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Do emigrants self-select along cultural traits? Evidence from the MENA countries*

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Abstract

This paper empirically investigates whether emigrants from MENA countries self-select on cultural traits such as religiosity and gender-egalitarian attitudes. To do so, we use Gallup World Poll data on individual opinions and beliefs, migration aspirations, short-run migration plans, and preferred destination choices. We find that individuals who intend to emigrate to OECD, high-income countries exhibit significantly lower levels of religiosity than the rest of the population. They also share more gender-egalitarian views, although the effect only holds among the young (aged 15 to 30), among single women, and in countries with a Sunni minority. For countries mostly affected by Arab Spring, since 2011 the degree of cultural selection has decreased. Nevertheless, the aggregate effects of cultural selection should not be overestimated. Overall, self-selection along cultural traits has limited (albeit non negligible) effects on the average characteristics of the population left behind, and on the cultural distance between natives and immigrants in the OECD countries.

Keywords: International migration, self-selection, cultural traits, gender-egalitarian attitudes, religiosity, MENA region.

JEL codes: F22, 015, J61, Z10

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1 Introduction

Human capital and cultural traits are proximate drivers of modernization, economic growth, and democracy. Hence, factors that affect human capital accumulation and the distribution of cultural traits have persistent effects on economic and political outcomes. International migration is one of these factors, and the existing literature has long emphasized that migrants self-select along educational levels (see, among others, Docquier *et al.* (2007); Grogger and Hanson (2011); Belot and Hatton (2012)). On the contrary, migrants' selection along cultural traits, beliefs and practices has been largely understudied. Focusing on the MENA countries, this paper tackles this issue and tests whether migration aspirations, short-run plans to emigrate and preferred destination choices are influenced by cultural traits. We focus on religiosity and attitudes towards women's rights, two traits that are correlated with economic outcomes and for which MENA countries exhibit distinctive distributions.

We use the Gallup World Poll microdata and extract 12 questions on opinions and beliefs, as well as question on migration aspirations, on plans to emigrate within 12 months, and on individual characteristics. Using a double principal component analysis (PCA), we identify four cultural indicators and normalize them between zero and one. Among them, religiosity and gender-egalitarian attitudes are the only ones being correlated with income per capita. Focusing on these two cultural traits, we then investigate (i) whether cultural traits affect the aspirations and plans to emigrate over the 2007-2016 period, (ii) whether selection on culture varies across group of respondents and with country-specific characteristics, and (iii) whether the selection intensity has changed after the Arab Spring. We show that aspiring migrants from the MENA and individuals with concrete migration plans are culturally self-selected, and that this selection along cultural traits depends on the preferred destination choice. Intended migrants to OECD, high-income countries exhibit significantly lower levels of religiosity than intended non-migrants. As far as attitude towards women's rights are concerned, aspiring migrants to OECD countries have more gender-egalitarian views in the age group 15-30, when they are single women, or when they originate from countries with a Sunni minority. Finally, we find a robust effect of the Arab Spring on the intensity of cultural selection, but only in countries highly impacted by the Arab Spring. In these countries, the Arab Spring has decreased the degree of cultural selection. Given the high correlation between aspirations and actual migration flows, our results indicate that emigration to OECD countries potentially impacts the distribution of cultural traits among those left behind. However, the aggregate effects of cultural selection

should not be overestimated. First, self-selected emigration hardly affects the distribution of cultural traits in the MENA countries. Second, it has a limited (albeit non negligible) effect on the cultural distance between natives and immigrants in the OECD countries.

It is worth stressing that our analysis does not make any value judgment about specific cultural traits, and does not argue that cultural differences should be combated or that a set of traits dominates others. Culture shapes the utility function of people, implying that comparisons of economic outcomes do not reflect comparisons in welfare. This is evidenced in Campante and Yanagizawa-Drott (2015), who show that religious practices in Muslims' countries (as measured by the length of the Ramadan fasting period) have negative implications for economic performance, but increase subjective wellbeing among the followers. Nevertheless, there are several reasons that justify focusing on cultural selection in general, and on selection by religiosity and by gender-egalitarian views in particular. First, cultural selection is one of the main mechanisms through which emigration affects the distribution of cultural traits in the population left behind. If not compensated by ex-post transfers of norms and beliefs from destination to origin countries,[1] selection on gender-egalitarian attitudes is likely to impact effective gender inequality, which is repulsive in its own rights. In the same vein, the distribution of cultural traits may affect the openness to innovation and the modernization potential of the origin country. Second, cultural selection may increase the cultural distance between poor and rich countries, which has been seen as a brake on technology diffusion and on the transmission of democratic values. Third, cultural selection is a key determinant of the cultural distance between migrants and host-country citizens, therefore determining the level of cultural diversity at destination, opinions towards immigration, and migrants' capacity to assimilate. The literature on these potential mechanisms has been growing rapidly for the last decade or so.

The idea of culture being an important determinant of economic development levels probably starts with Weber's theory of the Protestant work ethic (Weber (1946)). Culture is seen as a key determinant of individual effort and the overall quality of the institutions that support market friendly exchange. Recent works have produced sound econometric tests of the link between economic outcomes and culture, often using opinion survey data as a means of measuring cultural elements such as economic beliefs (Piketty (1995); Di Tella and MacCulloch (2014)), trust (Knack and Keefer (1997)), etc. The relationship

[1] Rapoport *et al.* (2017) study such transfers of norms. Investigating which of these two effects (i.e., the ex-ante self-selection of migrants, and the ex-post transfers of norms) dominates is beyond the scope of this paper, which solely focuses on the first selection mechanism. To the best of our knowledge there is only one recent study which analyzes the reverse effect of emigration on cultural traits in the MENA countries by Bououiyour and Miftah (2017).

between culture and economic performances has been recently investigated in the Arab context (Gorodnichenko and Roland (2011); Kostenko *et al.* (2017); Diwan and Tzannatos (2017); Kuran (2012)). More related to our work, recent studies focus on the link between views on gender inequalities, religiosity and growth. As far as gender-egalitarian attitudes are concerned, they play a key role in explaining effective discriminations (Bergh (2007); Baxter and Kane (1995)), and the resulting gender inequalities in health, education, political empowerment and employment have long been seen as major barriers to human and economic development (UN (2015); Duflo (2012)). As for religiosity, Benabou *et al.* (2015) identify a negative association with individual openness to innovation and with effective patents per capita.[2] Chase (2014) finds a negative association with economic growth, despite the fact that religiosity tends to reduce the level of corruption. Price (2015) shows that MENA countries hold significantly less egalitarian attitudes toward women's employment and specific levels of religiosity compared to those in all other nations sampled, even after controlling for natural resources. She argues that the negative correlation between religiosity and gender-egalitarian views is magnified among individuals living in the MENA. Moreover, the renewed upturn of patriarchal views due to the recent rise of political Islam intensified gender inequality in the MENA context (Tzannatos (1999); Alexander Welzel (2011); Norris and Inglehart (2011); El Mikawy *et al.* (2017); Stetter (2008)).

Other contributions have highlighted the implications of cultural distance between countries for the speed of technology adoption (e.g. Spolaore and Wacziarg (2012)) and for the democracy transition (e.g. Murtin and Wacziarg (2014)). In their study on the diffusion of economic development, Spolaore and Wacziarg (2009) measure the relatedness between populations using a proxy for cultural distance (based on the probability that two randomly drawn individuals from the two populations share identical genes). They show that genetic distance captures barriers to the diffusion of development, as similarity in genetic traits would tend to facilitate communication and understanding, and hence the diffusion and adaptation of complex technological and institutional innovations. Desmet *et al.* (2011) document that European populations that are genetically closer give more similar answers to a set of 430 questions about norms, values, and cultural characteristics included in the 2005 wave of the World Values Survey (Sections on perceptions of life, family, religion, and morals). Spolaore and Wacziarg (2016) support the same conclusion using a larger set of countries: on average, populations that are more closely genetically related tend to be more similar with respect to traits (habits, customs, beliefs, values, etc.)

[2] It is worth reminding that religion and religiosity are two different concepts. Noland (2005) does not find any negative relation between the share of Muslims in the population and economic performance.

and share closer technological and political characteristics.

Finally, migrants' selection on culture determines the level of cultural diversity in the host country. Although diversity induces beneficial effects on the host country (Ottaviano and Peri (2006); Alesina *et al.* (2016); Docquier *et al.* (2016)), several empirical studies show that immigrants' economic outcomes at destination depend on the distance between their identity and the dominant norms (e.g., Pendakur and Pendakur (2005); Battu and Zenou (2010); Casey and Dustmann (2010); Bisin *et al.* (2011); Islam and Raschky (2013)). The effect is usually negative and its size is uncertain. Perceived cultural distance is also the source of negative attitudes towards immigrants (Card *et al.* (2006)), leading to discrimination, marginalization and exclusion from the economic, social and political life. In particular, Islamophobia has been increasing in Western societies, and around 70% of western natives think that tensions between the Muslim and Western worlds originate in cultural and religious differences (Gallup (2010)).

Migrant selection on culture has potentially important effects on many economic outcomes. However, to the best of our knowledge, there are very few papers investigating the link between cultural traits and migration aspirations. Berlinschi and Harutyunyan (2016) use data from the Life in Transition Survey (LITS) jointly collected by the European Bank of Reconstruction and Development and the World Bank in 2010. It covers around 39,000 households from 34 countries. They identify a positive correlation between migration aspirations from Eastern European or post-Soviet countries and opinions about home-country governance, political participation and trust in other people. More related to our analysis, Myers (2000) finds that migration aspirations of US citizens are negatively correlated with involvement in social activities related to religion. Hoffman *et al.* (2015) finds that external religiosity (e.g., participating in religious activities) and internal religiosity (e.g., spirituality) induce different effects on migration aspirations of Roman Catholic Mexican students: while external religiosity is negatively correlated with migration aspirations, internal religiosity increases the desire to work and live in the US. Using the second (2010-11) and third (2012-14) waves of the Arab Barometer for nine Islamic countries, Falco and Rotondi (2016) focus on the role of radical Islam views measured by opinions about the use of Islamic law in the formulation of penal, personal status and inheritance law. They find that radical views are negatively correlated with migration aspirations. Our paper uses a similar specification but focuses on different origin countries and on specific cultural traits that are often considered as causing cultural tensions in Western societies.

The rest of this paper is organized as following. Section 2 describes our data on

migration aspirations and culture. The empirical specification is discussed in Section 3. Estimation results are presented in Section 4. Finally, Section 5 concludes.

2 Data and stylized facts

We use microdata on migration aspirations, cultural traits and other individual characteristics from the Gallup World Poll (GWP) surveys. Although GWP covers 148 countries, our sample is limited to 17 MENA countries where Gallup conducted at least one wave of its survey between the years 2007 and 2016.[3] On average, the sample includes about 1,000 randomly selected respondents per year and per country. For the majority of countries in our sample, the data are collected through face-to-face interviews. Exceptions are Iran and Iraq, where interviews were mainly conducted through phone calls.[4] The sampling frame is such that GWP data are representative of the entire population aged 15 and over (including populations from rural areas). Our full sample includes 146,680 respondents. However, our analysis is conducted on the working age population only (i.e., individuals aged 15 to 64).[5]

Measuring migration aspirations. – There is a large literature in sociology and demography investigating the determinants of aspirations to migrate (among others, see Becerra (2012); Drinkwater and Ingram (2009); Jónsson (2008); Wood *et al.* (2010)). Most of them focus on a single country; they are hard to compare with each other or across countries. The fact that the GWP database covers many countries makes it exceptional. As the data are relatively new, the literature relying on these data to capture migration aspirations is limited. Manchin *et al.* (2014) investigate the impact of individual satisfaction with local and country-level amenities on the willingness to migrate internationally and locally. Dustmann and Okatenko (2014) study the role of wealth constraints and local amenities in governing migration intentions from sub-Saharan African countries. Docquier *et al.* (2014) and Dao *et al.* (2016) study the determinants of migration aspirations after aggregating GWP data by country pair and by education level. Docquier *et al.* (2015) use the GWP data to proxy the number of potential migrants who could respond to an abolition of migration barriers. Bertoli and Ruyssen (2016) quantify the effect of migrant networks on the migration as-

[3]Our sample of MENA countries excludes the Persian Gulf countries, which exhibit much greater levels of income. It includes Afghanistan, Algeria, Azerbaijan, Chad, Egypt, Jordan, Iran, Iraq, Lebanon, Mali, Mauritania, Morocco, Niger, Palestine, Syria, Tunisia, and Yemen

[4]In these two countries, more than 80% of the population has a telephone land-line.

[5]Descriptive statistics and correlation coefficients are provided in appendix; see Tables A4 and A5.

pirations and destination choices. Ruyssen and Salomone (2015) investigates whether gender discrimination fosters women's migration intentions.

The GWP includes several questions capturing migration aspirations, preferred destination choices, and whether individuals are actively taking steps to emigrate. The three GWP questions used in this paper are the following:[6]

- Ideally, if you had the opportunity, would you like to move permanently to another country, or would you prefer to continue living in this country?
- To which country would you like to move?
- Are you planning to move permanently to another country in the next 12 months, or not?

We define as aspiring migrants those who answer the first question affirmatively. Note that the last two questions are asked to aspiring migrants only. In line with Bertoli and Ruyssen (2016), we find that migration aspirations are correlated with actual migration flows. Using the annual flow data from the OECD *International Migration Database*, the correlation with aspirations is positive (0.435) and significant at the 1% threshold. Hence, patterns of migration aspirations are likely to be similar to the patterns of actual migration.

The average share of aspiring migrants in our sample is around 24%. Large variations exist across countries. Countries exhibiting the greatest shares of aspiring migrants are Syria (35.6%), Jordan (27.6%) and Algeria (27.5%); countries exhibiting the smallest shares are Niger (16.1%), Azerbaijan (18.3%) and Chad (17.9%). Cross-country variations in destination choices are even larger. Most MENA countries were colonized or administered by European powers. Algeria, Chad, Lebanon, Mali, Mauritania, Morocco, Niger, Syria and Tunisia were colonized or administered by France during the 19th and 20th centuries. Egypt, Iraq, Jordan and Palestine and (South-)Yemen were colonized or administered by the Great Britain. Azerbaijan proclaimed independence from the Soviet Union in 1991. Due to cultural proximity and network effects, these historical ties are still affecting the preferred destination of aspiring migants. On average, the share of aspiring migrants who would like to emigrate to an OECD destination country equals 52.3%.[7] The latter share amounts to 90.9% in Morocco and to 86.7% in Algeria; it only equals 10% in Yemen and 12.8% in Niger.

