

Security and rural out-migration: Insights from Kosovo

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Abstract

Drawing on household and network models, this paper analyses rural out-migration in Kosovo. It assesses the extent to which propositions based on the aforementioned models hold in a post-conflict country where push factors linked to personal and property security, may be of greater relevance. The analysis exploits a rich household dataset (13,500 observations). We identify the determinants of the propensity to migrate and length of migration, accounting for gender differences. The Kosovo diaspora, resulting from the conflicts of the 1990s, facilitates contemporary migration. While security problems are typically regarded as stimulating migration, the study demonstrates this may not always hold.

Key words

Migration, human capital, networks, post-conflict, security, Kosovo

Introduction

Rising levels of domestic and international migration characterize contemporary societies with the International Organization for Migration (2013) estimating that in 2013 there were almost 231.8 million international migrants. This is a 50 per cent increase compared with 1990, which in turn was double the figure recorded in 1980, and these data are before the large migratory movement of 2014-2015. Legal permanent migration to OECD countries amounted to 4.3 million people in 2014, and has been rising at a rate of over 5 per cent per annum in recent years (OECD 2015). In the European Union (EU), permanent legal migration from outside the EU is now equivalent to what is recorded in the United States, i.e. about one million a year. Migration flows are often related to local conflicts, but also underdevelopment and relocation of people to areas and countries in which they can achieve higher returns to their labor (Czaika and de Haas 2012, European Commission 2012, Fernández-Huertas Moraga 2013, OECD 2015, Stark 1991).

Local conflicts not only give rise to international migration, but also to internal, rural-urban migration stemming from land insecurity, shortage of off-farm employment and the need to accumulate capital to invest in farm assets depleted during the conflict (Longley, Christoplos, and Slaymaker 2006). Often migrants aim to escape fragile rural economies, the consequences of radical political and economic reforms, and / or ethnic conflict and post-conflict situations. In such an environment, capital cities typically act as magnets, e.g. Freetown in Sierra Leone (Lynch et al. 2013). On the other hand, even without an ethnic conflict or post-conflict situation, due to deep political and economic reforms, rural areas in many Central and Eastern European countries have witnessed substantial out-migration since the early 1990s

(OECD 2015). Out-migration has tended to be relatively greatest from the most impoverished regions, which also are typically those most reliant on agriculture as a source of income and employment. These areas lack a significant growth pole, suffering from structural underdevelopment and high unemployment (GVG 2012, International Organization for Migration 2013).

Out-migration can have a considerable and negative impact on rural communities in both developed and developing countries. For instance, the disappearance of smaller family farms in the USA resulted in the decline or even death of some rural towns and communities (Moore 2001). Research in Moldova documents villages where over half of school aged children have at least one parent working abroad with their care left to grandparents or other relatives (Cash 2015). This is an unfortunate situation, with a social cost, particularly in terms of the educational achievement and emotional welfare of children left behind by migrants (Mboya and Nesengani 1999, Parreñas 2001). Migration also may adversely affect agricultural output, farm incomes and food security at the household level. Previous research established that rural out-migration negatively affects farm technical efficiency (Sauer, Gorton, and Davidova 2015), an effect amplified for households with better educated adult males.

Against this backdrop, Kosovo is an interesting case study. Kosovo has seen substantial migration out of rural areas to the capital city, Pristina, and internationally (ASK 2012). In Kosovo, as well as in all Western Balkans countries, migration out of rural areas was driven by the restructuring and privatization of the former agro-kombinats (with regards to their land and non-land assets), which adversely affected the rural labor market, and by the hardships of the armed conflicts in the late 1990s.

The largest flow of refugees and internally displaced persons occurred during the conflict - by the end of April 1999, about 600,000 residents of Kosovo had become refugees; another 400,000 were displaced inside Kosovo, meaning that half of the two million residents of Kosovo were refugees or internally displaced (Vathi and Black 2007). However, migration continued in the post-conflict period with official estimates suggesting that 27 per cent of migrants left Kosovo during peaceful times (Gashi and Haxhikadrija 2012). A report prepared for the European Commission Directorate for General Employment, Social Affairs and Inclusion (GVG 2012) argues that the share of the population in rural areas is still declining, and that armed conflicts intensified rural-urban migration in the late 1990s as rural areas were more affected by wars and the destruction of houses.

The present study is based on the general assumption that the current situation in Kosovo is a post-conflict one, even though the armed conflict ended officially in 1999. Various definitions describe a post-conflict situation. Post-conflict does not necessarily imply full and stable peace without tensions (Longley, Christoplos, and Slaymaker 2006). Often, it is accompanied by chronic political instability and weak public institutions, which is the case of Kosovo. For instance, the Corruption Perceptions Index, which order countries based on how corrupt a country's public sector is perceived to be, ranks Kosovo at 103rd place out of 168 countries (Transparency International 2015). Instead of improving, the situation in Kosovo has deteriorated. According to the indicator 'Political Stability and Absence of Violence and Terrorism', in 2009 Kosovo was in the 62nd percentile amongst all countries in the world, but in 2014 it fell to the 33rd percentile (World Bank 2015). The general elections in mid-2014 led to a protracted political-constitutional crisis, with five per

cent of Kosovo's population migrating to the EU during a "winter of discontent" in 2014/15 (The World Bank Group in Kosovo 2015).

Given this post-conflict situation, the paper empirically tests the probability to migrate utilizing data for agricultural households in Kosovo. Due to the large scale of migration, the importance of remittances to Kosovo in terms of economic development and poverty alleviation has been studied extensively (e.g. Havolli 2011, Möllers et al. 2013, Möllers and Meyer 2014). However, little work rigorously analyzes the propensity to migrate out of rural areas. The study draws on individual, household, network and relative deprivation models of migration, testing the extent to which the propositions formulated on the basis of these models hold in a post-conflict country where some push factors may be linked to security concerns. The study investigates whether the legacy of the conflict that persists in terms of a large Kosovo diaspora, which migrated during the conflict or its immediate aftermath, and the existence of land mines, unexploded ordinance and lack of land security are still important in stimulating rural out-migration. The paper draws on a unique dataset, which combines very detailed household information with extensive income and farm production data, allowing us to meet calls for more accurately testing empirically competing theories of migration (Clemens, Özden, and Rapoport 2014).

Models and Determinants of Out-migration

The literature emphasizes the importance of individual characteristics (Hatton and Williamson 2005, Germenji and Swinnen 2005), household decision-making (Stark and Bloom 1985), networks (Taylor, Rozelle, and de Brauw 2003), and relative as

well as absolute differentials in expected earnings (Massey et al. 1993) as motivators for migration. Each of these, along with security issues, are reviewed in turn.

Individual characteristics

Neoclassical models treat migration as an outcome of a cost-benefit analysis conducted by individuals (Harris and Todaro 1970), whereby workers compare the differential in incomes between destination and existing locations, and the costs involved in migration (transport, documentation, risks of being deported if undocumented etc.). Hatton and Williamson (2005) express this as:

$$d_i = w_{f,i} - w_{h,i} - z_i - c > 0 \quad (1)$$

So that the decision of individual i to migrate from home (h) to a foreign (f) destination is a function of the differential in earnings ($w_{f,i} - w_{h,i}$), z_i is the individual's compensating differential in favor of h , and c is the direct cost of migration. The differential in wages depends on whether the returns to skills are greater in the destination relative to current location. If interpreted as present values, it is expected that the likelihood of migration declines as individual i ages and their remaining working life shortens.

