Remittances and Emigration Intentions: Evidence from Armenia

Aleksandr Grigoryan
Knar Khachatryan

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Abstract

In this paper we analyze the recent migration wave in Armenia, using household level representative data from 2011. We identify determinants of emigration intentions by estimating a bivariate probit model with endogenous remittances. The key finding is that remittances help potential migrants to ease the migration process, serving as a resource rather than as a contractual tool between migrants and non-migrants. Spatial factors dominate in the set of (community level) instruments driving remittances. When distinguishing the destination country for potential migrants, Post-Soviet versus Western countries (EU countries or USA), we find that the instruments identified for remittances are more relevant for individuals targeting the Post-Soviet area (mainly Russia). Nevertheless, remittances remain a significant resource for migrating to Western countries. In this case, we control for endogeneity of remittances using Lewbel's (2012) methodology. Our findings suggest that the two pools of potential migrants differ crucially in the main set of skill characteristics: high-skilled potential migrants opt for Western countries (brain drain), while the low-skilled prefer Post-Soviet countries as a destination. In particular, English language knowledge and computer literacy increase the likelihood for migrating to Western countries, and individuals with those skills are less likely to migrate to Post-Soviet countries. Education is significant for the Post-Soviet model only, with a negative impact on migration intentions.

Keywords: Migration, remittances, intentions, development, households.

JEL Classifications: F22, J11, O12.

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[1] Corresponding author. Associate Professor, American University of Armenia, Manoogian Simone College of Business and Economics, 40, avenue Baghramyan – 0019 Yerevan, Armenia and CERGE-EI Foundation Teaching Fellow, Politických vězňů 7, 111 21 Prague 1, Czech Republic.
 Tel: (+374) 60612614. Email: aleksandr@aua.am.
[2] Associate Professor, American University of Armenia, Manoogian Simone College of Business and Economics. Email: kkhachatryan@aua.am.

1. Introduction

Migration is an inextricable part of development with complex implications for migrant-sending societies (Massey, 1988; Martin and Taylor, 1996); Abramitzky et al., 2013). On a decision-making level, migration is a familial arrangement with an underlying contractual relationship between migrants and their families (Stark and Bloom, 1985). In a macroeconomy, among other consequences, migration entails flows of remittances, which benefit transition economies by reducing poverty (Adams and Page, 2003; McKenzie and Rapoport, 2010) and may hurt them by distorting growth (Jahjah et al., 2003). Overall, migration is a consequence of certain socio-economic, demographic and political interactions, and it further reshapes these interactions as a self-enforcing dynamic process. It is inherent to developing countries that have heterogeneous political regimes, deep-rooted ethno-cultural heritage, socio-economic conditions and future opportunities.

Remittances play a crucial role in explaining the pattern of out-migration. According to the New Economics of Labor Migration (NELM) (Lucas and Stark, 1985; Stark, 1995), remittances are driven by an implicit contractual relationship, based on various motives (such as insurance bequest, wealth accumulation, risk allocation and more) or presuming certain types of services from a recipient's side. A different strand of literature (Garip, 2008, among others) considers remittances as a distinct component of migrant social capital, according to which remittances may facilitate the process of migration for potential migrants. The strength of migrant social capital from its resource perspective is then reflected in the information disclosed about remittances.

Nowadays, remittances represent a significant means of financial intermediation (Aggarwal, Demirgüç-Kunt, Pería, 2011; Giuliano and Ruiz-Arranz, 2009). Nevertheless, there is little evidence about the link between remittances and intentions to emigrate, although over recent decades the positive role of international remittances has increasingly been put forward as an economic development tool.

The main aim of this study is to contribute to knowledge about the impact of remittances on the willingness to emigrate. The literature highlights several theoretical and empirical studies that observe the impact of remittances on migration (Taylor, 1999; Van Dalen et al., 2005; Garip, 2008; Dimova and Wolff, 2015, to name a few). These papers provide solid evidence for the relevance of remittances in migration decisions, particularly in developing economies. We treat remittances as endogenous and study the relationship using cross-sectional data from Armenia, one of the former Soviet Union member countries, collected for the period of December 2011 - January 2012.

Former Soviet states, as a specific bloc of the developing world, have already faced huge migration flows in their early stage of independence, along with broken traditional trade links, reciprocal territorial claims, civil wars and ethnic cleansing (Tishkov et al., 2005).[3] Armenia, among the most developed Soviet Republics in that era, has been given minimal opportunities to start building an independent, healthy-growing economy with a promising future. Over more than twenty years of independence, Armenia has been hit by numerous adverse shocks resulting in rather low resilience and absorption capability. The country has also experienced high rates of out-migration and remittance inflows.

This paper tests two theories on the role of remittances in shaping intensions to emigrate: the first is based on the insurance motive, and the second on interpreting remittances as a resource for migrant social capital. The NELM literature suggests that once we acknowledge that migration is a familial arrangement, remittances are used as a tool to establish and sustain a contractual relationship between migrants and non-migrant household members, aimed at maintaining the latter at home (Lucas and Stark,1985; Stark and Bloom,1985). Our findings suggest a different role for remittances: for non-migrants they serve as a signal for better opportunities to make money in a host country, and thereby strengthens their incentives to emigrate. Building on Garip (2008, 2015), and defining remittances as resources to assist potential migrants, our findings suggest that remittances help potential migrants to ease the migration process, rather than serving as a contractual tool between migrants and non-migrants.

We argue that the need for remittances, the ability and the strength of the migrant social capital (or the network) are the factors that jointly determine intentions to emigrate. Potential migrants heading to Post-Soviet countries are most sensitive to the presence of remittances, as well as to budget transparency and revenues. Given that there are still many common characteristics and shared societal values among Post-Soviet countries that facilitate low educated Armenians' integration into their job markets, low-skilled Armenians opt rather for migration to those countries. This does not hold true for Western countries, since our findings show that education is a driving force for emigration to the West. We claim that Armenians with a higher level of formal education and hands-on skills, such as English knowledge and computer literacy, express less intention to migrate to one of the Post-Soviet states, in particular to Russia. Furthermore, our results indicate that for potential migrants heading to Western countries, remittances are not as important for out-migration decisions as they are for potential migrants whose destination is to Post-Soviet countries.

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[3] Migration flows between Post-Soviet countries reached about 2 million people in 1991, with a gradual decrease of about 600,000 in 2002.

Our paper contributes to the migration literature and policy agenda in several aspects. First, we provide a testable framework for the two theories linking remittances and migration in an Armenian context as a former Soviet state. This can add to our knowledge of understanding the complexity behind migration related decisions for developing countries. Second, and most importantly, we add a novel element to the existing empirical literature by being the first to specify the mechanism allowing differentiation of migration flows to Post-Soviet and Western countries, conditioned by individuals' intellectual and technical skills (such as education, language knowledge and computer literacy). We argue that remittances serve as a resource for non-migrants to ease the migration process in Armenia. The pattern is particularly strong for potential migrants to Post-Soviet countries.

The rest of the paper is organized as follows. The relevant literature is briefly surveyed in Section 1. Some background information and related macroeconomic evidence for the Armenian economy is provided in Section 2. Section 3 is devoted to data description. Estimation and the robustness of the model are in Sections 4 and 5, respectively. Concluding remarks follow.

2. Literature review

Recent evolutions in migration studies highlight the complexity of migration-development interactions in migrant sending societies. Theoretical perspectives stress the importance of viewing migration as a developmental phenomenon (Massey, 1988), for which application of distinct theories in isolation may fail to uncover the complex realities (de Haas, 2010). For the former Soviet countries, many features of international migration can be understood and interpreted within existing migration-development theories, with the caveat that these societies share a unique heritage, and also the early phase of transition.

In neo-classical models (Todaro, 1969; Harris and Todaro, 1970) migration is an individual decision based on wage differentials, and no role is given to intra-family relationships. In contrast, NELM considers migration as a family decision, and remittances as a key consequence of migration (Lucas and Stark, 1985; Stark, 1995). Taylor (1999) summarizes early literature on NELM from the developmental viewpoint, concluding that remittances may contribute to the development process. Docquier and Rapoport (1998) review recent findings in NELM from micro- and macroeconomic perspectives.

Channels linking migration and remittances are numerous and interconnected, and in order to capture the intrinsic mechanism, empirical studies should be theory driven (Massey, 1999 and Cohen, 2005). In the NELM literature, two types of motives are identified for explaining the existence and nature of remittances: altruism (Lucas and Stark, 1985; Stark and Lucas, 1988; Van Dalen et al., 2005, among

others), and self-interest. In the second category, there are numerous motives assuming implicit contractual relationship: bequest (Hoddinott, 1994; Bernheim et al., 1985), accumulation of wealth (Dustmann and Kirchkamp, 2002), covering educational costs of household (Lucas and Stark, 1985), allocating risks (Stark and Lucas, 1988; Cox et al., 1998), exchange of various types of services with remittances (Docquier and Rapoport, 2005). As a distinct motive, remittances may encourage or discourage migration from a home country (e.g. Stark, 1995; Van Dalen et al., 2005; Docquier and Rapoport, 1998).

Migrant social capital is a key factor in explaining migration trends. Garip (2008), using the framework of Portes (1998), distinguishes three components of migrant social capital, (i) resources (information about or assistance with migration), (ii) sources (prior migrants) and (iii) recipients (potential migrants). Remittances are seen as a resource for facilitating migration, rather than a contractual tool between migrants and non-migrants. Evidence suggests that the probability of revealed emigration is significantly higher among those who report clear intention to emigrate (Van Dalen & Henkens, 2008). There is a growing literature using data on migration intentions to capture the probability to migrate (Van Dalen et al., 2005a, b; Piracha and Saraogi 2017; Dimova and Wolff, 2015). In our study, we take the same approach and model emigration intention through a binary variable.

Van Dalen et al. (2005) investigate whether remittances are determined by altruism or enlightened self-interest, and whether they have an influence on additional migration by using an empirical data on five sending countries (Ghana, Senegal, Morocco, Egypt, and Turkey) for households with family members living abroad and two receiving countries (Spain and Italy). Main findings show that the family ties and the net earnings potential of migrants have stronger effects on the flow of remittances than the net earnings potential of the households in the country of origin. Also, the authors claim that as the receipt of remittances has a positive effect on the emigration intentions of household members still living in the country of origin, the receipt of remittances may contribute to new flows of migration.

Dermendzhieva (2011) provides cross-country empirical evidence on labor migration for countries in the South Caucasus. The author finds no evidence of massive migration among skilled workers. However, individuals with higher education are more likely to emigrate to high income OECD countries from the capital of Armenia.

Our study framework is closer to more recent studies of Piracha and Saraogi (2017) and Dimova and Wolff (2015), that explore the link between intentions to emigrate and remittances. Piracha and Saraogi, (2017) use a large household survey data from Moldova to study the relationship of remittances and migration intentions by employing a simultaneous equations model. The authors find

that there is a dual causality between receipt of remittances by non-migrants and their migration intentions. They claim that remittances not only relieve credit constraints in the home country, but also act as a signaling device of success in the host country.

Dimova and Wolff (2015) investigate whether there is a positive impact of remittances sent by family members abroad on the migration prospects of those still in the country of origin. The authors use a 2001–2004 panel data survey from Bosnia and Herzegovina and find that remittances have a significant positive impact on the migration prospects of their recipients. Furthermore they show that young, healthy and well-educated people are most likely to migrate, thus shedding light on a potential negative implication of migration and remittances.

In our study, we aim to further illuminate the causal link between remittances and emigration in the Armenian context. We add a novel element to the empirical literature by suggesting a mechanism that allows us to differentiate migration flows to Post-Soviet and Western countries conditioned by individuals' intellectual and technical skills (such as computer literacy, knowledge of English and others).