[6] In the GWP, these questions are coded *wp1325*, *wp3120* and *wp10252*, respectively.

[7] Appendix A1 lists the top-5 desired destinations by country of origin, distinguishing between OECD and non-OECD destinations.

Measuring cultural traits. – Our objective is to test whether cultural traits affect the aspiration to migrate. The GWP includes several questions on cultural norms, beliefs, values and attitudes. To proxy cultural traits, we select 12 questions which cover different aspects of the respondent's cultural spectrum in the MENA region:

$Q1$ Have you donated money to a charity in the last past month?

$Q2$ Have you volunteered your time to an organization?

$Q3$ Have you helped a stranger or someone you didn't know who needed help?

$Q4$ Is religion an important part of your daily life?

$Q5$ Have you attended a place of worship or religious service within the past seven days?

$Q6$ Do you agree that women and men should have equal legal rights?

$Q7$ Do you agree that women should be allowed to hold any job for which they are qualified outside the home?

$Q8$ Do you agree that women should have the right to initiate a divorce?

$Q9$ Do you think that for the military to target and kill civilians is sometimes justified?

$Q10$ Do you think that for an individual person or a small group of persons to target and kill civilians is sometimes justified?

$Q11$ To which extent is it morally justified to sacrifice one's life for what one believes in?

$Q12$ Do you believe that oppressed groups (suffering from injustice) can improve their situation by peaceful means alone?

The first five questions are asked in all countries of the world. The seven others are only asked in specific geographical regions. We normalize responses between 0 and 1, giving the same order to questions belonging to the same area.[8]

[8]Being generous or spending time for others ($Q1$,$Q2$,$Q3$) is coded as 1, 0 otherwise. Sharing gender-egalitarian views ($Q6$,$Q7$,$Q8$) is coded as a 1, while not sharing those values is coded as 0. Related to religiosity ($Q4$,$Q5$), not being religious is coded as 1, while attending place of worship or thinking that religion is an important part of your daily life is coded as 0. Not to justify violence ($Q9$,$Q10$) is coded as 1, 0 otherwise. It is more difficult to rank $Q11$ and $Q12$; for these two questions, we use the GWP coding

Several methods can be used to extract synthetic information on cultural traits.[9] We conduct a two-stage *Principal Component Analysis* (referred to as PCA henceforth). This allows us highlighting common patterns across groups of respondents, and identifying linear combinations of questions that explain the greatest share of heterogeneity in cultural traits.[10] We run the first stage of PCA on the entire set of questions. Figure 1(a) and Table A3 in the Appendix show that the first two components combine five subsets of questions in a similar way.[11] The first set captures generosity ($Q1$, $Q2$ and $Q3$; relabeled as *Generosity 1, 2 and 3* on Figure 1(a)), the second one measures the degree of religiosity ($Q4$ and $Q5$; relabeled as *Religiosity 1 and 2*), the third one includes questions on gender-egalitarian attitudes ($Q6$, $Q7$ and $Q8$; relabeled as *Gender 1, 2 and 3*), the fourth one relates to opinions about the use of violence ($Q9$ and $Q10$; relabeled as *Violence 1 and 2*), and the fifth one includes $Q11$ and $Q12$ (relabeled as *Other 1 and 2)*.

In the second stage, we drop $Q11$ and $Q12$, which cause a huge drop in the number of observations. Although some questions were asked in all waves 2007-2016, the second question on religiosity and all questions on gender-egalitarian attitudes are not avalailable after 2011. Our benchmark analysis is thus restricted to the period 2007-2011; we consider alternative sets of questions covering the period 2007-2016 in the robustness analysis. Then, for each component, we aggregate the responses using the values of the eigenvectors as weights,[12] and perform a second-stage PCA on the four synthetic indicators. Figure 1(b) illustrates the composition of the first two components of the second-stage PCA; it shows that it is irrelevant to go further in aggregating.

Table 1 reports the mean value of each indicator and for each country. Lebanon and Azerbaijan are the most progressive in terms of gender-egalitarian attitudes.[13] Iran and Azerbaijan are the less religious countries.[14] Iran, Afghanistan and Syria exhibit the high-

[9]For example, Spolaore and Wacziarg (2016) combine different sets of questions in order to create an aggregate measure of culture. They use the Euclidean distance to aggregate question-specific differences between groups of respondents.

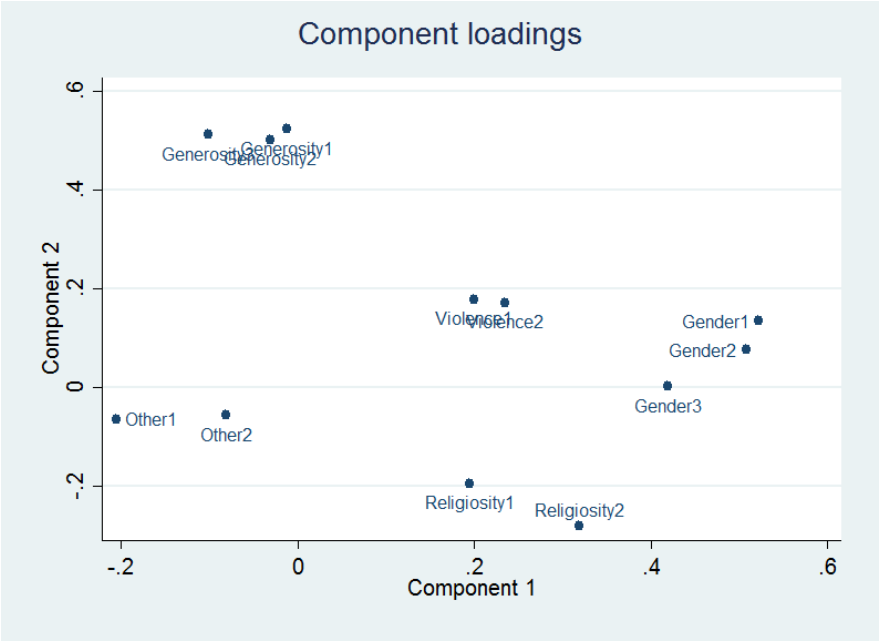
[10]See Asselin (2002) or Tuccio *et al.* (2016).

[11]Table A3 in Appendix reports the values of the eigenvectors associated with each component.

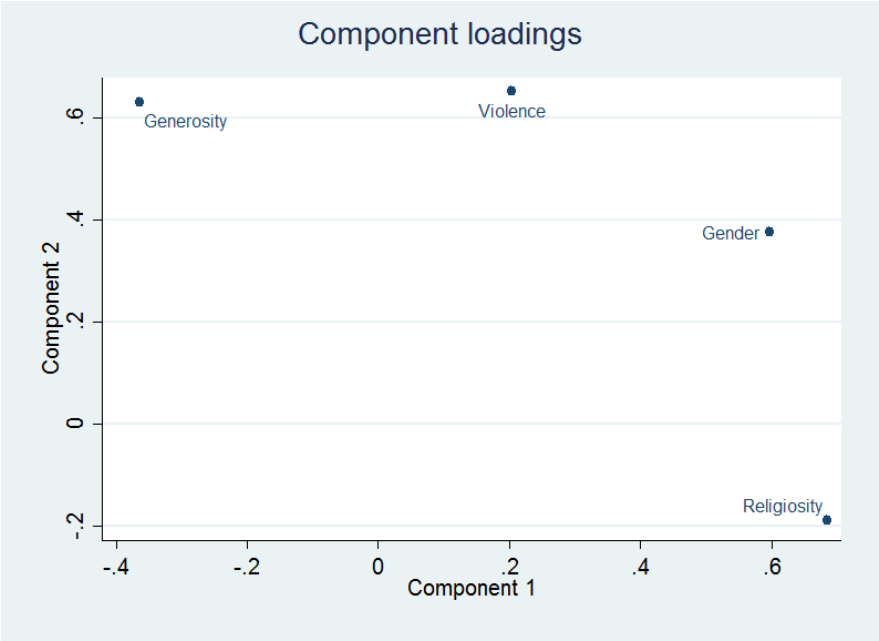
[12]A similar technique is used in UN (2005).

[13]This may be due to the fact that Azerbaijan has a Soviet legacy on this point, and Lebanon has about 44% of Christians, making it a pluri-confessional society with 17 recognized religious denominations and cultural groups (Karouby (2014)). Surprisingly, countries like Tunisia and Marocco with gender-egalitarian institutions (Kammoun (2014); Sadiqi (2014)) are not the most gender-egalitarian countries.

[14]Moaddel and Azadarmaki (2002) indicate that Iranians are not more religious than other Middle Eastern populations. Kashavarzian (2010) concludes that average levels of religiosity have remained constant compared to the pre-1979 revolution period, and that participation in Friday prayers has declined. Reformists that came into power in the 2000's addressed many of the concerns of women. Women accessed the higher education system and the labor market in large numbers. As a result female illiteracy declined substantially. Enrollment of women in universities led to an increase in the age of first marriage. In the 1990s the popula-



(a) First-stage PCA



(b) Second-stage PCA

Figure 1: Principal Component Analysis - Loadings plot

est levels of generosity. Four countries that experienced turmoil and riots during the Arab Spring (i.e., Algeria, Egypt, Tunisia and Yemen) hardly justify the use of violence. We refer to these countries, with Syria, as the group of *Main Insurgents*.[15] In these countries, a large share of the population finds unjustifiable to use any kind of violence against civilians. Finally, sub-Saharan African countries (Chad, Mauritania, Mali and Niger) exhibit a high level of religiosity. The geographical distribution of these cultural traits is plotted in Appendix A4.

It is worth noticing that GWP is not the only database documenting the distribution of cultural traits. For example, several questions of the World Values Survey (WVS) can be used to document beliefs and values. However, the WVS includes a smaller set of countries,[16] and has no specific question on migration plans and aspirations. Still, some WVS questions closely relate to our four indices of cultural traits, and their geographic distributions can be compared to those reported in Table 1. As far as reliogiosity is concerned, the sixth wave of the WVS includes four questions: (i) How important in life is religion; (ii) How often do you attend religious service?; (iii) How often do you pray?; (iv) Are you a religious person? As for gender-egalitarian attitudes, the WVS includes two indicators on gender-equality based on questions related to the role of women in the economy and in politics.[17] We normalize WVS responses between 0 and 1, using the same order as before.[18] Table 2 reports the the correlations between the country-specific mean levels of our indicators and the of the WVS data. Our index of religiosity is highly correlated with the WVS responses. Our gender-egalitarian index is poorly correlated with the WVS

tion growth rate declined in Iran due to a change in government policy in favor of family planning. Currently Iranian women are more educated, marry later in life, have fewer children and work more outside of home, aspiring to greater gender equality in the family and society (Kashavarzian (2010)). In Azerbaijan, the major political forces are secular. The country has a high level of literacy and human development, a legacy of the Soviet period.

[15]The uprisings in Egypt, Tunisia and Syria were triggered by rising unemployment over the years (especially for the young), the persistence of economic inequality, and rural-urban disparities. Elite governments and a popular desire for freedom fueled growing bitterness. Economic and political frustrations of the aspiring youth played an important role (Boughzala and Romdhane (2017)). In Syria authoritarian political system and the mismanagement of the economy led to uprisings, that developed into a civil war eventually drawing both regional and international external armed interventions (Safadi and Neaime (2017)). The possible persistence of authoritarism in those countries could be related to cultural factors (Elbadawi and Makdisi (2017))

[16]As far as the MENA region is concerned, WVS data are available for the following countries: Algeria, Azerbaijan, Egypt, Jordan, Iraq, Lebanon, Morocco, Palestine, Tunisia and Yemen.

[17]Those indicators came from the Secular and Emancipative Values Indicators included in the WVS, and they build on several questions such as (i) When jobs are scarce, men should have more right to a job than women?; (ii) On the whole, men make better political leaders than women do? etc.

[18]Being religious takes value of 0, while not being religious value 1; sharing gender-egalitarian views is associated with value 1, 0 otherwise.

Table 1: Cultural traits: mean levels by country

Countries	Gender	Religiosity	Generosity	Violence
Afghanistan	0.505	0.131	0.345	0.840
Algeria	0.734	0.204	0.225	0.926
Azerbaijan	0.847	0.609	0.275	0.809
Chad	0.768	0.091	0.245	0.808
Egypt	0.739	0.153	0.243	0.976
Iran	0.802	0.309	0.410	0.804
Iraq	0.596	0.276	0.327	0.936
Jordan	0.693	n.a.	0.233	0.805
Lebanon	0.854	0.279	0.323	0.872
Mali	0.643	0.139	0.233	0.788
Mauritania	0.686	0.120	0.279	0.804
Morocco	0.678	0.199	0.228	0.886
Niger	0.551	0.086	0.225	0.765
Palestine	0.687	0.234	0.194	0.914
Syria	0.671	0.225	0.355	n.a.
Tunisia	0.739	0.300	0.259	0.931
Yemen	0.677	0.199	0.177	0.945
All	0.692	0.266	0.230	0.860
Main Insurgents	0.714	0.244	0.230	0.944
Others	0.684	0.277	0.230	0.834

All the values in the table are the mean values of each indicator
Main Insurgents: Algeria, Egypt, Syria, Tunisia and Yemen.

index of economic equality. It is however nicely correlared with the WVS index of equality in politics.

Correlates of cultural traits. – We finally investigate whether our proxies for cultural traits are correlated with four macro indicators capturing the branch of Islam (Sunni or Shia) that is prevalent in the origin country, the level of economic development, the quality of institutions, and past migration flows. Data on the shares of Sunnis and Shiites in the Muslim population are taken from the CIA World Factbook and from the PEW Research Center; data on GDP per capita are obtained from the Maddison Project; data on the control of corruption and on the rule of law are taken from the Worldwide Governance Indicators of the World Bank; as for past migration, we compute the percentage of respondents with a family member or a friend abroad from the GWP data (a proxy for migration networks).