Empirical research suggests that age significantly affects the propensity to migrate in a non-linear fashion. Specifically, the likelihood of migration rises until peaking around the ages of late twenties and early thirties, before falling as individuals grow older (Germenji and Swinnen 2005). Generally, the returns to education will be higher in more developed markets (Grogger and Hanson 2011), so

that the differential in expected earnings grows as human capital increases and education thus makes migration more attractive. However, not all forms of human capital may transfer from home to destination labor markets. For instance, qualifications from one market may not be recognized in another, or if illegal or undocumented, migrants may be restricted to the informal economy and relatively unskilled jobs.

Neo-classical theory assumes that individuals possess a compensating differential or preference (z_i) in favor of remaining in their current location. The nature of this preference may vary across groups. For instance, in traditional societies where women are expected to care for older relatives, maintain the family home and relocating alone is considered culturally unacceptable, migration is likely to be strongly biased toward males. In such cases, female migration may be limited to that instigated by marriage or following husbands abroad (Rosenzweig and Stark 1989), so that the determinants of migration differ significantly according to gender (Mendola and Carletto 2009). Finally, in terms of the neo-classical model, while generally it is assumed that z_i takes a positive value, for young people in particular, there might be a desire to seek foreign adventures and experience different lifestyles (Arrehag, Sjöberg, and Sjöblom 2006).

Household Characteristics

In contrast to the neo-classical assumption of decision-making by individuals, the New Economics of Labor Migration (NELM) takes a household perspective (Stark and Bloom 1985, Stark 1991). NELM models assume that households jointly make migration decisions to increase income, obtain funds for investment, and insure against production and income risks in the face of market failures in credit and

insurance markets (Taylor 1999). The selection of who within the household migrates depends on their expected earning potential and ‘at home’ family commitments (Davis, Stecklov, and Winters 2002, Massey et al. 1993).

Regarding family structures, long-distance migration may be curtailed by marriage and the presence of dependent children. In some societies it may be socially unacceptable for a wife to leave the matrimonial home and / or the husband to leave his wife and children. Consistent with this, empirical analysis of German *gastarbeiter* reveals that the first waves of migrants were biased toward unmarried males without dependent children and that the propensity to return home rises with having a spouse and children in the country of origin (Constant and Massey 2002). For Albania, Germenji and Swinnen (2005) found that the presence of children in the household had a negative but insignificant effect on migration.

The expected income differential ($w_{f,i} - w_{h,i}$), *ceteris paribus*, will be larger for poorer households, so that the motivation to migrate will be stronger for lower income groups. In contrast, wealthier households, as a result of the diminishing marginal utility of income, possess weaker incentives (Kotorri 2010). However, migration involves direct costs such as transportation, documentation, upfront rent and in some cases bribes (c in equation 1). In the presence of imperfect credit markets and household budget constraints, poorer households may lack the financial means to meet the direct costs of migration (Arrehag, Sjöberg, and Sjöblom 2006). This suggests that the impact of household income on migration is non-linear, with the propensity to migrate being lowest for those from the very poorest and very richest households.

Network effects

Massey et al. (2010, p.317) define a migration network as a “set of interpersonal ties that link migrants, former migrants and non-migrants in origin and destination areas through the bonds of kinship, friendship and shared community origin” and thus a form of social capital. Migration networks can provide information on employment opportunities in destination markets, direct assistance in the form of housing, transport and food in the host environment, and reduce some of the social costs of migration (loneliness, psychological distance from one’s own culture etc.). Migration networks may thus lower the differential in favor of remaining in the current location (z_i) as well as reducing the direct costs of migration and, through the identification of employment opportunities, increase the expected wage differential. There is robust empirical evidence that such networks facilitate migration (Davis, Stecklov, and Winters 2002, McKenzie and Rapoport 2007) with the strongest network bonds developing with other household members who are or were previously migrants (Germenji and Swinnen 2005).

Relative Deprivation

The NELM argues that migration stems not only from a desire for households to improve their incomes in absolute terms but also increase *income relative to others*. In other words, the marginal utility of income depends also on the income of others (Stark 1991), so that migration propensities will be positively correlated with the level of inequality in the origin community (Czaika and de Haas 2012). As a result, migration from poor households will be greater if they live amongst richer, rather than equally poor, neighbors (Quinn 2006). In this regard the origin community remains the focal reference group and such relative deprivation may explain why migrants

accept employment that is “dangerous, dirty and demeaning” (Czaika and de Haas 2012), which native workers refuse, if it raises their standing and socio-economic status in the origin community (Czaika 2013). There is some, although far from universal, empirical evidence supporting the notion that migration depends on a household’s income relative to its reference group (origin municipality or village) rather than just absolute income levels (Quinn 2006, Stampini, Carletto, and Davis 2008, Stark 1991).

Security effects

The greatest flows of migrants in history stemmed from wars, and in a post-conflict environment, on-going outbreaks of violence and discrimination may prompt further migration (Ibáñez and Vélez 2008, Morrison and May 1994). The legacy of armed conflicts can pose specific problems for farming. For instance, landmines and other unexploded ordnance can prohibit cultivation or access to support infrastructure such as irrigation channels (Trevelyan et al. 2004). The loss of income and livelihoods for those affected may stimulate migration, with problems persisting long after the cessation of conflicts. For instance, in the Balkans as well as in other affected countries such as Cambodia, Vietnam and Afghanistan demining efforts have been slow (Habib 2016, Trevelyan et al. 2004). A wider set of security concerns may also prompt migration. Most attention has been paid to land registration and titling as a mechanism for securing property rights, particularly following regime change, such as after the downfall of state socialism in Central and Eastern Europe or separation from the former Yugoslavia as in the case of Kosovo (Hartvigsen 2014, Todorovski, Zevenbergen, and van der Molen 2016). However, land registration may be insufficient in itself to provide the security required for farming land effectively. For

example, drawing on research in Bulgaria, Fredriksson et al. (2017) document cases of land abandonment following repeated theft of crops and / or equipment, or a neighboring farmer allowing his guard dogs to roam freely over the land of others. The lack of personal safety and security of property can devastate returns to farming activities and precipitate migration.

Characteristics of the Case Study Area

Kosovo is a small, landlocked economy with a total area of 1.1 million hectares (ha) and population of 1.8 million. Nearly 60 per cent of the population live in rural areas. Recently, there have been some important macroeconomic achievements. Kosovo has been one of only four countries in Europe that recorded positive growth rates in every year of the post-crisis period after 2008 (The World Bank Group in Kosovo 2015). Despite this growth, Kosovo is still one of the poorest countries in Europe. GDP per capita in 2014 was only €3,084 (ASK 2015b). The World Bank Group in Kosovo (2015), estimates that the average per capita income is about one-tenth of the average for the EU, with poverty rates of 80 per cent if the threshold of USD 5 per day is applied (at Purchasing Power Parity). If instead the domestic poverty line of €1.72 per day, as defined by Kosovo's Agency of Statistics (ASK) is applied, 29.7 per cent of the population is classified as poor.