3. Background

The early stage of emigration flows in Armenia started before the collapse of the Soviet Empire. After the Spitak earthquake in 1988, around 200,000 Armenians left the country. The same year, the territorial conflict over Nagorno-Karabakh entailed two-direction migration flows: around 170,000 Azerbaijanis left Armenia and around 360,000 Armenians immigrated to the country from Azerbaijan (Yeghiazaryan et al., 2003). The next wave of migration evolved right after independence in 1991, when economic conditions had constantly deteriorated due to broken traditional trade links within the post-Soviet territories and the military phase of the Nagorno-Karabakh conflict during 1991-1994. According to different estimates, around 800,000 Armenians left the country during the 1991-2001. [4] In the first decade of independence, two major outflows were reported, 1991-95 and 1999-2001, the latter wave mostly conditioned by strong disappointment regarding the government's inability to take substantial steps towards sustainable development.

Several migration waves have also been observed since 2000. Figure 1 identifies four waves of net migration within a decade. The peaks for the first 3 waves were observed in 2000, 2003 and 2007. The last wave, beginning with the global financial crisis in 2008, has had a strong and lasting effect, and differs substantially in its magnitude. Our study aims to explain the pull and push factors behind emigration in the middle of the wave. Taking a closer look at the country's recent history and current tendencies, it seems that emigration incentives among distinct groups of the population reflect general

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[4] Melkonyan and Grigorian (2012) discuss the early transition path from the migration perspective.

dissatisfaction with the country's development. A double-digit growth rate of GDP and significant improvement in poverty and inequality indexes in 2001-2008 had little effect on strong incentives to leave the home country and join the fast-growing young Armenian diaspora. As mentioned above, migration is perceived as a pattern intrinsic to development, but the geopolitical environment specific to Armenia makes the issue sensitive to national security, since human capital in Armenia has traditionally been acknowledged as a leading factor contributing to long term development. The military conflict with Azerbaijan is another reason that the government needs to take significant steps to reverse the current tendency in migration.

Figure 1: Migration waves in the period 2000 - 2012.
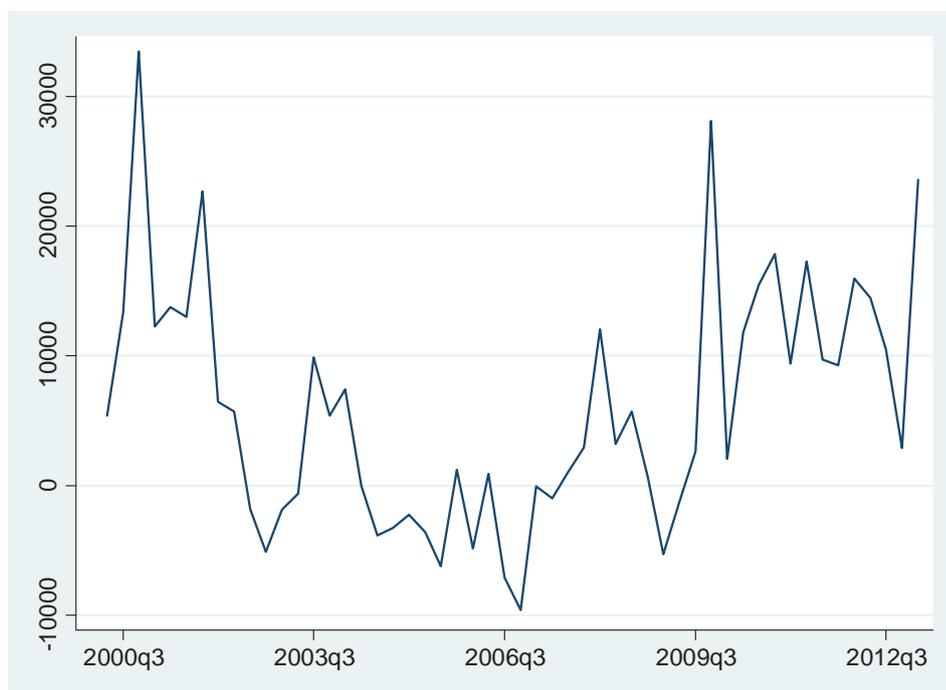
Source: National Statistical Service of Republic of Armenia.

As argued throughout the paper, remittances play a central role in shaping a migration related decision. The Armenian economy is heavily dependent on remittances. According to the World Bank, in 2009 – 2013, personal remittances amounted to 21 percent of GDP for Armenia, the fourth largest ratio among 257 countries (after Nepal, Moldova and Haiti). Figure 2 plots the ratio for the selected countries from the former Soviet states, where Armenia, together with Moldova and Georgia, differs substantially from the remaining countries in this indicator.

Sizable remittances signal the existence of the large diaspora. As we argue here, for Armenia, remittances help potential migrants join their household members abroad and enlarge the stock of the diaspora. South America and the Middle East are the regions where the Armenian diaspora has been formed since the early 1900s. Currently, Europe is of more interest with its high living standards, and

Russia is attractive for relatively easy access to the labor market and low adaptation costs. According to the dataset used in this paper, 53.77 percent of respondents consider Russia as a destination country. Comparing this number with Russia's share of the Armenian diaspora, 39.2 percent, it becomes clear that the composition of the diaspora is rapidly changing in favor of Russia. Consequently, the main source country for Armenian remittances is Russia, which, in 2012, was the source of around 86 percent of all remittances. The share has consistently increased from 65 percent in 2006 to 81 percent in 2011.[5] The dependence of the volume of total remittances from Russia's GDP is also strong (see Figure 6 in Ghazaryan and Tolosa, 2012).

Figure 2: Personal remittances as percentage of GDP. Source: World Bank.
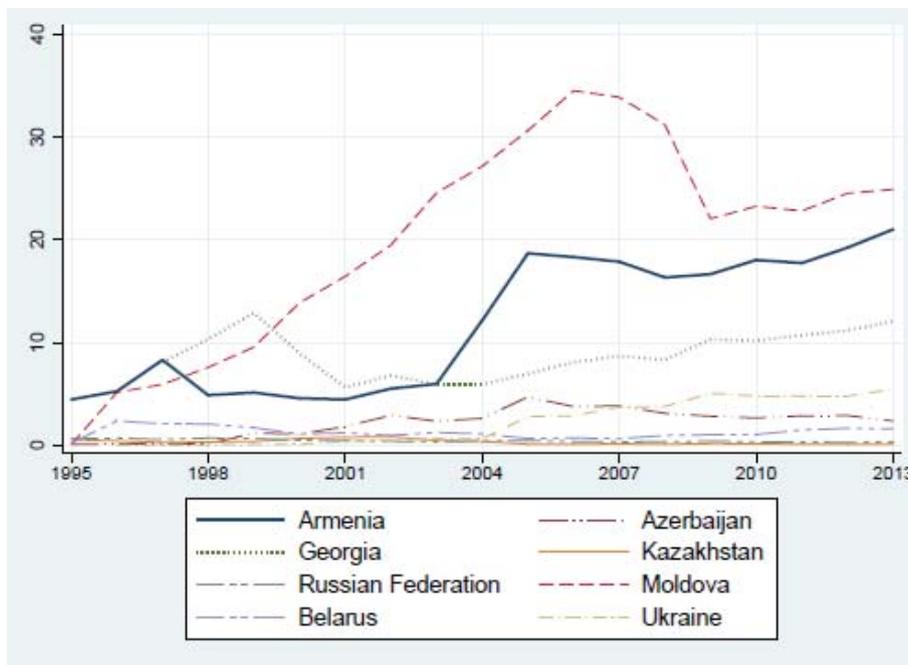
4. Data description

We use household level country-representative data collected by the European Training Foundation (ETF) over December 24, 2011 - January 30, 2012. Randomly selected individuals were asked questions on five groups of distinct characteristics: (i) education, skills and socio-demographic profile, (ii) work, (iii) intentions, (iv) expectations and (v) economic and living conditions of the household. The title of the survey - Potential Migration Survey- reflects its primary objective, which is to disclose individuals' intentions and expectations concerning emigration. There were 2,630 respondents. After filtering variables due to the absence of answers for different reasons (refuse to answer, no answer, do not know and not applicable) we obtain around 2,338 observations for the

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[5] Source: Central Bank of Armenia.

variables of interest. Summary statistics for observations included in the pooled model are reported in Table 1. For observations in the Post-Soviet and Western models, we report summary statistics in Tables A1 and A2 of the Appendix.

Remittances are observed throughout the year of the survey, while the presence of a migrant in a family is identified during the interview. The period of the interview, December 24 - January 30, is the return time for seasonal migrants working in Russia and other former Soviet countries. As a result, we observe households with return migrants and many of them, while working abroad, have sent remittances during the year. One third of respondents answered 'Yes' to the question "Are you thinking seriously to move abroad to live and work at the moment?". Importantly, this question is instrumental to disclose intentions on permanent emigration.

There are several interesting observations directly related to our study. When considering emigration as an option, 25 percent of respondents are looking for support from relatives living abroad. 96.5 percent of respondents, if migrating, will send money first of all for living expenses for family and relatives, supporting the evidence that remittance-receivers are heavily wealth-constrained. Intentions to move abroad are slightly lower among the respondents with elderly dependant(s) (29.4 percent), while respondents with child dependants express intentions close to the average, 33.9 percent. Marital status and gender separately do not align intentions much - percentages on intentions to move for these groups are 31.7 and 30.7 percent. On the other hand, 37.7 percent of married and 39.9 percent of male respondents express intentions to emigrate.

Next, we check whether there is a significant difference in intentions to emigrate among households in rural versus urban areas. We distinguish three types of residence: village, town and the capital. An independent means test indicates that intentions are almost the same among respondents living in all three areas. There is some difference (at the 10 percent significance level) in intentions within two pools of households, one living in villages and the second in towns, with slightly higher intentions to emigrate in town areas. Overall, we do not see drastic differences in emigration intentions in rural versus urban areas, signaling that migration is a countrywide phenomenon and cannot be merely explained by considerably different living standards in rural areas.

Regarding the specific geopolitical situation Armenia has been experiencing since the collapse of the Soviet Union, we also inspect the variation of intentions to emigrate along the regions bordering Georgia and Azerbaijan.[6] Respondents living in regions on the border with Azerbaijan express less intention to emigrate relative to the average, 29.8 percent. If we select rural areas, in addition to the

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[6] Administrative regions in Armenia are Marzes. Armenia has 10 Marzes and the city of Yerevan.

border with Azerbaijan, then the number changes only slightly, 28.5 percent. Respondents in regions bordering Georgia are more inclined to emigrate, 38.1 percent, and the number is little smaller in rural areas, 36.1 percent. Given the overall underdevelopment of infrastructures in remote areas, and the ongoing military conflict with Azerbaijan, one might expect higher emigration intentions in these regions, but this is not supported by the data. More probably, the emigration process has been stabilized there, with households either thoroughly migrated or remaining at home.

We also draw evidence from the inspection of an individual's emigration intentions at a regional level: Yerevan reflects the average level of emigration intentions; the Syunik region, with the strong dominance of the mining sector in the industry, has the lowest intentions[7]; the Kotayk region, with the largest share of manufacturing, reports highest intentions, and Shirak, with the highest poverty, reports the second highest intentions. As for remittances, Syunik reports the lowest values for these measures too, suggesting that it experiences minimum emigration and related consequences within the regions and Yerevan.

5. Econometric model

Our econometric model is aimed at capturing the determinants of emigration intentions in a bivariate probit model framework.[8] A fraction of households in the survey receives remittances from household migrant members and/or close friends abroad, which potentially affects migration decisions for respondents. In the benchmark bivariate probit model, we use an indicator (dummy) variable for remittances, and in the alternative IV-probit model we construct a categorical variable taking values from 0 to 4. We do not use actual volumes of remittances, because households systematically underreport these volumes (Shonkwiler et al., 2011).

Table 1. Summary statistics for observations included in the pooled model.

Variable name	Mean	Std. Dev.	Min	Max
Move abroad (Yes = 1, No = 0)	0.331	0.471	0	1
Move to one of the Post-Soviet countries (Yes = 1, No = 0)	0.183	0.386	0	1
Move to Russian Federation	0.178	0.383	0	1
Move to one of the Western countries (Yes=1, No=0)	0.106	0.307	0	1
Remittances (Yes = 1, No=0)	0.172	0.377	0	1
Migrant member abroad (Yes=1, No=0)	0.107	0.309	0	1
Remittances categories (*R* is the volume in AMD)	0.432	1.068	0	4
1[no remittances], 0[otherwise]	0.833	0.373	0	1
1[0 <R<74500], 0[otherwise]	0.037	0.188	0	1

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[7] Grigoryan (2013) analyses the impact of the mining sector on socio-economic indicators in Armenia. The key finding is that the mining sector is growth enhancing, but it may amplify income inequality.

