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The determinants of religiosity among immigrants and the native born in Europe

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Abstract This paper examines differences in religious behaviors of the native born and immigrants in European countries, measured by self-reported religiosity, frequency of praying, and frequency of church attendance. Using the European Social Survey, we first show that, on average, the religiosity of immigrants is greater than that of the native born and is greater than that of the stayers in the European origins, even among those who report they have no religious affiliation. Hypotheses are tested that can explain these observations. Differences in individual characteristics, such as age, education, income, marital status, and notably religious denominations, partly account for the overall differences. Religiosity of migrants declines with duration in the destination, approaching the levels of both the native born in destination countries and of the stayers in European origin countries. Both origin and destination country characteristics affect religiosity, such as economic development, religious pluralism, religious freedom, and societal attitudes towards religion, suggesting that both economic and culture persistence and adaptation take place.

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1 Introduction

While Europeans progressively diminish not only church attendance, but even mere affiliation to any religion, concerns have been expressed about different religious denominations and behavior of immigrants (Davie 2000).[1] These concerns translate into vivid political and social debates about the cultural, and more specifically, religious integration of immigrants. This has led to banning the construction of minarets in Switzerland (2009), banning public appearance in full Islamic face veil in Belgium and in France (2010), the challenging of the ritual slaughter of animals (Halal and Kosher slaughtering practices), and challenges to male circumcision in various parts of Europe.

Much of these debates presume that immigrants' religious behavior is inherently different from that of the native-born in Europe, and is particularly rigid and persistent over time. Some of the recent economic research also pointed in this direction, documenting a strong persistence of religious identity (Bisin and Verdier 2000), and of immigrants' religious identity in particular (Bisin et al. 2008).[2]

The purpose of this paper is to advance the literature on the religiosity of immigrants in European countries, and to examine more closely the hypothesis of religiosity's persistence.

It will be shown that immigrants in Europe indeed have an overall higher degree of religiosity than the native born within the same religious denomination, but that the differences diminish with the immigrant's duration in the destination.[3] We propose several explanations for this observation.

First, we suggest that differences in certain individual characteristics, such as education level or income, between immigrants and the native born may translate into differences in religiosity.

Second, we claim that immigration represents an important moment in the life of an individual, and, hence, higher religiosity may be a natural response to these profound life change caused by migration.[4] For example, church attendance as a

[1] In this paper, the term "church" is used to refer to any place of religious worship, regardless of the religion.

[2] The literature leaves open the question of overall potentially different assimilation patterns for Muslim immigrants. For the most recent studies, see Constant et al. (2006) and Manning and Roy (2010).

[3] In this paper the term "native born" refers to people living in the European country in which they were born, while immigrant refers to someone born outside the European country of residence at the time of the survey.

[4] There may also be selection in terms of religiosity: among those who migrate. Such selection, however, is not likely to take place in a systematic way. High religiosity may not be an easily transferable component of an individuals' human capital as it may have a low value at a secularized destination and may penalize an immigrant. Thus, prospective immigrants, unless they are scholars or preachers of a religion, should be discouraged from significant investments valued only at the origin, such as higher

social expression of religiosity may also be an essential rational response to the need to establish new networks. If this proposition is true, we expect to observe a decline in the level of religiosity of migrants with a longer duration in the destination as compared to the native born but also as compared to their compatriots who did not migrate. This is indeed what the data uncover.

Third, we hypothesize that religiosity can change under the influence of external factors and settings. We show that origin country's characteristics, such as economic development, former communist past, religious freedom and societal attitudes towards religion continue to determine individual religiosity even after migration, suggesting that culture persistence may be taking place and that religiosity indeed has persistence. We also find, however, that the role of destination country characteristics is paramount: religious pluralism, religious freedom, and societal attitudes towards religion at the destination determine the religiosity of immigrants in a manner largely similar to that of the native born. This suggests that the religiosity of immigrants may over time approach that of the native born.

Understanding differences in religiosity between immigrants and the native born is important for at least two reasons. First, it is vital to have a clear picture of religiosity's differences in light of the debates on the acceptance, tolerance, and the integration processes of immigrants. Second, religion and religiosity have been shown to predict numerous individual outcomes, such as education (Lehrer 1999, 2004; Mukhopadhyay 2011), employment prospects (Bisin et al. 2011), earnings (Chiswick and Huang 2008), economic and policy preferences and attitudes (Guiso et al. 2003; Bénabou and Tirole 2006), health and well-being (Regnerus 2003; Chiswick and Mirtcheva 2012; Connor 2010), to name a few (see Lehrer 2010 for an overview). Understanding differences in religiosity may thus help shed light on differences in these outcomes between immigrants and the native born.

The rest of the paper is organized as follows. Section 2 provides the theoretical setting for the analysis of religiosity. Section 3 describes the data to be studied, the data from the European Social Survey (ESS) and the Association of Religion Data Archives (ARDA). Section 4 discusses the empirical strategy and results, as well as their robustness. The last section is a summary and conclusion.

2 Determinants of religious outcomes: what makes immigrants different?

2.1 Individual determinants of religiosity

Religiosity and religious behavior have multiple facets and can be analyzed from several perspectives, such as self-reported degree of religiosity, church attendance, the frequency of praying, donating money to church activities, and the extent of

Footnote 4 continued
religiosity. Therefore, while persecuted religious minorities in an origin may have an incentive to emigrate, active members of a dominant religious group in an origin would be less inclined to emigrate to an alien religious culture. Moreover, even if the immigrants are drawn from the less religious members of the origin population, they may still be more religious than the very low religiosity population in the destination. For an overview of the economics of immigrant religious adjustment, see Chiswick (2003).

belief or of devotion. In this paper, we study the first three aspects of religiosity separately, analyzing the effect of socio-economic factors. The degree of self-reported religiosity and praying refer to private aspects of religiosity, to personal experiences and feelings. In contrast, church attendance, being an observed social and public activity, combines the concepts of human and social capital, and reflects the demand for a ritual, and an institutional attachment (Davie 2000). The two types of religiosity, private and public, may be affected in a different way by life circumstances, such as migration.

There are various reasons why individuals may be religious. Paraphrasing Azzi and Ehrenberg (1975) and Iannaccone (1990), the religion good may comprise three goods: an afterlife good, a spiritual good, and a social good. Religion has the "salvation motive", and it may provide benefits that extend beyond life's limits. It also gives satisfaction and psychological comfort by helping answer important life questions. Networks created through religious practice, in addition to allowing socialization, give access to the marriage market, and help to educate children in the norms and values of the denomination. Religion may also satisfy more materialistic needs, such as providing social insurance benefits in terms of money and networks, helping in times of hardship, finding employment, or creating business opportunities (Stark and Finke 2000; Scheve and Stasavage 2006).

The literature suggests numerous factors that may affect the religious behavior of any individual, regardless of their nationality status. Among the observed regularities, age, income or social class, belonging to a minority group, and living in rural areas have been found as significant determinants of religiosity, notably measured as church attendance (Azzi and Ehrenberg 1975). Specifically, as with many other types of social participation, age is related to religious participation in a non-linear way, with periods of declining activity observed for 30–35 year olds (the busiest time of professional development, creating families and raring small children: Alesina and La Ferrara 2000), as well as for elderly individuals. Income, or social class, may have little impact on church attendance, but have a strong association with other types of religious behavior, such as donations (Iannaccone 1998). In contrast, the impact of gender on religiosity is more complex, and it varies across denominations: while Christian women are usually found to have a higher rate of Church attendance then Christian men, the opposite is generally true for Muslims and Jews (Sullins 2006).

2.2 Immigration as a personal experience

We expect religiosity outcomes of immigrants and of the native born in the destination country to be rather different for at least three reasons. First, immigrants' overall socio-economic characteristics are usually different from those of the population they join, and these differences may translate into different levels of religiosity and practice. If, for example, the native born have a higher level of schooling than immigrants, they may be less religious simply because some measures of religiosity tend to decrease with educational attainment.[5] One of the

[5] Even though education may have a differential impact on different measures of religiosity and also on affiliation with a religion (Mukhopadhyay 2011).

main individual differences may also be a different religious denomination (if any). Since the average degree of religiosity, for example, measured by Church attendance, may vary from one denomination to another, immigrants with a different denomination than an average native-born person may have a different average religiosity.

Differences in other individual characteristics, such as income, employment, or place of residence may also be important. As the time since migration goes by, a convergence of these characteristics between immigrants and native born in economic and social terms may take place (Chiswick 1978; Green 1999; Dustmann 1996; Fernandez and Fogli 2009). This convergence may translate into greater resemblance in religious behavior.

Second, immigration by itself represents a turning point in a person's life, as it exposes an individual to a different cultural environment, and induces changes in behavior as a response to changing economic and family situations. As such, it may change an individual's religious behavior because a migrant may resort to religion in a particular life moment to address profound life concerns, obtain psychological comfort, or mitigate loneliness (Waite and Lehrer 2003; Connor 2010; Lehrer 2010). Stark and Finke (2000) note that, along with marriage, migration is also a major factor in religion switching, reflecting social adaptation and the need to form new networks. Even those migrants who rarely attended a church in their origin country may start doing so at a destination, in order to meet both the native born and other immigrants, particularly from the same origin country. Indeed, churches have been primary places for ethnic gatherings and celebrations. Oftentimes, they serve as an "island of familiar experience […] where origin-specific skills (such as language, ritual, etiquette) can still yield benefits" (Chiswick 2003). Migration networks created through religious institutions can play an important role in information transmission regarding economic opportunities, housing, schooling, and obtaining legal status in the receiving society (see Borjas and Hilton 1996; Mayda 2010; Munshi 2003; Ebaugh and Chafetz 2000, for an overview). They also create further opportunities for religious, civic, and community engagement (ASDC Report 2002; Cyrus et al. 2006).

