*Article*

# The Migration Intentions of Young Egyptians

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**Abstract:** This study examines the migration intentions of young people in Egypt before and after the 2011 revolution, driven by three sets of factors: (1) individual demographic and socioeconomic characteristics, (2) household characteristics, and (3) community characteristics and political and civic participation. Logistic regression models are applied to study the determinants of intentions to live, study, or work abroad among young Egyptians (defined as individuals aged 18 to 29), using data from the Survey of Young People in Egypt (SYPE) conducted in 2009 (N = 8488) and in 2014 (N = 5885). The surveys are nationally representative, covering all governorates in Egypt. The analysis indicates that respondents' age, gender, marital status, and employment status play a significant role in shaping migration intentions. After the 2011 revolution, the effects are dependent upon economic and institutional conditions. The employment status affects the migration intention of young people in 2009; but the effects become insignificant in 2014. Moreover, respondents who have participated in political and voluntary activities are more likely to express migration intentions. Pollution levels in the community are also positively correlated with the intention to migrate. The results indicate that those who expressed migration intentions are a selective group in terms of demographic and socioeconomic characteristics. Our findings have policy relevance because knowledge and understanding of migration intentions and their determinants can be used to assess and develop scenarios about future migration.

**Keywords:** youth; migration; Egypt; MENA; intention; Arab Spring

## 1. Introduction

The decision to migrate, both within a country and internationally, is motivated by the wish to increase the quality of life [1,2]. However, the determinants of migration decisions are complex, including a range of social, economic, political, and environmental drivers at the macro level as well as the sociodemographic characteristics, perceptions, and capabilities of people at the individual level. The Arab Spring revolutions, political conflicts, and persistently high levels of unemployment and food insecurity in the Middle East and North Africa (MENA) region have made migration a prominent topic in politics and public debate [3,4]. Indeed, in certain contexts, political instability such as revolutions and other conflicts may be an important factor determining the migration decision, even more significantly than economic factors [5].

Media reports and popular discourses typically paint an apocalyptic image of an influx of desperate migrants from Africa trying to enter Europe [6]. These claims, however, are often not based on empirical evidence. Recent estimates of global bilateral flows based on stock data show that in fact most international migration in Africa occurs within the continent [7,8]. While the estimates are useful in providing an overview of global migration trends, they have some limitations [9]. One limitation of these estimates is that additional migration events to third countries or return migration are not accounted for and may therefore underreport the total number of migrants. To this end, a

study of changing migration intentions in people before and after the political upheaval can provide useful information and evidence to help assess the changes in migration flows.

Understanding migration intentions reveals individual attitudes towards migration. Carling defines migration intentions or aspirations as an individual's "preference for migration over staying, regardless of the reason" [10]. This helps to understand the conditions underlying a decision to move even if migration desires may not be ultimately fulfilled [11]. The aspirations-capabilities framework proposed by De Haas offers a micro-level theory that goes beyond the deterministic macro theories focusing on macro-level migration determinants without consideration of human agency [12]. By making a behavioral link, De Haas proposes a framework that accounts for aspirations to migrate when people perceive better opportunities elsewhere and are capable of moving [12]. Aspirations are determined by many factors, ranging from individual personality, education, and awareness of opportunities elsewhere to access to information and networks [13,14]. As aspirations are a pre-requisite for actual migration, Carling emphasizes how studying migration aspirations overcomes the methodological issue in drawing a comparison between migrants and stayers. Studying migration intentions can thus contribute to the understanding of why people migrate [15].

The Middle East and North African (MENA) region has increasingly become a hub for all types of migration, an origin and destination for regular, irregular, transit, and refugee flows. The diversification and complexification of migratory patterns in the region is the result of globalization, conflicts and political instability within and outside of MENA, changing labor markets, poverty, and emerging transnational networks [16]. Being the most populous country in MENA with a population estimated at over 100 million in 2019 [17], Egypt is the largest supplier of migrant labor to the Middle East in the region. In Egypt, remittances are a key source of income, constituting as much as 10.2% of the gross domestic product (GDP) in 2018 [18]. Not only is Egypt a key migrant-sending country, it has also become a key destination for Arab and African immigrants as well as Palestinians, Sudanese, and, since 2011, Syrian refugees. Its geopolitical context also makes Egypt a transit country in Mediterranean migration routes used by sub-Saharan Africans moving to Europe. Migration is thus high on the Egyptian government policy agenda.

Fertility levels have been declining slowly since the late 1990s in Egypt, causing persistent high population growth [19]. Moreover, age composition of the population has also changed, including a significant increase in the share of working-age groups. Whilst an increase in the working-age population is often seen as a window of opportunity for a country to catch up with production and economic growth, it requires an economic system that is able to absorb the young workers into productive employment. Demographic pressures coupled with major structural changes in the Egyptian economy and external shocks have contributed to stubbornly high unemployment rates in Egypt, which increased from 8% in 1999 to 13% in 2013, with some improvements in 2019 (11%). Although the young populations are significantly more educated than the older generations, youth unemployment rates are especially high—at 32% in 2019—and the prevalence of unemployment of young women is even higher, at 41% in the same year [20,21]. That the more educated young Egyptians have higher unemployment rates is somewhat counterintuitive because, in other countries, both low- and high-income countries, unemployment decreases as the level of education increases [22]. Facing difficulties finding a job in the local labor market, migration has become a meaningful way out for youth in the region [23]. If the more educated youth are indeed moving or intend to move out of Egypt for employment opportunities elsewhere, it would be a human capital loss for Egypt—the so-called "youth brain drain". However, the current policies in Egypt and many other developing countries seldom take into account the migration behavior of the youth who have an intention to move, despite the fact that the majority of the world's young migrants (60%) are from developing countries [24].

In this paper, we study the changes of migration intentions and their determinants among youth in Egypt before and after the 25 January Revolution, which occurred in 2011 (the date marks the start of the Egyptian revolution of 2011 which spread across the country and led to the overthrow of President Mubarak who had been in office since 1981). By examining the migration intention and their determinants, we hope to provide useful information for estimating migration flows and offer policy references for origin and destination countries [25].

This study opens up new avenues to investigate issues pertaining to international migration in Egypt and the whole MENA region. Our focus on Egypt is not only because migration represents an essential asset for the Egyptian economy, with remittances increasing from 7.1 US$ billion in 2009 to 19.6 US$ billion in 2012, and to 25.5 US$ billion in 2018 [26,27], the paper also represents a first comprehensive analysis of the migration intentions and their determinants among young Egyptians. Moreover, taking advantage of the unique two-round survey of Egyptian youth before and after the 2011 revolution, this paper contributes to the migration literature about the impacts of major political and socioeconomic changes on determinants of migration intentions, and sheds light on how the economic, political, and social consequences of the Arab Spring revolution have influenced the migration intentions of the young people in Egypt and other countries of the MENA region.

The paper is structured as follows. Section 2 presents the main theories of intention and human behavior, and migration intention globally. Section 3 briefly reviews literature on migration intention and migration determinants in Egypt. Section 4 introduces the data source and methodology. It then provides information about the national Survey of Young People in Egypt (SYPE) and the variables, which are useful for studying the characteristics of young people who intend to migrate. Section 5 shows the results from the empirical analysis regarding the determinants of young people's intentions to migrate in Egypt. Section 6 offers discussion and some concluding remarks.

## 2. The Literature on Migration Intentions

Most of the empirical research on intentions is based on the theory of reasoned action (TRA) developed by Ajzen and Fishbein [28]. According to this theory, actions are directly influenced by intentions, and therefore the assessment of intentions allows for the prediction of actions. TRA assumes that intentions are determined by attitudes toward actions, as well as subjective norms (beliefs about the expectations of other people) related to action. An attitude is the individual's positive or negative evaluation of an action's likely outcomes, e.g., assessing the advantages and disadvantages of migration. Subjective norms are external opinions and expectations as perceived by the individual in relation to the specific action, e.g., how significant others would judge their migration. The theory of planned behavior builds upon TRA, adding perceived behavioral control as an additional factor influencing the formation of intentions [29,30]. This determinant of intentions takes into account the subjective individual perception of the difficulty involved in realizing the specific action. It is related to a sense of self-efficacy or ability (and thus, indirectly to self-confidence).

Numerous studies have considered intention as an immediate driver of certain behaviors such as smoking [31–33], sexual activity, contraception use, abortion [34–37], illicit drug use [38–40], and childbearing [41–43].

There has been a growing number of publications devoted to examining migration intentions in the recent decade [11,24,30–33,44–46]. Bonifazi and Paparusso [25] provide a valuable review of the literature on the topic: migration intention is related but distinct from aspiration and actual migration, because aspiration refers to "desire, wish, and preference" of moving [11], while intention is in between aspiration and "realism of migration" [44]; although many realize their migration intentions, others migrate unexpectedly [47]; even though people with migration intentions are closer to the final stage of migration decision [45], only 34% of native residents in the Netherlands who reported their intentions to move abroad actually migrated in the next five years [46]. Therefore, we should take into consideration that our findings on migration intentions may not translate directly into realized migration. However, other authors [48] found a strong correlation between bilateral migration plans and actual bilateral migration flows and therefore proposed to apply data on migration intentions to estimate migration flows in the absence of reliable migration data [23,47–49]. Xenogiani et al. used the data collected by Gallup in a survey that includes information on sociodemographic characteristics and labor market outcomes of all adults (aged 15 years and over) from more than 160 countries during the period 2007 to 2013. The authors found that one in seven persons (more than 406 million) wanted to move permanently abroad if an opportunity arose [50]. The share of the population that intended to migrate ranges from 16% (for Asia and Oceania) to 32% (for sub-Saharan Africa) over the period 2007–2013. In Latin America and the Caribbean (22% of the population) and the Middle East and North Africa

(23%), the proportion is also substantial. The authors found that men, young people, the more educated, and wealthier persons were more likely to express their desire to emigrate, as were those who have a network in the destination country (friends and families abroad). Similarly, Migali and Scipioni used more recent data from the Gallup World Poll survey for the period 2010–2015 to examine migration intentions in different countries, classified by income level [45]. They showed that the percentage of individuals intending to move is higher in low-income countries (about one-fourth of the total population), as compared to lower-middle and upper middle-income countries (approximately 22%). They also indicated that migration intentions consistently increased over the period 2010–2015 [45]. Dao et al. also confirmed these results using the same Gallup data but controlling education levels and found that the younger and more educated people display higher aspirations to migrate. They also found that the dyadic geographic variables (such as the distance between the country of origin of potential migrants and their desired destination) and the presence of networks at destination are associated with migration aspirations for both high- and low-educated individuals [51]. Income is a significant determinant of aspirations for low-skilled individuals only.

Dustmann and Okatenko used the 2006 Gallup wave data to investigate the drivers of potential moves from the origin. Their study proved that the likelihood of migration increases substantially with individual income for those living in poorer areas in Africa and Asia, while this relation is not strong for individuals coming from more developed areas in Latin America [52]. The findings are in line with another study that found an inverted U-shaped relationship between income and migration [53]. Dustmann and Okatenko also observed that satisfaction with local amenities (such as security and public services) negatively affects the likelihood of migration [52]. Furthermore, Ivlevs proved that life satisfaction and happiness are negatively correlated with migration intention and decision, although causal relationships have not been established yet [54]. OECD countries are considered the most favorable destinations. Esipova et al. indicated that the number of people who named the USA as their preferred destination is about four times the total number of individuals (adults and children) who already migrated to the USA during the period 2007–2010 [55]. Potential migrants to Europe named France and the United Kingdom as their most desired destinations, followed by Germany, Spain, and Italy [56].

