Immigration has become systematically politicized and opposed by many individuals. We examine individual attitudes toward equal opportunities for foreigners and Swiss citizens, using cross-sectional data from the Swiss Household Panel. Individuals with low levels of education tend to oppose foreigners, while the opposition by individuals with high levels of education increases with the risk of unemployment. Values and beliefs explain the negative attitudes of individuals with low levels of education, but not the association with the risk of unemployment for individuals with high levels of education. Clearly, both values and economic factors are important for explaining attitudes toward foreigners.

The research leading to these results has received funding from the Swiss National Science Foundation under grant agreement number 138620 and in the context of the NCCR /On the Move. This study benefited from comments by Etienne Piguet, Ellen Percy Kraly, two anonymous referees, participants of the conference “Increasing Heterogeneity in the Workforce and its Impact” in Nuremberg (Germany), the 7th International Conference of Panel Data Users in Switzerland in Lausanne (Switzerland), the 11th Arnoldshain Seminar on “Migration, Development, and Demographic Change — Problems, Consequences, Solutions” in Antwerp (Belgium) and the XXVIII National Conference of Labour Economics in Rome (Italy). Author contributions: DR and MP designed research; MP performed research; MP and DR wrote the paper.

[Correction added on 3 June 2016, after first online publication: the APPENDIX section (Table A1 through Table A19) has been removed and is now available as Supporting Information to this article (Table S1 through Table S19).]
INTRODUCTION

Over the past three decades, immigration has become one of the most prominent topics in election campaigns, systematically politicized by parties on the right. Across Western Europe, there appears to be growing support for anti-immigrant policies and organizations associated with anti-immigrant sentiments. The most common and perhaps most basic explanation for attitudes toward foreigners revolves around the idea of economic competition. Following this approach, negative attitudes toward foreigners and immigrants are seen as a direct reaction against unwanted competition in the labor market. Despite a growing literature on the attitudes of the mainstream society toward foreigners and immigrants, the exact role of education remains poorly understood, especially given that the impact of education is unlikely to be uniform (Jenssen and Engesbak 1994). While an association between low levels of education and negative sentiments toward immigrants can be found across countries, the underlying mechanism remains poorly specified.

In this article, we assess to which extent the labor market competition hypothesis is relevant in shaping attitudes toward foreign citizens in Switzerland. We focus on Switzerland for several reasons: With more than a fifth of the population being foreign citizens, and a concentration of immigrants in both low-skilled and highly skilled occupations, Switzerland offers an ideal case to study the role of education in attitudes toward immigrants. The high level of economic prosperity and low unemployment rates would lead us to expect low levels of grievances against foreigners, but Switzerland has seen the electoral success of the right-wing Swiss People’s Party—a party drawing heavily on a rhetoric that depicts immigration as a negative influence on Swiss citizens (Ruedin 2013). In this rhetoric, it is taken for granted that more immigration leads to wage dumping and job displacement through increased competition in the labor market among native workers.

There is a burgeoning literature on attitudes toward immigrants drawing on different theoretical traditions. A basic tenet is the competition—in different forms—between different groups in society, particularly different ethnic/racial groups. Sherif and Sherif (1953) and particularly Blumer’s (1958) work on racial prejudice highlighted the importance of group positions and perceptions of threat (for recent theoretical developments, refer to Bobo and Hutchings 1996). This perspective
of competitive threat remains the staple of research on attitudes toward immigrants (for reviews, refer to Ceobanu and Escandell 2010; Hainmueller and Hopkins 2014; Dancygier and Laitin 2014). Much of the literature has focused on economic threats such as the competition over jobs and salaries, but other forms of threat are recognized.

Competitive threat theory has the advantage that it allows the formulation of clear hypotheses (Coenders and Scheepers 1998). It is largely compatible with rational action approaches that regard individuals as self-interested: negative attitudes toward immigrants can be seen as a simple protection against unwanted competitors (Borjas 1999). There is empirical support for the argument that economic competition is associated with negative attitudes toward immigrants (e.g., Scheve and Slaughter 2001; Mayda 2006; Ortega and Polavieja 2012), but the argument has been refined by economists and sociologists alike. Particular attention is paid to the many non-economic explanations for negative attitudes, including the role of (group) identities and individual-level values and beliefs (e.g., Hainmueller and Hiscox 2007; Sides and Citrin 2007; Müller and Tai 2010) and the multiple factors that influence perceptions of threat (e.g., Bobo and Hutchings 1996; Semyonov et al. 2004; Hello, Scheepers, and Sleegers 2006). These contributions highlight that the individual situation in the labor market plays a less significant role in shaping attitudes toward immigrants once values and beliefs are accounted for. In their recent review, Hainmueller and Hopkins (2014) argue strongly that the individual economic situation plays only a minor role. The economic situation is not unimportant, however, as sociotropic concerns with the economy of the country or locality are among the most potent predictors for negative attitudes toward immigrants. In this sense, the existing evidence highlights the importance of the group level underlined by Blumer (1958) many decades ago. Rather than largely dismissing the labor force channel as Hainmueller and Hopkins seem to do, Facchini, Mayda, and Puglisi (2013) take a more conciliatory approach, arguing that economic and non-economic factors play a complementary role in explaining attitudes toward immigrants.

Previous literature reveals three significant shortcomings. First, existing studies assume that the immigrants in a receiving country are either predominantly unskilled or predominantly skilled. For most countries, this means that the immigrant population is regarded as lower skilled than the native population. Accordingly, only low-skilled individuals of the native population are exposed to competition from immigration. By so
doing, however, these studies ignore the fact that the skill distribution of immigration tends to be somewhat bimodal, with peaks at both the high-skill and low-skill ends of the distribution (e.g., Borjas, Friedman, and Katz 1997; Kahn 2004; Felbermayr and Kohler 2007). This means that highly skilled workers are also exposed to competition from immigrants, with corresponding implications on attitudes toward immigration. Second, as shown by Malhotra, Margalit, and Mo (2013), most studies equate education with skills. Ortega and Polavieja (2012), however, stress that defining skills solely in terms of educational attainment constitutes a very narrow definition of the human capital resources that characterize native–foreigner competition in the labor market. It follows that these studies provide an incomplete test for the labor market competition hypothesis. Third, earlier research that investigated the labor market determinants of attitudes toward immigration relied on dependent variables measuring respondents’ desired levels of immigration in their home country. Such subjective measures do not capture the attitudes of natives toward competition from foreign workers directly; they may reflect a wide range of reasons as to why natives have negative attitudes toward immigrants.

For a better understanding of the role of education, we assess the relevance of the labor market competition hypothesis in explaining individual attitudes toward equal opportunities for foreign and Swiss citizens. To fulfill this objective, we examine to what extent education and labor market skills correspond, rather than making the assumption that they largely do. We control for non-economic factors such as opinions on Swiss tradition and trust in organizations for the defense of human rights to further establish whether attitudinal effects of education are independent of values and beliefs. These variables tend to correlate with levels of education and may indeed reflect different propensities to control prejudice (Jenssen and Engesbak 1994; Blinder, Ford, and Ivarsflaten 2013), although previous research suggests that social desirability biases cannot account for all of the effects of education (Ostapczuk, Musch, and Moshagen 2009). To check the robustness of our results, skills are defined not only in terms of educational attainment, but also in terms of occupational level. In the empirical analysis, we thus improve on most existing studies in three important aspects. First, we use a measure of individual preferences for equal opportunities for foreign citizens. This attitudinal variable better captures the attitudes of natives toward competition from foreigners and is thus more relevant to study the labor market determinants of attitudes toward immigration than the variables most commonly used in the
literature. For reasons of comparability, we use alternative specifications
drawing on variables that capture attitudes toward immigration more gen-
erally. Second, we account for nonlinearity in educational attainment, to
account for the fact that foreigners are over-represented at both the bot-
tom and the top of the education distribution. Third, while labor market
competition is commonly operationalized by education, we additionally
allow for interaction between education and risk of unemployment in
order to better assess exposure to competition from foreigners. This means
we circumvent the assumption that only workers in low-skilled occupa-
tions are exposed to economic pressure from immigrants.

