DETERMINANTS OF RETURN AND CIRCULAR MIGRATION IN ALBANIA*

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Abstract: Using the Albanian Living Standard Measurement Survey 2005, our paper analyses the determinants of short term migration movements. Both a multinomial logit model and a maximum simulated likelihood (MSL) probit with two sequential selection equations are used to estimate the determinants of circular vs. temporary migration. The results show that the best and brightest Albanians do not migrate, rejecting the "brain-drain" hypothesis in the Albanian case. Furthermore, the least educated engage in circular migration. Other factors that affect the form of migration that an individual engages in are gender, age, family ties, geographical location and past migration experience. Many migrants have migrated only once because they failed their migration target or have already accumulated enough savings, while circular migrants have returned mainly after the expiry of a seasonal work permit, with the intention to migrate again.

JEL classification: C35, F22, J61

Keywords: return migration, circular migration, sample selection

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1. Introduction

On the policy level, circular migration is frequently linked to expectations of mutual gains for the migrant host and home countries. As expressed, for example, by the European Commission (2005) in a report on migration and development, circular migration of skilled and high skilled workers should allow Western EU countries to fill labour market gaps with the simultaneous compensation of possible "brain drain" in developing (migrant sending) countries through the transfer of know-how and technology. The circular migration movement of lower skilled workers should also contribute to sustained flows of migrant remittances. Therefore, circular migration is fundamental in understanding the development impact of international labour flows. However, while the socio-economic motivations of return migration have been extensively analysed in the literature, the determinants of repeat/circular migration are rather poorly understood, partly due to the lack of adequate data and the complexities of the processes involved.

Datasets from migrant sending countries usually have information on non-migrants and return migrants, but not on the characteristics of migrants that are abroad, while migrant host country data lack information on the characteristics of the population from which immigrants are selected (i.e. the non-migrants). We use data from the Albanian Living Standard Measurement Survey 2005, which is a dataset containing a rich set of information on the non-migrant, migrant and return migrant population groups, allowing a full analysis of the self-selection of individuals into different migration forms.

Our aim is to contribute to the migration literature through analysing the determinants of short term migration movements, i.e. circular migration (back and forth movements between home country and one ore more countries of destination) and temporary migration (one migration episode with permanent return to the home country). Though there has already been some research done on the Albanian migration experience, to our knowledge, this is the first study that looks at the determinants of different forms of short-term migration in a systematic way using the latest available data. Along with socio-economic and regional characteristics, we also take into consideration the effect of migration history (e.g. past migration movements, legal vs. illegal residence, success into finding work and return reasons) on the re-migration intentions, as own experience is assumed to strongly affect subsequent migration decisions. The main research questions are: Which socio-economic characteristics affect

the self-selection process into different forms of migration? and What factors affect the decision of return migrants to re-migrate vs. resettling permanently back in the home country?

We find that migration from Albania, in particular short term migration, is predominantly male. Our results shows that the relative better educated Albanians do not migrate, rejecting the "brain-drain" hypothesis. The least educated are most likely to be circular migrants as prospects for them in Albania tend to be bleak. Other factors that affect the migration form are gender, age, family ties, migration networks, geographical location and past migration experience. Many migrants have migrated only once because they failed their migration target or have already accumulated enough savings, while circular migrants have returned mainly after the expiry of a seasonal work permit, with the intention to migrate again.

The remainder of the paper is organised as follows. The next section briefly reviews the literature on return migration and discusses the theoretical framework of the analysis. Some background information and stylised facts on the different forms of Albanian migration are presented in section 3. Section 4 presents the econometric specification, while Section 5 analyses the empirical results of the determinants of the migration forms. The last section concludes the paper.

2. Literature Review and Theoretical Framework for Analysis

The concept of return migration is at odds with the perceived notion of migration which is inherently seen a strategic choice by individuals to move from a low-wage, high unemployment region/country to the one which has relatively higher wages and employment rates. Since agents make a life-time, utility maximising decision, based on perceived net benefits from migration, migrants should intuitively remain abroad until retirement. However, many recent papers have explored the possibility of return migration before the end of the individual's active life cycle (i.e. retirement) and despite persistent income differences between the home and host countries.

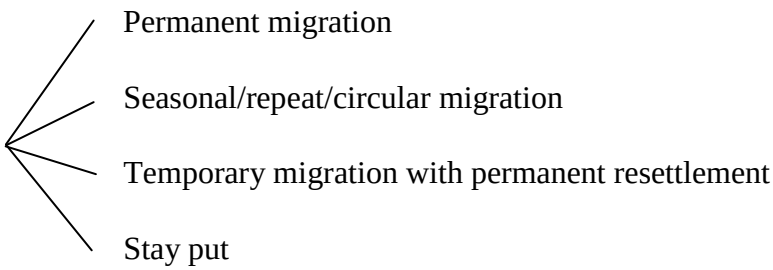
There are two different approaches to modelling the return migration decisions. The first considers the return decision as an integral part of the one-time migration decision, as an optimal residential location plan over the life cycle. Arguments used for explaining return migration to less rich economies are, for example, relative deprivation, location-specific preferences, differences in purchasing power between the

host and home country currencies, and returns to the human capital accumulated in the host country (e.g. Stark, 1991; Djajic and Milbourne, 1988; and Dustmann 1995, 1997, and 2003). Return migration can further be part of a life cycle plan to accumulate capital for self employment activities. This is often the case when capital constraints in the home economy hinder individuals to start an enterprise, and migration is used as a strategy to accumulate the needed start up funds (Mesnard, 2004).

Alternatively, the initial migration decision might be revised after a period of time spent abroad. For example, a migrant may return as a result of failure in achieving initial migration target (i.e. does not find job or finds a job only at a lower wage than expected). Potential migrants in the source country are uncertain about the conditions in the country of destination and as return migration costs are low (particularly non-pecuniary), migrants who experience outcomes worse than expected may decide to return (Borjas and Bratsberg, 1996). Return could also occur involuntarily and be induced by policies in the host country: changes in the regulations and policies may require some immigrants to depart; return could be a condition of the initial entry (as in the Gulf States) or irregular migrants may be caught and deported (OECD, 2007).

The theoretical considerations in these models might be used to describe the decision process behind circular migration movements. On the one hand, as in Hill (1987), the choice of circular migration can be considered integral to the initial migration decision (i.e. it is taken before the migrant leaves the home country; see Decision Tree 1). Utility is assumed to depend on a time path of residence in the home and host country, with the individual maximising utility by choosing the optimal amount of time spent abroad as well as the frequency of trips.

Decision Tree 1: Return and re-migration integral to the initial migration decision

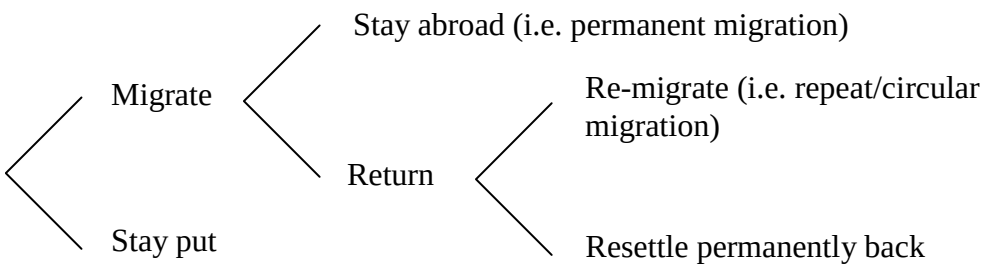


In this case, repeat/circular migration might be further determined by the seasonal character of the job chosen. For example, if taking up employment in

construction or farming, the migrant will probably have no employment in the host country for several months a year and would be motivated to plan from the very beginning to spend that period in the home country, as the living costs there are often lower and/or due to preference for living at home. Due to family or cultural attachments, individuals interested in increasing their yearly income through work abroad might even prefer to spend repeatedly shorter periods of time abroad instead of one longer period (i.e. several years).

