(0.015)	(0.013)	(0.012)
	{0.104}	{0.013}**	{0.292}	{0.253}	{0.081}*	{0.166}
N	16323	16323	16323	16323	16323	16323
Sample Mean	0.188	0.084	0.042	0.382	0.259	0.157
1st Stage F-test	11.066	11.066	11.066	11.066	11.066	11.066
P-value	0.001	0.001	0.001	0.001	0.001	0.001

The treatment group consists of individuals born up to 4 years after the first cohort potentially affected by an education reform. The control group consists of those born up to 4 years before the pivotal cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. Control characteristics include Age, Age Squared, Male, Ethnic Minority, City, Mother Immigrant and Mother Working variables. The estimations use sampling weights and include survey year dummies, survey country dummies and country-specific cohort trends. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Columns (4) to (6) in the Panel B of Table 2.5 display the results where the outcome variable is an indicator for whether the individual belongs to the top 30 percent, 20 percent, or 10 percent of his/her country's religiosity distribution, respectively. The estimated coefficients are negative, ranging from -0.058 to -0.087, indicating that an additional year of schooling reduces the probability of an individual being in the top 30, 20, or 10 percent of his/her

country's religiosity distribution. When the standard errors are estimated by clustering at the country/state level, the inference does not change.

It must be noted that the estimated effects of education relate to a very specific group of people. In particular, compulsory schooling reforms have induced some individuals to obtain additional years of education, who would not have done so otherwise. Thus, I estimate the local average treatment effect (LATE) of education for these individuals, "compliers." Therefore, I cannot generalize the estimated effects to the entire population.

Control variables, which are not reported in the interest of space, reveal that those individuals whose mothers are immigrants are more likely to pray. Such individuals are also more likely to report higher levels of religiosity. Males are significantly less likely than females to attend religious services, pray and declare themselves religious. These gender differences in religiosity are consistent with those reported in other settings (Cesur and Mocan 2013, Miller and Stark 2002, Walter and Davie 1998, Suziedelis and Potvin 1981).

Table 2.5 also shows that the significance of the reduced form coefficients is consistent with the IV regressions for each model. Thus, the results reported in Table 2.5 indicate that both the extent of religiosity and the practice of religion are diminished by educational attainment. This finding is in contrast to the conjecture of Glaeser and Sacerdote (2008) who argued that the positive correlation between education and church attendance they found in the U.S. data could be because attending religious services is more socially beneficial to the more educated. [31] The results, on the other hand, are consistent with recent research (Becker et al. 2014, Cesur and Mocan 2013, Hungerman 2014).

2.7.2. The Impact of Education on Superstitious Beliefs

Table 2.6 presents the instrumental variables results where the outcome variables are whether the person believes in the protective power of lucky charms (columns 1 and 2), whether the person consults horoscope at least monthly (column 3) and whether he/she takes horoscope into account in daily life sometimes, most of the time, or always (column 4). The models include country and survey year fixed effects, age and its quadratic, a gender indicator, and an indicator for whether the respondent lives in a city, as well as country-specific cohort trends.

[31] The difference in the results could be due to the source of data. I analyze the behavior of people in 14 European countries, whereas Glaeser and Sacerdote (2008) analyze data from the U.S. It could be that the motivation for attending religious services could be different in the U.S. from Europe. The difference could also be attributable to the fact that I instrument educational attainment, whereas the inference of Glaeser and Sacerdote (2008) was based on OLS because of data limitations.

The first row shows that the coefficients of education obtained from instrumental variables regressions are always negative. They are statistically significant at the 5 percent level in columns (1) and (2), and significant at the 10-percent level in columns (3) and (4).[32] The number of observations drops from about 16,500 in the religiosity

Table 2.6
The Impact of Education on Superstition, IV Results

	On a scale from 1 to 10 person's belief that lucky charm protects …			
	… is ≥ 4	… is ≥ 5	Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.111**	-0.125**	-0.124*	-0.076*
	(0.054)	(0.057)	(0.074)	(0.040)
	{0.011}**	{0.006}***	{0.075}*	{0.007}***
1st stage coefficient	0.505***	0.505***	0.862**	1.186***
	(0.161)	(0.161)	(0.351)	(0.384)
Reduced form coefficient	-0.056**	-0.063***	-0.107**	-0.090**
	(0.022)	(0.022)	(0.041)	(0.041)
	{0.010}**	{0.007}***	{0.087}*	{0.003}***
N	6969	6969	1650	1416
Sample Mean	0.279	0.246	0.354	0.147
1st Stage F-test	9.859	9.859	6.041	9.535
P-value	0.002	0.002	0.016	0.003

The treatment group consists of individuals born up to 7 years after the first cohort potentially affected by an education reform. The control group consists of those born up to 7 years before the pivotal cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. Control characteristics include Age, Age Squared, Male, and City variables. The lucky charm sample (columns (1) and (2)) includes respondents from Austria, Belgium, Denmark, France, Great Britain, Greece, Hungary, Ireland, Northern Ireland, Italy, Poland, Portugal, Spain, Sweden and West Germany. The horoscope sample (columns (3) and (4)) includes respondents from Austria, Greece, France, Italy and West Germany. Standard errors clustered at the country and year of birth level are reported in parenthesis. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}. The estimations use sampling weights and include survey year dummies, survey country dummies and country-specific cohort trends. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses.

regressions that used the ESS data (reported in Table 5) to about 7,000 in the lucky charm regressions and to 1,400-1,650 in the horoscope regressions both of which use the EVS data.[33]

[32] The bootstrapped standard errors, based on clustering at the country-level, indicate better levels of statistical significance. Their p-values are reported in {curly brackets}.
[33] Horoscope regressions only include Austria, Germany, Greece, Italy and France, because the horoscope questions were not asked in other countries with an available education reform instrument.

The results of Table 2.6 indicate that an additional year of schooling reduces people's belief that a lucky charm protects them by 11 or 12 percentage points.[34] One more year of schooling reduces the propensity to take horoscopes into account in daily life by about 8 percentage points. The reduced form coefficients of the education reform, also reported in Table 2.6, indicate that exposure to the reform lowers the propensity to believe in lucky charms by 5 to 6 percentage points, and it lowers the propensity to believe in horoscopes by 9 to 11 percentage points. These results, taken together, show that education reduces the propensity for believing in superstitious phenomena.[35,36]

2.7.3. Robustness

To investigate the robustness of the results I estimated different versions of the main specifications. For example, I added a cubic term in age in addition to its quadratic specification, which did not alter the results. Similarly, interacting age with country dummies did not change the results. I also controlled for age by using seven mutually exclusive age dummies. The results followed the same pattern.

To investigate the sensitivity of the results to the inclusion of people older than 65, I added to the sample those who are 65 years of age and older, and re-estimated the models. The results, which remained intact, are reported in Appendix A, Table A.2.

The pivotal birth cohort years, shown as the vertical lines in the graphs, are excluded from the benchmark models because it is difficult to determine the extent to which these cohorts are impacted by the reforms in their respective countries (see the details of the reforms in Appendix B). One exception is France, where the pivotal cohort is included in the treatment group. This is because, as explained by Grenet (2013), in France everyone who was born on or after January 1, 1953 has been affected by the reform of 1959. Thus, the entire 1953 cohort in France is arguably impacted by the reform. Nevertheless, I re-estimated the models by dropping this pivotal cohort of

[34] When I estimate the lucky charm model, defining superstition as belonging to categories of 6 and higher (on the scale from 1 to 10) regarding the belief in the power of lucky charms, I find that only 17 percent of the sample possesses this level of superstition and the estimated IV coefficient is -0.034, not statistically significant at conventional levels.

[35] When I estimate the religiosity and superstition regressions reported in Tables 2.5 and 2.6 using OLS instead of IV, I find that the estimated coefficients of education are very small, and most of the estimated coefficients are statistically insignificant when standard errors are clustered at the state/country level and bootstrapped. These OLS results are summarized in Appendix A, Table A.1.

[36] If I use the treatment intensity (number of additional years of education due to reform) as an instrument instead of exposure to the reform, I find that the first stage coefficients become smaller in magnitude, but their statistical significance remains. The estimated IV coefficients for religiosity outcomes are smaller and in most cases they lose their significance. The IV coefficients for superstition also become smaller in magnitude, but remain significant.

France from the sample. The results, displayed in Appendix A, Table A.3, are not impacted by this omission. I also considered the pivotal cohorts in all countries as part of the treated cohorts. In this case, the cohorts for which the exposure to the reforms was unclear (the cohorts marked with vertical lines in the Figures) are added to the treatment groups. This exercise did not change the results appreciably, although the standard errors became larger in some cases. These results are displayed in Appendix A, Table A.4.

Brunello, Fabbri and Fort (2013) use nine of the countries in my sample to investigate the impact of education on body mass index using the reforms as an instrument for education. Because there are differences between Brunello et al. (2013) dates and my dates regarding the pivotal cohorts, I re-estimated the models using the dates listed in Table 1 of Brunello et al. (2013).[37] The results are not impacted with the exception of the standard errors in the superstition regressions, which became larger. I also ran the models by treating the states of Germany as separate countries. Once again, the results are not impacted appreciably. These results are shown in Appendix A, Tables A.5 and A.6, respectively.

The benchmark models control for country-specific cohort trends. As alternative specification I ran models with quadratic age trends as was done in Brunello et al. (2013) and obtained similar results (Appendix A, Table A.7).[38]

As another sensitivity analysis, I expanded the control and treatment groups to include people born up to 7 years before and after the pivotal cohort, respectively. These results are provided in Appendix A, Table A.8. One again, they are consistent with those obtained from the benchmark specification.

Finally, I analyzed the extent to which the results change when I turn the control variables on-off. I excluded each control variable one by one and re-estimated the models. Additionally, I estimated the models with no controls. These changes did not alter the impact of education demonstrably.

2.7.4. Ordered Probit Models for Religiosity and Superstition

As an alternative specification, I estimated the religiosity and superstition models using ordered probit specifications while accounting for endogeneity of education. For each outcome, each person is classified into one

[37] See Appendix B for the description of the reforms and implementation dates.
[38] In the spirit of Brunello (2013), in this specification I also included dummies for 5-year intervals for the year of birth.

of the three categories based on their location on the relevant scale of religiosity or superstition. These categories are displayed in rows I and II of Table 2.7. The ordered probit specification is described by Equations (2.3)-(2.5):

$$R^*_{ikct} = \delta \text{Education} + X'_{ikct}\Omega + \mu_c + \eta_t + u_{ikct}, \quad (2.3)$$

where R^*_{ikct} is the unobserved latent religiosity or superstition variable and R_{ikct} is the observed outcome measure: $R_{ikct} = 1$ if $R^*_{ikct} \leq \alpha_1$, $R_{ikct} = 2$ if $\alpha_1 < R^*_{ikct} \leq \alpha_2$, and $R_{ikct} = 3$ if $R^*_{ikct} > \alpha_2$, α_1 and α_2 are unknown cut-offs to be estimated. u_{ikct} is assumed to be standard normal. μ_c and η_t stand for country and year of survey fixed effects, respectively. The specification also includes country-specific quadratic age trends and dummies for 5-year intervals for the year of birth. The probabilities of being in each of the three categories of religiosity or superstition-related behavior are given by:

$$\Pr(R_{ikct} = 1) = \Phi(\alpha_1 - \delta \text{Education}_{ikct} - X'_{ikct}\Omega - \mu_c - \eta_t)$$

$$\Pr(R_{ikct} = 2) = \Phi(\alpha_2 - \delta \text{Education}_{ikct} - X'_{ikct}\Omega - \mu_c - \eta_t) - \Phi(\alpha_1 - \delta \text{Education}_{ikct} - X'_{ikct}\Omega - \mu_c - \eta_t)$$

$$\Pr(R_{ikct} = 3) = 1 - \Phi(\alpha_2 - \delta \text{Education}_{ikct} - X'_{ikct}\Omega - \mu_c - \eta_t) \quad (2.4)$$

Education is modeled as follows:

$$\text{Education} = \gamma_0 + \gamma_1 \text{Reform}_{kc} + X'_{ikct}\Omega + \mu_c + \eta_t + v_{ikct}, \quad (2.5)$$

where it is assumed that (u_{ikct}, v_{ikct}) is jointly normally distributed: $(u_{ikct}, v_{ikct}) \sim N(0, \Sigma)$, and is independent of the instrument Reform_{kc}.

The ordered probit is estimated by conditional maximum likelihood by specifying the joint distribution for the relevant outcome variable and education, given the exogenous variables X'_{ikct} and the instrument Reform_{kc}.[39] The marginal effects of education are calculated at mean values of regressors, and standard errors are computed by the delta method.

[39] Estimation is carried out using the cmp Stata command described in Roodman (2011). The command is built on the Stata maximum likelihood estimation framework, and allows for the use of weights and clustering of standard errors.

Table 2.7
The Impact of Education on Religiosity and Superstition, Ordered Probit with Endogenous Education

Panel A: Religiosity

	"How often do you attend religious services?" from 1 "Every day" to 7 "Never"	"How often do you pray?" from 1 "Every day" to 7 "Never"	"How religious are you?" from 0 "Not at all religious" to 10 "Very religious"
(I)	Category 1 (30.4%): never Category 2 (38.3%): only on special holy days or less often Category 3 (31.3%): at least once a month	Category 1 (33.3%): never Category 2 (26.7%): more often than never but less often than weekly Category 3 (40.0%): at least once a week	Category 1 (31.2%): 0 to 3 Category 2 (50.0%): 4 to 7 Category 3 (18.8%): 8 to 10
Ordered Probit coefficient	-0.191*** (0.047)	-0.197*** (0.046)	-0.201*** (0.048)
Category 1 Marginal effect	0.066*** (0.020)	0.072*** (0.019)	0.075*** (0.020)
Category 2 Marginal effect	0.004** (0.002)	0.004*** (0.001)	-0.013*** (0.003)
Category 3 Marginal effect	-0.071*** (0.020)	-0.077*** (0.019)	-0.061*** (0.022)
N	16337	16163	16323

Panel B: Superstition

	"Do you believe lucky charms protect?" from 1 "Definitely not" to 10 "Definitely yes"	"How often do you consult your horoscope?" from 1 "Every day" to 5 "Never"	"How often do you take horoscope into account in daily life?" "Always" to 5 "Never"
(II)	Category 1 (65.4%): 1 and 2 Category 2 (25.1%): 3 to 7 Category 3 (9.4%): 8 to 10	Category 1 (64.6%): never or less often than once a month Category 2 (10.4%): at least once a month Category 3 (25.1%): at least once a week or every day	Category 1 (69.5%): never Category 2 (15.7%): not very often Category 3 (14.7%): sometimes, most of the time or always
Ordered Probit coefficient	-0.129* (0.077)	-0.145 (0.120)	-0.176*** (0.058)
Category 1 Marginal effect	0.048* (0.029)	0.058 (0.048)	0.062** (0.027)
Category 2 Marginal effect	-0.025** (0.011)	-0.004 (0.003)	-0.018*** (0.002)
Category 3 Marginal effect	-0.023 (0.018)	-0.054 (0.049)	-0.044 (0.028)
N	6969	1650	1416

Please see text for the specification details. In Panel A, the treatment and control groups consist of those born up to four years after and before the pivotal cohort, respectively. In Panel B, the treatment and control groups consist of those born up to seven years after and before the pivotal cohort, respectively. In both panels, with the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. In Panel A, standard errors in parentheses are clustered at regional level. In Panel B, standard errors in parentheses are clustered at country and year of birth level.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In all cases, we classified answers into three categories. Panel A of Table 2.7 displays the results pertaining to the religiosity models. Column (1) reports the ordered probit results where the dependent variable consists of three categories of the frequency of attending religious services: The individual is in Category 1 if she/he never attends religious services. Category 2 identifies attendance only on special or holy days or even less often. Category 3 designates more frequent attendance: at least once a month. As shown in column (1), the proportion of people in each category is about the same. The estimated ordered probit coefficient is reported in column (1) along with the marginal effects for each category. The results show that a one-year increase in education, induced by the mandate, increases the probability of never attending religious services. It also increases the probability of attending very infrequently, while decreasing the probability of attending religious services at least once a month.

Column (2) of Panel A in Table 2.7 shows that a one-year increase in education makes people less likely to pray at least once a week, and makes them more likely to never pray or pray infrequently. Column (3) of Panel A demonstrates that one additional year of education reduces the probability that the individual indicates he/she is very religious (being in Category 3) by 6.1 percentage points. Similarly, an extra year of education reduces the probability of being in the second religiosity category by 1.3 percentage points. The probability of being not religious (Category 1) goes up by about 7.5 percentage points due to the same increase in education.

Panel B of Table 2.7 presents the instrumental-variable ordered probit results for superstition outcomes. Column (1) shows that one year of extra education decreases individuals' propensity to believe in the protective power of lucky charms as it moves them from Categories 2 and 3 to Category 1. Column (2) of Panel B in Table 2.7 presents the results pertaining to consulting horoscopes about the future. An increase in education reduces the frequency with which people refer to horoscopes, but the estimated coefficients are insignificant. The results reported in column (3) of Table 2.7 show that an additional year of education makes people more likely to indicate that they never take horoscopes into account in their daily lives.[40] Correspondingly, an additional year of education makes people less likely to reveal that they belong to Categories 2 or 3, which are associated with taking horoscopes into account in daily affairs at least sometimes.

[40] Dummies for 5-year intervals for the year of birth had to be omitted from this estimation in order for the cmp command to achieve conversion.

2.7.5. Placebo Treatment

In this final analysis of the chapter, I implement placebo tests for the treatment. Specifically, I move the reform dates in each country two or three years forward or two or three year backward in comparison to the actual reform dates, and re-estimate the models. If the results reported so far are spurious and if the impact of the reform on education, religiosity and superstition is coincidental (e.g. because it merely captures the impact of a general move towards secularity), then moving the reform dates should still have an impact on religious and superstitious beliefs. The results are reported in Appendix A, Tables A.9 to A.12. Between the instrumental variables and the reduced models, 128 coefficients are estimated, and only eight of them are different from zero, and in all cases the first-stage regressions are meaningless. These results indicate that the actual dates of the reforms determine the variation of education among individuals, which in turn impacts their religious and superstitious beliefs.

2.8. Summary and Conclusion

Although it has been argued that adherence to religion and superstition would diminish as level of education rises, it is a challenging task to find exogenous variation in education between individuals that can be used to identify the extent to which education impacts their superstitious and religious beliefs.

In this chapter, I exploit compulsory schooling reforms implemented in European countries during the 1960s and 70s. These schooling laws increased the mandatory years of education by one or more years, depending on the country. Based on their year of birth, some individuals were exposed to these education reforms and were therefore mandated to receive additional years of schooling. Other individuals in the same country were exempt from the mandate because they were born before the cut-off date of the law, and therefore the law was not binding for them.