Correlation coefficients are reported in Table 3. Two main findings emerge from this table. First, our index of religiosity is highly correlated with the composition of the Muslim

Table 2: Correlation between GWP and WVS indices

Indicator	Religiosity	Gender
Important in life: religion	0.851***	-
Attending religious service	0.847***	-
Praying frequently	0.718**	-
Religious Person	0.948***	-
Gender equality: job	-	0.199
Gender equality: politics	-	0.649**

Note: Authors' calculations based on Gallup database, and World Values Survey.*** p<0.01, ** p<0.05, * p<0.1. Countries: Algeria, Azerbaijan, Egypt, Jordan, Iraq, Lebanon, Morocco, Palestine, Tunisia and Yemen.

population. Countries with a greater share of Shiites are less religious than Sunni countries. Second, the level of development is highly correlated with religiosity and gender-egalitarian attitudes, in line with the empirical literature on culture and economic growth (see Duflo (2012); Benabou *et al.* (2015); Chase (2014)). On the contrary, the level of development is not significantly correlated with generosity and with attitudes towards violence; and none of our cultural proxies is significantly correlated with the quality of institutions or with the size of the network.[19] For these reasons, the rest of our empirical analysis mostly focuses on the role of gender-egalitarian attitudes and religiosity in shaping migration behaviors.

Table 3: Correlation between aggregate cultural values and macro indicators

Indicator	Gender	Religiosity	Generosity	Violence
Sunnis	-0.291	-0.496*	-0.336	0.421
Shiites	0.367	0.660***	0.609***	-0.033
ln Gdp	0.648***	0.679***	0.223	0.280
Rule of Law	0.257	0.068	-0.376	0.079
Control Corr.	0.156	-0.091	-0.447*	0.085
Network	0.348	0.169	0.103	0.273

Note: Authors' calculations based on the Gallup data, CIA World Factbook, World Bank indicators, Maddison Project and UN databases. *** p<0.01, ** p<0.05, * p<0.1.

[19]Only Generosity is correlated with a measure of control of corruption, but just at 10% level.

3 Empirical Strategy

Our goal is to analyze the determinants of migration aspirations, and to test whether these aspirations are affected by cultural traits. This section describes the benchmark specification used in our empirical analysis, and then discusses some econometric issues.

Benchmark specification. – Our benchmark empirical model features the intention to migrate as the dependent variable. For respondent i originating from region r at year t, the variable $Migration_{irt}$, takes a value of 1 if individual i expresses a desire to migrate abroad permanently and 0 otherwise. Theoretically speaking, this decision results from the comparison of expected utility levels across alternative locations (see Chort (2014) and Ruyssen and Salomone (2015)). Hence, we control for a set of factors that influence utility and moving costs. Given the nature of our data, we opt for a logit model:

$$Prob\{Migration_{irt} = 1|Culture_{irt}, X_{irt}\} = \Phi\{\alpha + \beta Culture_{irt} + \Gamma X_{irt}\} \tag{1}$$

where $Culture_{irt}$ is our proxy of cultural traits ranging from zero (when they do not share gender-egalitarian views or when they are religious) to one; X_{irt} is a set of other determinants of migration aspirations that vary across households or individuals; α , β and Γ are the parameters to be estimated; the error terms are clustered at the country level.

The set of control variable includes: age, gender, marital status, the presence of children in the household, the level of income per household member and its squared, the education level (a dummy variable equal to one if the respondent has least 9 years of education), and the presence of a friend or relative abroad. These variables are denoted by x_{irt}, a subset of X_{irt} (as explained below). In line with the existing literature, these variables affect the size of migration costs as well as the expected gains from migration.

We explain above that migration aspirations are correlated with actual migration flows, in line with Bertoli and Ruyssen (2016). However, the number of aspiring migrants is much greater than the number of actual migrants. Hence, cultural traits and other determinants may affect realization rates, and may have heterogeneous effects on the desire to emigrate and on the capacity to realize these aspirations. Hence, as a robustness check, we also estimate Eq. (1) using migration plans (instead of migration aspirations) as a dependent variable. This dependent variable takes a value of 1 if respondent i is actually making steps to move to another country within 12 months, and 0 otherwise.[20]

[20]The question writes as: *Are you planning to move permanently to another country in the next 12 month, or not?* It is only asked if the answer related to the intention to migrate is affirmative.

Eq. (1) is estimated using the sample of working age respondents living in the 17 MENA countries, and using the main cultural proxies identified in Section 2 (i.e., the synthetic indices of gender-egalitarian attitudes and religiosity). Remember we use a two-stage PCA to proxy cultural traits. Alternative methods could be used to aggregate multiple questions on culture. Hence, we also estimate Eq. (1) using the arithmetic mean or the geometric mean of the question-specific responses.[21] In addition, our estimates can be affected by the presence of immigrants in the sample; the latter are likely to exhibit different characteristics, cultural traits and have different migration strategies (e.g., transit immigrants). To keep the sample as homogenous as possible, we exclude the foreign born from the sample and only consider native residents.

Our approach entails several methodological issues that might lead the logit model to generate inconsistent estimates. In particular, we discuss below how we deal with heterogeneous effects and with endogeneity problems.

Heterogeneous effects. – Migration patterns in general, and the role of cultural traits in particular, may vary according to the regional context, to the choice of destination, or to individual characteristics. To test for heterogeneity across countries of origin, we first estimate Eq. (1) at the country level. Since we find large variations across countries, we augment Eq. (1) with some country-specific variables and with their interaction with cultural proxies. In line with Table 3, we account for the country shares of Sunnis and Shiites among the Muslim population, for the log of GDP per capita, for two indicators of institutional quality, and for the share of native citizens living in a OECD country member state.

To test for heterogeneity across periods, we distinguish between the pre-Arab Spring period and the subsequent years. The Arab Spring started in December 2010 in Tunisia (with the attempted self-immolation of Mohamed Bouazizi); it triggered riots and political unrest in several MENA countries in the subsequent months. Most economies were adversely affected in the post-Arab Spring period. Investments collapsed, tourism and exports declined, capital flight accelerated (especially in countries such as Egypt, Tunisia and Yemen). In Syria, economic production declined significantly. Unemployment increased throughout the region and economic growth was negative in Tunisia and Yemen (Richards *et al.* (2014)). The Arab Spring may have impacted cultural norms and migration intentions jointly. In particular, the political instability and the rise of authoritarianism that characterize the post-Arab Spring period (sometimes referred to as as the Arab Winter)

[21] The results of these variants are presented in Table A7 in Appendix. We only consider migration aspirations to OECD destination countries.

may have affected the process of cultural selection of aspiring migrants.[22] We exploit this possible source of variation by focusing on the first GWP question on religiosity (see $Q4$ above); this question is asked in all years from 2007 to 2016. The correlation between responses to $Q4$ and our synthetic indicator of religiosity is large (0.781) and highly significant.[23] We then augment Eq. (1) with a dummy variable capturing the post-Arab Spring period (i.e., a dummy equal to one for the years 2011 to 2016) and with its interaction with religiosity. Note that we also distinguish between the full set of countries, the sample of countries that were impacted by the Arab Spring,[24] and the other MENA countries. Indeed, the group of *Main Insurgents* may exhibit specific distributions of cultural traits and migration aspirations.

At the individual level, we first investigate whether cultural selection is affected by the intended destination of aspiring migrants. If migrants have cultural values that are more similar to those of the intended host country, we expect to find heterogeneous selection patterns across preferred destination types. To deal with this issue, we estimate our model with a modified dependent variable, distinguish between migration aspirations towards the OECD member states or towards non-OECD destinations. Furthermore, we perform several robustness checks by sub-samples, distinguishing between age groups (15-30, 31-45, 45-65), between skill groups (respondents with less than 9 years of education or more), between employment status (unemployed, employed, out of the labour force), between gender and marital status(married and unmarried individuals, female and male) between religious groups (Muslims, Christians, others) and by place of residence (farm, town and city).

Omitted variables. – Although we control for a traditional set of individual characteristics, migration aspirations can be governed by unobserved characteristics. These omitted variables can be related to the regional environment of the respondents (e.g., governance and security in the region, ethnic composition of the population, climatic conditions, distribution of cultural traits, percentage of natives citizens abroad, etc.), or to their own characteristics (e.g., cognitive skills and abilities, family ties, etc.). These unobserved characteristics may jointly affect the acquisition of cultural traits and migration aspirations (see Bisin and Verdier (1998)). To deal with unobserved region characteristics, we take

[22] In the post-Arab Spring period, Islamists became dominant in Egypt and Tunisia, and partly in Yemen. Richards *et al.* (2014) see two reasons for this. First, the fear of political Islam declined. Second, Islamist parties propagated on the lack of social justice and corruption under the previous rulers. Initially, their messages became appealing to the middle class voters. Later, they proliferated due to grassroot movements.

[23] The correlation between our indicators and cultural questions are presented in Table A6

[24] This group is referred to as the *Main Insurgents*. It includes Algeria, Egypt, Tunisia, Syria and Yemen.

advantage of the fact that GWP identifies the detailed geographical location of the respondent (within the country), and covers several years. For these reasons, we systematically augment the set of controls with spatial and year (or GWP wave) fixed-effects, and estimate a fixed-effect logit model. Hence, the full set of control variables in Eq. (1) writes as:

$$\Gamma X_{irt} = \theta_r + \theta_t + \gamma x_{irt},$$

where θ_r and θ_t are the intra-country region and year/wave fixed effects, and γ is the vector of incidence parameters related to the individual controls.

As for unobserved individual characteristics, disparities in the distribution of covariates between aspiring migrants and non-migrants may influence the accuracy of our estimates. As shown by Imbens and Rubin (2012), large distributional gaps magnify the sensitivity of the estimated coefficients to any ostensibly minor change in the specification. To address this issue, we use a matching technique. We implement a design phase that precedes the empirical analysis, and which consists in constructing a balanced sample in terms of observed covariates. In practice, we match aspiring migrants with non-migrants using the *Mahalanobis Metric Matching* method, using all observed covariates to compute the distance between individuals. A particular property of the *Mahalanobis Metric Matching* method is that the resulting set of matches is invariant to affine transformations of the covariates. Moreover, it generates samples such that the number of aspiring migrants and non-migrants are equalized in each country. We then conduct our regressions on the balanced sample, making it more robust and more credible in terms of internal validity.

4 Results

Our empirical analysis follows the structure explained in Section 3. In Section 4.1, we begin by investigating the effect of cultural traits on migration aspirations using fixed-effects logit regressions, and distinguishing between OECD and non-OECD destinations. In addition, we check whether similar cultural selection patterns can be identified when considering short-run migration plans (instead of migration aspirations). Then, in Section 4.2, we run regressions by subsample to assess whether the effect of culture varies across groups of individuals; focusing on migration aspirations to OECD member states, we distinguish between destination countries, between skill groups and between age groups. Section 4.3 describes the results obtained when we use a matched sample of aspiring migrants and non-migrants. In Section 4.4, we assess whether cultural selection varies across coun-

tries, using both country-specific regressions and full-sample regressions with interaction terms. Section 4.5 compares the pre and post-Arab Spring periods. Finally, Section 4.6 summarizes our results and discuss policy issues.

4.1 Logit Regression

Table 4 focuses on migration aspirations and describes the results of the fixed-effect logit regressions for the full sample of MENA countries and by type of destination. Columns (1) and (2) report estimates for migration aspirations to all destinations. It shows that aspirations are affected by religiosity. The coefficient of religiosity is positive (0.416) and significant at the 1% threshold. The logit model is non linear. To illustrate the magnitude of this effect, let us define the benchmark category of respondent as males with college education, aged 24 to 35, married with children, without friends or relatives abroad, and with a level of religiosity equal to the sample mean (0.229). The same benchmark category is used below to interpret the results of other regressions. For this category of respondent, increasing our indicator of religiosity by one standard deviation (+0.297) raises the desire to emigrate by 8.1 percentage points.[25] Note that the mean proportion of aspiring migrants equals 23.7% in the MENA region. On the contrary, the effect of gender-egalitarian views is not significantly different from zero. Control variables are usually significant and have intuitive signs. In line with the literature, aspirations are higher for young, single men with higher education, with lower level of income per household member, and who have friends or relatives abroad.

The rest of the table distinguishes between migration aspirations to OECD and to non-OECD destinations. Columns (5) and (6) reveal that cultural traits have insignificant impact on migration aspirations to non-OECD countries. On the contrary, low levels of religiosity and gender-egalitarian views increase intentions to emigrate to OECD destinations, as shown in Columns (3) and (4). The effect of gender-egalitarian views is relativeley small and significant at the 10% threshold only. The robustness checks below show that this effect is not robust across groups of respondents. However, the effect of religiosity is greater than in column (2) and highly significant. Increasing our indicator by one standard deviation raises the desire to emigrate to OECD destinations by 13.5 percentage points (for the benchmark category of respondent). Aspirations to migrate to OECD destinations are even more influenced by education attainment and by the presence of network members abroad. Hence, Table 4 evidences that aspiring migrants from MENA countries self-select

[25] Increasing the religiosity index implies reducing the level of religiosity

Table 4: Logit regressions - Full sample 2007-2011
Dependent = Migration aspirations by destination type

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	All	All	OECD	OECD	non OECD	non OECD
Culture	0.062	0.416***	0.190*	0.509***	-0.072	0.258
	(0.110)	(0.104)	(0.115)	(0.093)	(0.159)	(0.170)
Female	-0.674***	-0.572***	-0.761***	-0.675***	-0.601***	-0.408***
	(0.121)	(0.105)	(0.120)	(0.102)	(0.164)	(0.156)
Network	0.694***	0.628***	0.745***	0.704***	0.702***	0.539***
	(0.076)	(0.069)	(0.105)	(0.088)	(0.080)	(0.074)
Age	-0.286***	-0.249***	-0.313***	-0.293***	-0.259***	-0.186***
	(0.044)	(0.041)	(0.054)	(0.041)	(0.042)	(0.046)
Education	0.186***	0.128	0.269**	0.250**	0.078	-0.007
	(0.059)	(0.079)	(0.105)	(0.126)	(0.076)	(0.078)
Marital	-0.247***	-0.393***	-0.367***	-0.486***	-0.140**	-0.281**
	(0.063)	(0.095)	(0.073)	(0.088)	(0.062)	(0.109)
Children	-0.008	0.009	0.011	-0.001	-0.014	0.029
	(0.074)	(0.042)	(0.108)	(0.040)	(0.076)	(0.076)
Income	-0.009**	-0.008***	-0.004	-0.006	-0.013**	-0.011***
	(0.004)	(0.003)	(0.005)	(0.004)	(0.005)	(0.003)
$Income^2$	0.000**	0.000***	0.000	0.000**	0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.277**	-0.163**	-1.986***	-1.305***	-0.546***	-0.647***
	(0.129)	(0.081)	(0.159)	(0.107)	(0.114)	(0.107)
Observations	29,500	31,281	25,689	27,368	25,555	26,295
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.110	0.104	0.161	0.170	0.103	0.0974

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. OECD destinations: US, UK, France, Germany, Netherlands, Spain, Italy, Poland, Hungary, Sweden, Greece, Denmark, Israel, Canada, Australia, New Zealand, South Korea, Austria, Estonia, Finland, Japan, Mexico, Belgium, Turkey, Iceland, Ireland, Latvia, Norway, Portugal, Slovenia, Switzerland, Czech Rep.