Furthermore, the sheer fact of being an immigrant and, oftentimes, a minority, can increase "the social value of religious activity […] as discrimination may limit their [immigrants'] market consumption alternatives" beyond religion (Azzi and Ehrenberg 1975), helping to sustain a potentially different religiosity.

If these hypotheses are valid, immigrants' religiosity may change as the time since migration goes by. Social, economic, and also religious adaptation in the host society may decrease the necessity of private religious practice, such as praying. Church attendance as a social expression of religiosity may also diminish if initial high attendance was a strategic search for networks, and if new networks outside of the church have been created. It may also, however, increase over time, if more time at the destination gives access to greater possibilities of attendance in terms of place, time, the language of the service, and greater attachment to new religious networks.

Thus, for immigrants, the years since migration may be an important predictor of religiosity. However, given the array of the effects that may come into play over time, we would be cautious to interpret the changing religiosity as a sign of greater

or lesser assimilation, as is usually done in migration studies. In addition, in the case of religiosity, integration rather than assimilation may be a more desirable outcome, in which the acceptance on the part of the native born, and the right to freely exercise one's difference matters more.[6] Immigrants may also, and in different dimensions, maintain their ethno-religious identity, and at the same time adapt and integrate to different degrees into the mainstream society in which they live (Ebaugh and Chafetz 2000; Hillman 2010).

2.3 Religiosity, economic development and culture

Last but not the least reason for potential differences in religiosity between natives and the foreign born is the fact that immigrants may come from countries that are very different in terms of religious traditions, levels of religious practice, the cultural role of religion, and the societal and governmental attitudes towards religion. Indeed, according to Gallup and Crabtree (2010), religiosity varies greatly across the world, from very low levels in most of the developed countries, such as West European and countries of the former Soviet bloc, to very high levels in the least developed countries and in the United States.

The literature offers several reasons for these cross-country differences. One of the leading hypotheses—the secularization theory—suggests a negative link between development and religiosity, predicting the decline of both religious participation and beliefs as countries advance in economic terms (Weber 1993 [1922]; Martin 1978). One of the reasons for this is that economic development produces numerous forms of other activities, and raises the value of time (Barro and McCleary 2003a). Since religious participation tends to be a time intensive activity, as wage rates increase with development, competition between religious participation and expanded secular activities reduces the time and effort devoted to the former (Gruber and Hungerman 2008). Numerous studies developed and confirmed the predictions of the secularization model, most recent Verweij et al. (1997) and Gaskins et al. (2009).

There are some countries, however, that stand out as particularly striking exceptions to the predictions of this model, and the United States is the leading example. Here, religious belief and practice have been remarkably stable over time, and high compared to other high-income OECD countries (Greeley 1989; Stark et al. 1996). This observation gave rise to the "religious market" model (Iannaccone 1998), according to which diversity of religions and churches, or religious pluralism, increases competition for adherents. By offering religious goods and services that better satisfy the desires of consumers, religion providers increase religiosity, be it in terms of prayer, participation, or donation (Iannaccone 1991; Finke 1998).

[6] To quote the British Home Secretary Roy Jenkins, 1966: "I do not regard [integration] as meaning the loss, by immigrants, of their own national characteristics and culture. I do not think that we need in this country a 'melting pot', which will turn everybody out in a common mould, as one of a series of carbon copies of someone's misplaced vision of the stereotyped Englishman… I define integration, therefore, not a flattening process of assimilation but as equal opportunity, accompanied by cultural diversity, in an atmosphere of mutual tolerance". Quotation borrowed from Algan et al. (2010).

Despite its appealing underlying economic reasoning, empirical tests of this religious market model produced mixed results. For example, the measure of religious pluralism often employed in empirical work and based on Herfindahl index[7] has been found to often have a negative, if any, correlation with religiosity (see Chaves and Gorski 2001, for an overview of empirical studies). This result may arise because this measure of pluralism also reflects overall tolerance and freedom of societies (Alesina et al. 2003). The latter, however, may favor all forms of religious beliefs and participation, including none. At the same time, religious freedom is usually found to be positively associated with greater religiosity, while state religions tend to discourage religiosity, supporting the model's predictions (Chaves and Cann 1992; Iannaccone et al. 1997; Barro and McCleary 2003b). On the other hand, one may consider the case of communist countries, where governments sought to fully suppress religion. As a result, these countries exhibited some of the lowest rates of religiosity (Gallup and Crabtree 2010; Barro and McCleary 2003a), with these rates increasing once the repression of religion diminished.

Provided that institutional, economic, and cultural developments in origin countries have long-lasting, post-migration effects, immigrants coming from different parts of the world will be different from both those born in Europe and from other immigrants. In addition, differences in receiving countries may also have a differentiated impact on the religiosity of immigrants coming from the same country. In what follows, we assess the role of these home and host country effects in determining immigrants' religiosity.

3 Data description

3.1 The sample

The analysis of this paper is based on the European Social Survey, which is a Europe-wide survey conducted every two years. The first four rounds, covering the period 2002–2009, were pooled. The survey provides information on individual socio-economic characteristics, including their religious denomination and various measures of religiosity. The survey also contains information on the individual's country of birth, allowing us to distinguish between those born in the country in which they live (natives) and immigrants, and the length of time immigrants spent in the destination.

The sample is restricted to individuals 16–70 years of age, whose country of birth is known. The sample is further restricted to individuals of Roman Catholic, Protestant, Eastern Orthodox Christian, Other Christian, Muslim, and Jewish

[7] Index of religious pluralism, or fractionalization (Iannaccone 1998; Alesina and La Ferrara 2000) is constructed according to the formula: $RF_i = 1 - \sum_k s_{ki}^2$, where s is a share of k religion denominations in country i. This index is also known as one minus Herfindahl index of group shares. It measures the probability that two randomly drawn individuals in country i belong to different religions. Higher values of the index represent higher religious fragmentation, and hence, heterogeneity.

religious denominations, and those who report they do not have a religion.[8] The category "other religion" is omitted from the analysis, as this group is very heterogeneous and represents only 1 % of the sample. We also exclude from the analysis native-born children of immigrants as well as those with one foreign-born parent. Sample sizes of these groups of individuals are too small for a meaningful separate analysis. Lastly, we omit the native born without citizenship, as well as several destination countries.[9] The final sample consists of 24 European countries of residence, 84,447 native-born persons, defined as native-born individuals with both parents born in the country of current residence, and 7,017 first-generation immigrants (see Table 7 of the Appendix for more details).

The countries in the dataset under study are heterogeneous in terms of migration histories and patterns. Approximately 40 % of all immigrants come from other Western European countries, as well as from Canada, Australia, and Japan. Some destination countries, such as Switzerland, Germany, or Great Britain, are home to immigrants from over twenty destinations. Others, such as Eastern European countries or Russia, host immigrants from just a few, mostly neighboring countries, with the native and foreign born population of similar ethnicity. In these countries, it would perhaps be more accurate to characterize the foreign-born as "born outside of the country's modern territory", rather than immigrants. Countries such as Ireland, Spain and Greece are known to be new immigration countries, and this fact is reflected in the very low proportion of immigrants with more than twenty years of residence. These differences are an important source of variation in country characteristics and in immigrant-specific characteristics that we are going to explore.

With the exception of the UK and the Netherlands, there is a certain sorting of migrants: religious affiliation of the majority of immigrants corresponds to the country's main religion in most of the destinations (Table 7 of the Appendix). In most of the countries, however, unaffiliated immigrants also outnumber immigrants with a religious affiliation. Islam often comes as a second main religion among immigrants (and even as a first immigrant religion in Nordic countries).

3.2 Measures of religiosity

Three questions measure the individual's self-reported religiosity. First is the explicit question "how religious are you", measured on the scale from 1 to 10, with higher values indicating stronger religiosity. In addition, there are also questions "how often do you pray", and "how often do you attend religious services", with responses ranging from "never" to "every day", which are converted into the days per year (see Appendix Table 8). These three measures of religiosity are used as alternative dependent variables in the regression analysis.

Self-reported measures of religiosity vary substantially among individuals who differ by denomination, and most dramatically between those who do and do not

[8] The survey questionnaire notes that "Other Christians" category includes Anglican, Baptist, Methodist, Presbyterian, Congregational or other denominations that can be categorized as Christian.