Individuals with higher education are more likely to translate migration intention into actual migration, especially when they have transnational social networks in the desired destination countries [57], and the growth prospects there are favorable [45]. Moreover, cultural and community aspects should be taken into consideration to understand migration intentions. Ruyssen and Salomone examined the causal effects of gender discrimination in the country of origin on women's desires to migrate over the period 2009–2013 in 148 countries. They found that women's awareness of existing gender discrimination increases their willingness to migrate [58]. In Lebanon, Dibeh et al. have used a unique dataset from the SAHWA Youth Survey (2016) to examine some of socioeconomic drivers behind the decision of youths to emigrate from Lebanon. They found that youths from the most impoverished regions showed the highest propensity to migrate, while youths with explicit socioeconomic concerns also have a higher willingness to emigrate [59]. However, there was no difference between youth living in rural or urban areas regarding their decisions to emigrate or not.

## 3. Migration in Egypt

According to the 2017 census, more than 9.4 million Egyptians live abroad—about 1 in 10 out of a population estimated at 97 million—and about 6.2 million are in the Middle East. The number of Egyptians living abroad has increased substantially from 2.2 million in 1996 [16,60,61]. The majority of migrants are young people: the average age of the migrant population is under 30 years, compared to the average age of 35 years for non-migrants [62]. Farid and El-Batrawy reported the median age at first migration was 25.1 years for males and 25.6 years for females [63]. A study of 1552 Egyptian men found that 87% of the surveyed young adults intended to migrate to European countries, especially Italy and France [64], although they were aware of the potential difficulties and challenges associated with entering Europe, including the potential negative consequences of illegal migration. This study also

revealed that the young migrants to Europe and Gulf Cooperation Countries (GCC) plan to return to Egypt after achieving certain financial goals and improving their economic conditions.

After the 25 January Revolution in 2011, the International Organization for Migration (IOM) interviewed 1417 adults aged 15 to 29 to understand youth aspirations and the determinants of migration intentions. The study reported that 52% expressed a desire to move abroad due to the concerns of corruption, wages, security, employment, and constitutional reforms after the revolution. The study indicated that most young people search for information about migration through the Internet and ask their relatives and friends, given that more than 50% had family or friends living abroad [65]. Similarly, using data from the 2009 Survey of Young People in Egypt (SYPE), Elbadawy also found that social network is one of the key factors for migration aspirations, and well-off young people were more likely to choose European countries as destination [66]. David et al. used three waves of the Egyptian Labor Market Panel Survey (ELMPS) covering the 1998–2012 period to study the determinants of emigration at the individual and household level. Using a Probit regression model, they found that age is a strong determinant of migration, with the young being more prone to migrate; being unemployed increases migration aspirations; and the wealthier the household, the more likely an individual is to migrate for she or he is more able to overcome the costs of migration [49]. Moreover, education is also positively associated with migration decision. Ramos studied the determinants of migration intentions among youth during their school-to-work transitions in Egypt, Jordan, Lebanon, Palestine, and Tunisia using microdata from School-to-Work Transition Surveys (SWTS) conducted by the International Labor Organization (ILO) from 2013 to 2015. His analysis revealed that age has a positive and significant effect, while gender, educational level, marital status, labor participation, the wealth of household, household size, and parent's age are all important drivers of migration aspirations [23].

Despite a growing literature on motivations for migration among adults, empirical analyses on migration intentions are limited, and the findings are non-conclusive. The few existing analyses do not consider how political and civic participation of youth and environmental factors affect individual determinants of migration decisions. Moreover, to the best of our knowledge, no previous research has used longitudinal datasets to investigate the factors affecting migration intention among youth before and after a political upheaval. Our paper aims to fill the gap in the literature by examining the individual determinants of migration intentions among young people in Egypt before and after the 2011 revolution.

## 4. Data and Methodology

### 4.1. Data

This research uses data from the Survey of Young People in Egypt (SYPE) conducted in 2009 and 2014 by the Central Agency for Public Mobilization and Statistics (CAPMAS). The samples are nationally representative, covering all regions in Egypt, including the five frontier governorates. It is a stratified, multi-stage cluster sample. In 2009, out of the 11,372 households included in the SYPE sample, a total of 15,029 young people aged 10–29 were successfully surveyed, among which about 8488 young people aged 18–29 answered a set of questions on migration. In 2014, the survey collected information from 10,916 young people, including 5885 young people aged 18–29 who answered the questions on migration. The surveys are the first of their kind conducted on the youth of ages between 10 and 29 years and focused on critical aspects of their lives, including education, employment, health, family formation, migration, reproductive health, social issues, and civic/political participation. Moreover, the second round of the survey was conducted in 2014 in the wake of significant transitions that took place in Egypt with the outbreak of the 25 January Revolution calling for freedom, social justice, and equality.

### 4.2. Methodology

We first present some descriptive statistics about the main characteristics of Egyptian youth who had an intention to migrate abroad in 2009, compared to those who did not intend to migrate. We

further investigate potential determinants (push and pull factors) of their intention during the period 2009–2014.

In the second part, we first apply logistic regression models to all youth to investigate the determinants of their intentions to live, study, or work abroad. Furthermore, to consider the family and social constraints of the region [67], we develop separate models for men and women. This allows us to check whether gender drives migration intentions differently using a uniform set of explanatory variables.

### 4.2.1. Dependent Variable

We use the binary variable of migration intention in SYPE (2009 and 2014), which included a question directed to young people aged 18 and above as to whether or not they intended to migrate abroad.

### 4.2.2. Independent Variables

Following reviews of the factors affecting migration decision, we include the following control variables in our models as discussed below.

Individual characteristics**:** The control variables we used in the analysis are age (along the following age groups: 18–21, 22–25, and 26–29), gender (male and female), marital status (not married and married), education (never been in school, some schooling, primary, preparatory, secondary, and post-secondary), and self-assessed health status (good and not good; the survey asked the respondent to describe his/her own health situation by choosing one answer from multiple choices: a. excellent, b. very good, c. good, d. fair, and, e. poor. We put a, b, and c into the "good" category, and d and e into "not good" category) of the young people. These variables have been shown in the literature to be strong predictors and play different roles in explaining migration decisions [23,68–74]: age is significantly and negatively associated with migration [71,75,76]; women are less likely to migrate than men [77,78]; the unmarried are more likely to move than married people [79,80]; the unemployed young people are more mobile in both sending and receiving countries [81,82]; migrants are healthier than both non-migrants in the origin country and native residents in the destination country [83], because transitions into another culture and work environment are easier for the healthy [80].

Household characteristics: Variables used to explain the household characteristics are gender (male, female) and age (along age groups: >30, 30–39, 40–49, 50–59, 60+) of household head, household size (1–3, 4–5, 6+ persons), and poverty status (poor, middle, and rich; the surveys include a variable representing wealth condition of the household. All the households are classified into 5 quantiles of wealth from low to high. We simplify the five categories into three, by grouping the lowest two quantiles as "poor", the third quantile as "middle", and the highest two quantiles as "rich"). According to the new economics of migration [84,85], migration is often not decided by just an individual but jointly by household members, depending on the sociodemographic, economic, and cultural characteristics of the household [68,70,85,86]. The literature reveals that household size and number of siblings have positive effects on migration decisions [87]. Resources and wealth owned by households may facilitate the process of migration [79,88]. Parents who have high socioeconomic status can cover the initial costs associated with migration for their children. Hence, migration intentions can also vary depending on the education and age of the household head [89]. In our analysis, we use the education of the household head as a proxy for migrant's socioeconomic background.

Civic participation and community characteristics: Political and civic participation and regional characteristics are often used to better understand migration decisions of young people [90–94]. Political stability, well-functioning democratic societies, and environmental factors can act as hurdles of or motivations for migration [80,92,95,96]. In our analysis, we used participation in voluntary activities and politics (participate, not participate), place of residence in Egypt (frontier, urban, urban lower, rural lower, urban upper, and rural upper governorate), and environmental quality (with or without pollution) of the region to reflect civic participation and community characteristics.

We developed three models to examine the determinants of migration intentions at different levels: the first model includes individual variables, the second individual and household characteristics, and the third individual, household, and community characteristics. To check for potential multicollinearity issues that could occur in our regression models, we calculated variance inflation factors (VIF) (indicating multicollinearity when VIF value is higher than five [97] or higher than ten [98]) and correlation matrices [99].

We also investigate the characteristics of about 2603 young people who were included in the 2009 survey but missing in the 2014 survey, assuming that they probably migrated internally or internationally.

## 5. Results

Tables 1 and 2 display the characteristics of young people in Egypt in 2009, while Tables 3 and 4 show the characteristics of youth respondents in Egypt in 2014. We found that about 26% of young men and 7% of young women intended to migrate in 2009. However, the figures declined significantly in 2014, down to about 14% for young men and only 2.4% for young women. However, the changes in migration intentions of young people varied by demographic and socioeconomic characteristics. Migration intentions were slightly higher among the employed young men (26%) than the unemployed (24%) in 2009; in 2014, the unemployed men (19%) expressed a higher intention to move than the employed men (12%). The data also show that around 28% of unmarried young men intended to migrate abroad in 2009, while only 16% of the unmarried young men intended to emigrate in 2014. Similarly, about 8% of unmarried young women had an intention to migrate in 2009, while the figure reduced to 3.6% in 2014. We noticed a statistically significant association between migration intentions and education level before and after the 2011 revolution: about 20% of youth with at least post-secondary education reported a desire to migrate, in comparison to 15% of those with only a secondary level of education and 4% of illiterate youth in 2009; the figures change to 12%, 7%, and 2% respectively in 2014. Moreover, migration intentions of young people differ significantly by characteristics of the residence region and degrees of voluntary and political participation before and after the 2011 revolution.

Our analysis also reveals changes in the push and pull factors of migration intentions among young people in 2009 and 2014. Figure 1 shows that while lack of job opportunities, mediocre living conditions, and low income are the main reasons for migration intentions in both 2009 and 2014, politics and security concerns were important factors motivating many young people, particularly women, to consider migration after the 2011 revolution. About 16% of young women reported that they intended to migrate abroad because of reasons related to politics and security, compared to 10% of young men. While the main pull factor for young men in 2009 was earning money (94%), it was only the main reason for 32% in 2014 (Figure 2). For young women, the primary pull factors were to gain working experience (44%), and higher job salaries in the destination (37%).