Agriculture accounts for approximately 12 and 25 per cent of GDP and total employment respectively. According to the Agricultural Census conducted in 2014, 413,635 hectares (ha) of land were given over to farming, amounting to 41.8 per cent of the total area of Kosovo (ASK 2015a). The average utilized agricultural area per holding was 3.2 ha. However, 35.5 per cent of agricultural holdings cultivated less

than 0.5 ha of arable land. Given this unfavorable, fragmented farm structure rural households struggle to generate reasonable incomes without recourse to other gainful activities outside of agriculture. However, there are several barriers to engagement with off-farm employment, the most significant of which for agricultural households in Kosovo is the high level of regional unemployment (Osmani, Gorton, and White 2013). Under these circumstances, migration to larger cities is often a preferred livelihood strategy.

Commuting to urban areas is sometimes hindered by the poor quality of local roads. There are, however, several major roads that connect Kosovo to the bordering countries: the north axis, which connects northern Kosovo with Serbia; east axis, which connects eastern Kosovo with Serbia; south-southeast axis, which connects Kosovo with the Former Yugoslav Republic of Macedonia (FYROM), and south axis which connects the country with Albania. Whilst Kosovo has very good economic relations with Albania and relatively good ones with the FYROM, relations with Serbia remain tense following the armed conflict of the late 1990s. Therefore, the location of a farm household close to a particular border implies a distinct set of opportunities (or their absence) for trade and income generation, and perceptions of security.

Modelling and Data

As the literature suggests that migrants self-select out of the general population non-randomly (McKenzie and Rapoport 2010), it is necessary to control for selection bias. We employ therefore a Heckman selection modelling approach to effectively control for potential selection bias with respect to the estimation of the propensity to migrate

at the individual level. The first stage of the model estimates whether a particular member of household migrated or not during 2012, while the second stage considers the length of time the household member migrated in 2012 (expressed in months). We estimate determinants for the variation in the propensity to migrate and length of migration, considering gender related differences, as suggested by McKenzie and Rapoport (2007). A bootstrap based resampling procedure ensures the robustness of our estimates. Beside migrant related characteristics, we test for the effect of household, as well as farm and network effects on migration. We enrich our econometric models by considering also the reasons given by respondent households for leaving land fallow and not engaging in production, as these can relate to the eventual decision to leave rural areas. Such potential reasons refer, first, to underdeveloped input and output markets, and second, to the nature of the post-conflict environment, e.g. land mines and also the lack of security.

We expect that an individual's decision to migrate or not is influenced by a multitude of factors: household related and personal characteristics, farm and production related conditions, security, social networking effects, and relative deprivation. It is likely that, in these regards, the characteristics of migrants will differ from non-migrants. Unobservable characteristics affecting the decision to migrate will be correlated with the unobservable characteristics affecting an individual's level of migration in the particular year. Selectivity bias would be present, therefore, if we were to draw inferences about the determinants of the level of migration for all individuals based on the observed level of migration for the subset which is actually migrating. Heckman's two-stage sample selection model copes with such a selection problem by assuming that the individual makes two judgements with regard to

migration and the intensity or level of migration, with each determined by a different set of explanatory variables (Heckman 1979).

There are, hence, two latent dependent variables models, where the decision to migrate or not is modeled as a selection equation specified as:

$$P_i = \begin{cases} 1 & \text{if } \alpha + \sum_j \beta_j hh_{ij} + \sum_k \gamma_k net_{ik} + \sum_l \delta_l dep_{il} + u > 0 \\ 0 & \text{otherwise} \end{cases} \quad [2]$$

where P_i is a binary variable which takes the value one if the individual is a migrant and zero if the individual decided not to migrate, hh denotes the vector of household related and individual characteristics, net stands for social network effects, dep for factors related to relative economic deprivation. α, β, γ , and δ are the parameters to be estimated, and u is the error term with the corresponding log-likelihood function for [2] given in Maddala (1998).

The migration intensity or level equation is given by:

$$level_i = \mu + \sum_m \tau_m hh_{im} + \sum_n \varphi_n net_{in} + \sum_o \omega_o dep_{io} + \sum_q \epsilon_q fal_{iq} + v \quad [3]$$

where $level$ takes continuous values, hh denotes again the vector of household related and individual characteristics, net stands for social network effects, dep for factors related to relative economic deprivation, and fal for the variables related to stated reasons to leave land fallow. $\mu, \tau, \varphi, \omega$, and ϵ are the parameters to be estimated, and v is the error term, with the corresponding log-likelihood function for [3] also detailed in Maddala (1998). We estimate [2] and [3] by following Heckman's two-stage estimation procedure (1979) to address the potential selection bias. The first stage of the estimation procedure consists of estimating equation [2] as the migration equation. The second stage of the estimation procedure is the ordered probit equation of

migration intensity (or level) which contains the inverse Mill's ratio as a correcting term.

To address the potential problem of small sample bias, as well as heteroscedasticity, we estimate the robust covariance matrix using the Huber-White sandwich estimator (White 1980, Huber 1967). The latter provides consistent estimates of the covariance matrix for parameter estimates even when the fitted parametric model fails to hold because of misspecification or violation of the error related assumptions.¹ Puhani (2000) demonstrated that the one-stage full-information ML estimation of the Heckman selection model is preferable in the case where collinearity problems are absent. The auxiliary regressions performed showed that some minor collinearity in the explanatory variables could be excluded. Hence, we prefer to apply a two-stage estimation procedure. To examine the validity of the final model specification, we test for the group wise insignificance of the parameters in [2] and [3] by a common generalized likelihood ratio testing procedure. Finally, a White (1980) test checked for possible heteroscedasticity.

Dataset

The data employed in the study were extracted from the agricultural household surveys conducted by the Statistical Office of Kosovo (SOK) in 2008 and 2012.²

These unique datasets contain information on household characteristics (age, gender,

¹ Here the estimate is calculated as the product of three matrices: the matrix formed by taking the outer product of the observation-level likelihood/pseudo-likelihood score vectors is used as the middle of these matrices, and this matrix is in turn pre- and post-multiplied by the usual model-based variance matrix.

² During this period the statistical institution was called the Statistical Office of Kosovo. It is now known as *Agjencia e Statistikave të Kosovës* (Kosovo Agency of Statistics).

education, and months absent from the household for each member), location, farming patterns (size of farm, number of plots, labor input, and production patterns), value of agricultural machinery and gross farm incomes. Data collection occurred face to face with the sample stratified by region and farm size to ensure its representativeness. For the purpose of the survey, SOK defined agricultural households as those that cultivate more than 0.10 ha of arable land or less than 0.10 ha of utilized arable land but had at least one cow or three pigs or five sheep/goats, or 50 poultry, or 20 beehives. Based on the theoretical and empirical evidence presented above, variables were selected for the empirical analysis (Table 1). Table 2 details the descriptive statistics.

Tables 1 and 2 about here

Empirical Results

Tables 3 and 4 present the results of the econometric analysis. Column 1, outcome, shows the effect of the explanatory variables on the length of migration, i.e. on the months in a year away from the household, and column 2, selection, shows the effect of the explanatory variables on the probability to be selected as a migrant in 2012. Columns 3 and 4 show the marginal effects of the explanatory variables on the length of migration and on the probability of being selected, respectively. Table 3 details the analysis for the full sample, with two sets of estimations presented which differ in terms of inclusion of variables relating to the reasons for land being left fallow (if applicable). Table 4 presents the estimations for the sub-samples of male and female household members respectively as the factors motivating migration may differ between the two groups (Fernández-Huertas Moraga 2013). Considering the different diagnosis tests performed and measures of model quality, the estimated model

specifications are statistically significant at a satisfactory level with no severe signs of misspecification.