[9] Omitted are Italy, Bulgaria, Iceland, Cyprus and Turkey, for the lack of data on the foreign born, as well as Israel, for its specificity with regard to the question studied. For more details on this, and on the survey in general, see www.europeansocialsurvey.org. See also Jowell et al. (various issues).

have a specific religious affiliation. The proportion of unaffiliated individuals in Europe is high: 44 % of the native born and 39 % of first-generation immigrants report belonging to no particular religion. Previous research has shown that this group is very heterogeneous, as it contains individuals with both particularly low and high levels of educational attainment, atheists, agnostics, doubters, and people in search of a religion. In general, while secularization has been a common feature of European societies, it has affected primarily the social aspects of religiosity, such as church attendance and donations (Keysar and Kosmin 1995; Iannaccone 1998), while, some argue, the need for a private search for spirituality has remained. In fact, Ekelund et al. (2006) suggest that in the modern societies, individuals with "no religion" are often those who are moving away from organized religion towards individualized belief systems, rather than individuals with no beliefs at all, and hence we may observe significant levels of religiosity even among these individuals.

The latter proposition is confirmed by the descriptive evidence on differences in religiosity across individuals with and without a religious affiliation, as well as between immigrants and the native born (Table 1). For both immigrants and the native born, levels of all three measures of religiosity are non-negligible among those who profess no religion, even though they are always lower than for individuals affiliated to a religion. On average, immigrants with and without religious affiliation have slightly higher levels of all types of religiosity compared to the native born of the same category.

3.3 Explanatory variables

Three main types of independent variables are considered in the econometric analysis of the determinants of religiosity.

First, are the individual socio-economic characteristics that affect religiosity regardless of the nativity status. Following previous discussion, they include age, years of education, gender, number of household members, marital status, income, employment status (employee, unemployed, or self-employed, with "out of the labor force" being the omitted group), as well as urban residence (McCleary and Barro 2006). We also control for individual religious denominations, including none. Table 8 of the Appendix provides a full definition of these variables, and Table 9 contains descriptive statistics for both population groups.

Immigrants do not differ from the native born in many individual characteristics. For example, there is no difference in age, in number of household members, or in household income between first-generation immigrants and the native born. However, immigrants on average have lower marriage rates and higher divorce rates, higher unemployment rates, and are more likely to live in urban areas as opposed to the native born. Education levels between the two groups are largely similar (12.6 years). Lastly, among immigrants, there is a significantly lower share of individuals belonging to the main religious denomination of their host country, and a lower share of non-affiliated individuals. There is a lower proportion of Roman Catholics and Protestants among immigrants than among natives, but a larger proportion of all other denominations. Do these patterns explain differences in religiosity?

Second, for first-generation immigrants, we also control for a range of immigrant-specific variables that are standard for this type of research. These

Table 1 Variation in religiosity across religious variables and immigrant status (percent)

	Native born		Foreign born	
	No religion	Belongs to a religion	No religion	Belongs to a religion
Degree of religiosity: percent of individuals				
Low (scale 0)	31.39	1.76	27.84	2.01
Moderate (scale 1–4)	53.45	42.08	49.13	36.05
High (scale 5–10)	15.16	56.16	23.03	61.94
Total	100	100	100	100
Average value (scale 0–10)	2.61	5.89	3.22	6.35
Frequency of praying: percent of individuals				
Low (never)	69.97	16.21	57.68	12.58
Moderate (special holidays, or rarer)	18.28	24.07	21.49	21.81
High (once a month or more often)	11.75	59.72	20.83	65.61
Total	100	100	100	100
Average value (scale 0–10)	17.13	124.58	37.36	153.39
Attendance at religious service: percent of individuals				
Low (never)	63.50	13.88	58.96	15.70
Moderate (special holidays, or rarer)	33.30	45.44	36.11	45.62
High (once a month or more often)	3.20	40.68	4.93	38.68
Total	100	100	100	100
Average value (scale 0–10)	1.77	20.99	2.68	23.03
Percent of sub-sample	42.20	57.80	37.56	62.44

Source: European Social Survey, 2002–2009

Throughout this paper the native born refers to people living in the European country in which they were born, whereas the foreign born or immigrants refers to people living in a country different from the one in which they were born, whether the birth was in Europe or elsewhere

include language, citizenship status, as well as years since migration. Naturally, from Table 9, immigrants have a lower rate of speaking at home the dominant language of the host country, or being citizens.

Third, we also consider the role of origin and destination country cultures and societal settings that may affect religiosity both through culture transmission and culture adaptation processes. These characteristics include religious fragmentation (diversity of denominations), religious freedom, and a measure of social attitudes towards other religions. Using the information on the largest religious group in each destination, we also construct a variable "belonging major", which takes the value of one if an individual belongs to the largest religious branch of the country. These data come from the Association of Religion Data Archives (ARDA). Also included are GDP per capita as a measure of economic development[10] (World Bank

[10] For destination countries, GDP per capita is measured at each year of the survey. For origin countries, we use the value for 2005, which corresponds to the mid-point of the data collection. Alternatively, we tried to include the GDP measure at time of migration, with similar results.

Development Indicators), and a dichotomous variable for having a communist government, presently or in the past.

4 Econometric strategy and results

4.1 The role of individual differences between immigrants and the native born

Our point of departure is the analysis of differences in religiosity between native-born and foreign-born men and women, given the differences in their individual characteristics. To this end, we estimate the following specification:

$$Y_{ij} = \alpha_{ij} + \beta_{1ij} X_i + \beta_{2ij} Immigr_i + \beta_{3ij} Immigr_i \times Z_i + \varepsilon_i \quad (1)$$

where Y_{ij} is an individual's i outcome of interest j, j = how religious; attending religious services; frequency of praying. X_i is the set of individual characteristics; $Immigr_i$ is a dichotomous variable for the first-generation immigrant, Z_i is the set of immigrant-specific characteristics.

Tables 2, 3, 4 contain OLS estimation results for three alternative dependent variables measuring religiosity. The first two dependent variables—self-assessed religiosity and praying—refer to the private indicators, while the third—frequency of church attendance—refers to a more extravert, social, indicator of religiosity. All three dependent variables are treated as continuous variables.

In Tables 2, 3, 4, coefficients in columns (1) are estimated for the sub-sample of the Europeans living in their country of birth (native born). Across all three regressions, largely similar patterns are observed. Religiosity is related to age in a non-linear way: it first declines with age up to about the mid-twenties—early thirties, and then starts rising.[11] Older individuals are more religious. Similarly, nonlinearities are observed also for the effect of the years of completed schooling. Self-reported religiosity decreases with education up to 10 years of formal schooling, and rises afterwards; the reversal is also observed around 13 years of schooling for praying. The effect of schooling is positive for attendance (only the square term is significant, albeit at 10 %).

On aggregate, we find that women have a higher religiosity as opposed to men.[12] Individuals living in larger households are significantly more religious. The fact of being married is only associated with higher self-reported religiosity, but not with praying or church attendance. In contrast, divorced individuals have higher levels of self-reported religiosity, but lower rates of praying and church attendance, as

[11] From Table 2, col. 1, dREL/dAge $= -0.025 + 0.041 \times (\text{Age}/100) \times 2$, so that the partial effect is at its minimum at Age = 31 for self-reported religiosity. The partial effect is its minimum at Age = 23 for praying (Table 3, col. 1), and at Age = 27 for attendance (Table 4, col. 1).

[12] The gender effect is heterogeneous across denominations, however. In estimations done separately by denomination (below), we find that non-affiliated, and Christian women are more religious than men. In contrast, there is no statistically significant difference in self-reported religiosity and praying among Muslim men and women, while Muslim women have a statistically significant lower attendance rate. Jewish women and men do not have significantly different religious behavior along any of the three dimensions considered, but the Jewish sample is very small, only 68 observations, less than one percent of the native-born and the foreign-born.

Table 2 Analysis of religiosity: how religious are you?

Variables	Native born	Native born + First generation immigrants		First generation immigrants
	(1)	(2)	(3)	(4)
Age	−0.025 (0.006)**	−0.010 (0.004)*	−0.021 (0.006)**	0.030 (0.027)
Age squared/100	0.041 (0.007)**	0.025 (0.004)**	0.035 (0.007)**	−0.037 (0.029)
Education years	−0.042 (0.014)**	−0.090 (0.009)**	−0.077 (0.013)**	−0.181 (0.044)**
Education squared	0.002 (0.001)**	0.003 (0.000)**	0.003 (0.000)**	0.005 (0.002)**
Female	0.628 (0.026)**	0.695 (0.016)**	0.602 (0.026)**	0.463 (0.106)**
N hh members	0.126 (0.013)**	0.097 (0.007)**	0.132 (0.012)**	0.079 (0.042)
Married	0.220 (0.038)**	0.187 (0.024)**	0.203 (0.038)**	−0.043 (0.159)
Divorced	0.185 (0.049)**	0.145 (0.031)**	0.181 (0.048)**	0.206 (0.193)
Log of hh income	−0.187 (0.014)**	−0.119 (0.008)**	−0.138 (0.012)**	0.118 (0.054)*
Employee	−0.015 (0.053)	−0.073 (0.034)*	−0.050 (0.052)	−0.383 (0.200)
Self-employed	0.195 (0.064)**	0.175 (0.041)**	0.175 (0.063)**	−0.190 (0.276)
Unemployed	−0.271 (0.072)**	−0.176 (0.046)**	−0.222 (0.069)**	−0.129 (0.249)
Urban area	−0.187 (0.027)**	−0.197 (0.017)**	−0.184 (0.027)**	0.097 (0.121)
No religion	−3.313 (0.030)**	−2.986 (0.018)**	−3.158 (0.028)**	−3.158 (0.128)**
Protestant	−0.367 (0.037)**			−0.451 (0.182)
Orthodox	−0.574 (0.054)**			−0.223 (0.187)
Christian other	0.761 (0.112)**			0.836 (0.287)**
Muslim	0.241 (0.221)			0.132 (0.163)
Jewish	−2.027 (0.538)**			−1.378 (0.568)*
Immigr		0.548 (0.039)**	1.221 (0.129)**	
Immigr × No religion		0.051 (0.070)	0.094 (0.116)	
Immigr × YSM6–10			−0.235 (0.185)	−0.226 (0.182)
Immigr × YSM11–20			−0.271 (0.161)	−0.256 (0.162)