**Table 1.** Characteristics of young people with a migration intention in 2009.

| Variables | Percentage | Total | Chi-Square $\chi^2$ (d.f.) | *p*-Value < 0.05 |
|---|---|---|---|---|
| **Individual characteristics** | | | | |
| Sex | | | | |
| Male | 25.70% | 3709 | 685.491 | 0.000 |
| Female | 5.60% | 4779 | (1) | |
| Age group | | | | |
| 18–21 | 17% | 2948 | 22.72 | 0.000 |
| 22–25 | 14% | 3111 | (2) | |
| 26–29 | 12% | 2429 | | |
| Marital status | | | | |
| Never married | 20% | 4893 | 289.53 | 0.000 |
| Currently married | 7% | 3517 | (3) | |
| Divorced/separated/widowed | 5% | 78 | | |
| Educational status | | | | |
| Never been in school | 4% | 965 | 146.955 | 0.000 |
| Currently in school | 20% | 1239 | (3) | |

| | | | | |
|---|---|---|---|---|
| Some schooling | 8.60% | 534 | | |
| Primary | 11.80% | 880 | | |
| Preparatory | 11.30% | 480 | | |
| Secondary | 15.50% | 3066 | | |
| Post-secondary | 20% | 1324 | | |
| **Employment status** | | | | |
| Employed | 23% | 3725 | 386.94 | 0.000 |
| Unemployed | 8% | 4763 | (1) | |
| **Health status** | | | | |
| Good | 14% | 7387 | 2.896 | 0.089 |
| Not good | 16% | 1101 | (1) | |
| **Household characteristics** | | | | |
| Sex of household head | | | | |
| Male | 14% | 7511 | 5.56 | 0.018 |
| Female | 17% | 977 | (1) | |
| Age of household head | | | | |
| Less than 30 | 10% | 1546 | | |
| 30–39 | 5% | 1555 | 205.09 | 0.000 |
| 40–49 | 18% | 1365 | (4) | |
| 50–59 | 19% | 2602 | | |
| Over 60 | 18% | 1420 | | |
| Wealth index | | | | |
| Lowest (poor) | 12% | 3164 | 29.85 | 0.000 |
| Middle | 15% | 1801 | (2) | |
| Highest (rich) | 17% | 3523 | | |
| **Community characteristics and civic participation** | | | | |
| Voluntary participation/last year | | | | |
| Participated | 36% | 527 | 210.09 | 0.000 |
| Did not participate | 13% | 7961 | (1) | |
| Political participation | | | | |
| Participated in election | 24% | 1282 | 102.72 | 0.000 |
| Never participated | 13% | 7204 | (1) | |
| Environmental pollution | | | | |
| Polluted | 11% | 6209 | 186.78 | 0.000 |
| Not polluted | 23% | 2279 | (1) | |
| Region | | | | |
| Urban governorates | 14% | 2009 | | |
| Urban lower | 17% | 929 | | |
| Rural lower | 15% | 2509 | 33.69 | 0.000 |
| Urban upper | 18% | 597 | (5) | |
| Rural upper | 13% | 1816 | | |
| Frontier governorates | 8% | 629 | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

**Table 2.** Characteristics of young people with a migration intention in 2009 according to gender.

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Chi-Square | | | | Chi-Square | |
| **Variables** | **Percentage** | **Total** | $\chi^2$ **(d.f.)** | *p*-**Value < 0.05** | **Percentage** | **Total** | $\chi^2$ **(d.f.)** | *p*-**Value < 0.05** |
| **Individual characteristics** | | | | | | | | |
| Age group | | | | | | | | |
| 18–21 | 27% | 1396 | 4.73 | 0.094 | 7% | 1552 | 8.889 | 0.012 |
| 22–25 | 26% | 1344 | (2) | | 5.3% | 1767 | (2) | |
| 26–29 | 23.3% | 969 | | | 4.5% | 1460 | | |
| Marital status | | | | | | | | |
| Never married | 28% | 2918 | 34.94 | 0.000 | 8% | 2053 | 38.53 | 0.000 |
| Currently married | 17.6% | 791 | (1) | | 3.8% | 2726 | (1) | |
| Educational status | | | | | | | | |
| Never been in school | 18.4% | 185 | 23.62 | 0.001 | 0.9% | 780 | 177.18 | 0.000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Currently in school | 25% | 683 | (6) | | 12.8% | 556 | (6) | |
| Some schooling | 17.5% | 251 | | | 0.7% | 283 | | |
| Primary | 23.6% | 415 | | | 1.3% | 465 | | |
| Preparatory | 23.2% | 203 | | | 2.5% | 277 | | |
| Secondary | 28% | 1385 | | | 5.2% | 1681 | | |
| Post-secondary | 29.3% | 587 | | | 11.9% | 737 | | |
| **Employment status** | | | | | | | | |
| Employed | 26.2% | 2838 | 1.55 | 0.214 | 12.2% | 887 | 88.7 | 0.000 |
| Unemployed | 24.1% | 871 | (1) | | 4% | 3892 | (1) | |
| **Health status** | | | | | | | | |
| Good | 25.6% | 3177 | 0.199 | 0.655 | 5.5% | 4210 | 0.631 | 0.427 |
| Not good | 26.5% | 532 | (1) | | 6.3% | 569 | (1) | |
| **Household characteristics** | | | | | | | | |
| **Sex of household head** | | | | | | | | |
| Male | 25.4% | 3233 | 1.409 | 0.235 | 5.5% | 4278 | 0.642 | 0.423 |
| Female | 28% | 476 | (1) | | 6.4% | 501 | (1) | |
| **Age of household head** | | | | | | | | |
| Less than 30 | 17% | 735 | | | 3.7% | 811 | | |
| 30–39 | 24% | 79 | 36.59 | 0.000 | 3.9% | 1476 | 26.47 | 0.000 |
| 40–49 | 29% | 687 | (4) | | 6.6% | 678 | (4) | |
| 50–59 | 27.7% | 1444 | | | 7.6% | 1158 | | |
| Over 60 | 27.4% | 764 | | | 7.2% | 65 | | |
| **Family size** | | | | | | | | |
| 1–3 | 23.5% | 824 | 8.8 | 0.012 | 5.7% | 1097 | 0.939 | 0.625 |
| 4–5 | 24.5% | 1579 | (2) | | 5.9% | 2201 | (2) | |
| 6+ | 28.6% | 1306 | | | 5.1% | 1481 | | |
| **Wealth index** | | | | | | | | |
| Lowest (poor) | 23.6% | 1303 | 5.52 | 0.063 | 3.5% | 1861 | 47.7 | 0.000 |
| Middle | 28% | 816 | (2) | | 4.2% | 985 | (2) | |
| Highest (rich) | 26.2% | 1590 | | | 8.4% | 1933 | | |
| **Community characteristics and civic participation** | | | | | | | | |
| **Voluntary participation/last year** | | | | | | | | |
| Participated | 24.1% | 3353 | 48.2 | 0.00 | 25.1% | 171 | 127.9 | 0.000 |
| Not participated | 41% | 356 | (1) | | 5% | 4608 | (1) | |
| **Political participation** | | | | | | | | |
| Participated in election | 32% | 756 | 19.6 | 0.000 | 11.4% | 526 | 37.55 | 0.000 |
| Never participate | 24.1% | 2951 | (1) | | 4.9% | 4253 | (1) | |
| **Environmental pollution** | | | | | | | | |
| Polluted | 31% | 1341 | 29.2 | 0.000 | 11.7% | 938 | 82.6 | 0.000 |
| Not polluted | 23% | 2368 | (1) | | 41% | 3841 | (1) | |
| **Region** | | | | | | | | |
| Urban governorates | 23% | 965 | | | 5.8% | 1043 | | |
| Urban lower | 28.8% | 400 | | | 8.1% | 529 | | |
| Rural lower | 28.4% | 1100 | 31.5 | 0.000 | 4.9% | 1409 | 31.55 | 0.000 |
| Urban upper | 27.7% | 249 | (5) | | 10.3% | 348 | (5) | |
| Rural upper | 27.9% | 707 | | | 4.6% | 1109 | | |
| Frontier governorates | 14.6% | 288 | | | 2.3% | 341 | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

**Table 3.** Characteristics of young people with a migration intention in 2014.

| Variables | Percentage | Total | $x^2$ (d.f.) | *p*-Value < 0.05 |
|---|---|---|---|---|
| | | | **Chi-Square** | |
| **Individual characteristics** | | | | |
| Sex | | | | |
| Male | 13.5% | 2576 | 265.513 | 0.000 |
| Female | 2.4% | 3309 | (1) | |
| Age group | | | | |
| 18–21 | 9.1% | 2062 | 18.65 | |
| 22–25 | 7.1% | 2156 | (2) | 0.000 |
| 26–29 | 5.4% | 1667 | | |
| Marital status | | | | |
| Never married | 12% | 1924 | 78.23 | 0.000 |
| Currently married | 5.2% | 3961 | (1) | |
| Educational status | | | | |
| Never been in school | 2.2% | 953 | | |
| Currently in school | 8% | 127 | | |
| Some schooling | 7% | 337 | | |
| Primary | 7.3% | 440 | 73.7 (6) | 0.000 |
| Preparatory | 6% | 360 | | |
| Secondary | 7.2% | 2401 | | |
| Post-secondary | 11.7% | 1265 | | |
| Employment status | | | | |
| Employed | 11.2% | 2555 | 101.83 | 0.000 |
| Unemployed | 4.3% | 3330 | (1) | |
| Health status | | | | |
| Good | 7.2% | 5419 | 1.254 | 0.263 |
| Not good | 8.6% | 466 | (1) | |
| **Household characteristics** | | | | |
| Sex of household head | | | | |
| Male | 7.2% | 5245 | 0.143 | 0.706 |
| Female | 7.7% | 640 | (1) | |
| Age of household head | | | | |
| Less than 30 | 5% | 1122 | | |
| 30–39 | 3% | 1124 | | |
| 40–49 | 8.4% | 952 | 65.35 (4) | 0.000 |
| 50–59 | 10% | 1766 | | |
| Over 60 | 8.9% | 921 | | |
| Family size | | | | |
| 1–3 | 6.2% | 1247 | 8.13 | |
| 4–5 | 8.4% | 2608 | (2) | 0.017 |
| 6+ | 6.6% | 2030 | | |
| Wealth index | | | | |
| Lowest (poor) | 5.7% | 2191 | 23.14 | |
| Middle | 6.2% | 1146 | (2) | 0.000 |
| Highest (rich) | 9.1% | 2548 | | |
| **Community characteristics and civic participation** | | | | |
| Voluntary participation/last year | | | | |
| Participated | 13.5% | 170 | 10.085 | 0.001 |
| Not participated | 7.1% | 5715 | (1) | |
| Political participation | | | | |
| Participated in election | 8.5% | 4235 | 30.26 | 0.000 |
| Never participate | 4.3% | 1650 | (1) | |
| Environmental pollution | | | | |
| Polluted | 9% | 3923 | 39.41 | 0.000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Not polluted | 4.3% | 1962 | (1) | | | | | |
| **Region** | | | | | | | | |
| Urban governorates | 9.8% | 1130 | | | | | | |
| Urban lower | 6.3% | 682 | | | | | | |
| Rural lower | 8.1% | 1927 | 38.42 | 0.000 | | | | |
| Urban upper | 6.3% | 348 | (5) | | | | | |
| Rural upper | 6.8% | 1303 | | | | | | |
| Frontier governorates | 1.6% | 495 | | | | | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