[8] The model appears in the classic book by Maddala (1983). Greene (1998) provides a derivation of the maximum likelihood estimator for the bivariate probit model, which is consistent and fully efficient and therefore preferred to the two-step estimator (Rivers and Vuong, 1988).

	Mean	SD	Min	Max
1[74500 ≤ R<254000], 0[otherwise]	0.044	0.204	0	1
1[254000 ≤ R<745000], 0[otherwise]	0.038	0.191	0	1
1[R ≥745000], 0[otherwise]	0.048	0.215	0	1
Work status (Yes=0, No=0)	0.670	0.470	0	1
Education categories (Yes=1, No=0)	4.351	1.415	1	7
Primary and less	0.001	0.036	0	1
Lower secondary	0.059	0.236	0	1
Upper secondary general	0.367	0.482	0	1
Upper secondary vocational	0.060	0.237	0	1
Post-secondary vocational	0.196	0.397	0	1
Higher education (bachelor/master)	0.308	0.462	0	1
Post-graduate (PhD)	0.009	0.094	0	1
Age	35.118	9.221	19	52
Marital status (Yes = 1, No=0)	0.630	0.483	0	1
Never married	0.312	0.464	0	1
Married/Living together	0.630	0.483	0	1
Divorced/Separated	0.041	0.198	0	1
Widowed	0.017	0.128	0	1
Female	0.642	0.480	0	1
English knowledge skills	0.480	0.794	0	3
1[Do not speak at all], 0[otherwise]	0.677	0.468	0	1
1[Basic knowledge], 0[otherwise]	0.199	0.400	0	1
1[Good knowledge], 0[otherwise]	0.090	0.287	0	1
1[Excellent knowledge], 0[otherwise]	0.033	0.180	0	1
Russian knowledge skills	1.536	0.907	0	3
1[Do not speak at all], 0[otherwise]	0.135	0.342	0	1
1[Basic knowledge], 0[otherwise]	0.345	0.475	0	1
1[Good knowledge], 0[otherwise]	0.369	0.483	0	1
1[Excellent knowledge], 0[otherwise]	0.151	0.359	0	1
Number of household members	4.752	1.836	1	13
Home ownership (own=1, rented=0)	1.957	0.209	0	2
Number of dependants (>65) in household	0.342	0.475	0	1
Number of children (<17) in household	1.210	1.159	0	8
Financial situation of household	1.475	0.975	0	4
1[Not at all sufficient], 0[otherwise]	0.177	0.381	0	1
1[Insufficient], 0[otherwise]	0.340	0.474	0	1
1[Sometimes sufficient, sometimes not], 0[otherwise]	0.322	0.468	0	1
1[Sufficient], 0[otherwise]	0.155	0.362	0	1
1[More than sufficient], 0[otherwise]	0.006	0.080	0	1
Having a computer at home (Yes=1, No=0)	0.483	0.500	0	1
Mining sector in a community (Yes=1, No=0)	0.125	0.331	0	1
1[community is rural and has a border], 0[otherwise]	0.154	0.361	0	1
1[community is rural and has no border], 0[otherwise]	0.159	0.365	0	1
1[community is urban and has a border], 0[otherwise]	0.190	0.392	0	1
1[community is urban and has no border], 0[otherwise]	0.498	0.500	0	1
Driving distance between capital and a community (in minutes)	71.410	75.015	5	385
Driving distance between a regional and a community (in minutes)	19.994	30.273	0	160

Budget transparency	1.117	0.600	0	2
Budget is published in the newspaper (Yes=0, No=0)	0.630	0.483	0	1
Budget is published in the community website (Yes=0, No=0)	0.486	0.500	0	1
Community budget revenues from internal sources (per capital AMD)	20.973	44.251	1.310	567.862

Number of observations: 2338

Remittances and migration intention are jointly determined within the model

$$I = 1[I^* = \alpha_1 + \beta_1\Omega + \gamma_1 R + \epsilon_1 > 0], \qquad (1)$$
$$R = 1[R^* = \alpha_2 + \beta_2\Omega + \gamma_2 Z + \epsilon_2 > 0]; \qquad (2)$$

where the variables with an asterisk are latent. If $I^* > 0$, then the willingness to emigrate is sufficiently high to report intention, $I = 1$. R^* is the actual volume of remittances, and R is the indicator variable with the value 1, if a household has received remittances, otherwise zero. Ω is the vector of control variables and Z is the vector of instruments of remittances, excluded from the migration equation. The vector of errors, (ϵ_1, ϵ_2), is independently and identically distributed as a bivariate normal, with the covariance matrix involving a nonzero off-diagonal element ρ_{IR}. Correlation in error terms indicates the presence of endogeneity. If $\rho_{IR} \neq 0$, then the direct use of the the observed status on the remittance recipient in (1) will lead to a biased estimate for γ_1. The source of correlation could be unobserved characteristics of a migrant and/or close friend outside, which jointly affect the decision on sending remittances and the emigration intention.

We estimate the model for 3 categories of respondents: (i) all respondents, without specifying the possible destination of emigration for those who intend to emigrate (denoted as Model 1 in the rest of the paper), (ii) respondents who disclose willingness to emigrate to one of the Post-Soviet countries, together with respondents who report no intention to emigrate (Model 2), and (iii) respondents who are willing to emigrate to European or North American countries, together with respondents who report no intention to emigrate (Model 3).

In the migration-remittances literature, regional level data are used to instrument remittances. Diverse socio-economic conditions in regions have the potential to capture the variation of remittance flows from one region to another. Amuedo-Dorantes and Pozo (2006) and Grigorian and Melkonyan (2011) use regional employment rates. Grigorian and Melkonyan (2011) use the ratio of the vulnerable population to the total regional population as an instrument to capture the demand for remittances. They also use a measure of corruption as an instrument for past migration in a household, as the latter

"is seen as a serious enough threat for the future wellbeing of the family, the entire family would relocate" (page 145).

In our dataset, we have 125 communities, which allows us to identify instruments with sufficient variability. We choose the following contextual, community level variables as instruments: (i) distance between a community and the capital, (ii) distance between a community and the regional (marz) center, (capital or marz center) by car; (iii) budget transparency and (iv) budget revenue from internal sources per capita. High distance from the regional center and/or from the capital may create difficulties for receiving remittances. In the long-term, families in remote areas may decide to relocate to a host country, as keeping a migrant can be costly for remittance-recipient households, distanced from banking services needed for money transfer. Such households will also find it hard to build their life on investment on behalf of their migrant members, as economic activity is highly concentrated in the capital and its neighborhood, while remote areas lack infrastructure, access to markets, financial instruments (such as bank transfers) and business opportunities.

Overall, the spatial factor plays an important role in the remittance equation. There could be at least two reasons: (i) households are spatially clustered based on certain characteristics (wealth, business activity type, vulnerability towards external shocks etc.), which drives corresponding, cluster-specific decisions concerning remittances and (ii) social norms, which are region specific and projected to migrants' uniform behavior, disciplined by households through social sanctions.[9] Distances are calculated from a Google map and measured by minutes needed to arrive at the destination point. Finally, we use distance from the regional center to the capital as an instrument to capture correlation between remittance flows and regional disproportional development of the country.

Transparency boils down to the accessibility of information, which is a public good that improves market operations and prevents failures (Stigler, 1961; Stiglitz and Weiss, 1981; Stiglitz, 2000). Transparency is one of the good governance mechanisms that enables the public to monitor and evaluate the performance of their representatives and public servants. Moreover, it is an important component of institutional quality, which is associated with economic growth, efficiency and public welfare (Knack and Keefer 1995; Williamson, 2000; Acemoglu, Johnson and Robinson, 2002; Kaufman and Kraay, 2002). Existing evidence provides solid arguments to claim that improved transparency acts to minimize the moral hazard problem and make corruption less probable (Blumkin and Gradstein, 2002; Lindstedt and Naurin, 2010; Peisakhin and Pinto, 2010). To the best of our knowledge there are very few studies which explore the link between local municipality transparency (in reporting data) and remittances. Most of the existing empirical studies are devoted to national

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[9] An interesting discussion on the topic can be found in Docquier and Rapoport (2005).

government transparency or country-specific transparency, focusing either on the public administration or on the private sector.

For budget transparency, we use community level data on the Publicity of Community Budget, reported by municipalities. The variable *Budget Transparency* takes a value of 0, if a community budget has not been publicized either through a local newspaper or a community's webpage; it takes value 1 if the budget has been publicized only through the newspaper and takes a value of 2 if it has been publicized through both the newspaper and a webpage. We use the data observed in the fourth quarter of 2011.

The last instrument is the per-capita community budget revenue from internal sources. We expect that budget revenues from internal sources decrease the probability of receiving remittances. That is, a household located in a richer community is less likely to receive remittances. With this result, we control for community wellbeing and allow budget transparency to be merely linked to corruption and business risks.

Our control variables can be grouped into households and individual characteristics. Household level characteristics are a rural versus urban dummy interacted with a dummy indicating whether a community is bordered by Azerbaijan or Georgia, a dummy indicator for the presence of the mining industry in/close to community, household size, home ownership, children and elderly dependants in the household, the financial situation of the household and a dummy indicating a computer at home. The latter variable captures access to and the use of modern technologies by household members. Individual characteristics are (i) work income status, (ii) education level (7 levels), (iii) age, (iv) marital status, (v) gender, (vi) English and Russian language skills, rated from zero (no skill) to 4 (fluent).

6. Estimation results

The impact of remittances on emigration intentions is of primary interest for this paper. In order to control for endogeneity of remittances, we estimate a two-stage model, and for this reason we discuss remittances and migration equations separately. The second dimension expanding the set of estimation results is the destination point for potential migrants. In Model 1, we do not specify a destination, while in Models 2 and 3 we have Post-Soviet and Western countries, respectively. We analyze estimation results for the pooled model and highlight the differences in the other two models, if any.

6.1. Remittance equation

We report estimation results for the pooled model in Table 2. The first two columns refer to the bivariate probit model, and the remaining three models are mainly discussed in the Robustness section. From the remittance equation (columns 1-2 in each model type), we learn that a larger distance between a community and the regional center decreases the probability of receiving remittances. Distance from the capital, equivalent to an additional hour to reach to the capital decreases the probability of receiving remittances by 4.8 percent.[10] The corresponding value for the distance from the regional community is 7.8 percent. The magnitudes remain the same for the Post-Soviet (Table 3) and Western (Table 4) models. Importantly, after controlling for the remoteness of a community from the country perspective, distance from the regional center still matters in receiving remittances. Since the distance measures account for the quality of roads, and therefore captures access to infrastructures, the result suggests that households distanced from centers also lack the social protection layer that remittances provide.

If a municipality improves budget publicity, say by reporting the budget not only in a local newspaper, but on a municipality's website, the probability that a household from that community will receive remittances will decrease by 7.75 percent in the pooled model, 7.38 percent in the Post-Soviet model and 6.68 percent in the Western model. This goes in line with the argument that greater transparency of a municipality is an indicator of lower corruption risks and more favorable business conditions in such communities. Therefore, there is less need for remittances to cover the primary needs of remittance recipients. For instance, Caamaño et al. (2011) study budget transparency for 33 municipalities in Galicia, Spain. Their results show that unemployment is negatively correlated with budget transparency. So, a budget transparency improvement can lead to a decrease in unemployment, and thus, a decrease in remittances. Remittances, if generally sent to cover primary needs, do not flow to such communities, as households there are able to afford basic needs. If remittances were used for investments, there would more likely be a positive sign for the dummy on budget transparency, but in general they are not.