Table 2 continued

Variables	Native born	Native born + First generation immigrants		First generation immigrants
	(1)	(2)	(3)	(4)
Immigr × YSM20+			−0.496 (0.154)**	−0.337 (0.170)*
Immigr × Language			−0.109 (0.115)	−0.165 (0.117)
Immigr × citizen			−0.390 (0.114)**	−0.096 (0.112)
No. of observations	84,447	91,472	91,453	7,017
R-squared	0.372	0.325	0.363	0.303

Source: European Social Survey, 2002–2009

** and * represent statistical significance at $p < .01$ and $p < .05$, respectively

1. Dependent variable: "how religious are you?" Measured on the scale from 1 to 10, 10 indicating higher values. It is treated as a continuous variable

2. Coefficients from OLS regressions. All regressions are estimated accounting for the population and design survey weights. Robust standard errors of the estimated coefficients are shown in parentheses

3. Omitted categories of independent variables: out of the labor force; Roman Catholic

Table 3 Analysis of religiosity: how often do you pray?

Variables	Native born	Native born + first generation immigrants		First generation immigrants
	(1)	(2)	(3)	(4)
Age	−1.217 (0.299)**	−0.873 (0.193)**	−1.074 (0.298)**	1.331 (1.317)
Age squared/100	2.632 (0.344)**	2.154 (0.218)**	2.396 (0.341)**	−0.259 (1.479)
Education years	−3.612 (0.700)**	−5.463 (0.481)**	−5.883 (0.713)**	−7.285 (2.645)**
Education squared	0.140 (0.024)**	0.190 (0.018)**	0.209 (0.025)**	0.271 (0.099)**
Female	33.964 (1.307)**	37.448 (0.829)**	32.377 (1.309)**	29.952 (5.581)**
N hh members	8.196 (0.685)**	6.374 (0.361)**	8.856 (0.653)**	8.606 (2.680)**
Married	2.482 (1.781)	5.153 (1.149)**	2.289 (1.772)	−0.728 (7.437)
Divorced	8.768 (2.446)**	10.156 (1.526)**	9.843 (2.422)**	28.490 (10.081)**
Log of hh income	−14.540 (0.686)**	−10.599 (0.441)**	−10.239 (0.682)**	4.636 (2.843)
Employee	−3.684 (2.474)	−11.036 (1.734)**	−5.026 (2.459)*	−7.014 (9.973)
Self-employed	6.879 (3.095)*	−0.057 (2.158)	6.448 (3.078)*	−5.808 (13.505)
Unemployed	−9.135 (3.421)**	−10.341 (2.356)**	−5.900 (3.356)	−6.665 (12.982)
Urban area	−12.399 (1.418)**	−7.549 (0.881)**	−12.275 (1.420)**	7.994 (6.582)
No religion	−104.006 (1.509)**	−92.530 (0.805)**	−90.848 (1.254)**	−111.860 (6.942)**
Protestant	−27.865 (2.318)**			−18.223 (12.108)
Orthodox	−47.826 (3.611)**			−35.692 (11.779)**
Christian other	57.195 (7.199)**			84.811 (17.117)**
Muslim	−9.427 (14.092)			51.067 (10.915)**
Jewish	−22.556 (31.594)			−88.199 (29.981)**
Immigr		32.604 (2.610)**	75.766 (8.391)**	
Immigr × No religion		−14.438 (3.289)**	−26.878 (5.525)**	
Immigr × YSM6–10			−20.451 (10.186)*	−21.233 (9.639)*
Immigr × YSM11–20			−28.933 (9.257)**	−29.397 (8.700)**

Table 3 continued

Variables	Native born	Native born + first generation immigrants		First generation immigrants
	(1)	(2)	(3)	(4)
Immigr × YSM20+			−18.440 (8.912)*	−20.064 (9.290)*
Immigr × Language			−3.644 (6.642)	−5.584 (6.466)
Immigr × citizen			−10.848 (6.268)	5.219 (6.004)
No. of observations	83,865	90,849	90,831	6,976
R-squared	0.223	0.198	0.208	0.211

Source: European Social Survey, 2002–2009

** and * represent statistical significance at $p < .01$ and $p < .05$, respectively

1. Dependent variable: how often do you pray? Measured on the scale from 0 to 365, 0 stands for "never", 365 stands for "every day". It is treated as a continuous variable

2. Coefficients from OLS regressions. All regressions are estimated accounting for the population and design survey weights. Robust standard errors of the estimated coefficients are shown in parentheses

3. Omitted categories of independent variables: out of the labor force; Roman Catholic

Table 4 Analysis of religiosity: how often do you attend religious services?

Variables	Native born (1)	Native born + first generation immigrants (2)	(3)	First generation immigrants (4)
Age	−0.267 (0.069)**	−0.334 (0.051)**	−0.247 (0.073)**	−0.263 (0.556)
Age squared/100	0.494 (0.085)**	0.624 (0.060)**	0.448 (0.089)**	0.499 (0.630)
Education years	−0.311 (0.181)	−1.017 (0.157)**	−1.337 (0.275)**	−5.271 (2.072)*
Education squared	0.013 (0.006)*	0.038 (0.006)**	0.046 (0.010)**	0.191 (0.078)*
Female	2.607 (0.335)**	3.051 (0.205)**	1.770 (0.364)**	−3.395 (2.050)
N hh members	1.705 (0.184)**	1.869 (0.103)**	1.896 (0.182)**	1.487 (1.013)
Married	−0.175 (0.428)	−0.496 (0.307)	−0.103 (0.444)	1.802 (2.684)
Divorced	−1.444 (0.520)**	−1.928 (0.394)**	−1.561 (0.550)**	−0.649 (3.120)
Log of hh income	−2.898 (0.169)**	−2.499 (0.110)**	−1.768 (0.199)**	−0.915 (1.061)
Employee	−2.235 (0.627)**	−4.104 (0.549)**	−2.919 (0.710)**	−5.856 (5.383)
Self-employed	0.070 (0.871)	−2.854 (0.638)**	−0.325 (0.925)	−4.902 (5.885)
Unemployed	−4.359 (0.722)**	−4.960 (0.659)**	−3.278 (0.851)**	−2.307 (6.651)
Urban area	−1.467 (0.357)**	−1.118 (0.225)**	−1.646 (0.383)**	2.150 (2.362)
No religion	−20.668 (0.334)**	−16.374 (0.184)**	−15.955 (0.274)**	−19.592 (2.015)**
Protestant	−9.755 (0.510)**			3.145 (4.761)
Orthodox	−16.230 (0.787)**			−9.353 (3.359)**
Christian other	15.770 (2.863)**			30.618 (7.711)**
Muslim	0.979 (6.396)			15.171 (5.015)**
Jewish	−11.356 (3.837)**			−2.166 (11.960)
Immigr		3.129 (0.784)**	15.409 (3.889)**	
Immigr × no religion		−2.397 (0.839)**	−7.887 (1.819)**	
Immigr × YSM6–10			−4.049 (3.366)	−4.002 (3.210)
Immigr × YSM11–20			−3.131 (3.409)	−2.655 (3.319)

Table 4 continued

Variables	Native born (1)	Native born + first generation immigrants (2)	(3)	First generation immigrants (4)
Immigr × YSM20+			−1.205 (3.280)	−1.210 (3.285)
Immigr × Language			−3.702 (2.502)	−3.180 (2.259)
Immigr × citizen			−3.055 (2.210)	0.319 (2.278)
No. of observations	84,447	91,472	91,453	7,017
R-squared	0.139	0.103	0.103	0.105

Source: European Social Survey, 2002–2009

** and * represent statistical significance at $p < .01$ and $p < .05$, respectively

1. Dependent variable: how often do you attend religious services? Measured on the scale from 0 to 365, 0 stands for "never", 365 stands for "every day". It is treated as a continuous variable

2. Coefficients from OLS regressions. All regressions are estimated accounting for the population and design survey weights. Robust standard errors of the estimated coefficients are shown in parentheses

3. Omitted categories of independent variables: out of the labor force; Roman Catholic

opposed to single individuals. We also find that religiosity is related in a negative way to household income, and is also significantly affected by employment status. Self-employed individuals have higher rates of private religiosity and praying as compared to individuals out of the labor force, while the unemployed have lower religiosity measured by any of the variables. Furthermore, we confirm earlier findings that native-born individuals living in urban areas exhibit lower levels of each of the three measures of religiosity than those living in rural areas.