**Table 4.** Characteristics of young people with a migration intention in 2014 according to gender.

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Chi-Square** | | | | **Chi-Square** | |
| **Variables** | **Percentage** | **Total** | $\chi^2$ **(d.f.)** | ***p*-Value < 0.05** | **Percentage** | **Total** | $\chi^2$ **(d.f.)** | ***p*-Value < 0.05** |
| **Individual characteristics** | | | | | | | | |
| Age group | | | | | | | | |
| 18–21 | 16% | 987 | 10.79 | 0.04 | 3% | 1075 | 0.958 | 0.62 |
| 22–25 | 13.40% | 927 | (2) | | 2.30% | 1229 | (2) | |
| 26–29 | 10.30% | 662 | | | 2.20% | 1005 | | |
| Marital status | | | | | | | | |
| Never married | 16% | 1261 | 10.52 | 0.001 | 3.60% | 663 | 5.08 | 0.024 |
| Currently married | 11.40% | 1315 | (1) | | 2% | 2646 | (1) | |
| Educational status | | | | | | | | |
| Never been in school | 7.70% | 220 | | | 0.50% | 733 | | |
| Currently in school | 6.20% | 81 | | | 11% | 46 | | |
| Some schooling | 14.30% | 161 | 15.26 | 0.018 | 0.60% | 176 | 81.48 | 0.000 |
| Primary | 14.30% | 203 | (6) | | 1.30% | 237 | (6) | |
| Preparatory | 13.80% | 138 | | | 1.40% | 222 | | |
| Secondary | 13.30% | 1131 | | | 1.70% | 1270 | | |
| Post-secondary | 16.50% | 641 | | | 6.70% | 624 | | |
| Employment status | | | | | | | | |
| Employed | 12.40% | 2108 | 13.48 | 0.000 | 5.60% | 447 | 22.09 | 0.000 |
| Unemployed | 19% | 468 | (1) | | 2% | 2862 | (1) | |
| Health status | | | | | | | | |
| Good | 13% | 2398 | 6.104 | 0.013 | 2.50% | 3021 | 0.621 | 0.431 |
| Not good | 20% | 178 | (1) | | 1.70% | 288 | (1) | |
| **Household characteristics** | | | | | | | | |
| Sex of household head | | | | | | | | |
| Male | 13.60% | 2256 | 0.056 | 0.813 | 2.40% | 2989 | 0.08 | 0.778 |
| Female | 13% | 320 | (1) | | 2.20% | 320 | (1) | |
| Age of household head | | | | | | | | |
| Less than 30 | 9% | 520 | | | 1.50% | 602 | | |
| 30–39 | 25% | 61 | 18.86 | 0.001 | 1.80% | 1063 | 12.25 | 0.016 |
| 40–49 | 14.70% | 484 | (4) | | 2% | 468 | (4) | |
| 50–59 | 15% | 1001 | | | 3.50% | 765 | | |
| Over 60 | 13% | 510 | | | 4% | 411 | | |
| Family size | | | | | | | | |
| 1–3 | 11.20% | 545 | 10.7 | 0.005 | 2.30% | 702 | 3.644 | 0.162 |
| 4–5 | 16% | 1072 | (2) | | 3% | 1536 | (2) | |
| 6+ | 12% | 959 | | | 1.80% | 1071 | | |
| Wealth index | | | | | | | | |
| Lowest (poor) | 12.20% | 892 | 4.11 | 0.11 | 1.20% | 1299 | 23.72 | 0.000 |
| Middle | 12.30% | 497 | (2) | | 1.50% | 649 | (2) | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Highest (rich) | 15% | 1187 | | | 4% | 1361 | | |
| **Community characteristics and civic participation** | | | | | | | | |
| Voluntary participation/last year | | | | | | | | |
| Participated | 13.40% | 2463 | 1.976 (1) | 0.3 | 7% | 57 | 5.2 (1) | 0.023 |
| Not participated | 17% | 113 | | | 2.30% | 3252 | | |
| Political participation | | | | | | | | |
| Participated in election | 14.50% | 2013 | 6.48 (1) | 0.011 | 3% | 2222 | 10.24 (1) | 0.001 |
| Never participate | 10.30% | 563 | | | 1.20% | 1087 | | |
| Environmental pollution | | | | | | | | |
| Polluted | 16% | 1713 | 28.7 (1) | 0.000 | 1% | 1099 | 14 (1) | 0.000 |
| Not polluted | 8.50% | 863 | | | 3% | 2210 | | |
| Region | | | | | | | | |
| Urban governorates | 16% | 549 | | | 4.30% | 581 | | |
| Urban lower | 13% | 299 | | | 1.30% | 383 | | |
| Rural lower | 16% | 855 | 29.2 (5) | 0.000 | 2% | 1072 | 19.68 (5) | 0.001 |
| Urban upper | 12.70% | 157 | | | 1% | 191 | | |
| Rural upper | 13% | 480 | | | 3.20% | 823 | | |
| Frontier governorates | 3% | 236 | | | 0.40% | 259 | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.
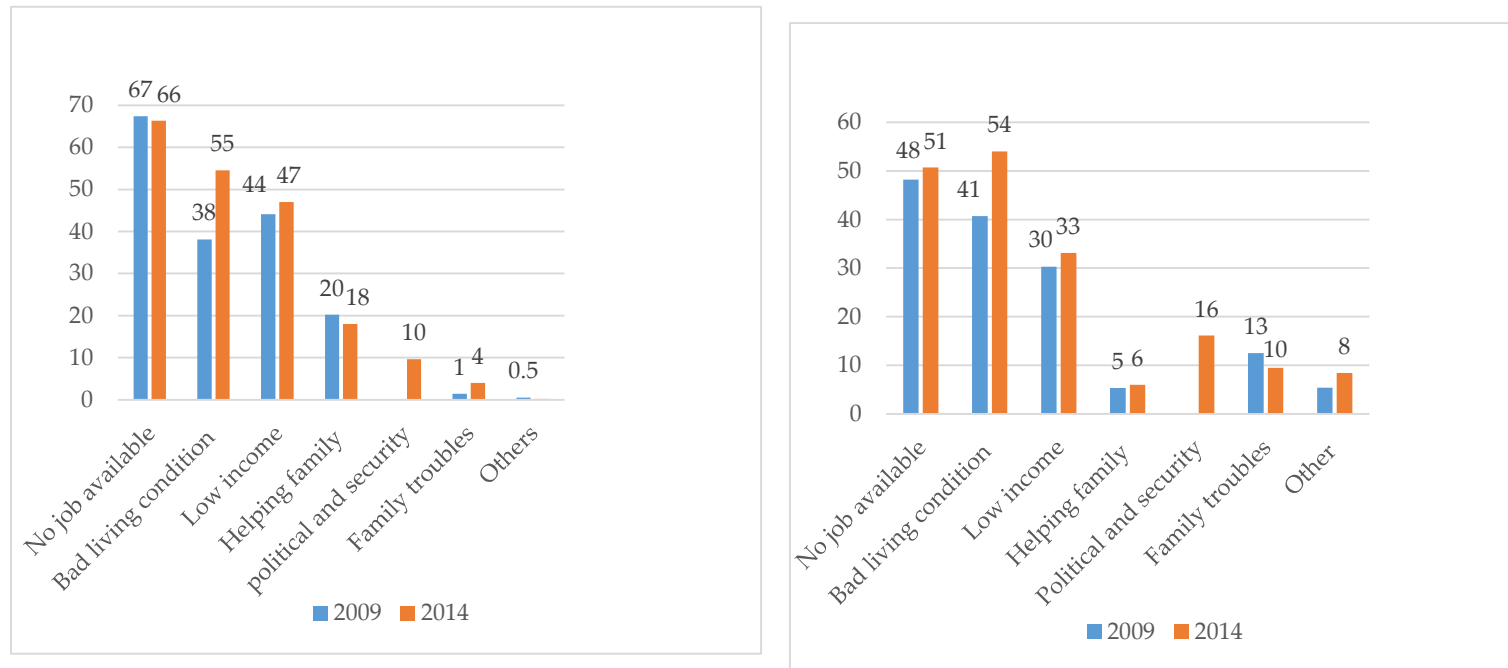
**Figure 1.** Changes in push factors, 2009 and 2014 for young men (left panel) and women (right panel).
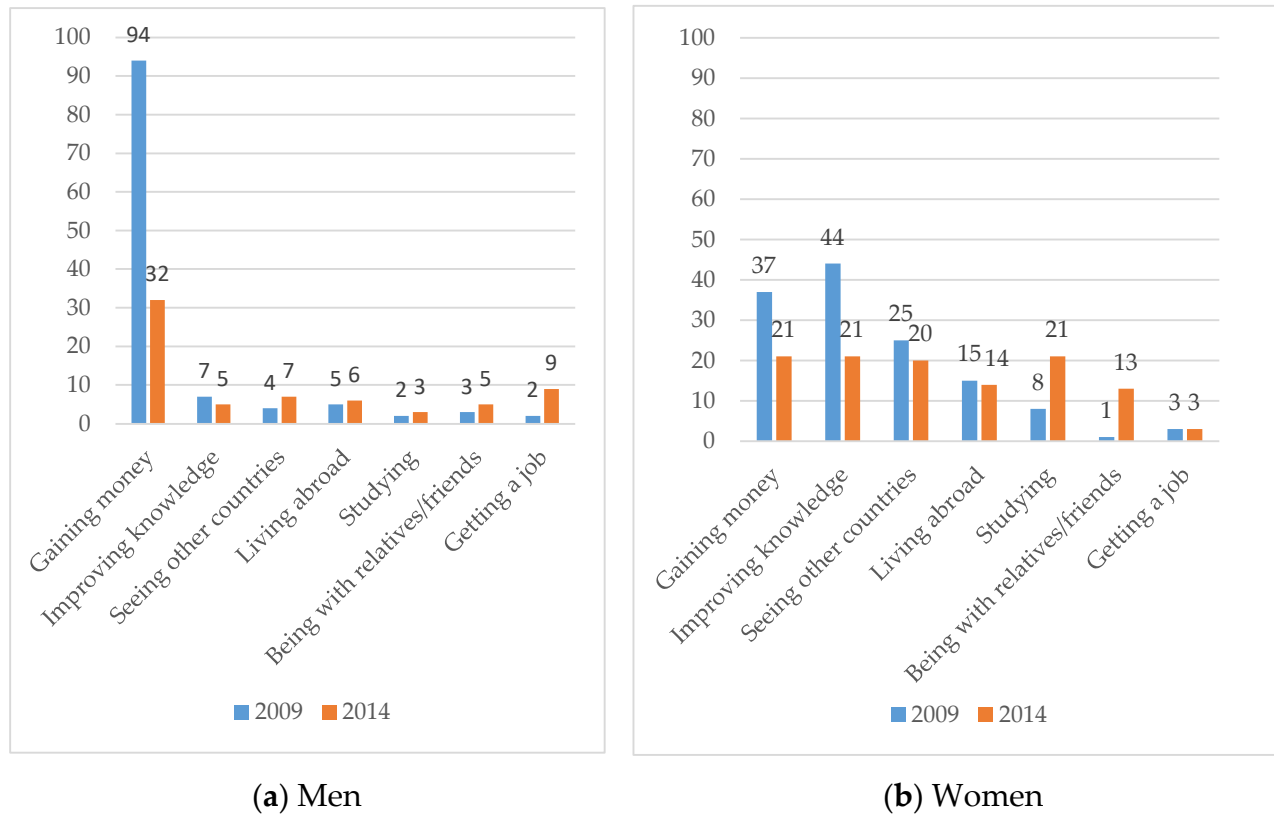
(**a**) Men

(**b**) Women

**Figure 2.** Changes in pull factors, 2009 and 2014.

To explore the determinants of migration intentions and the potential changes before and after the revolution, we conducted logistical regression analyses for all respondents, males and females in both 2009 and 2014 respectively. The results are presented in Tables 5 and 6. Model 1 controls for individual characteristics, while model 2 combines both individual and household characteristics. Finally, model 3, the most complete model, includes characteristics of the individual, household characteristics, and civic participation and community characteristics. We conduct robustness tests for each model and include the test results in the tables. The likelihood ratio chi-square with a *p*-value of 0.0001 (<0.05) confirms that our regression models, using datasets 2009 and 2014, as a whole fit significantly better than an empty model (i.e., a model with no predictors). An examination of the VIF was conducted to check the existence of multicollinearity problems, as shown in Tables 7 and 8. The results show that the maximum value of VIF in our models was 2.58, less than five, indicating no multicollinearity problems in our models. These results were confirmed with the correlation matrices (Tables 9 and 10) as the highest correlation value was 68%, recognized as acceptable in migration research. The goodness-of-fit of the models improved when adding household and community characteristics as independent variables (Pseudo R-squared are 0.12, 0.13, and 0.15 for models 1, 2, and 3 for all respondents in 2009, and 0.10, 0.11, and 0.13 in 2014, respectively). The R-squared values of the models for female respondents are substantially higher. While a high R-squared value is not always good, it is noteworthy that the models do not perform as well in explaining the variations in migration intentions of male respondents—the R-squared values were lower than 0.1 and the area under the ROC curve (AUROC) was only around 0.6. This is not totally unexpected, given the general difficulties in predicting human behavior and social events. Moreover, it is especially complicated to model human feelings, ideas, psychological emotions, and migration intentions, in this case. We acknowledge the limitations while interpreting the model results.