More budget revenues from internal sources decrease the probability of receiving remittances. If the per-capita budget increases by 10,000 AMD (equivalent to 20 USD), then the probability of receiving remittances for a household in that community will be lower by 3.6 percent. Our finding is in line with existing evidence at a country and regional level, showing that relatively larger flows of remittances go to poorer countries and/or developing regions. The evidence suggests that the lower

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[10] The reported coefficients for distance measures reflect probability changes per minute and therefore coefficients should be multiplied by 60.

the average income in a country, the more likely there will be migration, and therefore the higher its remittance inflows will be.[11]

In the remittance equation of the pooled model, among the controls, it is worth pointing out the significance of rural-border dummies. The reference is an urban community without a border, and, relative to this, the probability of receiving remittances is higher by 10.2 percent in rural areas with borders, and by 11.8 percent in urban areas with borders. In other words, the likelihood of remittance flows in communities with borders is largely the same for rural and urban areas. For urban communities with no border, the probability of receiving remittances is smaller by 12.4 percent (relative to urban communities without a border). The picture is qualitatively the same for the Post Soviet model. It is, however, different for the Western model. Rural and border factors seem to be less significant for the pool of respondents who intend to migrate to Western countries. The only strong significance is observed for households located in rural areas with borders, 13.2 percent, relative the reference. Almost no difference is observed for the other two locations (only 10 percent significance for rural areas with borders), suggesting that households with emigration intentions towards Western countries are less sensitive to their location as remittance-recipients.

Other controls, significant in the remittance equation, are income from work, age, marital status, household size, computer and mining industry. As expected, if a respondent reports income from work, her/his household is less likely to receive remittances. In the pooled model, the probability of receiving remittances for such households is smaller by 5.2 percent. For the Post-Soviet and Western models, the downward shifts in probabilities 4.3 and 5.5, respectively. Our finding is in line with Rapoport and Docquier (2006) who argue that remittances are a positive function of the income of the migrant and are hence an indication of his/her financial success in the host labor market. The probability of receiving remittances increases with respondents' age and household size, as well as in dummy indicators for computer and mining industry connected to the community. Remittances decrease with marital status in the pooled model.

Table 2. Estimation output from the pooled model (Model 1).

	Bivariate probit		IV-Probit		2-stage linear probability model (2S-LPM)		Probit
VARIABLES	Remittances	Move abroad	Remittances	Move abroad	Remittances	Move abroad	Move abroad
Remittances		0.5327***		0.2974***		0.7659***	0.1907**
		(0.0858)		(0.0715)		(0.2331)	(0.0916)
Distance from capital	-0.0008***		-0.0016***		-0.0007**		

	(0.0003)		(0.0007)		(0.0003)		
Distance from regional center	-0.0013***		-0.0014**		-0.0008*		
	(0.0004)		(0.0010)		(0.0004)		
Budget transparency	-0.0775***		-0.0702		-0.0558**		
	(0.0209)		(0.0599)		(0.0255)		
Budget revenue per cap.	-0.0036***		-0.0011***		-0.0004***		
	(0.0008)		(0.0004)		(0.0002)		
1[rural=1, border=1]	0.1018**	0.0038	0.5602***	-0.0612	0.1906***	-0.0249	
	(0.0459)	(0.0429)	(0.1458)	(0.0569)	(0.0556)	(0.0507)	
1[rural=1, border=0]	-0.1241***	-0.0065***	-0.0845	0.0174	-0.0370	0.0099	
	(0.0334)	(0.0419)	(0.0743)	(0.0373)	(0.0298)	(0.0458)	
1[rural=0, border=1]	0.1178***	-0.0168	0.3854***	-0.0304	0.1774***	-0.0340	
	(0.0394)	(0.0384)	(0.1345)	(0.0384)	(0.0465)	(0.0416)	
Income from work	-0.0517**	0.0982	-0.0893	0.0760***	-0.0508**	0.1135***	0.2333***
	(0.0204)	(0.0308)	(0.0650)	(0.0288)	(0.0232)	(0.0357)	(0.0852)
Education level	-0.0102	-0.0112	-0.0179	-0.0089	-0.0101	-0.0109	-0.0471
	(0.0074)	(0.0104)	(0.0205)	(0.0106)	(0.0079)	(0.0113)	(0.0287)
Age	0.0029***	-0.0064***	0.0041	-0.0043***	0.0027**	-0.0071***	-0.0153***
	(0.0011)	(0.0015)	(0.0032)	(0.0016)	(0.0012)	(0.0017)	(0.0043)
Married	-0.0431**	-0.0065	-0.0506	-0.0162	-0.0403*	-0.0003	-0.0874
	(0.0217)	(0.0314)	(0.0621)	(0.0306)	(0.0232)	(0.0350)	(0.0866)
Female	0.0158	-0.1088***	0.0414	-0.0876***	0.0180	-0.1163***	-0.2932***
	(0.0182)	(0.0270)	(0.0552)	(0.0337)	(0.0203)	(0.0288)	(0.0726)
English skills	-0.0005	0.0083	0.0240	-0.0017	-0.0016	0.0106	0.0256
	(0.0138)	(0.0202)	(0.0415)	(0.0182)	(0.0151)	(0.0222)	(0.0542)
Russian skills	0.0014	0.0508***	-0.0174	0.0358**	-0.0053	0.0522***	0.1434***
	(0.0107)	(0.0164)	(0.0326)	(0.0176)	(0.0116)	(0.0174)	(0.0455)
Household size	0.0175**	-0.0053	0.0366	-0.0046	0.0221**	-0.0097	0.0166
	(0.0080)	(0.0102)	(0.0242)	(0.0104)	(0.0096)	(0.0119)	(0.0277)
Home ownership	0.0178	-0.1381**	-0.0411	-0.0807	0.0022	-0.1530**	-0.4036***
	(0.0438)	(0.0548)	(0.1075)	(0.0582)	(0.0382)	(0.0611)	(0.1458)
Dependant (old)	0.0024	-0.0468	0.0401	-0.0553*	0.0012	-0.0512	-0.1402*
	(0.0196)	(0.0295)	(0.0617)	(0.0283)	(0.0226)	(0.0316)	(0.0806)
Dependant (child)	-0.005	0.0006	-0.0174	0.0026	-0.0140	0.0045	-0.0185
	(0.0109)	(0.0152)	(0.0324)	(0.0141)	(0.0122)	(0.0164)	(0.0418)
Financial situation	0.0124	-0.0745***	0.0545**	-0.0548***	0.0135	-0.0802***	-0.2050***
	(0.0098)	(0.0143)	(0.0279)	(0.0161)	(0.0110)	(0.0152)	(0.0394)
Computer	0.0729***	-0.0031	0.1051**	-0.0015	0.0744***	-0.0243	0.0947
	(0.0202)	(0.0306)	(0.0597)	(0.0336)	(0.0223)	(0.0364)	(0.0805)
Mining industry	0.0785***	-0.1176***	0.1656*	-0.0615	0.0934**	-0.1271***	-0.2952**
	(0.0303)	(0.0440)	(0.0989)	(0.0408)	(0.0372)	(0.0450)	(0.1211)
Wald chi-sq. of rho, P-value	14.56***, 0.0001		5.04**, 0.0247				
Hansen J-statistic, P-value					0.46, 0.92		
Endogeneity test, P-value					9.006***, 0.0027		
Wald chi-sq. of probit, P-value							104.6***, 0.0000
Observations	2,338		2509		2,338		2,338

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05, * p<0.1

6.2. Migration equation

The key finding of this paper is that respondents whose families receive remittances are more likely to emigrate. From the pooled model (Table 2, columns 3-4), we learn that the probability of emigrating among such respondents is higher by 53.3 percent. The corresponding jumps in probabilities in the Post-Soviet (Table 3, column 2) and Western (Table 4, column 2) models are 41.6 and 37.8 percent, respectively. We conclude that remittances drastically shift emigration intentions upward and make the probability of emigrating high enough for an average respondent to opt for out-migration. Our analysis shows that omitted variables driving both remittances and emigration intentions introduce a negative bias in the model. The bias can be identified by comparing the remittance coefficients from bivariate probit and simple probit models (the last column in Tables 1, 2 and 3). The jump in probability of emigration with non-zero remittances is 34.2 percent in the pooled model, 21.8 percent in the Post-Soviet model and much lower in the Western model, 2.9 percent. The driving forces of remittances suggest that *respondents in remote areas are most sensitive to the presence of remittances for respondents opting for migration to Post-Soviet countries, mainly Russia*. These factors per se do not affect emigration intentions, but remittance senders select potential migrants based on these characteristics.

There is a mixed pattern in the variation of emigration intentions in rural and border dimensions. It seems to be moderate in the pooled and Post-Soviet Model and rather strong in the Western model. Our decision to exclude distance measures from the structural equation and include rural-urban dummies is based on the check of the validity instruments, discussed in the robustness section. When controlling for rural and border factors, distance becomes irrelevant in the structural equation, while they have strong explanatory power explaining the exogenous variation of remittance decisions.

The need for remittances, and *the ability* and *the strength of the migrant social capital* (or the network) are factors which jointly determine emigration intentions. The first two items - the need and the ability - are self-explanatory. If the migrant social capital was not strong enough to mitigate the emigration process, remittances as the only measure capturing migrant social capital in the model would not have power to explain emigration intentions. The main finding in the literature is that remittances help non-migrants sustain their wellbeing and stay at home. In our model, remittances are explained by instruments capturing the vulnerability of households, such as remoteness, municipality budget revenues per-capita and publicity, the latter potentially capturing the responsiveness of remittances to a community's transparency. If the purpose of remittances in maintaining non-migrants at home were dominant, then the two-stage model would correct the bias of the coefficient in an opposite direction, leading to a smaller coefficient in the bivariate probit model. Instead, the positive impact

of remittances on emigration intentions is corrected upward, suggesting a different role of remittances in migration decisions. Remittances provide a credible signal that a migrant household member or a close friend/relative is successful in a host country so it is worth emigrating. The descriptive analysis, on the other hand, indicates that the help from the extended household member abroad is crucial to successful emigration, suggesting that the network is influential in emigration decisions. Clearly, remittances also relax wealth constraints to make migration costs affordable. Importantly, the dummy variable controlling for a migrant member or close friend/relative abroad becomes insignificant after we properly identify the driving factors of remittances in the first stage. In a one-stage model, both factors affect intentions positively, signaling the possibility of a migration chain, whereby current migration begets migration in the future. After endogenizing remittances, the model shows *it is the remittances signaling for chain migration*.

The impacts of individual skill factors on emigration intentions, such as education level and language knowledge, differ in the three models. Education is not significant in the pooled and Western models, but significant in the Post-Soviet model, with a negative sign. An additional level of education makes intention to emigrate to one of the Post-Soviet states 2.3 percent less probable. Such evidence can be found in the literature. For instance, Beine, Docquier and Ozden (2009) find that diasporas increase migration flows, lower their average educational level and lead to higher concentration of low-skill migrants. Overall, we do not observe high selectivity among respondents on educational grounds. In particular, there is not a pattern of brain drain. Our finding is in line with Docquier & Marfouk's (2006) study, which shows that landlocked developing countries are, on average, less affected by brain drain. The authors use the UN definition on landlocked countries that also includes Armenia in the list of 31 countries. The study argues that smaller countries are generally more open to migration, and differences in skilled migration are somewhat proportional to differences in total migration rates. Another more recent study, which explores to what extent education directly influences major migration decisions in Ukraine, finds that education does not have a clear and persistent effect on most of the migration decisions of Ukrainians (Vakhitova and Coupé, 2013).

Education in Armenia shares the quality and approaches of other Post-Soviet countries because of common heritage, and the negative impact indicates selection of low skilled Armenians opting for migration to Russia and other Post-Soviet countries. There is much less in common between education in Armenia and in Western countries, and the differences are reflected in quality. *This deprives education of being a driving force for emigration to the West.* Instead, respondents may self-select based on language knowledge, when it comes to skills. In the pooled model, only the knowledge of Russian is significant. In the Post-Soviet model, as expected, knowledge of Russian is a push factor for potential migrants. An additional level of Russian knowledge increases the probability of

emigration by 3.63 percent. Interestingly, English knowledge has a negative coefficient in the Post-Soviet model, with an almost 10 percent significance level (P-value is 0.102).[12] That is, Armenians with English skills are, on average, less likely to emigrate to one of the Post-Soviet countries. It might be that English knowledge is not a part of the skillset needed for success in Russia. Also, language knowledge reflects cultural background and diaspora ties of respondents' families.