These regressions also control for the individual self-reported religious affiliation, including no affiliation at all. The benchmark category is Roman Catholics, which is one of the largest and also most homogeneous religious groups of the sample. There is a high diversity of religiosity among native-born individuals, depending on their denomination. As expected, individuals with no reported affiliation have significantly lower levels of religiosity as opposed to Roman Catholics, and as opposed to individuals of any other religious group. Protestants and Orthodox Christians, however, also have significantly lower religiosity compared to Roman Catholics, while "other Christians" have higher religiosity. The sample size of representatives of other denominations is relatively small to draw definite inferences; but our data suggest that there are no significant differences in religiosity between Muslims and Catholics, while Jews have lower self-reported religiosity and attendance, notwithstanding similar praying frequency.

Columns (2) of Tables 2, 3, 4 are based on the pooled-sample estimation of native and foreign born individuals. In these columns, we distinguish only between individuals having no religious allegiance (*norelig* dummy), using any other religious affiliation as a comparison group. The immigrant dichotomous variable (*immigr*) is interacted with the *norelig* variable in order to assess the differentiated effect of non-affiliation for immigrants and for the native born. Across the three regressions, we find that being an immigrant is associated with a higher level of religiosity, even when belonging to a religious group is held constant. Statistically significant interaction terms on the *norelig* and *immigr* dichotomous variables in Tables 3 and 4 coupled with the statistically significant *immigr* term suggest that even for individuals reporting no religious affiliation, being an immigrant amplifies religiosity.

Further, in columns (3) of Tables 2, 3, 4 we repeat the pooled-sample estimation, including all other immigrant-specific characteristics, such as the years since migration, language and citizenship. Private forms of religiosity have a clear tendency of decreasing over time, and this is especially true for praying, which is significantly lower for immigrants with more than 5 years of residence as compared to the newcomers. Despite this, private religiosity of immigrants remains overall higher than for the native born through the respondents' life. In contrast, a longer duration of residence has no particular impact on church attendance—a result that is somewhat surprising, but which is refined in what follows. We also note that speaking any of the official languages of the destination country at home as a first language has no association with religiosity. Being a citizen is associated with lower self-reported religiosity, a result that can also be interpreted as assimilation into the host society. There is no effect of being a citizen on prayer or church attendance.

If the religiosity of immigrants upon arrival is higher than that of the native born in the destination but declines over time, does this decline reflect a convergence of

behaviors or simply a diminishing need to resort to religiosity as the immigrant's life gets stabilized? One of the ways to test this would be to split the sample into more religious and less religious countries, and to analyze the behavior of immigrants from more religious countries in the less religious destinations and vice versa. We have done such a split by ranking the countries of Europe by the percent of individuals who attend church at least monthly. Within the twelve less religious countries, we kept only those immigrants who came from the twelve other more religious European countries of our sample (803 immigrants). Similarly, within the more religious countries, we kept only those immigrants who came from the twelve other less religious European countries (1503). Unfortunately, as we do not have the data on non-European attendance in origin countries, we could not keep more immigrants in our sample, and hence the sample became not only considerably reduced, but less representative of immigrants in the destination.

We repeated estimations such as in Tables 2, 3, 4 columns 3 based on these sub-samples. Our regression results are quite interesting (and are available upon request), though more research is definitely needed to establish their validity. They show that migrants from more religious European countries to less-religious European countries are more religious than the native born in the destination, and their religiosity is not affected by duration in the destination. In contrast, migrants from less religious European countries to more religious European countries exhibit the same levels of private forms of religiosity upon arrival as the native born in the destination, and this level does not change over time. Upon arrival, these migrants also have the same level of church going as the native born, but this level actually declines over time. It does not increase, as would have been the case if the immigrants' behavior converges to the native born. This finding may partly be attributable to the rational behavior of immigrants who decrease their church attendance once the benefits from it become less important.

Higher religiosity levels of all immigrants, including non-affiliated ones, may also be due either to the selectivity in migration or because the immigration experience by itself leads to higher religiosity. As noted in footnote 4, selectivity in terms of religiosity is unlikely to be systematic. In its turn, the effect of the migration experience on religiosity may be due either to the profound life changes, and hence a greater quest for spirituality or religious affiliation, or due to the rational behavior, such as a desire to establish new networks through religious participation. If this is the case, the higher religiosity of immigrants would most likely be a transitory phenomenon. One way to explore the validity of this hypothesis would be to test whether immigrants also have higher religiosity as compared to their compatriots who did not migrate, and to see whether these differences also diminish over time. With our data, we can perform such a test on a sub-sample of European migrants to other European destinations. For this, we match immigrants from European countries in our initial sample to the native born from their origin European countries, and repeat regressions such as in Tables 2, 3, 4 columns (3), but now looking at emigrants versus stayers. Appendix Table 10 summarizes the results of these estimations. We do find that emigrants have a higher religiosity as compared to stayers. Interestingly, the self-declared religiosity does not seem to change with the years since migration, but praying and church attendance do.

Moreover, for emigrants with over 20 years abroad, there is no statistically significant difference in church going as opposed to stayers (the statistics on the difference of the sum of coefficients on *Emigr* and *YSM20* + from zero is $F(1, 871) = 0.02$; $Prob > F = 0.886$), and neither in praying. These results further support the hypothesis that there may be a certain rational spike in religiosity following migration and that this spike diminishes with time. Unfortunately, we are not able to definitely claim the causal effect of migration on religiosity, as well as to definitely claim that there is no selectivity. To establish this, we would need longitudinal data on pre-migration and post-migration levels of religiosity.

Lastly, in Tables 2, 3, 4 columns (4), the regression (1) is reported for the sub-sample of immigrants. There are several differences in the impact of individual characteristics of immigrants on religiosity, as contrasted to the native born (columns 1). Notably, age does not seem to matter for immigrants,[13] as well as the employment status, while the income effect is positive for self-reported religiosity and insignificant for other measures. For immigrants, non-linearities in the effect of schooling are also present, as religiosity measures show a decline with education, followed by an increase. The turning point, however, is different between immigrants and the native born. Self-reported religiosity decreases with the years of schooling up to 18 years. It increases thereafter. However, only 7 percent of the sample for immigrants has more than 18 years of schooling. The turning point for praying of immigrants is at 13 years of education, and at 14 years for attendance. Household size has a positive and significant effect only for immigrants' praying (Table 3, column 4); it is positive but insignificant for two other measures.

In terms of allegiance, both native and immigrant non-affiliated individuals, Orthodox Christians, and Jews have consistently lower religiosity levels than native and immigrant Catholics. In contrast, the group referred to as other Christians are more religious than Catholics, and hence more so than any other group, regardless of nativity. For Protestants, while lower religiosity patterns are observed among the native born, no differences from Catholics are found for immigrants.

We have also performed these regressions including country of destination and country of origin fixed effects. The basic results do not change. If anything, they become stronger: for instance, the language variable gains significance throughout: those immigrants who do speak an official language of the destination country at home tend to have lower levels of religiosity. These results are available upon request.

4.2 Differences in religiosity across denominations

As a next step, we repeat the pooled regressions for the native born and first generation immigrants by denomination. From Table 5, compared to the native born of the same group, non-affiliated and Roman Catholic immigrants have a significantly stronger religiosity as measured by all three indicators of religiosity. For Roman Catholics, there is particularly strong evidence of declining religiosity

[13] If we omit the square term from regressions, age has a statistically significant negative impact on praying for immigrants, and a positive impact on attendance, significant at the 7 % level.

with duration at the destination. Among Protestants, immigrants have only a slightly higher level of religiosity, while Orthodox immigrants only pray more than Orthodox natives, and these differences remain intact with duration. There is no apparent difference between the native- and foreign-born respondents from other branches of Christianity.

Unfortunately, the sample sizes are particularly small for Muslims (252 natives and 832 immigrants) and especially for Jews (44 natives and 24 immigrants).[14] The results for these two groups suggest that both Muslim and Jewish immigrants also have a higher religiosity as compared to the native-born co-religionists, and that they also have a tendency for their religiosity to decline over time (the only exception is higher religiosity of Jews with 6–10 years after migration). However, given the very small sample size for Jews, especially Jewish immigrants, we are cautious to interpret these results as definitive.

4.3 Religiosity and home and host country characteristics

In this section, we explore the role of home and host country economic, cultural, and institutional characteristics that affect religiosity, as well as the robustness of previous results to the inclusion of these variables (Table 6).

The results for the native born (Table 6, column 1) suggest that host country characteristics are indeed important predictors of religiosity. In line with previous studies, higher GDP per capita has a negative association with all three forms of religiosity, which is consistent with the secularization theory (Barro and McCleary 2003a; Verweij et al. 1997). In contrast, the religious markets theory, as tested by the measure of religious fragmentation, is rejected, as suggested by the negative sign on this variable, and which is also consistent with numerous previous findings (Chaves and Gorski 2001). However, religious freedom, which may also be viewed as the opposite of government regulation, has a positive association with religiosity, perhaps by increasing the efficiency of religion providers (Iannaccone et al. 1997; Chaves and Cann 1992). Social regulation has a positive effect, suggesting that societies with more conservative views and attitudes exhibit more religious behavior (Gaskins et al. 2009). For this variable in particular, however, the direction of causality may also be reversed: social regulation may be greater in more conservative societies. Religious minorities may feel besieged and respond by grouping together, while members of religious minorities with a weaker attachment may convert to a major religion. Thus, we do not give a causal interpretation to this result. This logic is also confirmed by the coefficient on the variable *belonging major* which suggests that individuals sharing the main religion of the country tend to be less religious than those belonging to any other religion.