Tables 3 and 4 about here

Model results identify the significance of household / personal characteristics, farm characteristics, and network effects in explaining variations in the selection and outcome variables. Considering both the propensity to migrate and length of migration, for the full sample of respondents, the coefficients for age and age squared of each person are significant and with differing signs. This is as expected - the likelihood of migration increases with age but only up to a certain point, after which it declines. On average, the tipping point in both models with and without the reasons to leave land fallow is around 25 to 26 years of age *ceteris paribus* (around 31 and 32 for male, whereas around 15 to 16 years of age for female migrants). The low tipping point for females suggests that they may move out as teenagers either due to early marriage or migrate out of rural areas for education – a phenomenon observed in some other low income countries (Rosenzweig and Stark 1989, Kudo 2015). In the last year of the so-called ‘upper secondary school’ in Kosovo, attended by 15 to 18 years old, 46.1 per cent are girls (UNICEF 2013).

Graph 1 about here

Whilst the ratio of older people in the household (above 65 years of age) does not affect either the propensity to migrate or the length of migration, the ratio of children and young adults (up to 15 years of age) hinders migration. For the full

sample, it affects negatively the length of migration, whilst for both male and female sub-samples the coefficient for propensity to migrate is large and negative but is significant at only at 10 per cent level. Additionally, for men having children negatively affects the length of migration. These results corroborate some initial studies on the subject (Mincer 1978, Long 1972). More recent studies found a negative effect of pre-school children on rural-urban migration in China, but the coefficient was not statistically significant (Zhao 1999).

The likelihood of an individual migrating falls as gross income per household member rises but only up a certain point, after which rises in household income per capita positively affect the likelihood of migration (Graph 2) . On average, the tipping point in the model without the reasons to leave land fallow is around €3000 to €3100 per capita per year *ceteris paribus*, however, significantly less if fallow reasons are considered (around €2000 to €2100 per capita per year *ceteris paribus*). For males this point is around €2600 to €2700 per capita per year and for females around €2500 to €2600 Euro per capita and year. When other factors are controlled for, females are significantly less likely to migrate than males.

Graph 2 about here

For the full sample, the propensity to migrate is negatively related to the size of farm, measured in hectares operated, and educational achievement. However, when considering length of migration, farm size is not a significant determinant and education is only significant at the 10 per cent level in the model including all observations. The propensity to be a migrant in 2012 was positively related to whether

any other member of the household was a migrant in 2008 and the average level of migration in the household's locality (municipality) in 2008, but not, surprisingly, whether the individual was a migrant in 2008. This pattern also holds for the length of migration but is less evident when considering the sub-samples for males and females. Nevertheless, the analysis underlines the importance of a household perspective for understanding migration, rather than focusing merely on individuals in isolation. It supports expectations based on the NELM about the role of migration networks (McKenzie and Rapoport 2007, Davis, Stecklov, and Winters 2002). A legacy of the conflict is a large diaspora which facilitates further migration in the post-conflict era.

Most independent variables have a similar effect on the propensity of males and females to migrate, apart from education. The level of education achieved has a negative effect on male migration but displays a positive sign for females. This may reflect gender differences in the labor markets for migrants. Male migration is biased toward construction and physical work, while the public sector and office work is far more common for females and requires a higher level of education (Gashi and Haxhikadrija 2012). The size of the farm negatively influences the propensity of males to migrate, but has no influence on female migration. This again reflects labor market differences – males are more likely to be required to work on the labor-intensive family farm than females.

The effect of relative deprivation on migration was captured through two variables: gross household income relative to the mean for the region and hectares of land per household member relative to the mean for the region. There is no strong support for the importance of either measure as a determinant of migration. Across the

four models, in most instances these two variables are either not significant or only significant at the 10 per cent level.

Empirical results support the notion that an inability to cultivate a household's farmland may stimulate migration. Land left fallow because of a farm household's lack of inputs, manpower, equipment and poor economic profitability positively affect the propensity to migrate (Table 3). However, land left fallow because of a lack of security or the presence of landmines negatively affects the propensity to migration. The former may reflect a belief that family members are required to stay on farm to ensure the security of property and other assets. Minefields in Kosovo are skewed toward border lands, where the ownership of property is most disputed and insecure. While insecurity is thus often regarded as a 'push' factor (Huysmans 2006), remaining on farm to preserve assets and protect other family members can be a strong inhibitor of migration, particularly whilst the memories of the armed conflicts, in which people lost their houses and land, are still fresh.

Conclusions

This paper investigates the determinants of rural out-migration in Kosovo, a post-conflict country. Although the armed conflict took place at the end of 1990s, feelings of insecurity and weak institutions pervade, with on-going disputes in those areas with multi-ethnic populations. To measure the determinants of rural out-migration, the analysis employed data from an agricultural household survey conducted at two points in time (2008 and 2012). Although the dependent variables were the propensity to migrate, and for migrants, the length of migration in 2012, several variables relating to 2008 reveal how past developments affected migration in 2012.

The results support some of the key tenets of the NELM. Estimations underline the importance of taking a household perspective in studying migration. For instance, having another household member as a migrant in 2008 had a positive effect on both propensity to migrate and the length of migration of another household members in 2012. The study also reveals the importance of networks and social capital as pull factors. However, whilst the NELM hypothesizes a positive relationship between the propensity to migrate and the inequality in the origin community (Stark 1991, Stark and Bloom 1985), in this study relative deprivation, when measured in terms of both household and per capita incomes and farm size compared to regional means, is not statistically significant. In absolute terms, incomes have a non-linear effect on migration. Contrary to some expectations, individuals from poorer and richer households have a higher propensity to migrate – ones pushed by poverty, others pulled by the expectations to achieve better returns to their skills in more developed labor markets and have the financial means to migrate.

Despite *a priori* expectations, differences in the drivers of male and female migration are, overall, fairly minor. One notable exception is the role of education. Whilst males with better education are less likely to migrate or stay longer away from the household, females with better education are more likely to migrate. This most likely reflects gender divisions in the nature of labor market opportunities.

An important policy message of this study is that the main push factors for rural out-migration linked to farmland being left fallow are economic rather than related to the past conflict. In the model that includes the reasons to leave land fallow,

the variables that increase the propensity to migrate are a lack of inputs, manpower and equipment, and the lack of farm profitability. The variables linked to the (post)conflict – landmines and insecurity – mainly keep people on-farm. The intuition behind this result is that in a post-conflict situation some people do not move off their farms in order to protect their families, houses and land. Many rural inhabitants lost loved ones, homes and other property during the armed conflict. Therefore, security concerns that are usually seen as stimulating migration may not be always act as push factors in a post-conflict situation. Given the relationships between the reasons for why land is left fallow and migration, the results suggest that policies seeking to decrease rural out-migration should focus on the growth and development of market institutions, stimulating competitive input markets and outlets for the sale of farm produce.