On the other hand, the decision process can be altered by the presence of uncertainty or imperfect information about the prospects in the destination country (and, while abroad, about the prospects in the home country). In this setup, a migrant decides while abroad, based on the realities he faces, whether he should return or not. However, once back home, there is another layer in the decision process regarding re-migration, perhaps due to problems of re-integration, the failure to find a suitable job or having to acquire more capital for the business started after return. In this case, the decision process would rather have the following form:

Decision Tree 2: Multiple revisions of the migration decision



Another complexity of the migration process comes from the character of the migration decision: is it a choice or an outcome? Considering return as endogenous, the migrant decides about the form of migration, the duration of stay abroad and eventually the frequency of trips (Epstein and Radu, 2007). Temporary migration might, however, be induced exogenously by host country policies as well. In recent years, there has been a proliferation of immigrant employment schemes in industrial countries for sectors with jobs avoided by natives, with strong seasonal fluctuations (e.g. farming, road repairs and construction), and in the service industry (e.g. hotels and restaurants). These

employment schemes offer a variety of pre- and post-admission conditions and incentives, designed to keep flows temporary (Dayton-Johnson *et al.*, 2007).

Nevertheless, migrants do have the option among different immigration regimes, e.g. those which are more open to permanent migration (i.e. US, Canada, Australia, and New Zealand), those with temporary migration programmes (i.e. West European countries and the Gulf States), and/or those that are more lax with respect to immigration offences (i.e. irregular migration, overstaying of temporary residence permits; e.g. South European countries). Therefore, in the majority of cases the form of migration can be assumed to be a choice.

With regard to the characteristics of return migrants, research has documented that emigrants rather self-select, albeit with conflicting results on the nature of selection (Constant and Massey, 2003). For example, Borjas (1989) infers return migration from sample attrition and finds that the least successful foreign-born scientist and engineers seem to leave the United States. In contrast, Jasso and Rosenzweig (1988) report that relatively more successful migrants were likely not to naturalise and, thus, to leave the US. These conflicting results are reconciled in Borjas and Bratesberg (1996), in which the authors argue that the direction of self-selection in return migration depends on whether the migrants themselves are originally positively or negatively selected. If immigrants are originally positively selected then return migrants tend to be the lower skilled. If they were negatively selected then the highest skilled from the cohort would return. Unfortunately the limited data on emigration from and return migration to developing countries often does not permit to accurately describe and analyse this double selection process but only to compare return migrants to those individuals who never migrated (see de Coulon and Piracha, 2005; Radu and Epstein, 2007).

3. Background and Data

Precise figures on Albanian migration are difficult to gather due to the potentially high number of non-declared (illegal) migrants. Existing estimations suggest that since 1990 around 700,000 to 1,000,000 Albanians (i.e. up to 25 percent of the population) have either settled or worked for short time periods abroad, which is by far the highest proportion amongst the Central and East European countries (Vullentari, 2007; ETF, 2007). Own estimates based on data from the 2005 Albanian Living Standard Measurement Survey (ALSMS), led to similar figures. Using direct information on the migration history of the individuals surveyed and indirect

information on the present migration status and migration history of the spouses and children living outside the household and the siblings of the household head and spouse, we found that in 2005 about 24.6 percent of the Albanian population aged 15 to 64 was either currently migrant (16.5 percent) or had a past migration experience (i.e. return migrant; 8.1 percent). In addition, part of the migrants living abroad at the time of the survey will also return and hence the asserted proportion of one third short-term migrants should be seen as a lower bound.

The main reason for migration is for employment purposes. The collapse of the industrial sector in the early transition years, on the one hand, and the absence of a welfare state, on the other, has pushed many workers outside the labour market and into poverty. By 2004, around 30 percent of Albanians were estimated to live below the poverty line; half of them in extreme poverty, subsisting on less than US$ 1 per day (Barjaba, 2004). In face of these harsh realities, many have sought employment abroad, mainly in neighbouring EU countries.

Because of their geographical proximity, the main destination countries are Greece and Italy, hosting almost 80 percent of Albania's migrants in 2005. About 600,000 worked and/or lived in Greece, about 250,000 in Italy, while approximately 250,000 were scattered among industrialised countries in Western Europe and North America (Vullentari, 2007). The sector of employment and, thus, the form of migration is varying significantly among destinations: seasonal employment in construction, farming and tourism in Greece; temporary employment in manufacturing, construction and services in Italy; and predominantly permanent migration of skilled migrants to Western Europe, the US, and Canada (ETF, 2007; Barjaba, 2004).

The data used for the empirical analysis is from the 2005 Albanian Living Standards Measurement Survey (ALSMS), collected by the Albanian Institute for Statistics (INSTAT) with technical support from the World Bank. The data is based on a survey of 3,640 households (17,302 individuals) and contains a detailed module on migration.[2] We drew the information on migrants from two parts of the migration module. The first is on the migration history of the household members present (e.g. country of last migration episode, year of migration, time spent abroad, legal residence abroad, legal work abroad, reasons for returning to Albania, previous migration episodes since turning 15, etc.). The second part provides detailed information on the

[2] A migrant is defined as a person who migrated abroad for at least one month, for non visits purposes, since turning age 15.

spouse and/or children that are currently abroad and we added these absent household members to the sample.

Since the focus of the paper is the analysis of the determinants of labour migration movements, we restricted our sample to individuals in the potential labour force (i.e. not enrolled in education, not a housewife/-husband, not retired, not handicapped, and not in military service) and aged 20 to 60. Moreover, in order to select the permanent migrants from our second group, we excluded all migrants that were abroad at the time of the survey for three years or less (i.e. 539 observations). For the purpose of this analysis, our definition for a permanent migrant is, hence, an individual who has spent 37 months or more abroad since the last time he/she left the country.[3]

Given the above screening and after excluding all observation with missing values for the variables included, our sample contains 7,280 individuals: out of which 4,756 (65.3 percent) are non-migrants, 1,430 (19.6 percent) permanent migrant, 536 (7.4 percent) are temporary migrants (i.e. individuals having migrated abroad in the past only once and being back in Albania at the time of the survey) and 558 (7.7 percent) are circular migrants (i.e. individuals having migrated abroad more than once and being back in Albania at the time of the survey).

Group mean values of the data described above show that Albanian migration, and in particular short term migration, is predominantly male (see Table 1). Females represent 35 percent of the permanent migrants, but only 8.2 percent of the temporary and just 1.4 of the circular migrant groups.

Migrants in all groups are on average younger compared to non migrants. In order for migration to be financially rewarding (i.e. additional income from employment abroad to exceed the migration costs) it has to take place early in the active lifetime. Taking into account that migration costs are highest if resettling permanently to another country, it is not surprising that permanent migrants are on average the youngest at time of migration with an average age of 25.1 compared to 29.4 in the case of temporary migrants. Interestingly, circular migrants are on average 2.9 years younger at their first migration trip compared to temporary migrants.