Table 5: Logit regressions - Full sample 2007-2011
Dependent = Migration plans to OECD destinations

	(1)	(2)	(3)	(4)
Dep. Var.	Int Mig	Plan Mig	Int Mig	Plan Mig
Culture	Gend	Gend	Rel	Rel
Destination	OECD	OECD	OECD	OECD
Culture	0.190*	-0.068	0.509***	0.832***
	(0.115)	(0.173)	(0.093)	(0.235)
Female	-0.761***	-0.583***	-0.675***	-1.103***
	(0.120)	(0.154)	(0.102)	(0.187)
Network	0.745***	1.072***	0.704***	1.963***
	(0.105)	(0.219)	(0.088)	(0.268)
Age	-0.313***	-0.207**	-0.293***	-0.397***
	(0.054)	(0.103)	(0.041)	(0.097)
Education	0.269**	0.204	0.250**	-0.222
	(0.105)	(0.133)	(0.126)	(0.189)
Marital	-0.367***	-0.335***	-0.486***	-0.205
	(0.073)	(0.106)	(0.088)	(0.169)
Children	0.011	-0.130	-0.001	-0.220*
	(0.108)	(0.108)	(0.040)	(0.114)
Income	-0.004	0.002	-0.006	-0.008
	(0.005)	(0.005)	(0.004)	(0.009)
$Income^2$	0.000	0.000	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-1.986***	-3.592***	-1.305***	-3.711***
	(0.159)	(0.189)	(0.107)	(0.170)
Observations	25,689	10,860	27,368	12,231
Region f.e.	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes
Partial R^2	0.161	0.158	0.170	0.231

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. OECD destinations. Dep. Var.: intention to migrate (Int Mig); plan to migrate in the next 12 months (Plan Mig)

along cultural traits but only when they intend to migrate to an OECD destination; they exhibit lower levels of religiosity than those who do not intend to migrate.[26]

In Table 5, we check whether similar selection patterns apply to individual who have concrete migration plans, i.e. those who are taking concrete steps to leave their country within the next 12 months. Columns (1) and (3) report the results from Table 4 for migration aspirations. Relying on the same specification, Columns (2) and (4) provides the results for migration plans. Column (2) shows that the effect of gender-egalitarian views is insignificant. On the contrary, the effect of religiosity is highly significant and greater than for migration aspirations. We obtain a coefficient of 0.832, which means that increasing our indicator by one standard deviation (+0.297) raises the probability to have concrete migration plans by 27.6 percentage points. Note that the mean proportion of individuals taking steps to move within 12 months equals 2.9% and its standard deviation equals 16.7 percentage points. We thus find evidence of an effect of religiosity on migration plans, implying that emigration to OECD countries affects the distribution of cultural traits in the population left behind.

4.2 Robustness by subsample

In this section, we investigate whether the identified self-selection patterns vary by country of destination, by educational level, by gender, and by age group.[27] We focus on migration aspirations to OECD destination countries. We begin by splitting the set of OECD destinations into three subsets of countries that are frequently reported as preferred destinations in the data, namely the European Union, North America (i.e. Canada and the United States) and Turkey. Fixed-effect logit regressions are used to explain migration aspirations to these three sets of countries. Results are provided in Table 6. Columns (1), (3) and (5) confirm that the effect of gender-egalitarian views remains insignificant for all sets of destination (or poorly significant in the case of migration aspirations to North America). Columns (2) and (4) show that the effect of religiosity is highly significant when considering OECD, high-income destinations. We also notice that the intensity of the self-selection

[26] In table A8 in the Appendix we also test whether those results are mostly driven by a deviation from the average level of culture at the regional level. To do so, we conduct our analysis without fixed effects (or with country fixed-effects only). Intending migrants always self-select on religiosity, and results are magnified when individuals deviate from the region/country mean.

[27] Regressions by employment status and by place of residence give similar results (available upon request). Results by religious groups are presented in Table A9. We find that the cultural selection process is driven by the Muslim population. Results by gender and marital status are presented in Table A10. Interestingly, unmarried women that would like to move to OECD destination countries show more gender-egalitarian attitudes.

process is greater for individuals intending to migrate to North America (0.683) than for those who intend to migrate to Europe (0.468). On the contrary, we find no evidence of cultural selection towards Turkey.

Table 6: Logit regressions - Robustness by destination country 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	EU	EU	US/Can	US/Can	Turk	Turk
$Culture$	0.085	0.468***	0.261*	0.683***	0.325	0.179
	(0.130)	(0.117)	(0.153)	(0.136)	(0.207)	(0.272)
$Female$	-0.868***	-0.737***	-0.745***	-0.575***	-0.584	-0.136
	(0.116)	(0.084)	(0.164)	(0.130)	(0.410)	(0.350)
$Network$	0.669***	0.727***	0.968***	0.724***	1.160***	0.691**
	(0.143)	(0.092)	(0.144)	(0.090)	(0.175)	(0.280)
Age	-0.354***	-0.311***	-0.310***	-0.269***	-0.348***	-0.256
	(0.052)	(0.036)	(0.074)	(0.053)	(0.104)	(0.156)
$Education$	0.191*	0.245**	0.385***	0.351**	0.113	-0.055
	(0.098)	(0.124)	(0.149)	(0.154)	(0.198)	(0.205)
$Marital$	-0.402***	-0.564***	-0.290***	-0.383***	-0.255*	-0.585**
	(0.073)	(0.088)	(0.100)	(0.089)	(0.137)	(0.246)
$Children$	-0.024	-0.064	0.016	0.031	0.205	0.362
	(0.095)	(0.071)	(0.118)	(0.111)	(0.189)	(0.220)
$Income$	-0.004	-0.007	0.001	-0.006***	-0.003	0.005
	(0.006)	(0.005)	(0.006)	(0.002)	(0.019)	(0.014)
$Income^2$	0.000	0.000	0.000	0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Constant$	-1.837***	-1.723***	-4.411***	-2.294***	-3.970***	-4.661***
	(0.151)	(0.188)	(0.116)	(0.161)	(0.385)	(0.494)
Observations	22,570	24,733	22,018	22,780	10,699	11,347
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.182	0.203	0.141	0.137	0.181	0.126

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. Col. (1) and (2): European destinations that are member states of the OECD; Col. (2) and (3): US and Canada; Col. (5) and (6) Turkey.

Coming back to the whole set of OECD countries, Table 7 investigates whether cultural selection varies across skill and gender groups. In Columns (1) and (2), we report results for men only. We find that men self-select more than the whole population. The coefficient

on religiosity reaches 0.716 for men, to be compared with 0.509 for the whole population (see Table 4). Then, splitting men across skill groups reveals that cultural selection does not vary with education. The coefficient for highly educated men equals 0.722 in Column (6), against 0.793 for less educated men in Column (4). The results also indicate that migration aspirations of highly educated men are less influenced by age and by the presence of network members abroad.

Table 7: Logit regressions - Robustness by skill group 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Group	Men	Men	Men LS	Men LS	Men HS	Men HS
$Culture$	0.264	0.716***	0.160	0.793***	0.352*	0.722***
	(0.161)	(0.094)	(0.196)	(0.246)	(0.183)	(0.107)
$Network$	0.734***	0.606***	0.810***	0.770***	0.684***	0.501***
	(0.116)	(0.105)	(0.128)	(0.191)	(0.149)	(0.120)
Age	-0.345***	-0.273***	-0.390***	-0.379***	-0.298***	-0.197***
	(0.061)	(0.049)	(0.079)	(0.084)	(0.055)	(0.044)
$Education$	0.224**	0.068				
	(0.093)	(0.151)				
$Marital$	-0.379***	-0.637***	-0.346***	-0.534***	-0.461***	-0.739***
	(0.088)	(0.117)	(0.130)	(0.153)	(0.080)	(0.126)
$Children$	-0.007	0.028	-0.076	-0.071	0.018	0.044
	(0.125)	(0.070)	(0.183)	(0.169)	(0.119)	(0.056)
$Income$	-0.006	-0.005	-0.019	-0.000	0.005	-0.008
	(0.005)	(0.005)	(0.015)	(0.012)	(0.005)	(0.006)
$Income^2$	0.000	0.000	0.000	-0.000	-0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Constant$	-2.084***	-0.939***	-2.225***	-2.144***	-1.437***	0.336**
	(0.139)	(0.147)	(0.243)	(0.334)	(0.108)	(0.143)
Observations	12,809	13,744	5,086	4,903	7,286	8,515
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.158	0.169	0.188	0.224	0.144	0.145

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. destinations: same as Table 4. Col. (3) and (4): men with less than 9 years of education. Col. (5) and (6): men with at least 9 years of education.

Table 8: Logit regressions - Robustness by age group 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Age	15-30	15-30	31-45	31-45	46-65	46-65
$Culture$	0.332**	0.448***	-0.128	0.620***	0.207	0.508**
	(0.131)	(0.110)	(0.220)	(0.123)	(0.284)	(0.217)
$Female$	-0.866***	-0.704***	-0.738***	-0.687***	-0.368***	-0.528***
	(0.111)	(0.109)	(0.181)	(0.117)	(0.140)	(0.138)
$Network$	0.827***	0.743***	0.671***	0.762***	0.564***	0.388***
	(0.127)	(0.099)	(0.096)	(0.144)	(0.188)	(0.101)
Age	-0.209***	-0.249***	-0.214*	-0.270***	-0.479**	-0.434***
	(0.077)	(0.069)	(0.113)	(0.072)	(0.191)	(0.121)
$Education$	0.201	0.224	0.325***	0.231*	0.380**	0.306**
	(0.148)	(0.149)	(0.095)	(0.135)	(0.158)	(0.134)
$Marital$	-0.423***	-0.455***	-0.198	-0.543***	0.086	-0.211
	(0.094)	(0.068)	(0.149)	(0.126)	(0.226)	(0.265)
$Children$	0.015	0.026	-0.280	0.025	0.468**	-0.068
	(0.126)	(0.068)	(0.187)	(0.129)	(0.226)	(0.169)
$Income$	0.001	-0.003	-0.012	-0.020***	-0.017	-0.007
	(0.003)	(0.005)	(0.008)	(0.006)	(0.018)	(0.006)
$Income^2$	-0.000	0.000	0.000*	0.000**	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Constant$	-1.979***	-1.201***	-1.710***	-3.049***	-1.967***	-0.449
	(0.137)	(0.127)	(0.335)	(0.206)	(0.725)	(0.644)
Observations	11,927	12,493	7,659	8,433	4,235	4,806
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.170	0.163	0.156	0.150	0.145	0.149

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. OECD destinations: same as Table 4.

Finally, Table 8 reports results by age group, distinguishing between individuals aged 15 to 30, those aged 31 to 45, and those aged 46 to 65. Selection by religiosity is significant for all age groups, and the estimated coefficient increases with age. As far as gender-egalitarian views are concerned, the coefficient is insignificant for individuals aged 31 and over. However, it is significant (at the 5% threshold) and positive (0.332) for individuals aged 15 to 30, i.e. for the group of respondents who are the most likely to realize their migration aspirations. Overall, we find evidence of a robust selection process by cultural traits. Selection by religiosity is obtained for all groups, while selection by gender-egalitarian attitudes is obtained for the young population.

4.3 Using matched samples

We now investigate whether our results are driven by differences in the composition of the samples of aspiring migrants and non-migrants. In line with comparisons between treated and control groups, we use the *Mahalanobis Metric Matching* technique to identify samples of aspiring migrants and non-migrants that are balanced in terms of covariates. The matching procedure minimizes the Mahalanobis metric. For each covariate x , we compute the normalized difference:[28]

$$\Delta_x = (\bar{x}_{Mig} - \bar{x}_{SNon}) \left(\frac{s^2_{x,Mig} + s^2_{x,Non}}{2} \right)^{-1/2}$$

where the difference between the mean value of the covariate for aspiring migrants and non-migrants, $\bar{x}_{Mig} - \bar{x}_{Non}$, is divided by the mean of the standard deviations of the covariate over the whole sample ($s_{x,Mig}$ and $s_{x,Non}$).

Results of the matching technique are described in Table 9. For each sample, we report the difference in terms of covariates before and after the matching procedure. Before matching, the distribution of covariates is unbalanced for both samples; differences in characterstics are always statistically different from zero. On the contrary, the matching technique allows generating a matched sample exhibiting a balanced distribution of covariates. After matching, the only variable along which aspiring migrants and non-migrants exhibit statistically different outcomes is the level of income per household member.

Table 10 provides the results of the fixed-effect logit regressions using the matched samples; they can be easily compared to those of Table 4 for the non-matched samples.

[28]Since some individuals did not answer all questions on religiosity and gender-egalitarian views, we decide to perform a specific matching procedure for each regression

Table 9: Mahalanobis matching procedure 2007-2011
Matched and non-matched samples

	Non-matched Sample				*Matched Sample*			
Variables	Mean	s.d.	Diff.	P-val	Mean	s.d.	Diff.	P-val
Religiosity								
Gender	0,51	0,00	39,49	0,00	0,44	0,01	0,73	0,71
Network	0,20	0,00	47,94	0,00	0,26	0,00	2,92	0,14
Age	33,43	0,08	-60,17	0,00	30,63	0,13	0,24	0,91
Marital	0,57	0,00	-62,44	0,00	0,47	0,01	-0,75	0,71
Children	0,74	0,00	14,05	0,00	0,72	0,00	1,50	0,45
Income	10821	89,02	7,49	0,01	11168	176,13	4,49	0,02
Education	0,47	0,00	33,52	0,00	0,52	0,01	1,28	0,52
Gender views								
Gender	0,51	0,00	-46,69	0,00	0,43	0,01	-0,32	0,87
Network	0,24	0,00	50,19	0,00	0,30	0,01	0,56	0,78
Age	33,24	0,08	-62,78	0,00	30,17	0,13	-0,20	0,92
Marital	0,58	0,00	-57,22	0,00	0,49	0,01	0,44	0,83
Children	0,74	0,00	-12,37	0,00	0,73	0,00	-0,13	0,95
Income	11410	87,38	19,84	0,00	12390	172,22	3,87	0,05
Education	0,44	0,00	43,40	0,00	0,52	0,01	0,24	0,91

The difference (Diff) between intending migrants' average covariate and intending stayers is divided by the std. error.