In general, the logistic regression models confirmed our assumptions about changes in determinants of migration intentions. The odds ratios of migration intentions for young men, compared to young women, increased in the three models from around 3.5 in 2009 to around 6.4 in 2014. The effect of education on migration intentions is also very different between men and women. In 2009, the young women currently in school were around 12 times more likely to want to migrate than those who had never been in school (in all three models); and the odds ratios increased to 26, 23, and 23 in the three models respectively. However, education had no significant effect on the migration intentions among young men in 2014. It is worth mentioning that marriage decreased the likelihood of migration intention among young men in 2009, as the never-married were about 1.6 times more likely to want to migrate than the ever-married. However, the data show an equal likelihood of migration intention among married or non-married young men in 2014. Before the revolution, employed young people were twice as likely to be intending to move than the unemployed. However, the employed young men were less likely (odds ratio 0.69) to be intending to move than those unemployed in 2014. Furthermore, there was no difference in migration intentions among young people by age of the household head in 2009. However, the young men living with a household head aged 30–39 years old had significantly higher migration intentions than those living in households with a head in any other age group, while the odds ratio of migration intention among young women monotonically increased with the age of the household head. It is worth noting that while the likelihood of migration intention of young men who participate in voluntary activities declined in 2014 compared to 2009, it was stable among young women across the two surveys.

**Table 5.** Logistic regression—migration intentions among young people aged 18–29 in 2009.

| Variable Names | All Respondents | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Model (1)** | **Model (2)** | **Model (3)** | **Model (1)** | **Model (2)** | **Model (3)** | **Model (1)** | **Model (2)** | **Model (3)** |
| | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) |
| **Individual characteristics** | | | | | | | | | |
| Sex (ref: "Female") | | | | | | | | | |
| Male | 3.513 *** | 3.655 *** | 3.218 *** | | | | | | |
| | (0.367) | (0.380) | (0.345) | | | | | | |
| Age (ref:"18–21") | | | | | | | | | |
| 22–25 | 0.823 ** | 0.837 * | 0.780 ** | 0.853 ** | 0.869 | 0.821* | 0.759 * | 0.776 | 0.697 * |
| | (0.079) | (0.080) | (0.077) | (0.093) | (0.095) | (0.091) | (0.153) | (0.159) | (0.15) |
| 26–29 | 0.824 * | 0.840 | 0.750 ** | 0.845 ** | 0.860 | 0.773 * | 0.874 | 0.882 | 0.823 |
| | (0.0966) | (0.100) | (0.093) | (0.115) | (0.120) | (0.112) | (0.202) | (0.214) | (0.205) |
| Education (ref: "Never been") | | | | | | | | | |
| Currently in school | 2.599 *** | 2.580 *** | 2.047 ** | 1.191 * | 1.196 | 0.976 | 12.063 *** | 11.667 *** | 9.339 *** |
| | (0.555) | (0.574) | (0.459) | (0.309) | (0.320) | (0.263) | (5.65) | (5.843) | (4.891) |
| Some schooling | 0.897 | 0.881 | 0.827 ** | 0.748 | 0.719 | 0.669 * | 0.556 | 0.571 | 0.624 |
| | (0.227) | (0.225) | (0.208) | (0.213) | (0.208) | (0.191) | (0.455) | (0.467) | (0.511) |
| Primary | 1.262 | 1.235 | 1.177 ** | 1.056 | 1.017 | 0.964 | 0.814 | 0.823 | 0.918 |
| | (0.273) | (0.270) | (0.260) | (0.265) | (0.259) | (0.247) | (0.487) | (0.498) | (0.558) |
| Preparatory | 1.394 | 1.33 ** | 1.280 ** | 1.083 | 1.078 | 0.985 | 2.397 | 2.492 | 2.376 |
| | (0.342) | (0.344) | (0.319) | (0.307) | (0.310) | (0.285) | (1.401) | (1.498) | (1.438) |
| Secondary | 1.952 *** | 1.916 *** | 1.632** | 1.467 * | 1.427 | 1.227 | 4.048 *** | 4.104 *** | 3.680 ** |
| | (0.369) | (0.3711) | (0.316) | (0.330) | (0.329) | (0.284) | (1.711) | (1.804) | (1.670) |
| Post-secondary | 2.325 *** | 2.271 *** | 1.871 *** | 1.498 * | 1.480 | 1.252 | 7.082 *** | 6.793 *** | 5.542 *** |
| | (0.466) | (0.482) | (0.399) | (0.360) | (0.373) | (0.315) | (3.035) | (3.135) | (2.664) |
| Marital status (ref: "Currently married") | | | | | | | | | |
| Not married | 1.664 *** | 1.444 ** | 1.508 *** | 1.777 *** | 1.548 ** | 1.639 *** | 1.078 | 0.978 | 0.948 |
| | (0.166) | (0.202) | (0.219) | (0.227) | (0.289) | (0.316) | (0.187) | (0.227) | (0.238) |
| Employment status (ref: "Unemployed") | | | | | | | | | |
| Employed | 2.015 *** | 2.028 *** | 1.928 *** | 1.285 * | 1.295 ** | 1.252 * | 3.125 *** | 3.129 | 2.958 *** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (0.243) | (0.246) | (0.236) | (0.201) | (0.203) | (0.197) | (0.526) | (0.531) | (0.538) |
| **Health status (ref: "Not good")** | | | | | | | | | |
| Good | 0.982 | 0.968 | 0.951 | 1.073 | 1.052 | 1.044 | 0.680 * | 0.666 * | 0.658 ** |
| | (0.103) | (0.102) | (0.100) | (0.127) | (0.126) | (0.126) | (0.139) | (0.136) | (0.132) |
| **Household characteristics** | | | | | | | | | |
| Sex (ref: "Female") | | | | | | | | | |
| Male | | 1.027 | 1.055 | | 1.002 | 1.034 | | 1.124 | 1.091 |
| | | (0.117) | (0.123) | | (0.130) | (0.137) | | (0.260) | (0.251) |
| Age (ref: "<30") | | | | | | | | | |
| 30–39 | | 1.119 | 1.155 | | 1.019 | 1.032 | | 0.954 | 0.933 |
| | | (0.193) | (0.200) | | (0.362) | (0.365) | | (0.235) | (0.239) |
| 40–49 | | 1.271 | 1.284 | | 1.197 | 1.185** | | 1.310 | 1.300 |
| | | (0.223) | (0.230) | | (0.266) | (0.266) | | (0.401) | (0.415) |
| 50–59 | | 1.201 | 1.203 | | 1.152 | 1.131 | | 1.102 | 1.142 |
| | | (0.195) | (0.200) | | (0.232) | (0.232) | | (0.331) | (0.3611) |
| 60+ | | 1.270 | 1.282 | | 1.230 | 1.219 | | 1.170 | 1.235 |
| | | (0.21) | (0.217) | | (0.252) | (0.254) | | (0.356) | (0.392) |
| Family size (ref: "1–3") | | | | | | | | | |
| 4–5 | | 0.926 | 0.909 | | 0.932 | 0.918 | | 0.955 | 0.953 |
| | | (0.091) | (0.091) | | (0.107) | (0.107) | | (0.171) | (0.178) |
| 6+ | | 1.089 | 1.041 | | 1.144 | 1.111 | | 0.972 | 0.935 |
| | | (0.117) | (0.115) | | (0.143) | (0.143) | | (0.211) | (0.210) |
| Wealth index (ref: "Lowest poor") | | | | | | | | | |
| Middle | | 1.063 | 1.075 | | 1.143 | 1.150 | | 0.716 | 0.738 * |
| | | (0.108) | (0.113) | | (0.002131) | (0.136) | | (0.163) | (0.171) |
| Highest/the rich | | 1.063 | 1.188 * | | 1.032 | 1.137 | | 1.053 | 1.234 |
| | | (0.100) | (0.126) | | (0.111) | (0.138) | | (0.199) | (1.234) |
| **Civic participation and community characteristics** | | | | | | | | | |
| Voluntary activities (ref: "Not participate") | | | | | | | | | |
| Participate | | | 2.155 *** | | | 1.909 *** | | | 2.864 *** |
| | | | (0.264) | | | (0.259) | | | (0.638) |
| Political participation (ref: "Not participate") | | | | | | | | | |
| Participated | | | 1.581 *** | | | 1.493 *** | | | 1.807 *** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | (0.153) | | | (0. 162) | | | (0.327) |
| Region (ref: "Frontier gov") | | | | | | | | | |
| Urban gov. | | | 1.642 *** | | | 1.760 *** | | | 1.441 |
| | | | (0.297) | | | (0.355) | | | (0.573) |
| Urban lower gov. | | | 2.288 *** | | | 2.517 *** | | | 1.888 * |
| | | | (0.446) | | | (0.559) | | | (0.757) |
| Rural lower gov. | | | 2.244 *** | | | 2.407 *** | | | 1.829 * |
| | | | (0.392) | | | (0.468) | | | (0.712) |
| Urban upper gov. | | | 2.521 *** | | | 2.287 *** | | | 3.054 *** |
| | | | (0.527) | | | (0.551) | | | (1.272) |
| Rural upper gov. | | | 2.298 *** | | | 2.347 *** | | | 2.872 *** |
| | | | (0.423) | | | (0.482) | | | (1.154) |
| Pollution (ref: "No") | | | | | | | | | |
| Exist | | | 1.629 *** | | | 1.460 *** | | | 2.604 *** |
| | | | (0.130) | | | (0.132) | | | (0.382) |
| Number of obs. | | 8488 | | | 3709 | | | 4779 | |
| Wald chi² | 692.14 (12) | 834.97 (21) | 801.97 (29) | 54.62 (11) | 67.24 (20) | 144.08 (28) | 174.15 (11) | 201.54 (20) | 279.25 (28) |
| Prob > chi² | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pseudo R² | 0.1237 | 0.1337 | 0.1494 | 0.0163 | 0.0182 | 0.0403 | 0.1112 | 0.1157 | 0.1664 |
| Omnibus Tests | 1,866,065 (12) | 188,706,706 (21) | 2,253,900 (29) | 16,187 (11) | 186,695 (20) | 401,152(28) | 408,675 (11) | 419,943 (20) | 11,380 (28) |
| Chi-square (df) sig. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cox & Snell R Square | 0.107 | 0.108 | 0.127 | 0.019 | 0.022 | 0.046 | 0.049 | 0.051 | 0.073 |
| Nagelkerke R Square | 0.178 | 0.180 | 0.213 | 0.027 | 0.032 | 0.067 | 0.135 | 0.139 | 0.199 |
| AIC | 0.720 | 0.722 | 0.700 | 1.132 | 1.136 | 1.111 | 0.390 | 0.395 | 0.377 |
| BIC | −70,543.738 | −70,435.890 | −70,511.610 | −26,177.565 | −26,083.935 | −26,084.308 | −38,514.505 | −38,407.538 | −38,411.839 |
| Count R² | 0.856 | 0.856 | 0.857 | 0.743 | 0.743 | 0.745 | 0.944 | 0.94 | 0.944 |
| Area under ROC | 0.7573 | 0.7597 | 0.7866 | 0.5858 | 0.5961 | 0.6490 | 0.7650 | 0.7672 | 0.8019 |

* = significant at 10% (the *p*-value < 0.10), ** = significant at 5% (the *p*-value < 0.05), *** = significant at 1% (the *p*-value < 0.01), AIC (Akaike Information Criterion), BIC (Bayesian Information Criterion).