I use data from the European Social Survey and consider the treatment by the compulsory schooling laws implemented by Austria, Belgium, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Poland, Portugal, Spain, Sweden and the United Kingdom as exogenous instruments that impact individuals' actual attained education and show that these education reforms increased average education by 0.4 years. Using questions on religiosity and the frequency of attending religious services and running instrumental variables regressions, I find that an additional year of education, triggered by the mandate, has a significant negative impact on both measures of religiosity. I also find that education has a negative impact on the frequency of praying. The results indicate that education not only

reduces the extent of religiosity, it also lowers the propensity for participation in social religious activities (i.e. attending religious services), as well as the propensity to engage in private religious activities (i.e. praying).

Using data from the European Values Study, I apply the same empirical procedure and investigate the extent to which education impacts superstitious beliefs. I find that education reduces the propensity to believe in the power of lucky charms (such as mascots or talismans). Education also reduces the frequency with which people consult horoscopes to learn about the future, and the extent to which people take into account horoscopes in their daily lives.

A variety of specification alternatives and falsification tests reveal the robustness of the findings, showing that education reduces the tendency to be religious and superstitious.

CHAPTER 3. THE IMPACT OF TAX RATES AND CULTURE OF LEISURE ON LABOR SUPPLY IN EUROPE

3.1. Introduction

There are substantial differences between people around the world regarding how many hours they work in the labor market. For example, in 2012, the average annual hours worked by American workers was 1,789. The average worker in Germany worked 22 percent fewer hours than an American worker in that year, and a French worker worked 17 percent less. A worker in Belgium spent about 12 percent less time at work in comparison to an American worker. Similar disparities are observed when hours per person is analyzed, instead of hours per worker.[41] Annual hours worked per working age population (ages 15 to 64) are 10 percent lower in Germany, 19 percent lower in France, and 17 percent lower in Belgium in comparison to the U.S.

In an influential paper, Edward Prescott (2004) employed a growth model with a representative household and calibrated the model to show that the difference in hours worked between the United States and Europe at two points in time can be explained almost entirely by the differences in the tax rates on labor and consumption. A large literature that followed provided a number of nuanced extensions and modifications to Prescott's framework, regarding the preferred labor supply elasticities to calibrate such macro models, modifications to the model to incorporate the ability for the household to self-insure through asset accumulation, the role of productivity growth, and so on (e.g. Ljungqvist and Sargent 2006, Ohanian et al. 2008, Rogerson 2008, Olovsson 2009, Chetty et al. 2011, McDaniel 2011). In a different framework, Algan and Cahuc (2005) showed that family labor supply attitudes were important in explaining the variation in the employment rates of different demographic groups in OECD countries.

The finding that taxes are a major factor in explaining cross-country differences in market work is important because it implies that reductions in taxes can generate significant increases in economic activity. Alternative, or at least complementary, hypotheses have been proposed to explain the differences in hours worked between Europe and the U.S. These include the importance of regulations and labor unions (Alesina, Glaeser and Sacerdote 2006), and the role of home production (Olovsson 2015). An important aspect of this discussion is the role of preferences for leisure. The assumption of identical preferences between countries, and in particular between Europeans and Americans has been questioned (Blanchard 2006). This point is also emphasized by Alesina, Glaeser

[41] This measure incorporates both the willingness to participate in the labor market (the decision on whether or not to work) and the decision on how many hours to work.

and Sacerdote (2006) who suggested that an initial decline in market work might increase individuals' utility from leisure and this process can be amplified by a social multiplier (Glaeser, Sacerdote and Scheinkman 2003) if there exist complementarities in leisure – individuals' utility from leisure is enhanced when more people are consuming leisure.

The argument that Europeans have stronger taste for leisure than Americans (Blanchard 2004) is perhaps intuitive, and fits well with many people's pre-conceived image of longer vacations and shorter work weeks in most European countries. Although tastes for leisure can impact labor supply, no systematic analysis has been conducted on this subject.[42] In this chapter, I focus on European countries and investigate the impact of taxes and the culture of leisure on labor supply. Using a large micro data set consisting of individuals from 26 European countries, I analyze people's labor supply decisions both at the extensive and the intensive margins.[43] While there are significant differences between Americans and Europeans in hours worked, there are also substantial differences in market work *between* European countries. To demonstrate the extent of variation between countries in hours worked, I use OECD data and calculated hours worked per population ages 15 to 64 in 2012, in a sample of European countries, which are displayed in Table 3.1. This measure contains two dimensions of market work: the fraction of the working age population that actually works and the number of hours of those who work. The entries in Table 3.1 are standardized to portray average hours worked in each country relative to the U.K. For example, hours worked per person in France, Germany and Greece are 19 percent, 10 percent, and 3 percent lower, respectively, than in the

[42] Standard empirical models of labor supply include a vector of worker attributes such as racial and ethnic background, if available, in an effort to control for pre-market factors that can impact labor supply, but explicit adjustment to taste for leisure has not been done so far.

[43] The conjecture is that some countries have stronger preferences for leisure, and people in those countries would have worked fewer hours even if they faced lower marginal tax rates. On the face of it, this argument does not seem to explain the increasing wedge between labor supply of Americans and Europeans over the last three decades or so, because culture is not expected to change rapidly. Even though the goal of this chapter is *not* to explain the divergence of hours worked between countries over time, I would still like to emphasize that cultural attributes are malleable, and they change in reaction to external factors. For example, Fernández (2013) shows that social attitudes towards women's work endogenously change over time. Alesina and Fuchs-Schündeln (2007) find that individual preferences are shaped by the political regime in which the individual lives. Giuliano and Spilimbergo (2014) show that individuals' political preferences and support for government redistribution are impacted by whether or not they grew up during recessionary periods. Giavazzi, Petkov and Schiantarelli (2014) show that while some cultural values evolve slowly, others change rapidly. Cannonier and Mocan (2012) find that women in Sierra Leone whose education is improved by an education reform are more likely to disapprove of the cultural practice of female genital mutilation. Mocan (2013) finds that the intensity of vengeful feelings depends on the economic environment of the individual.

Table 3.1
Hours Worked Per Capita (ages 15-64) in Selected OECD Countries in 2012

Country	Hours Worked per Working Age Person (Indexed to UK=100)
Portugal	105
Sweden	104
Austria	104
United Kingdom	100
Greece	97
Netherlands	96
Italy	95
Denmark	93
Germany	90
Belgium	84
Spain	84
France	81
Turkey	74

Source: OECD Labor Database and OECD Productivity Database.

U.K. Swedes work 4 percent more than the working age population in the U.K. Importantly, as I will show later in the chapter, there is also substantial variation in the effective marginal tax rates between European countries.

The critical issue for the purposes of this chapter is how to measure the "taste for leisure," and how to identify its impact on market work. I focus on second-generation immigrants who reside in various European countries. These individuals are born in Europe, and, being residents of different European countries, have been exposed to institutional, legal and labor market structures of their countries, including the marginal tax rates on labor and consumption income. Their fathers had migrated from somewhere else in the world, and I know these fathers' countries of origin. I use immigrant fathers' countries of birth to determine the ancestral roots and assume that culture of leisure in fathers' countries of origin is transmitted from the immigrant fathers to the offspring. I focus on fathers, rather than mothers because most of the literature uses the birthplace of the father to assign country of origin to second-generation immigrants (Alesina et al. 2015, Alesina and Giuliano 2011, Alesina and Giuliano 2010, Fernández and Fogli 2009, Card et al. 1998). By exploiting a separate data set that asks people around the world various questions to gauge their taste for leisure, I connect these second-generation immigrants in Europe to the culture of leisure in their father's country of origin.

I analyze the labor supply of second-generation immigrants who are born in the countries to which their fathers have migrated. It is conceivable that fathers' migration decisions were motivated by the tax rates in the countries of destination. For example, people from those countries where leisure is valued highly could have chosen to migrate to destination countries which have high tax rates. If this is the case, such self-selection of migrants as a function of destination country tax rates could confound the estimated impact of taxes on the labor supply of the

second-generation. To investigate this possibility I divided the analysis sample into two groups: the countries with above-median tax rates, and the countries with below-median tax rates. I show that the observed characteristics of the second-generation immigrants and the characteristics of their immigrant fathers are balanced between these two groups of destination countries. Furthermore, the indicators of "taste for leisure" in the countries of origin are balanced as well, minimizing the concern of first-generation's (fathers') self-selection based on the tax rates.

I have data from about 7,000 individuals who live and work in 26 European countries. These individuals have ancestral origins in 47 different countries.[44] Thus, I am able to identify the impact of taxes in the country of residence on hours worked, holding constant observable attributes of individuals, various attributes of the country in which they live, and attributes of their father's country of origin, including the taste for leisure in that country of origin. Similarly, I can identify the impact of culture of leisure on labor supply, holding constant all personal attributes and various characteristics of the country of residence, including the tax rates. To eliminate, to the extent possible, the factors that may impact the labor market activity of the individuals stemming from the demand side and institutional structure, I control for such variables as the unemployment rate, per capita income, legal origin, religious make-up, as well as the size of the population and average education of the country of destination. A similar set of covariates are included for the country of origin. These variables are described in the data section below.

I find that both taxes and culture of leisure impact labor force participation and hours worked for women. For men, taxes influence labor supply both at the intensive and the extensive margin, but culture of leisure has no impact. The magnitude of the estimated effects indicates that while taxes on labor income are a significant determinant of aggregate hours worked, culture of leisure is important as well.

This chapter is also related to a growing new literature that investigates the interplay between culture and economic outcomes. Some recent examples include Fernández and Fogli (2009) who investigate the impact of female labor force participation and fertility rates in the country of origin on work and fertility decisions of second-generation American women. Alesina and Giuliano (2011) who investigate the impact of family ties on political participation, labor force participation and trust. Luttmer and Singhal (2011) report that immigrants' redistributive preferences are impacted by the average preference in their country of birth. Ljunge (2014) analyzes the

[44] I have dropped individuals if their countries of origin had contributed fewer than 10 observations to the sample. Including these individuals had no impact on the results.

transmission of trust to immigrant children. Alesina et al. (2015) find that people who inherit strong family ties are less mobile and have lower wages and higher unemployment. A detailed description of this literature can be found in Alesina and Giuliano (2014) and Fernández (2011).

3.2. Theoretical Framework

To motivate the empirical model, I follow the framework of Prescott (2004) and consider a representative agent who is endowed with one unit of time that can be divided between labor and leisure. Preferences over consumption and leisure are represented by the utility function in Equation (3.1):

$$U = \sum_{t=0}^{\infty} \beta^t (\log c_t + \gamma \log(1 - h_t)), \tag{3.1}$$

where c_t stands for consumption and h_t represents hours worked; implying that $(1 - h_t)$ is the amount of leisure. The discount factor β represents the degree of patience, where $0 < \beta < 1$. The parameter γ is the value attached to leisure. The aggregate production function of the economy is Cobb-Douglas, with an output elasticity of capital θ, and elasticity of labor $(1 - \theta)$. The production function converts labor (h_t in Equation (3.1)) and capital into output, which can be consumed or invested.

The budget constraint of the representative agent is:

$$(1 + \tau_c)c_t + (1 + \tau_x)x_t = (1 - \tau_h)w_t h_t + (1 - \tau_k)r_t k_t + T_t, \tag{3.2}$$

where τ_c is the consumption tax rate, x_t stands for investment, τ_x is the tax rate on investment, and τ_h is the marginal labor tax rate; r_t stands for the rental price of capital and τ_k is the capital income tax rate. T_t represents government transfers at time t that are financed by taxes. w_t is the price of labor, therefore $w_t h_t$ represents labor income.

The standard first-order conditions indicate that the marginal rate of substitution between leisure and consumption is equal to the ratio of their prices, and that labor is paid its marginal product. The first-order conditions imply:

$$h_t = (1 - \theta) / \left\{1 - \theta + \frac{c_t}{y_t} \frac{\gamma}{(1 - \tau)}\right\}, \tag{3.3}$$

where $\tau = (\tau_h + \tau_c)/(1 + \tau_c)$, which is the effective marginal tax rate on labor income. It represents the combined labor and consumption taxes exerted on labor income, holding investment constant. Equation (3.3) depicts the supply of hours worked. Because the effective marginal tax rate on labor income, τ, is embedded in one of the first-order conditions, it is also in Equation (3): an increase in the tax rate τ reduces labor supply h_t.

Much attention has been devoted to the investigation of the impact of taxes on hours worked at a cross-section of countries, or by using the variation in the tax rates of countries over a period of time. On the other hand, the impact of marginal utility of leisure on hours worked (which is depicted by γ in Equation (3.3)), has not been investigated, despite the fact that it has been postulated to be a potentially important factor to explain cross-country differences in labor supply. An increase in γ has a negative impact on hours worked. As I describe in the next section, I develop measures of γ to represent the value of leisure that can vary between countries.

Equation (3.3) provides a framework in which labor supply depends on taxes and tastes for leisure. I will not estimate the specific structural parameters, based on the specific form depicted by Equation (3.3). Rather, as shown below, I will estimate a linear formulation of labor supply, which depends on personal attributes of individuals, country characteristics including taxes, and measures of taste for leisure.

Although I use survey data on individuals from various years, there is no substantial variation in marginal taxes over the years in a country. Thus, the elasticity estimates can be interpreted as steady-state elasticities. I estimate elasticities both at the extensive and intensive margins.

3.3. Empirical Implementation

Consistent with the theoretical framework described in the previous section, I estimate the following specification to investigate the impact of taxes and taste for leisure on labor supply:

$$h_{ijnt} = \beta_0 + \beta_1 \tau_j + \beta_2 L_n + X_i \Phi + C_j \Omega + CO_n \Psi + \delta_t + \varepsilon_{ijnt}, \quad (3.4)$$

where h_{ijnt} stands for the labor supply of person i who is a second-generation immigrant, living in country j, surveyed at time t. Labor supply is measured both at the extensive and intensive margins, allowing me to estimate models for labor force participation and for hours worked, conditional on participation. The subscript n represents the country-of-origin of this person's father (who migrated from country n to country j). The vector X_i includes personal attributes of individual i that may impact his/her labor supply decision such as age, completed years of education, marital status, and the size of the city of residence. Because ethnic minorities may face labor market discrimination which may alter their labor supply, I also control for whether the person perceives him/herself as an ethnic minority in that country.

The variable τ measures the effective marginal tax rate on labor income in country j where person i resides and works. I follow the literature closely, and as detailed in the next section, use country-specific tax rates

generated by the previous research (Prescott 2004, McDaniel 2011). Although I use surveys of individuals from different years, the two measures of taxes I employ (the effective marginal tax rate, as well as the average tax rate for a single person without a dependent) do not change appreciably within a country in the sample period. Thus, the impact of taxes on labor supply is identified mainly from cross-country variation in tax rates.

L_n stands for various measures of the culture of leisure in the country of origin, constructed by using data from the World Values Survey and the European Values Study. For example, one particular question in these surveys is: "How important is leisure in your life?" Possible answers range from 1 "Not important" to 4 "Very important." The average value of answers to this question was 3.5 in Sweden, 3.3 in Uruguay, 2.9 in Morocco, and 2.6 in China, suggesting that people in Sweden value leisure more strongly in comparison to those who live in Morocco or in China, for example. Other examples of indicators for culture of leisure are responses to such statements as "People who don't work turn lazy" (agree-disagree on a scale from 1 to 5) and "Work is a duty to society" (agree-disagree from 1 to 5). The details of these and other measures of culture of leisure in the country of origin are explained in the data section.

The framework shown in Equation (3.4) is termed an "epidemiological" approach by Fernández (2008, 2007) because it aims to identify the impact of inherited, pre-existing factors on behavior, holding constant the context in which the decision takes place. Note that reverse causality from labor supply to "taste for leisure" is unlikely to be an issue here because the labor supply decision of the individual cannot have an impact on the extent of the taste for leisure in father's country of origin. Similarly, an individual's labor supply is not expected to have an immediate impact on the tax rate in her country of residence. Even if the government wanted to react to a variation in aggregate hours worked in the economy by altering the tax rates, it cannot do so quickly, because it is well known that the inside-lags are substantial in case of fiscal policy. In other words, changes in taxes necessitate negotiations both in the legislature and with different constituents including labor unions. Because of the lags in legislative implementation, it is implausible that tax rates would react contemporaneously to a change in the aggregate hours worked in the economy.

Neither the tax rates nor aggregate labor supply vary significantly within a country from year to year. For example, in Germany average hours worked per working-age population were 1,066 in 2008, 1,057 in 2010, and 1,067 in 2012. I display the aggregate hours worked and the effective marginal tax rate for France, Germany, the U.K. and Belgium from the OECD data over the period of 2000-2012 in Table 3.2. There is no systematic change in

Table 3.2
Average Hours Worked and the Effective Marginal Tax Rate in Selected European Countries 2000-2012

	France		Germany		United Kingdom		Belgium	
Year	Hours worked per working age population	Effective marginal tax rate	Hours worked per working age population	Effective marginal tax rate	Hours worked per working age population	Effective marginal tax rate	Hours worked per working age population	Effective marginal tax rate
2000	995	55.5	1,045	52.7	1,217	44.1	976	58.0
2001	997	54.8	1,037	52.4	1,218	44.2	982	57.8
2002	969	54.3	1,026	52.3	1,208	43.2	972	58.6
2003	960	54.6	1,014	52.6	1,203	42.9	965	58.0
2004	972	54.7	1,021	51.5	1,191	43.3	967	58.2
2005	968	55.2	1,007	51.4	1,204	43.6	970	57.6
2006	956	55.2	1,029	51.7	1,200	43.6	977	56.6
2007	974	54.7	1,053	52.3	1,198	43.9	986	56.3
2008	979	54.7	1,066	52.6	1,190	43.8	991	56.4
2009	953	54.8	1,038	52.6	1,156	42.9	971	56.2
2010	954	54.4	1,057	51.3	1,154	43.2	974	56.5
2011	962	55.6	1,071	51.4	1,157	43.9	988	56.9
2012	960	56.9	1,067	52.1	1,182	43.3	989	57.7

Source: Hours worked per working age population are constructed using data from the OECD Labor Database and the OECD Productivity Database. τ is the effective marginal tax rate on labor income (Prescott 2004). The calculation of τ follows the formulation of Prescott (2004) and McDaniel (2011):
$\tau = \frac{\tau_{ss}+1.6*\tau_{inc}+\tau_c}{1+\tau_c}$, where τ_{ss}, τ_{inc}, and τ_c are taken from McDaniel (2014) data.

hours worked or in the tax rate in these countries over the course of these 13 years. When I calculate the year-to-year change in average hours worked and in the effective marginal tax rate over the same period for the 26 European countries used in the analysis, I find that the average annual growth rate is essentially zero for both hours worked and taxes (the average growth rate is -0.002 in case of annual hours and -0.003 in case of taxes).