Regarding the educational composition of the different groups, permanent and temporary migrants have the highest secondary education rate: 45.9 and 49.4 percent respectively, compared to 38.9 percent for non-migrants. The most affected during the

[3] Percentile statistics show that 90 percent of the individuals with a past migration experience (i.e. a temporary of circular migrant) returned to Albania after spending a maximum of three years abroad during their last migration episode.

economic transition were secondary educated workers who lost their jobs following the bankruptcy of uncompetitive state owned factories. Many of them used permanent or temporary migration as a strategy to improve their standard of living. Moreover, 55.6 percent of circular migrants have at most primary education. Majority of them are probably small (subsistence) farmers who supplement their small income through seasonal work abroad. Because of their better job opportunities, tertiary migrants seem to be the least likely to migrate. With 12.6 percent, the tertiary education rate of the non migrants is about 3 percentage points higher compared to permanent and temporary migrants and 8.3 percentage points higher compared to circular migrants.

Migrants were significantly more likely to have spoken at least one foreign language in 1990, with the form of migration being related to the language of the destination countries. It seems that permanent migration was driven by the proficiency in English (9.2 percent) and/or Italian (12.3 percent); temporary migration by the knowledge of Italian (8.6 percent) and/or Greek (7.1 percent); while circular migration by the knowledge of Greek (6.4 percent). The main destination country for circular migrants has been Greece (88.0 percent); for temporary migrants Greece (74.8 percent) and Italy (16.6 percent), while many permanent migrants have not only settled in Greece (41.1 percent) and Italy (37.9 percent) but also in other West European or North American countries (21.0 percent).

In terms of marital status, permanent migrants have the lowest marriage rate in 2005. Nevertheless, at the time they left the country, they had the highest marriage rate (72.3 percent) compared to the other migrant groups (63.2 for temporary migrants; 53.1 for circular migrants). Migrating for longer periods without the spouse sets, in many cases, considerable strain on the relationship of a couple, often leading to separation and divorce. On the other hand, the savings accumulated abroad made it easier for temporary and circular migrants to start up a family after return. Similarly, short term migrants were significantly more likely to have children at the time of their first migration but they were less likely to migrate with them.

Temporary migration seems to be more common among members of relatively richer households. Many in this group are target savers originating from middle or upper middle class families who, through migration and investment of the repatriated savings after return, significantly improved their economic situation above the Albanian average (see Piracha and Vadean, 2009). Compared to permanent migrants, they might also have decided to return because of their relatively better social and economic

position in Albania (Stark and Taylor, 1991). Contrarily, circular migrants are members of poorer and relatively larger families.

Permanent migrants originate from households with less social connections (i.e. friends), which probably means that they had lower social and emotional relocation costs. However, they left from communities that have more individuals as current or past migrants. As found in other studies, that could be evidence to the fact that migrant networks and/or the culture of migration in the community are important for the migration decision.

Geographically, most permanent and temporary migrants are from urban areas (56.6 percent and 57.6 percent respectively), while circular migrants come from rural areas (62.8 percent). Moreover, permanent migrants are more likely to be from the Coastal region (16.5 percentage points higher compared to non-migrants and 9.8 percentage point higher compared to temporary migrants), while circular migrants are more likely to be from the regions closer to Greece (i.e. the Central and the Mountain regions).

Regarding the migration history, circular migrants were least likely to have legal residence during their first migration trip (only 23.8 percent of them) but that increased considerably in time to 54.5 percent for the last migration trip. This is certainly due to the large legalisation programs in Greece and Italy after 1999. As for temporary migrants, they are also quite likely to have migrated irregularly: only 36.4 percent of them had legal residence abroad. Borjas and Bratsberg (1996) argued that the failure of a migrant to obtain legal residence while abroad might determine his decision to return permanently back. Nevertheless, if a migrant does intend to return to his home country but does not intend to migrate again in the future, he is certainly more likely to overstay a work or tourist visa in order to fulfil, for example, his saving target.

With paid employment being the main reason for short term migration, temporary and circular migrants were significantly more likely to work while abroad compared to permanent migrants. Nevertheless, they were also considerably more likely to work illegally.

The reason for returning differs notably between the forms of short term migration. While the majority of temporary migrants returned because of failing their migration target (45.9 percent; i.e. have not found work, have not obtained legal residence or have been deported) or after having accumulated enough savings (21.8 percent), 25.3 percent of the circular migrants have returned because of the expiry of a

seasonal/temporary work permit (compared to only 10.6 percent in the case of temporary migrants).

Finally, there seems to be quite a strong state dependency in circular migration: in 2005, 54.3 percent of the circular migrants intend to migrate again during the next 12 months, while 28.3 percent intend to resettle permanently in Albania and 17.4 percent are undecided. In contrast, 64.6 percent of the temporary migrants intend to settle permanently back.

4. Econometric Specification

The migration decision processes described in Section 2 lead to alternative econometric models. If assuming a single utility maximisation migration decision over the life-time (i.e. Decision Tree 1), the form of migration may be determined by a pairwise comparison of the indirect utilities of the given alternatives:

- no migration: $U_N > U_P, U_N > U_T, U_N > U_C$,
- permanent migration: $U_P > U_N, U_P > U_T, U_P > U_C$,
- temporary migration: $U_T > U_N, U_T > U_P, U_T > U_C$,
- circular migration: $U_C > U_N, U_C > U_P, U_C > U_T$, (1)

where *N*, *P*, *T*, and *C* stand for no migration, permanent migration, temporary migration (with permanent return), and circular migration respectively. The unordered choice settings can be motivated by a random utility model (Green, 2002). For the ith individual faced with $k = \{N, P, T, C\}$ choices, the utility of choice *j* is given by:

$$U_{ij} = \beta_j x_i + \varepsilon_{ij} \quad (2)$$

where U_{ij} is the indirect utility of choice *j* for individual *i*, x_i a vector of characteristics which affect the choice of the migration form, and β_j a vector of choice-specific parameters.

Assumptions about the disturbances (ε_{ij}) determine the nature of the model and the properties of its estimator. We assume that ε_{ij} are independent and identically distributed with type I extreme value distribution, which leads to the multinomial logit model (Green 2002; McFaden, 1973). The probability of choosing alternative *j* is specified as:

$$\Pr(y_i = j) = \frac{e^{\beta_j x_i}}{\sum_{k=N,P,T,C} e^{\beta_k x_i}} \quad (3)$$

Not all β_j in eq. (3) are identified and we normalise by setting $\beta_N = 0$.

The dynamics among the possible choices in the estimation results of the multinomial logit model are illustrated by computing odds ratios. The factor change in the odds of outcome *m* versus outcome *n* for a marginal increase in x_k and the other independent variables in the model held constant is given by:

$$\frac{\Omega_{m|n}(\mathrm{x}, x_{k,m|n} + 1)}{\Omega_{m|n}(\mathrm{x}, x_{k,m|n})} = e^{\beta_{k,m|n}} . \quad (4)$$

The limit of analysing the determinants of the migration form in the framework of a multinomial logit model is that one can control only for variables observed for all alternatives. One problem arising from that is the difficulty in some cases to infer the direction of causality. Many of the individuals' socio-economic characteristics observed for all population groups (e.g. age, marital status, household size, or household income) are collected at the time of survey (i.e. in 2005). However, for migrants these might have been different at the time of their first migration episode, their return, or their subsequent migration trips. Therefore, some of the observed socio-economic characteristics may be in fact determined by the migration experience and the form of migration chosen. Moreover, the multinomial logit model does not allow to control for the effect of a previous migration experience (e.g. found work while abroad for the first time, legal residence while abroad, or reason for returning) on the decision to re-migrate, since non-migrants have no such experience. However, if assumed that the individual revises his initial migration decision after each migration step (Decision Tree 2), the migration experience would influence future migration movements. Nevertheless, running separate estimations only for migrants will give biased and inconsistent results, as migrants might be a non-random selected group.