**Table 6.** Logistic regression—migration intentions among young people aged 18–29 in 2014.

| Variable Names | All Respondents | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) |
| | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds Ratio (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) | Odds R. (Rob. S.E) |
| **Individual characteristics** | | | | | | | | | |
| Sex (ref: "Female") | | | | | | | | | |
| Male | 5.933 *** (1.173) | 6.353 *** (1.391) | 6.444 *** (1.426) | | | | | | |
| Age (ref: "18–21") | | | | | | | | | |
| 22–25 | 0.843 (0.115) | 0.855 (0.119) | 0.856 (0.12) | 0.851 (0.130) | 0.903 (0.141) | 0.903 (0.141) | 0.929 (0.279) | 0.836 (0.255) | 0.810 (0.242) |
| 26–29 | 0.670 ** (0.114) | 0.694 ** (0.123) | 0.697 ** (0.122) | 0.625 ** (0.123) | 0.702 (0.146) | 0.668 * (0.141) | 0.938 (0.309) | 0.877 (0.327) | 0.895 (0.337) |
| Education (ref: "Never been") | | | | | | | | | |
| Currently in school | 1.372 (0.624) | 1.126 (0.523) | 0.844 (0.40) | 0.474 (0.268) | 0.383 (0.218) | 0.289 ** (0.167) | 26.003 *** (19.21) | 23.141 *** (18.062) | 23.075 *** (18.612) |
| Some schooling | 2.600 *** (0.871) | 2.563 *** (0.856) | 2.372 ** (0.791) | 2.493 ** (0.929) | 2.439 ** (0.904) | 2.280 ** (0.844) | 1.049 (1.18) | 1.030 (1.162) | 0.997 (1.123) |
| Primary | 2.686 *** (0.868) | 2.565 *** (0.838) | 2.369 *** (0.782) | 2.439 ** (0.892) | 2.271 ** (0.849) | 2.091 ** (0.783) | 3.065 (1.379) | 2.922 * (2.287) | 3.167 * (2.503) |
| Preparatory | 2.513 ** (0.907) | 2.332 ** (0.837) | 2.038 ** (0.721) | 2.376 ** (0.976) | 2.146 * (0.873) | 1.879 (0.751) | 3.223 (2.567) | 3.130 * (2.524) | 2.891 (2.339) |
| Secondary | 2.454 *** (0.633) | 2.267 *** (0.587) | 2.038 *** (0.534) | 2.130 ** (0.632) | 1.986 ** (0.588) | 1.802 ** (0.534) | 4.114 *** (2.266) | 3.446 ** (1.978) | 3.945 ** (2.364) |
| Post-secondary | 3.671 *** (0.979) | 3.065 *** (0.833) | 2.606 *** (0.730) | 2.431 ** (0.744) | 2.082 *** (0.645) | 1.781 * (0.560) | 17.891 *** (9.516) | 12.026 *** (7.128) | 15.724 *** (10.430) |
| Marital status (ref: "Currently married ") | | | | | | | | | |
| Not married | 1.102 (0.1451) | 1.096 (0.157) | 1.107 (0.162) | 1.031 (0.155) | 1.000 (0.160) | 1.107 (0.162) | 0.797 (0.233) | 0.698 * (0.233) | 0.711 (0.250) |
| Employment status (ref: "Unemployed") | | | | | | | | | |
| Employed | 0.920 (0.155) | 0.939 (0.159) | 0.875 (0.148) | 0.689 ** (0.117) | 0.694 ** (0.119) | 0.647 ** (0.111) | 1.690 * (0.496) | 1.646 * (0.481) | 1.442 (0.419) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Health status (ref: "Not good") | | | | | | | | | |
| Good | 1.528 ** | 1.552 ** | 1.543 ** | 1.694 ** | 1.703 ** | 1.707 ** | 0.715 | 0.787 | 0.754 |
| | (0.308) | (0.309) | (0.311) | (0.386) | (0.387) | (0.398) | (0.355) | (0.397) | (0.393) |
| **Household characteristics** | | | | | | | | | |
| Sex (ref: "Female") | | | | | | | | | |
| Male | | 1.231 | 1.233 | | 1.289 | 1.287 | | 1.644 * | 1.668 |
| | | (0.234) | (0.235) | | (0.274) | (0.279) | | (0.762) | (0.810) |
| Age (ref: "<30") | | | | | | | | | |
| 30–39 | | 1.557 | 1.465 | | 3.588 *** | 3.341 ** | | 0.935 | 0.852 |
| | | (0.421) | (0.396) | | (1.42) | (1.347) | | (0.438) | (0.412) |
| 40–49 | | 1.347 | 1.294 | | 1.536 * | 1.427 | | 0.853 | 0.818 |
| | | (0.323) | (0.318) | | (0.414) | (0.399) | | (0.539) | (0.516) |
| 50–59 | | 1.347 | 1.294 | | 1.440 * | 1.331 | | 1.403 | 1.431 |
| | | (0.289) | (0.287) | | (0.343) | (0.332) | | (0.794) | (0.815) |
| 60+ | | 1.308 | 1.324 | | 1.271 | 1.287 | | 2.313 * | 2.201 |
| | | (0.300) | (0.311) | | (0.323) | (0.339) | | (1.280) | (1.219) |
| Family size (ref: "1–3") | | | | | | | | | |
| 4–5 | | 1.223 | 1.259 | | 1.218 | 1.283 | | 1.250 | 1.285 |
| | | (0.202) | (0.210) | | (0.255) | (0.242) | | (0.465) | (0.492) |
| 6+ | | 0.798 | 0.834 | | 0.755 | 0.821 | | 0.690 | 0.634 |
| | | (0.149) | (0.159) | | (0.160) | (0.179) | | (0.321) | (0.303) |
| Wealth index (ref: "Lowest poor") | | | | | | | | | |
| Middle | | 1.002 | 0.945 | | 0.989 | 0.898 | | 1.088 | 1.195 |
| | | (0.178) | (0.167) | | (0.194) | (0.176) | | (0.469) | (0.518) |
| Highest/the rich | | 1.230 | 1.188 | | 1.143 | 1.013 | | 1.614 | 1.480 |
| | | (0.170) | (0.162) | | (1.142) | (0.164) | | (0.535) | (0.531) |
| **Civic participation and community characteristics** | | | | | | | | | |
| Voluntary activities (ref: "Not participate") | | | | | | | | | |
| Participate | | | 1.241 | | | 1.148 | | | 2.810 * |
| | | | (0.360) | | | (0.343) | | | (1.670) |
| Political participation (ref: "Not participate") | | | | | | | | | |
| Participated | | | 1.648 *** | | | 1.642 ** | | | 1.533 |
| | | | (0.258) | | | (0.288) | | | (0.560) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Region (ref: "Frontier gov") | | | | | | | | | |
| Urban gov. | | | 2.646 ** | | | 2.284 * | | | 7.054 * |
| | | | (1.126) | | | (1.024) | | | (7.238) |
| Urban lower gov. | | | 2.057 * | | | 2.228 * | | | 1.548 |
| | | | (0.910) | | | (1.036) | | | (1.714) |
| Rural lower gov. | | | 2.739 ** | | | 2.594 ** | | | 5.179 * |
| | | | (1.127) | | | (1.129) | | | (5.211) |
| Urban upper gov. | | | 2.115 * | | | 1.974 | | | 2.635 |
| | | | (0.987) | | | (0.965) | | | (3.195) |
| Rural upper gov. | | | 2.636 ** | | | 2.145 * | | | 14.751 ** |
| | | | (1.111) | | | (0.954) | | | (14.930) |
| Pollution (ref: "No") | | | | | | | | | |
| Exist | | | 1.930 *** | | | 2.061 *** | | | 1.649 |
| | | | (0.289) | | | (0.335) | | | (0.598) |
| Number of obs. | | 5883 | | | 2575 | | | 3309 | |
| Wald chi²(df) | 252.08 (12) | 290.56 (21) | 330.06 (29) | 39.44 (11) | 64.13 (20) | 109.24 (28) | 80.62 (11) | 96.70 (20) | 135.7 (28) |
| Prob > chi² | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pseudo R² | 0.1006 | 0.1079 | 0.1264 | 0.0222 | 0.0339 | 0.0568 | 0.1101 | 0.1326 | 0.1812 |
| Omnibus Tests Chi-square (df) sig. | 1,024,770 (12) | 109,884 (21) | 1,287,401 (29) | 162,255 (11) | 24,800 (20) | 416,138 (28) | 222,831 (11) | 268,292 (20) | 366,682 (28) |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cox & Snell R Square | 0.058 | 0.062 | 0.073 | 0.018 | 0.028 | 0.046 | 0.027 | 0.032 | 0.044 |
| Nagelkerke R Square | 0.130 | 0.139 | 0.162 | 0.032 | 0.049 | 0.082 | 0.123 | 0.147 | 0.200 |
| AIC | 0.471 | 0.472 | 0.464 | 0.789 | 0.790 | 0.77 | 0.217 | 0.221 | 0.217 |
| BIC | −48,163.200 | −48,071.116 | −48,038.405 | −18,092.122 | −18,013.175 | −17,973.843 | −25,987.806 | −25,893.511 | −25,833.483 |
| Count R² | 0.927 | 0.927 | 0.927 | 0.864 | 0.864 | 0.864 | 0.976 | 0.976 | 0.976 |
| Area under ROC | 0.7523 | 0.7612 | 0.7842 | 0.6108 | 0.6299 | 0.6720 | 0.7479 | 0.7717 | 0.8172 |

\* = significant at 10% (the *p*-value < 0.10), ** = significant at 5% (the *p*-value < 0.05), *** = significant at 1% (the *p*-value < 0.01), AIC (Akaike Information Criterion), BIC (Bayesian Information Criterion).