Using these more sophisticated measures of exposure to market com-
petition, we find no evidence that — once values and beliefs are
accounted for — workers with low levels of education \textit{a priori} have more
negative attitudes toward foreigners than those with upper secondary edu-
cation. This finding contrasts with most prior research. Moreover, we
show that even if workers with a tertiary education robustly appear to
have more positive attitudes toward foreigners than their counterparts
with an upper secondary education, their higher risk of unem-
ployment is associated with more negative attitudes toward foreigners.

\textbf{SWISS IMMIGRATION POLICY AND LABOR MARKET}

As in many Western European countries, the postwar period in Switzerland
was characterized by strong economic growth and the gradual liberalization
of international trade. Immigration policy served as a useful macroeco-
nomic instrument allowing the pro-cyclical exploitation of a low-skilled for-
eign labor force to meet the demands of the economy. This guest-worker
immigration was characterized by state control and corporatist agreements,
and initially both settlement and contact with the indigenous population
were actively discouraged. Following pressure from the public and interna-
tional organizations, as well as competition from other Western European
countries offering a “better” deal for labor migrants, this approach changed
during the 1960s toward a model of integration (Skenderovic and D’Amato
2008, Ruedin et al. 2015). As elsewhere, the political debate on immigra-
tion came to be dominated by two opposing movements: one side high-
lighted economic growth, the other side voiced concerns of overpopulation,
wage dumping, and a threat to local culture. The German concept of
\textit{Überfremdung} combines these concerns, with concurrent connotations of
there being too many immigrants and immigrants that are “too foreign.”
The Swiss People’s Party (UDC/SVP) is the main actor for mobilizing anti-immigrant sentiments in Switzerland, taking up an issue about which a large part of the population is concerned (Ruedin and D’Amato 2015). Between 1987 and 2007, the national vote share of this conservative party in parliament has increased from 11 percent to 29 percent. During the same period, there were over 20 referenda and popular initiatives on immigration-related topics. Until recently, most attempts to introduce a more restrictive immigration regime using direct democratic means were defeated at the polls, such as in 2000 when voters rejected an initiative to limit the proportion of foreign citizens to 18 percent of the population. More recently, however, a ban on the building of new minarets was introduced in Switzerland using a popular initiative (in 2009), or a law on the automatic expulsion of foreigners guilty of crimes is awaiting enactment. The newspaper advertisements in Figure I are recent examples of propaganda by the Swiss People’s Party according to which immigration induces wage dumping and job displacement. While there appears to be growing support for anti-immigrant policies and organizations associated with anti-immigrant sentiments in some way, it is not the case that all Swiss voters have become more hostile to immigrants.

Since the 1990s, Swiss policy increasingly favored European immigrants and introduced restrictive policies for so-called third country nationals: immigrants from outside the European Union and the European Economic Area (EEA). With asylum seekers and family reunion, immigrant categories beyond labor immigration gained prominence, but the Swiss economy continued to struggle with a shortage of qualified labor (e.g., Huth 2004; Zimmerli et al. 2009; Schellenbauer et al. 2010). Gradually working toward free mobility with EU/EEA countries, Swiss employers were advised to fill their needs with migrants from Western European countries since 1991 and particularly since 1998. It remains possible to recruit skilled workers from outside the EU/EEA, but quotas are in place. Non-European workers are only admitted if no Swiss or European worker can be recruited to fill a vacant job. As a result of this...

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2The party’s growth seems to have slowed, and in the most recent national election in 2011, it was unable to increase its vote share, although it remains the largest party in parliament with 27 percent of the vote.

3There are some exceptions with regard to intra-firm transfer and family reunification. Until 2004, priority was given to Swiss workers over EU-15/EFTA workers, but these restrictions have been removed.
focus on EU/EEA immigrants, the nature of migration flows has evolved from a mainly low-educated labor force to one favoring highly qualified labor (Pecoraro 2005).

Figure II illustrates the result of this change in the nature of migration flows to Switzerland. It shows the distribution of educational attainment across the working-age population by different national groups (Swiss nationals, all foreigners, and foreigners settled in Switzerland within the previous five years). In the top panel, the highest fraction of workers with the lowest levels of education is found among foreign residents. On the one hand, this is a legacy of immigrant recruitment before the 1990s, where manual workers were actively sought. On the other hand, we note that recent immigrants are slightly more common in this category than Swiss citizens. This reflects the fact that the prioritizing of European immigration continues to attract immigrants with low levels of education — mostly from Italy and Portugal. The middle panel includes workers with upper secondary education,
Figure II. Levels of Education by National Group, 1999–2009

Swiss Labour Force Survey 1999–2009.

Notes: Individuals aged 18–65; recent foreigners are those residing in Switzerland for <5 years.
whose proportion is dominant among Swiss workers (around 60% of Swiss workers fall into this category). By contrast, the proportion of tertiary-educated workers among recent foreigners clearly exceeds those among other groups in the bottom panel. Put differently, we observe a clear bipolarity in terms of educational attainment among foreigners. This concentration of immigrants at the high and low end reflects labor market shortages and has not changed substantively in the decade under observation. The immigration policies in place seem successful in counteracting these shortages by means of immigration. Historically, this first meant a focus on low-skilled labor, and since the 1990s a focus on immigration of highly skilled labor. At the same time, immigration for other reasons than work (notably family reunification or asylum) along with continued immigration from countries such as Italy and Portugal ensures a supply of low-skilled labor.

The increased focus on immigrants from European countries, however, did not abate concerns about immigration among the population. Immigration is consistently among the most mentioned “most important problems” in opinion surveys (Bornschier 2010; Morales et al. 2015), and the continuing success of the Swiss People’s Party can be understood as an indication that governmental policy does not sufficiently address concerns over immigration.

**Attitudes toward Immigration**

Anti-immigrant sentiments may be abound in Western Europe, but not everyone shares negative feelings toward foreigners. A common explanation is that individuals who directly compete with immigrants in the labor market are more likely to oppose immigrants. The Heckscher–Ohlin approach “predicts that immigrants pressure the wages of similarly skilled natives nationwide” (Scheve and Slaughter 2001, 133). It suggests that immigration leads to lower wages for native workers whose skills are substituted by immigrants (i.e., a negative wage effect). At the same time, wages are expected to increase for native workers with complementary skills to the immigrants (i.e., a positive wage effect). It follows that if immigration increases the supply of unskilled labor relative to skilled labor, then the wages of skilled individuals are expected to rise, and the wages of unskilled individuals are expected to fall. The expectation is the opposite if immigrants are predominantly more skilled than the native workers. The implication on attitudes toward immigrants is that native
workers who are more exposed to competition with immigrants are expected to have more negative attitudes, because it is in their rational self-interest to protect their wages.

Empirical research has generally supported this hypothesis, in particular that the relative skill composition of natives to immigrants in the receiving country determines the sign of correlations between education/skills and attitudes to immigration. In the US context, where it is often posited that highly skilled labor is the abundant factor and thus immigrants are less skilled than natives on average, individuals with lower levels of education are more likely to be against immigration (e.g., Espenshade and Hempstead 1996; Kessler 2001; Scheve and Slaughter 2001). Low levels of education are also a consistent factor for studies covering Europe (e.g., Dülmer and Klein 2005; Schneider 2008; Ceobanu and Escandell 2010). On the basis of cross-country survey data, Mayda (2006) and O’Rourke and Sinnott (2006) have confirmed this result. Moreover, they have shown that in countries where native workers are generally less skilled than immigrants — such as in the Philippines — natives with lower levels of education tend to favor immigration. Using a more comprehensive measure of skills, Ortega and Polavieja (2012) have also provided support for the labor market competition hypothesis according to which individuals employed in jobs less exposed to competition with immigrants are relatively more in favor of immigration.

Only few studies reject the labor market competition hypothesis outright. For instance, Hainmueller and Hiscox (2007) have found that individuals with higher levels of education are more favorable to both skilled and unskilled immigrants. According to the authors, this result stems from the fact that education is a proxy for values and beliefs, suggesting that a different mechanism may be dominant rather than competitive threat. Sides and Citrin (2007) emphasize a social psychological approach to attitudes toward immigration, in which the role of values and identities outweighs the influence of material concerns. Their results show that cultural and national identities matter more than economic concerns for opinion formation. Malhotra, Margalit, and Mo (2013) use a survey experiment to underline this explanation: Cultural and economic threats are different phenomena, and individuals react differently depending on which threat they perceive. Focusing on the high-technology sector in the United States, a sector that relies heavily on Indian H-1B visa holders, they find
little evidence for labor market competition as driving negative attitudes toward Indian immigration. On the other hand, economic threat turns out to significantly predict opposition toward H-1B immigration as (Indian) H-1B visa holders are more directly competing with highly skilled Americans. The few studies using survey experimental settings apart, most of the aforementioned studies have tried to handle the association between education and values and beliefs by estimating specifications that account for indicators of individual values and beliefs. Despite these additional controls often being jointly significant, the relationship between education and attitudes toward foreigners remains strong. This finding suggests that the significant correlation between education and attitudes toward immigration is not primarily driven by differences in values and beliefs, reinforcing the relevance of the labor market competition hypothesis.