In this respect, a more efficient model proves to be a probit with two sequential self-selection equations: the first selection equation controls for selection into migration while the second – including only migrants – for the selection into return. This model can be estimated stepwise (i.e. the inverse Mill's ratio – IMR – of the first selection

probit is introduced as a covariate in the second selection equation and the IMR from the second selection equation is then used as a covariate in the outcome probit) or by maximum likelihood. Relative to the maximum likelihood approach, the stepwise method is often perceived to give inconsistent results (Lahiri and Song, 2000). In particular, this is the case when there is strong multicolliniarity between covariates in the outcome equation and the selection controls (i.e. covariates of the selection equations). If there are no overlapping covariates in the outcome and selection equations, then multicolliniarity can be assumed insignificant (see Stolzenberg and Relles, 1997 and Nawata and Nagase, 1996).

The equations for the probit model with two sequential selections have the following form for each observation:

- Migrant: $M^* = W'\beta + m$, where $M = I(M^* > 0)$
- Return migrant: $R^* = Y'\delta + r$, where $R = I(R^* > 0)$ if $M = 1$ and missing otherwise
- Circular/repeat migrant: $C^* = Z'\theta + c$, where $C = I(C^* > 0)$ if $R = 1$ (and $M = 1$) and missing otherwise.

The variables denoted by asterisks are the latent outcomes, and those without are binary indicators summarising the observed outcomes. *I*(.) is the indicator function equal to one if its argument is true, and zero otherwise. We assume the error terms $(m, r, c) \sim N_3(0, V)$, where V is a symmetric matrix with typical element $\rho_{kl} = \rho_{lk}$ for $k, l \in \{m, r, c\}$ and $k \neq l$, and $\rho_{kk} = 1$ for all k. The errors in each equation are assumed to be orthogonal to the predictors (elements of the vectors *W*, *Y*, and *Z* respectively).

We define a set of signs variables $\kappa_T = 2T - 1$ for $T \in \{M, R, C\}$. The likelihood contribution for a return migrant, i.e. with $M = 1$ and $R = 1$ is:

$$L_3 = \Phi_3(\kappa_M W'\beta, \kappa_R Y'\delta, \kappa_C Z'\theta, \kappa_M \kappa_R \rho_{mr}, \kappa_M \kappa_C \rho_{mc}, \kappa_R \kappa_C \rho_{rc}),$$

the likelihood contribution for a permanent migrant (i.e. $M = 1$ and $R = 0$) is:

$$L_2 = \Phi_2(\kappa_M W'\beta, \kappa_R Y'\delta, \kappa_M \kappa_R \rho_{mr}),$$

while the likelihood contribution for a non-migrant (i.e. $M = 0$) is:

$$L_1 = \Phi_1(\kappa_M W'\beta)$$

It follows that the log-likelihood contribution to be calculated by the evaluator function for each observation is:

$$\ln L = (1 - M)\ln L_1 + M(1 - R)\ln L_2 + MR \ln L_3$$

The model is estimated using maximum simulated likelihood (MSL) in Stata. We evaluate multivariate standard normal probabilities with 200 random draws using the *mvnp()* function by Cappellari and Jenkins (2006), a function based on the Geweke-Hajivassiliou-Keane (GHK) smooth recursive conditioning simulator. For the maximization, we used Stata's modified Newton-Raphson algorithm (see Gould *et al.*, 2003).

5. Empirical Results

The estimation results of the multinomial logit model of the choice of migration form are given in Table 2. The likelihood ratio test for combining alternatives shows that no pair of alternatives should be collapsed. The Hausman test for independence of irrelevant alternatives (IIA) failed for temporary migration, however, the Small-Hsiao test holds for all subsets.[4]

The factor changes in odds among the subsets of equation 3 are presented in Table 3. As expected from the descriptive statistics, being a female decreases significantly the likelihood of being a migrant, in particular a circular migrant (see also Figure 1). Given the more traditional gender roles in the Albanian context, women are often in charge of taking care of children and household, while the men are the bread-earners (King *et al.*, 2006). Therefore, it is not surprising that Albanian women often follow their husbands in case he settles abroad, but are significantly less likely to engage in short term migration for employment purposes. The gender difference between temporary and circular migration can be further explained through the gender difference in terms of the type of jobs they engage in, with men taking jobs with a more seasonal character, e.g. in construction, farming and tourism (ETF, 2007).

Age has a significant impact on the choice of migration form as well. As predicted by various migration models and confirmed by empirical findings, age decreases the odds of all forms of migration vs. non-migration. In particular, permanent migration seems to be a decision taken at a younger age (a marginal increase in age decreases the odds of permanent migration vs. non migration by a factor of 0.90; see Firgure 2) as social and financial relocation costs are lower and the larger time span until the end of the active lifetime allows for higher gains from migration (Radu and Epstein, 2007). The second most affected by age is circular migration: 9 percent lower odds compared to non migration and 3 percent lower odds compared to temporary

[4] The test results are available from the authors upon request.

migration. Circular migrants being less educated, they are likely to start the migration process earlier in their life-time.

Even after controlling for other characteristics, tertiary education significantly and strongly decreases the likelihood of migration under any form, by factors of 0.51 to 0.64. This shows that "brain drain" should be less a concern in the Albanian case. Secondary educated are more likely to migrate temporarily (but also permanently), while primary (or less) educated being more likely to be circular migrants. However, after controlling for urban location and region the education effect turns insignificant in the case of circular migration and significant only at 10 percent level in the case of temporary and permanent migration. Location, thus, seems to be more important in determining the form of migration, with individuals from rural areas and from the Central and Mountain regions being more prone to choose circular migration, while those from urban areas temporary or permanent migration.

From the three languages considered, speaking at least some Greek in 1990 has the strongest effect on migration. The common border of about 282 km and a shared culture and history (until 1990 a large Greek minority lived in the Southern part of Albania) made Greece the most important destination. Since the cost of crossing the Greek border (in particular illegally) is quite low, it is not surprising that speaking Greek increases most the odds of being a circular (8.14) or a temporary migrant (7.54). Nevertheless, probably due to the large exodus of ethnic Greeks at the beginning of the 1990s who were rapidly nationalised in Greece (see Barjaba, 2004), speaking Greek in 1990 also significantly increases the odds of permanent migration (5.76).

Family ties have conflicting effects on migration. On the one hand, being married increases strongly the odds of all migration forms, giving probably evidence to the fact that a married couple can decrease income risk if one of them works abroad. On the other hand, the household size decreases the likelihood of being a migrant; the social ties within the family perhaps increasing the emotional cost of migration. Nevertheless, both being married and the household size significantly affect the form of migration, increasing the odds of temporary vs. permanent migration but also of circular vs. temporary migration.