[14] Native-born adult Muslims have a different distribution across countries than Muslim immigrants. In our sample, there are no Muslim natives in Switzerland, Estonia, Finland, Luxembourg, and Norway. The largest concentration of Muslim natives is in Russia (66 %), Greece (15 %), Great Britain (3 %), and Slovenia (3 %). The largest concentration of Muslim immigrants is in Germany (13 %), the Netherlands (10 %), Switzerland (10 %), and Great Britain (9 %); Muslim immigrants are more evenly distributed across the European countries than Muslim natives. There are no Muslims in our sample in the Czech Republic or Hungary, neither among immigrants nor among the native born.

Table 5 Differences in religiosity by sub-group of denomination and immigrant type

Sub-sample	Dep. variable	Native born + first generation					
		Immigr	Immigr × YSM6–10	Immigr × YSM11–20	Immigr × YSM20+	No. of observations	R-squared
No religion	How religious	1.278 (0.253)***	−0.179 (0.381)	−0.027 (0.305)	−0.314 (0.293)	39,790	0.033
	Praying	24.571 (9.507)***	−8.211 (9.856)	−5.624 (9.264)	−0.189 (9.765)	49,674	0.028
	Attending	3.263 (1.605)**	−2.193 (1.937)	−1.385 (1.870)	−2.975 (1.658)*	39,686	0.005
Roman	How religious	1.488 (0.243)***	−0.347 (0.289)	−0.365 (0.261)	−0.637 (0.266)**	27,598	0.086
Catholic	Praying	90.708 (17.330)***	−2.093 (20.632)	−33.928 (18.783)*	−41.906 (17.064)**	27,334	0.147
	Attending	18.335 (5.999)***	−5.507 (5.321)	−11.085 (5.768)*	−10.308 (5.025)**	27,655	0.083
Protestant	How religious	0.915 (0.490)*	−0.450 (0.557)	−0.787 (0.502)	−0.394 (0.518)	16,021	0.059
	Praying	27.537 (27.964)	19.000 (36.355)	−5.868 (35.552)	24.736 (35.607)	15,938	0.068
	Attending	9.947 (6.330)	0.085 (6.601)	−6.646 (7.490)	11.570 (10.718)	16,039	0.054
Orthodox	How religious	0.361 (0.348)	0.949 (0.490)*	0.184 (0.475)	−0.309 (0.468)	5,254	0.073
	Praying	56.261 (24.314)**	−16.500 (30.978)	−20.121 (28.873)	10.660 (32.175)	5,114	0.119
	Attending	4.022 (4.144)	1.902 (5.794)	6.748 (7.327)	1.542 (9.726)	5,244	0.041
Christian	How religious	0.516 (0.522)	−0.182 (0.618)	−0.088 (0.715)	−0.515 (0.672)	1,638	0.082
Other	Praying	49.803 (32.936)	−43.294 (47.060)	−45.053 (43.895)	−51.715 (39.576)	1,630	0.119
	Attending	−10.408 (13.834)	−4.615 (13.016)	0.532 (18.429)	−0.243 (15.291)	1,642	0.088
Muslim	How religious	0.821 (0.439)*	−0.840 (0.423)**	−0.592 (0.375)	−0.795 (0.391)**	1,084	0.122
	Praying	63.041 (28.516)**	−70.196 (28.191)**	−55.576 (25.964)**	−51.379 (25.839)**	1,073	0.125
	Attending	7.477 (18.508)	−11.847 (13.967)	1.952 (15.059)	9.334 (14.408)	1,077	0.070
Jewish	How religious	3.399 (1.609)**	−1.446 (1.502)	−2.100 (1.773)	−1.307 (1.944)	68	0.592
	Praying	24.400 (105.942)	−17.520 (95.500)	−179.907 (94.060)*	−95.345 (103.995)	68	0.403

Table 5 continued

Sub-sample	Dep. variable	Native born + first generation					
		Immigr	Immigr × YSM6–10	Immigr × YSM11–20	Immigr × YSM20+	No. of observations	R-squared
	Attending	30.594 (50.354)	92.665 (39.754)**	19.087 (26.404)	42.736 (30.143)	68	0.516

Source: European Social Survey, 2002–2009

***, **, and * represent statistical significance at $p < .01$, $p < .05$, and $p < .10$, respectively

1. Each line represents a separate regression; where the first row's heading defines the sub-sample (for example, pooled sample of individuals with no religious denomination); and second row's heading defines the dependent variable (for example, "how religious")

2. Coefficients from OLS regressions. All regressions include the full set of individual-specific and immigrant-specific characteristics as in Tables 2, 3, 4, and are estimated accounting for the population and design survey weights. Robust standard errors of the estimated coefficients are shown in parentheses. The observations for each denomination are the sum of the number of native-born and the foreign-born who profess that religion

Table 6 Country characteristics as determinants of religiosity

Variables	(1) Native born	(2) Native born and immigrants	(3) Immigrants
How religious			
Belonging major	−0.128 (0.057)**	0.010 (0.024)	0.162 (0.183)
Relig fragm	−0.839 (0.058)***	−0.868 (0.038)***	−0.656 (0.294)**
Relig freedom	0.349 (0.093)***	0.354 (0.045)***	1.044 (0.335)***
Social attitudes	0.647 (0.049)***	0.472 (0.033)***	1.373 (0.283)***
GDP	−0.008 (0.001)***	−0.011 (0.001)***	0.011 (0.005)**
Immigr		2.146 (0.196)***	
Immigr × YSM6–10		−0.065 (0.112)	−0.135 (0.189)
Immigr × YSM11–20		−0.059 (0.104)	−0.200 (0.170)
Immigr × YSM20+		−0.181 (0.099)*	−0.363 (0.177)**
Immigr × Belonging major at origin		−0.362 (0.078)***	−0.134 (0.160)
Immigr × Relig fragm at origin		−0.466 (0.127)***	−0.342 (0.223)
Immigr × Relig freedom at origin		0.160 (0.147)	0.688 (0.238)***
Immigr × Social attitudes at origin		−0.139 (0.123)	0.231 (0.207)
Immigr × GDP at origin		−0.028 (0.003)***	−0.027 (0.004)***
Immigr × Communist at origin		−0.629 (0.080)***	−0.634 (0.168)***
Praying			
Belonging major	−30.930 (3.254)***	−22.096 (1.328)***	−27.319 (10.722)**
Relig fragm	−57.739 (3.299)***	−72.698 (2.111)***	−87.250 (16.458)***
Relig freedom	81.575 (4.176)***	56.177 (2.598)***	48.288 (17.976)***
Social attitudes	44.220 (2.785)***	33.029 (1.812)***	86.507 (15.339)***
GDP	−0.461 (0.056)***	−0.331 (0.033)***	0.352 (0.257)
Immigr		97.095 (10.626)***	
Immigr × YSM6–10		−4.734 (6.095)	−9.671 (9.651)
Immigr × YSM11–20		−10.364 (5.570)*	−15.611 (8.740)*
Immigr × YSM20+		−17.422 (5.295)***	−10.874 (9.461)
Immigr × belonging major at origin		−6.690 (4.736)	−2.229 (10.178)
Immigr × relig fragm at origin		−18.841 (6.912)***	9.318 (11.866)
Immigr × relig freedom at origin		12.602 (7.988)	29.597 (13.218)**
Immigr × social attitudes at origin		6.655 (6.643)	12.114 (10.989)
Immigr × GDP at origin		−1.721 (0.141)***	−1.995 (0.237)***
Immigr × communist at origin		−63.107 (4.437)***	−42.022 (7.951)***
Attending			
Belonging major	−2.486 (0.836)***	−3.072 (0.323)***	−4.490 (3.528)
Relig fragm	−16.193 (0.774)***	−16.244 (0.502)***	−37.865 (7.971)***
Relig freedom	12.497 (1.002)***	14.141 (0.615)***	9.493 (5.875)

Table 6 continued

Variables	(1) Native born	(2) Native born and immigrants	(3) Immigrants
Social attitudes	11.180 (0.714)***	5.589 (0.474)***	34.566 (6.904)***
GDP	−0.159 (0.015)***	−0.093 (0.008)***	0.165 (0.121)
Immigr		20.642 (3.108)***	
Immigr × YSM6–10		−3.911 (1.700)**	−1.265 (3.239)
Immigr × YSM11–20		−2.221 (1.653)	1.430 (3.307)
Immigr × YSM20+		−2.446 (1.607)	1.378 (3.272)
Immigr × belonging major at origin		−5.867 (1.366)***	−2.552 (3.705)
Immigr × relig fragm at origin		−6.105 (1.754)***	0.283 (3.224)
Immigr × relig freedom at origin		1.364 (2.406)	4.989 (5.300)
Immigr × social attitudes at origin		3.550 (1.833)*	13.314 (4.283)***
Immigr × GDP at origin		−0.253***	−0.374***
Immigr × communist at origin		−10.696***	−10.045***