References

- Arrehag, Lisa, Örjan Sjöberg, and Mirja Sjöblom. 2006. "Post-Communist Cross-Border Migration in South-Eastern Albania: Who Leaves? Who Stays Behind?" *Journal of Ethnic and Migration Studies* 32 (3):377-402. doi: 10.1080/13691830600554817.
- ASK. 2012. Kosovo Population and Housing Census 2011. Prishtinë: Agjencia e Statistikave të Kosovës.
- ASK. 2015a. Agriculture Census in the Republic of Kosovo 2014 Final Results. . Pristina: Agjencia e Statistikave të Kosovës,.
- ASK. 2015b. Gross Domestic Product Dataset. edited by Agjencia e Statistikave të Kosovës. Pristina.
- Cash, Jennifer R. 2015. "Between Starvation and security: povertty and food in rural Moldova." In *Ethnographies of Grey Zones in Eastern Europe: Relations,*

- Borders and Invisibilities*, edited by Ida Harboe Knudsen and Martin Demant Frederiksen, 41-56. London: Anthem Press.
- Clemens, Michael A., Çağlar Özden, and Hillel Rapoport. 2014. "Migration and Development Research is Moving Far Beyond Remittances." *World Development* 64:121-124. doi: <http://dx.doi.org/10.1016/j.worlddev.2014.05.018>.
- Constant, Amelie, and Douglas S. Massey. 2002. "Return migration by German guestworkers: Neoclassical versus new economic theories." *International migration* 40 (4):5-38.
- Czaika, Mathias. 2013. "Are unequal societies more migratory?" *Comparative Migration Studies* 1 (1):97-122. doi: 10.5117/cms2013.1.czai.
- Czaika, Mathias, and Hein de Haas. 2012. "The Role of Internal and International Relative Deprivation in Global Migration." *Oxford Development Studies* 40 (4):423-442. doi: 10.1080/13600818.2012.728581.
- Davis, Benjamin, G. U. Y. Stecklov, and Paul Winters. 2002. "Domestic and international migration from rural Mexico: Disaggregating the effects of network structure and composition." *Population Studies* 56 (3):291-309. doi: 10.1080/00324720215936.
- European Commission. 2012. Social Impact of Emigration and Rural-Urban Migration in Central and Eastern Europe. Brussels: DG Employment, Social Affairs and Inclusion
- Fernández-Huertas Moraga, Jesús. 2013. "Understanding different migrant selection patterns in rural and urban Mexico." *Journal of Development Economics* 103 (0):182-201. doi: <http://dx.doi.org/10.1016/j.jdevec.2013.02.005>.

- Fredriksson, Lena, Alastair Bailey, Sophia Davidova, Matthew Gorton, and Diana Traikova. 2017. "The commercialisation of subsistence farms: Evidence from the new member states of the EU." *Land Use Policy* 60 (1):37-47. doi: <http://dx.doi.org/10.1016/j.landusepol.2016.10.009>.
- Gashi, A. , and A. Haxhikadrija. 2012. Social Impact of Emigration and Rural-Urban Migration in Central and Eastern Europe, Final Country Report: Kosovo.
- Germenji, Etleva, and Johan F. M. Swinnen. 2005. "Human capital, market imperfections, poverty and migration: evidence From Albania." *Licos Discussion Papers* (157).
- Grogger, Jeffrey, and Gordon H. Hanson. 2011. "Income maximization and the selection and sorting of international migrants." *Journal of Development Economics* 95 (1):42-57. doi: <http://dx.doi.org/10.1016/j.jdeveco.2010.06.003>.
- GVG. 2012. Social Impact of Emigration and Rural-Urban Migration in Central and Eastern Europe. Brussels: European Commission Directorate General Employment, Social Affairs and Inclusion.
- Habib, Maki. 2016. "Mine clearance techniques and technologies for effective humanitarian demining." *Journal of Conventional Weapons Destruction* 6 (1):62-65.
- Harris, John R., and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review* 60 (1):126-142.
- Hartvigsen, Morten. 2014. "Land reform and land fragmentation in Central and Eastern Europe." *Land Use Policy* 36:330-341. doi: <http://dx.doi.org/10.1016/j.landusepol.2013.08.016>.

- Hatton, Timothy J., and Jeffrey G. Williamson. 2005. "What Fundamentals Drive World Migration?" In *Poverty, International Migration and Asylum*, edited by George J. Borjas and Jeff Crisp, 15-38. London: Palgrave Macmillan UK.
- Havolli, Sokol. 2011. "Determinants of Migrants' Earnings and Remittances: Evidence from Kosovo." *Focus on European Economic Integration* (1):90-99.
- Heckman, J. J. 1979. "Sample selection bias as a specification error." *Econometrica: Journal of the econometric society* 47 (1):153-161.
- Huber, Peter J. 1967. "The behavior of maximum likelihood estimates under nonstandard conditions." Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability.
- Huysmans, J. 2006. *The Politics of Insecurity: Fear, Migration and Asylum in the EU*. Abingdon: Routledge.
- Ibáñez, Ana María, and Carlos Eduardo Vélez. 2008. "Civil Conflict and Forced Migration: The Micro Determinants and Welfare Losses of Displacement in Colombia." *World Development* 36 (4):659-676. doi: <http://dx.doi.org/10.1016/j.worlddev.2007.04.013>.
- International Organization for Migration. 2013. World Migration Report. Geneva: International Organization for Migration
- Kotorri, Mrika. 2010. "The Probability of Economic Emigration in Kosovo." *Eastern European Economics* 48 (6):17-35. doi: 10.2753/EEE0012-8775480602.
- Kudo, Yuya. 2015. "Female Migration for Marriage: Implications from the Land Reform in Rural Tanzania." *World Development* 65 (1):41-61. doi: <http://dx.doi.org/10.1016/j.worlddev.2014.05.029>.
- Long, Larry H. 1972. "The influence of number and ages of children on residential mobility." *Demography* 9 (3):371-382. doi: 10.2307/2060860.

- Longley, Catherine, Ian Christoplos, and Tom Slaymaker. 2006. *Agricultural Rehabilitation Mapping the Linkages between Humanitarian Relief, Social Protection and Development* London: Overseas Development Institute.
- Lynch, Kenneth, Roy Maconachie, Tony Binns, Paul Tengbe, and Kabba Bangura. 2013. "Meeting the urban challenge? Urban agriculture and food security in post-conflict Freetown, Sierra Leone." *Applied Geography* 36:31-39. doi: <http://dx.doi.org/10.1016/j.apgeog.2012.06.007>.
- Maddala, G. S. 1998. *Limited-Dependent Variables and Qualitative Variables in Econometrics*. Cambridge, England: Cambridge University Pres.
- Massey, D. S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino, and J. E. Taylor. 1993. "Theories of international migration: a review and appraisal." *Population and Development Review* 19 (3):431-466.
- Mboya, Mzobanzi M., and Ralintho I. Nesengani. 1999. "Migrant labor in South Africa: A comparative analysis of the academic achievement of father-present and father-absent adolescents." *Adolescence* 34 (136):763.
- McKenzie, David, and Hillel Rapoport. 2007. "Network effects and the dynamics of migration and inequality: Theory and evidence from Mexico." *Journal of Development Economics* 84 (1):1-24. doi: <http://dx.doi.org/10.1016/j.jdeveco.2006.11.003>.
- McKenzie, David, and Hillel Rapoport. 2010. "Self-Selection Patterns in Mexico-U.S. Migration: The Role of Migration Networks." *Review of Economics and Statistics* 92 (4):811-821. doi: 10.1162/REST_a_00032.
- Mendola, Mariapia, and Calogero Carletto. 2009. International migration and gender differentials in the home labor market: Evidence from Albania. In *World Bank*

Policy Research Working Paper Series. Washington D.C.: World Bank
Development Research Group Poverty Team.

Mincer, Jacob. 1978. "Family Migration Decisions." *Journal of Political Economy* 86
(5):749-773.