Finally, the number of migrants in the community has a positive impact on the decision to migrate, the strongest being on permanent and circular migration. This could be evidence that the culture of migration in the community has an important effect on the decision to migrate. Moreover, taking into account the relatively high migration

failure rate among temporary migrants (46 percent), the existence of a strong community migrant network might prove essential for the success of the migration project.

The alternative model, through which the determinants of circular vs. temporary migration are assessed by MSL probit with double selection, is run under two specifications of the dependent variable. The first (Table 4) considers past repeat migration movements over having migrated only once. However, some of the returnees that have migrated only once (i.e. temporary migrants) may migrate again in the future and could be, in fact, repeat circular migrants, even if we do not observe that. Assuming that individuals in this subgroup of temporary migrants have characteristics similar to circular migrants, our results could be biased. Therefore, in order to test the robustness of our results, in a second specification (Table 5), we consider the temporary migrants who intend to re-migrate in the next 12 months as circular migrants, while in the third specification (Table 6) they are excluded from the analysed sample.

Based on the results from the multinomial logit model (see Table 3), for both settings, the variables chosen to describe the selection into migration are: gender, education level, speaking Italian in 1990, speaking Greek in 1990, number of friends and the number of migrants in the community. Most selection instruments are significant and have the expected signs: gender and tertiary education negatively affect the probability of being a migrant, while secondary education, speaking the language of a neighbouring destination country and the culture of migration in the community (or the migrant network) have a positive effect.

For the selection into return we used covariates observed only for migrants. Return migration is positively determined by the age at time of migration, illegal employment and migration to Greece, while the length of the trip, having obtained legal residence and having migrated with the children affect it negatively. A formal test for whether sample selection is ignorable is based on the null hypothesis that the cross-equation correlations are jointly different from zero. The test results show that for all settings the estimation results would have been biased and inconsistent, had we not corrected for selection.[5]

As robust outcomes (and similar to the results of the multinomial logit estimation), we find that circular migration is negatively affected by gender, age, secondary education and urban origin. Additionally, the return reason has strong and

[5] The test results are available from the authors upon request.

robust effect on the likelihood of having migrated repeatedly vs. having resettled permanently in Albania after the first migration trip. Failing the migration target is a negative experience that not only determines return migration (Borjas and Bratsberg, 1996) but seems to act as a deterrent for future migration movements. Target savers may have intended from the very beginning to return permanently back and start a business with the capital accumulated abroad, as argued by Mesnard (2004). Nevertheless, family reasons seem to be equally important in determining permanent return.

In the case of circular migrants, the main reason for return after the first trip abroad was the expiry of a temporary/seasonal work permit. Therefore, it seems that circular migration is often a choice made before leaving the country for the first time.

6. Conclusions

The empirical results of this study show that short term migration movements are an important phenomenon in Albania, with about one third of the migrants falling into this category. About 50 percent of those who returned are temporary migrants (i.e. have migrated abroad only once), while the other half are seasonal or circular migrants.

Our main results show that, in the Albanian case, the form of migration is determined by gender, age, the labour market prospects for specific skills, family ties, urban/rural origin, and past migration experience. For example, women and tertiary educated are more likely to stay put in Albania; the amount of time spent abroad, legal residence, and accompanying family are positively related to permanent migration; age, secondary education, failed migration or fulfilment of a saving target are determining permanent return; while being a male, having a lower education level, originating from a rural area, and having past positive short term migration experience are factors affecting circular migration.

Given that the majority of the circular migrants are primary educated, development gains through transfers of skills and technology should probably be expected through temporary and not from circular migration (as expressed by the European Commission in the 2005 report on Migration and Development). As shown in a previous paper of Piracha and Vadean (2009), many successful temporary migrants start up own businesses and become entrepreneurs after settling back to Albania.

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Table 1: Descriptive statistics by form of migration

	Non migrant		Permanent migrant		Temporary migrant		Circular migrant
	Mean value	*difference*	Mean value	*difference*	Mean value	*difference*	Mean value
Individual Characteristics							
Gender (female=1)	0.522	*0.171****	0.350	*0.268****	0.082	*0.068****	0.014
Age	39.422	*6.623****	32.799	*-4.492****	37.291	*1.744****	35.547
Education level: primary	0.485	*0.040****	0.445	*0.027*	0.418	*-0.139****	0.557
Education level: secondary	0.389	*-0.070****	0.459	*-0.035*	0.494	*0.095****	0.400
Education level: tertiary	0.126	*0.030****	0.096	*0.008*	0.088	*0.045****	0.043
Speaks English (1990)	0.050	*-0.042****	0.092	*0.034***	0.058	*0.038****	0.020
Speaks Italian (1990)	0.057	*-0.066****	0.123	*0.037***	0.086	*0.052****	0.034
Speaks Greek (1990)	0.009	*-0.051****	0.059	*-0.011*	0.071	*0.006*	0.065
Married	0.799	*0.165****	0.634	*-0.165****	0.799	*-0.008*	0.806
Household Characteristics							
HH subjective economic status in 1990	3.571	*0.095**	3.476	*-0.171*	3.647	*0.438****	3.210
HH subjective economic status in 2005	3.818	*-0.200****	4.018	*-0.038*	4.056	*0.294****	3.762
Log of HH income	12.363	*0.408****	11.956	*-0.497****	12.452	*0.421****	12.031
HH size	4.859	*1.681****	3.178	*-1.618****	4.797	*-0.354****	5.151
Number of friends	1.953	*0.224****	1.729	*-0.426****	2.155	*0.322****	1.833
Community and Regional Characteristics							
Urban area	0.529	*-0.037***	0.566	*-0.011*	0.576	*0.204****	0.373
Region: Coastal	0.250	*-0.165****	0.415	*0.098****	0.317	*0.045*	0.272
Region: Central	0.286	*0.011*	0.276	*-0.010*	0.285	*-0.048**	0.333
Region: Mountain	0.288	*0.138****	0.150	*-0.050****	0.200	*-0.121****	0.321
Region: Tirana	0.176	*0.016*	0.160	*-0.038***	0.198	*0.124****	0.073
Average wage at district level (LEK)	30,886.23	*297.60***	30,588.63	*-607.68****	31,196.31	*1,743.90****	29,452.41
Number of migrants in community (PSU)	6.920	*-3.715****	10.635	*1.822****	8.813	*-0.545***	9.358

Table 1: Descriptive statistics by form of migration (continued)

	Non migrants		Permanent migrants		Temporary migrants		Circular migrants
	Mean value	*difference*	Mean value	*difference*	Mean value	*difference*	Mean value
Migration history (first migration trip)							
Age at first migration trip			25.126	*-4.270****	29.396	*2.919****	26.477
Length of first migration trip			92.081	*70.012****	22.069	*12.610****	9.459
Legal residence during first migration trip			0.899	*0.535****	0.364	*0.125****	0.238
Legal residence during last migration trip			0.899	*0.535****	0.364	*-0.181****	0.545
Work during first migration trip: no			0.160	*0.071****	0.090	*0.029**	0.061
Work during first migration trip: legally			0.748	*0.399****	0.349	*0.050**	0.299
Work during first migration trip: illegally			0.092	*-0.469****	0.562	*-0.078****	0.640
Married: no			0.277	*-0.091****	0.368	*-0.120****	0.487
Married: migrated with spouse			0.640	*0.481****	0.159	*0.130****	0.029
Married: spouse in Albania			0.083	*-0.391****	0.474	*-0.010*	0.484
Children: no			0.352	*-0.107****	0.459	*-0.075***	0.534
Children: migrated with children			0.562	*0.459****	0.103	*0.081****	0.022
Children: children in Albania			0.086	*-0.352****	0.438	*-0.006*	0.444
Migrated to Greece			0.411	*-0.337****	0.748	*-0.132****	0.880
Migrated to Italy			0.379	*0.213****	0.166	*0.100****	0.066
Migrated to other country			0.210	*0.124****	0.086	*0.032***	0.054
Age at first return					31.235	*3.970****	27.265
Return reason: family/non economic					0.216	*0.095****	0.122
Return reason: unsuccessful					0.459	*-0.046*	0.505
Return reason: temporary/seasonal permit					0.106	*-0.146****	0.253
Return reason: accumulated enough savings					0.218	*0.098****	0.120
Re-migration intention: yes					0.192	*-0.351****	0.543
Re-migration intention: no					0.646	*0.362****	0.283
Re-migration intention: don't know					0.162	*-0.012*	0.174
Observations	4,756		1,430		536		558