Few studies have examined the relationship between labor market considerations and anti-immigration attitudes in Switzerland specifically, the case under study in this article. This relative lack of studies is surprising because a number of authors have used cross-country data from the European Social Survey (ESS) or the World Value Survey (WVS), both of which include Switzerland. Few of these cross-national studies, however, have presented their results per country or only for Switzerland. Exceptions are the studies by Hainmueller and Hiscox (2007) and Green, Fasel, and Sarrasin (2010). While Green et al. focus on how diversity in immigration influences attitudes across Swiss municipalities — drawing on contact theory and a perspective of cultural threat — Hainmueller and Hiscox have demonstrated that, contrary to predictions by the labor market competition hypothesis, higher levels of education mean greater support for all types of immigration (i.e., both low and highly skilled). To our knowledge, only Helbling (2011) has relied on data from a survey of Swiss citizens living in the city of Zürich. Investigating whether Swiss Germans perceive German migrants as cultural and economic threats, Helbling claims to find support for the labor market competition hypothesis, in particular: Negative attitudes toward immigrants from former Yugoslavia (who are more likely to have low levels of education) decrease with Swiss Germans’ level of education, but there is no significant relationship between the level of education and the Swiss Germans’ dislike of German migrants.
DATA

We use data from the Swiss Household Panel (SHP), a yearly panel following a random sample of households and their members in Switzerland since 1999. The SHP dataset provides useful information on various aspects of professional life as well as an indicator on whether respondents are in favor of Switzerland offering foreigners the same opportunities as those offered to Swiss citizens, or whether they favor better opportunities for Swiss citizens. Here we understand attitudes toward equal opportunities for foreigners as a case of attitudes toward foreigners more generally, and use the two terms interchangeably.

The empirical analysis is based on two waves of the panel, in 1999 and 2011, each of which is used as a cross-section. Accordingly, cross-sectional individual weights are used to produce representative estimates of the population in Switzerland.\textsuperscript{4} Hereafter, we focus on 1999 because the politicization of immigration was probably less pronounced at the time than in recent years, meaning that our analyses constitute a “least likely” case for labor force effects.\textsuperscript{5} The reported results, however, can be replicated for more recent years. As we show, estimation results for 2011 do not deviate from those presented here. These results are reported in Tables S14–S17.

In 1999, the question on equal opportunities for foreigners was asked in a more fine-grained way than in subsequent years. While the variable capturing attitudes toward equal opportunities for foreigners is available in all waves, it generally uses an ordered response with three categories (“in favor of equal opportunities for foreigners” (1), “neither of them” (2), and “in favor of better opportunities for Swiss citizens” (3)). In 1999, individuals responding “1” or “3” were also asked whether they

\textsuperscript{4}The SHP dataset includes cross-sectional weights to adjust for non-response at the individual and household level. See Graf (2009) for a detailed description of the procedures implemented for computing weights in the SHP. Using Stata’s \texttt{svy} command, all regression analyses incorporate cross-sectional individual weights to take into account the sampling design of the SHP and obtain reliable estimates concerning the population of interest. Stata calculates robust standard errors using the ‘linearization’ variance estimator based on a first-order Taylor series linear approximation.

\textsuperscript{5}Recall that while immigration is perhaps increasingly politicized in recent years, it has been the topic of heated debates in Switzerland at least since the 1970s with the so-called Schwarzenbach initiatives to limit the proportion of foreigners (Ruedin and D’Amato 2015).
are rather in favor or strongly in favor. This allows us to code the response as an ordered response with five categories.

Our sample consists of Swiss citizens of voting age who are active in the labor market, and we only keep respondents who reported valid information for the variables of interest (i.e., attitudes toward foreigners and risk of unemployment). To check whether education reflects non-labor market considerations, we additionally use subsamples of individuals not in the labor force: both the total subsample and only retired people—those aged 65 and older. Tables S1 and S12 give further details on the sample selection procedure for 1999 and 2011, respectively.

While the main analyses use data from the SHP survey, we also provide results drawing on the European Social Survey (ESS) and the World Value Survey (WVS). These additional analyses allow us to ascertain—rather than just assert—that the findings based on the SHP data are more generally valid. Table S13 shows the sample selection procedure based on the ESS and WVS datasets.

**METHODS**

To explain attitudes toward equal opportunities for foreigners, we estimate the following baseline equations broadly similar to the specification adopted in the literature analyzing the determinants of attitudes toward immigration:

\[ y_i^* = \alpha_s S_i + X_i \beta + \epsilon_i \]  

\[ y_i^* = \alpha_1 L_{1i} + \alpha_3 L_{3i} + X_i \beta + \epsilon_i \]

where the dependent variable \( y_i^* \) is the unobserved latent variable for attitudes toward foreigners, \( X_i \) is a vector of observed personal characteristics, including a dummy for gender, age, age squared, a binary variable for father’s and mother’s national origin, respectively.\(^6\) Two specifications are used: Equation (1) incorporates years of schooling \( S_i \), while in equa-

\(^6\)Individual income is not controlled for in this analysis, whereas it has been found to be an important determinant of individual preferences towards immigration in some previous studies (e.g., Facchini and Mayda 2009, 2012). We have replicated all the estimation results after including the log of gross annual income from work (deflated into 2000 Swiss francs). Given the close correlation between income and education, the association between the log of income and the probability of having positive attitudes towards foreigners is generally not significant. In addition, the inclusion of the income variable does not alter the findings (compare Table S8 with Table S11).
tion (2) years of schooling are replaced by levels of schooling $L_{hi}$ (with $h \in \{1, 2, 3\}$). According to the second specification, individuals with primary or lower secondary education ($h = 1$) and individuals with tertiary education ($h = 3$) are compared to those with upper secondary education ($h = 2$). Years and levels of schooling are both derived from the highest level of education achieved, consisting of 10 levels classified in an increasing hierarchical order. While Table S2 shows how each level of education is translated into the total number of years of schooling, Table S3 presents all explanatory variables included in the regression analyses, and descriptive sample statistics are shown in Table S4.

To account for the ordinal nature of the observed dependent variable $y_i$, we use ordered probit estimations where

$$
\varepsilon_i \mid \text{covariates} \sim \text{Normal}(0, 1).
$$

The continuous latent variable $y_i^*$ can be thought of as the propensity to exhibit positive attitudes toward foreigners. The observed response categories are tied to the latent variable as follows:

$$
y_i = \begin{cases} 
1 & \text{Strongly in favor of better opportunities for Swiss citizens} \\
2 & \text{Rather in favor of better opportunities for Swiss citizens} \\
3 & \text{Neither of them} \\
4 & \text{Rather in favor of equal opportunities for foreigners} \\
5 & \text{Strongly in favor of equal opportunities for foreigners}
\end{cases}
$$

if $y_i^* \leq \mu_1$

if $\mu_1 < y_i^* \leq \mu_2$

if $\mu_2 < y_i^* \leq \mu_3$

if $\mu_3 < y_i^* \leq \mu_4$

if $\mu_4 < y_i^*$

Foreigners recently settled in Switzerland are over-represented at both the bottom and particularly the top of the education distribution (compare Figure II). Following labor market competition theory, we expect low- and highly educated Swiss workers to be more opposed than those in the middle category. Accordingly, we formulate the following formal test of the labor market competition thesis:

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7 Following Flückiger and Ramirez (2000) and de Coulon et al. (2003), a duration of seven years has been attributed to workers with incomplete compulsory schooling; in terms of levels of schooling completed, these individuals have been included among those with primary or lower secondary education ($h = 1$).
As recognized by an increasing number of scholars (e.g., Scheve and Slaughter 2001; Hainmueller and Hiscox 2007), if education is highly correlated with individual values and beliefs, the relationship between the educational attributes of workers and their attitudes toward foreigners should have very little, if anything, to do with fears about labor market competition:

\[ \alpha_1 < 0 \text{ and } \alpha_3 < 0 \]

Scheve and Slaughter (2001) propose two procedures to test whether education affects attitudes through non-economic factors. First, the baseline models are also estimated for the not-in-labor-force subsample; if the estimates associated with education deliver the same conclusion than those computed on the basis of the sample of workers, years or levels of schooling are probably unsatisfactory measures of labor market skills. Another check consists of extending the baseline models to account for indicators of individual values and beliefs such as opinions on Swiss tradition and trust in organizations for the defense of human rights. In addition, we perform sensitivity analysis in which we replace levels of education by levels of occupation using the one-digit ISCO code condensed into four categories, as did Dumont and Monso (2007):

\[
y^*_i = \tilde{\alpha}_0 \tilde{L}_{0i} + \tilde{\alpha}_1 \tilde{L}_{1i} + \tilde{\alpha}_3 \tilde{L}_{3i} + \mathbf{X}_i \beta + \epsilon_i
\]

where \( \tilde{L}_{0i} \) is a binary variable for missing values, \( \tilde{L}_{1i} \) is a binary variable for jobs demanding low skills (=1 for ISCO category 9), \( \tilde{L}_{2i} \) is a binary variable for jobs demanding intermediate skills (=1 for ISCO categories 4–8), and \( \tilde{L}_{3i} \) is a binary variable for jobs demanding high skills (=1 for ISCO categories 1–3). We use separate models that include levels of education and levels of occupation to directly relate to the different approaches common in the literature. At the same time, this approach demonstrates the robustness of the results — which will be immediately apparent from the juxtaposed figures and tables.

8These variables are not available in 2011, so we rely on other proxies for values and beliefs, namely general trust in people and political position. Both sets of values, used in 1999 and 2011, correspond to concepts highlighted by relevant theory.
In line with Ortega and Polavieja (2012), we furthermore rely on an extended model to understand how risk of unemployment induces more exposure to labor market competition from foreigners:

\[ y_i^* = \alpha_1 L_{1i} + \alpha_3 L_{3i} + \gamma U_i + \mathbf{X}_i \beta + \epsilon_i \]  

(2’)

\[ y_i^* = \tilde{\alpha}_0 \tilde{L}_{0i} + \tilde{\alpha}_1 \tilde{L}_{1i} + \tilde{\alpha}_3 \tilde{L}_{3i} + \gamma U_i + \mathbf{X}_i \beta + \epsilon_i \]  

(3’)

where the self-assessed risk of unemployment in the following 12 months $U_i$, based on a scale from “0” (“no risk at all”) to “10” (“a real risk”), is added as an additional variable to the models in equations (2) and (3). Swiss workers with a higher risk of unemployment are likely to be more exposed to labor market competition and can thus be expected to have more negative attitudes toward foreigners:

$\gamma < 0$

To investigate possible interactions between risk of unemployment and education, we also estimate the model on three subsamples: (1) individuals with (in)complete primary or lower secondary-level education, (2) those with upper secondary-level education, and (3) those with tertiary level education. As an additional robustness check, we provide estimates by level of occupation rather than education.

It is important to keep in mind that the risk of unemployment is unlikely to be randomly determined; in other words, this variable is probably endogenous in our equations and thus correlated with $\epsilon_i$. Ignoring this endogeneity problem may lead to biased estimates of the attitudinal effects associated with the risk of unemployment. We test for endogeneity of $U_i$ using a similar version of the two-step approach developed by Rivers and Vuong (1988). Following Wooldridge (2010), we run the OLS regression of $U_i$ on our control variables and the variable unemployment occurrence in the last 12 months as an instrument, save the residuals, and run the ordered probit $y_i$ on our control variables, $U_i$ and the residuals.

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9Based on ordinal values of the variable “unemployment occurrence in the last 12 months,” we construct the following binary variable: no occurrence (reference category) versus once or several times.
from the first step. The $t$ statistic on the latter is a valid test of the null
hypothesis that $U_t$ is exogenous. Our choice of instrument is motivated
by the well-documented *scarring* effects of unemployment experience on
subsequent employment outcomes (e.g., Arulampalam, Booth, and Taylor
2000; Arulampalam, Gregg, and Gregory 2001; Gangl 2004). Accordingly,
we expect a significant impact of unemployment occurrences in the
previous year on the future risk of unemployment at work.

As a reminder, the hypotheses can be summarized as follows:

**Hypothesis 1**: Exposure to labor market competition is associated with
negative attitudes, in particular for those at the bottom and top of the
education distribution ($\alpha_1 < 0$ and $\alpha_3 < 0$). The same applies if levels
of education are replaced by levels of occupation ($\tilde{\alpha}_1 < 0$ and
$\tilde{\alpha}_3 < 0$).

**Hypothesis 2**: If individual values and beliefs are accounted for, there is
no significant association between levels of education and attitudes toward
foreigners ($\alpha_1 = 0$ and $\alpha_3 = 0$).

| TABLE 1 | ORDERED PROBIT MODEL: BASELINE MODELS WITH EDUCATION |
|----------|--------------------------------------------------|
| **Equation** | (1) | (2) |
| $S$: years of schooling | 0.086** (0.007) | |
| $L_2$: upper secondary education (base) | | |
| $L_1$: compulsory education | | $-0.199** (0.054)$ |
| $L_3$: tertiary education | | $0.349** (0.040)$ |
| Male (base) | | |
| Female | 0.003 (0.035) | 0.003 (0.035) |
| Age | 0.015* (0.009) | 0.017* (0.009) |
| Age$^2$ | $-0.000** (0.000)$ | $-0.000** (0.000)$ |
| Father: Swiss (base) | | |
| Father: dual nationality | 0.306** (0.135) | 0.318** (0.136) |
| Father: foreign nationality | 0.171** (0.074) | 0.183** (0.073) |
| Father: missing nationality | 0.256 (0.167) | 0.244 (0.165) |
| Mother: Swiss (base) | | |
| Mother: dual nationality | 0.130 (0.082) | 0.132 (0.082) |
| Mother: foreign nationality | 0.191** (0.076) | 0.200** (0.075) |
| Mother: missing nationality | 0.088 (0.172) | 0.079 (0.171) |
| Canton dummies | Yes | Yes |
| Observations | 4,222 | 4,222 |
| Percentage correctly predicted | 33.6% | 33.6% |

Swiss Household Panel, first wave in the SHP_I sample (1999).
Notes: Linearized standard errors in parentheses. **$p < 0.05$, *$p < 0.10.$ Coefficient estimates, data are weighted.
Dependent variable: attitudes toward equal opportunity for foreigners; the label “compulsory education” captures
primary and lower secondary education.
Hypothesis 3: Individuals with an increased risk of unemployment are more likely to have negative attitudes toward foreigners ($\gamma < 0$).

FINDINGS

In a first step, we examine the relationship between education and attitudes toward equal opportunities for immigrants. Ordered probit estimates from the baseline models are presented in Table 1. In line with prior research on the determinants of attitudes toward immigration, estimates from equation (1) in the first column show that the coefficient associated with years of education is significantly positive; this result is confirmed by estimates from equation (2) in the second column. Compared to middle-educated workers, those with low levels of education tend to exhibit anti-foreigner attitudes ($\alpha_1 < 0$) while those with high levels of education tend to hold positive attitudes ($\alpha_3 > 0$). This means that the labor competition argument, as specified in Hypothesis 1, seems to be relevant only among low-educated workers. Most of the other estimates have

| TABLE 2 |
|---|
| ORDERED PROBIT MODEL: ACTIVE IN THE LABOR MARKET (BASELINE MODELS) VERSUS OUT OF THE LABOR FORCE |

| Equation | Active in the Labor Market | Out of the Labor Force |
|---|---|---|
| | (1) | (2) | (1) | (2) | (1) | (2) |
| $S$: years of schooling | 0.086** | 0.061** | 0.059** |
| | (0.007) | (0.010) | (0.015) |
| $L_2$: upper secondary education (base) | -0.199** | -0.198** | -0.250** |
| | (0.054) | (0.061) | (0.095) |
| $L_1$: compulsory education | 0.349** | 0.281** | 0.253** |
| | (0.040) | (0.075) | (0.109) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Canton dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,222 | 4,222 | 1,877 | 1,877 | 776 | 776 |
| Percentage correctly predicted | 33.6% | 33.6% | 33.0% | 33.0% | 33.8% | 33.8% |

Swiss Household Panel, first wave in the SHP_I sample (1999).