Table 10: Logit regressions - Matched samples of migrants and non-migrants 2007-2011
Dependent = Migration aspirations by destination type

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	All	All	OECD	OECD	non OECD	non OECD
Culture	0.121	0.347***	0.210	0.521***	0.022	0.067
	(0.130)	(0.118)	(0.146)	(0.113)	(0.176)	(0.164)
Female	-0.050	-0.025	-0.183**	-0.152*	0.084	0.149*
	(0.044)	(0.038)	(0.078)	(0.084)	(0.078)	(0.088)
Network	0.003	0.040	0.020	0.131*	0.019	-0.058
	(0.041)	(0.045)	(0.063)	(0.068)	(0.054)	(0.044)
Age	-0.017	0.005	-0.034	-0.036***	0.005	0.052*
	(0.015)	(0.012)	(0.030)	(0.014)	(0.027)	(0.028)
Education	-0.045	-0.027	0.100	0.131	-0.172**	-0.208***
	(0.031)	(0.036)	(0.088)	(0.095)	(0.086)	(0.079)
Marital	0.044*	0.005	-0.046	0.011	0.119***	-0.015
	(0.025)	(0.036)	(0.044)	(0.051)	(0.041)	(0.056)
Children	-0.001	0.073***	-0.005	0.064*	-0.010	0.110
	(0.032)	(0.028)	(0.073)	(0.039)	(0.060)	(0.067)
Income	0.001	0.002	0.007	0.004	-0.005	-0.000
	(0.003)	(0.002)	(0.005)	(0.003)	(0.005)	(0.003)
$Income^2$	0.000	0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.136**	-0.298***	-2.518***	-1.807***	0.008	-0.608***
	(0.069)	(0.076)	(0.138)	(0.091)	(0.082)	(0.154)
Observations	9,736	11,034	7,228	8,415	7,179	7,757
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.0483	0.0377	0.101	0.0865	0.0808	0.0849

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. OECD destinations: same as Table 4.

All conclusions of the benchmark regressions hold when using the matched samples. Columns (1) and (2) confirm that aspiring migrants self-select in terms of religiosity, but not along gender-egalitarian attitudes. Column (4) and (6) confirm that the results are driven by migration aspirations to OECD destination countries only. The coefficient of religiosity equals 0.521 and is significant at the 1% threshold; it is almost identical to that of Table 4. Increasing the indicator of religiosity by one standard deviation raises the desire to emigrate 13.3 percentage points.[29]

4.4 Heterogeneity across countries

We now explore whether cultural selection varies across countries or with country-specific characteristics. The set of country characteristics includes the shares of Sunnis and Shiites among the Muslim population, the log of GDP per capita, two indicators of institutional quality, and the share of native citizens from the same origin country living in a OECD country member state, as a proxy of network abroad. Figure 2 plots the coefficient of religiosity obtained from country-specific regressions against the level of country characteristics; it also shows the linear trend between them. It evidences large variations across countries, both in the size of the estimated coefficient and in its confidence interval. Such variations can be explained by differences in sample size or by more structural factors. However, the correlation between the estimated coefficients and country characteristics is always insignificant, except when considering the share of Shiites in the Muslim population. In the latter case, the correlation is positive (0.514). The same exercise is conducted for gender-egalitarian attitudes in Figure 3. It reveals a negative correlation between the estimated effect of culture and two country characteristics, namely the share of Sunnis in the Muslim population (0.515) and the control of corruption (0.582).

To generalize this descriptive analysis of correlations, we run regressions accounting for the interactions between country characteristics and cultural traits. Results are provided in Table 11. Overall, the interaction between progessive views on religiosity and country characteristics is never significant, even when considering the interaction with the share of Shiites in the Muslim population. In addition, the effect of religiosity remains significant in all specifications (except when controlling for corruption in Column (3)). This reinforces our conclusion that aspiring migrants from virtually all MENA countries self-

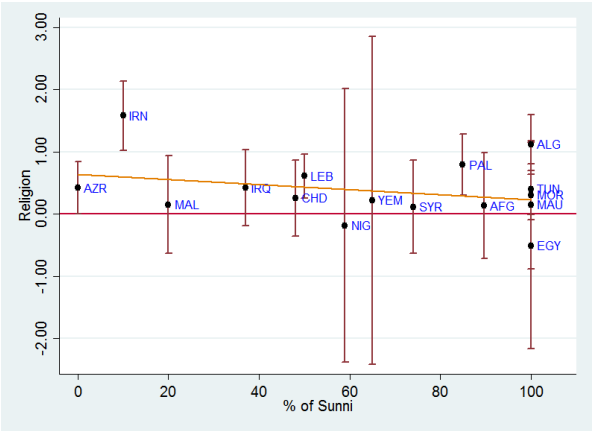
[29] As before, this effect on migration aspirations is computed for the benchmark group, which consists of male individuals without friends or relatives abroad, with college education, married with children, between 24 to 35 years old, and with an average level of religiosity (0.229).

select along religiosity levels. As far as gender-egalitarian attitudes are concerned, the results in Column (1) suggest that aspiring migrants from countries with a Sunni majority have less progressive views. This is confirmed in Column (2) which reports a positive coefficient for the interaction between cultural traits and the share of Shiites. Selection along gender-egalitarian views also becomes significant when controlling for the aggregate share of native citizens living abroad, a proxy for openness to migration.

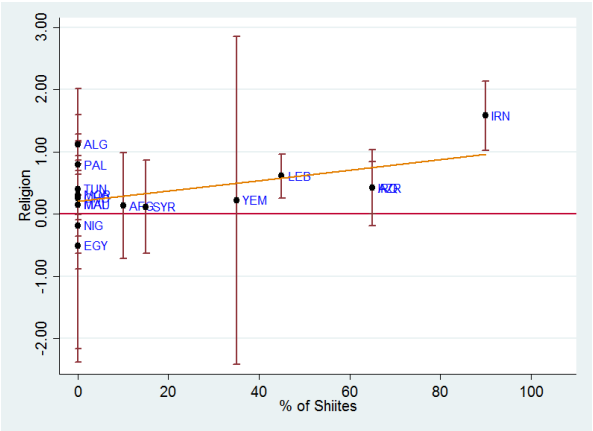
Table 11: Logit regressions - Accounting for origin-country characteristics 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Interaction	Sunnis	Shiites	Cont. Corr.	Rule Law	ln GDP	Net.
Religiosity						
$Culture$	0.322**	0.538***	0.235	0.471**	0.570***	0.417***
	(0.148)	(0.143)	(0.153)	(0.196)	(0.174)	(0.128)
$Interaction$	0.003	-0.001	1.042	0.003	-0.000	2.397
	(0.003)	(0.003)	(0.830)	(0.389)	(0.000)	(1.525)
Observations	27,368	27,368	24,471	24,471	27,368	27,368
Partial R^2	0.171	0.172	0.180	0.178	0.172	0.173
Gender-egal.						
$Culture$	0.903***	0.033	0.613*	0.531	0.114	0.314**
	(0.299)	(0.113)	(0.351)	(0.388)	(0.159)	(0.130)
$Interaction$	-0.010***	0.016***	-1.717	-0.828	0.000	-4.936*
	(0.004)	(0.006)	(1.241)	(0.815)	(0.000)	(2.784)
Observations	25,689	25,689	24,221	24,221	25,689	25,689
Partial R^2	0.163	0.165	0.168	0.167	0.163	0.164

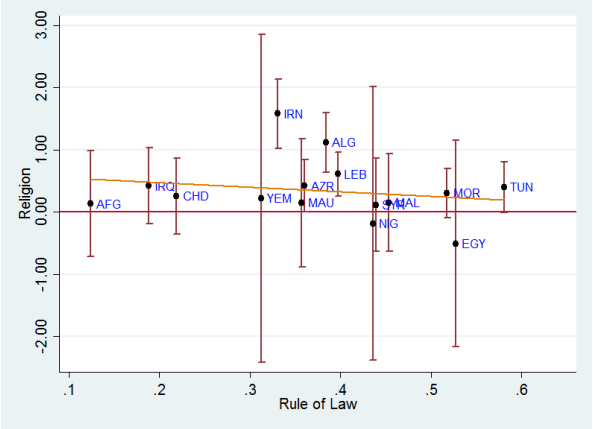
Source: Author's calculations on Gallup Data. Std. errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1. We control for gender, network, age cohort, level of education,marital status, presence of children, income, income squared, year-wave and region f.e. Std. errors are clustered at the country level. OECD destinations: same as Table 4



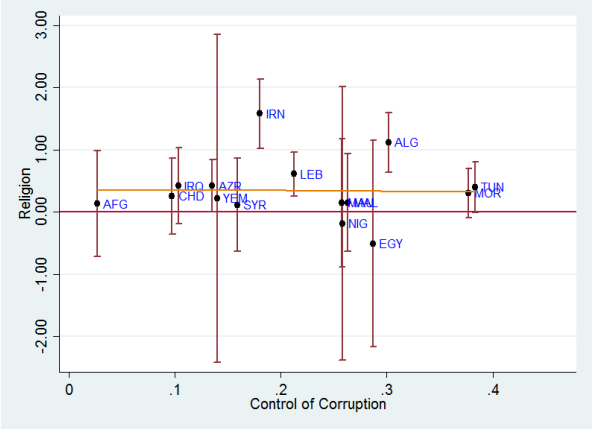
(a) Sunnis - (Corr = -0.288)



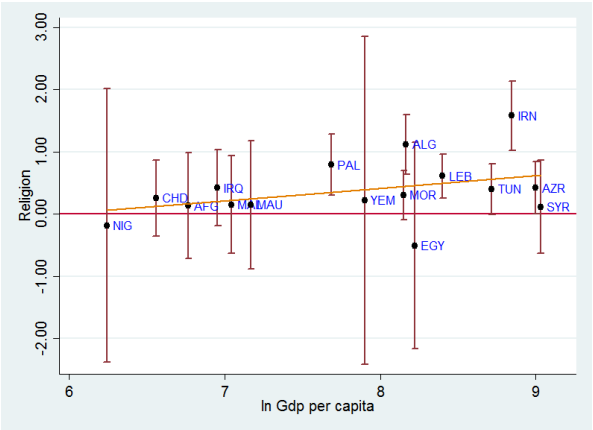
(b) Shiites - (Corr = 0.514^{***})



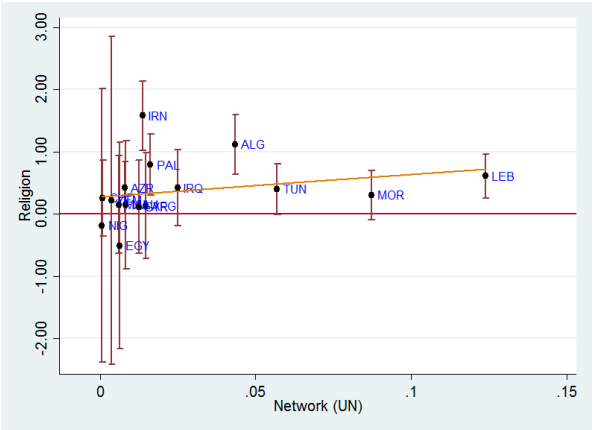
(c) Rule of Law - (Corr = -0.187)



(d) Control of Corruption - (Corr = -0.024)

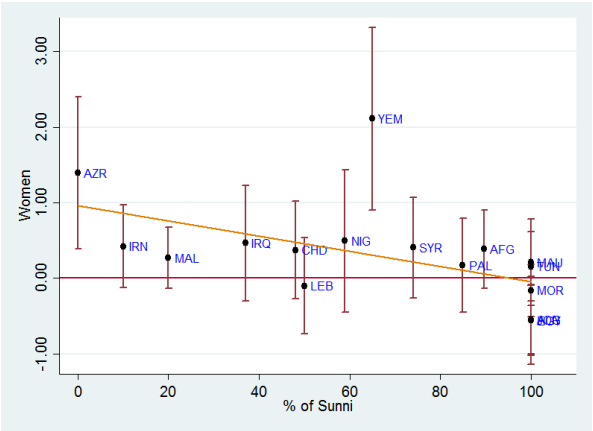


(e) ln GDP - (Corr = 0.375)

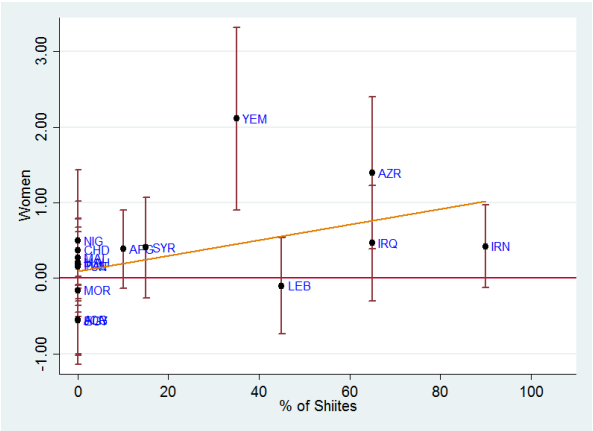


(f) Network - (Corr = 0.254)

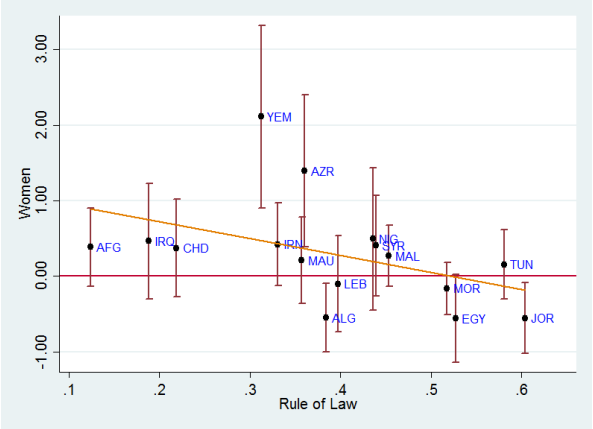
Figure 2: Religiosity: estimated $\hat{\beta}$ and its 95% interval of confidence by country