Source: European Social Survey, 2002–2009

** and * represent statistical significance at $p < .01$ and $p < .05$, respectively

1. Dependent variables are indicated in the first column

2. Coefficients from OLS regressions. All regressions include the full set of individual-specific and immigrant-specific characteristics as in Tables 2, 3, 4, and are estimated accounting for the population and design survey weights. Robust standard errors of the estimated coefficients are shown in parentheses

The results (Table 6, column 3) reveal that the characteristics of the country of destination have a largely similar effect for immigrants and for the native born. The magnitudes of some coefficients differ, but the directions and the overall patterns are largely the same. Immigrants in countries with high religious pluralism tend to be less religious, while both religious freedom and stricter social attitudes have a positive association with religiosity. One notable exception is the impact of the GDP per capita variable, which is positive for personal religiosity, and statistically insignificant for the other religion variables. Potentially, it may reflect the "gratification" effect, especially for immigrants from poorer countries, who may feel more religious as a result of being more thankful for their better living conditions and economic opportunities. Overall, that any of the destination country characteristics is of importance for immigrants is an interesting finding in itself. It suggests that religiosity is not a completely rigid trait, and that it does change under the influence of external factors, notably religious institutions and culture in which an individual is placed, as well as with duration of residence in the destination, as seen above.

From Table 6 column (3), we also note that similar country of origin characteristics also continue playing a role after migration, although their effect is much more disparate. Consistent with other studies, and across dependent variables, GDP at the origin has a negative impact on religiosity among immigrants

in the destination, as well as the former communist past (Barro and McCleary 2005). Religious freedom has a positive association only with personal types of religiosity, but not with the attendance; while social attitudes at the origin only affect attendance, but not the personal religiosity.

In pooled estimation (Table 6, column 2), the variable *immigr* remains significantly positive. Religiosity remains persistently higher among immigrants throughout their lifetime, albeit decreasing over time, even when origin and destination country characteristics are held constant. This suggests that, while external factors are important for the individual introvert measures of religiosity, they are not fully able to account for differences between immigrants and the native born. There may be other factors related to culture, education, or experience that continue shaping the differences between natives and the foreign born. It also may be that personal religiosity is indeed strongly influenced by the personal experience of migration. Experiences related to the fact of migration may have a long-term effect on the individual relationship with religiosity or spirituality in a broad sense.

We also check the robustness of all these results to the definition of the dependent variables and the estimation method. In particular, we recode the dependent variables into dichotomous variables. "How religious are you" gets a value of one if an individual reports any value of religiosity above 5, and zero otherwise. "How often do you pray" and "how often do you attend religious services" gets a value of one if an individual reports doing these activities more often than once a month. Probit estimation results are consistent with previous OLS results (available on request from the authors). Some differences between the probit and the OLS results in Table 6 are that social attitudes and religious freedoms in the origin have positive signs for any religiosity measure. Compared to the results in Table 5, praying decreases with the years since migration for all religious denominations, except Muslims, and attending church also decreases significantly over time for Orthodox migrants and individuals with no religious affiliation.

5 Summary and conclusions

This paper provided a Europe-wide analysis of differences in religiosity between immigrants and the native born, measured in terms of self-assessed religiosity, frequency of praying, and frequency of church attendance. According to the descriptive statistics, immigrants have higher religiosity as compared to the native born measured along these three dimensions, and regardless of their religious denomination. We suggest that, all other things equal, two main sets of explanations account for these differences.

First, there are several differences in the role of the individual characteristics of immigrants in explaining religiosity, as contrasted to the native born. Both native and immigrant females have higher religiosity than males; however, this effect varies by denomination. Age and education affect religiosity of the native born in a non-linear way, with the lowest levels of religiosity observed in the late twenties and among individuals with 10–13 years of schooling. For immigrants, religiosity

increases linearly with age, while the impact of education is the lowest for 13–18 years of schooling, depending on the measure of religiosity.

Marital status has a strong association with the religiosity of the native born, but not of immigrants, except that being divorced increases the frequency of praying for immigrants. Household size has a positive and significant effect for any measure of religiosity of the native born, but only for immigrants' praying. For the native born, income has a negative association with religiosity, while for immigrants, the effect of income is positive for self-reported religiosity, and insignificant for other measures. Other individual characteristics seem not to matter for immigrants' religiosity.

Among immigrants, religiosity is greater than among the native born in the destination and has a tendency to decline with the years since migration. This decline suggests that adaptation to the life in the destination country's environment is taking place. Church attendance as a social expression of religiosity may also be a rational response to the need to establish new networks, to mitigate loneliness, and to capitalize on the origin-specific human capital even after migration. These benefits of attendance may also decline as outside options in the destination country appear for a migrant. Some additional evidence contrasting religiosity of immigrants from less religious to more religious European countries, as well as of European emigrants versus stayers also points in this direction.

Second, contrary to common perceptions, religiosity is not a rigid personal trait, but it can and does change under the influence of external economic and social factors, and settings into which an individual lives. Specifically, origin countries' characteristics continue to influence immigrants' religious behaviour even after migration. However, the impact of these factors is much more disparate and relatively weak as compared to the destination country characteristics, such as religious pluralism, religious freedom, and societal attitudes towards religion. These results suggest that external factors play an important role in private expressions of religiosity.

These findings cast doubt on the recent restrictive measures adopted by some European governments' regarding religious minorities, which assume little voluntary responsiveness of immigrants to the environment in which they live. Some European governments might be trying to speed up the assimilation process, without recognizing the more general role of the existing environment in this process, and without recognizing the rational aspects of religiosity, such as church-going.

The analysis of this paper is based primarily on the European Social Survey, which covers most of the European countries. This type of analysis is particularly rare as many countries (including the United States) prohibit the collection of religion data by census authorities. Thus, the analysis of the paper has an additional value-added of outlining religiosity patterns among the European native born, as well as the immigrants. Moreover, it demonstrates the value of including questions on religion and religiosity in survey data.

Appendix

See Tables 7, 8, 9 and 10.

Table 7 Sample description

Destination country	No. of observations		Percent of immigrants with over 20 years of residence	No. of immigrant countries of origin	Largest immigrant origin country	Largest religion	First largest religion among immigrants[a]	Second largest religion among immigrants
	Native born	First-generation immigrants						
Austria	2,971	228	41.20	16	Germany	Catholic	Catholic	Islam
Belgium	4,169	381	48.53	18	France	Catholic	Catholic	Islam
Switzerland	3,423	943	44.86	39	Germany	Catholic	Catholic	Protestant
Czech Republic	2,047	68	82.76	3	Slovakia	Atheist	Catholic	Oth. christian
Germany	6,485	554	31.55	26	Russia	Catholic	Catholic	Islam
Denmark	4,135	191	38.14	15	Turkey	Protestant	Islam	Protestant
Estonia	1,542	411	85.11	11	Russia	Protestant	Orthodox	Protestant
Spain	3,540	299	7.14	21	Morocco	Catholic	Catholic	Islam
Finland	4,551	87	12.75	4	Russia	Protestant	Protestant	Orthodox
France	3,471	297	62.50	15	Algeria	Catholic	Catholic	Islam
The UK	4,916	413	37.28	24	India	Protestant	Catholic	Islam
Greece	2,177	255	8.40	10	Albania	Orthodox	Orthodox	Islam
Hungary	3,407	45	22.92	4	Romania	Catholic	Catholic	Protestant
Ireland	3,504	227	24.26	11	The UK	Catholic	Catholic	Protestant
Luxembourg	778	544	38.00	19	Portugal	Catholic	Catholic	Oth. christian
The Netherlands	5,014	428	48.97	12	Surinam	Atheist	Islam	Catholic
Norway	5,320	311	30.75	19	Sweden	Protestant	Islam	Protestant
Poland	4,888	31	57.14	3	Germany	Catholic	Catholic	Islam
Portugal	3,127	151	31.13	8	Brazil	Catholic	Catholic	Protestant
Russia	2,967	148	46.10	11	Ukraine	Orthodox	Orthodox	Islam
Sweden	4,976	570	48.96	23	Finland	Protestant	Islam	Protestant
Slovenia	2,775	159	74.85	5	Bosnia	Catholic	Catholic	Orthodox

Table 7 continued

Destination country	No. of observations		Percent of immigrants with over 20 years of residence	No. of immigrant countries of origin	Largest immigrant origin country	Largest religion	First largest religion among immigrants[a]	Second largest religion among immigrants
	Native born	First-generation immigrants						
Slovakia	2,530	47	57.45	3	Czech Rep.	Catholic	Catholic	Oth. christian
Ukraine	1,734	229	73.58	10	Russia	Orthodox	Orthodox	Islam
Total	84,447	7,017						

Source: European Social Survey, 2002–2009, and Association of Religious Data Archive, 2005

Counted are only the observations of the sample restricted for the analysis, and for which full information on all socio-economic characteristics is available. As income is missing for about 20 percent of the sample, the original ESS data contains considerably more observations. There is, however, no systematic difference between individuals who report and do not report their income in terms of age, gender, education, or employment status. The largest numbers of both native and foreign-born income non-reporters are in Portugal (12 %), Austria (10 %), and Spain (10 %). Number of immigrant countries of origin: counted are only countries represented by more than 3 immigrants