In the Western model, Russian language skills are still relevant, both in terms of magnitude and significance. English knowledge enters the model with a positive sign, but the significance is poor (P-value is 0.158). However, when estimating the model by alternative methods, our finding is that the coefficient is larger by more than 50 percent, with 10 percent significance. Language skills therefore matter in the choice of destination area – while Russian knowledge will help potential migrants in Post-Soviet countries, both Russian and English knowledge matters when deciding to migrate to Western countries. The role of the English language in choosing a destination area is therefore twofold – Armenians with English knowledge are less likely to migrate to one of the Post-Soviet countries, but more inclined to migrate to the West.

Work status for non-migrants is another factor that alters emigration intentions upward. Having income from work increases the migration probability by 9.82 percent in the pooled model. The impact is a little smaller for the Post-Soviet model, 8.60 percent. In the Western model, the impact is smaller, 4.65 percent, and significance decays in alternative models. At first glance, this result is counterintuitive - those who hold a vacancy with a permanent income are expected more to abstain from migrating, as it entails uncertainty in job finding, among other risks. This is what the neo-classical theory would predict, in which the migration decision hinges on earning differentials (Sjaastad, 1962, Borjas, 1987). It might be that individuals with work status are not satisfied from employment conditions, while the indicator effectively selects respondents who are competitive in labor markets with better opportunities overseas.

Table 3. Regression results for destination Post-Soviet States versus staying at home (Model 2).

VARIABLES	Bivariate probit		IV-Probit		2-stage linear probability model (2S-LPM)		Probit
	Remittance	Move abroad	Remittance	Move abroad	Remittance	Move abroad	Move abroad
Remittances		0.4158***		0.3009***		0.6781***	0.1973*
		(0.0946)		(0.0671)		(0.2350)	(0.1066)
Distance from capital	-0.0009***		-0.0019**		-0.0008***		
	(0.0003)		(0.0008)		(0.0003)		
Distance from marz center	-0.0010		-0.0007		-0.0006		
	(0.0004)		(0.0009)		(0.0004)		

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[12] The coefficient is significant at the 10 percent level in IV-Probit and Probit models.

Budget transparency	-0.0738**		-0.0656		-0.0475*		
	(0.0227)		(0.0523)		(0.0280)		
Budget revenue per capita	-0.0038***		-0.0009**		-0.0004**		
	(0.0009)		(0.0004)		(0.0002)		
1[rural=1, border=1]	0.1245	0.1115***	0.5948***	-0.0004	0.2197***	0.0838	0.5680***
	(0.0508)	(0.0409)	(0.1521)	(0.0714)	(0.0575)	(0.0531)	(0.1266)
1[rural=1, border=0]	-0.0996*	0.0308	-0.0486	0.0412	-0.0095	0.0412	0.0922
	(0.0365)	(0.0366)	(0.0779)	(0.0324)	(0.0320)	(0.0409)	(0.1225)
1[rural=0, border=1]	0.1317***	0.0398	0.4171***	-0.0001	0.1938***	0.0154	0.2369*
	(0.0439)	(0.0373)	(0.1387)	(0.0448)	(0.0494)	(0.0414)	(0.1249)
Income from work	-0.0428*	0.0860***	-0.0882	0.0766***	-0.0418*	0.0945***	0.2701***
	(0.0223)	(0.0301)	(0.0713)	(0.0293)	(0.0248)	(0.0361)	(0.1004)
Education level	-0.0057	-0.0227**	-0.0125	-0.0165	-0.0063	-0.0196*	-0.0898**
	(0.0081)	(0.0103)	(0.02230	(0.0114)	(0.0086)	(0.0115)	(0.0348)
Age	0.0024**	-0.0042***	0.0051	-0.0037**	0.0022	-0.0049***	-0.0125**
	(0.0012)	(0.0015)	(0.0036)	(0.0015)	(0.0013)	(0.0017)	(0.0050)
Married	-0.0360	-0.0005	-0.0363	-0.0050	-0.0296	0.0124	-0.0436
	(0.0241)	(0.0304)	(0.0669)	(0.0288)	(0.0256)	(0.0347)	(0.1040)
Female	0.0092	-0.1112***	0.0247	-0.0848**	0.0154	-0.1240***	-0.3687***
	(0.0199)	(0.0260)	(0.0604)	(0.0359)	(0.0222)	(0.0287)	(0.0847)
English skills	-0.0018	-0.0341	0.0228	-0.0385*	-0.0031	-0.0283	-0.1232*
	(0.0157)	(0.0208)	(0.0485)	(0.0228)	(0.0176)	(0.0213)	(0.0702)
Russian skills	0.0015	0.0363**	-0.0107	0.0235	-0.0064	0.0390**	0.1192**
	(0.0116)	(0.0159)	(0.0347)	(0.0165)	(0.0123)	(0.0173)	(0.0542)
Household size	0.0144*	-0.0033	0.0268	-0.0037	0.0173*	-0.0087	0.0113
	(0.0081)	(0.0102)	(0.0234)	(0.0104)	(0.0094)	(0.0122)	(0.0323)
Home ownership	0.0002	-0.1940***	-0.0904	-0.1043	-0.0142	-0.2182***	-0.7075***
	(0.0439)	(0.0502)	(0.1200)	(0.0670)	(0.0417)	(0.0665)	(0.1632)
Dependant (old)	0.0103	-0.0353	0.0683	-0.0518*	0.0102	-0.0417	-0.1157
	(0.0208)	(0.0272)	(0.0642)	(0.0266)	(0.0245)	(0.0308)	(0.0913)
Dependant (child)	-0.0062	0.0028	-0.0166	0.0061	-0.0131	0.0062	-0.0094
	(0.0118)	(0.0144)	(0.0343)	(0.0141)	(0.0130)	(0.0163)	(0.0485)
Financial situation	0.0148	-0.0563***	0.0681**	-0.0441***	0.0181	-0.0584***	-0.1784***
	(0.0103)	(0.0138)	(0.0310)	(0.0139)	(0.0122)	(0.0161)	(0.0456)
Computer	0.0698**	-0.0407	0.0645	-0.0222	0.0662***	-0.0616*	-0.0642*
	(0.0216)	(0.0289)	(0.0651)	(0.0282)	(0.0244)	(0.0359)	(0.0952)
Mining industry	0.0844***	-0.0423	0.1653*	-0.0159	0.0984**	-0.0521	-0.1015
	(0.0315)	(0.0397)	(0.1002)	(0.0379)	(0.0386)	(0.0453)	(0.1340)
Wald chi-sq. of rho, P-value	11.9507***, 0.0005		461.35***, 0.0000				
Hansen J-statistic, P-value					0.371, 0.9463		
Endogeneity test, P-value					9.297***, 0.0023		
Wald chi-sq. of probit, P-value							120.19***, 0.000
Observations	1,991		2139		1,991		1991

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05, * p<0.1

Among the remaining individual characteristics, age and gender are significant, both entering the model with a negative sign. The probability of emigration for a ten year older respondent is 6.4 percent less. If we take 25 years of difference between generations, then a representative of the elder generation has a 16 percent less intention to emigrate. In other words, there is a substantial difference in emigration intentions between young and old generations, the latter being less eager to leave the

home country. In the migration literature, the inverse relationship between age and geographic mobility emerges constantly (Long, 1972, 1973; Miller, 1977). Sandefur & Scott (1981) argue that this relationship is attributed to the association between age and unmeasured characteristics and aspects of family life cycle and work career. The age impact on emigration intentions is smaller in the Post-Soviet and Western model, 4.2 and 4.0 percent, respectively.

In the pooled model, female respondents are less eager to emigrate by 10.9 percent, and the downward shift is even larger in the Post-Soviet model, 11.1 percent, with 1 percent significance. In the Western model, gender does not matter in migration decisions. Studies of migration provide mixed evidence on the association of gender with migration. Some scholars argue that for women, lower income and comfort expectations are important for migration (De Jong, 2000), while others claim that, opposite to women, men migrate more from the regions which have strong a migration culture (Heering, Van Der Erf & Van Wissen, 2004). The existing evidence also shows that for men, temporary labor migration is mainly a response to community level factors, while for women that decision is predominantly determined by individual characteristics (Yang & Guo, 1999).

Our results show that marital status is not significant in either model. In general, evidence of the relationship between marital status and migration decisions is mixed. According to Mincer (1978), family ties have an important effect on migration. According to Epstein and Epstein (2006), being married is not significant for migration intentions/probability. The authors argue that having friends who have worked abroad, friends and relatives who are abroad, and friends and relatives who are planning to go abroad determine the migration potential of an individual. They show that herds and networks provide varying degrees of assistance and information to potential migrants.

Homeowners are less likely to emigrate. From the pooled model we learn that emigration intentions among home owners are lower by 13.81 percent. The coefficient is high enough to affect the ultimate decision on migration. The opportunity cost for a potential migrant increases dramatically if she/he has an apartment/house in the home country. The policy implication of this result is that stimulating the housing market in the home country can slow down out-migration. The magnitude is even larger in absolute value in the Post-Soviet model, 19.40 percent, while it is insignificant in the Western model. Another indicator linked to the welfare of respondents' households is their financial situation. A one step improvement in the financial situation of a household dampens the emigration intentions of a respondent by 7.45 percent. Corresponding percentages in the Post-Soviet and Western models are 5.63 and 4.56, respectively. Dependents in households, either children or elderly, do not perturb emigration intentions significantly. The coefficient of the old dependent(s) is negative and close to 10 percent significance (P-value = 0.112), suggesting that having an elder in the family makes the

option of emigration less attractive, and in some cases, not feasible. The magnitude is, however, not sizeable.

The presence of the mining industry connected to a community pulls down emigration intentions. The mining industry in Armenia played an important role during the World Financial Crisis that began in 2008 and that continued to impact the Armenian and global economy in 2011 and 2012. Mining pays relatively high wages and is in third place in the sectoral wage ranking after the financial and IT sectors (see, e.g., Gigoryan, 2013), and many households in communities with mines benefit from the sector directly as employees or indirectly, through the shared prosperity mechanisms peculiar to extractive industries.

Having a computer at home does not alter emigration intentions significantly. Still, the impact is negative and close to significance in the Post-Soviet model (P-value = 0.16), suggesting that respondents who have access to modern technologies, in our model captured by the presence of computer at home, have fewer incentives to leave for one of the Post-Soviet countries. Together with this evidence, we conclude that Armenians with a higher level of formal education and hands-on skills, such as English knowledge and computer literacy, express less intention to migrate to one of the Post-Soviet states, most likely to Russia. The impact of having a computer at home is positive for the Western models, but the significance is preserved in only two models (IV linear and probit).

Table 4. Regression results for destination Western countries versus staying at home (Model 3).