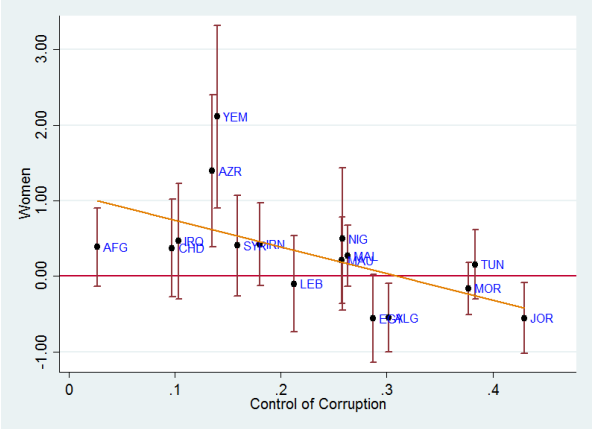
(a) Sunnis - (Corr = -0.515^{**})



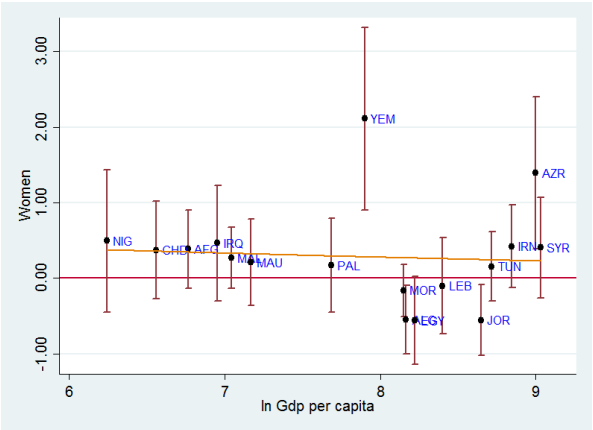
(b) Shiites - (Corr = 0.455)



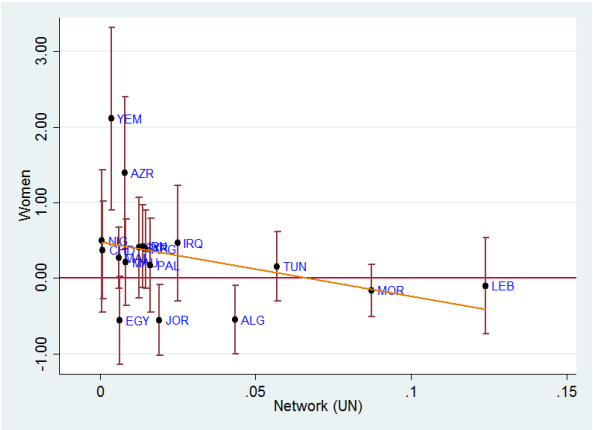
(c) Rule of Law - (Corr= -0.438)



(d) Control of Corruption - (Corr = -0.582^{**})



(e) ln GDP - (Corr= -0.072)



(f) Network - (Corr= -0.361)

Figure 3: Gender-egalitarian views: estimated $\hat{\beta}$ and its 95% interval of confidence by country

4.5 Effect of the Arab Spring

We finally explore whether the link between cultural traits and migration has been affected by the Arab Spring. Since most questions on religiosity and gender-egalitarian views are asked from 2007 to 2011, we use the only proxy for religiosity that is available in all waves of the GWP (2007-2016). The question is: Is religion an important part of your daily life? Responses to this question are highly correlated with the synthetic indicator of religiosity resulting from our two-stage PCA.

Table 12: Logit regressions - Accounting for the Arab Spring 2007-2016
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Sample	Full	Full	Full	Matched	Matched	Matched
Countries	All	Main Ins.	Others	All	Main Ins.	Others
Religiosity	0.473***	0.560***	0.409***	0.446***	0.559***	0.396***
	(0.080)	(0.088)	(0.116)	(0.062)	(0.108)	(0.082)
Interaction	-0.110	-0.475**	0.081	-0.149	-0.425*	0.010
	(0.177)	(0.215)	(0.203)	(0.173)	(0.244)	(0.228)
Observations	100,544	34,914	65,630	41,801	14,328	27,473
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.139	0.170	0.127	0.142	0.173	0.131

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. We control for gender, network, age cohort, level of education, marital status, presence of income squared, the interaction terms with individual controls and Arab Spring, children, income, and region f.e.. Std. errors are clustered at the country level. Sample legend: Full Sample (FS); Matched on After Arab Spring (Matched). OECD destinations: same as Table 4

We run fixed-effect logit regressions accounting for the interactions between a post-Arab Spring dummy (equal to one for the years 2011 to 2016) and religiosity. Results are provided in Table 12, which distinguishes between the full sample of MENA countries, the *Main Insurgents* (i.e., Algeria, Egyp, Syria, Tunisia and Yemen), and the other countries. Columns (1) to (3) use the full sample; Columns (4) to (6) use matched samples of of the population, matched on the post-Arab Spring period.[30]

In all specifications, selection by religiosity is always positive and significant. Although

[30]We match individual pre-post Arab Spring. Results of the matching are available in Table A11

the Arab Spring has not affected the intensity of cultural selection in the less affected countries, it has reduced it in the *Main Insurgent* countries. The latter findings are highly robust to the use of matching techniques. In other words, the Arab Spring has increased the relative religiosity of aspiring migrants. The data do not allow us to investigate whether the degree of cultural selection has changed after the recent conflicts and political unrest in the Middle-East. Given similarities with the Arab Spring period, it is however plausible that the 2015 wave of asylum seekers is less culturally selected than previous migration waves.

4.6 Discussion and policy issues

Our empirical results indicate that individuals who intend to emigrate to OECD, high-income countries exhibit significantly lower levels of religiosity than the rest of the population. They also share more gender-egalitarian views, although this effect only holds among the young. Potentially, these results have implications from the point of view of both origin and destination countries.

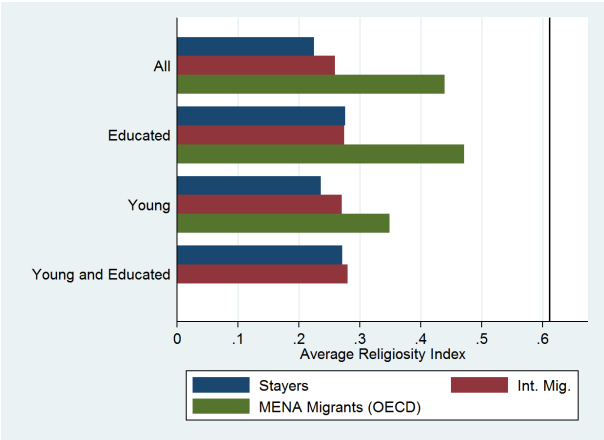
From the *point of view of destination countries*, selection on religiosity and gender-egalitarian attitudes implies that the cultural distance between migrants and host country citizens is smaller than between the country populations. This means easier integration to the host country labor market and social norms. Selective migration from MENA to high income OECD countries should be less of a concern from the point of view of the OECD member states. On the one hand, *informing public opinion in this regard* might influence attitudes towards immigration and discrimination practices; this seems a relevant policy recommendation. On the other hand, the effect of cultural selection should not be overestimated. Figure 4(a) compares the average level of religiosity of OECD natives (0.612) with the average level of intending stayers, of intending migrants towards OECD destinations, and of current migrants from MENA countries in the OECD. When considering all respondents, the religiosity index of intending migrants (0.259) is 15% higher than that of intending stayers (0.225). Remember, zero corresponds to the maximal religiosity level. Hence, self-selection along religiosity levels reduces the gap between MENA and OECD countries by 9% only. Similar findings are found when comparing young intended migrants and non-migrants. When considering highly educated respondents, the average religiosity index is slightly greater (0.279) but cultural differences between intended migrants and non-migrants become negligible.[31] The Gallup data also enable us to compare actual

[31] We identify a significant effect of religiosity and gender-egalitarian views on migration aspirations of

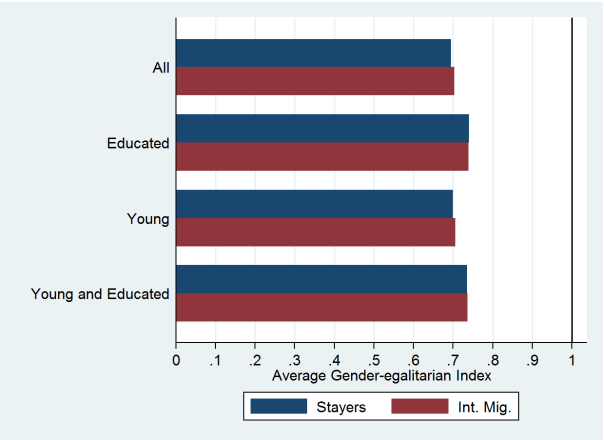
migrants from MENA countries (those who have already migrated) with OECD native citizens. Figure 4(a) shows that the religiosity index of actual migrants is much closer to that of natives, and this is especially true for older migrants and for the highly educated. The gap between actual and intended migrants can be due to several reasons: (i) cultural selection in the realization of migration aspirations (in line with Table 5), (ii) a gradual decline in cultural selection over time (in line with our findings about the Arab Spring, see Table 12), (iii) a sign of cultural assimilation abroad, (iv) estimation biases due to the underrepresentation of the foreign-born population in the survey (the Gallup survey only includes 282 immigrants from the MENA in the OECD countries). As for gender-egalitarian views, data for OECD countries are not available. Figure 4(b) shows that intended migrants are slightly more progressive, an effect that is mostly driven by the young population (in line with Table 8). On average, selection on gender-egalitarian views is small. In sum, despite cultural selection, immigrants from the MENA countries exhibit markedly different cultural traits compared to OECD natives.

From *the point of view of the home country*, the distribution of cultural traits in the population left behind tends to be skewed towards more religiosity and less gender-egalitarian attitudes. Emigration to OECD countries impacts the distribution of cultural traits among those left behind, with potential implications for modernization, growth and democracy. On this basis, it could be argued that emigration should be combated if the home-country government targets to achieve a higher level of economic development. Our results do not support this view. Religiosity and gender-egalitarian attitudes are correlated with other observed and unobserved characteristics that affect migration aspirations. Figure 4(c) compares the observed average indices of religiosity and gender-egalitarian view of the current MENA population (in blue), with those obtained if all intended migration had left their country (in red), or if all young intended migrants had left (in green). Given the proportion of intended migrants towards OECD countries (12,3% on average) and the small cultural differences between groups, the average cultural traits of the population left behind hardly changes under these two counterfactuals. In addition, emigration towards OECD countries could even reverse the effect on average cultural traits of the selection effect if migrants abroad transfer more progressive norms and beliefs to their home country, as argued in Rapoport *et al.* (2017). In sum, despite cultural selection, emigration from the MENA countries is unlikely to induce negative effects on modernization, growth and democracy.

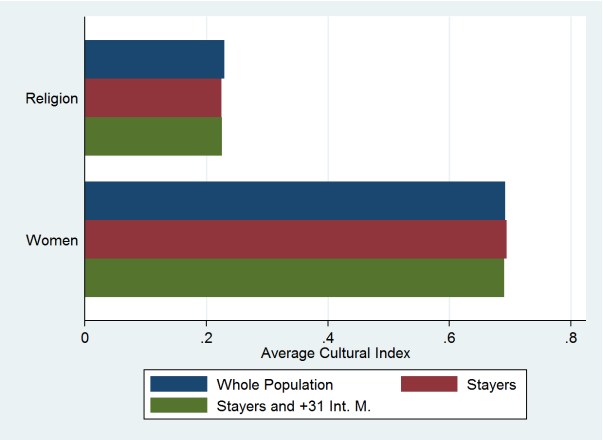
highly educated individuals (see Table 7). However, this effect is dominated by other distributional characteristics of the highly educated population.



(a) Religiosity Index (migrants vs non-migrants)



(b) Gender-Egal. Index (migrants vs non-migrants)



(c) Cultural traits in the MENA

Figure 4: Average Cultural Indexes across groups and simulations

The graph shows the mean level of religiosity and gender-egalitaria views of the intending stayers (Stayers), intending migrants towards OECD (Int. Mig) and the migrants already in the OECD (MENA Migrants (OECD)) on panels (a) and (b). The vertical black line is the mean level of religiosity of natives in the OECD on panel (a), and a society sharing fully gender-egalitarian views on panel (b). The means are computed for four groups: the overall population (All), the population between 15 and 30 (Young), the population with at least 9 year of education (Educated) and the young population with high education (Young and Educated). Panel (c) shows the mean level of religiosity and gender-egalitarian views of the whole population, of intending stayers, and of the whole population minus young intending migrants. Author's calculations based on Gallup World Poll and World Bank Data.

5 Conclusions

In this paper, we use a unique database on migration aspirations, opinions and beliefs in the MENA countries to test whether migrants positively select by culture traits. We conduct fixed-effect logit regressions using the full sample or using matched samples of aspiring migrants and non-migrants. We find that aspiring migrants in general, and those who have concrete migration plans to migrate in particular, are culturally selected, and that this selection on cultural traits depends on the type of preferred destination. Intended migrants to OECD, high-income countries exhibit lower level of religiosity. This result is robust across gender, age groups and education levels. As far as attitude towards women's rights are concerned, aspiring migrants have more gender-egalitarian views in the age group 15-30, when they are single women, or when they originate from countries with a Sunni minority. Finally, we find a robust effect of the Arab Spring on the intensity of cultural selection only in countries highly impacted by the Arab Spring. In these countries, the Arab Spring has decreased the degree of cultural selection.

These results have implications from the point of view of both origin and destination countries. From the point of view of destination countries, cultural selection implies that the cultural distance between migrants and host country citizens is smaller than between the country populations. From the point of view of the home country, the distribution of cultural traits in the population left behind tends to be skewed towards more religiosity and less gender-egalitarian attitudes, with potential implications for modernization, growth and democracy. However, the aggregate effects of cultural selection are limited, albeit non negligible. Selective emigration has limited effects on the distribution of cultural traits in the MENA countries, and on the cultural distance between natives and immigrants in the OECD countries. To quantify the impact of emigration on culture, these effects should be compared with those linked to ex-post transfers of norms and beliefs from diasporas abroad to those left behind. Further research on such transfers of cultural norms and beliefs is on our agenda.