** significant at 10%; ** significant at 5%; *** significant at 1%*

Notes: The sample included is the potential labour force (i.e. not enrolled in education, not a housewife/-husband, not retired, not handicapped, and not in military service) aged 20 to 60. HH subjective economic status: 1=poor to 10=rich.

Table 2: Multinomial Logit estimation of choice among migration forms

	Permanent migrant vs. Non migrant	Temporary migrant vs. Non migrant	Circular migrant vs. Non migrant
Individual Characteristics			
Gender (female = 1)	-1.15709	-2.9776	-4.9696
	[0.08470]***	[0.16797]***	[0.36255]***
Age	-0.10854	-0.06552	-0.09144
	[0.00471]***	[0.00605]***	[0.00634]***
Education level: secondary	0.15077	0.19979	0.03244
	[0.08700]*	[0.10944]*	[0.10941]
Education level: tertiary	-0.67947	-0.43958	-0.57224
	[0.15676]***	[0.20685]**	[0.25165]**
Speaks English (in 1990)	0.41515	0.03718	-0.26864
	[0.18425]**	[0.26135]	[0.37631]
Speaks Italian (in 1990)	0.4943	0.48002	0.25149
	[0.15937]***	[0.21389]**	[0.28854]
Speaks Greek (in 1990)	1.75017	2.02072	2.09715
	[0.23986]***	[0.26560]***	[0.28502]***
Married	0.53022	1.06709	1.59773
	[0.09994]***	[0.14777]***	[0.15073]***
Household Characteristics			
HH subjective economic status in 1990	-0.04059	0.01145	-0.03743
	[0.02240]*	[0.02817]	[0.03090]
HH size	-0.77646	-0.05986	-0.02664
	[0.02875]***	[0.02842]**	[0.02807]
Number of friends	-0.01818	0.0782	-0.04278
	[0.02368]	[0.02604]***	[0.03419]
Regional Characteristics			
Number of migrants in the community	0.19731	0.13807	0.17472
	[0.00964]***	[0.01218]***	[0.01218]***
Urban Area	0.1637	0.28237	-0.10765
	[0.09082]*	[0.11711]**	[0.11751]
Region: Coastal	0.2416	-0.03442	0.34345
	[0.13013]*	[0.16084]	[0.21153]
Region: Central	0.07515	-0.01304	0.73709
	[0.13128]	[0.15912]	[0.20679]***
Region: Mountain	0.15255	-0.30398	0.7502
	[0.14298]	[0.17216]*	[0.20998]***
Constant	4.06981	-0.94014	-0.73216
	[0.25353]***	[0.32819]***	[0.35472]**
Observations		7,280	
Wald chi-sq		4159.17	
Pseudo R-sq		0.29	

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: HH subjective economic status1990: 1=poor to 10=rich; the control group for the regional dummies is "Tirana".

Table 3: Odds ratios for choice among migration forms

	Gender	Age	Education level: secondary	Education level: tertiary	Speaks English (1990)	Speaks Italian (1990)	Speaks Greek (1990)	Married
P vs. N	0.31***	0.90***	1.16*	0.51***	1.51**	1.64***	5.76***	1.70***
T vs. N	0.05***	0.94***	1.22*	0.64**	1.04	1.62**	7.54***	2.91***
T vs. P	0.16***	1.04***	1.05	1.27	0.69	0.99	1.31	1.71***
C vs. N	0.01***	0.91***	1.03	0.56**	0.76	1.29	8.14***	4.94***
C vs. P	0.02***	1.02**	0.89	1.11	0.50*	0.78	1.41	2.91***
C vs. T	0.14***	0.97***	0.85	0.88	0.74	0.80	1.08	1.70***

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Odds ratios for choice among migration forms (continued)

	Subjective econ. status 1990	HH size	No. of friends	No. of migrants in community	Urban area	Coastal region	Central region	Mountain region
P vs. N	0.96*	0.46***	0.98	1.22***	1.18*	1.27*	1.08	1.16
T vs. N	1.01	0.94**	1.08***	1.15***	1.33**	0.97	0.99	0.74*
T vs. P	1.05	2.05***	1.10***	0.94***	1.13	0.76	0.92	0.63**
C vs. N	0.96	0.97	0.96	1.19***	0.90	1.41	2.09***	2.12***
C vs. P	1.00	2.12***	0.98	0.98*	0.76**	1.11	1.94***	1.82***
C vs. T	0.95	1.03	0.89***	1.04**	0.68***	1.46	2.12***	2.87***

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Odds ratios computed based on the estimation in Table 2. HH subjective economic status 1990: 1=poor to 10=rich; the control group for the regional dummies is “Tirana”.

Table 4: MSL three-variate probit with two selections of the decision to migrate circularly

Migration equation		*Circular migration equation*	
Gender (female = 1)	-0.91659	Gender (female = 1)	-0.67789
	[0.10377]***		[0.23921]***
Education level: secondary	0.12875	Age after first migration trip	-0.03904
	[0.04893]***		[0.00599]***
Education level: tertiary	-0.2378	Education level: secondary	-0.1206
	[0.09147]***		[0.05034]**
Spoke Italian in 1990	0.56879	Education level: tertiary	0.03331
	[0.04634]***		[0.23080]
Spoke Greek in 1990	1.08148	Married at time of the first migration	0.13678
	[0.08178]***		[0.12662]
Number of friends	-0.01718	Economic situation in 1990	-0.01862
	[0.01828]		[0.03457]
Number of migrants in the community	0.1016	Log of HH income	-0.03633
	[0.00598]***		[0.03414]
Constant	-0.96729	HH size	-0.01876
	[0.15450]***		[0.01590]
		Urban location	-0.15967
			[0.07510]**
Return equation		Log of average wage (district level)	-1.55591
Age at first migration trip	0.02425		[0.75343]**
	[0.00680]***	Returned from Greece	0.16508
Months remained away (first trip)	-0.02914		[0.30151]
	[0.00437]***	Returned from Italy	-0.27712
Obtained legal residence (first trip)	-0.50115		[0.34960]
	[0.12608]***	Return reason: family/non economic	-0.57042
Worked abroad during first trip: legally	0.10122		[0.21044]***
	[0.16954]	Return reason: unsuccessful	-0.50653
Worked abroad during first trip: illegally	0.38536		[0.19649]***
	[0.11610]***	Return reason: acc. enough savings	-0.56418
Married: migrated with spouse	0.03323		[0.21610]***
	[0.21631]	Constant	18.51599
Married: spouse in Albania	0.31093		[7.77962]**
	[0.26471]		
Children: migrated with children	-0.89996		
	[0.18851]***		
Children: children in Albania	-0.14535		
	[0.23423]	*Cross-equation correlations*	
Country of destination: Greece	0.91165	r21	-0.31173
	[0.20041]***		[0.11404]***
Country of destination: Italy	-0.00563	r31	-0.26464
	[0.22281]		[0.16325]
Constant	0.82576	r32	-0.31071
	[0.28582]***		[0.09712]***
Total number of observations	7,280		
Number of migrants	2,524		
Number of returnees	1,094		
Number of circular migrants	558		
Log of pseudo likelihood	-4976.33		