It is conceivable that culture of leisure might differ systematically between countries due to income differences. Put differently, to the extent that leisure is a normal good, it would be valued differently as the average income level of the country goes up. To account for this effect, I control for per capita income in the country of origin (as part of the vector CO_n). Note, however, that most of the questions that aim to measure culture of leisure do not target the inter-temporal aspect of work-leisure tradeoff. Specifically, the answers to questions such as "Do you think people who don't work turn lazy?" and "Do you think work is a duty to society?" should be largely independent of cyclical variations in economic conditions faced by the respondents. Rather, the answers to these questions should, arguably, reflect beliefs that are rather stable. The vector CO_n contains a number of other

attributes of the country of ancestry, such as the index of ethno-linguistic fragmentation, legal origin indicators, a measure of democracy, and measures of the religious make-up of the country of origin.

The vector C_j controls for the attributes of the country of residence that may influence labor supply through their impact on aggregate labor productivity, institutional factors and so on. It is also possible that both country-level taxes and individual labor supply are driven by certain socio-economic and cultural attributes of the country. For example, societies can be rated on a scale ranging from "individualistic" to "collectivist" using the index of individualism, developed by Hofstede (2001) and Hofstede (2005). Lower values indicate the higher extent of collectivism of the society, which stands for the extent to which individuals are integrated into groups. In collectivist societies, people from birth onwards are integrated into strong, cohesive in-groups, often extended families (with uncles, aunts and grandparents) which continue protecting them in exchange for unquestioning loyalty. Higher values of the index represent individualistic societies where the ties between individuals are loose, and where people are expected to look after themselves and their immediate family.[45] There is substantial variation around the world in the extent to which countries are individualistic or collectivist. For example, Australia is rated a highly individualistic country with a score of 90 (out of 100), and the most collectivist societies are Colombia with a score of 13, Indonesia with a score of 14 and Costa Rica with a score of 15. It could be the case that the extent of individualism in the country may be correlated with the peoples' desired level of government regulation and tax rates, as well as with the extent of the labor supply. I control for individualism in the country to account for such an effect.

Additionally, the vector C_j contains other variables that potentially impact both taxes and labor supply including per capita GDP in the country of residence, average educational attainment in the country, the index of ethno-linguistic fragmentation, size of the population, legal origin indicators, and number of years in which country experienced democracy between 1930 and 1995. I control for the unemployment rate as an indicator of the labor market conditions in the survey year because the tightness of the labor market would impact the labor supply decision of the individual. I control for the religious composition of the country because it may be a cultural determinant of labor supply. I also control for the legal origin of the country. These indicators account for whether

[45] These descriptions are obtained from (http://www.geert-hofstede.com/geert_hofstede_resources.shtml).

the country's legal origin is British common law, French commercial code, socialist or communist law, German commercial law or Scandinavian commercial law.

Time fixed-effects δ_t account for the year in which individuals are surveyed. Standard errors are clustered at the country of origin.

Alternative versions of Equation (3.4) are estimated as shown below.

$$h_{ijnt} = \alpha_0 + \alpha_1 \tau_j + X_i \Theta + C_j \Xi + \xi_t + \mu_n + \nu_{ijnt} \quad (3.5)$$

$$h_{ijnt} = \lambda_0 + \lambda_1 L_n + X_i \Lambda + CO_n \Gamma + \theta_t + \omega_j + u_{ijnt} \quad (3.6)$$

In Equation (3.5), I replace all country-of-origin variables by country-of-origin fixed-effects (μ_n). This specification does not contain measures of culture of leisure, but it still includes country-of-residence attributes as well as the tax rate in the country of origin. Analogously, in Equation (3.6), the country-of residence variables, including the tax rate, are replaced by country-of-residence fixed-effects (ω_j), whereas variables measuring country-of-origin attributes, including proxies for culture of leisure, are retained. Equation (3.5) allows me to investigate the sensitivity of the tax impact when I control for country-of-origin differences by a set of country-of-origin fixed effects. Equation (3.6) does the reverse: it allows me to analyze the sensitivity of the culture-of-leisure coefficient when I control for the attributes of the countries of residence by a set of country-of-residence fixed-effects.

3.4. Data and Descriptive Statistics

The analyses are based on a number of different data sets. Data on labor supply and personal attributes of individuals are from the European Social Survey (ESS). I use five cross-sectional rounds of the ESS, conducted biennially between years 2004 and 2013. The ESS covers 35 European countries that participated in at least one round of the survey. I include in the analysis 26 countries for which the OECD tax data are available. The core module of the ESS is administered in all rounds and contains information about respondents' socio-economic circumstances, including employment history and work-related variables. Starting with the second round, the ESS asks its respondents the countries in which their mother and father were born, in addition to asking about respondent's own country of birth. My sample consists of second-generation immigrants. These individuals were born in their country of residence but their fathers have migrated from a different country.

3.4.1. Outcomes and Personal Attributes

The two outcome variables are labor force participation and hours of work for the individual. The labor force participation variable takes the value of one if the individual reported being engaged in any paid work in the last 7 days or has been unemployed and is actively looking for a job. The second measure of labor supply quantifies the intensive margin, where the outcome is hours normally worked in a week at the respondent's main job. This information is obtained from individuals who are either working at the time of the interview or have worked in the past. In the former case, hours worked pertains to hours at the current job, while in the latter case, hours worked corresponds to the hours worked at the respondents' last job. I know the year in which this last job was held and I limit the sample to those who last worked in the year 2000 or later. The reason is twofold: first, the OECD tax measure is only available after year 2000, and second, measurement error is likely to increase as people have to recall their weekly work hours from further back in the past.

Table 3.3 presents the descriptive statistics of the sample used in the hours worked equation. The descriptive statistics of the sample used in participation regressions are provided in Appendix D, Table D.2. Although the samples in the labor force participation and the hours regressions are different by design, their descriptive statistics are similar. The first panel of Table 3.3 presents the summary statistics by dividing the sample by gender of the worker and further by the availability of the tax measure. Average weekly hours worked is about 36 for females and 43 for males. Average age is about 41 for both sexes and average years of schooling is about 13 years.

3.4.2. Tax Measures

I employ two different tax measures. The first tax measure comes from the OECD Tax Database. It is the average personal income tax and the social security contribution rate on gross labor income for a single person without a dependent. This tax measure is available for 26 countries in the ESS for all years from 2000 to 2013. The second tax measure is the effective marginal tax rate on labor income (τ) as used by others (e.g. Prescott 2004, McDaniel 2011). I use the average tax series updated by McDaniel (2014) to construct τ.[46] This tax measure is not available for all 26 countries and for all years for which the OECD average tax rate is available. In particular,

[46] The calculation of τ follows the formulation of Prescott (2004) and McDaniel (2011): $\tau = \frac{\tau_{ss}+1.6*\tau_{inc}+\tau_c}{1+\tau_c}$, where τ_{ss}, τ_{inc}, and τ_c are taken from McDaniel (2014) data.

Table 3.3
Descriptive Statistics for the Hours Worked Sample

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
Panel A: Personal Characteristics					
Normal Weekly Hours	Hours normally worked in a week at the main job as reported by the ESS respondents	36.693 (11.993)	35.916 (12.301)	43.549 (11.948)	42.802 (11.950)
Age	Age of the respondent	42.273 (12.668)	41.656 (12.871)	41.356 (13.297)	41.125 (13.375)
Ethnic Minority	==1 if the respondent belongs to minority ethnic group in country	0.127 (0.333)	0.090 (0.287)	0.147 (0.354)	0.113 (0.317)
Years of Schooling	Number of years of full-time education completed	13.597 (3.492)	13.443 (3.702)	13.197 (3.459)	13.214 (3.617)
Married	==1 if the respondent is married, 0 otherwise	0.539 (0.499)	0.488 (0.500)	0.537 (0.499)	0.500 (0.500)
City	==1 if respondent lives in a big city, 0 otherwise	0.333 (0.471)	0.218 (0.413)	0.297 (0.457)	0.216 (0.412)
Panel B: Culture of Leisure in Country of Origin					
Leisure Important	Average country response to the question "How important is Leisure Time in your life?" 1: 'Not at all important' 2: 'Not very important' 3: 'Rather important' 4 'Very important'" (A)	3.070 (0.190)	3.117 (0.199)	3.083 (0.178)	3.118 (0.182)
Generous Holidays	Average country response to the question "Please tell me if generous Holidays are important in a job." 0: Not Important, 100: Very important. (A)	34.744 (14.990)	30.956 (12.820)	34.324 (14.870)	31.369 (13.244)
People Turn Lazy	Average country response to the question "Do you agree or disagree with the following statement: People who don't work turn lazy. 1 'Strongly agree' 2 'Agree' 3 'Neither agree nor disagree' 4 'Disagree' 5 'Strongly disagree'" (A)	2.182 (0.304)	2.240 (0.318)	2.190 (0.306)	2.234 (0.321)
Work Is a Duty to Society	Average country response to the question "Do you agree or disagree with the following statement: Work is a duty towards society." 1: 'Strongly agree' 2: 'Agree' 3: 'Neither agree nor disagree' 4: 'Disagree' 5: 'Strongly disagree' (A)	2.269 (0.329)	2.256 (0.252)	2.253 (0.324)	2.236 (0.262)
Work Should Come First	Average country response to the question "Do you agree or disagree with the following statement: Work should always come first, even if it means less spare time." 1: 'Strongly agree' 2: 'Agree' 3: 'Neither agree nor disagree' 4: 'Disagree' 5: 'Strongly disagree' (A)	2.551 (0.445)	2.613 (0.402)	2.560 (0.435)	2.600 (0.405)
Average Weekly Hours	Weekly hours actually worked per employed person in the country of origin (I)	35.547 (3.574)	35.079 (3.531)	41.855 (3.092)	41.845 (3.048)

Table 3.3 (Continued)

Variable	Description (Source)	Females		Males	
		Average Tax sample	τ sample	Average Tax sample	τ sample
	Panel C: Other Country of Origin Characteristics				
Per capita Income	PPP adjusted GDP per capita in constant 2011 US$ (D)	24,519 (12,992)	28,563 (13,329)	25,470 (12,924)	28,652 (13,133)
Ethnolinguistic Fragmentation	Roeder's 1985 Index of the extent of ethnolinguistic fragmentation in the country (B)	0.272 (0.193)	0.238 (0.199)	0.264 (0.188)	0.239 (0.197)
Democratic	Number of years in which the country experienced democracy between 1930 and 1995 (C)	22.397 (24.976)	30.589 (25.758)	24.353 (25.055)	30.849 (25.367)
British Legal Origin	==1 if the legal origin of home country is English Common Law, 0 otherwise (C)	0.099 (0.299)	0.133 (0.340)	0.097 (0.296)	0.122 (0.328)
French Legal Origin	==1 if the legal origin of home country is French Commercial Code, 0 otherwise (C)	0.376 (0.484)	0.415 (0.493)	0.413 (0.493)	0.450 (0.498)
Socialist/Comm. Legal Origin	==1 if the legal origin of home country is Socialist/Communist Laws, 0 otherwise (C)	0.397 (0.489)	0.270 (0.444)	0.350 (0.477)	0.247 (0.432)
German Legal Origin	==1 if the legal origin of home country is German Commercial Code, 0 otherwise (C)	0.079 (0.270)	0.115 (0.319)	0.098 (0.298)	0.130 (0.337)
Scandinavian Legal Origin	==1 if the legal origin of home country is Scandin. Commercial Code, 0 otherwise (C)	0.049 (0.216)	0.067 (0.251)	0.042 (0.200)	0.051 (0.219)
% Catholic 1980	% Catholic in a country in 1980 (C)	31.794 (36.427)	45.138 (37.028)	35.046 (37.157)	46.263 (36.856)
% Muslim 1980	% Muslim in a country in 1980 (C)	22.412 (38.369)	15.947 (34.450)	21.958 (38.257)	17.049 (35.651)
% Protestant 1980	% Protestant in a country in 1980 (C)	10.916 (22.721)	14.243 (25.154)	10.619 (21.964)	13.377 (23.675)
% Other Denomin. 1980	% Other Denomination in a country in 1980 (C)	34.878 (35.100)	24.672 (26.649)	32.377 (34.007)	23.311 (25.857)
	Panel D: Country of Residence Characteristics				
Average Tax Rate	Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (G)	25.407 (8.231)		26.398 (8.676)	
τ	The effective marginal tax rate calculated using McDaniel data (H)		48.956 (9.372)		48.828 (9.426)
Unemployment Rate	Country unemployment rate (D)	7.590 (3.153)	7.038 (2.955)	7.583 (3.157)	7.139 (3.015)
Per capita Income	PPP adjusted GDP per capita in constant 2011 US$ (D)	35,478 (11,195)	39,657 (9,215)	37,206 (12,722)	40,271 (9,406)
Average Country Education	Average education of individuals aged 15 and over in the country (E)	11.542 (0.897)	11.277 (0.974)	11.491 (0.923)	11.315 (0.944)
Population	Country population in millions (D)	19.941 (25.761)	30.456 (29.405)	22.325 (27.445)	31.729 (29.989)
Individualism	Hofstede Index of the degree to which individuals are integrated into groups (F)	63.688 (11.555)	68.242 (12.494)	64.580 (11.307)	68.644 (11.328)

Table 3.3 (Continued)

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
Ethnolinguistic Fragmentation	Roeder's 1985 Index of the extent of ethnolinguistic fragmentation in the country (B)	0.313	0.278	0.318	0.292
		(0.178)	(0.191)	(0.187)	(0.201)
Democratic	Number of years in which the country experienced democracy during 1930-1995 (C)	42.853	50.973	44.644	52.220
		(24.625)	(22.305)	(24.477)	(21.294)
British Legal Origin	==1 if the legal origin of home country is English Common Law, 0 otherwise (C)	0.287	0.112	0.232	0.101
		(0.453)	(0.316)	(0.422)	(0.302)
French Legal Origin	==1 if the legal origin of home country is French Commercial Code, 0 otherwise (C)	0.199	0.310	0.244	0.328
		(0.399)	(0.463)	(0.430)	(0.469)
Socialist/Comm. Legal Origin	==1 if the legal origin of home country is Socialist/Communist Laws, 0 otherwise (C)	0.248	0.154	0.228	0.136
		(0.432)	(0.361)	(0.419)	(0.343)
German Legal Origin	==1 if the legal origin of home country is German Commercial Code, 0 otherwise (C)	0.168	0.288	0.198	0.309
		(0.374)	(0.453)	(0.399)	(0.462)
Scandinavian Legal Origin	==1 if the legal origin of home country is Scandin. Commercial Code, 0 otherwise (C)	0.098	0.136	0.098	0.126
		(0.298)	(0.343)	(0.297)	(0.332)
% Catholic 1980	% Catholic in a country in 1980 (C)	31.747	49.905	36.258	51.067
		(34.614)	(30.920)	(35.250)	(30.705)
% Muslim 1980	% Muslim in a country in 1980 (C)	2.277	0.829	2.053	0.823
		(4.404)	(0.997)	(5.665)	(0.998)
% Protestant 1980	% Protestant in a country in 1980 (C)	27.803	27.502	28.046	27.575
		(30.374)	(28.591)	(30.325)	(28.850)
% Other Denomin. 1980	% Other Denomination in a country in 1980 (C)	38.173	21.764	33.643	20.534
		(32.659)	(21.311)	(31.243)	(20.649)
N		2909	1649	2738	1719

Personal characteristics variables data come from the ESS survey. I restrict the sample to second-generation immigrants who are either working at the time of the interview or have held their last job in year 2000 or later and are/were between 16 and 64 years of age at the time of working. I also exclude individuals who reported either zero hours normally worked or more than 100 hours. Survey weights are used.

τ sample includes the following countries of destination: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. Average Tax Rate sample includes the following additional countries of destination: Estonia, Iceland, Israel, Luxembourg, and Turkey.

A: World Values Survey and European Values Study data. The original variable Leisure Important had reverse scale; it was recoded so that higher values correspond to “lazier” culture.

B: Philip G. Roeder, 2001. “Ethnolinguistic Fractionalization (ELF) Indices, 1961 and 1985” <http://pages.ucsd.edu/~proeder/elf.htm>; C: Teorell, Jan, Nicholas Charron, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Petrus Sundin and Richard Svensson, 2013. “The Quality of Government Dataset” version qog_std_cs_20dec13 <http://www.qog.pol.gu.se>; D: World Bank’s World Development Indicators Database <http://databank.worldbank.org /data/databases.aspx>; E: Barro and Lee data set version BL2013_MF1599_v2.0 <http://www.barrolee.com/data/full1.htm>. The variable is available for the years 2000, 2005, and 2010; the values in between are interpolated; years 2010, 2011, 2012, and 2013 are assigned the 2010 value; F: Hofstede, G. “Cultural Dimensions” <http://geert-hofstede.com/countries.html>. G: OECD Tax Database Table 5 <http://stats.oecd.org.libezp.lib.lsu.edu/index.aspx?DataSetCode=TABLE_I5#>; H: <http://www.caramcdaniel.com/researchpapers>; I: International Labor Organization ILOSTAT Database annual weekly hours actually worked per employed person gender-specific indicator, averaged over the period since year 2000.

Estonia, Iceland, Israel, Luxembourg, and Turkey have missing data for all years. Thus, the regressions that use τ are based on smaller samples. Table 3.4 displays the tax rates for countries in which the individuals in our sample reside. The two measures are highly correlated with a correlation coefficient of 0.73. The tax variables are merged with the individual-level data based on the year of work when the outcome is the weekly hours normally worked, and based on the year of interview when the outcome is labor force participation.

Table 3.4
Tax Rates in Countries of Residence

Country	τ	Average Personal Income Tax
Austria	56.486	32.627
Belgium	57.293	42.426
Czech Republic	45.076	22.977
Denmark	62.847	40.830
Estonia		20.230
Finland	55.364	30.490
France	55.252	28.276
Germany	52.082	41.545
Greece	42.194	24.172
Hungary	52.668	35.680
Iceland		28.147
Ireland	41.181	16.643
Israel		20.903
Italy	53.137	28.983
Luxembourg		25.884
Netherlands	48.625	31.963
Norway	50.617	29.769
Poland	41.895	26.709
Portugal	40.674	22.701
Slovak Republic	39.054	21.653
Slovenia	45.979	34.285
Spain	42.095	20.636
Sweden	63.378	28.651
Switzerland	30.547	17.496
Turkey		29.667
United Kingdom	43.532	25.804
Mean	48.570	28.044
Std. Dev.	(8.398)	(7.011)

The first tax measure (τ) is the effective marginal tax rate on labor income (Prescott 2004).
The second tax measure is the average personal income tax and social security contribution rate on gross labor income for a single person without a dependent earning 100% of average earnings of industry workers in the country (Source: OECD Tax Database Table 5).
The tax values are averaged for the period 2000 to 2013.