**Table 7.** Collinearity diagnostics using the variance inflation factors (VIF).

| VIF | All Respondents | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) |
| Sex | 1.7 | 1.73 | 1.77 | | | | | | |
| Age | 1.41 | 1.42 | 1.44 | 1.58 | 1.60 | 1.65 | 1.32 | 1.34 | 1.36 |
| Education | 1.22 | 1.31 | 1.33 | 1.45 | 1.52 | 1.54 | 1.12 | 1.26 | 1.28 |
| Marital status | 1.5 | 2.57 | 2.58 | 1.38 | 2.28 | 2.3 | 1.32 | 2.3 | 2.31 |
| Employment status | 1.84 | 1.87 | 1.88 | 1.52 | 1.60 | 1.61 | 1.15 | 1.15 | 1.17 |
| Health status | 1 | 1.01 | 1.01 | 1 | 1.00 | 1.02 | 1.01 | 1.01 | 1.01 |
| HH gender | | 1.09 | 1.09 | | 1.08 | 1.08 | | 1.11 | 1.11 |
| HH age | | 1.94 | 1.95 | | 1.85 | 1.85 | | 1.95 | 1.96 |
| Family size | | 1.22 | 1.24 | | 1.17 | 1.20 | | 1.29 | 1.31 |
| Wealth index | | 1.11 | 1.29 | | 1.09 | 1.28 | | 1.15 | 1.32 |
| Voluntary | | | 1.03 | | | 1.02 | | | 1.03 |
| Politics | | | 1.08 | | | 1.09 | | | 1.05 |
| Region | | | 1.23 | | | 1.24 | | | 1.25 |
| Pollution | | | 1.04 | | | 1.01 | | | 1.02 |

**Table 8.** Collinearity diagnostics.

| VIF | All Respondents | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) | Model (1) | Model (2) | Model (3) |
| Sex | 2.07 | 2.08 | 2.08 | | | | | | |
| Age | 1.16 | 1.2 | 1.2 | 1.29 | 1.36 | 1.36 | 1.08 | 1.11 | 1.11 |
| Education | 1.04 | 1.17 | 1.23 | 1.01 | 1.09 | 1.11 | 1.03 | 1.20 | 1.30 |
| Marital status | 1.28 | 1.43 | 1.44 | 1.37 | 1.47 | 1.48 | 1.08 | 1.26 | 1.27 |
| Employment status | 1.94 | 1.4 | 1.97 | 1.13 | 1.14 | 1.14 | 1.03 | 1.04 | 1.05 |
| Health status | 1.01 | 1.01 | 1.02 | 1.02 | 1.02 | 1.03 | 1.01 | 1.01 | 1.02 |
| HH gender | | 1.07 | 1.07 | | 1.07 | 1.07 | | 1.07 | 1.07 |
| HH age | | 1.43 | 1.44 | | 1.27 | 1.28 | | 1.51 | 1.52 |
| Family size | | 1.20 | 1.24 | | 1.16 | 1.21 | | 1.27 | 1.30 |
| Wealth index | | 1.12 | 1.15 | | 1.08 | 1.11 | | 1.14 | 1.17 |
| Voluntary | | | 1.01 | | | 1.01 | | | 1.01 |
| Politics | | | 1.11 | | | 1.05 | | | 1.14 |
| Region | | | 1.17 | | | 1.13 | | | 1.21 |
| Pollution | | | 1.06 | | | 1.06 | | | 1.08 |

**Table 9.** Correlation matrix.

| | Sex | Age | Education | Marital Status | Employment Status | Health Status | HH Gender | HH Age | Family Size | Wealth Index | Voluntary | Politics | Region | Pollution |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sex | 1.00 | | | | | | | | | | | | | |
| Age | 0.06 | 1.00 | | | | | | | | | | | | |
| Education | −0.06 | 0.22 | 1.00 | | | | | | | | | | | |
| Marital status | 0.36 | 0.46 | 0.04 | 1.00 | | | | | | | | | | |
| Employment status | 0.58 | −0.16 | −0.35 | 0.19 | 1.00 | | | | | | | | | |
| Health status | 0.04 | −0.03 | 0.03 | 0.00 | 0.03 | 1.00 | | | | | | | | |
| HH gender | −0.04 | −0.04 | −0.01 | −0.17 | −0.04 | −0.03 | 1.00 | | | | | | | |
| HH age | −0.19 | −0.27 | −0.01 | −0.67 | −0.10 | 0.02 | 0.14 | 1.00 | | | | | | |
| Family size | −0.03 | −0.13 | −0.13 | −0.26 | 0.03 | 0.01 | −0.14 | 0.32 | 1.00 | | | | | |
| Wealth index | −0.04 | −0.01 | 0.23 | −0.09 | −0.02 | 0.05 | −0.04 | 0.08 | −0.11 | 1.00 | | | | |
| voluntary | −0.12 | −0.01 | 0.05 | −0.08 | −0.09 | 0.03 | 0.02 | 0.06 | 0.00 | 0.06 | 1.00 | | | |
| Politics | 0.13 | −0.16 | −0.16 | −0.02 | 0.17 | −0.03 | 0.00 | −0.01 | 0.03 | −0.03 | −0.10 | 1.00 | | |
| Region | 0.05 | −0.01 | −0.11 | 0.09 | 0.08 | 0.03 | −0.03 | −0.08 | 0.15 | −0.39 | −0.04 | −0.05 | 1.00 | |
| Pollution | −0.18 | −0.01 | 0.05 | −0.08 | −0.14 | −0.04 | 0.01 | 0.04 | −0.01 | 0.06 | 0.06 | −0.03 | −0.03 | 1.00 |

**Table 10.** Correlation matrix.

| | Sex | Age | Education | Marital Status | Employment Status | Health Status | HH Gender | HH Age | Family Size | Wealth Index | Voluntary | Politics | Region | Pollution |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sex | 1.00 | | | | | | | | | | | | | |
| Age | 0.07 | 1.00 | | | | | | | | | | | | |
| Education | −0.15 | −0.09 | 1.00 | | | | | | | | | | | |
| Marital status | 0.31 | 0.36 | −0.11 | 1.00 | | | | | | | | | | |
| Employment status | 0.68 | −0.04 | −0.16 | 0.13 | 1.00 | | | | | | | | | |
| Health status | 0.03 | 0.02 | −0.05 | −0.02 | 0.06 | 1.00 | | | | | | | | |
| HH gender | −0.04 | −0.04 | −0.01 | −0.12 | −0.05 | 0.03 | 1.00 | | | | | | | |
| HH age | −0.20 | −0.27 | 0.15 | −0.40 | −0.14 | −0.03 | 0.15 | 1.00 | | | | | | |
| Family size | −0.03 | −0.13 | −0.06 | −0.18 | 0.00 | −0.04 | −0.12 | 0.34 | 1.00 | | | | | |
| Wealth index | −0.05 | −0.05 | 0.31 | 0.01 | −0.04 | −0.02 | −0.02 | 0.10 | 0.00 | 1.00 | | | | |
| voluntary | −0.08 | −0.01 | 0.06 | −0.05 | −0.06 | 0.07 | 0.00 | 0.01 | −0.01 | 0.05 | 1.00 | | | |
| Politics | 0.12 | 0.00 | −0.24 | 0.01 | 0.15 | 0.07 | −0.01 | −0.04 | 0.06 | −0.16 | −0.06 | 1.00 | | |
| Region | 0.05 | −0.01 | −0.19 | 0.07 | 0.02 | −0.07 | −0.03 | −0.07 | 0.16 | −0.18 | 0.00 | 0.14 | 1.00 | |
| Pollution | 0.00 | 0.00 | 0.07 | 0.00 | −0.01 | 0.04 | 0.02 | 0.01 | −0.05 | −0.05 | 0.02 | −0.09 | −0.23 | 1.00 |

We also explored the main characteristics of young people who were interviewed in 2009 but were missing in the 2014 survey. The survey referred to those young people as potential internal or international migrants. The analysis results are reported in Tables 11 and 12. It showed that about 34% of respondents who intended to move in 2009 were missing in 2014, compared to 30% of those who expressed no intention to migrate in 2009 and were missing in 2014. The proportion is higher among young women than men—about 44% of young women who intended to migrate abroad in 2009 were missing in 2014. Moreover, more than one-third of never-married young people in 2009 were missing in 2014. Moreover, the more educated young people, especially women, had a better chance of potentially migrating than the less educated. Table 12 displays that about 43% of young females who had a post-secondary degree in 2009 were missing in 2014 compared to 37% of young males. Those young people interviewed in 2009 but missing in 2014 more likely lived with household heads aged 50 years or older (67%) and more likely lived in richer households (37%). Table 12 also shows that 46% of young females who participated in voluntary activities in 2009 were missing in 2014. Although 44% of young people who lived in urban governorates were missing in 2014, about 45% of young females were living in urban upper governorates in 2009 were missing in 2014, compared to 37% of young males who were living in the same region.

**Table 11.** Characteristics of young people who went missing between 2009 and 2014.

| Variables | Percentage | Total | Chi-Square $\chi^2$ (d.f.) | Chi-Square $p$-Value < 0.05 |
|---|---|---|---|---|
| **Migration intention in 2009** | | | | |
| Had an intention | 34.1% | 1222 | 8.026 | |
| Had no intention | 30% | 7266 | (1) | 0.003 |
| **Individual characteristics** | | | | |
| Sex | | | | |
| Male | 30.5% | 3709 | 0.044 | |
| Female | 30.8% | 4779 | (1) | 0.833 |
| Age group | | | | |
| 18–21 | 30.1% | 2948 | | |
| 22–25 | 30.7% | 3111 | 1.088 | 0.580 |
| 26–29 | 31.4% | 2429 | (2) | |
| Marital status | | | | |
| Never married | 33% | 4893 | 33.53184 | |
| Currently married | 27.2% | 3517 | (1) | 0.000 |
| Educational status | | | | |
| Never been in school | 29.4% | 965 | | |
| Currently in school | 34.4% | 1239 | | |
| Some schooling | 26.6% | 534 | | |
| Primary | 28.2% | 880 | 92.010 | 0.000 |
| Preparatory | 25.4% | 480 | (6) | |
| Secondary | 27.7% | 3066 | | |
| Post-secondary | 40.3% | 1324 | | |
| Employment status | | | | |
| Employed | 30.5% | 4763 | 0.132 | |
| Unemployed | 30.9% | 3725 | (1) | 0.716 |
| Health status | | | | |
| Good | 30.5% | 1101 | 0.013 | |
| Not good | 30.7% | 7387 | (1) | 0.908 |
| **Household characteristics** | | | | |
| Sex of household head | | | | |
| Male | 30.2% | 7511 | 7.603 | |
| Female | 34.5% | 977 | (1) | 0.003 |
| Age of household head | | | | |
| Less than 30 | 27.4% | 1546 | 30.095 | 0.000 |

| | Percentage | Total | $\chi^2$ (d.f.) | p-Value |
|---|---|---|---|---|
| 30–39 | 27.7% | 1555 | (4) | |
| 40–49 | 30.3% | 1365 | | |
| 50–59 | 32.1% | 2602 | | |
| Over 60 | 35.1% | 1420 | | |
| **Wealth index** | | | | |
| Lowest (poor) | 27% | 3164 | 113.294 | 0.000 |
| Middle | 25% | 1801 | (2) | |
| Highest (rich) | 37% | 3523 | | |
| **Community characteristics and civic participation** | | | | |
| **Voluntary participation/last year** | | | | |
| Participated | 34% | 527 | 2.252 | 0.133 |
| Not participated | 31% | 7961 | (1) | |
| **Political participation** | | | | |
| Participated in election | 29% | 1282 | 3.206 | 0.073 |
| Never participate | 31% | 7204 | (1) | |
| **Environmental pollution** | | | | |
| Polluted | 33% | 2279 | 7.368 | 0.004 |
| Not polluted | 30% | 6209 | (1) | |
| **Region** | | | | |
| Urban governorates | 44% | 2008 | | |
| Urban lower | 27% | 929 | | |
| Rural lower | 23% | 2509 | 299.32 | 0.000 |
| Urban upper | 42% | 597 | (5) | |
| Rural upper | 28% | 1816 | | |
| Frontier governorates | 21% | 629 | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