Notes: Linearized standard errors in parentheses. **$p < 0.05$. Coefficient estimates, data are weighted. Dependent variable: attitudes toward equal opportunity for foreigners; the label ”compulsory education” captures primary and lower secondary education.
the expected sign, in particular: having a mother or a father of foreign origin increases the propensity to exhibit positive attitudes toward foreigners.

The negative relationship between education and anti-foreigner attitudes may be attributed to the fact that individuals with low levels of education are more likely to be conservative in the sense of greater ties to Swiss tradition and lower trust in organizations for the defense of human rights (compare Kam 2012; Hatemi et al. 2011 for potential underlying mechanisms). When running the ordered probit regression on the subsample of those out of the labor force, we get substantively the same results as for the baseline models, regardless of whether the entire subsample or only retired people are considered. Indeed, as shown in Table 2, all estimates associated with years of schooling are significantly positive and those derived from equation (2) provide the same pattern of results. According to this initial set of checks, the educational variables seem to measure non-labor market considerations.

In a second series of procedures, we control for individual indicators of values and beliefs when estimating the baseline models. $F$ tests, reported in the last row of Table 3, indicate that their inclusion is jointly significant. As presented in the fourth column of the same table, the coefficient associated with years of education is still significant when values and beliefs are taken into account. By contrast, when nonlinearity in educational attainment is considered, the significant relationship between a low level of education and attitudes vanishes ($\alpha_1 = 0$), while the coefficient associated with a high level of education remains significantly

---

10 As noted by Hainmueller and Hiscox (2007) and Ortega and Polavieja (2012) among others, indicators of individual values and beliefs might be endogenous, in the sense that the relationship between values/beliefs and education may result from concerns about labor market competition. To deal with this issue, we follow the procedure suggested by Hainmueller and Hiscox which consists of estimating levels of (1) trust in organizations for the defence of human rights, and (2) attachment to Swiss tradition using education as a predictor. If the indicators of individual values and beliefs are endogenous to labor market concerns, the relationship between these indicators and education should be significant among individuals in the labor force, but not significant among those out of the labor force. Table S7 presents significant estimates of the same sign for the education variable among both subsamples, meaning that the association between values and education is not driven by labor market concerns. The same conclusion follows when education is replaced by occupation.
positive. Replacing levels of schooling with levels of occupation does not change the previous statement, in particular: Only the category of workers in jobs demanding high skills is associated with positive attitudes toward foreigners, whether or not we control for values and beliefs.

All in all, these findings indicate that the labor market competition hypothesis is rejected in favor of Hypothesis 2 as the strong relationship between a low level of education and anti-foreigner attitudes is mainly due to the omission of values and beliefs. This finding contrasts with Hello, Scheepers, and Sleegers (2006), who found that perceived threat (and not values or personality traits) is the most important factor explaining the educational effect on attitudes toward ethnic minorities among a Dutch sample of young adults. Here, the insignificant attitudinal effects for low-educated workers and those in low-skilled jobs are consistent with

| TABLE 3 | ORDERED PROBIT MODEL: ADDING INDIVIDUAL VALUES AND BELIEFS |
| --- | --- |
| Equation | No Proxies for Values and Beliefs | Proxies for Values and Beliefs |
| | (1) | (2) | (3) | (1) | (2) | (3) |
| $S$: years of schooling | 0.086** | 0.054** |
| | (0.007) | (0.007) |
| $L_2$: upper secondary education (base) | $L_1$: compulsory education | $L_2$: tertiary education |
| | $-0.199**$ | $0.349**$ |
| | (0.054) | (0.040) |
| | $-0.057$ | $0.222**$ |
| | (0.055) | (0.041) |
| $L_2$: medium skills (base) | $L_0$: missing | $L_1$: low skills |
| | 0.011 | $-0.005$ |
| | (0.100) | (0.079) |
| | $-0.064$ | $-0.007$ |
| | (0.102) | (0.080) |
| $L_2$: high skills | 0.470** | 0.307*** |
| | (0.036) | (0.038) |
| Proxies for values and beliefs | No | No | No | Yes | Yes | Yes |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Canton dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,222 | 4,222 | 4,222 | 4,222 | 4,222 | 4,222 |
| Percentage correctly predicted | 33.6% | 33.6% | 33.9% | 40.5% | 40.7% | 40.7% |
| Test for joint significance of values and beliefs | $>F(16, 4200)$ |
| | 34.02** | 35.70** | 34.10** |

Swiss Household Panel, first wave in the SHP_I sample (1999).
Notes: Linearized standard errors in parentheses. **p < 0.05. Coefficient estimates, data are weighted. Dependent variable: attitudes toward equal opportunity for foreigners; the label "compulsory education" captures primary and lower secondary education.
results from recent studies on the wage impact of immigration in Switzerland (Gerfin and Kaiser 2010; Favre 2011) showing no evidence for negative wage effects in low-skilled occupations. Favre argues that there is little room for downward adjustment of wages in low-skill occupations as most of the latter are covered by collective agreements ensuring minimum wage protection. Put differently, immigration flows to Switzerland may simply not put native workers under pressure.

With respect to the remaining significant positive association between high levels of education/skills and positive attitudes, recall that our proxies only cover some aspects of relevant values and beliefs. For instance, workers with higher education may be more prone to have friends from different countries, a characteristic that we are not able to capture on the basis of our data. We are also unable to capture the tendency to control prejudice (Blinder, Ford, and Ivarsflaten 2013), which is more prevalent among those with higher levels of education. On the other hand, it could indeed be in the interest of skilled natives to ensure equal access for legally admitted migrants to the labor market more generally. Recent research has stressed the role of skilled migration in generating benefits for destination countries (e.g., Chiswick 1999; Hunt and Gauthier-Loiselle 2010; Kerr and Lincoln 2010; Stuben, Mobarak, and Maskus 2012). This is particularly relevant in the Swiss case where some professional fields are regularly experiencing shortages of qualified labor, despite increasing levels of highly skilled immigrants overall.

**Risk of Unemployment**

Thus far, we were unable to find clear support for the labor competition theory as stipulated in Hypothesis 1. Relying on education and occupation variables, however, provides an incomplete picture of the labor market exposure to foreign competitors. Accordingly, in this section, we go a step further by including the risk of unemployment in the models in equations (2) and (3). As shown in the first column of Tables 4 and 5, respectively, the findings outlined above remain valid when including individual risk of unemployment in the models: Only workers with a tertiary education or in highly skilled occupations have significantly more positive attitudes toward foreigners than the middle category. Moreover, the risk of unemployment does not seem to be relevant in explaining attitudes toward foreigners in itself; its coefficient
estimates are statistically insignificant and, a priori, Hypothesis 3 that the risk of unemployment matters for attitudes is rejected. However, estimating the ordered probit model separately for each level of edu-

TABLE 4
ORDERED PROBIT MODEL: ADDING UNEMPLOYMENT RISK IN EQUATION (2)

| Sample          | All | $L_1$ | $L_2$ | $L_3$ |
|-----------------|-----|-------|-------|-------|
| $L_2$: upper secondary education (base) |     |       |       |       |
| $L_1$: compulsory education       | 0.055 (0.056) |       |       |       |
| $L_3$: tertiary education         | 0.212** (0.041) |       |       |       |
| $U$: unemployment risk            | 0.008 (0.007) | 0.009 (0.019) | 0.002 (0.009) | -0.037** (0.016) |
| Control variables                 | Yes | Yes   | Yes   | Yes   |
| Canton dummies                   | Yes | Yes   | Yes   | Yes   |
| Proxies for values and beliefs   | Yes | Yes   | Yes   | Yes   |
| Observations                     | 4,090 | 537   | 2,412 | 1,141 |
| Percentage correctly predicted   | 40.8% | 41.0% | 39.3% | 45.7% |
| Test for joint significance of the excluded instruments in the first stage | 46.3** | 6.8** | 29.6** | 12.4** |
| Test for exogeneity of $U_i$ >t statistic | -0.64 | -0.17 | -1.10 | 0.18 |

Swiss Household Panel, first wave in the SHP_I sample (1999).
Notes: Linearized standard errors in parentheses. **p < 0.05. Coefficient estimates, data are weighted. Dependent variable: attitudes toward equal opportunity for foreigners; the label "compulsory education" captures primary and lower secondary education.