3.4.3. Measures of Culture of Leisure in the Country of Origin

To construct culture of leisure measures, I use data from the World Values Survey (WVS) and the European Values Study (EVS). I employ the five cross-sectional waves of the WVS (1981–1984, 1990–1993, 1995–1997, 1999–2004, and 2005-2009). The WVS coverage starts with 22 countries in the 1981-1984 wave, and reaches 87 countries by the time of the 2005-2009 wave. The WVS asks its respondents about their attitudes regarding a variety of topics, including religion, political preferences, family values and work ethics.

The European Values Study (EVS) consists of four waves of cross-sectional surveys conducted in 49 predominantly European countries (1981-1984, 1990-1993, 1999-2001, and 2008-2010). The formulation of EVS questions about attitudes to work and leisure is identical to the WVS formulation. By pooling the WVS and the EVS, I am able cover a large number of countries around the world to gauge the beliefs about the importance of work and leisure in people's lives in these countries.

The descriptions of the variables and their sample means and standard deviations are provided in Panel B of Table 3.3. I created five variables to measure the extent of culture of leisure. Higher values of each variable represent a higher appreciation of leisure in that country. The first variable Leisure Important is the average response in the country to the question "Indicate how important leisure time is in your life." Potential answers range from 1 "Not at all important" to 4 "Very important." Table 3.3 shows that for individuals who enter the hours of work regressions the average value of this variable is 3.1. Appendix Table D.1 displays the average response to Leisure Important variable in each of the countries that represent the country-of-origin of the immigrant father. For example, the value of Leisure Important is 3.251 in Austria.[47] In comparison, the average value of Cyprus is 3.47, indicating that Cypriots attach a higher value to leisure than Austrians do.[48]

The second variable that gauges culture of leisure in a country is based on the question of "Do you agree or disagree with the statement: People who don't work turn lazy." Possible answers range from 1 "Strongly agree" to 5 "Strongly disagree." A higher value indicates a more tolerant attitude towards not working. The third and fourth variables in this group are measured similarly, and they are based on answers to the following questions: "Do you agree or disagree with the statement: Work is a duty toward society," and "Do you agree or disagree with the

[47] This number is the average response of 4,353 Austrians surveyed in various waves of the WVS and the EVS between 1990 and 2010.
[48] The average Cypriot response is based on 1,969 Cypriots who were surveyed in various waves between 2005 and 2010.

statement: Work should always come first, even if it means less spare time." A fifth variable is created to measure the extent of appreciation of leisure in a country by calculating the proportion of people in the country who believe that provision of generous holidays is an important aspect of a job.

Finally, I created two additional measures that capture the extent of labor market attachment in the country-of-origin. They are the labor force participation rates and average weekly hours worked in father's country-of-origin. Labor force participation in the country of ancestry has been used before as a cultural proxy for work (Fernádez and Fogli 2009, Fernández and Fogli 2006). I calculate these variables by gender. This allows for conducting more nuanced analyses. For example, I can investigate how the labor supply decision of a female second-generation immigrant in Europe is impacted by the intensity of labor market activity of women in the country from which this person's father migrated. Furthermore, I fine-tuned this measure to connect it to the relevant age groups using the age bands of 15-24, 25-54 and 55-64.[49]

Similarly, I obtained weekly hours actually worked per employed person in the country of origin. The data come from the International Labor Organization ILOSTAT Database. Because the annual data are not available for every year and country, I use averaged available values over the time period 2000 to 2013. The ILOSTAT indicator covers both employees and the self-employed and it counts hours people have worked either on all jobs, or, in some country-years, at their main and second job only. Both part-time and full-time employment hours are accounted for.[50] The measure of weekly hours in the country of origin is gender-specific, but not age-group specific, as the ILOSTAT does not provide an age group-specific indicator.

3.4.4. Country Attributes

In each specification, I also control for a host of country characteristics both in the country of respondent's residence and in his/her father's country of origin. These variables include, among others, ethno-linguistic fragmentation, the legal origin of the country, the religious composition of the country, and the number of years in which the country was democratic from 1930 to 1995. Additionally, the models include per capita income, average

[49] For example, I connected the propensity to participate in the labor market of a female 2nd generation immigrant in Europe who is 20 years old to the labor force participation rate of women aged 15-24 in her father's country of origin. Country-age-and gender specific labor force participation rates were obtained from the International Labor Organization ILOSTAT database. Because the annual data are not available for every year, country, and age band, I use averaged available values over the time period 2002 to 2013.

[50] In addition, the ILOSTAT provides a number of flags indicating data inconsistencies that can complicate analysis across time and countries. For example, in China, Costa Rica, Guatemala, Egypt, Pakistan, Panama, Viet Nam, and Zimbabwe only full-time employment hours are counted, and I exclude these countries from our sample.

country education, unemployment rate, population size, and individualism index in the country of residence. The full definitions and the descriptive statistics of these and other country attributes used in the regressions are presented in panels C and D of Table 3.3.

3.5. Results

Table 3.5 displays the summary results for females. Panel A presents the coefficients of tax and culture variables in the labor force participation equation, and Panel B presents the estimated tax and culture coefficients from the hours equation for those who reported positive work hours. All models include control variables pertaining to the individual, country of ancestry and country of residence. These variables are summarized in panels A, C, and D of Table 3.3. The coefficients of these variables are not reported in the interest of space, although in Appendix Table D.3 I display the full set of coefficients of the model in column (1) of Panel A in Table 3.5.

Table 3.5 presents six specifications in six columns. Each specification includes a different culture of leisure construct, which is displayed at the column header. For example, in the model of column (1) culture of leisure is measured by the mean value of the question that gauges the importance of leisure in people's lives (Leisure Important). Similarly, in column (2) culture of leisure is measured by responses to the statement of "People who don't work turn lazy" in the country of origin. Higher values of culture variables in columns (1) to (5) indicate stronger preference for leisure. Thus, the estimated coefficient of culture of leisure in these columns is expected to be negative. In column (6), culture is measured by the labor force participation rate in the country of origin when I estimate models on the extensive margin (Panel A), or as the average hours worked in the country of origin when I estimate models on the intensive margin (Panel B). The coefficients of these variables are expected to be positive to the extent that work effort in the country of ancestry is a cultural attribute transmitted to the offspring.

Both Panels A and B of Table 3.5 have two sections. The models in the top section of each panel use the first tax measure (average tax), while the models in the bottom section employ τ (effective marginal tax) as the measure of the tax rate in the country. Panel A of Table 3.5 shows that taxes have a negative impact on female labor force participation in all models when taxes are measured by the average tax. The same is true also in models where taxes are measured by the effective marginal tax rate τ, although the point estimates are significant only at the 15-20 percent level.

Culture of leisure in the country of origin has a negative and statistically significant impact on female labor force participation in models displayed in columns (1) and (5). In the regression reported in column (6), culture of

Table 3.5
The Impact of Tax Rates and Culture of Leisure on Labor Supply--Females

	Panel A Dependent variable: Labor Force Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.004***	-0.003**	-0.003**	-0.003**	-0.004***	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Culture	-0.133***	-0.036	-0.022	0.006	-0.001***	0.003***
	(0.029)	(0.036)	(0.047)	(0.034)	(0.000)	(0.001)
N	3770	3489	3489	3489	3626	2705
	Models with the Effective Marginal Tax Rate					
τ	-0.004	-0.003	-0.003	-0.003	-0.004	-0.004
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Culture	-0.128***	-0.069*	-0.067	-0.022	-0.002***	0.003**
	(0.037)	(0.040)	(0.045)	(0.036)	(0.000)	(0.001)
N	2204	2091	2091	2091	2165	1864
	Panel B Dependent variable: Weekly Hours Normally Worked in Main Job					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.083*	-0.102**	-0.106**	-0.108**	-0.083**	-0.123**
	(0.042)	(0.044)	(0.042)	(0.042)	(0.040)	(0.048)
Culture	0.892	-2.233*	-2.505*	-1.799*	0.014	-0.029
	(1.843)	(1.138)	(1.309)	(1.051)	(0.022)	(0.182)
N	2909	2676	2676	2676	2796	1920
	Models with the Effective Marginal Tax Rate					
τ	-0.270***	-0.288***	-0.289***	-0.297***	-0.289***	-0.315***
	(0.066)	(0.071)	(0.069)	(0.068)	(0.065)	(0.072)
Culture	0.286	-3.052**	-2.692	-3.656***	0.057**	0.115
	(1.890)	(1.197)	(1.778)	(1.296)	(0.026)	(0.226)
N	1649	1555	1555	1555	1619	1392

τ – The effective marginal tax rate on labor income (Prescott 2004).
Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year dummies. * p < 0.1, ** p < 0.05, *** p < 0.01.

leisure is measured by female labor force participation in the country-of-ancestry. Its coefficient is positive as expected, and significantly different from zero. When culture of leisure is measured by the variable People Turn Lazy, its impact on labor force participation is significantly different from zero in the model that uses the marginal tax rate τ.

Panel B presents the results where the dependent variable is hours worked for females, conditional on working. Both higher taxes in the country of residence and higher culture of leisure in the country of origin reduce female hours. Culture coefficients are statistically different from zero in models 2, 3, and 4 when taxes are measured by average personal income tax rate for a single person without a dependent, and in models 2, 4 and 5 with effective marginal tax rate on labor income, although the coefficient is positive in model 5. The picture that emerges in Table 3.5 is that for females, taxes have a negative impact on labor supply both at the extensive and intensive margins, and culture of leisure also negatively impacts labor supply, although the precision of the estimated coefficients varies between specifications.

Table 3.6 reports the results of the same models for males. In Panel A, I observe that taxes have a negative impact on labor force participation, regardless of the measure of culture and regardless of the measure of taxes. On the other hand, the coefficients of culture variables are never statistically different from zero. Panel B summarizes the models that investigate hours worked for males, conditional on working. While there is strong evidence on the impact of taxes on labor male labor supply, culture of leisure has no impact on hours worked for males.

It is possible that second-generation Muslim immigrants are different from non-Muslim immigrants in a number of dimensions ranging from labor market attachment and the impact of culture of leisure. This may be particularly true for Muslim women. To investigate if the results are sensitive to the behavior of Muslim immigrants, I dropped from the sample the individuals whose fathers have migrated from Morocco, Turkey, Algeria, Iraq and Iran. The overwhelming majority of the population in these countries adheres to Islam, and these countries represent the largest Muslim immigrant groups in the data. The results for women are presented in Table 3.7. Sample sizes decline by 500 to 700 observations because of the omission of Muslim immigrants, but the results are very similar to those displayed in Table 3.5, although the impact of taxes is weaker in the labor force participation regressions. Table 3.8 presents the results for non-Muslim immigrant men. This table is the counterpart to Table 3.6 and the results are very similar between the two tables. Thus, Tables 3.7 and 3.8 show that the results are not impacted by the inclusion or exclusion of Muslim immigrants to the analysis.

In Table 3.9, I summarize these results by reporting them in elasticity form. The elasticities with respect to taxes are based on median estimate of the effective marginal tax rate coefficients, and the elasticity with respect to culture is the median estimate within the relevant panels of Tables 3.5 and 3.6. The implied aggregate hours elasticity for taxes is -0.65 for females and -0.54 for males. The impact of culture of leisure, expressed in elasticity

Table 3.6
The Impact of Tax Rates and Culture of Leisure on Labor Supply--Males

	Panel A Dependent variable: Labor Force Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.003**	-0.003***	-0.003***	-0.003***	-0.003**	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Culture	0.020	0.008	0.028	0.024	-0.000	-0.001
	(0.045)	(0.038)	(0.032)	(0.032)	(0.000)	(0.001)
N	3295	3060	3060	3060	3178	2313
	Models with the Effective Marginal Tax Rate					
τ	-0.005***	-0.005***	-0.005***	-0.005***	-0.004**	-0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Culture	0.081	-0.003	0.022	0.042	-0.000	-0.001
	(0.058)	(0.034)	(0.036)	(0.033)	(0.001)	(0.001)
N	2022	1913	1913	1913	1998	1692
	Panel B Dependent variable: Weekly Hours Normally Worked in Main Job					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.092**	-0.094*	-0.092*	-0.097*	-0.099**	-0.094*
	(0.043)	(0.047)	(0.047)	(0.048)	(0.044)	(0.051)
Culture	2.302	1.359	2.718	3.805***	0.014	-0.390
	(2.140)	(1.536)	(1.935)	(1.229)	(0.022)	(0.364)
N	2738	2533	2533	2533	2652	1876
	Models with the Effective Marginal Tax Rate					
τ	-0.191**	-0.191**	-0.194**	-0.189**	-0.193**	-0.191**
	(0.074)	(0.079)	(0.077)	(0.075)	(0.075)	(0.084)
Culture	2.064	1.275	3.207	3.224*	0.006	-0.488
	(2.752)	(1.579)	(2.286)	(1.692)	(0.026)	(0.493)
N	1719	1624	1624	1624	1703	1436

τ – The effective marginal tax rate on labor income (Prescott 2004).
Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year dummies. * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 3.7
The Impact of Tax Rates and Culture of Leisure on Labor Supply--Females
Excluding Muslim Immigrants

Panel A
Dependent variable: Labor Force Participation

	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
Models with the Average Personal Income Tax Rate						
Average Tax	-0.002	-0.002	-0.002*	-0.002*	-0.002*	-0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Culture	-0.110**	-0.019	-0.021	0.033	-0.001	0.002**
	(0.045)	(0.039)	(0.050)	(0.041)	(0.001)	(0.001)
N	3075	3033	3033	3033	3023	2249
Models with the Effective Marginal Tax Rate						
τ	-0.002	-0.001	-0.001	-0.002	-0.002	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Culture	-0.116**	-0.064	-0.125***	-0.048	-0.001	0.003**
	(0.051)	(0.039)	(0.038)	(0.038)	(0.001)	(0.001)
N	1890	1851	1851	1851	1851	1624

Panel B
Dependent variable: Weekly Hours Normally Worked in Main Job

	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
Models with the Average Personal Income Tax Rate						
Average Tax	-0.092**	-0.085*	-0.089*	-0.091**	-0.095**	-0.108**
	(0.045)	(0.046)	(0.045)	(0.044)	(0.045)	(0.049)
Culture	-3.499	-2.534**	-2.975**	-2.703**	-0.062	-0.038
	(2.570)	(1.181)	(1.393)	(1.112)	(0.037)	(0.181)
N	2383	2352	2352	2352	2352	1799
Models with the Effective Marginal Tax Rate						
τ	-0.241***	-0.245***	-0.257***	-0.251***	-0.260***	-0.260***
	(0.065)	(0.069)	(0.068)	(0.068)	(0.069)	(0.068)
Culture	-5.396*	-3.239**	-1.498	-3.728**	-0.067	0.188
	(2.636)	(1.251)	(1.957)	(1.497)	(0.054)	(0.240)
N	1446	1416	1416	1416	1416	1311

τ – The effective marginal tax rate on labor income (Prescott 2004).
Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.8
The Impact of Tax Rates and Culture of Leisure on Labor Supply--Males
Excluding Muslim Immigrants

	Panel A Dependent variable: Labor Force Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Culture	0.004	0.033	0.020	0.030	-0.001	-0.000
	(0.061)	(0.036)	(0.035)	(0.036)	(0.002)	(0.001)
N	2670	2646	2646	2646	2633	1899
	Models with the Effective Marginal Tax Rate					
τ	-0.005**	-0.005**	-0.005**	-0.005**	-0.005**	-0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Culture	-0.020	0.006	0.012	0.035	-0.003*	-0.001
	(0.060)	(0.035)	(0.043)	(0.040)	(0.001)	(0.001)
N	1687	1663	1663	1663	1663	1442
	Panel B Dependent variable: Weekly Hours Normally Worked in Main Job					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
	Models with the Average Personal Income Tax Rate					
Average Tax	-0.094	-0.096	-0.093	-0.097	-0.094	-0.083
	(0.057)	(0.058)	(0.058)	(0.058)	(0.056)	(0.059)
Culture	-1.181	1.541	2.410	3.115**	0.115**	-0.305
	(3.910)	(1.578)	(2.115)	(1.439)	(0.054)	(0.399)
N	2235	2219	2219	2219	2219	1741
	Models with the Effective Marginal Tax Rate					
τ	-0.199**	-0.200**	-0.202**	-0.200**	-0.188*	-0.191*
	(0.094)	(0.097)	(0.095)	(0.094)	(0.097)	(0.099)
Culture	-0.409	1.511	4.142	2.942	0.112*	-0.454
	(4.897)	(1.584)	(2.729)	(1.837)	(0.063)	(0.513)
N	1470	1454	1454	1454	1454	1335

τ – The effective marginal tax rate on labor income (Prescott 2004).
Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.9
Elasticities

		Extensive margin	Intensive margin
Females	Tax Rate	-0.25	-0.40
	Culture of Leisure	-0.15	-0.15

Table 3.9 (Continued)

Males	Tax Rate	-0.32	-0.22
	Culture of Leisure	0.00	0.00

terms, is smaller than the impact of taxes, but still sizable for female labor supply, while culture of leisure has no impact on men's labor market activity.

To put these elasticities in perspective, note for example, that in Belgium average hours per working age population was 989 in 2012, and the effective marginal tax rate was 58%. In Portugal, average hours worked in 2012 was 1,237 and the effective marginal tax rate was 42%. If the tax rate in Belgium went down 16 percentage points to bring it down to the level prevailing in Portugal, this would have been a 28 percent reduction. Using the elasticity estimates for men and women in Table 3.9, and using the weights of men and women in employment, I find that aggregate hours would go up by 16% or by 158 hours per working-age person. This would help close the gap in hours of work between Belgium and Portugal (see Table 3.1) by about 64%.

The mean value of the response to the question of Work is a Duty to Society is 2.3 in Belgium. If the tastes for leisure were weaker so that the mean response to this question were 1.91 (the level in Portugal), this would constitute a 17% decline in the intensity of tastes for leisure. This particular change in preferences would impact hours worked only through its effect on females, because in the case of males neither participation nor hours respond to changes in culture of leisure. The impact on aggregate hours worked per working age population would be an increase by 20 hours (about 2%). This would close the gap in hours worked between Belgium and Portugal by 8%.