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Appendices

A1: List of intended destinations

Table A1: Top-5 preferred OECD destinations

Origin	1st best	2nd best	3rd best	4th best	5th best
Afghanistan	United States	Germany	Canada	UK	Turkey
Algeria	France	Canada	UK	Italy	Spain
Azerbaijan	Turkey	Germany	United States	UK	France
Chad	United States	France	Canada	UK	Japan
Egypt	United States	Italy	France	Germany	UK
Iran	Canada	United States	Germany	Australia	UK
Iraq	Sweden	United States	UK	Germany	Canada
Jordan	United States	Canada	Germany	Sweden	Turkey
Lebanon	Canada	United States	Australia	France	Germany
Mali	France	United States	Spain	Canada	Germany
Mauritania	France	United States	Spain	Canada	Germany
Morocco	France	Spain	Italy	Canada	United States
Niger	United States	France	Belgium	Canada	Germany
Palestine	United States	Sweden	Canada	Norway	Germany
Syria	United States	Canada	Sweden	Germany	Turkey
Tunisia	France	Italy	Germany	Canada	United States
Yemen	United States	UK	Turkey	Canada	Germany

Table A2: Top-5 preferred non-OECD destinations

Origin	1st best	2nd best	3rd best	4th best	5th best
Afghanistan	Iran	Saudi Arabia	Pakistan	UAE	Tajikistan
Algeria	UAE	Saudi Arabia	Egypt	Other	Qatar
Azerbaijan	Russia	Ukraine	Iran	Egypt	India
Chad	Nigeria	Cameoon	Saudi Arabia	Sudan	Senegal
Egypt	Saudi Arabia	UAE	Kuwait	Libya	Jordan
Iran	UAE	Other	Malaysia	Jordan	Russia
Iraq	UAE	Syria	Lebanon	Other	Egypt
Jordan	UAE	Saudi Arabia	Kuwait	Qatar	Palestine
Lebanon	UAE	Saudi Arabia	Qatar	Kuwait	South Africa
Mali	Ivory Coast	Angola	China	Equatorial Guinea	South Africa
Mauritania	UAE	Morocco	Saudi Arabia	Senegal	Qatar
Morocco	Saudi Arabia	UAE	Russia	Egypt	Qatar
Niger	Nigeria	Ivory Coast	Ghana	Libya	Togo
Palestine	UAE	Saudi Arabia	Jordan	Egypt	Other
Syria	UAE	Saudi Arabia	Qatar	Kuwait	Lebanon
Tunisia	UAE	Saudi Arabia	Libya	Other	Qatar
Yemen	Saudi Arabia	UAE	Qatar	Egypt	Other

A2: Principal Component Analysis

Table A3: Principal components eigenvectors

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7	Comp8	Comp9	Comp10	Comp11	Comp12
Violence1	0.1993	0.1780	-0.6297	0.1006	0.0923	-0.0041	0.1730	-0.0043	0.0800	-0.0444	0.4751	0.4994
Violence2	0.2347	0.1712	-0.6178	0.0552	0.1167	0.0894	-0.0104	0.1347	0.0074	-0.0028	-0.4307	-0.5527
Religiosity1	0.1947	-0.1960	0.1783	0.6362	0.1472	0.1862	0.2923	-0.0512	-0.0507	-0.5778	-0.0792	-0.0065
Religiosity2	0.3190	-0.2829	0.0588	0.4016	0.2078	0.2810	-0.4184	-0.0532	0.0191	0.5824	0.1172	0.0124
Generosity1	-0.0125	0.5235	0.2242	0.1520	0.0940	0.0432	-0.1850	0.0720	0.7684	-0.0806	0.0471	-0.0568
Generosity2	-0.0309	0.5028	0.1830	0.2790	0.0447	-0.1144	0.5355	-0.1845	-0.2624	0.4692	-0.0050	-0.1001
Generosity3	-0.1006	0.5125	0.0709	0.0224	0.0786	0.3609	-0.4515	0.1384	-0.5436	-0.2237	0.0319	0.1252
Gender1	0.5217	0.1338	0.1105	-0.1957	0.0787	-0.1804	-0.0885	-0.3457	-0.0020	-0.0338	-0.5411	0.4466
Gender2	0.5074	0.0753	0.1614	-0.3100	0.0076	0.0014	-0.0151	-0.3351	-0.0853	-0.1791	0.5102	-0.4500
Gender3	0.4194	0.0011	0.2286	-0.2240	-0.0838	0.2306	0.3018	0.7415	0.0026	0.1042	-0.0050	0.0986
Other1	-0.2056	-0.0649	-0.0188	-0.3469	0.3358	0.7121	0.2923	-0.3016	0.1481	0.0535	-0.0914	0.0591
Other2	-0.0809	-0.0569	0.0826	-0.1207	0.8775	-0.3747	-0.0087	0.2132	-0.0812	-0.0371	0.0638	-0.0303

A3: Descriptive statistics and correlations

Table A4: Descriptive statistics

Variable	Obs	Mean	s.d.	Min	Max
Migration desire	146680	0.237	0.425	0	1
Plan to Migrate	146680	0.029	0.167	0	1
Religiosity	34906	0.229	0.297	0	1
Gender views	33908	0.697	0.326	0	1
Generosity	142758	0.281	0.287	0	1
Violence	41878	0.858	0.245	0	1
Female	146680	0.487	0.499	0	1
Network	146680	0.259	0.438	0	1
Age	146680	34.38	12.88	16	65
Education	146680	0.584	0.492	0	1
Marital	146680	0.612	0.487	0	1
Children	146680	0.716	0.450	0	1
Income HH	143082	12963	1699	0	1616

Authors' elaboration on Gallup data.

Table A5: Pearson correlations across variables

	Rel	Gend	Gender	Viol	Fem	Netw	Age	Educ	Marital	Child	Inc
Religiosity	1.0										
Gender views	0.0949*	1.0									
Generosity	-0.0798*	-0.0237*	1.0								
Violence	-0.002	0.0561*	-0.0193*	1.0							
Female	0.1714*	0.2685*	-0.1003*	0.0242*	1.0						
Network	-0.0090	0.0563*	0.0686*	-0.0088	-0.0159*	1.0					
Age	-0.0427*	-0.0259*	0.0361*	0.0041	-0.0308*	-0.0498*	1.0				
Education	0.1289*	0.1359*	0.1258*	0.0592*	-0.0870*	0.0660* -	0.1759*	1.0			
Marital	-0.0722*	-0.0546*	0.0362*	-0.0281*	0.0286*	-0.0657*	0.4135*	-0.1464*	1.0		
Children	-0.1351*	-0.0971*	-0.0237*	-0.0372*	0.0032	-0.066*	-0.0865*	-0.1137*	0.2147*	1.0	
Income HH	0.0847*	0.0970*	0.1327*	-0.0228*	-0.0308*	0.0932*	-0.0042*	0.2199*	-0.0587*	-0.1185*	1.0

Notes: * p<0.05. Source: Authors' elaboration on Gallup data.

Table A6: Pearson correlations across cultural components

Value	Relig.	Gender	Gener.	Violence
Religiosity 1	0.781*	0.067*	0.004	-0.025*
Religiosity 2	0.804*	0.079*	-0.131*	0.046*
Gender 1	0.090*	0.754*	-0.008	0.098*
Gender 2	0.050*	0.755*	-0.023*	0.039*
Gender 3	0.075*	0.693*	-0.022*	-0.018
Generosity 1	-0.050*	-0.012	0.698*	-0.033*
Generosity 2	-0.024*	-0.011	0.613*	-0.042*
Generosity 3	-0.082*	-0.019*	0.749*	0.019*
Violence 1	-0.009	0.056*	-0.007	0.872*
Violence 2	-0.005	0.032*	-0.021*	0.859*

Notes: * p<0.01. Source: Authors' elaboration on Gallup data.