TABLE 5
ORDERED PROBIT MODEL: ADDING UNEMPLOYMENT RISK IN EQUATION (3)

| Sample          | All | $L_0 & L_1$ | $L_2$ | $L_3$ |
|-----------------|-----|-------------|-------|-------|
| $L_2$: medium skills (base) |     |             |       |       |
| $L_0$: missing   | 0.058 (0.112) |             |       |       |
| $L_1$: low skills   | -0.004 (0.081) |             |       |       |
| $L_3$: high skills  | 0.288** (0.038) |             |       |       |
| $U$: unemployment risk | 0.008 (0.007) | 0.006 (0.029) | 0.011 (0.010) | -0.037** (0.011) |
| Control variables | Yes | Yes         | Yes   | Yes   |
| Canton dummies    | Yes | Yes         | Yes   | Yes   |
| Proxies for values and beliefs | Yes | Yes         | Yes   | Yes   |
| Observations      | 4,090 | 305         | 1,651 | 2,134 |
| Percentage correctly predicted | 40.9% | 40.7% | 37.2% | 43.9% |
| Test for joint significance of the excluded instruments in the first stage | 45.7** | 6.3** | 24.1** | 18.3** |
| Test for exogeneity of $U_i$ >t statistic | -1.18 | -0.28 | 0.62 | -1.30 |

Swiss Household Panel, first wave in the SHP_I sample (1999).
Notes: Linearized standard errors in parentheses. **p < 0.05. Coefficient estimates, data are weighted. Dependent variable: attitudes toward equal opportunity for foreigners.

estimates are statistically insignificant and, a priori, Hypothesis 3 that the risk of unemployment matters for attitudes is rejected. However, estimating the ordered probit model separately for each level of educa-
tion or occupation shows that the propensity to hold positive attitudes toward foreigners decreases with an increasing risk of unemployment only among highly educated workers or those in jobs demanding high skills (cf. second, third, and fourth column in Tables 4 and 5, respectively). This result is independent of whether values and beliefs are controlled for (cf. Tables S5 and S6). In line with Hypothesis 3, among highly educated workers, attitudes toward foreigners become more negative with higher risk of unemployment. This finding is somewhat reminiscent of Facchini and Mayda (2012) who found, on the basis of the ESS data, that more educated natives are less likely to favor skilled immigration. Here we use a dependent variable more appropriate to capture labor force competition.

The impact of risk of unemployment on attitudes is highlighted in Figures III and IV where predicted probabilities for $y_i = 1$ (i.e.,
strongly against equal opportunities) and \( y_i = 5 \) (i.e., strongly in favor of equal opportunities) are plotted as a function of self-reported risk of unemployment by education or occupation level, respectively. All explanatory variables in \( X_i \) are set to their mean. While the highest change in predicted probabilities — visible by the steepest curve — is found among highly educated workers and those in jobs demanding high skills, there is no significant change with an increasing risk of unemployment when considering other levels of education or skills. As illustrated in Figure III, for a ten-unit increase in unemployment risk (from zero to 10), the highly educated see the predicted probability of being strongly against equal opportunities doubling from 0.05 to 0.1, whereas their predicted probability of being strongly in favor of equal opportunities decreases by more than 10 percentage points. The predicted probabilities by occupation level shown in Figure IV lead to the same conclusions.

As a final test, we consider endogeneity bias using the variable \textit{unemployment occurrence in the last 12 months} as an instrumental variable. The result of the exogeneity test is presented at the bottom of Tables 4 and 5. It should be emphasized that our instrument is a significant predictor of \( U_i \) in the first-stage equation, with most values of the \( F \) statistic exceeding
In addition, low values of the $t$ statistic indicate that the residuals in the second stage are never significant at a level of 10 percent (cf. last rows), meaning the null hypothesis of exogeneity is not rejected in all samples. Thus, there is no evidence of endogeneity bias in the estimated coefficients of $U_i$.

Additional Evidence from the ESS and WVS

The attitudinal question in the SHP captures preferences with regard to equal opportunities for foreigners instead of focusing on respondents’ desired level of immigration as is commonly done in the literature. In this section, we use data from the European Social Survey (ESS, round 1) and the World Value Survey (WVS, waves 3 and 5 combined) to examine to what extent the drivers of attitudes toward equal opportunities correspond to those of attitudes toward immigrants more generally. This will help to better understand the results presented and put them into perspective.

Both the ESS and the WVS include various questions on public opinion on immigration policy and have been used in various studies such as Mayda (2006) or Hainmueller and Hiscox (2007). We use two dependent variables from each survey. In the case of the ESS, we adopt the ordinal version of the variable used by Facchini and Mayda (2009) drawing on the individual perception about how many immigrants (of the same race and ethnic group as the majority) should be allowed in. The second variable for attitudes is a variation on the former, asking about immigrants belonging to a different race or ethnic group. In the case of the WVS, we use a question on immigration preferences already used by Mayda (2006), as well as a question more similar to the one used in this article: Whether employers should give priority to natives over immigrants when jobs are scarce. With regard to the explanatory variables, it is important to note the following: Years/Levels of education and the ISCO code for occupation are available in the ESS, while the WVS only includes levels of education. We replicate ordered probit models on the basis of the baseline equations. Equations (1) to (3) can only be estimated using data from the ESS. Neither the ESS nor the WVS contains information on the

Stock and Watson (2003) suggest a simple rule of thumb according to which a first-stage $F$ statistic lower than 10 indicates weak instruments, that is instruments in first-stage linear regressions are weakly correlated with the included endogenous variables.
individual risk of unemployment, and we are unable to estimate equations (2') and (3').

The results of three models using data from the ESS are presented in Table 6. The findings correspond to those reported in the main part of this article. In line with previous research, there is a significant positive association between education and pro-immigration attitudes. Indeed, as above, only the coefficient for tertiary education is significant (Model 2). This is also true for Model 3 that uses levels of occupation, and there are no substantive differences between the two dependent variables (i.e., whether the race/ethnicity of immigrants is the same as that of the majority population). Taken together, this is further evidence that Hypothesis 1 of labor market competition should be rejected, even without controls for values and beliefs. In none of the models does the inclusion of income affect the predicted attitudes or any other variable in the model in a significant way.

Table 7 draws on data from the WVS and shows results that are more mixed. In particular, the statistical effect of education is different depending on whether attitudes refer to the desired level of immigration or to preference for hiring native workers. This complements findings by Jessen and Engesbak (1994) who showed evidence for the multifaceted impact of education on Norwegian attitudes toward immigrants. Their results indicate that the impact of education varies as a function of the types of attitudes under consideration. In their analysis, the level of education is found to have a sizeable impact particularly when attitudes capture views about equal rights or stereotypic beliefs about immigrants. Here, the results for hiring native workers (right-hand side of Table 7) are in line with those using the SHP: Compared to Swiss-born workers with a middle level of education, only those with an upper level of education have significantly more positive attitudes once equation (2) includes a full set of controls for values and beliefs.13 By contrast, adding proxies for values and beliefs in the models of attitudes toward immigration (left-hand side of Table 7) does not remove the statistical significance of education. Taken together, there is partial support for Hypothesis 1 (labor market