Table 3.10 reports the same models reported earlier, but these models include country-of-origin fixed-effects. As a result, the impact of leisure variables cannot be identified, but I can investigate whether the impact of taxes is altered by this specification. Table 3.10 displays the coefficients of the average and marginal taxes in both the participation and hours equations. They are very similar to those reported in Tables 3.5 and 3.6. For example, the top panel of Table 3.5 shows that the coefficients of the average tax in the labor force participation regression are -0.003 or -0.004, depending on the model. Column (1) of Table 3.10 shows that the coefficient of average tax is -0.004 for female participation equation in the models with country of origin fixed effects. For men, the top panel of Table 3.6 shows that the coefficient of average tax is -0.003 in most participation models, and column (3) of Table 3.10 reports the same magnitude as the tax coefficient. Other coefficients are also comparable between Tables 3.5, 3.6 and 3.10. For example, the bottom panel of Table 3.5 shows that the coefficient of the effective marginal

Table 3.10
The Impact of Tax Rates on Labor Supply
Models with Country of Origin Fixed Effects

	Female		Male	
	(1) Labor Force Participation	(2) Weekly Hours	(3) Labor Force Participation	(4) Weekly Hours
	Models with the Average Personal Income Tax Rate			
Average Tax	-0.004**	-0.062	-0.003**	-0.119***
	(0.001)	(0.044)	(0.001)	(0.043)
N	3770	2909	3295	2738
	Models with the Effective Marginal Tax Rate			
τ	-0.003	-0.242***	-0.004**	-0.221***
	(0.003)	(0.077)	(0.002)	(0.074)
N	2204	1649	2022	1719

τ – The effective marginal tax rate on labor income (Prescott 2004).
Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year and country of origin dummies. * p < 0.1, ** p < 0.05, *** p < 0.01.

tax rate on hours worked for women ranges from -0.27 to -0.31. The corresponding coefficient in column (2) of Table 3.10 is -0.242.

Tables 3.11 and 3.12 display the results of the analogous exercise, but in this case, I replace the country-of-residence variables, including the tax rates, with country of residence dummies. Country-of-origin variables, including leisure measures, are retained. Table 3.11 presents the results for females. The estimated coefficients of various measures of leisure are consistent with the ones reported earlier in both participation and hours decisions, but the statistical significant is spotty. The results for males, shown in Table 3.12, are also consistent with those reported earlier: taste for leisure is not a statistically significant determinant of men's labor market activity.

3.6. Potential Self-Selection of Immigrant Fathers

First-generation immigrants are a self-selected group of people who chose to leave their country-of-origin and migrate to another country. Thus, their unobserved attributes, including their propensity to work, may be different from the general population. This could be an issue if the first-generation immigrants (who are the fathers of our survey respondents) have self-selected themselves into destination countries based on the tax rates of those countries. For example, if people from countries with a strong culture of leisure choose to migrate to countries with high tax rates, and if the first-generation's taste for leisure is transmitted to the second-generation, then the impact of taxes on the labor supply of second generation will be estimated with bias. To shed light on this issue, I divided the

Table 3.11
The Impact of Culture of Leisure on Labor Supply--Females
Models with Country of Residence Fixed Effects

	Panel A Dependent variable: Labor Force Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
	Average Personal Income Tax Rate Sample					
Culture	-0.113***	-0.041	-0.059	0.006	-0.001***	0.003***
Coefficient	(0.035)	(0.035)	(0.042)	(0.031)	(0.000)	(0.001)
N	3770	3489	3489	3489	3626	2705
	Effective Marginal Tax Rate Sample					
Culture	-0.111**	-0.075*	-0.124**	-0.030	-0.001***	0.003**
Coefficient	(0.043)	(0.042)	(0.046)	(0.038)	(0.000)	(0.001)
N	2204	2091	2091	2091	2165	1864
	Panel B Dependent variable: Weekly Hours Normally Worked in Main Job					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
	Average Personal Income Tax Rate Sample					
Culture	0.308	-1.794	-1.659	-1.872*	0.010	-0.002
Coefficient	(1.878)	(1.140)	(1.292)	(1.092)	(0.024)	(0.194)
N	2909	2676	2676	2676	2796	1920
	Effective Marginal Tax Rate Sample					
Culture	-0.189	-2.798*	-1.831	-3.749**	0.048	0.129
Coefficient	(2.067)	(1.392)	(1.636)	(1.412)	(0.029)	(0.250)
N	1649	1555	1555	1555	1619	1392

Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year and country of destination dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.12
The Impact of Culture of Leisure on Labor Supply--Males
Models with Country of Residence Fixed Effects

	Panel A Dependent variable: Labor Force Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	LFP in Origin Country
	Average Personal Income Tax Rate Sample					
Culture	0.020	0.018	0.041	0.040	-0.000	-0.001
Coefficient	(0.045)	(0.039)	(0.036)	(0.033)	(0.000)	(0.001)
N	3295	3060	3060	3060	3178	2313
	Effective Marginal Tax Rate Sample					
Culture	0.076	0.010	0.034	0.048	0.000	-0.001
Coefficient	(0.054)	(0.035)	(0.039)	(0.032)	(0.001)	(0.001)
N	2022	1913	1913	1913	1998	1692

Table 3.12 (Continued)

	Panel B Dependent variable: Weekly Hours Normally Worked in Main Job					
	(1)	(2)	(3)	(4)	(5)	(6)
	Leisure Important	People Turn Lazy	Work Is a Duty to Society	Work Should Come First	Generous Holidays	Average Hours in Origin Country
	Average Personal Income Tax Rate Sample					
Culture	1.642	0.844	1.789	3.429**	0.015	-0.318
Coefficient	(2.182)	(1.562)	(2.018)	(1.316)	(0.022)	(0.405)
N	2738	2533	2533	2533	2652	1876
	Effective Marginal Tax Rate Sample					
Culture	1.437	0.752	2.484	2.702	0.005	-0.357
Coefficient	(2.835)	(1.661)	(2.285)	(1.697)	(0.026)	(0.511)
N	1719	1624	1624	1624	1703	1436

Each regression includes the control variables listed in Panels A, C, and D of Table 3.3.
Standard errors, clustered at the country of origin, are in parentheses. The estimations use sampling weights and include survey year and country of destination dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

sample into two groups: immigrants in destination countries with above-median tax rates, and immigrant in destination countries with below-median tax rates. I calculated the mean values of the culture of leisure variables using each second-generation immigrant's country of heritage. Table 3.13 shows that there are 2,957 second-generation immigrants in the data set whose fathers have migrated to high-tax countries, and that the average tax rate in those countries is 34.59%. There are 4,108 second-generation immigrants in the data set who live in low-tax countries, with an average tax rate of 19.9%. The mean value of the Leisure Important variable is 3.12 in the former group and it is 3.04 in the latter. This indicates that the average taste for leisure in the country of origin of second-generation immigrants who live in high-tax countries is not different from the taste for leisure in countries of origin of other second-generation immigrants who live in low-tax countries. The same picture emerges when considering People Turn Lazy variable. The mean value of this variable attached to those who live in high-tax countries is 2.20, whereas it is 2.15 for those who live in low-tax countries. Similarly, the mean values of Work Is a Duty to Society, Work Should Come First and Generous Holidays variables are very similar between the two groups. Columns 3-6 show that the same conclusion is reached when analyzing women and men separately. Thus, Table 3.13 indicates that the taste for leisure in the country of origin is the same between migrants who migrated to high-tax or to low-tax countries. This provides evidence against the hypothesis that tastes for leisure might have motivated people to migrate based on the tax rates in the countries of destination.

Table 3.13
Balance of Covariates for High and Low Tax Destination Countries

Variable	Both Genders		Females		Males	
	(1)	(2)	(3)	(4)	(5)	(6)
	High Tax Countries	Low Tax Countries	High Tax Countries	Low Tax Countries	High Tax Countries	Low Tax Countries
Average Tax Rate	34.595	19.903	34.350	19.695	34.856	20.148
	(5.959)	(3.335)	(5.803)	(3.205)	(6.113)	(3.467)
Culture of Leisure in the Country of Origin by Migration Destination (High Tax vs. Low Tax Countries)						
Leisure Important	3.122	3.040	3.127	3.039	3.118	3.041
	(0.180)	(0.198)	(0.180)	(0.198)	(0.179)	(0.198)
People Turn Lazy	2.204	2.146	2.218	2.141	2.189	2.152
	(0.335)	(0.288)	(0.337)	(0.287)	(0.332)	(0.289)
Work Is a Duty to Society	2.202	2.266	2.215	2.268	2.188	2.263
	(0.306)	(0.351)	(0.298)	(0.352)	(0.313)	(0.350)
Work Should Come First	2.548	2.521	2.560	2.512	2.536	2.531
	(0.452)	(0.447)	(0.452)	(0.453)	(0.452)	(0.441)
Generous Holidays	32.715	36.831	32.231	37.030	33.231	36.597
	(15.643)	(14.759)	(15.429)	(14.800)	(15.858)	(14.712)
Survey Participant (Second-generation Immigrant) Characteristics by Country of Residence (High Tax vs. Low Tax Countries)						
Labor Force Participation	0.700	0.740	0.665	0.687	0.737	0.803
	(0.459)	(0.438)	(0.472)	(0.464)	(0.441)	(0.398)
Years of Schooling	13.126	13.125	13.200	13.294	13.048	12.926
	(3.580)	(3.417)	(3.619)	(3.391)	(3.537)	(3.438)
Father Completed Upper-Secondary Education	0.553	0.566	0.547	0.573	0.559	0.559
	(0.497)	(0.496)	(0.498)	(0.495)	(0.497)	(0.497)
Father Worked when respondent was 14 years old	0.880	0.904	0.878	0.892	0.883	0.919
	(0.325)	(0.294)	(0.328)	(0.311)	(0.322)	(0.274)
N	2957	4108	1527	2243	1430	1865

Personal characteristics variables data come from the ESS survey. High Tax sample includes the following countries of destination: Belgium, Germany, Denmark, Hungary, Slovenia, Austria, the Netherlands, Finland, Norway, Turkey, Italy, Sweden, and France. Low Tax sample includes the following countries of destination: Iceland, Poland, Luxembourg, the United Kingdom, Greece, Czech Republic, Portugal, the Slovak Republic, Israel, Spain, Estonia, Switzerland, and Ireland.

Table 3.13 also demonstrates that the second-generation immigrations analyzed in the chapter have the same average education levels regardless of whether they reside in a high-tax or low-tax country. More importantly, Table 3.13 shows that the education levels of the fathers of these individuals, who have chosen which country to migrate to, are similar between high-tax and low-tax countries. Fifty-five percent of the fathers who have chosen to migrate to a high-tax country have completed upper secondary education. The rate is about 57 percent among immigrant fathers who have migrated to a low-tax country. Finally, Table 3.13 also shows that labor force

participation decisions of fathers who have migrated to high vs. low-tax countries were also similar. That is, the first-generation immigrants had similar labor market attachments regardless of whether they moved to a high-tax vs. low-tax country. In summary, Table 3.13 does not support the hypothesis that first-generation immigrants' education levels, labor market attachments or the taste for leisure in their country of origin are related to the tax rates in the country of destination.

3.7. Summary and Conclusion

There are substantial differences in aggregate hours worked between countries. In an influential paper, model Prescott (2004) argued using a growth model that virtually all of the difference in hours worked between the U.S. and Europe could be explained by the differences in tax rates. A large literature that followed Prescott (2004) provided various extensions ranging from consideration of households' self-insurance through asset accumulation (Ljungqvist and Sargent 2006) to incorporation of household production (McDaniel 2011).

Taxes distort the margin at which the market labor supply decision is made and higher taxes on labor income motivate people to shift away from market work to leisure. The large magnitude of the labor supply response in the Prescott framework, however, prompted the skeptics to suggest alternative or complementary mechanisms to explain the labor supply differences between countries, including the importance of regulations and labor unions (Alesina, Glaeser and Sacerdote 2005). One important point in this framework is the assumption of homogeneous preferences between countries. While it has been explicitly acknowledged that preferences for leisure may not be identical between countries (Blanchard 2006), no research has addressed the question of whether or not the "aste for leisure has a role in labor supply differences.

In this chapter, I use micro data from the European Social Survey that include information on labor force participation and hours worked of second-generation immigrants who reside in 26 European countries. These individuals are born in Europe, and they have been exposed to institutional, legal and labor market structures of their countries, including the tax rates. Fathers of these individuals are first-generation immigrants and the data allow me to identify 47 different countries they migrated from. I follow the recent literature on the impact of culture on economic behavior (Alesina et al. 2015, Alesina and Giuliano 2010, Fernández 2011) and use the immigrant father's country of birth to determine the ancestral roots, and assume that culture of leisure in the father's country of origin is transmitted from the immigrant father to the offspring.

Using the World Values Survey and the European Values Study, I construct measures of culture of leisure in the country of origin of each immigrant father. These measures include average responses in a country to such questions as "How Important is leisure time in your life?" "Do you agree or disagree with the statement: People who don't work turn lazy." "Do you agree or disagree with the statement: Work is a duty to society." "Do you agree or disagree with the statement: Work should always come first even if it means less spare time." The details of these and other variables that aim to gauge the extent of culture of leisure in the country of origin are provided in the chapter.

I employ two different tax measures. The first one is the average personal income tax and the social security contribution rate on gross labor income for a single person without a dependent. The second one is the effective marginal tax rate on labor income. I control for individual characteristics such age, education, marital status, size of the city and ethnic minority status. I also control for a large set of attributes of the country of residence and country of origin, ranging from per capita income to the unemployment rate, from legal origin of the country to the religious composition. Thus, I am able to identify the impact of taxes on labor supply (both at the extensive and intensive margin), holding constant observable attributes of individuals, various attributes of the country in which they live, and attributes of their father's country of origin, including the taste for leisure in that country of origin. Similarly, I can identify the impact of culture of leisure on labor supply, holding constant personal characteristics and country attributes, including taxes.

It can be argued that migration decisions could be motivated by the tax rates in the destination countries. For example, people from the countries where leisure is valued highly could have chosen to migrate to destination countries which have high tax rates, perhaps because such countries could have more generous welfare benefits. If this is the case, self-selection of migrant fathers as a function of destination country tax rates could confound the estimated impact of taxes on the labor supply of their children. I show, however, that the taste for leisure in the immigrants' country of origin is not related to the tax rates in the country of destination. Furthermore, education levels and labor force participation rates of first-generation immigrants are very similar regardless of whether they chose to migrate to a low-low or high-tax country of destination.

The results show that, for women, both taxes and culture of leisure impact participation and hours worked. For men, taxes influence labor supply both at the intensive and the extensive margin, but culture of leisure has no impact. I find aggregate labor supply elasticity of -0.65 for women and -0.54 for men. The elasticity for "taste for

leisure" is -0.30 for women and zero for men. These results suggest that while labor income tax is a significant determinant of aggregate hours worked, culture of leisure in the country is important as well. Thus, my results indicate that people would work less in a country if the tax rates or taste for leisure is higher in that country.

CHAPTER 4. CONCLUSION

4.1. Compulsory Schooling and the Impact of Education on Religiosity and Superstitious Beliefs

Education provides monetary benefits because it increases productivity and earnings (Card 2001, Oreopolous 2006). Education also affects outcomes ranging from health (Clark and Royer 2013, Chou et al. 2010, Grossman 2008) to fertility (Cygan-Rehm and Maeder 2013, Black et al. 2008, Osili and Long 2008). There are other non-pecuniary benefits of education, for example, the positive influence on civic engagement (Dee 2004) and information acquisition (Borgonovi et al. 2010).

In Chapter 2, I use compulsory schooling reforms implemented in European countries during the 1960s and 70s to identify the causal effect of education on religiosity and superstitious beliefs. I first show that the education reforms increased individuals' average level of education by about 5 months. Then I employ instrumental variable analysis and find that an additional year of education has a significant negative impact on individual's frequency of religious service attendance, frequency of prayer, and propensity to report being on the upper end of the religiosity scale.

In the second part half of Chapter 2, I apply the same empirical method to the European Values Study data and find evidence that an additional year of schooling negatively impacts individuals' propensities to believe in the protective power of lucky charms, consult horoscopes, and take horoscopes into account in daily lives.

The effects estimated in Chapter 2 pertain to the individuals whose educational attainment was influenced by the compulsory schooling reforms (local average treatment effects) and therefore are not readily generalizable to the entire population. Nonetheless, a variety of robustness checks and placebo tests reveal that the estimates, although large, are not a spurious product of a general trend towards secularity.

The results of Chapter 2 support the secularization hypothesis and fit into a broader line of recent research, showing that cultural traits and individual preferences are malleable and react to external factors. For example, Fernández (2013) shows that social attitudes towards women's work endogenously change over time. Giuliano and Spilimbergo (2014) report that individuals' political preferences and their support for government redistribution policies are impacted by whether or not they grew up during recessionary periods. D'Hombres and Nunziata find that higher education improves attitudes towards immigrants, and Cannonier and Mocan (2012) find that, for women in Sierra Leone, education encourages intolerance for violent cultural norms and behaviors. Giavazzi et al. (2014)

show that cultural values evolve at different rates, while Mocan (2013) reports that the intensity of vengeful feelings depends on the economic environment of the individual.

4.2. The Impact of Tax Rates and Culture of Leisure on Labor Supply in Europe

Chapter 3 of this dissertation focuses on the cultural traits that are transmitted from father to offspring and examines how culture of leisure and tax rates impact the labor supply of individuals (2nd generation immigrants) residing in 26 European countries. I show that, for females, ancestral culture of leisure is an important determinant of labor supply, adding to the existing evidence that cultural and institutional factors matter for economic outcomes (Fernández 2011, Acemoglu and Robinson 2012). In contrast, the results show no effect of culture of leisure in males' origin country on their labor supply. I consider these gender differences to be a reasonable finding, as one would expect female labor supply to be relatively more elastic.

In Chapter 3, I additionally examine the impact of tax rates on labor force participation and usual weekly hours of second-generation immigrants. I find that tax rates have a significant negative influence on labor supply of males and females both at the extensive and intensive margins. To illustrate the magnitude of the tax rate impact, I make a back-of-the-envelope calculation and find that if the effective marginal tax rate in Belgium went down to, for example, the level of the tax rate prevailing in Portugal, the gap in annual hours of work per working age population between Belgium and Portugal would close by about 64%. In contrast, the impact of culture of leisure is much smaller in this example. If the mean value of the variable Work is a Duty to Society decreased in Belgium to the level observed in Portugal, the gap in annual hours worked would shrink only by about 8%.

The results of Chapter 3 complement the existing macroeconomic studies by offering novel estimates of the impact of tax rates and culture of leisure on individuals' labor supply. The findings are robust to controlling for country-of-origin and country-of-residence fixed effects and using two different tax rate measures, as well as a variety of culture of leisure measures. The results of Chapter 3 can be interpreted as evidence against the assumption of homogeneous preferences for leisure across countries and indicate that such preferences may be an important explanatory factor, among others, for the cross-country differences in annual hours worked.