**Table 12.** Characteristics of young people who went missing between 2009 and 2014 according to gender.

| | Men | | | | Women | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Chi-Square** | | | | **Chi-Square** | |
| **Variables** | Percentage | Total | $\chi^2$ (d.f.) | p-Value < 0.05 | Percentage | Total | $\chi^2$ (d.f.) | p-Value < 0.05 |
| **Migration intention in 2009** | | | | | | | | |
| Had an intention | 31% | 954 | 0.288 | 0.592 | 44% | 268 | 24.8 | 0.000 |
| Had no intention | 30% | 2755 | (1) | | 30% | 4511 | (1) | |
| **Individual characteristics** | | | | | | | | |
| **Age group** | | | | | | | | |
| 18–21 | 29% | 1396 | 1.76 | 0.415 | 31% | 3709 | 0.194 | 0.908 |
| 22–25 | 31% | 1344 | (2) | | 30% | 1552 | (2) | |
| 26–29 | 32% | 969 | | | 31% | 1767 | | |
| **Marital status** | | | | | | | | |
| Never married | 32% | 2918 | 5.782 | 0.009 | 35% | 2053 | 35.81 | 0.000 |
| Currently married | 27% | 791 | (1) | | 27% | 2726 | (1) | |
| **Educational status** | | | | | | | | |
| Never been in school | 31% | 185 | | | 29% | 780 | | |
| Currently in school | 32% | 683 | | | 38% | 556 | | |
| Some schooling | 28% | 251 | 17.22 | 0.009 | 25% | 283 | 97.05 | 0.000 |
| Primary | 29% | 415 | (6) | | 28% | 465 | (6) | |
| Preparatory | 33% | 203 | | | 20% | 277 | | |
| Secondary | 28% | 1385 | | | 27% | 1681 | | |
| Post-secondary | 37% | 587 | | | 43% | 737 | | |
| **Employment status** | | | | | | | | |
| Employed | 30% | 2838 | 2.535 | 0.111 | 34% | 887 | 5.53 | 0.019 |
| Unemployed | 33% | 871 | (1) | | 30% | 3892 | (1) | |
| **Health status** | | | | | | | | |
| Good | 30% | 3177 | 0.21 | 0.648 | 31% | 4210 | 0.34 | 0.560 |
| Not good | 31% | 532 | (1) | | 30% | 569 | (1) | |
| **Household characteristics** | | | | | | | | |
| Sex of household head | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Male | 30% | 3233 | 1.28 | 0.259 | 30% | 4278 | 7.57 | 0.005 |
| Female | 33% | 476 | (1) | | 36% | 501 | (1) | |
| **Age of household head** | | | | | | | | |
| Less than 30 | 29% | 735 | | | 26% | 811 | | |
| 30–39 | 23% | 79 | 5.78 | 0.216 | 28% | 1476 | 33.7 | 0.000 |
| 40–49 | 30% | 687 | (4) | | 31% | 678 | (4) | |
| 50–59 | 31% | 1444 | | | 34% | 1158 | | |
| Over 60 | 33% | 764 | | | 37% | 656 | | |
| **Wealth index** | | | | | | | | |
| Lowest (poor) | 27% | 1303 | 42.11 | 0.000 | 27% | 1861 | 72.3 | 0.000 |
| Middle | 25% | 816 | (2) | | 25% | 985 | (2) | |
| Highest (rich) | 36% | 1590 | | | 38% | 1933 | | |
| **Community characteristics and civic participation** | | | | | | | | |
| **Voluntary participation/last year** | | | | | | | | |
| Participated | 28% | 356 | 1.69 | 0.193 | 46% | 171 | 19.85 | 0.000 |
| Not participated | 31% | 3353 | (1) | | 30% | 4608 | (1) | |
| **Political participation** | | | | | | | | |
| Participated in election | 29% | 756 | 1.34 | 0.248 | 28% | 526 | 1.91 | 0.167 |
| Never participate | 31% | 2951 | (1) | | 31% | 4253 | (1) | |
| **Environmental pollution** | | | | | | | | |
| Polluted | 33% | 1341 | 6.88 | 0.009 | 33% | 938 | 1.69 | 0.194 |
| Not polluted | 29% | 2368 | (1) | | 30% | 3841 | (1) | |
| **Region** | | | | | | | | |
| Urban governorates | 43% | 965 | | | 44% | 1043 | | |
| Urban lower | 25% | 400 | | | 28% | 529 | | |
| Rural lower | 22% | 1100 | 139.4 | 0.000 | 24% | 1409 | 176.9 | 0.000 |
| Urban upper | 37% | 249 | (5) | | 45% | 348 | (5) | |
| Rural upper | 32% | 707 | | | 26% | 1109 | | |
| Frontier governorates | 18% | 288 | | | 24% | 341 | | |

The *p*-value < 0.05 indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

## 6. Discussion and Conclusions

The objective of this paper was to study one important aspect of the migration decision-making process, focusing on migration intention among young people in Egypt before and after the 25 January Revolution in 2011. This topic is relevant because migration intentions have been shown to be related to migration realization, and the survey shows that intentions were quite important among youth in 2009 and 2014. Moreover, brain drain and undocumented migration represent a challenge for achieving sustainable development goals in Egypt, the second country to experience an Arab Spring. The study has confirmed the importance of demographic and socioeconomic factors, as well as civic and community characteristics, in defining the migration intention as an intermediate stage in the migration decision-making process.

In order to understand how these factors shape migration intentions among young people before and after the 2011 revolution, we performed a bivariate analysis and binary logistic regression, using 2009 and 2014 SYPE data. As expected, the results show that socioeconomic factors are the most influential indicators driving migration aspirations among young people in Egypt. For instance, about 66% of young people reported that the lack of available job opportunities in Egypt is the main reason for their desire to migrate, followed by bad living conditions, a result that is in line with Etling et al., Farid & El-Batrawy, and Efendic [5,63,100]. In this paper, we explicitly explore how individual and household characteristics, and political and civic participation affected migration intentions among young people before and after the 2011 revolution in Egypt. We find that age, gender, and marital status are important predictors of migration intentions among young people in Egypt, with the younger male, well-educated, and never-married youth being more likely to intend to migrate. This result is in line with the literature on migration intentions (see for instance, Migali and Scipioni using a global survey [45]; Xenogiani, et al. for OECD countries [50]; Yang for China [101]; Papapanagos and Sanfey for Albania [102]; and Reisi and Hashemianfar for Iran [103]). The phenomenon that younger people are more motived to move is commonly observed among almost all populations in all societies. This could

be due to the fact that younger people can more easily adapt to new environments and have fewer constraints and concerns about the challenges associated with migration. They are more likely to be unmarried and find it easier to move than those with their own family and children [66,80,101]. In fact, some unmarried young people in Egypt want to migrate abroad temporarily and earn money to cover marriage costs. Thus, the age effect is also related to the marriage effect. Moreover, the migration intention significantly differs by gender. Being a woman in Egypt significantly decreases the likelihood of migration intention, a result similar to the one found by Ramos for some selected countries in the MENA region [23], David et al. and Elbadawy for Egypt [49,66] and Dibeh et al. for Lebanon [59]. While this could be attributed to the dominance of the patriarchal system, there is a clear trend toward the autonomation of women in Arab countries, also regarding migration [90].

Our study shows positive effects of education on migration intentions among young people in Egypt, as found in studies in other countries [23]. This is because educated individuals may have stronger anticipation of benefits and opportunities from technology and information access in the migration destination [49]. They also have higher expectations of better job opportunities elsewhere when facing scarcity of quality jobs in their own country [49,104]. The positive effect of education on migration intention is more obvious among young females than males in Egypt. The young women with post-secondary or higher education are significantly more likely to want to move than their less educated counterparts. However, there are only small variations in the migration intentions of young men of different education levels. This result was also found by Ramos in Lebanon in his study of selected MENA countries [23]. A potential explanation is that most migrants from the Arab countries often seek jobs in the neighboring Gulf countries, such as Libya and Jordan which have liberal immigration policies towards fellow Arabs, and need unskilled or semiskilled labor as workers in construction and manufacturing industries [63,105,106].

The employment status of young people plays a different role in affecting their migration intentions. Before the 2011 revolution (in 2009), employed young people were two to three times more likely to want to move than the unemployed. This might be because they would have more means to migrate, but it could also be due to the advantages granted by the Egyptian government to employed people, such as permission to travel abroad while keeping their job positions, and encouraging employed youth to consider temporary migration abroad to earn money and raise their standard of living. However, these benefits largely disappeared in 2014 because of the economic crises and reduced job opportunities after the 2011 revolution, which turned into a push factor for the unemployed to think about seeking employment abroad [63,91]. Moreover, the effects of health selectivity on migration intentions [107,108] among young people in Egypt also differ after the 2011 revolution. While health status was not a significant factor affecting youth migration intentions in 2009, young people with good health were 1.5 times more likely to have an intention to migrate than those without good health in 2014.

Therefore, our research clearly demonstrates that on the one hand, demographic and socioeconomic characteristics of individuals and households are important factors determining migration intentions of young people; on the other, the effects of the micro-level variables to a large extent are influenced by the macro political, institutional, and economic conditions.

Our study specifically considered how the community characteristics and political and civic participation of the young people affect their migration intentions. We found that young people who live in a polluted environment are more likely to consider migration, a finding suggested in several other publications [95,109,110]. The result also indicates that the effect is even more significant among young women than men. For instance, the young women living in a polluted environment in 2009 were 2.6 times more likely to intend to migrate than those who lived in an unpolluted environment. This could be because women are more sensitive to environmental quality and more vulnerable than men to autoimmune disorders, many of which have known associations with environmental pollution [111]. Moreover, this study also reveals that the urbanization level of the region can significantly influence the migration intentions of young people, especially among young women living in Upper Egypt, a region plagued by extreme poverty, chronic unemployment, and social exclusion [23,112,113].

The paper confirms the results of Pitea and Hussain [65] and Adserà et al. [92] that social and political factors are important in shaping the migration process. Many studies suggest that corruption and

political instability were the primary factors that pushed young people in Egypt to rally in 2011 [93,94,114]. Political distrust may drive young people either to political participation and "voice" to change, or to "exit" and leave the country for a better place [100,115,116]. Our study reveals that young people who participated in voluntary or political activities such as elections or engagement in political parties in 2009 were more likely to intend to migrate because they found participation and voting (voice) could not deal effectively with the corruption. The result also shows that while higher salaries and gaining money in the destination country were the most important incentives to migrate before the 2011 revolution, it became a less important reason for migration after the revolution. Instead, political and security concerns along with bad living conditions became prominent push-factors for migration by young people, especially women.

These outcomes allow us to investigate research questions about their applicability to present a comprehensive framework of migration aspiration among young people in Arab Spring Revolution countries. Egypt and many other countries in the MENA region are under major political, social, and demographic transitions. The lessons learned from the analysis of Egypt could be applied to other countries with similar situations. The large proportion of working-age population provides a potential demographic dividend for these countries to boost labor productivity and economic growth. On the other hand, the increasing share of young people also generates challenges for the countries to provide enough job opportunities. The economic crisis, lacking employment opportunities, deteriorating environmental conditions, and climate variabilities and changes have become the main push factors driving up the migration intentions among the young and more educated people of these countries. Migration selectiveness can lead to serious problems of brain drain, affecting their capacities to achieve the sustainable development goals (SDGs) and improve the wellbeing of people in the origin in the short and long-run. Therefore, it is important for the countries to maintain political stability, enhance social participation of youth, provide equal opportunities for young men and women in both rural and urban areas, develop the economic systems to absorb the young workers into productive employment. Of course, this does not mean that migration should be stopped. On the contrary, migration as one of the most prominent demographic megatrends helps encourage young people of the countries to participate in developing the increasingly integrated global economy and benefit from the global social and economic development. Our paper empirically studied the sociodemographic characteristics of individuals and households, as well as the national and international socioeconomic and political changes, that jointly determine the migration intentions of young people. It provides useful information to assess the changes of migration flows and develop scenarios about future migration, as well as their consequences on socioeconomic and environmental sustainability in both the origins and destinations.

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