13The way how values and beliefs are measured is very much data-driven. While the chosen proxies in the ESS and the WVS are quite different from those in the SHP, most of them have been employed in the literature to control for individual values. For instance, Ortega and Polavieja (2012) considered a rich set of variables reflecting various facets of values such as ideology, religiosity, happiness, trust, and social capital.
## TABLE 6
**Ordered Probit Model: Education Versus Occupation Levels**

| Dependent Variable: Favor Immigration of | Same Race/Ethnic Group as Majority | Different Race/Ethnic Group from Majority |
|------------------------------------------|------------------------------------|-------------------------------------------|
| Equation                                 | (1)                                | (2)                                       |
|                                          | (3)                                | (3)                                       |
| $S$: years of fulltime education completed| 0.066**                            | 0.078**                                   |
|                                          | (0.012)                            | (0.012)                                   |
| $L_2$: upper secondary education (base)  | 0.356                              | 0.711**                                   |
| $L_2$: other education                  | (0.239)                            | (0.181)                                   |
| $L_1$: compulsory education             | -0.052                             | -0.089                                    |
|                                          | (0.111)                            | (0.121)                                   |
| $L_3$: tertiary education               | 0.533**                            | 0.540**                                   |
|                                          | (0.089)                            | (0.088)                                   |
| $L_2$: medium skills (base)             |                                    |                                           |
| $L_0$: missing                          | 0.600**                            | 0.317                                     |
|                                          | (0.235)                            | (0.217)                                   |
| $L_1$: low skills                       | -0.013                             | -0.164                                    |
|                                          | (0.253)                            | (0.236)                                   |
| $L_3$: high skills                      | 0.462**                            | 0.476**                                   |
|                                          | (0.082)                            | (0.081)                                   |
| Household income                        |                                    |                                           |
| Less than €150 monthly (base)           |                                    |                                           |
| 150–300                                 | 0.179                              | 0.194                                     |
|                                          | (0.886)                            | (0.818)                                   |
| 300–500                                 | -0.239                             | -0.072                                    |
|                                          | (0.864)                            | (0.772)                                   |
| 500–1,000                               | 0.067                              | 0.082                                     |
|                                          | (0.921)                            | (0.855)                                   |
| 1,000–1,500                             | 0.125                              | -0.252                                    |
|                                          | (0.875)                            | (0.766)                                   |
| 1,500–2,000                             | -0.077                             | -0.252                                    |
|                                          | (0.844)                            | (0.747)                                   |
### TABLE 6 (CONTINUED)

**Ordered Probit Model: Education Versus Occupation Levels**

| Dependent Variable: Favor Immigration of | Same Race/Ethnic Group as Majority | Different Race/Ethnic Group from Majority |
|----------------------------------------|-----------------------------------|------------------------------------------|
| Equation                                | (1) (2) (3)                        | (1) (2) (3)                               |
| 2,000–2,500                             | −0.244 (0.844)                     | −0.124 (0.680)                            |
|                                         | −0.222 (0.800)                     | −0.083 (0.568)                            |
|                                         | −0.090 (0.740)                     | 0.013 (0.578)                             |
| 2,500–3,000                             | −0.466 (0.833)                     | −0.287 (0.677)                            |
|                                         | −0.442 (0.791)                     | −0.251 (0.566)                            |
|                                         | −0.352 (0.731)                     | −0.204 (0.579)                            |
| 3,000–5,000                             | −0.235 (0.826)                     | −0.042 (0.666)                            |
|                                         | −0.194 (0.783)                     | 0.013 (0.552)                             |
|                                         | −0.132 (0.724)                     | 0.021 (0.567)                             |
| 5,000–7,500                             | −0.033 (0.827)                     | 0.033 (0.667)                             |
|                                         | 0.018 (0.784)                      | 0.072 (0.554)                             |
|                                         | 0.054 (0.725)                      | 0.089 (0.567)                             |
| 7,500–10,000                            | 0.218 (0.839)                      | 0.099 (0.678)                             |
|                                         | 0.259 (0.795)                      | 0.170 (0.566)                             |
|                                         | 0.341 (0.737)                      | 0.190 (0.579)                             |
| More than 10,000                        | 0.146 (0.844)                      | −0.133 (0.686)                            |
|                                         | 0.225 (0.800)                      | −0.013 (0.575)                            |
|                                         | 0.338 (0.743)                      | 0.061 (0.588)                             |
| Missing                                 | −0.285 (0.826)                     | −0.329 (0.668)                            |
|                                         | −0.232 (0.783)                     | −0.258 (0.553)                            |
|                                         | −0.159 (0.723)                     | −0.235 (0.566)                            |
| Proxies for values and beliefs          | No                                 | No                                        |
| Control variables                       | Yes                                | Yes                                       |
| Canton dummies                          | Yes                                | Yes                                       |
| Observations                            | 1,099                              | 1,099                                     |
| Percentage correctly predicted          | 60.4%                              | 55.1%                                     |

European Social Survey 2002.

Notes: Linearized standard errors in parentheses. **p < 0.05. Coefficient estimates, data are weighted. The dependent variables are based on a 1 (allow none) to 4 (allow many immigrants to come and live in one's country) scale. $I_e$ includes individuals in armed forces or in missing occupations. Unreported control variables are a dummy for gender (=1 if female, =0 otherwise), age, age squared, two dummies for father's place of birth (foreign-born, missing values, being Swiss-born as reference category), two dummies for mother's place of birth (foreign-born, missing values, being Swiss-born as reference category), five region dummies (Central Middleland, North Switzerland, Central Switzerland, West Switzerland, Ticino; Lake Geneva as reference category). Estimation results including controls for variables of values and beliefs, alike those used by Hainmueller and Hiscox (2007), lead to the same conclusions. Estimates associated with levels of education or occupation remain unchanged when excluding the income variable.
## TABLE 7
### ORDERED PROBIT MODEL: EDUCATION, INDIVIDUAL VALUES, AND BELIEFS

| Dependent Variables | Pro-Immigration Policy | Equal Job Opportunity for Immigrants |
|---------------------|------------------------|---------------------------------------|
|                     | (1) | (2) | (3) | (1) | (2) | (3) |
| $L_2$: middle level of education (base) | -0.465** | -0.416** | -0.377** | -0.360** | -0.278* | -0.233 |
|                     | (0.133) | (0.139) | (0.137) | (0.153) | (0.156) | (0.157) |
| $L_1$: lower level of education | 0.512** | 0.423** | 0.384** | 0.469** | 0.361** | 0.330** |
|                     | (0.094) | (0.097) | (0.098) | (0.102) | (0.107) | (0.108) |
| Relative income | | | | | | |
| Lowest decile (base) | | | | | | |
| 2nd decile | -0.613* | -0.630* | -0.701** | -0.417 | -0.311 | -0.385 |
|                     | (0.365) | (0.370) | (0.348) | (0.331) | (0.315) | (0.314) |
| 3rd decile | -0.485 | -0.402 | -0.426 | -0.064 | 0.172 | 0.143 |
|                     | (0.324) | (0.330) | (0.312) | (0.303) | (0.293) | (0.291) |
| 4th decile | -0.784** | -0.733** | -0.741** | -0.168 | 0.009 | -0.042 |
|                     | (0.318) | (0.322) | (0.303) | (0.297) | (0.283) | (0.280) |
| 5th decile | -0.655** | -0.598* | -0.611** | -0.336 | -0.172 | -0.220 |
|                     | (0.313) | (0.317) | (0.296) | (0.289) | (0.277) | (0.275) |
| 6th decile | -0.521* | -0.450 | -0.491* | -0.156 | 0.058 | -0.013 |
|                     | (0.315) | (0.318) | (0.297) | (0.287) | (0.274) | (0.272) |
| 7th decile | -0.258 | -0.117 | -0.238 | -0.035 | 0.257 | 0.139 |
|                     | (0.312) | (0.316) | (0.295) | (0.291) | (0.278) | (0.279) |
| 8th decile | -0.257 | -0.117 | -0.146 | 0.030 | 0.327 | 0.266 |
|                     | (0.319) | (0.323) | (0.301) | (0.290) | (0.278) | (0.278) |
| 9th decile | -0.557* | -0.437 | -0.506 | -0.275 | -0.054 | -0.141 |
|                     | (0.325) | (0.329) | (0.308) | (0.302) | (0.289) | (0.291) |
| Highest decile | -0.439 | -0.426 | -0.521 | 0.066 | 0.211 | 0.127 |
|                     | (0.336) | (0.344) | (0.324) | (0.303) | (0.293) | (0.292) |
| Missing | -0.389 | -0.315 | -0.323 | -0.157 | 0.035 | -0.003 |
|                     | (0.317) | (0.322) | (0.303) | (0.286) | (0.272) | (0.270) |
| Proxies for values and beliefs | No | Partial | Full | No | Partial | Full |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
TABLE 7 (CONTINUED)
ORDERED PROBIT MODEL: EDUCATION, INDIVIDUAL VALUES, AND BELIEFS

| Dependent Variables | Pro-Immigration Policy | Equal Job Opportunity for Immigrants |
|---------------------|------------------------|-------------------------------------|
|                     | (1)        | (2)        | (3)        | (1)        | (2)        | (3)        |
| Region dummies      | Yes        | Yes        | Yes        | Yes        | Yes        | Yes        |
| Observations        | 1,170      | 1,170      | 1,170      | 1,170      | 1,170      | 1,170      |
| Percentage correctly predicted | 60.0% | 60.5% | 61.1% | 58.6% | 61.9% | 62.2% |
| Test for joint significance of values and beliefs >F statistic | 4.13** | 5.02** | | 4.73** | 3.99** |