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APPENDIX A: SUPPLEMENTARY TABLES FOR CHAPTER 2

Table A.1
The Impact of Education on Religiosity and Superstition
OLS Results

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... more than once a week	... every day
Years of Schooling	-0.002	-0.001	-0.004***	-0.003**	-0.003**	-0.002
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
	{0.425}	{0.769}	{0.106}	{0.216}	{0.235}	{0.335}
N	16337	16337	16163	16163	16163	16163

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
Years of Schooling	-0.004***	-0.003***	-0.003***	-0.004**	-0.001	-0.003*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
	{0.139}	{0.103}	{0.011}**	{0.194}	{0.633}	{0.331}
N	16323	16323	16323	16323	16323	16323

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …			
	… is ≥ 4	… is ≥ 5	Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes most of the time, or always
	(1)	(2)	(3)	(4)
Years of Schooling	-0.006***	-0.006***	-0.009**	-0.004*
	(0.001)	(0.001)	(0.003)	(0.003)
	{0.010}**	{0.007}***	{0.214}	{0.243}
N	6969	6969	1650	1416

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.2
The Impact of Education on Religiosity and Superstition
Using Individuals of All Ages

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.122**	-0.089**	-0.093**	-0.128**	-0.097*	-0.058
	(0.052)	(0.038)	(0.046)	(0.057)	(0.050)	(0.036)
	{0.003}***	{0.020}**	{0.045}**	{0.020}**	{0.034}**	{0.203}
Reduced Form coefficient	-0.050***	-0.036***	-0.037***	-0.050***	-0.038**	-0.022*
	(0.014)	(0.012)	(0.014)	(0.014)	(0.015)	(0.012)
	{0.006}***	{0.043}**	{0.099}*	{0.017}**	{0.038}**	{0.189}
N	16481	16481	16304	16304	16304	16304

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.087**	-0.061**	-0.021	-0.061	-0.072*	-0.077**
	(0.041)	(0.027)	(0.015)	(0.043)	(0.039)	(0.039)
	{0.057}*	{0.018}**	{0.161}	{0.160}	{0.145}	{0.121}
Reduced Form coefficient	-0.036***	-0.025***	-0.008	-0.025	-0.030**	-0.032**
	(0.012)	(0.009)	(0.006)	(0.015)	(0.013)	(0.012)
	{0.124}	{0.021}**	{0.262}	{0.277}	{0.116}	{0.198}
N	16467	16467	16467	16467	16467	16467

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.108**	-0.123**	-0.124*	-0.076*
	(0.053)	(0.056)	(0.074)	(0.040)
	{0.012}**	{0.006}***	{0.075}*	{0.007}***
Reduced Form coefficient	-0.055**	-0.063***	-0.107**	-0.090**
	(0.022)	(0.022)	(0.041)	(0.041)
	{0.011}**	{0.006}***	{0.087}*	{0.003}***
N	7047	7047	1650	1416

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.3
The Impact of Education on Religiosity and Superstition
Excluding the 1953 cohort in France

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.135**	-0.098**	-0.108*	-0.150**	-0.114*	-0.070
	(0.061)	(0.045)	(0.056)	(0.074)	(0.064)	(0.044)
	{0.004}***	{0.021}**	{0.020}**	{0.005}***	{0.019}**	{0.067}*
Reduced Form coefficient	-0.050***	-0.037***	-0.037***	-0.050***	-0.038**	-0.023**
	(0.014)	(0.012)	(0.014)	(0.014)	(0.015)	(0.011)
	{0.008}***	{0.046}**	{0.072}*	{0.019}**	{0.036}**	{0.178}
N	16360	16360	16188	16188	16188	16188

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.102**	-0.059*	-0.016	-0.064	-0.103**	-0.100**
	(0.048)	(0.031)	(0.018)	(0.048)	(0.051)	(0.045)
	{0.051}*	{0.015}**	{0.202}	{0.214}	{0.098}*	{0.098}*
Reduced Form coefficient	-0.038***	-0.022**	-0.006	-0.023	-0.038***	-0.037***
	(0.012)	(0.009)	(0.007)	(0.015)	(0.013)	(0.011)
	{0.051}*	{0.070}*	{0.444}	{0.261}	{0.076}*	{0.043}**
N	16347	16347	16347	16347	16347	16347

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.120*	-0.136**	-0.131*	-0.085*
	(0.065)	(0.068)	(0.079)	(0.045)
	{0.011}**	{0.006}***	{0.077}*	{0.007}***
Reduced Form coefficient	-0.054**	-0.061***	-0.115**	-0.100**
	(0.022)	(0.023)	(0.044)	(0.044)
	{0.011}**	{0.008}***	{0.087}*	{0.007}***
N	6964	6964	1646	1416

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.4
The Impact of Education on Religiosity and Superstition
Treating all Pivotal Cohorts as Part of the Treatment Group

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.108*	-0.067	-0.116**	-0.161**	-0.109*	-0.052
	(0.055)	(0.042)	(0.056)	(0.072)	(0.058)	(0.041)
	{0.019}**	{0.142}	{0.010}**	{0.004}***	{0.017}**	{0.152}
Reduced Form coefficient	-0.030***	-0.018*	-0.033***	-0.045***	-0.031**	-0.014
	(0.010)	(0.010)	(0.011)	(0.011)	(0.012)	(0.011)
	{0.023}**	{0.165}	{0.019}**	{0.014}**	{0.027}**	{0.259}
N	18400	18400	18200	18200	18200	18200

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.068	-0.048*	-0.022	-0.035	-0.032	-0.041
	(0.046)	(0.029)	(0.019)	(0.046)	(0.038)	(0.040)
	{0.187}	{0.037}**	{0.149}	{0.475}	{0.549}	{0.519}
Reduced Form coefficient	-0.019*	-0.014*	-0.006	-0.010	-0.009	-0.012
	(0.010)	(0.007)	(0.005)	(0.012)	(0.011)	(0.010)
	{0.266}	{0.090}*	{0.153}	{0.573}	{0.565}	{0.649}
N	18381	18381	18381	18381	18381	18381

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.051	-0.058	-0.204	-0.093*
	(0.067)	(0.070)	(0.163)	(0.056)
	{0.444}	{0.424}	{0.015}**	{0.030}**
Reduced Form coefficient	-0.016	-0.018	-0.107***	-0.076**
	(0.020)	(0.021)	(0.039)	(0.036)
	{0.434}	{0.421}	{0.015}**	{0.030}**
N	7435	7435	1746	1503

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.5
The Impact of Education on Religiosity and Superstition
Using the dates in Table 1 of Brunello et al. (2013) to determine Pivotal Cohorts

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.182**	-0.110**	-0.092*	-0.160**	-0.128**	-0.080*
	(0.075)	(0.048)	(0.051)	(0.073)	(0.064)	(0.048)
	{0.001}***	{0.028}**	{0.030}**	{0.004}***	{0.021}**	{0.096}*
Reduced Form coefficient	-0.062***	-0.037***	-0.030**	-0.052***	-0.042***	-0.026**
	(0.016)	(0.012)	(0.013)	(0.014)	(0.014)	(0.013)
	{0.004}***	{0.045}**	{0.083}*	{0.008}***	{0.014}**	{0.071}*
N	16125	16125	15954	15954	15954	15954

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.094**	-0.052*	0.003	-0.075	-0.107**	-0.072*
	(0.044)	(0.027)	(0.017)	(0.050)	(0.052)	(0.041)
	{0.022}**	{0.032}**	{0.920}	{0.020}**	{0.012}**	{0.066}*
Reduced Form coefficient	-0.034***	-0.018**	0.002	-0.026	-0.039***	-0.026**
	(0.012)	(0.008)	(0.006)	(0.016)	(0.014)	(0.012)
	{0.075}*	{0.100}*	{0.806}	{0.089}*	{0.020}**	{0.203}
N	16106	16106	16106	16106	16106	16106

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.058	-0.096	-0.209	-0.079
	(0.058)	(0.063)	(0.285)	(0.093)
	{0.371}	{0.145}	{0.167}	{0.442}
Reduced Form coefficient	-0.025	-0.041*	-0.074	-0.043
	(0.023)	(0.022)	(0.050)	(0.043)
	{0.364}	{0.143}	{0.171}	{0.442}
N	6874	6874	1663	1424

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.6
The Impact of Education on Religiosity and Superstition
With State-specific (Germany) Cohort Trends

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.107**	-0.086**	-0.065	-0.081*	-0.079	-0.047
	(0.052)	(0.042)	(0.040)	(0.046)	(0.049)	(0.037)
	{0.018}**	{0.067}*	{0.087}*	{0.014}**	{0.032}**	{0.074}*
Reduced Form coefficient	-0.049***	-0.039***	-0.028*	-0.035**	-0.034*	-0.021
	(0.017)	(0.014)	(0.016)	(0.017)	(0.018)	(0.015)
	{0.015}**	{0.067}*	{0.168}	{0.041}**	{0.053}*	{0.210}
N	16337	16337	16163	16163	16163	16163

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.034	-0.038	-0.012	-0.007	-0.039	-0.025
	(0.030)	(0.024)	(0.017)	(0.041)	(0.035)	(0.027)
	{0.235}	{0.072}*	{0.346}	{0.587}	{0.326}	{0.435}
Reduced Form coefficient	-0.016	-0.017*	-0.006	-0.004	-0.018	-0.011
	(0.012)	(0.010)	(0.008)	(0.018)	(0.014)	(0.011)
	{0.250}	{0.095}*	{0.514}	{0.802}	{0.206}	{0.426}
N	16323	16323	16323	16323	16323	16323

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.100**	-0.115**	-0.103*	-0.086**
	(0.048)	(0.051)	(0.058)	(0.041)
	{0.014}**	{0.008}***	{0.122}	{0.007}***
Reduced Form coefficient	-0.054**	-0.063***	-0.100**	-0.097**
	(0.022)	(0.023)	(0.044)	(0.039)
	{0.014}**	{0.008}***	{0.128}	{0.007}***
N	6969	6969	1650	1416

Please see text for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.7
The Impact of Education on Religiosity and Superstition
Specifications with State-specific Quadratic Age Trends

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.119**	-0.093**	-0.070**	-0.067*	-0.065*	-0.033
	(0.052)	(0.042)	(0.034)	(0.037)	(0.040)	(0.032)
	{0.010}**	{0.020}**	{0.062}*	{0.060}*	{0.094}*	{0.332}
Reduced Form coefficient	-0.058***	-0.046***	-0.034**	-0.032**	-0.032*	-0.016
	(0.018)	(0.016)	(0.015)	(0.016)	(0.017)	(0.015)
	{0.011}**	{0.022}**	{0.062}*	{0.051}*	{0.081}*	{0.324}
N	16337	16337	16163	16163	16163	16163

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.048	-0.040*	-0.020	-0.019	-0.045	-0.031
	(0.029)	(0.024)	(0.016)	(0.038)	(0.032)	(0.026)
	{0.076}*	{0.029}**	{0.258}	{0.630}	{0.132}	{0.269}
Reduced Form coefficient	-0.023*	-0.020*	-0.010	-0.009	-0.022	-0.015
	(0.012)	(0.010)	(0.008)	(0.018)	(0.014)	(0.012)
	{0.084}*	{0.032}**	{0.267}	{0.633}	{0.128}	{0.282}
N	16323	16323	16323	16323	16323	16323

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.062*	-0.075*	-0.048	-0.086*
	(0.037)	(0.039)	(0.034)	(0.049)
	{0.097}*	{0.044}**	{0.417}	{0.115}
Reduced Form coefficient	-0.039*	-0.047**	-0.050	-0.102*
	(0.023)	(0.023)	(0.038)	(0.060)
	{0.103}	{0.048}**	{0.433}	{0.163}
N	6969	6969	1650	1416

Please see text for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.8
The Impact of Education on Religiosity and Superstition
Specifications with a 7-year Window around the Pivotal Cohorts

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.119***	-0.071**	-0.094**	-0.100**	-0.072*	-0.060*
	(0.046)	(0.034)	(0.042)	(0.048)	(0.043)	(0.035)
	{0.000}***	{0.104}	{0.008}***	{0.000}***	{0.006}***	{0.063}*
	-0.040***	-0.023**	-0.030***	-0.032***	-0.024**	-0.019**
	(0.011)	(0.009)	(0.010)	(0.012)	(0.012)	(0.010)
	{0.000}***	{0.080}*	{0.046}**	{0.030}**	{0.034}**	{0.041}**
N	27515	27515	27232	27232	27232	27232
Sample Mean	0.304	0.181	0.455	0.393	0.324	0.216
1st Stage F-test	15.138	15.138	14.249	14.249	14.249	14.249
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.058*	-0.050**	-0.019	-0.029	-0.040	-0.056*
	(0.031)	(0.023)	(0.016)	(0.041)	(0.033)	(0.030)
	{0.058}*	{0.017}**	{0.079}*	{0.491}	{0.186}	{0.036}**
Reduced Form coefficient	-0.020**	-0.017**	-0.006	-0.010	-0.013	-0.019**
	(0.009)	(0.007)	(0.006)	(0.014)	(0.011)	(0.009)
	{0.197}	{0.048}**	{0.251}	{0.550}	{0.306}	{0.170}
N	27490	27490	27490	27490	27490	27490
Sample Mean	0.186	0.083	0.042	0.385	0.259	0.155
1st Stage F-test	15.857	15.857	15.857	15.857	15.857	15.857
P-value	0.000	0.000	0.000	0.000	0.000	0.000

The treatment group consists of individuals born up to 7 years after the first cohort potentially affected by an education reform. The control group consists of those born up to 7 years before the pivotal cohort. With the exception of France, the first potentially affected cohort is not included, because the extent of their exposure to an education reform is unclear. Control characteristics include Age, Age Squared, Male, Ethnic Minority, City, Mother Immigrant and Mother Working variables. The estimations use sampling weights and include survey year dummies, survey country dummies and country-specific cohort trends. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.9
The Impact of Education on Religiosity and Superstition
Placebo Reforms. Assumed Implementation: 2 Years Earlier than the Actual Reform

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.093	-0.078	-0.059	-0.064	-0.064	-0.004
	(0.063)	(0.066)	(0.045)	(0.047)	(0.046)	(0.037)
	{0.683}	{0.870}	{0.492}	{0.502}	{0.404}	{0.767}
Reduced Form coefficient	-0.002	0.008	-0.024	-0.032*	-0.015	-0.021
	(0.015)	(0.016)	(0.017)	(0.018)	(0.017)	(0.015)
	{0.897}	{0.705}	{0.438}	{0.333}	{0.589}	{0.329}
N	15883	15883	15719	15719	15719	15719
1st Stage F-test	0.001	0.001	0.005	0.005	0.005	0.005

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.045	-0.014	0.018	-0.091	-0.023	-0.046
	(0.051)	(0.036)	(0.029)	(0.075)	(0.053)	(0.048)
	{0.146}	{0.101}	{0.924}	{0.228}	{0.221}	{0.087}*
Reduced Form coefficient	-0.008	0.003	0.005	0.000	0.016	-0.006
	(0.015)	(0.011)	(0.008)	(0.017)	(0.016)	(0.015)
	{0.796}	{0.831}	{0.652}	{0.995}	{0.552}	{0.875}
N	15869	15869	15869	15869	15869	15869
1st Stage F-test	0.004	0.004	0.004	0.004	0.004	0.004

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	0.085	0.152	0.363	0.088
	(0.196)	(0.253)	(0.509)	(0.853)
	{0.605}	{0.348}	{0.044}**	{0.911}
Reduced Form coefficient	-0.012	-0.021	-0.102**	-0.005
	(0.024)	(0.025)	(0.048)	(0.031)
	{0.610}	{0.355}	{0.063}*	{0.927}
N	6713	6713	1567	1328
1st Stage F-test	0.676	0.676	0.574	0.018

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.10
The Impact of Education on Religiosity and Superstition
Placebo Reforms. Assumed Implementation: 2 Years Later than the Actual Reform

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	0.223 (0.799) {0.541}	-0.099 (0.371) {0.245}	-0.474 (1.945) {0.116}	-0.455 (1.889) {0.090}*	-0.076 (0.474) {0.105}	0.141 (0.818) {0.866}
Reduced Form coefficient	-0.007 (0.017) {0.711}	0.008 (0.013) {0.547}	0.020 (0.016) {0.207}	0.019 (0.015) {0.223}	0.007 (0.013) {0.537}	-0.002 (0.013) {0.828}
N	16640	16640	16448	16448	16448	16448
1st Stage F-test	0.183	0.183	0.211	0.211	0.211	0.211

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	1.052 (11.602) {0.667}	0.996 (11.022) {0.785}	0.172 (2.022) {0.999}	2.109 (23.381) {0.533}	1.937 (21.402) {0.377}	2.067 (22.564) {0.489}
Reduced Form coefficient	-0.009 (0.014) {0.577}	-0.008 (0.011) {0.514}	-0.001 (0.007) {0.957}	-0.018 (0.017) {0.288}	-0.018 (0.016) {0.236}	-0.020 (0.014) {0.274}
N	16617	16617	16617	16617	16617	16617
1st Stage F-test	0.154	0.154	0.154	0.154	0.154	0.154

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.536 (1.548) {0.067}*	-0.656 (1.878) {0.019}**	0.062 (0.153) {0.681}	-0.113 (0.270) {0.405}
Reduced Form coefficient	-0.033 (0.022) {0.065}*	-0.040* (0.023) {0.020}**	0.018 (0.040) {0.687}	-0.024 (0.041) {0.481}
N	7200	7200	1727	1484
1st Stage F-test	0.108	0.108	0.584	0.229

Please see Tables 2.5 and 2.6 for the specification details. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.11
The Impact of Education on Religiosity and Superstition
Placebo Reforms. Assumed Implementation: 3 Years Earlier than the Actual Reform

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	-0.055	-0.014	-0.002	0.027	-0.028	-0.007
	(0.077)	(0.057)	(0.068)	(0.076)	(0.068)	(0.053)
	{0.410}	{0.814}	{0.393}	{0.211}	{0.491}	{0.544}
Reduced Form coefficient	0.015	0.005	0.001	-0.006	0.008	0.002
	(0.017)	(0.015)	(0.017)	(0.017)	(0.016)	(0.013)
	{0.464}	{0.967}	{0.902}	{0.712}	{0.638}	{0.616}
N	15496	15496	15357	15357	15357	15357
1st Stage F-test	1.855	1.855	1.732	1.732	1.732	1.732

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	0.018	-0.080	-0.042	0.071	0.011	0.064
	(0.055)	(0.058)	(0.038)	(0.080)	(0.061)	(0.067)
	{0.648	{0.050}**	{0.195}	{0.706}	{0.539}	{0.851}
Reduced Form coefficient	-0.006	0.021*	0.011	-0.021	-0.004	-0.018
	(0.014)	(0.011)	(0.007)	(0.017)	(0.016)	(0.013)
	{0.685}	{0.315}	{0.310}	{0.411}	{0.743}	{0.277}
N	15495	15495	15495	15495	15495	15495
1st Stage F-test	1.908	1.908	1.908	1.908	1.908	1.908