VARIABLES	Bivariate probit		IV-Probit		2-stage linear probability model (2S-LPM)		Probit
	Remittance	Move abroad	Remittance	Move abroad	Remittance	Move abroad	Move abroad
Remittances		0.3780**		-0.0484		0.0531	0.3486***
		(0.1550)		(0.1996)		(0.1080)	(0.1233)
Distance from capital	-0.0007*		-0.0023**		-0.0009**		
	(0.0004)		(0.0011)		(0.0003)		
Distance from marz center	-0.0009**		-0.0013		-0.0006		
	(0.0005)		(0.0017)		(0.0005)		
Budget transparency	-0.0668***		-0.0930		-0.0533*		
	(0.0233)		(0.0879)		(0.0275)		
Budget revenue per capita	-0.0027***		-0.0005		-0.0004**		
	(0.0009)		(0.0008)		(0.0002)		
1[rural=1, border=1]	0.1285**	-0.1742***	0.6957**	-0.1090	0.2258***	0.1048***	-0.6815***
	(0.0549)	(0.0426)	(0.2034)	(0.0781)	(0.0664)	(0.0292)	(0.1850)
1[rural=1, border=0]	-0.1006**	-0.0489	-0.0257	-0.0508	-0.0260	-0.0620*	-0.2582
	(0.0390)	(0.0386)	(0.0913)	(0.0402)	(0.0351)	(0.0349)	(0.1732)
1[rural=0, border=1]	0.1511***	-0.0918***	0.6056***	-0.0444	0.2275***	0.0766***	-0.3347**
	(0.0483)	(0.0330)	(0.1654)	(0.0544)	(0.0545)	(0.0294)	(0.1530)
Income from work	-0.0554**	0.0465**	-0.1028	0.0198	-0.0563**	0.0399	0.1635
	(0.0234)	(0.0272)	(0.0756)	(0.0301)	(0.0266)	(0.0266)	(0.1307)

Education level	-0.0067	0.0015	-0.0126	-0.0001	-0.0070	-0.0002	-0.0001
	(0.0083)	(0.0088)	(0.0232)	(0.0084)	(0.0090)	(0.0088)	(0.0423)
Age	0.0033***	-0.0040***	0.0038	-0.0022	0.0033	0.0030**	-0.0155**
	(0.0012)	(0.0014)	(0.0035)	(0.0014)	(0.0014)	(0.0014)	(0.0065)
Married	-0.0616**	0.0250	-0.0935	-0.0108	-0.0586**	-0.0024	0.0385
	(0.0238)	(0.0276)	(0.0681)	(0.0311)	(0.0259)	(0.0285)	(0.1308)
Female	0.0091	-0.0237	0.0329	-0.0209	0.0052	-0.0147	-0.1182
	(0.0212)	(0.0232)	(0.0647)	(0.0215)	(0.0235)	(0.0230)	(0.1081)
English skills	0.0057	0.0242	0.0170	0.0312*	0.0039	0.0321*	0.1294
	(0.0160)	(0.0171)	(0.0472)	(0.0168)	(0.0174)	(0.0189)	(0.0798)
Russian skills	-0.0102	0.0364***	-0.0481	0.0292**	-0.0114	0.0321**	0.1669***
	(0.0122)	(0.0137)	(0.0378)	(0.0145)	(0.0134)	(0.0136)	(0.0639)
Household size	0.0242***	0.0021	0.0606**	0.0144	0.0297***	0.0137	0.0536
	(0.0091)	(0.0086)	(0.0294)	(0.0167)	(0.0113)	(0.0112)	(0.0409)
Home ownership	0.0189	0.0289	-0.0370	0.0122	0.0038	0.0190	0.1276
	(0.0491)	(0.0485)	(0.1435)	(0.0412)	(0.0492)	(0.0446)	(0.2196)
Dependant (old)	-0.0127	-0.0106	-0.0345	-0.0214	-0.0144	-0.0227	-0.0759
	(0.0217)	(0.0244)	(0.0664)	(0.0255)	(0.0247)	(0.0245)	(0.1159)
Dependant (child)	-0.0170	-0.0176	-0.0480	-0.0260	-0.0258*	0.0241**	-0.1216**
	(0.0127)	(0.0133)	(0.0357)	(0.0179)	(0.0137)	(0.0122)	(0.0608)
Financial situation	0.0083	-0.0456***	0.0491	-0.0380**	0.0075	0.0494***	-0.2213***
	(0.0118)	(0.0120)	(0.0329)	(0.0128)	(0.0127)	(0.0129)	(0.0602)
Computer	0.0900***	0.0247	0.1764**	0.0610	0.0893***	0.0506**	0.2357**
	(0.0238)	(0.0267)	(0.0684)	(0.0478)	(0.0254)	(0.0248)	(0.1164)
Mining industry	0.0803**	-0.1340***	0.1998*	-0.1115**	0.1037**	0.0989***	-0.6288***
	(0.0348)	(0.0372)	(0.1115)	(0.0345)	(0.0434)	(0.0245)	(0.1757)
Wald chi-sq. of rho, P-value	239.88*, 0.0761		141.2***, 0.0000				
Hansen J-statistic, P-value					5.019, 0.1704		
Endogeneity test, P-value					0.0023, 0.9735		
Wald chi-sq. of probit, P-value							114.05, 0.0000
Observations	1,811		1920		1,811		1811

In the next section, we analyze the robustness of our findings, suggesting alternative estimation methods. As we will see, the bivariate probit and alternative two stages models are not sufficiently powerful to explain intentions to migrate to Western countries.

7. Robustness of the model

We check the robustness of the model in several ways. In particular, we want to make sure that the estimation results do not change qualitatively if we run alternative two-stage models. In columns 3-4, Table 2, we report the output from the IV-probit model, in which the instrumented variable is required to be continuous. We construct a count variable for remittances (from 0 to 4) and treat it as a continuous variable, in order to estimate the model as an IV-probit. The very distance between zero and nonzero observations is substantially mitigated when introducing the count variable. Importantly, when we estimate the IV-probit with levels of remittances, the outcomes do not differ from those with

count variable qualitatively.[13] In IV-probit, remittances are significant in the pooled and the post-Soviet models, but not in the Western model.

The estimation output from the two-stage linear probability model (2S-LPM) is reported in columns 5-6, in Tables 2-4. The 2S-LPM model has a strong potential to approximate the nonlinear probabilistic model. In our case, the magnitude and the significance of estimated coefficients from the 2S-LPM are very close to their counterparts from the bivariate probit. The 2S-LPM coefficients from the second stage are uniformly larger, but otherwise the two outcomes are qualitatively the same. The rationale is then that since the 2S-LPM is a good approximation of the bivariate probit model, the diagnostic tests from the2S-LPM can be used to learn the quality of the specified econometric model, estimated by non-linear and linear methods. The quality of instruments is of particular interest. We estimate the 2S-LPM by a generalized method of moments (GMM), as the model is heteroskedastic, so that the GMM is preferred to the instrumental variable (IV) estimator.[14] The F-test for the joint significance of instruments is significant at the 99 percent level in all models.[15] The Hansen J-statistic is highly insignificant in all models, the null hypothesis being that the instruments are uncorrelated with the error term of the structural model. An endogeneity test (with the null hypothesis that remittances can be treated as exogenous) suggests, however, that the two-stage model for the Western model may not be identified.

Table 5. Two-stage and Lewbel (2012) models.

VARIABLES	2S-LPM	Lewbel (2012) without excluded instruments	Lewbel (2012) with excluded instruments
Remittances	0,0530	0,1196**	0,1068*
	(0,108)	(0,0596)	(0,0546)
1[rural=1, border=1]	-0,1048***	-0,1001***	-0,0955***
	(0,0292)	(0,0248)	(0,0246)
1[rural=1, border=0]	-0,0620*	-0,0426	-0,0493
	(0,0349)	(0,0346)	(0,0328)
1[rural=0, border=1]	-0,0765**	-0,0798***	-0,0812***
	(0.0294)	(0,0266)	(0,0251)
Income from work	0,0399	0,0503**	0,0596**
	(0,0266)	(0,0252)	(0,0244)
Education level	-0,0001	0,0030	0,0042
	(0,0088)	(0,0088)	(0,0083)
Age	-0,0030**	-0,0030**	-0,0031**
	(0,0014)	(0,0012)	(0,0012)
Married	-0,0023	0,0163	0,0138
	(0,0285)	(0,0282)	(0,0267)

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[13] Still, we prefer to report the IV-probit with the count variable for remittances, taking into account that (i) remittances are usually underreported and therefore cardinality cannot be properly captured and (ii) the distance between zero and non-zero observations in levels further distorts the distribution of reported remittances (in addition to excessive zeros).

[14] If there is heteroskedasticity, the GMM estimator is more efficient than the IV estimator. See, for instance, Baum et al. (2007). The Pagan-Hall tests confirms the presence of strong heteroskedasticity with the P-value = 0.001.

[15] When there is one endogenous variable, the F-test is identical to the partial R-square by Shea (1997), the general test for the relevance of instruments.

Female	-0,0146	-0,0193	-0,0081
	(0,0230)	(0,0226)	(0,0217)
English skills	0,0320*	0,0433**	0,0377**
	(0,0189)	(0,0195)	(0,0184)
Russian skills	0,0320**	0,0259**	0,0265**
	(0,0136)	(0,0130)	(0,0127)
Household size	0,0137	0,0081	0,0081
	(0,0112)	(0,0082)	(0,0075)
Home ownership	0,0189	0,0196	0,0182
	(0,0446)	(0,0467)	(0,0461)
Dependant (old)	-0,0226	-0,0133	-0,0157
	(0,0245)	(0,0232)	(0,0221)
Dependant (child)	-0,0241**	-0,0233*	-0,0226**
	(0,0122)	(0,0121)	(0,0109)
Financial situation	-0,0493***	-0,0512***	-0,0534***
	(0,0129)	(0,0124)	(0,0120)
Computer	0,0506**	0,0414*	0,0423*
	(0,0248)	(0,0227)	(0,0224)
Mining industry	-0,0989***	-0,0884***	-0,0901***
	(0,0245)	(0,0217)	(0,0213)
Wald chi-sq. of rho, P-value			
Hansen J-statistic, P-value	5.02 ; 0.17	15.1 ; 0.516	20.7; 0.416
Wald chi-sq. of probit, P-value			
Observations	1811	1811	1811

The robustness analysis shows that the two-stage model with selected instruments fails to retrieve the impact of remittances on out-migration for the Western model. While we have a significant coefficient for remittances in the bivariate model, it is not preserved in the alternative two models[16], suggesting that model identification can be achieved by a different set of exclusion restrictions.

Since the early 2000s, there have been several econometric methods achieving model identification without exclusion restrictions, such as Rigobon (2003) and Klein and Vella (2009, 2010). The method suggested by Lewbel (2012) has been successfully applied by several authors, such as Denny and Oppedisano (2013), Rashad and Markowits (2007), Emran and Hou (2008), Fortin and Ragued (2016), and Millimet and Roy (2016), among others. The model generates heteroskedasticity-based instruments from the variables, included in the structural model. It also allows the incorporation of excluded instruments into the model and identification of their net contribution.

The generic model in Lewbel (2012) has the following form:

$$Y_1 = X'\beta_1 + Y_2\gamma_1 + \varepsilon_1, \qquad (1)$$

$$Y_2 = X'\beta_2 + \varepsilon_2. \qquad (2)$$

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[16] A potential danger in achieving model identification is also reflected in the weak significance of Wald Chi-square test of rho in the bivariate model (P-value = 0.0761).

The variable Y_2 is endogenous ($Corr(Y_2, \varepsilon_1) \neq 0$), Y_1 is the outcome variable, X is the vector of exogenous variables, and the error terms ε_1 and ε_2 are potentially correlated. In the system of equations, (1) is the structural equation and (2) is the first stage. In the standard two-stage model, some elements in X are not a part of the structural equation, but they have power to explain the endogenous variable Y_2 and serve as excluded instruments. To be a valid instrument, they should also be orthogonal to the error term ε_1. Lewbel's (2012) method provides a solution to the identification of parameters when excluded instruments are not available. In order to identify the model, the following conditions should hold:

1. $E(X'\varepsilon_1) \neq 0$. This is the standard exogeneity condition for X;
2. $Cov(Z, \varepsilon_2^2) \neq 0$. In words, there should be hetereskedasticty in the first stage model. This assumption is testable by a standard Breusch – Pagan test;
3. $Cov(Z, \varepsilon_1\varepsilon_2) = 0$. This condition can be somewhat analogous to the excludability condition of instruments from the structural equation.

As Lewbel (2012) indicates, in a general class of models suffering from an endogeneity problem, correlation in error terms stems from the presence of an unobserved common factor. In our case, the key source of endogeneity stems from omitted characteristics of migrant members, affecting both remittance and out-migration decisions. The common factor driving both then becomes the omitted variable. In our case, the endogenous variable is a dummy, and Lewbel (2017) shows that the method, applicable for a continuous endogenous variable, works for a binary endogenous variable too.