Robust standard errors in brackets; adjusted for 12 clusters (i.e. counties)
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: MSL three-variate probit with two selections of the decision to migrate circularly (returnees who migrated only once but intend to re-migrate considered also as circular migrants)

Migration equation		*Circular migration equation*	
Gender (female = 1)	-0.91661	Gender (female = 1)	-0.47533
	[0.10369]***		[0.25261]*
Education level: secondary	0.12774	Age after first migration trip	-0.03631
	[0.04941]***		[0.00627]***
Education level: tertiary	-0.24013	Education level: secondary	-0.16288
	[0.09250]***		[0.06820]**
Spoke Italian in 1990	0.57557	Education level: tertiary	-0.17507
	[0.04419]***		[0.22118]
Spoke Greek in 1990	1.08057	Married at time of the first migration	0.00958
	[0.08295]***		[0.12894]
Number of friends	-0.01467	Economic situation in 1990	-0.01381
	[0.01825]		[0.03601]
Number of migrants in the community	0.10155	Log of HH income	-0.11807
	[0.00609]***		[0.05698]**
Constant	-0.97139	HH size	0.009
	[0.15360]***		[0.02695]
		Urban location	-0.18218
Return equation			[0.10850]*
Age at first migration trip	0.02474	Log of average wage (district level)	-0.80253
	[0.00633]***		[0.65532]
Months remained away (first trip)	-0.02877	Returned from Greece	0.08547
	[0.00442]***		[0.31781]
Obtained legal residence (first trip)	-0.50656	Returned from Italy	-0.33527
	[0.12677]***		[0.40772]
Worked abroad during first trip: legally	0.0874	Return reason: family/non economic	-0.53103
	[0.17506]		[0.19322]***
Worked abroad during first trip: illegally	0.39237	Return reason: unsuccessful	-0.71773
	[0.11895]***		[0.17778]***
Married: migrated with spouse	0.04775	Return reason: acc. enough savings	-0.88559
	[0.21097]		[0.17988]***
Married: spouse in Albania	0.31194	Constant	11.89913
	[0.25262]		[7.32821]
Children: migrated with children	-0.92569		
	[0.18846]***		
Children: children in Albania	-0.15783		
	[0.21528]		
Country of destination: Greece	0.92127	*Cross-equation correlations*	
	[0.19885]***	r21	-0.33162
Country of destination: Italy	-0.00767		[0.11032]***
	[0.22120]	r31	-0.01714
Constant	0.82235		[0.13980]
	[0.27735]***	r32	-0.15234
	0.02474		[0.12100]
Total number of observations	7,280		
Number of migrants	2,524		
Number of returnees	1,094		
Number of circular migrants	661		
Log of pseudo likelihood	-4962.65		

Robust standard errors in brackets; adjusted for 12 clusters (i.e. counties)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: HH subjective economic status: 1=poor to 10=rich. The control group for working abroad during migration trip is “No work”, for marital status it is “Not married”, for children it is “No children”, for the countries of destination it is “Other”; and for the return reasons it is “Seasonal/temporary migration”.

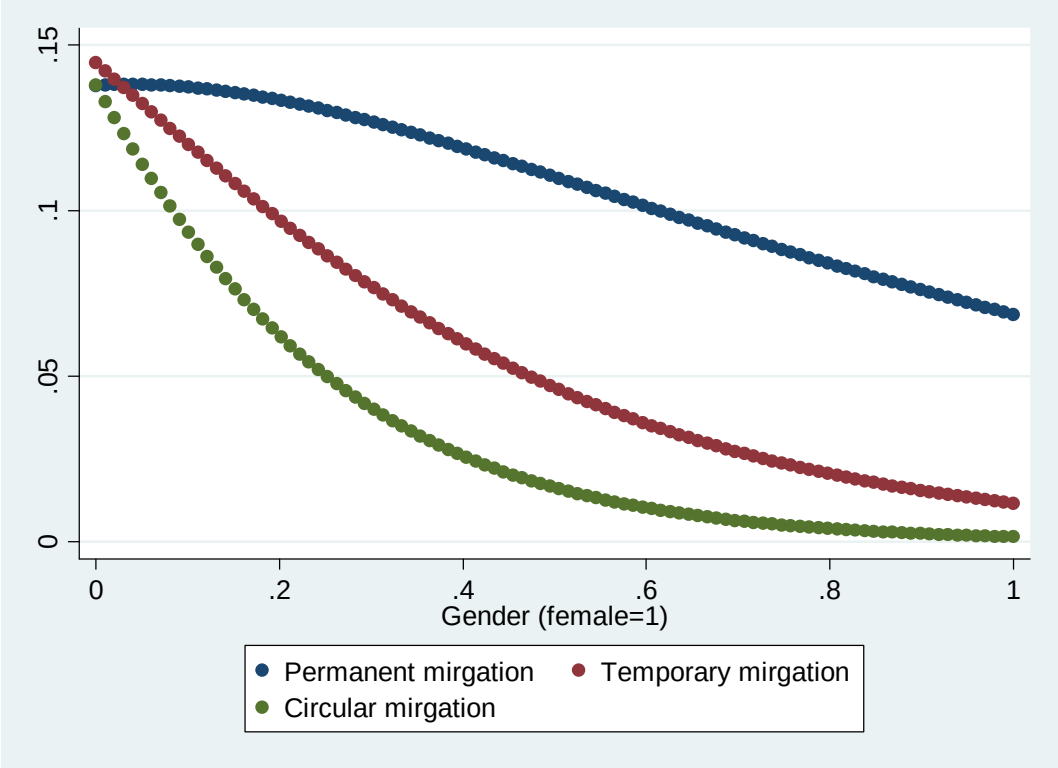
Table 6: MSL three-variate probit with two selections of the decision to migrate circularly (returnees who migrated only once but intend to re-migrate excluded from the sample)