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	-0.003	-0.121	0.134	-0.388
	(0.223)	(0.279)	(0.221)	(0.520)
	{0.984}	{0.451}	{0.634}	{0.049}**
Reduced Form coefficient	0.000	0.013	-0.043	0.104**
	(0.024)	(0.025)	(0.048)	(0.044)
	{0.985}	{0.457}	{0.632}	{0.076}*
N	6619	6619	1562	1316
1st Stage F-test	0.415	0.415	0.777	0.541

Please see Tables 2.5 and 2.6 for the specification details. * p < 0.1, ** p < 0.05, *** p < 0.01 are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

Table A.12
The Impact of Education on Religiosity and Superstition
Placebo Reforms. Assumed Implementation: 3 Years Later than the Actual Reform

Panel A: Frequency of Attending Religious Services and Praying

	(1)	(2)	(3)	(4)	(5)	(6)
	Attend religious services (apart from special occasions) …		Pray (apart from religious services) …			
	... at least once a month	...at least once a week	... at least once a month	... at least once a week	... several times a week	... every day
IV coefficient of Years of Schooling	0.031	-0.193	0.075	-0.065	-0.199	-0.122
	(0.184)	(0.238)	(0.307)	(0.249)	(0.411)	(0.282)
	{0.933}	{0.224}	{0.290}	{0.392}	{0.499}	{0.642}
Reduced Form coefficient	-0.005	0.020	-0.004	0.006	0.016	0.007
	(0.019)	(0.015)	(0.018)	(0.019)	(0.017)	(0.014)
	{0.663}	{0.426}	{0.746}	{0.915}	{0.773}	{0.860}
N	16893	16893	16683	16683	16683	16683
1st Stage F-test	0.649	0.649	0.520	0.520	0.520	0.520

Panel B: Religiosity

	(1)	(2)	(3)	(4)	(5)	(6)
	On a scale from 0 to 10 person's religiosity			Belongs to … of religiosity distribution in the country		
	... is 8, 9, or 10	... is 9 or 10	... is 10	top 30%	top 20%	top 10%
IV coefficient of Years of Schooling	-0.098	-0.020	-0.011	0.031	-0.027	-0.087
	(0.151)	(0.076)	(0.063)	(0.192)	(0.169)	(0.134)
	{0.845}	{0.960}	{0.916}	{0.612}	{0.815}	{0.832}
Reduced Form coefficient	0.010	0.002	0.001	-0.003	0.003	0.009
	(0.013)	(0.008)	(0.007)	(0.019)	(0.019)	(0.012)
	{0.850}	{0.742}	{0.753}	{0.585}	{0.786}	{0.920}
N	16876	16876	16876	16876	16876	16876
1st Stage F-test	0.651	0.651	0.651	0.651	0.651	0.651

Panel C: Superstition

	On a scale from 1 to 10 person's belief that lucky charm protects …		Individual consults horoscope at least monthly	Individual takes into account horoscope in daily life sometimes, most of the time, or always
	… is ≥ 4	… is ≥ 5		
	(1)	(2)	(3)	(4)
IV coefficient of Years of Schooling	0.001	-0.046	-0.925	-0.089
	(0.271)	(0.271)	(3.274)	(0.209)
	{1.000}	{0.872}	{0.091}*	{0.563}
Reduced Form coefficient	-0.000	0.004	0.083*	0.020
	(0.022)	(0.022)	(0.047)	(0.039)
	{1.000}	{0.878}	{0.093}*	{0.612}
N	7217	7217	1785	1535
1st Stage F-test	0.193	0.193	0.082	0.342

Please see Tables 2.5 and 2.6 for the specification details. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ are based on standard errors clustered at the regional level, which are reported in parentheses. The bootstrapped p-values based on standard errors clustered at the country/state level are reported in {curly brackets}.

APPENDIX B: EDUCATION REFORMS IN EUROPE

Austria:

In 1962, a federal education act increased the length of compulsory education from 8 to 9 years. According to Fort et al. (2011), the law came into effect on September 1 in 1966. School in Austria started at age 6 and, according to Fort et al. (2011), the cut-off date for school-entry was mostly September 1. This means that the first potentially affected pupils were those born in September-December 1951. On the other hand, Gathmann et al. (2014) code the first potentially affected cohort as those born in 1952. Since most of the individuals born in 1951 were not exposed to the reform, this chapter follows Gathmann et al. (2014) and codes those born in 1952 as the pivotal cohort, which is omitted from the regressions. People born in 1951 and earlier form the control group. Those born in 1953 or later were exposed to 9 years of compulsory education and form the treatment group.

Note: Brunello et al. (2009, 2013) suggest that the reform was both passed and implemented in 1962. Brunello et al. (2009, 2013) code the first potentially affected cohort as those born in 1947, because "the individuals born in 1947 who might have already left school when the reform was introduced were required to go back to school and complete the additional year."

Belgium:

The literature reports that in June 1983 the length of compulsory schooling was increased from 8 to 12 years (Brunello et al. 2009, Murtin and Viarengo 2011, Garrouste 2010). The mandate obliged students to stay in school until they were 18 years old, although the final two or three years could be completed part-time. School in Belgium started at age 6, which means that the students aged 14 in 1983 were the first cohort potentially affected by the reform. These people were born in 1969, and I omit them from the regressions. People born in 1968 or earlier form the treatment group, while those born in 1970 or later form the control group.

Denmark:

The literature reports two compulsory schooling extensions in Denmark in the second half of the 20th century (Brunello et al. 2009, Fort et al. 2011, Gathmann et al. 2014, Murtin and Viarengo 2011, Garrouste 2010). First, in 1958 the length of compulsory education was increased from 4 to 7 years. Then in 1971 it was further extended from 7 to 9 years. I only use the second reform. Those born in 1956 or earlier form the control group, while the treatment group is composed of respondents born in 1958 or later.

Note: Gathmann et al. (2014) state that the reform was implemented in 1972, but they still code the first potentially affected cohort as those born in 1957.

France:

During the 20th century, compulsory schooling in France was extended twice: from 7 to 8 years in 1936 (the Zay reform) and from 8 to 10 years in 1959 (Berthoin reform). I only use the second reform. This reform was implemented in 1967, increased the minimum school leaving age from 14 to 16 and affected all those born on January 1, 1953 or later. Thus, people who were born in 1952 or earlier were not exposed to the mandate and form the treatment group. Respondents born in 1953 or later form the control group.

Sources: Brunello et al. (2009), Fort et al. (2011), Gathmann et al. (2014), Murtin and Viarengo (2011), and Grenet (2013).

Germany:

The former Federal Republic of Germany increased the length of compulsory schooling from 8 to 9 years. The reform was implemented gradually across the 10 German states. Hamburg was the first state to implement the reform in 1949. The last state to implement the reform was Bayern in 1969. I borrow the coding of the reforms Pischke and Wachter (2005), published as Pischke and Wachter (2008). I use the reforms for 9 states, because the first cohort affected by the reform in Hamburg was born in 1935 and is outside of the age range of my sample.

Greece:

In 1976, the Greek Parliament increased years of compulsory education from 6 to 9 years (Law 309/1976). Since the starting school age is 6, the first potentially affected individuals are those were 12 in 1976 and were born in 1964. While Brunello et al. (2009, 2013) state that the date of the law is 1975, Murtin and Viarengo (2011), Garrouste (2010), and Kazamias (1978) all report that the law was passed in 1976. I code people born in 1965 or later as part of the treatment group and those born in 1963 or earlier as part of the control group. The extent of exposure of the 1964 cohort is unclear, and this cohort is omitted from the models.

Hungary:

In 1961, the length of compulsory education was increased from 8 to 10 years, with the corresponding increase in the minimum legal school leaving age from 14 to 16 (Borgonovi et al. 2010). People born in 1948 or later form the treatment group, while those born in 1946 or earlier belong to the control group. The extent of exposure of the 1947 cohort is unclear, and this cohort is omitted from the models.

Note: The information on this reform comes only from Borgonovi et al. (2010). Both Garrouste (2010) and Eurydice (2004/05) mention the Act III on Education of 1961, but no information on the increase of compulsory schooling years is available in these sources.

Ireland:

In 1972, the minimum school leaving age was increased from 14 to 15. For this reform, respondents born in 1959 or later form the treatment group, while those born in 1957 or earlier belong to the control group. The extent of exposure of the 1958 cohort is unclear, and this cohort is omitted from the models.

Sources: Brunello et al. (2009), Fort (2006), Garrouste (2010), Murtin and Viarengo (2011), Gathmann (2014).

Italy:

Reform that made junior high school compulsory was passed at the end of 1962 and implemented in 1963. The mandate increased the years of compulsory schooling from 5 to 8 and minimum legal school leaving age from 11 to 14. Both Brunello et al. (2009) and Gathmann (2014) refer to Brandolini and Cipollone (2002) and code those being born in 1949 as the first cohort affected by the reform. This is at odds with the straightforward calculation 1963-11=1952.

Fort (2006) gives two other cut-offs: "According to [Brandolini and Cipollone, 2002, pp. 12], people potentially affected by the reform are those who in 1963 were less than 15 years old and without middle school degree, those who were between 6 and 14 years old in 1963, that is those born between 1949-1957. Instead, [Flabbi, 1999, pp. 13] claimed that the reform starts "to be effective on people born after the 1950."

In addition, several papers point out that the compliance with the reform may have been imperfect:

Brunello et al. (2009): "Compliance with the reform was not immediate and only in 1976 the proportion of children attending junior high school approached 100%."

Brandolini and Cipollone (2002 Bank of Italy working paper) use 1949-1956 range for the omitted cohort and state the following: "Notwithstanding this initial success of the reform it took almost additional 15 years for the enrolment rate in the third class of junior high school to approach 100 per cent."

Bratti and Braga (2013 working paper): "Enforcement of the law was far from being perfect initially, and improved gradually, although it is necessary to wait until the mid `70s to observe full compliance with the new school obligation."

I follow d'Hombres and Nunziata (2015) and Bratti and Braga (2013) and code the first potentially affected cohort as those born in 1950. People born in 1949 or earlier form the control group, while those born in 1951 or later form the treatment group.

Poland:

In 1961 the length of compulsory education was increased from 7 to 8 years, with the corresponding increase in the minimum legal school leaving age from 14 to 15 (Borgonovi et al. 2010). Additional information is provided by the International Education Guide (2012): "Primary school was extended to 8 years following the introduction of the 1961 Education System Development Act (*Ustawa o rozwoju systemu oswiaty i wychowania*). Compulsory education covered Grades 1 to 8 (ages 7 to 15)." According to Joanna Jung-Miklaszewska (2003), the 8th grade (Form VIII) was organized in the school year 1966/67. This made those born in 1953 or later to be fully exposed to the reform, while those born in 1951 or earlier missed the mandate. It is uncertain whether the respondents born in 1952 were exposed to the reform; therefore, this cohort is omitted from the estimations.

Portugal:

The 1964 reform in Portugal increased the level of compulsory schooling from 4 to 6 years, raising the minimum school leaving age to 14. The reform applied to those who entered school from 1964 onwards, i.e. those born in 1956 and later. Thus, people born in 1955 or earlier form the control group, while those born in 1957 or later form the treatment group.

Portugal has also extended the length of compulsory schooling from 3 to 4 years in 1956 (for boys) and in 1960 (for girls). To avoid the potentially confounding effect of this reform, I narrow the window around the pivotal cohort to 3 years for girls. Dropping Portugal from the analysis had no impact on the results.

Sources: Brunello et al. (2013), Fort (2006), Garrouste (2010), Pereira and Martins (2002), Sousa et al. (2015), Vieira (1999).

Spain:

In 1970, the General Act on Education and Financing of Educational Reform increased years of compulsory schooling from 6 to 8 and the minimum legal school leaving age from 12 to 14 (Brunello et al. 2009, Fort 2006, Garrouste 2010, Gathmann et al. 2014). Both Brunello et al. (2009) and Gathmann et al. (2014) follow Pons and Gonzalo (2002) and code those born in 1957 as the first cohort potentially affected by the reform. These

respondents 13 years old in 1970. I follow this approach and assign people who were born before 1957 to the control group and people who were born after 1957 to the treatment group.

Sweden:

In 1962, Sweden increased its years of compulsory schooling from 8 to 9 (Brunello et al. 2009, Fort 2006, Murtin and Viarengo 2011). However, the full implementation of this reform was preceded by a period of experimental gradual implementation at the municipality level, which started in 1949 (Meghir and Palme 2005).

The gradual implementation of the reform makes it difficult to clearly isolate the cohorts impacted by the change. I follow Borgonovi et al. (2010) and d'Hombres and Nunziata (2015) and code the first potentially affected cohort as those born in 1951. People born in 1950 or earlier form the control group, while those born in 1952 or later form the treatment group.

The United Kingdom:

In March 1972, the minimum school leaving age was increased from 15 to 16, starting September 1 1972 (www.legislation.gov.uk/uksi/1972/444/pdfs/uksi_19720444_en.pdf). School started at age 5, which implies that the number of years of compulsory education increased from 10 to 11. In Northern Ireland, the reform of 1972 also increased the minimum school leaving age from 15 to 16.

The mandate affected all individuals born September 1957 or later in England, Wales, and Northern Ireland. However, the extent of the exposure of the 1957 cohort to the reform in not known. This cohort is excluded from the analysis. Respondents born in 1958 or later form the treatment group, while people born in 1956 or earlier form the control group.

For Scotland, several papers report 1976 as the date of the reform (Fort 2006, Gathmann et al. 2014, Brunello et al. 2013). However, Gathmann et al. (2014) and Fort (2006) suggest those born in 1958 as the first potentially affected cohort. I code people born in 1959 as the first fully affected cohort in Scotland. Those born 1957 or earlier form the control group, while people born in 1958 are excluded from the models.

In 1940s, the United Kingdom had another education reform that increased the minimum legal school leaving age from 14 to 15. However, the first cohort exposed to that mandate was born in 1930s. In order to avoid potentially confounding effects of ageing on religiosity, my sample is restricted to those 65 years old or younger, which prevents the usage of this early reform.

Sources: Brunello et al. (2009), Brunello et al. (2013), Fort (2006), Fort et al. (2011), Murtin and Viarengo (2011), Clark and Royer (2013), Oreopolous (2006, 2007), Gathmann (2014).

APPENDIX C: SUPPLEMENTARY DATA DOCUMENTATION FOR CHAPTER 2

ESS Religious Denominations

Respondents in the ESS were asked whether they belong to a religious denomination and, if so, to which denomination they belong. Possible answers included 1 "Roman Catholic," 2 "Protestant," 3 "Eastern Orthodox," 4 "Other Christian denomination," 5 "Jewish," 6 "Islamic," 7 "Eastern religions," and 8 "Other non-Christian religions." However, there were inconsistencies in the religious denomination reporting in the ESS data. First, in Round 2 of the ESS, for Hungarian respondents the category "Eastern Orthodox" was merged with the category "Roman Catholic." Second, for respondents from France in Rounds 1 and 2, the category "Other Christian denomination" was merged with the category "Other non-Christian religions." Third, in the United Kingdom in Rounds 2 and 3, many interviewers appear not to have probed respondents sufficiently if the respondents simply reported their religion as being "Christian." Rather than asking for more details about the Christian denomination to which the respondent felt they belonged, the interviewer instead used the "Other Christian denomination" category. This resulted in significantly larger proportions of people reporting belonging to "Other Christian denomination" when compared to other ESS rounds of the United Kingdom data (Rounds 1, 4, 5, and 6). These inconsistencies prevented the creation of a uniform religious denomination variable with fine subcategories. The final denomination variable has categories 1 "No denomination," 2 "Christian," and 3 "Non-Christian."

EVS Superstition Measures:

"Do you believe that a lucky charm such as a mascot or a talisman can protect or help you?" question was asked in the 1999 wave and the 2008 wave. The possible answers range from 1 "Definitely not" to 10 "Definitely yes." For specifications in Table 6, this variable is converted into two dichotomous indicators taking the values of one if the respondent's belief in lucky charm is, respectively, greater than or equal to 4, or greater than or equal to 5. This question was asked in all of the countries already present in the religiosity analysis. The list of countries in the "lucky charm" sample consists of Austria, Belgium, Denmark, France, Great Britain, Greece, Hungary, Ireland, Italy, Northern Ireland[51], Poland, Portugal, Spain, Sweden and West Germany.

[51] In the EVS data, Northern Ireland enters as a separate country. This is in contrast to the ESS, where survey design treats Northern Ireland region as a part of Great Britain (Rounds 1 to 6) or a part of Ireland (Round 4 only). I created a new country "Northern Ireland" in the ESS data when harmonizing the region variable across rounds. Northern Ireland has a separate country fixed effect in the regressions, but is not present in the graphs, since the number of observations is small.

Two questions about horoscope were asked in the 1999 wave: "How often do you consult your horoscope to know about your future?"[52] and "How often do you take this into account in your daily life"[53] The variable "How often do you consult your horoscope?" is converted into a dummy variable taking the value of one if the respondent reports consulting with the horoscope at least once a month, and zero otherwise. Similarly, the variable "How often do you take horoscope into account in daily life?" is converted into an indicator taking the value of one if the respondent reports taking horoscope into account at least sometimes, and zero otherwise. The questions about horoscope were asked in four countries, for which the education reforms information is available: Austria, France, Greece, Italy and West Germany. These countries compose the "horoscope" sample.

EVS Sample and the Education Measure:

The sample is restricted to individuals younger than 65 years old, citizens of the country of interview and non-students. In addition, to keep the EVS sample more comparable to the ESS sample, immigrants were dropped whenever the information on whether the individual was born in the country is available (the 2008 wave only).

The number of years of education in the ESS is approximated by subtracting the country school starting age (6 for most countries, 5 for Great Britain and Northern Ireland, 7 for Denmark, Poland and Sweden) from the age of education completion as reported by the respondent. Observations for which the current reported age is less than the reported age of completing education are dropped. In addition, observations with calculated years of education greater than 25 are dropped as well.

EVS Control Variables:

Unlike the ESS, the EVS does not ask its respondents about their self-perceived urbanicity. However, the actual size of the town, in which the interview was conducted, is available starting in the 1990 wave. The possible categories of this variable are "under 2,000," "2,000-5,000," "5,000-10,000" "10,000-20,000," "20,000-50,000," "50,000-100,000," "100,000-500,000," "500,000+." Approximately 50% of respondents in the original data lived in towns under 20,000. The variable city takes the value of one if the size of the town of the interview is 20,000 or more, and zero otherwise.

[52]The full set of possible answers includes 1 "Every day," 2 "At least once a week," 3 "At least once a month," 4 "Less often," and 5 "Never."
[53] The full set of possible answers includes 1 "Always," 2 "Most of the time," 3 "Sometimes," 4 "Not very often," and 5 "Never."