Möllers, Judith, and Wiebke Meyer. 2014. "The effects of migration on poverty and
inequality in rural Kosovo." *IZA Journal of Labor & Development* 3 (1):3-16.

Möllers, Judith, Wiebke Meyer, Sherif Xhema, and Gertrud Buchenrieder. 2013. A
socio-economic picture of Kosovar migrants and their origin farm households.
Halle (Saale), Germany: Leibniz Institute of Agricultural Development in
Transition Economies (IAMO).

Moore, R. M. 2001. *The Hidden America: Social Problems in Rural America for the
Twenty-first Century*. Selinsgrove: Susquehanna University Press.

Morrison, A. R., and R. A. May. 1994. "Escape from terror: violence and migration in
post-revolutionary Guatemala." *Latin American Research Review* 29 (2):111-
132.

OECD. 2015. *International Migration Outlook*. Paris: OECD.

Osmani, Faton, Matthew Gorton, and John White. 2013. "Agricultural households,
poverty and the rural labour market in Kosovo." *Post-Communist Economies*
25 (2):241-252. doi: 10.1080/14631377.2013.787756.

Parreñas, Rhacel Salazar. 2001. "Mothering from a Distance: Emotions, Gender, and
Intergenerational Relations in Filipino Transnational Families." *Feminist
Studies* 27 (2):361-390. doi: 10.2307/3178765.

Puhani, Patrick. 2000. "The Heckman Correction for Sample Selection and Its
Critique." *Journal of Economic Surveys* 14 (1):53-68. doi: 10.1111/1467-
6419.00104.

- Quinn, Michael A. 2006. "Relative Deprivation, Wage Differentials and Mexican Migration." *Review of Development Economics* 10 (1):135-153. doi: 10.1111/j.1467-9361.2005.00306.x.
- Rosenzweig, Mark, R. , and Oded Stark. 1989. "Consumption Smoothing, Migration, and Marriage: Evidence from Rural India." *Journal of Political Economy* 97 (4):905-926. doi: doi:10.1086/261633.
- Sauer, Johannes, Matthew Gorton, and Sophia Davidova. 2015. "Migration and farm technical efficiency: evidence from Kosovo." *Agricultural Economics* 46 (5):629-641. doi: 10.1111/agec.12159.
- Stampini, Marco, Calogero Carletto, and Benjamin Davis. 2008. "International Migration from Albania: The Role of Family Networks and Previous Experience." *Eastern European Economics* 46 (2):50-87. doi: 10.2753/EEE0012-8775460203.
- Stark, O. 1991. *The Migration of Labor*. Oxford: Basil Blackwell.
- Stark, O., and D. E. Bloom. 1985. "The New Economics of Labor Migration." *American Economic Review* 75 (2):173-178.
- Taylor, J. E. 1999. "The new economics of labour migration and the role of remittances in the migration process." *International Migration* 37 (1):63-88.
- Taylor, J. E., S. Rozelle, and A. de Brauw. 2003. "Migration and incomes in source communities: A new economics of migration perspective from China." *Economic Development and Cultural Change* 52 (1):75-101. doi: Doi 10.1086/380135.
- The World Bank Group in Kosovo. 2015. Country Snapshot: April 2015. Prishtina: World Bank Country Office in Kosovo.

- Todorovski, D., J. Zevenbergen, and P. van der Molen. 2016. "Conflict and post-conflict land administration – the case of Kosovo." *Survey Review* 48 (350):316-328. doi: 10.1179/1752270615Y.0000000044.
- Transparency International. 2015. "Corruption By Country." Accessed 29th February 2016. <https://www.transparency.org/country/%20-%20KOSranparency>.
- Trevelyan, James, Sabbia Tilli, Bradley Parks, and Teng Han Chiat. 2004. Farming minefields: economics of remediating land with moderate landmine and UXO contamination. Demining Research Project, Department of Mechanical and Materials Engineering, The University of Western Australia.
- UNICEF. 2013. Gender Review in Education in Kosovo. Prishtina: UNICEF Kosovo.
- Vathi, Z., and R. Black. 2007. Migration and poverty reduction in Kosovo. Brighton, UK: Development Research Centre on Migration, Globalisation, and Poverty.
- White, Halbert. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity." *Econometrica* 48 (4):817-838. doi: 10.2307/1912934.
- World Bank. 2015. "Governance Indicators." The World Bank Accessed 4th February 2016. <http://info.worldbank.org/governance/wgi/index.aspx#reports>.
- Zhao, Yaohui. 1999. "Leaving the Countryside: Rural-To-Urban Migration Decisions in China." *The American Economic Review* 89 (2):281-286.

Table 1: Variables from the Farm Survey Selected / Computed for the Empirical Analysis

<i>Dependent variable</i>	<i>Notes / a priori expectation</i>	<i>Link with theory</i>
Whether individual <i>i</i> is a migrant in 2012 (first stage). Number of months migrant is absent from origin household (second stage)	Heckmann	
<i>Independent variables</i>		
<i>Household / personal characteristics</i>		
Age of household member <i>i</i>	Negative	Young person has more years over which to recover the cost and receive the gains of migration than an old person
Age squared of household member <i>i</i>	Non-linear	Very young and very old may not migrate – non-linear
Gender	Lower for females	Females more tied to household for cultural reasons
Level of education of household member <i>i</i>	Positive	Education (human capital) increase potential returns from migration
<i>Farm characteristics</i>		
Total gross farm income per capita in 2008	Conflicting theory	Lower incomes per household member increase incentives to migrate but low incomes may act as a barrier to financing migration (wealth effect)
Farm income per capita squared in 2008	Non-linear	Migration rates should first increase and then decrease with wealth
Farm size (ha farmed in 2008)	Negative	Migration means to overcome credit and liquidity constraints which will be less pressing where have higher agricultural asset base
Total resale value of agricultural machinery in 2008 (euros)	Negative	As above
<i>Network effects</i>		
If member <i>i</i> was a migrant in 2008	Positive	Migration network effect
If any other member of household migrated in 2008	Positive	As above
Level of migration in municipality	Positive	As above
<i>Relative deprivation</i>		
Total gross income of household in 2008 relative to mean for region	Relatively deprived more likely to migrate	Households send workers abroad not only to improve income in absolute terms, but also to increase income relative to other households, reducing their relative deprivation compared with some reference group
Total farmed area (ha) per capita relative to regional mean (income figures may be unreliable)	Relatively deprived more likely to migrate	As above
Total farmed area (ha) per capita relative to regional mean (income figures may be unreliable)	Relatively deprived more likely to migrate	As above