Migration equation		*Circular migration equation*	
Gender (female = 1)	-0.89673	Gender (female = 1)	-0.72006
	[0.10338]***		[0.22389]***
Education level: secondary	0.14253	Age after first migration trip	-0.04485
	[0.04488]***		[0.00747]***
Education level: tertiary	-0.21135	Education level: secondary	-0.17537
	[0.08915]**		[0.05880]***
Spoke Italian in 1990	0.57484	Education level: tertiary	-0.0915
	[0.04145]***		[0.25497]
Spoke Greek in 1990	1.09299	Married at time of the first migration	0.13354
	[0.08347]***		[0.13706]
Number of friends	-0.01732	Economic situation in 1990	-0.01235
	[0.01842]		[0.03979]
Number of migrants in the community	0.1034	Log of HH income	-0.11281
	[0.00568]***		[0.05495]**
Constant	-1.02545	HH size	0.00707
	[0.14101]***		[0.02184]
		Urban location	-0.14086
			[0.08367]*
Return equation		Log of average wage (district level)	-1.36635
Age at first migration trip	0.01866		[0.79217]*
	[0.00746]**	Returned from Greece	0.08162
Months remained away (first trip)	-0.03217		[0.33931]
	[0.00390]***	Returned from Italy	-0.40662
Obtained legal residence (first trip)	-0.52249		[0.41455]
	[0.11983]***	Return reason: family/non economic	-0.66769
Worked abroad during first trip: legally	0.12373		[0.22519]***
	[0.15949]	Return reason: unsuccessful	-0.73812
Worked abroad during first trip: illegally	0.38191		[0.20130]***
	[0.13233]***	Return reason: acc. enough savings	-0.80716
Married: migrated with spouse	0.14536		[0.19721]***
	[0.22792]	Constant	17.86279
Married: spouse in Albania	0.45403		[8.64810]**
	[0.22442]**		
Children: migrated with children	-0.80377		
	[0.21092]***		
Children: children in Albania	-0.2087		
	[0.19622]	*Cross-equation correlations*	
Country of destination: Greece	0.91837	r21	-0.36648
	[0.23340]***		[0.11193]***
Country of destination: Italy	-0.0021	r31	-0.13081
	[0.26049]		[0.16799]
Constant	1.02466	r32	-0.33061
	[0.35347]***		[0.11617]***
Total number of observations	7,177		
Number of migrants	2,431		
Number of returnees	991		
Number of circular migrants	558		
Log of pseudo likelihood	-4731.33		

Robust standard errors in brackets; adjusted for 12 clusters (i.e. counties)
* significant at 10%; ** significant at 5%; *** significant at 1%

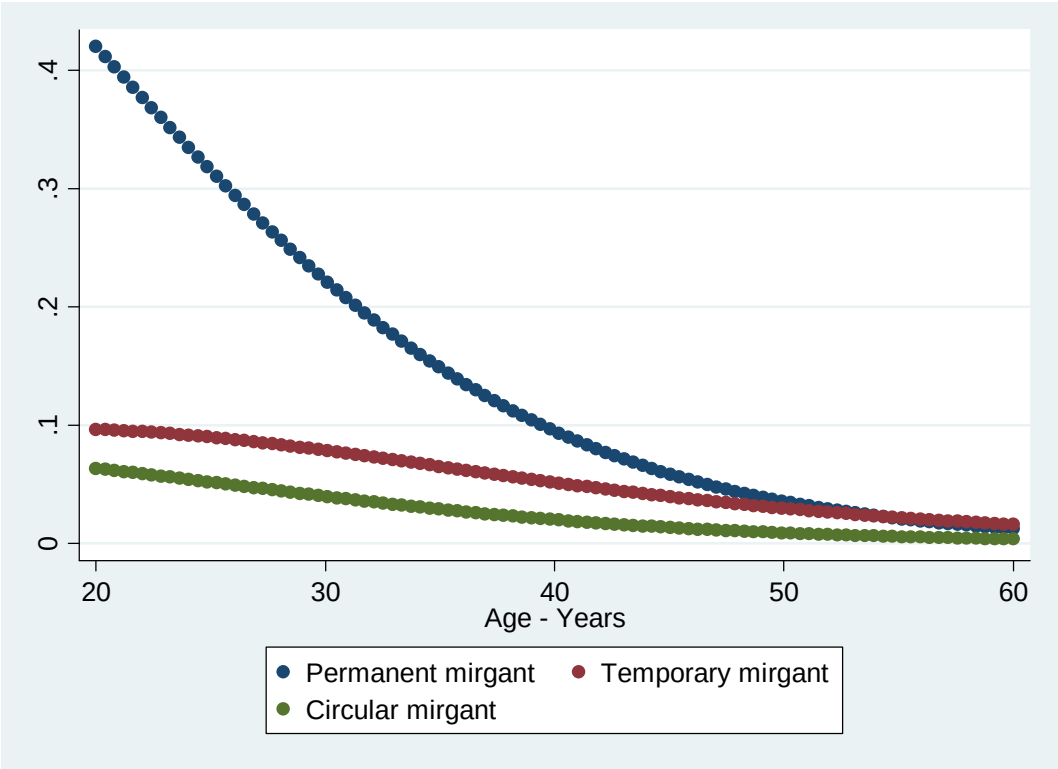
Notes: HH subjective economic status: 1=poor to 10=rich. The control group for working abroad during migration trip is “No work”, for marital status it is “Not married”, for children it is “No children”, for the countries of destination it is “Other”; and for the return reasons it is “Seasonal/temporary migration”.

Figure 1: Predicted probabilities of migration by gender



Note: Predicted probabilities are computed using the mlogit estimation results presented in Table 2.

Figure 2: Predicted probabilities of migration by age



Note: Predicted probabilities are computed using the mlogit estimation results presented in Table 2.

Appendix

Programme (ado-file): MSL thee-variate probit with two sequential selection equations

```
program define dhprob

        args lnf xb1 xb2 xb3 c21 c31 c32
        tempvar sp2 sp3 k1 k2 k3
quietly {
        gen double `k1' = 2*$ML_y1 - 1
        gen double `k2' = 2*$ML_y2 - 1
        gen double `k3' = 2*$ML_y3 - 1
        tempname cf21 cf22 cf31 cf32 cf33 C1 C2
        su `c21', meanonly
        scalar `cf21' = r(mean)
        su `c31', meanonly
        scalar `cf31' = r(mean)
        su `c32', meanonly
        scalar `cf32' = r(mean)
        scalar `cf22' = sqrt( 1 - `cf21'^2 )
        scalar `cf33' = sqrt( 1 - `cf31'^2 - `cf32'^2 )
        mat `C1' = (1, 0 , 0 \ `cf21', `cf22', 0 \ `cf31' , `cf32' , `cf33')
        mat `C2' = (1, 0 \ `cf21', `cf22')
        egen `sp3' = mvnp(`xb1' `xb2' `xb3') if $ML_y1==1 & $ML_y2==1, ///
                chol(`C1') dr($dr) prefix(z) signs(`k1' `k2' `k3')
        egen `sp2' = mvnp(`xb1' `xb2') if $ML_y1==1 & $ML_y2==0, ///
                chol(`C2') dr($dr) prefix(z) signs(`k1' `k2')
        replace `lnf'= ln(`sp3') if $ML_y1==1 & $ML_y2==1
        replace `lnf'= ln(`sp2') if $ML_y1==1 & $ML_y2==0
        replace `lnf'= ln(1- normprob(`xb1')) if $ML_y1==0
        }
end
```

Do file:

```
/* Initial values */
quietly {
probit mig x1
mat b1 = e(b)
mat coleq b1 = mig
probit return x2
mat b2 = e(b)
mat coleq b2 = return
probit circ x3
mat b3 = e(b)
mat coleq b3 = circ
mat b0 = b1, b2, b3
}

/* Halton draws with antithetics */
mdraws, dr(100) neq(3) prefix(z) burn(10) antithetics
global dr = r(n_draws)

/* ML probit with two selection equations */
ml model lf dhprob (mig: mig = x1) ///
               (return: return = x2) ///
               (circ: circ = x3) ///
               /c21 /c31 /c32 ///
               , cluster(county) missing title("3-var probit, 2 selections, MSL, $dr Halton
draws")
ml init b0
ml maximize
```