APPENDIX D: SUPPLEMENTARY TABLES FOR CHAPTER 3

Table D.1
Measures of Culture of Leisure in the Countries of Origin

Country	Leisure Important (1 "Not at all" to 4 "Very important")	People Turn Lazy (1 "Strongly agree" to 5 "Strongly disagree")	Work is a Duty to Society (1 "Strongly agree" to 5 "Strongly disagree")	Work Should Come First (1 "Strongly agree" to 5 "Strongly disagree")	Generous Holidays are Important (0 to 100)
Algeria	2.953				20.515
Austria	3.251	2.141	2.078	2.556	20.708
Belarus	3.006	2.175	2.353	3.089	39.322
Belgium	3.255	2.667	2.302	3.179	28.246
Brazil	3.297	2.163	2.131	2.395	16.107
Bulgaria	2.955	2.036	2.121	2.219	37.069
Canada	3.280	2.671	2.392	3.028	26.680
Chile	3.213	2.117	2.106	2.534	26.159
China	2.571	2.039	2.084	2.234	13.701
Croatia	3.109	2.464	2.598	2.816	33.549
Cyprus	3.470	1.954	1.911	2.228	39.550
Czech Republic	3.020	2.112	2.453	2.604	25.070
Denmark	3.391	2.322	2.119	2.777	18.842
Egypt	2.554	1.548	1.418	1.431	12.900
Estonia	2.996	2.289	2.534	2.902	30.144
Ethiopia	3.275	1.736	1.639	1.636	
Finland	3.343	2.521	2.422	3.090	14.920
France	3.195	2.609	2.378	3.182	15.553
Georgia	3.184	2.004	2.123	1.975	23.132
Germany	3.177	2.580	2.290	2.487	24.623
Greece	3.361	2.325	2.485	2.760	24.982
Hungary	3.123	1.988	2.192	2.172	34.146
India	2.599	1.861	1.946	2.084	39.353
Indonesia	2.817	1.975	2.507	2.003	29.980
Iran	3.038				37.480
Iraq	2.933				
Ireland	3.271	2.563	2.380	3.012	38.054
Italy	3.108	2.077	2.198	2.701	23.574
Latvia	2.866	2.189	2.535	2.974	27.232
Macedonia	3.405	2.076	2.257	2.223	33.774
Morocco	2.916	1.794	1.494	1.565	77.658
Netherlands	3.467	2.984	2.419	3.439	36.185
Norway	3.388	2.546	1.854	2.838	11.825
Pakistan	2.246				
Poland	3.119	2.134	2.371	2.609	31.796
Portugal	3.041	2.160	1.910	2.647	49.582
Romania	2.975	1.848	2.162	2.071	45.499

Table D.1 (Continued)

Country	Leisure Important (1 "Not at all" to 4 "Very important")	People Turn Lazy (1 "Strongly agree" to 5 "Strongly disagree")	Work is a Duty to Society (1 "Strongly agree" to 5 "Strongly disagree")	Work Should Come First (1 "Strongly agree" to 5 "Strongly disagree")	Generous Holidays are Important (0 to 100)
Russia	2.968	2.139	2.662	2.686	37.635
Slovak Republic	3.088	1.939	2.336	2.369	28.923
Spain	3.221	2.318	2.382	2.725	30.524
Sweden	3.487	2.988	2.449	3.165	21.012
Switzerland	3.346	2.662	2.267	2.869	18.506
Turkey	3.176	1.706	1.762	2.115	50.846
Ukraine	2.975	2.135	2.550	2.709	39.890
United Kingdom	3.373	2.734	2.483	3.223	29.204
United States	3.297	2.566	2.502	3.111	31.466
Vietnam	2.573	1.840	1.666	2.079	42.000
N	47	43	43	43	44
Mean	3.099	2.226	2.214	2.570	30.407
St. Dev.	(0.271)	(0.340)	(0.302)	(0.480)	(12.184)

Table D.2
Descriptive Statistics for the Labor Force Participation Sample

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
	Panel A: Personal Characteristics				
Labor Force Participation	==1 if the individual reported being engaged in any paid work in the last 7 days or has "Unemployed and actively looking for a job" marked as his or her main activity in the last week, 0 otherwise	0.682 (0.466)	0.678 (0.467)	0.780 (0.414)	0.777 (0.416)
Age	Age of the respondent	39.971 (13.587)	39.314 (13.875)	38.103 (13.758)	37.956 (13.925)
Ethnic Minority	==1 if the respondent belongs to minority ethnic group in a country	0.133 (0.340)	0.106 (0.308)	0.156 (0.363)	0.122 (0.327)
Years of Schooling	Number of years of full-time education completed	13.267 (3.524)	13.025 (3.708)	13.000 (3.468)	12.969 (3.577)
Married	==1 if the respondent is married, 0 otherwise	0.507 (0.500)	0.457 (0.498)	0.471 (0.499)	0.434 (0.496)
City	==1 if respondent lives in a big city, 0 otherwise	0.326 (0.469)	0.217 (0.412)	0.304 (0.460)	0.226 (0.418)

Table D.2 (Continued)

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
	Panel B: Culture of Leisure in Country of Origin				
Leisure Important	Average country response to the question "For each of the following aspects, indicate how important it is in your life. Leisure time: 1 'Not at all important' to 4 'Very important'" (A)	3.077 (0.191)	3.116 (0.201)	3.081 (0.183)	3.112 (0.189)
Generous Holidays	Average country response to the question "Here are some more aspects of a job that people say are important. Please look at them and tell me which ones you personally think are important in a job. Generous holidays" (A)	34.912 (15.211)	31.656 (13.687)	34.770 (15.132)	32.302 (13.971)
People Turn Lazy	Average country response to the question "Do you agree or disagree with the following statements: People who don't work turn lazy. 1 'Strongly agree' 2 'Agree' 3 'Neither agree nor disagree' 4 'Disagree' 5 'Strongly disagree'" (A)	2.177 (0.310)	2.225 (0.325)	2.175 (0.306)	2.210 (0.323)
Work Is a Duty to Society	Average country response to the question "Do you agree or disagree with the following statements: Work is a duty towards society. 1 'Strongly agree' 2 'Agree' 3 'Neither agree nor disagree' 4 'Disagree' 5 'Strongly disagree'" (A)	2.251 (0.330)	2.238 (0.266)	2.242 (0.334)	2.221 (0.279)
Work Should Come First	Average country response to the question "Do you agree or disagree with the following statements: Work should always come first, even if it means less spare time. 1 'Strongly agree' 2 'Agree' 3 'Neither agree nor disagree' 4 'Disagree' 5 'Strongly disagree'" (A)	2.535 (0.452)	2.586 (0.414)	2.541 (0.441)	2.576 (0.416)
Labor Force Participation	Gender and age group-specific labor force participation in the country of origin (I)	54.866 (23.292)	57.171 (22.891)	76.593 (20.485)	75.628 (20.805)
	Panel C: Other Country of Origin Characteristics				
Per Capita Income	PPP adjusted GDP per capita in constant 2011 US$ (D)	24,771 (12,945)	28,242 (13,360)	24,995 (12,930)	27,791 (13,196)
Ethnolinguistic Fragmentation	Roeder's 1985 Index of the extent of ethnolinguistic fragmentation in the country (B)	0.276 (0.195)	0.245 (0.200)	0.275 (0.192)	0.246 (0.198)
Democratic	Number of years in which the country experienced democracy between 1930 and 1995 (C)	22.448 (24.853)	29.569 (25.579)	23.500 (24.842)	29.466 (25.332)

Table D.2 (Continued)

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
British Legal Origin	==1 if the legal origin of home country is English Common Law, 0 otherwise (C)	0.096 (0.295)	0.123 (0.328)	0.098 (0.297)	0.124 (0.329)
French Legal Origin	==1 if the legal origin of home country is French Commercial Code, 0 otherwise (C)	0.393 (0.488)	0.430 (0.495)	0.422 (0.494)	0.459 (0.499)
Socialist/Comm. Legal Origin	==1 if the legal origin of home country is Socialist/Communist Laws, 0 otherwise (C)	0.384 (0.486)	0.270 (0.444)	0.353 (0.478)	0.256 (0.437)
German Legal Origin	==1 if the legal origin of home country is German Commercial Code, 0 otherwise (C)	0.084 (0.277)	0.119 (0.324)	0.088 (0.284)	0.113 (0.317)
Scandinavian Legal Origin	==1 if the legal origin of home country is Scandinavian Commercial Code, 0 otherwise (C)	0.044 (0.205)	0.058 (0.233)	0.039 (0.193)	0.048 (0.213)
% Catholic 1980	% Catholic in a country in 1980 (C)	32.551 (36.536)	44.392 (36.952)	33.474 (36.980)	43.948 (37.216)
% Muslim 1980	% Muslim in a country in 1980 (C)	22.851 (38.687)	17.908 (36.176)	22.996 (38.684)	19.535 (37.598)
% Protestant 1980	% Protestant in a country in 1980 (C)	10.655 (21.976)	13.553 (24.059)	9.966 (21.275)	12.290 (22.910)
% Other Denomin. 1980	% Other Denomination in a country in 1980 (C)	33.943 (34.599)	24.148 (26.473)	33.564 (34.646)	24.227 (26.979)
	Panel D: Country of Destination Characteristics				
Average Tax Rate	Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (G)	25.639 (8.469)		26.425 (8.768)	
τ	The effective marginal tax rate calculated using McDaniel data (H)		48.737 (9.383)		48.947 (9.338)
Unemployment Rate	Country unemployment rate (D)	7.595 (3.236)	7.051 (2.961)	7.646 (3.187)	7.234 (2.963)
Per Capita Income	PPP adjusted GDP per capita in constant 2011 US$ (D)	36,435 (11,805)	39,997 (9,123)	37,416 (12,933)	40,139 (9,313)
Average Country Education	Average education of individuals aged 15 and over in the country (E)	11.570 (0.955)	11.330 (1.009)	11.530 (0.946)	11.351 (0.961)
Population	Country population in millions (D)	20.094 (25.873)	29.579 (29.332)	22.054 (27.504)	31.619 (30.255)
Individualism	Hofstede Index of the degree to which individuals are integrated into groups (F)	63.363 (12.014)	67.420 (13.274)	64.218 (11.349)	67.961 (11.841)
Ethnolinguistic Fragmentation	Roeder's 1985 Index of the extent of ethnolinguistic fragmentation in the country (B)	0.311 (0.180)	0.284 (0.195)	0.315 (0.187)	0.288 (0.201)

Table D.2 (Continued)

		Females		Males	
Variable	Description (Source)	Average Tax sample	τ sample	Average Tax sample	τ sample
Democratic	Number of years in which the country experienced democracy between 1930 and 1995 (C)	43.202 (24.351)	50.135 (22.507)	44.124 (24.547)	51.170 (21.718)
British Legal Origin	==1 if the legal origin of home country is English Common Law, 0 otherwise (C)	0.272 (0.445)	0.098 (0.297)	0.226 (0.418)	0.091 (0.288)
French Legal Origin	==1 if the legal origin of home country is French Commercial Code, 0 otherwise (C)	0.215 (0.411)	0.319 (0.466)	0.241 (0.428)	0.326 (0.469)
Socialist/Comm. Legal Origin	==1 if the legal origin of home country is Socialist/Communist Laws, 0 otherwise (C)	0.235 (0.424)	0.155 (0.362)	0.232 (0.422)	0.143 (0.351)
German Legal Origin	==1 if the legal origin of home country is German Commercial Code, 0 otherwise (C)	0.185 (0.388)	0.307 (0.461)	0.203 (0.402)	0.322 (0.467)
Scandinavian Legal Origin	==1 if the legal origin of home country is Scandinavian Commercial Code, 0 otherwise (C)	0.093 (0.291)	0.122 (0.327)	0.098 (0.298)	0.118 (0.323)
% Catholic 1980	% Catholic in a country in 1980 (C)	34.053 (35.189)	50.908 (30.644)	36.545 (35.475)	51.646 (30.574)
% Muslim 1980	% Muslim in a country in 1980 (C)	2.512 (7.016)	0.801 (0.952)	2.257 (7.334)	0.806 (0.983)
% Protestant 1980	% Protestant in a country in 1980 (C)	26.788 (29.941)	26.961 (28.024)	28.012 (30.311)	26.991 (28.473)
% Other Denomin. 1980	% Other Denomination in a country in 1980 (C)	36.647 (32.754)	21.330 (21.558)	33.187 (31.047)	20.557 (20.852)
N		3770	2204	3295	2022

Personal characteristics variables data come from the ESS survey and cover years from 2004 to 2013. The sample is restricted to second-generation immigrants between 16 and 64 years of age. Survey weights are used.
τ sample includes the following countries of destination: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. Average Tax Rate sample includes the following additional countries of destination: Estonia, Iceland, Israel, Luxembourg, and Turkey.
A: World Values Survey and European Values Study data. The original variable Leisure Important had reverse scale; it was recoded so that higher values correspond to "lazier" culture.
B: Philip G. Roeder, 2001. "Ethnolinguistic Fractionalization (ELF) Indices, 1961 and 1985" <http://pages.ucsd.edu/~proeder/elf.htm>; C: Teorell, Jan, Nicholas Charron, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Petrus Sundin and Richard Svensson, 2013. "The Quality of Government Dataset" version qog_std_cs_20dec13 <http://www.qog.pol.gu.se>; D: World Bank's World Development Indicators Database <http://databank.worldbank.org /data/databases.aspx>; E: Barro and Lee data set version BL2013_MF1599_v2.0 <http://www.barrolee.com/data/full1.htm>. The variable is available for the years 2000, 2005, and 2010; the values in between are interpolated; years 2010, 2011, 2012, and 2013 are assigned the 2010 value; F: Hofstede, G. "Cultural Dimensions" <http://geert-hofstede.com/countries.html>. G: OECD Tax Database Table 5 <http://stats.oecd.org.libezp.lib.lsu.edu/index.aspx?DataSetCode=TABLE_I5#>; H: <http://www.caramcdaniel.com/researchpapers>; I: International Labor Organization ILOSTAT Database annual gender-and-age-group-specific indicator, averaged over the period since year 2002. The following bands were used for the age groups: 15-24, 25-54, and 55-64.

Table D.3
Models of Table 3.5 column (1) and Table 3.6 column (1): Reporting All Coefficients

	Females		Males	
	(1) LFP	(2) Weekly Hours	(3) LFP	(4) Weekly Hours
Average Tax	-0.004***	-0.083*	-0.003**	2.302
	(0.001)	(0.042)	(0.001)	(2.140)
Leisure Important	-0.133***	0.892	0.020	-0.092**
	(0.029)	(1.843)	(0.045)	(0.043)
Personal Characteristics				
Age	0.081***	0.430**	0.093***	0.842***
	(0.004)	(0.160)	(0.003)	(0.121)
Age Squared	-0.001***	-0.004**	-0.001***	-0.009***
	(0.000)	(0.002)	(0.000)	(0.001)
Ethnic Minority	0.016	0.247	0.016	-0.700
	(0.020)	(0.659)	(0.022)	(0.638)
Years of Schooling	0.012***	0.241***	0.001	0.107
	(0.002)	(0.069)	(0.003)	(0.064)
Married	-0.089***	-1.799***	0.029**	1.163*
	(0.016)	(0.528)	(0.015)	(0.640)
City	0.022	-0.094	-0.018	-1.598***
	(0.018)	(0.559)	(0.019)	(0.424)
Country of Origin Characteristics				
Per Capita Income	0.000*	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Ethnolinguistic Fragmentation	0.054	-1.582	0.044	-0.089
	(0.037)	(1.635)	(0.028)	(1.577)
Democratic	0.001	-0.037	0.000	0.001
	(0.001)	(0.034)	(0.001)	(0.031)
French Legal Origin	0.072*	-0.088	0.008	1.376
	(0.037)	(1.100)	(0.027)	(1.118)
Socialist/Communist Legal Origin	0.131**	-3.057	0.041	2.610
	(0.049)	(2.006)	(0.039)	(2.047)
German Legal Origin	0.047	-0.416	-0.021	2.988**
	(0.038)	(1.214)	(0.024)	(1.262)
Scandinavian Legal Origin	0.112**	2.360	-0.050	-0.596
	(0.055)	(1.912)	(0.039)	(2.270)
% Catholic 1980	0.000	-0.031***	0.001**	-0.001
	(0.000)	(0.010)	(0.000)	(0.015)
% Muslim 1980	0.001***	-0.038**	0.000	0.022
	(0.000)	(0.017)	(0.000)	(0.019)
% Protestant 1980	-0.000	-0.047**	0.001***	0.026
	(0.001)	(0.022)	(0.000)	(0.026)
Country of Destination Characteristics				
Unemployment Rate	-0.006	0.026	-0.003	0.081
	(0.004)	(0.103)	(0.003)	(0.097)
Per capita Income	-0.000**	0.000*	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Average Country Education	-0.009	-1.591***	-0.012	0.560
	(0.013)	(0.445)	(0.012)	(0.642)
Population	0.001**	0.018	0.000	0.041**
	(0.000)	(0.018)	(0.000)	(0.019)

Table D.3 (Continued)

	Females		Males	
	(1) LFP	(2) Weekly Hours	(3) LFP	(4) Weekly Hours
Individualism	-0.002**	-0.042	0.001	0.017
	(0.001)	(0.042)	(0.001)	(0.045)
Ethnolinguistic Fragmentation	0.121*	0.748	0.135**	6.339*
	(0.065)	(2.645)	(0.065)	(3.192)
Democratic	0.002	-0.059	-0.002*	-0.106*
	(0.002)	(0.045)	(0.001)	(0.059)
French Legal Origin	-0.020	2.518	-0.073	-0.264
	(0.041)	(1.701)	(0.058)	(1.433)
Socialist/Communist Legal Origin	0.021	8.096***	-0.101	-1.331
	(0.102)	(2.439)	(0.064)	(3.227)
German Legal Origin	-0.006	3.439**	-0.057	1.084
	(0.053)	(1.586)	(0.050)	(1.814)
Scandinavian Legal Origin	0.037	9.306***	-0.006	4.142*
	(0.073)	(2.210)	(0.047)	(2.340)
% Catholic 1980	0.001	-0.053**	0.001	-0.034*
	(0.001)	(0.021)	(0.000)	(0.017)
% Muslim 1980	-0.004***	-0.267***	-0.002*	-0.007
	(0.001)	(0.088)	(0.001)	(0.030)
% Protestant 1980	0.002**	-0.113***	0.001	-0.080**
	(0.001)	(0.024)	(0.001)	(0.031)
N	3770	2909	3295	2738

Average Tax – Average personal income tax and social security contribution rate on gross labor income for a single person without a dependent (OECD Tax Database Table 5).
Standard errors clustered at the country of origin are in parentheses. The estimations use sampling weights and include survey year dummies. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

VITA

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