In Table 5, we report the second stage estimation output from the following models: (i) standard 2S-LPM model, the same as reported in Table 4 (column 5-6), (ii) a Lewbel (2012) model with only generated instruments and (iii) a Lewbel (2012) model with generated and excluded instruments. A Breusch – Pagan test confirms the presence of heteroskedasticity – the null hypothesis that there is no heteroskedasticity is rejected at the one percent significance level. This is a necessary condition for applying the method. The remittance coefficients from two specifications of Lewbel (2012) are fairly close. Both the magnitude and the significance are slightly larger in the model with only generated instruments, suggesting that external instruments do not add much value in explaining the causal relationship between remittance and out-migration. The P-values of endogeneity tests from models (i) and (ii) are 0.1476 and 0.1884, respectively, confirming the argument. The remittance coefficient magnitudes from Lewbel models are 3 times smaller than their counterparts in bivariate and simple probit models. Taking into account that Lewbel's (2012) method utilizes the entire (available) set of information, both from external and internal sources and does a better job in model identification than the traditional two-stage model, we conclude that, *among potential migrants with a destination in Western countries, remittances are not as important for out-migration decisions as they are for potential migrants with a destination in Post-Soviet countries, mainly Russia.*

8. Concluding remarks

Post-Soviet history distinguishes several waves of migration in Armenia, with deep rooted reasons and consequences. The recent migration wave that evolved alongside the world financial-economic crisis that began in 2008 unfolds new demographic and socio-economic challenges for policymakers. In this paper, we take a step towards identifying the determinants of migration decisions in Armenia, using household level country-representative data from 2011-2012.

Our model framework enables us to test two theories; (i) based on the insurance motive and (ii) interpreting remittances as a resource for migrant social capital. The traditional literature (NELM) views remittances as a contractual tool to keep non-migrant household members at home. Our findings foresee a different role for remittances: for non-migrants they serve as a signal for better opportunities to make money in a host country, and thereby strengthens incentives to emigrate. Remittances serve as resources to alleviate the migration process, rather than serving as a contractual tool.

We conclude that among potential migrants to Western countries remittances are not as important for out-migration decisions as they are for potential migrants who chose Post-Soviet countries as a destination. Our model findings indicate that for potential migrants heading to post-Soviet countries, geographic location, together with budget transparency and revenues, are most sensitive to the presence of remittances.

The mix of different patterns on emigration intentions in the Post-Soviet and Western models results in rather low selectivity on individual and household characteristics in migration decisions in the pooled model. Differentiating the pool of potential migrants at the destination, however, shows that selectivity is high - Armenians opting for Post-Soviet countries are rather low-skilled, while Armenians choosing one of the Western countries as a destination are more likely to be high-skilled. Education in Armenia shares the quality and approaches of other Post-Soviet countries, explaining the selection of low-skilled Armenians with migration intentions to Post-Soviet countries. There is much less in common between the quality of the Armenian and Western education systems, depriving education from being a driving force for emigration to the West. Armenians with English skills are, on average, less likely to emigrate to one of the Post-Soviet countries. Language knowledge selects respondents on families' cultural background and diaspora ties. Nevertheless, Russian language skills are relevant for migrating to the West.

Overall, our conclusion is that Armenians with a higher level of formal education and hands-on skills, such as English knowledge and computer literacy express less intention to migrate to one of the Post-Soviet states, mainly Russia. Our finding adds to the already existing evidence and supports it. For

example, Laurelle (2007) shows that young labor migrants from Central Asia going to Russia are less skilled, have a poor command of Russian, and get low-paying jobs – particularly in the building trade. Furthermore, there is also evidence about migrants who go mainly to OECD countries: "The skilled migration and the employer-driven labor migration favored in many OECD countries are particularly reliant on flows from Asia" (OECD, 2012:2).[17] Still, if both low- and high- skilled are exposed to migration, the observation based outcome is that the country experiences mass migration (Massey and Zenteno, 1999).

Given the above outcomes, how should public policy, aimed at reducing (if not reverting) migration, be designed? The objective itself is subject to challenge from the viewpoint of the migration-development literature, but the fact that large migration outflows have distorted the demography of the country rationalizes it. For Armenia, central to the issue is the threat of chain migration, when migration becomes self-perpetuating by the help of strong migration networks (Massey, 1988). The regression outcome supports the existence of chain migration in modern Armenia, which, as the literature suggests (de Haas, 2007), may go on ad-infinitum.

Lower migration intentions among home-owners who target Post-Soviet countries suggest that large scale public programs, aimed at mitigating acquisition costs of apartments and houses, can effectively strengthen incentives to stay in the home country on a permanent basis. Improving employment conditions, such as setting a minimum salary to cover a basic consumption basket and introducing viable health insurance mechanisms can be instrumental in reverting emigration intentions among the employed population. Also, policies that improve access to education and modern technologies will make the home country more attractive for households opting for migration to Post-Soviet countries. Overall, we find that policies aimed at opening more opportunities for investing in both physical and human capital can have a decisive impact on changing emigration intentions towards Post-Soviet countries. On the contrary, factors shaping intentions to migrate to Western countries are about skills (computer literacy, language knowledge), which can make Armenians competitive globally.

Perceptions are central in the migration related decision. They embed long-term trends in the country's development discourse and form cumulative incentives for migration. Suggested policies need to be large-scale and long-lived to revert massive emigration intentions, as the causes of subsequent migration waves in the country are deep-rooted and institutions involved, and short-term policy adjustments cannot address the issue.

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[17] See http://www.oecd.org/els/mig/PartIII_Asia.pdf

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Table A1. Summary statistics for observations included in the Post-Soviet model

Variable name	Mean	Std. Dev.	Min	Max
Move one of the Post-Soviet countries (Yes = 1, No = 0)	0.214	0.411	0	1
Remittances (Yes = 1, No=0)	0.166	0.372	0	1
Migrant member abroad (Yes=1, No=0)	0.105	0.307	0	1
Remittances categories (R=amount, in AMD)	0.420	1.062	0	4
1[no remittances], 0[otherwise]	0.839	0.367	0	1
1[0 <R<74500], 0[otherwise]	0.036	0.185	0	1
1[74500 ≤ R<254000], 0[otherwise]	0.038	0.192	0	1
1[254000 ≤ R<745000], 0[otherwise]	0.039	0.194	0	1
1[R ≥745000], 0[otherwise]	0.048	0.213	0	1
Work status (Yes=0, No=0)	0.661	0.473	0	1
Education categories (Yes=1, No=0)	4.280	1.411	1	7
Primary and less	0.002	0.039	0	1
Lower secondary	0.064	0.245	0	1
Upper secondary general	0.381	0.486	0	1
Upper secondary vocational	0.061	0.240	0	1
Post-secondary vocational	0.197	0.398	0	1
Higher education (bachelor/master)	0.286	0.452	0	1
Post-graduate (PhD)	0.009	0.092	0	1
Age	35.485	9.216	19	52
Marital status (Yes = 1, No=0)	0.652	0.476	0	1
Never married	0.294	0.456	0	1
Married/Living together	0.652	0.476	0	1
Divorced/Separated	0.041	0.198	0	1
Widowed	0.013	0.114	0	1
Female	0.641	0.480	0	1
Enlglish knowledge skills	0.421	0.747	0	3
1[Do not speak at all], 0[otherwise]	0.710	0.454	0	1
1[Basic knowledge], 0[otherwise]	0.186	0.389	0	1
1[Good knowledge], 0[otherwise]	0.077	0.267	0	1
1[Excellent knowledge], 0[otherwise]	0.027	0.161	0	1
Russian knowledge skills	1.493	0.905	0	3
1[Do not speak at all], 0[otherwise]	0.144	0.351	0	1
1[Basic knowledge], 0[otherwise]	0.359	0.480	0	1
1[Good knowledge], 0[otherwise]	0.357	0.479	0	1
1[Excellent knowledge], 0[otherwise]	0.140	0.347	0	1
Number of household members	4.792	1.838	1	13
Home ownership (own=1, rented=0)	1.956	0.212	0	2
Number of dependants (>65) in household	0.353	0.478	0	1
Number of children (<17) in household	1.247	1.181	0	8
Financial situation of household	1.481	0.961	0	4
1[Not at all sufficient], 0[otherwise]	0.169	0.375	0	1
1[Insufficient], 0[otherwise]	0.344	0.475	0	1
1[Sometimes sufficient, sometimes not], 0[otherwise]	0.332	0.471	0	1
1[Sufficient], 0[otherwise]	0.149	0.356	0	1
1[More than sufficient], 0[otherwise]	0.007	0.081	0	1

	Mean	Std. Dev.	Min	Max
Having a computer at home (Yes=1, No=0)	0.454	0.498	0	1
Mining sector in a community (Yes=1, No=0)	0.136	0.342	0	1
1[community is rural and has a border], 0[otherwise]	0.171	0.377	0	1
1[community is rural and has no border], 0[otherwise]	0.168	0.374	0	1
1[community is urban and has a border], 0[otherwise]	0.199	0.400	0	1
1[community is urban and has no border], 0[otherwise]	0.462	0.499	0	1
Driving distance between capital and a community (in minutes)	75.922	76.950	5	385
Driving distance between a regional and a community (in minutes)	21.573	31.409	0	160
Budget transparency	1.106	0.620	0	2
Budget is published in the newspaper (Yes=0, No=0)	0.604	0.489	0	1
Budget is published in the community website (Yes=0, No=0)	0.503	0.500	0	1
Community budget revenues from internal sources (per capital AMD)	20.431	47.412	1.310	567.861

Number of observations: 1991

Table A2. Summary statistics for observations included the Western model

Variable name	Mean	Std. Dev.	Min	Max
Move to one of the Western countries (Yes = 1, No = 0)	0.136	0.343	0	1
Remittances (Yes = 1, No=0)	0.164	0.370	0	1
Migrant member abroad (Yes=1, No=0)	0.096	0.295	0	1
Remittances categories (R=amount, in AMD)	0.412	1.045	0	4
1[no remittances], 0[otherwise]	0.839	0.368	0	1
1[0 <R<74500], 0[otherwise]	0.038	0.190	0	1
1[74500 ≤ R<254000], 0[otherwise]	0.041	0.199	0	1
1[254000 ≤ R<745000], 0[otherwise]	0.037	0.189	0	1
1[R ≥745000], 0[otherwise]	0.045	0.208	0	1
Work status (Yes=0, No=0)	0.659	0.474	0	1
Education categories (Yes=1, No=0)	4.411	1.412	1	7
Primary and less	0.002	0.041	0	1
Lower secondary	0.050	0.217	0	1
Upper secondary general	0.359	0.480	0	1
Upper secondary vocational	0.062	0.241	0	1
Post-secondary vocational	0.190	0.392	0	1
Higher education (bachelor/master)	0.327	0.469	0	1
Post-graduate (PhD)	0.010	0.099	0	1
Age	35.246	9.259	19	52
Marital status (Yes = 1, No=0)	0.633	0.482	0	1
Never married	0.309	0.462	0	1
Married/Living together	0.633	0.482	0	1
Divorced/Separated	0.041	0.199	0	1
Widowed	0.017	0.130	0	1
Female	0.671	0.470	0	1
Enlglish knowledge skills	0.515	0.814	0	3
1[Do not speak at all], 0[otherwise]	0.656	0.475	0	1
1[Basic knowledge], 0[otherwise]	0.209	0.407	0	1
1[Good knowledge], 0[otherwise]	0.099	0.299	0	1

1[Excellent knowledge], 0[otherwise]	0.036	0.186	0	1
Russian knowledge skills	1.544	0.925	0	3
1[Do not speak at all], 0[otherwise]	0.144	0.351	0	1
1[Basic knowledge], 0[otherwise]	0.329	0.470	0	1
1[Good knowledge], 0[otherwise]	0.368	0.482	0	1
1[Excellent knowledge], 0[otherwise]	0.160	0.367	0	1
Number of household members	4.760	1.843	1	13
Home ownership (own=1, rented=0)	1.967	0.179	1	2
Number of dependants (>65) in household	0.352	0.478	0	1
Number of children (<17) in household	1.202	1.166	0	8
Financial situation of household	1.535	0.982	0	4
1[Not at all sufficient], 0[otherwise]	0.163	0.369	0	1
1[Insufficient], 0[otherwise]	0.326	0.469	0	1
1[Sometimes sufficient, sometimes not], 0[otherwise]	0.333	0.471	0	1
1[Sufficient], 0[otherwise]	0.170	0.376	0	1
1[More than sufficient], 0[otherwise]	0.008	0.091	0	1
Having a computer at home (Yes=1, No=0)	0.504	0.500	0	1
Mining sector in a community (Yes=1, No=0)	0.124	0.329	0	1
1[community is rural and has a border], 0[otherwise]	0.142	0.349	0	1
1[community is rural and has no border], 0[otherwise]	0.156	0.363	0	1
1[community is urban and has a border], 0[otherwise]	0.178	0.383	0	1
1[community is urban and has no border], 0[otherwise]	0.523	0.500	0	1
Driving distance between capital and a community (in minutes)	69.078	76.303	5	385
Driving distance between a regional and a community (in minutes)	19.262	30.158	0	160
Budget transparency	1.124	0.583	0	2
Budget is published in the newspaper (Yes=0, No=0)	0.649	0.477	0	1
Budget is published in the community website (Yes=0, No=0)	0.474	0.499	0	1
Community budget revenues from internal sources (per capita AMD)	22.535	47.726	1.310	567.862