A4: Distribution of Values

Figure A1: Gender-egalitarian views

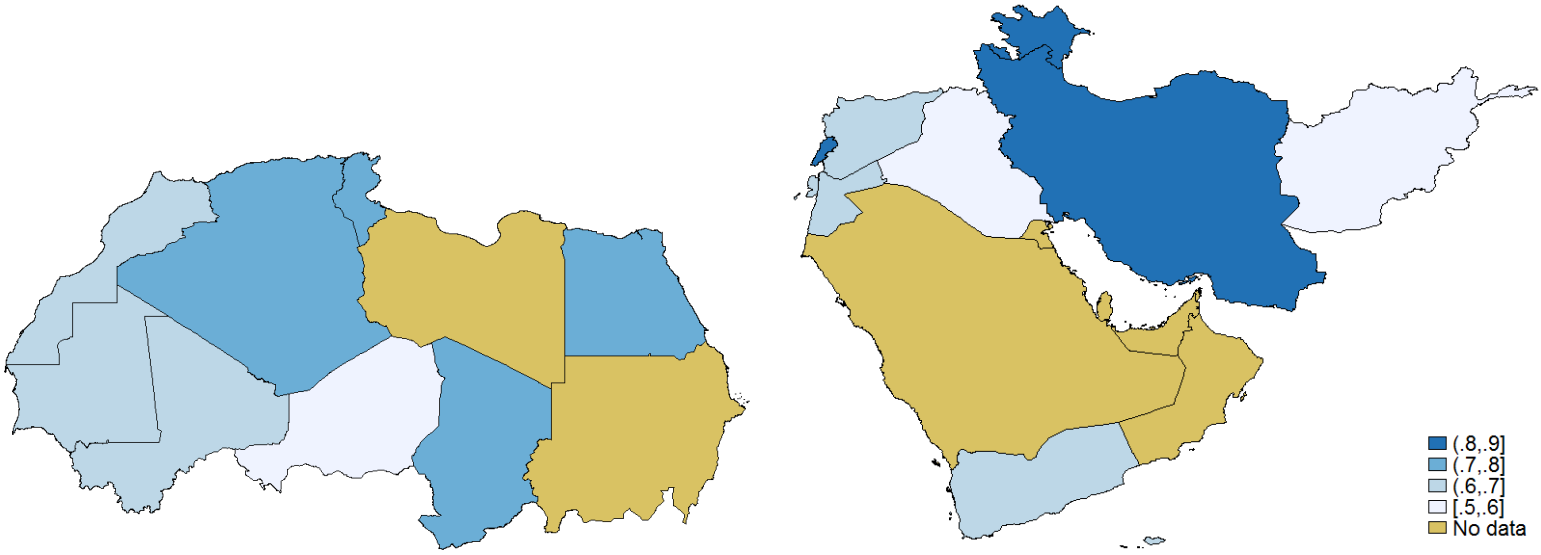


Figure A2: Religiosity

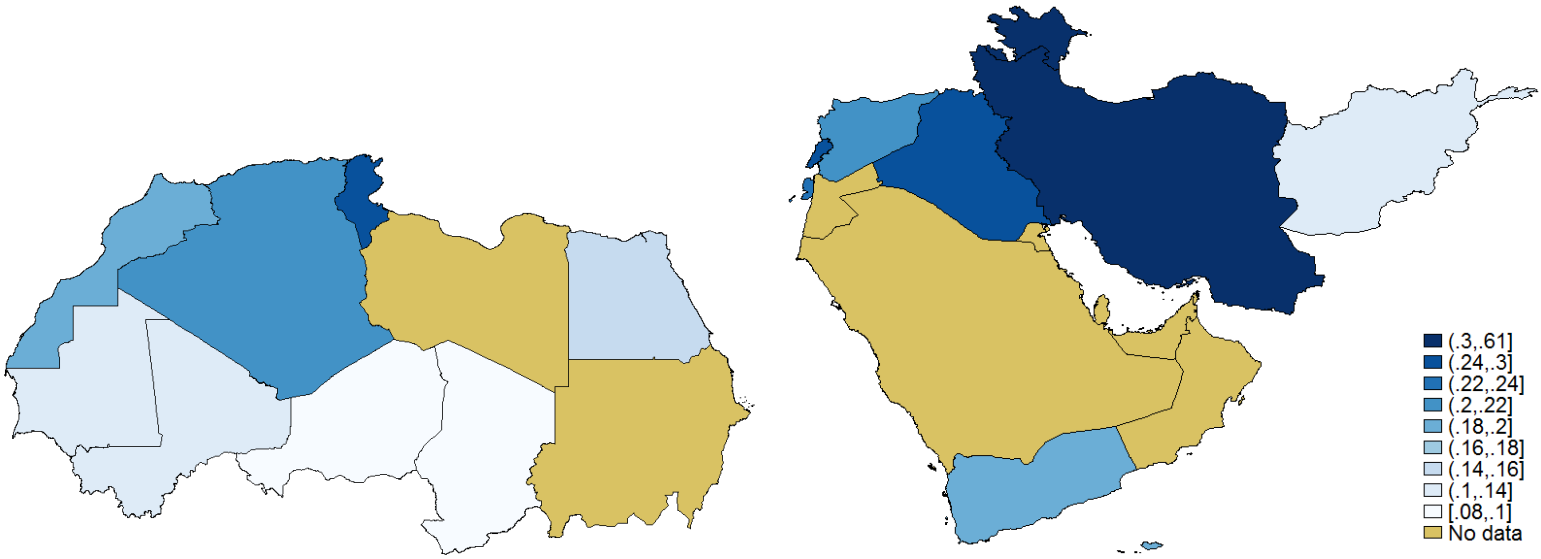


Figure A3: Generosity

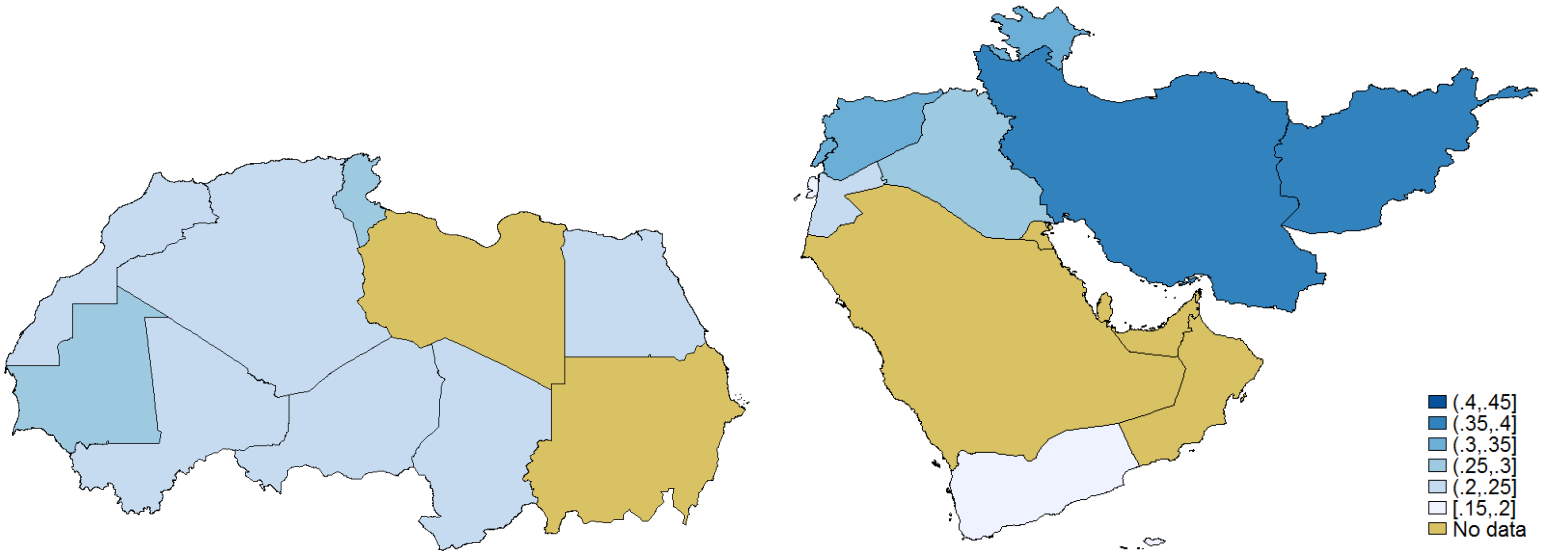
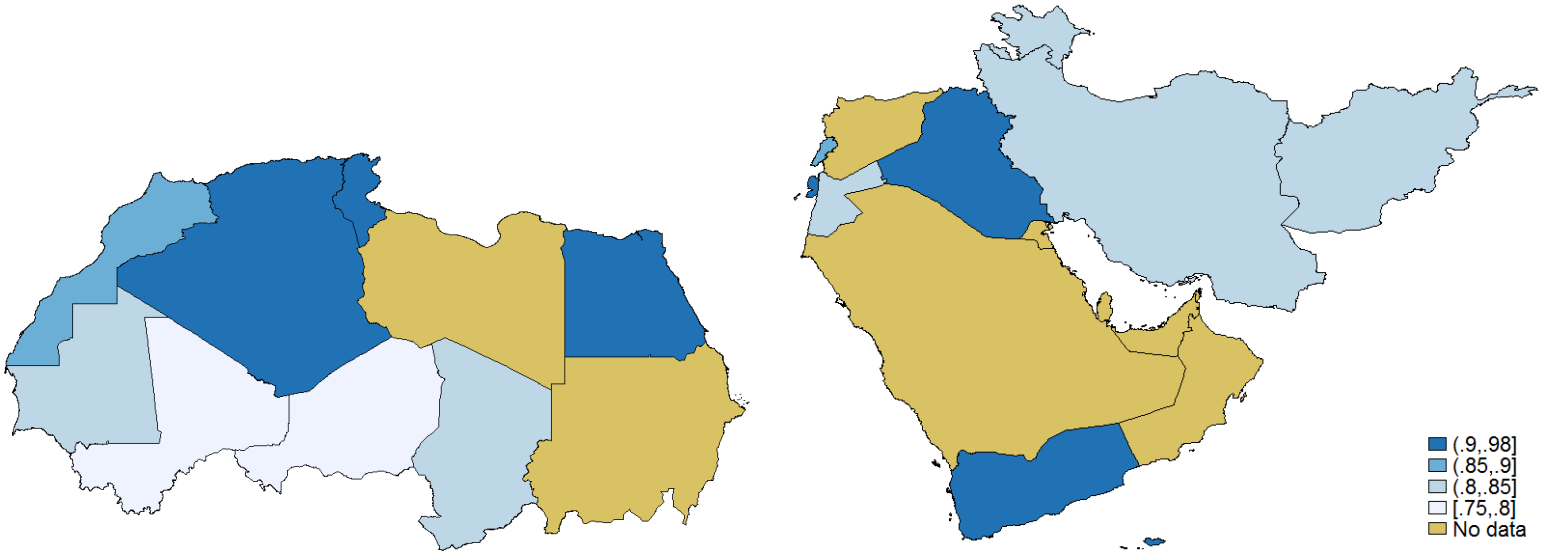


Figure A4: Use of violence



A5: Logit Regression: different aggregation for culture

Table A7: Logit regressions - Robustness to different indicators 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Rel	Rel	Rel	Gend	Gend	Gend
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Aggregation	PCA	Arthm.	Geom.	PCA	Arthm.	Geom.
$Culture$	0.509***	0.438***	0.472***	0.190*	0.187	0.033
	(0.093)	(0.091)	(0.061)	(0.115)	(0.117)	(0.091)
$Female$	-0.675***	-0.682***	-0.628***	-0.761***	-0.761***	-0.735***
	(0.102)	(0.102)	(0.100)	(0.120)	(0.120)	(0.123)
$Network$	0.704***	0.704***	0.701***	0.745***	0.745***	0.748***
	(0.088)	(0.087)	(0.088)	(0.105)	(0.105)	(0.104)
Age	-0.293***	-0.293***	-0.296***	-0.313***	-0.313***	-0.312***
	(0.041)	(0.041)	(0.042)	(0.054)	(0.054)	(0.054)
$Education$	0.250**	0.250**	0.247**	0.269**	0.269**	0.276***
	(0.126)	(0.126)	(0.126)	(0.105)	(0.105)	(0.105)
$Marital$	-0.486***	-0.486***	-0.491***	-0.367***	-0.367***	-0.369***
	(0.088)	(0.088)	(0.089)	(0.073)	(0.073)	(0.073)
$Children$	-0.001	-0.002	0.001	0.011	0.011	0.012
	(0.040)	(0.039)	(0.041)	(0.108)	(0.109)	(0.109)
$Income$	-0.006	-0.006	-0.006	-0.004	-0.004	-0.004
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
$Income^2$	0.000**	0.000**	0.000**	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Constant$	-1.305***	-1.302***	-1.268***	-1.986***	-1.980***	-1.927***
	(0.107)	(0.108)	(0.111)	(0.159)	(0.158)	(0.149)
Observations	27,368	27,368	27,368	25,689	25,689	25,689
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.170	0.170	0.169	0.161	0.161	0.160

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. OECD destinations: same as Table 4. Arthm: arithmetic average of the individual answers. Geom: geometric average.

A6: Logit Regression: analysis with different fixed effects

Table A8: Logit regressions - Different fixed effects 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Culture	Gend	Gend	Gend	Gend	Rel	Rel	Rel	Rel
Destination	OECD	OECD	OECD	OECD	OECD	OECD	OECD	OECD
$Culture$	0.100	0.200***	0.179	0.190*	0.303***	0.324***	0.547***	0.509***
	(0.063)	(0.066)	(0.111)	(0.115)	(0.063)	(0.064)	(0.101)	(0.093)
$Female$	-0.634***	-0.675***	-0.692***	-0.761***	-0.622***	-0.636***	-0.669***	-0.675***
	(0.042)	(0.042)	(0.098)	(0.120)	(0.039)	(0.039)	(0.091)	(0.102)
$Network$	0.672***	0.749***	0.743***	0.745***	0.713***	0.711***	0.705***	0.704***
	(0.042)	(0.043)	(0.083)	(0.105)	(0.043)	(0.043)	(0.070)	(0.088)
Age	-0.248***	-0.270***	-0.310***	-0.313***	-0.231***	-0.245***	-0.292***	-0.293***
	(0.019)	(0.019)	(0.044)	(0.054)	(0.018)	(0.018)	(0.042)	(0.041)
$Education$	0.547***	0.267***	0.306***	0.269**	0.377***	0.249***	0.287**	0.250**
	(0.046)	(0.048)	(0.110)	(0.105)	(0.043)	(0.045)	(0.122)	(0.126)
$Marital$	-0.448***	-0.462***	-0.356***	-0.367***	-0.685***	-0.667***	-0.489***	-0.486***
	(0.046)	(0.047)	(0.052)	(0.073)	(0.045)	(0.045)	(0.072)	(0.088)
$Children$	-0.191***	-0.176***	-0.037	0.011	-0.156***	-0.173***	-0.056	-0.001
	(0.044)	(0.045)	(0.092)	(0.108)	(0.043)	(0.044)	(0.048)	(0.040)
$Income$	0.003	0.003	-0.004	-0.004	0.001	0.002	-0.004	-0.006
	(0.002)	(0.002)	(0.004)	(0.005)	(0.002)	(0.002)	(0.005)	(0.004)
$Income^2$	-0.000	-0.000	0.000*	0.000	0.000	0.000	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-1.390***	-0.271***	-0.250	-1.986***	-1.055***	-0.218**	-0.628***	-1.305***
	(0.072)	(0.090)	(0.208)	(0.159)	(0.061)	(0.093)	(0.219)	(0.107)
Observations	29,775	29,775	29,775	25,689	30,752	30,752	30,752	27,368
Country f.e.	No	No	Yes	No	No	No	Yes	No
Region f.e.	No	No	No	Yes	No	No	No	Yes
Year-Wave f.e.	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Partial R^2	0.0843	0.107	0.145	0.161	0.0928	0.100	0.152	0.170

Source: Author's calculations on Gallup Data. Std. errors in parentheses are clustered at country level in columns (3), (4), (7) and (8); *** p<0.01, ** p<0.05, * p<0.1.

A7: Logit Regression: additional subsamples analysis

Table A9: Logit regressions - Robustness by religious group 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)
Culture	Gend	Rel	Gend	Rel	Gend	Rel
Destination	OECD	OECD	OECD	OECD	OECD	OECD
Religion	Muslims	Muslims	Christians	Christians	Others	Others
$Culture$	0.261*	0.486***	-0.542	0.205	0.140	0.786**
	(0.149)	(0.091)	(0.349)	(0.154)	(0.231)	(0.392)
$Female$	-0.804***	-0.742***	-0.630***	-0.676***	-0.654***	-0.518***
	(0.159)	(0.140)	(0.136)	(0.128)	(0.067)	(0.116)
$Network$	0.779***	0.747***	0.457***	0.280	0.790*	0.745***
	(0.093)	(0.086)	(0.132)	(0.188)	(0.465)	(0.249)
Age	-0.361***	-0.341***	-0.226***	-0.117***	-0.160	-0.253***
	(0.058)	(0.060)	(0.020)	(0.043)	(0.106)	(0.065)
$Education$	0.245***	0.280**	0.631**	0.189	0.264*	-0.009
	(0.087)	(0.111)	(0.266)	(0.482)	(0.142)	(0.100)
$Marital$	-0.399***	-0.448***	-0.180*	-0.154	-0.264**	-0.725***
	(0.091)	(0.077)	(0.108)	(0.235)	(0.125)	(0.150)
$Children$	0.117	-0.092	0.037	0.125	-0.272***	0.169
	(0.132)	(0.070)	(0.153)	(0.095)	(0.093)	(0.119)
$Income$	-0.005	-0.004	-0.022***	0.012***	-0.001	-0.015**
	(0.004)	(0.005)	(0.008)	(0.004)	(0.008)	(0.006)
$Income^2$	0.000	0.000	0.000**	-0.000***	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Constant$	-1.973***	-1.146***	2.458***	-1.335***	-0.692	-1.297***
	(0.184)	(0.146)	(0.223)	(0.478)	(0.551)	(0.410)
Observations	20,097	21,518	1,990	1,952	3,515	3,718
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.189	0.180	0.107	0.104	0.111	0.136

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. Muslims and Christians takes into account all the confessions of each religion. Others is a residual (not Muslim, not Christian)

Table A10: Logit regressions - Robustness by gender and marital status 2007-2011
Dependent = Migration aspirations to OECD destinations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Culture	Gend	Gend	Gend	Gend	Rel	Rel	Rel	Rel
Destination	OECD	OECD	OECD	OECD	OECD	OECD	OECD	OECD
Gender	Male	Female	Male	Female	Male	Female	Male	Female
Marital Status	Single	Single	Married	Married	Single	Single	Married	Married
$Culture$	0.338	0.478**	0.146	-0.063	0.635***	0.103	0.862***	0.385
	(0.230)	(0.237)	(0.146)	(0.287)	(0.096)	(0.260)	(0.171)	(0.245)
$Network$	0.853***	0.784***	0.583***	0.760***	0.624***	0.921***	0.573***	0.723***
	(0.112)	(0.155)	(0.140)	(0.170)	(0.138)	(0.186)	(0.080)	(0.091)
Age	-0.397***	-0.275***	-0.309***	-0.319***	-0.308***	-0.275***	-0.239***	-0.299***
	(0.075)	(0.042)	(0.063)	(0.096)	(0.042)	(0.066)	(0.081)	(0.080)
$Education$	0.233*	0.306	0.176	0.448***	0.038	0.585***	0.152	0.489**
	(0.134)	(0.216)	(0.111)	(0.163)	(0.168)	(0.177)	(0.167)	(0.196)
$Children$	-0.130	0.207	0.094	-0.186	-0.015	0.112	-0.019	-0.277**
	(0.165)	(0.197)	(0.124)	(0.149)	(0.097)	(0.125)	(0.149)	(0.121)
$Income$	-0.002	0.004	-0.009	-0.004	-0.001	-0.005	-0.013*	-0.008
	(0.007)	(0.006)	(0.010)	(0.010)	(0.007)	(0.004)	(0.007)	(0.007)
$Income^2$	0.000	0.000	0.000	0.000	0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-1.264***	-3.838***	-0.877**	-2.244***	-0.681***	-3.890***	-2.604***	-1.860***
	(0.172)	(0.189)	(0.377)	(0.347)	(0.204)	(0.308)	(0.238)	(0.308)
Observations	4,861	4,125	7,388	6,618	5,520	4,825	7,879	6,882
Region f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Wave f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Partial R^2	0.149	0.140	0.131	0.167	0.117	0.163	0.132	0.152

Source: Author's calculations on Gallup Data. Std. errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Std. errors are clustered at the country level. We run our analysis on gender (Male, Female) and marital status (Single, Married)

A8: Arab Spring Covariates Distribution - Full sample and Matched sample

Table A11: Before and After Arab spring Covariates distribution
Matched and non-matched samples

	Non-matched Sample				*Matched Sample*			
Variables	Average	Std Error	Diff.	P-value	Average	Std Error	Diff.	P-value
Gender	0,506	0,002	2,249	0,272	0,505	0,003	-2,597	0,194
Network	0,245	0,001	65,893	0,000	0,226	0,002	0,299	0,881
Age	33,660	0,044	5,676	0,005	33,739	0,071	-1,231	0,538
Marital	0,589	0,002	17,711	0,000	0,581	0,003	-4,797	0,016
Children	0,729	0,001	10,296	0,000	0,714	0,002	-1,573	0,431
Income	11577	49,101	11,885	0,000	11676	72,885	6,618	0,001
Education	0,460	0,002	-35,998	0,000	0,457	0,003	7,497	0,000

The difference individuals between average covariates of individuals before and after the Arab Spring is divided by the std error.

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