Table 2: Descriptive Statistics of Variables¹

Variable	No of observations	Mean	St Dev	Min	Max
<i>Household / individual effects</i>					
HH members No of months away in 2012	14570	0.800	2.972	0	12
Age ₁₂	14570	31.409	20.530	0	99
Age ² ₁₂	14570	1407.988	1599.184	0	9801
Gender (1 male, 2 female) ₁₂	14567	1.464	0.499	1	2
Education ₁₂ ²	14567	3.666	2.059	1	9
Gross income per capita ₁₂	13808	173.834	476.252	0	8378
Gross income per capita ²	13808	257018.100	2533771.000	0	70200000
Ratio of HH members up to 15 years old ₁₂	15481	0.240	0.228	0	0.9
Ratio of HH members over 65 ₁₂	15481	0.081	0.167	0	1
Hectares (ha) farmed ₀₈	14570	3.882	6.629	0.04	125
<i>Network effects</i>					
Migrant in ₀₈	14570	0.085	0.279	0	1
Other HH member migrant ₀₈	14570	0.304	0.460	0	1
Average migr level per HH in municipality ₀₈	14570	2.835	4.111	0.05	15
<i>Relative deprivation</i>					
Relative gross income per capita ₀₈	13808	173.834	476.252	0	8378
Relative ha per HH member ₀₈	14570	0.918	1.121	0.01	16
<i>Reasons to leave land fallow</i>					
Crop rotation ₀₈	15481	0.011	0.102	0	1
Lack of inputs ₀₈	15481	0.073	0.261	0	1
Lack of manpower ₀₈	15481	0.024	0.155	0	1
Lack of equipment ₀₈	15481	0.013	0.114	0	1
Low economic profitability ₀₈	15481	0.069	0.254	0	1
Land mines ₀₈	15481	0.002	0.041	0	1
Lack of security ₀₈	15481	0.004	0.065	0	1

¹ Subscripts 08 and 12 refer to years 2008 and 2012 respectively.

² The nine categories of education are 1 No education; 2 Some primary school; 3 Primary school completed; 4 Some secondary school; 5 Secondary school completed; 6 Some high school; 7 High school completed; 8 Some University study; 9 University completed.

Table 3: Heckman Selection Model for All Observations¹²

Variable	Reasons for leaving land fallow not included				Reasons for leaving land fallow included			
			Marginal effects				Marginal effects	
	Outcome (1)	Selection (2)	Outcome (3)	Selection (4)	Outcome (1)	Selection (2)	Outcome (3)	Selection (4)
Age ₁₂	0.178 [0.0294]***	0.022 [0.0047]***	0.034 [0.0092]***	0.003 [0.0006]***	0.193 [0.0277]***	0.023 [0.0047]***	0.034 [0.0081]***	0.003 [0.0006]***
Age ² ₁₂	-0.003 [0.0005]***	0.000 [0.0001]***	-0.001 [0.0002]***	-0.000 [0.0000]***	-0.004 [0.0004]***	-0.000 [0.0001]***	-0.001 [0.0002]***	-0.000 [0.0000]***
Gender ₁₂	-0.915 [0.2518]***	-0.168 [0.0342]***	-0.175 [0.0346]***	-0.022 [0.0044]***	-0.347 [0.2495]	-0.170 [0.0351]***	-0.062 [0.0558]	-0.022 [0.0045]***
Education ₁₂	-0.160 [0.0834]*	-0.028 [0.0103]***	-0.031 [0.0151]**	-0.004 [0.0013]***	-0.116 [0.0719]	-0.030 [0.0108]***	-0.021 [0.0151]	-0.004 [0.0014]**
Gross income per capita ₀₈	-0.002 [0.0008]**	-0.000 [0.0001]***	-0.000 [0.0001]**	-0.000 [0.0000]***	-0.002 [0.0008]***	-0.000 [0.0001]*	-0.000 [0.0002]**	-0.000 [0.0000]*
Gross income per capita ² ₀₈	0.000 [0.0000]**	0.000 [0.0000]***	0.000 [0.0000]**	0.000 [0.0000]***	0.000 [0.0000]**	0.000 [0.0000]***	0.000 [0.0000]*	0.000 [0.0000]***
Ratio of HH members up to 15 years old ₁₂	-1.677 [0.6301]**	-0.108 [0.0770]	-0.321 [0.1000]***	-0.014 [0.0099]	-0.969 [0.6911]	-0.149 [0.0723]**	-0.173 [0.1478]	-0.019 [0.0092]**
Ratio of HH members over 65 ₁₂	-1.789 [1.2631]	0.118 [0.1125]	-0.342 [0.2423]	0.015 [0.0145]	-0.533 [1.4094]	0.155 [0.1085]	-0.095 [0.2541]	0.020 [0.0137]
Hectares (ha) farmed ₀₈	-0.063 [0.0520]	-0.009 [0.0053]*	-0.012 [0.0099]	-0.001 [0.0007]*	-0.031 [0.0512]	-0.009 [0.0059]	-0.006 [0.0094]	-0.001 [0.0008]
Migrant in ₀₈	-0.085 [0.3883]	-0.011 [0.0621]	-0.016 [0.0744]	-0.001 [0.0080]	0.252 [0.3862]	-0.031 [0.0663]	0.045 [0.0688]	-0.004 [0.0084]
Other HH member migrant ₀₈	0.522 [0.2583]**	0.074 [0.0406]*	0.100 [0.0518]*	0.010 [0.0052]*	0.414 [0.2513]*	0.079 [0.0436]*	0.074 [0.0484]	0.010 [0.0055]*

Average migr level per HH in municipality ₀₈	0.234 [0.0228]***	0.040 [0.0035]***	0.045 [0.0073]***	0.005 [0.0005]***	0.248 [0.0220]***	0.039 [0.0034]***	0.044 [0.0127]***	0.005 [0.0004]***
Relative gross income per capita ₀₈	0.129 [0.1980]	0.038 [0.0220]*	0.025 [0.0377]	0.005 [0.0028]*	0.367 [0.2240]	0.023 [0.0215]	0.066 [0.0442]	0.003 [0.0027]
Relative ha per HH member ₀₈	0.063 [0.2091]	-0.012 [0.0260]	0.012 [0.0403]	-0.002 [0.0033]	-0.112 [0.2180]	-0.021 [0.0293]	-0.020 [0.0394]	-0.003 [0.0037]
Fallow due to crop rotation ₀₈						-0.554 [0.9998]		-0.070 [0.1264]
Fallow due to lack of inputs ₀₈						0.456 [0.0620]***		0.058 [0.0078]***
Fallow due to lack of manpower ₀₈						0.643 [0.1000]***		0.082 [0.0128]***
Fallow due to lack of equipment ₀₈						0.364 [0.1702]**		0.046 [0.0216]**
Fallow due to unprofitability ₀₈						0.199 [0.0653]***		0.025 [0.0082]**
Fallow due to land mines ₀₈						-4.819 [0.1111]***		-0.612 [0.0223]***
Fallow due to insecurity ₀₈						-4.834 [0.0898]***		-0.613 [0.0207]***
Mill's Ratio		6.2142 [0.3124]***				5.3935 [0.3041]***		
<i>Rho</i>		1.000				1.000		
<i>Sigma</i>		6.2142				5.3935		
Constant		-1.360 [0.0896]***				-1.403 [0.0909]***		
Observations		13805				13805		

¹Subscripts 08 and 12 refer to 2008 and 2012.

²Standard errors in brackets.