[a] "Without a religious affiliation" is the largest group among immigrants in the following countries: Austria, Belgium, Switzerland, Germany, Denmark, Estonia, Finland, France, the UK, Ireland, the Netherlands, Norway, Sweden, Slovakia, Slovenia

Table 8 Definition of variables used in the regression analysis and data sources

Variable	Description of variables used in the analysis
Dependent variables	
How religious are you?	How religious are you? An index from 0 to 10, 0 meaning not religious at all, 10—very religious
Attending religious services	How often attend religious services apart from special occasions? 365-every day 100-more than once a week 52-once a week 15-at least once a month 4-only on special holy days 1-less often 0-never
Praying frequency	How often do you pray? 365-every day 100-more than once a week 52-once a week 15-at least once a month 4-only on special holy days 1-less often 0-never
Individual socio-economic characteristics	
Age	Age, ranges from 16 to 70
Age squared/100	Age squared, divided by 100
Female	A dichotomous variable equal to 1 if female, 0 if male
Education years	Years of full-time education completed, ranges from 0 to 25
Education squared	Years of full-time education completed squared
N hh members	Number of people living regularly as member of household
Log of hh income	Logarithm of monthly total household income, constructed from a categorical variable using a mid-point level. I.e., if income level is between €1,800 and €3,600, the value of €2,700 is assigned. The value of the highest category is its lower bound multiplied by 1,5. Values in national currencies are converted into Euro using average exchange rate of the survey year.
Married	A dichotomous variable equal to 1 if married or in a civil partnership, 0 otherwise
Divorced	A dichotomous variable equal to 1 if divorced, separated, or widowed, 0 otherwise. Benchmark category: single (never married)
Employee	A dichotomous variable equal to 1 if works as an employee, zero otherwise
Self-employed	A dichotomous variable equal to 1 if self-employed or working in family business
Unemployed	A dichotomous variable equal to 1 if unemployed in the past 7 days, actively or inactively looking for a job. Benchmark category: not in the labor force (studying full-time/permanently sick/disabled/retired)

Table 8 continued

Variable	Description of variables used in the analysis
Current religious denomination:	A dichotomous variable equal to 1 if an individual belongs to any of the mentioned categories, 0 otherwise
Roman Catholic	
Protestant	
Orthodox	
Other Christian	
Muslim	
Jewish	
No religion	
Urban area	A dichotomous variable equal to 1 if an individual lives in urban area (city, suburb, or town), and 0 if in a village or a countryside farm
Immigrant -specific characteristics	
Immigr	A dichotomous variable equal to 1 if an individual is foreign-born and has both foreign-born parents, 0 otherwise.
Length of stay:	How long ago came to live to this country:
YSM6–10	1 if between 6 and 10 years ago
YSM10–20	1 if between 11 and 20 years ago
YSM20+	1 if over 20 years ago (Benchmark category: five years and less)
Citizen	A dichotomous variable equal to 1 if an individual is a citizen of the country of residence, 0 otherwise
Language	A dichotomous variable equal to 1 if an individual speaks any official language of a country of residence at home as the first language choice, 0 otherwise
Religion and country-specific variables	
Belong major	A dichotomous variable equal to 1 if an individual belongs to the religion which is the main religion of the country, 0 otherwise
Religious fragmentation	Index of religious fragmentation (Alesina et al. 2003; Iannaccone 1998). Constructed according to the formula: $RF_i = 1 - \sum_k s_{ki}^2$, where s is a share of k religion denominations in country i (we use first five denominations).This index is also known as one minus Herfindahl index, and measures the probability that two randomly drawn individuals in country i belong to different religions, which also means that higher values of the index represent higher religious fragmentation, hence, heterogeneity
Religious freedom (recoded from the original)	Freedom of religion. Category responses are the following: 0 = Does not exist. 0.333 = Limited and/or rights not protected or restricted. 0.666 = Law/Constitution provides for freedom of religion and the Government generally respects this right in practice, but some problems exist. 1 = Law/Constitution provides for freedom of religion and the Government 'generally respects' this right in practice

Table 8 continued

Variable	Description of variables used in the analysis
Social attitudes	The index is constructed on the basis of the following questions:
	Societal attitudes towards other or non-traditional religions; conversion to other religions? Do attitudes and/or clerical edits discourage proselytizing? Do established or existing religions try to shut out new religions in any way? Extent of assertive religious movements in the country?
	0—low social regulation (tolerant societies); 1—medium; 2—high
Belong major religion in origin	Similarly defined variables, for immigrants only and for their countries of origin
Religious fragmentation at origin	
Religious freedom at origin	
Social attitudes at origin	
GDP, GDP at origin	GDP PPP-adjusted per capita values
Communist at origin	A dichotomous variable equal to 1 if origin country has ever been under communism, 0 otherwise

Source

Jowell and the Central Co-ordinating Team (2009)

Association of Religious Data Archives International Religious Freedom Data (2005)

Grim and Finke (2006)

World Bank Development Indicators (WBDI)

World Bank (2006)

Table 9 Descriptive statistics

Variable	Native born		Immigrants	
	Mean	SD	Mean	SD
How religious are you?	4.47	2.91	5.15**	3.05
Attending religious services	12.20	32.34	14.63**	41.40
Praying frequency	76.72	136.57	106.53**	153.73
Age	44.10	14.68	43.55	13.75
Age squared/100	21.61	12.99	20.85*	12.37
Female	0.52	0.50	0.53*	0.50
Education years	12.54	3.79	12.63*	4.34
Education squared	171.65	101.16	178.44**	116.99
N hh members	2.83	1.40	2.83	1.44
Log of hh income	7.32	1.06	7.38	1.05
Married	0.55	0.50	0.58**	0.49
Divorced	0.15	0.36	0.17**	0.38

Table 9 continued

Variable	Native born		Immigrants	
	Mean	SD	Mean	SD
Employee	0.77	0.42	0.77	0.42
Unemployed	0.05	0.23	0.08**	0.27
Self-employed	0.11	0.31	0.09**	0.29
Out of the labour force	0.07	0.25	0.06**	0.24
Urban area	0.61	0.49	0.75**	0.43
YSM6–10	0.00	0.00	0.14**	0.35
YSM10–20	0.00	0.00	0.23**	0.42
YSM20+	0.00	0.00	0.46**	0.50
Citizen	1.00	0.00	0.50**	0.50
Language	0.95	0.21	0.69**	0.46
Roman Catholic	0.31	0.46	0.25**	0.43
Protestant	0.18	0.39	0.09**	0.28
Orthodox	0.05	0.22	0.11**	0.31
Muslim	0.00	0.05	0.12**	0.32
Jewish	0.00	0.02	0.00**	0.06
Other Christian	0.02	0.13	0.04**	0.19
No religion	0.44	0.50	0.39**	0.49
Belong major	0.50	0.50	0.31**	0.46
Religious fragmentation	0.49	0.24	0.54**	0.25
Religious freedom	0.77	0.19	0.75*	0.18
Social attitudes	0.76	0.28	0.74*	0.33
GDP/1,000	31.04	17.31	37.51**	18.13
Belong major origin			0.42	0.49
Religious fragm. origin			0.46	0.26
Religious freedom origin			0.63	0.27
Social attitudes origin			0.80	0.32
Former communist			0.34	0.47
GDP/1,000 at origin			15.07	15.47
Sample size	84,447		7,017	

Source: See Appendix Table 8

** and * represent statistical significance of 1 and 5 %, respectively of differences of means of individual characteristics, based on a *t* test for differences of sample means

The sample includes males and females aged 16–70. Native-born without citizenship, as well as immigrants with unknown country of birth are excluded from the sample. Native-born with one or both foreign-born parents are excluded. Individuals with "other religion" or missing religious belonging are also excluded

Table 10 Religiosity outcomes of emigrants versus stayers

Variables	How Religious (1)	Praying (2)	Attending (3)
Emigr	0.471 (0.124)**	14.024 (5.501)*	5.170 (1.195)**
Emigr × YSM6–10	−0.135 (0.171)	12.199 (7.977)	−1.874 (1.837)
Emigr × YSM11–20	0.066 (0.145)	−9.446 (6.583)	−4.861 (1.324)**
Emigr × YSM20+	−0.050 (0.133)	−14.708 (6.200)*	−5.012 (1.429)**
Emigr × Language	−0.388 (0.104)**	−10.370 (4.946)*	−3.054 (0.964)**
Emigr × citizen	0.026 (0.091)	0.921 (4.483)	−1.366 (0.981)
No. of observation	86,972	86,415	87,109
R-squared	0.325	0.199	0.109

Source: European Social Survey, 2002–2009

** and * represent statistical significance at $p < .01$ and $p < .05$, respectively

1. Three column headings define three dependent variables which are the same as in Tables 2, 3, 4

2. The sample is restricted to European emigrants and to their European compatriots who did not migrate

3. Coefficients from OLS regressions. All regressions are estimated accounting for the population and design survey weights. They contain all other regressors as in Tables 2, 3, 4. Robust standard errors of the estimated coefficients are shown in parentheses

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