Number of observations: 1811

Table A3. Correlation matrix for the variables of interest

	move_abroad	move_PS	move_Russia	move_West	remit	memb_abr	remit_cat	work_inc	educ_level	age	married	female	eng_skill	rus_skill	hh_size
move_PS	0.6719*														
move_Russia	0.6613*	0.9842*													
move_West	0.4886*	-0.1625*	-0.1599*												
remit	0.0793*	0.0633*	0.0577*	0.0683*											
memb_abr	0.0753*	0.0844*	0.0787*	0.0302	0.2983*										
remit_cat	0.0663*	0.0577*	0.0560*	0.0565*	0.8867*	0.2746*									
work_inc	0.0630*	0.0353	0.0318	0.0401	-0.0633*	-0.0436*	-0.0731*								
educ_level	0.0001	-0.1103*	-0.1115*	0.1065*	-0.0041	0.03	-0.0089	0.1994*							
age	-0.0708*	0.0017	0.0044	-0.0732*	0.0059	-0.0164	-0.0156	0.3038*	-0.0136						
married	-0.0652*	0.0206	0.0276	-0.0854*	-0.0241	-0.1002*	-0.0138	-0.0012	-0.1029*	0.3042*					
female	-0.0946*	-0.1204*	-0.1098*	0.0099	0.0542*	0.0467*	0.0428*	-0.2132*	0.0788*	0.0155	0.0782*				
eng_skill	0.0396	-0.1156*	-0.1122*	0.1708*	-0.0085	-0.0323	0.0105	0.0315	0.3980*	-0.2142*	-0.1572*	0.0749*			
rus_skill	0.0580*	-0.0342	-0.031	0.1113*	-0.0145	-0.1278*	-0.0195	0.1475*	0.3668*	0.0142	-0.0362	0.0491*	0.4417*		
hh_size	-0.0309	0.0101	0.0122	-0.0363	0.0349	0.0496*	0.0423*	-0.1611*	-0.1213*	-0.0968*	0.2740*	0.0504*	-0.0793*	-0.1006*	
home_own	-0.0693*	-0.0941*	-0.0976*	0.0104	0.0011	0.0043	-0.0131	0.0043	0.0263	0.0011	-0.017	-0.0077	0.0103	-0.0189	0.1164*
dep_old	-0.0629*	-0.0259	-0.0244	-0.0426*	0.0082	-0.0006	0.004	0.0271	-0.0038	0.1230*	-0.0056	-0.0256	0.0103	0.0109	0.3045*
dep_child	-0.0399	0.0212	0.0246	-0.0804*	0.0121	0.0211	0.0203	-0.1346*	-0.1288*	0.0401	0.3807*	0.0917*	-0.1237*	-0.1233*	0.6599*
hh_fin_sit	-0.1048*	-0.1144*	-0.1153*	-0.0047	0.0211	-0.0088	0.0595*	0.0378	0.2286*	-0.0988*	-0.0294	-0.0106	0.1869*	0.1745*	-0.0261
computer	0.0235	-0.1027*	-0.1120*	0.1382*	0.0492*	0.0018	0.0363	0.1149*	0.3093*	-0.0613*	-0.0637*	0.0027	0.2832*	0.2605*	-0.0164
mining	-0.0357	0.025	0.0232	-0.0671*	0.0329	0.0033	0.0309	0.0158	-0.0547*	0.0189	0.0466*	0.024	-0.0075	0.0155	-0.0052
rur1_bord1	-0.0147	0.0904*	0.0934*	-0.1039*	0.0795*	-0.0124	0.1067*	-0.1222*	-0.1141*	0.0415*	0.0905*	0.0013	-0.1274*	-0.0858*	0.1092*
rur1_bord0	-0.0219	0.028	0.0275	-0.0502*	-0.0893*	-0.0209	-0.0933*	-0.0834*	-0.1724*	-0.0297	0.0612*	-0.0127	-0.1357*	-0.1666*	0.1147*
rur0_bord1	0.0047	0.0590*	0.0542*	-0.0671*	0.0539*	-0.0293	0.0433*	0.0153	0.0024	0.0149	0.0751*	0.0249	-0.0317	0.0455*	-0.0024
rur0_bord0	0.023	-0.1319*	-0.1300*	0.1643*	-0.0343	0.0472*	-0.0427*	0.1371*	0.2064*	-0.0199	-0.1689*	-0.0112	0.2159*	0.1478*	-0.1606*
distance_cap	-0.0361	0.0886*	0.0888*	-0.1337*	0.0335	-0.0418*	0.0398	-0.0505*	-0.1129*	0.0559*	0.1359*	0.0091	-0.1289*	-0.0423*	0.0661*
distance_marz	-0.0327	0.0751*	0.0757*	-0.1111*	-0.0247	-0.0169	-0.0202	-0.0787*	-0.1252*	0.0493*	0.1368*	-0.0147	-0.1442*	-0.0898*	0.1013*
budget_transp	-0.0021	-0.0403	-0.0477*	0.0259	-0.0169	-0.014	-0.0166	0.0033	0.0076	-0.0473*	0.003	0.0189	0.0242	0.0107	-0.0437*
budget_news	0.0114	-0.1083*	-0.1095*	0.1161*	-0.0222	0.0058	-0.025	0.0899*	0.1694*	-0.0419*	-0.1168*	-0.008	0.2139*	0.2008*	-0.1438*
budget_int	-0.0135	0.0561*	0.0485*	-0.0811*	0.0011	-0.0224	0.0043	-0.0829*	-0.1544*	-0.0162	0.1164*	0.0304	-0.1775*	-0.1811*	0.0865*
budget_rev	-0.0382	-0.0735*	-0.0707*	0.0305	-0.0526*	-0.0162	-0.0486*	0.0930*	0.1070*	0.0133	-0.0216	-0.0420*	0.1195*	0.0887*	-0.0554*

	home_owr	dep_old	dep_child	hh_fin_sit	computer	mining	rur1_bord1	rur1_bord0	rur0_bord1	rur0_bord0	distance_cap	distance_marz	budget_transp	budget_news	budget_int
dep_old	0.0960*														
dep_child	0.0284	0.1001*													
hh_fin_sit	0.0199	-0.022	-0.0952*												
computer	0.0014	-0.0012	-0.0803*	0.3050*											
mining	0.0157	-0.0198	0.0294	-0.1035*	-0.0636*										
rur1_bord1	0.0589*	0.0854*	0.0803*	-0.0383	-0.2149*	-0.1146*									
rur1_bord0	0.0442*	0.0223	0.0706*	-0.0890*	-0.1928*	-0.0831*	-0.1850*								
rur0_bord1	0	-0.0412*	0.0203	-0.0937*	-0.0558*	0.5117*	-0.2062*	-0.2103*							
rur0_bord0	-0.0747*	-0.0456*	-0.1254*	0.1661*	0.3397*	-0.2580*	-0.4241*	-0.4324*	-0.4821*						
distance_cap	0.0328	0.037	0.0787*	-0.0768*	-0.2387*	0.4494*	0.4607*	-0.1441*	0.5694*	-0.6735*					
distance_marz	0.0017	0.0337	0.1036*	-0.0767*	-0.2326*	0.1271*	0.3428*	0.2234*	0.0741*	-0.4686*	0.4595*				
budget_transp	-0.0114	-0.0803*	-0.012	-0.0728*	0.0771*	0.3226*	-0.4113*	-0.1314*	0.4766*	0.0187	-0.0142	-0.3441*			
budget_news	-0.0423*	-0.0773*	-0.1064*	0.0702*	0.3043*	0.0650*	-0.3990*	-0.4848*	0.1561*	0.5195*	-0.3099*	-0.5974*	0.5923*		
budget_int	0.0272	-0.0217	0.0884*	-0.1552*	-0.2013*	0.3244*	-0.1082*	0.3105*	0.4213*	-0.4793*	0.2823*	0.1640*	0.6281*	-0.2550*	
budget_rev	-0.004	0.0002	-0.0411*	0.1081*	0.1424*	0.0790*	-0.1561*	-0.1552*	0.0061	0.2212*	0.0723*	-0.1565*	-0.0655*	0.1297*	-0.2039*

Note: coefficients with a star (*) are significant at least 5 percent level.

Variable names in Table A3:

move_abroad – disclosed intention to move abroad versus staying at home (dummy variable)

move_PS– disclosed intention to move to one of the post-Soviet states versus staying at home (dummy variable)

move_Russia - disclosed intention to move to Russian Federation versus staying at home (dummy variable)

move_West – disclosed intention to move to one of the Western countries (Western Europe or North America) versus staying at home (dummy variable)

remit – remittance indicator from household member(s) abroad or close relative(s)/friend(s); dummy variable

remit_cat - remittance indicator from household member(s) abroad or close relative(s)/friend(s); categorical variable.

memb_abr – dummy indicator on having household migrant member abroad

work_inc – dummy indicator on income from work

educ – education level of a respondent

age – age of respondent

married – marital status of a respondent (dummy variable, 1 if married)

female – respondent's gender status (1, if female)

eng_skill – respondent's English language skill level (4 levels)

rus_skill – respondent's English language skill level (4 levels)

hh_size – number of member in respondent's household (including respondents and those members who are temporary absent)

home_own - home ownership (dummy variable, 1 if household owns apartment or house)

dep_old – old dependant in household (dummy variable)

dep_child– number of children under 16 in household

hh_fin_sit– household's financial situation

computer – indicates whether household owns a computer (dummy variable)

mining – indicator on the presence mining company in a community

rur1_bord1 – dummy variable identifying household location. It is 1 if household is located in a rural area and the marz is bordered with either Georgia or Azerbaijan.

rur1_bord0 – dummy variable identifying household location. It is 1 if household is located in a rural area and the marz is bordered with neither Georgia nor Azerbaijan.

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rur0_bord1 – dummy variable identifying household location. It is 1 if household is not located in a rural area and the marz is bordered with either Georgia or Azerbaijan.

rur0_bord0 – dummy variable identifying household location. It is 1 if household is not located in a rural and the marz is bordered with neither Georgia nor Azerbaijan.

 distance_cap –driving minutes between respondent's community and the capital.

distance_marz –driving minutes between respondent's community and the marz center.

 budget_transp – dummy indicator, taking value 1, if the budget has been publicized through both a local newspaper and a webpage.

newspaper.budget_news - dummy indicator, taking value 1, if the budget has been publicized through a local newspaper.

budget_int – dummy indicator, taking value 1, if the budget has been publicized through a webpage

Abstrakt

Tento článek zkoumá emigraci z Arménie za použití dat na úrovni domácností z roku 2011. Odhadujeme determinanty úmyslu emigrovat v modelu s endogenními převody ze zahraničí. Hlavním výsledkem je to, že převody pomáhají potenciálním migrantům v uskutečnění migrace. Geografické faktory dominují mezi determinanty převodů, a to především pro potenciální migranty, jejichž plánovanou destinací jsou post-sovětské republiky a nikoliv západní země. Naše výsledky ukazují, že potenciální migranty lze rozdělit do dvou skupin: vysoce kvalifikovaní migranti plánují emigrovat do západních zemí, zatímco méně kvalifikovaní migranti plánují emigrovat do post-sovětských republik. Konkrétně, znalost anglického jazyka a počítačová gramotnost zvyšuje pravděpodobnost emigrace na západ. Vzdělání je signifikantním determinantem pouze u emigrace do post-sovětských republik a jeho vliv je negativní.