Table 4: Heckman Selection Model according to Gender

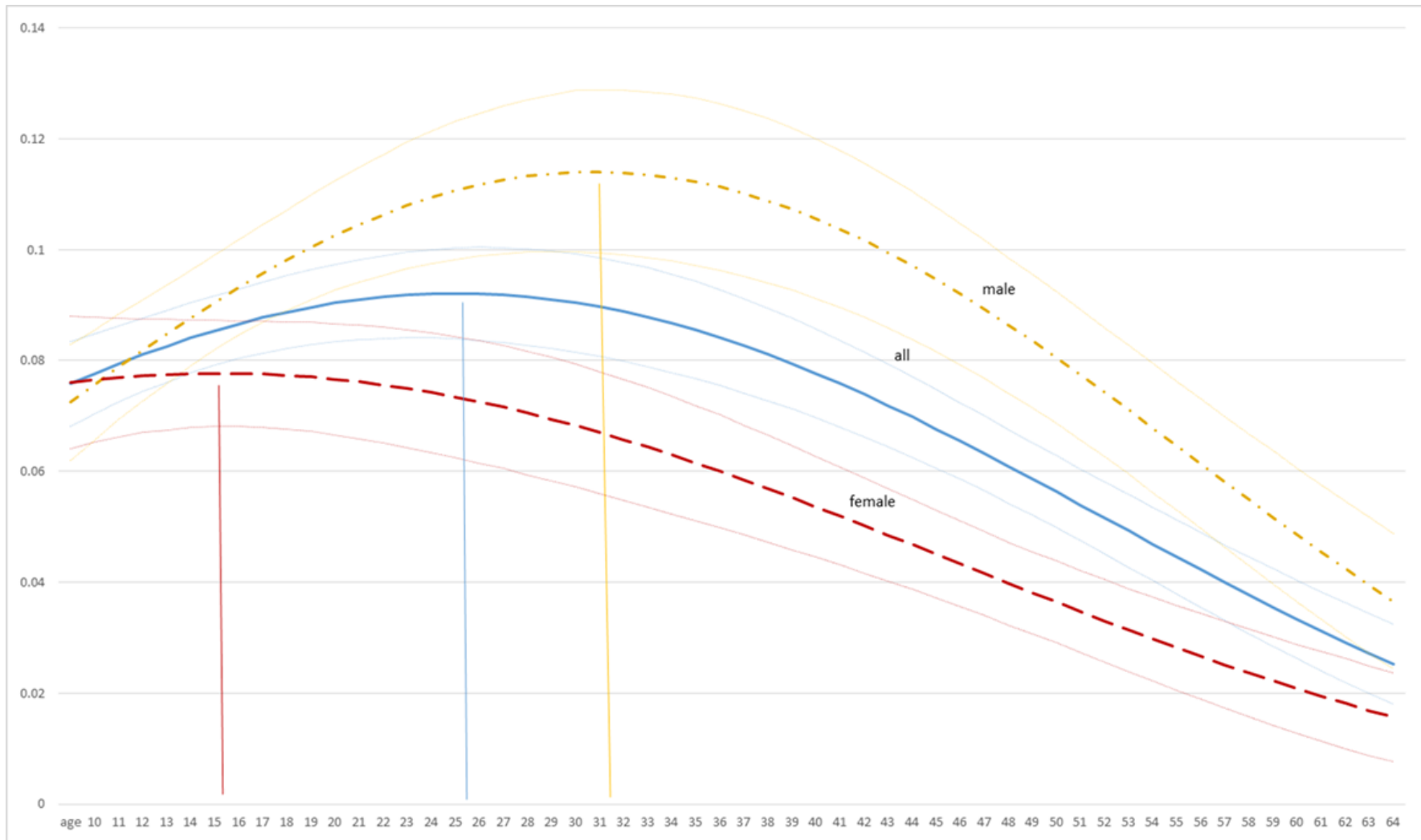
Variable	Male only				Female only			
			Marginal effects				Marginal effects	
	Outcome (1)	Selection (2)	Outcome (3)	Selection (4)	Outcome (1)	Selection (2)	Outcome (3)	Selection
Age ₁₂	0.255 [0.0367]***	0.035 [0.0067]***	0.045 [0.0079]***	0.005 [0.0010]***	0.050 [0.0441]	0.010 [0.0068]	0.011 [0.0099]	0.001 [0.0007]
Age ² ₁₂	-0.004 [0.0006]***	-0.001 [0.0001]***	-0.001 [0.0001]***	-0.000 [0.0000]***	-0.002 [0.0007]**	-0.000 [0.0001]***	-0.000 [0.0002]**	-0.000 [0.0000]***
Education ₁₂	-0.428 [0.1200]***	-0.082 [0.0145]***	-0.076 [0.0290]***	-0.012 [0.0021]***	0.165 [0.1009]	0.030 [0.0155]*	0.035 [0.0222]	0.003 [0.0017]*
Gross income per capita ₀₈	-0.001 [0.0009]	-0.000 [0.0001]	-0.000 [0.0002]	-0.000 [0.0000]	-0.003 [0.0017]	-0.000 [0.0001]**	-0.001 [0.0004]*	-0.000 [0.0000]**
Gross income per capita ² ₀₈	0.000 [0.000]	0.000 [0.0000]**	0.000 [0.0000]	0.000 [0.0000]**	0.000 [0.0000]	0.000 [0.0000]*	0.000 [0.0000]	0.000 [0.0000]*
Ratio of HH members up to 15 years old ₁₂	-1.392 [0.7139]*	-0.206 [0.1008]**	-0.246 [0.1604]	-0.029 [0.0143]**	-2.180 [1.2800]*	0.005 [0.1102]	-0.466 [0.2315]**	0.001 [0.0122]
Ratio of HH members over 65 ₁₂	-1.117 [1.4094]	0.026 [0.1511]	-0.197 [0.2553]	0.004 [0.0215]	-3.424 [2.4867]	0.248 [0.1670]	-0.731 [0.5191]	0.027 [0.0185]
Hectares (ha) farmed ₀₈	-0.099 [0.0636]	-0.015 [0.0087]*	-0.018 [0.0124]	-0.002 [0.0012]*	-0.011 [0.0788]	-0.004 [0.0071]	-0.002 [0.0168]	-0.000 [0.0008]
Migrant in ₀₈	-0.165 [0.4843]	-0.030 [0.0831]	-0.029 [0.0854]	-0.004 [0.0118]	0.134 [0.5944]	0.020 [0.1019]	0.029 [0.1270]	0.002 [0.0113]
Other HH member migrant ₀₈	0.454 [0.3104]	0.050 [0.0552]	0.080 [0.0548]	0.007 [0.0079]	0.473 [0.4630]	0.122 [0.0631]*	0.101 [0.0992]	0.013 [0.0070]*
Average migr level per HH in municipality ₀₈	0.214 [0.0257]***	0.042 [0.0045]***	0.038 [0.0099]***	0.006 [0.0007]***	0.204 [0.0389]***	0.037 [0.0056]***	0.044 [0.0076]***	0.004 [0.0006]***
Relative gross income per capita ₀₈	-0.170 [0.2296]	0.000 [0.0324]	-0.030 [0.0398]	0.000 [0.0046]	0.365 [0.4323]	0.064 [0.0328]*	0.078 [0.0922]	0.007 [0.0036]*

Relative ha per HH member ₀₈	0.345 [0.2272]	0.040 [0.0349]	0.061 [0.0402]	0.006 [0.0050]	-0.231 [0.4099]	-0.067 [0.0484]	-0.049 [0.0868]	-0.007 [0.0053]
Mill's Ratio		5.5665				5.7355		
<i>Rho</i>		1.0000				1.0000		
<i>Sigma</i>		5.5665				5.7355		
Constant		-1.5136 [0.1014]***				-1.720 [0.1135]***		
Observations		7388				6417		

¹ Subscripts 08 and 12 refer to 2008 and 2012.

² Standard errors in brackets.

Graph 1: Marginal Probabilities and 95-Confidence Intervals for Migrating by Age



Graph 2: Marginal Probabilities and 95-Confidence Intervals for Migrating by Income