Notes: Linearized standard errors in parentheses. **p < 0.05, *p < 0.10. Coefficient estimates, data are weighted. The first dependent variable (left-hand side) is similar to those used in Table 6, taking four values from 1 (=prohibit people coming here from other countries) to 4 (= let anyone come who wants to). The second dependent variable (right-hand side) is similar to the one in the SHP survey, taking three values (=1 if individuals disagree that employers should give priority to natives over immigrants when jobs are scarce, =2 if neither of them, =3 if individuals agree). The three levels of education are derived from the highest educational level attained. Unreported control variables are a dummy for gender (=1 if female, =0 otherwise), age, age squared, a dummy for 2007, two dummies for linguistic regions (“French,” “Italian,” “German” as reference category). The partial set of variables for values and beliefs are taken from Mayda (2006), namely political affiliation with the right (ranging from 1 = “left-wing” to 10 = “right-wing” and expressed in nine dummies for values from 2 to 10, the reference category being 1, plus a dummy for missing values) and two dimensions of national pride (three dummies for values from 2 = “quite proud of own nationality” to 4 = “not at all proud,” the reference category being 1 = “very proud,” plus a dummy for missing values; a dummy for the willingness to fight for one’s country, the reference category being unwillingness, plus a dummy for missing values). In the full set of variables for values and beliefs, the partial set is complemented by two dummies for trust in people (“cannot be too careful in dealing with people,” “missing values,” with “most people can be trusted” as reference category) and four dummies for confidence in the United Nations (“quite a lot of confidence,” “not very much,” “none at all,” “missing values,” with “great deal of confidence” as reference category). Estimation results based on specifications in which the income variable is not controlled to deliver the same conclusions.
competition) as, relative to the middle educated, only Swiss-born workers with a low level of education exhibit more negative attitudes. We note that the estimates for the relative income also differ according to the type of attitudes: While income deciles do not appear to influence attitudes toward equal opportunity at work, people in the second-to-sixth income deciles are less likely to express positive attitudes toward immigration compared to those in the lowest decile. This result may reflect welfare-related self-interest where individuals with low-to-average income reject immigrants who could pose a burden on the welfare state. In any case, the relationship between relative income and attitudes toward immigration tends to be nonlinear.

CONCLUSION

This paper has examined the labor market determinants of attitudes toward immigration, using cross-sectional data from the Swiss Household Panel Survey. Contrary to the existing literature, we used an explicit measure of individual attitudes that captures preferences toward equal opportunities for foreign and Swiss citizens. This allows for a closer test of labor market competition than more common questions like whether more immigrants should be allowed in a country. The case of Switzerland was chosen because of its high share of foreign citizens and a clear concentration of immigrants in both low-skilled and highly skilled occupations. This makes Switzerland an ideal case to study the labor market competition hypothesis, compared to countries where immigrants are concentrated at one end of the scale only. What is more, with low levels of unemployment, the effects of labor market competition outlined in this paper are likely to be more pronounced in other Western European countries, although only explicit tests will be able to confirm this.

While most existing studies use educational attainment to measure labor market skills, it is increasingly acknowledged that such an approach is likely to lead to incorrect conclusions. Indeed, Jenssen and Engesbak (1994) explored the multitude of educational effects on attitudes. In this article, we reflect their argument and explicitly acknowledge that the level of education attained reflects non-economic unobservables in addition to actual skill endowment. For instance, we control for proxies of values and beliefs — opinions on Swiss tradition and trust in organizations for the defense of human rights — when estimating the attitudinal effects of education. When so doing, the analyses highlight that the commonly found
association between low levels of education and negative attitudes toward immigration is likely a reflection of omitted variables. Indeed, once individual values and beliefs are accounted for in models that allow for non-linear education effects, the impact of having a low level of education on anti-foreigner attitudes is no longer significant. Contrary to predictions by labor market competition theory and many existing studies, low-educated workers do not exhibit anti-foreigner attitudes more than those with medium levels of education.

The situation is different for highly educated workers who are *a priori* more likely to express positive views toward foreigners than their counterparts with an upper secondary education. This difference to individuals with medium levels of education can be found irrespective of the control for values and beliefs. Put differently, the variables of values and beliefs included in this article are unable to explain the attitudinal difference between individuals with upper secondary and tertiary education. In contrast to the other groups considered, however, highly educated workers tend to have more negative attitudes toward foreigners with an increasing risk of unemployment. This finding complements research by Ortega and Polavieja (2012) who showed that highly educated workers protected by more job-specific human capital tend to have more favorable attitudes toward immigrants. Given the low levels of unemployment in Switzerland, we assume that the magnitude of this effect is higher in other contexts. To assess the robustness of our findings, we have also replicated all results using levels of occupation rather than levels of education and used alternative data sources. All in all, our results indicate that the labor market competition hypothesis does hold, but only for workers with a tertiary education or in highly skilled occupations.

Unlike most earlier studies, we account for nonlinearity in the relationship between education and attitudes as foreign workers are over-represented at both the bottom and the top of the educational distribution. This allows a more realistic test of labor force competition and leads to a more detailed account of the relationship between education and attitudes. Coenders and Scheepers (2003) suggest that the effects of education on attitudes are less significant in new democracies. It is unclear as to how this finding affects the nuanced picture presented in this article, and further research is needed in this regard — particularly research that illuminates the mechanism involved. The finding that highly educated and highly skilled individuals are affected by the risk of unemployment clearly suggests that education is more than a reflection of social desirability.
biases (Ostapczuk, Musch, and Moshagen 2009). While this article is unable to say anything about the origins of norms and ideology, variables capturing these non-economic factors are able to account for much of the attitudinal difference often attributed to education: Once ideological factors are taken into consideration, there is no significant difference between individuals with low levels of education and those with medium levels of education.

The analysis incorporating the self-assessed risk of unemployment to capture individual exposure to competition from foreigners suggests that the effects of education on attitudes are indeed multifaceted. As an additional contribution to the literature, we interacted the risk of unemployment with the level of education to relax the assumption that the attitudinal impact of unemployment risk is the same for different educational levels. Similarly, the comparison of results with different dependent variables led to the insight that the predicted effect of education on attitudes toward immigration indeed differs between variables that capture attitudes toward labor force competition more directly. Put differently, the common view that education and attitudes are somewhat inherently linked — albeit due to unclear mechanisms — (e.g., Ceobanu and Escandell 2010; Hainmueller and Hopkins 2014) needs to be revised (see Jenssen and Engesbak 1994; Hello, Scheepers, and Sleegers 2006).

On the whole, the findings in this article reveal that attitudes toward equal opportunities for foreigners cannot be entirely attributable to the skill composition of the foreign workforce within the labor market. Indeed, we have demonstrated that the strong link between a low level of education and negative attitudes toward foreigners is driven by differences in values and beliefs. At the same time, the positive link between high levels of education and positive attitudes toward foreigners hides a more complex picture, in which a higher risk of unemployment leads to less positive attitudes toward foreigners. With this, we find support for labor force competition theory, but only for specific groups: highly educated and highly skilled workers. At the other end of the skills scale, negative attitudes toward foreigners seem to be driven by individual values and beliefs. We would argue that economic and cultural explanations should not be seen as competing theories for attitudes toward foreigners, but as complementary mechanism that affect different parts of the population in distinct ways.
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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher’s web site:

Table S1. Individuals from 1999 retained in the empirical analysis.

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Table S12. Individuals from 2011 retained in the empirical analysis.

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Table S18. Ordered probit model: adding unemployment risk with interactions for 1999.

Table S19. Ordered probit model: adding unemployment risk with interactions for 2011.