Emigration intentions: theory and evidence

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Abstract

In this paper we use the household block of the Grigoryan (2014b) model and derive testable hypotheses on the causal relationship between politico-economic factors and emigration intentions. The hypotheses are tested for South Caucasian countries, using household level dataset for the period $2010 - 2013$. The response of emigration intentions to a change in political factors is the largest in transition, thus rejecting the hypothesis that partial impacts can be ordered according to the level of politico-economic development. On the other hand, the response of emigration intentions to economic policy factors is effectively ordered. The paper suggests a novelty for a non-linear relationship between emigration (intentions) and the stage of development - political discontent need not be high in transition, but small perturbation in the development process may create a high resonance in emigration intentions.

Keywords: Emigration intentions; institutions; democracy, South Caucasus; bivariate probit

JEL Codes: F22, J11, O15, R23, R28

Introduction

The relationship between out-migration and a development stage of a country is complex and involves households' expectations towards the future politico-economic discourse of the

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country. If emigration waves are frequent, then in later phases people may leave the home country permanently and join their migrant household members. Family unification as a terminal condition for households' life cycle makes migration related decisions long lived and hence more sensitive to the current and future development of a country. In this paper we aim to explain this relationship for the three post Soviet neighboring countries, Armenia, Azerbaijan and Georgia, which share common inheritance from the Soviet time, but are currently different in the stage of politico-economic development. We observe a change in a transition stage from one country to another, and estimate how emigration intentions are different in these countries, in terms of responses to certain political and economic factors.

Since the collapse of the Soviet empire, the three countries in the South Caucasus have permanently experienced large population outflows. Emigration rates in these countries are among the highest in the world. On the other hand, these countries differ in geographic conditions, unresolved territorial/ethnic conflicts and distribution of natural resources, among other factors. As a result, the countries have adopted different paths of economic development.

This paper studies the differences in emigration patterns in the South Caucasus, using microeconomic data on emigration intentions, rather than revealed actions. In the theory part, we expand the household block of the model by Grigoryan (2014b) and formally derive the hypothesis that emigration intentions are more sensitive to the political institutions, departed from democracy. Socio-economic conditions are commonly perceived endogenous to political institutions[1], implying that emigration intentions should be more responsive to these conditions in such polities either. According to our novelty, the divergence of political institutions in the South Caucasus region explains the differences in emigration patterns directly and indirectly, the latter through economic institutions.

The theoretical model involves distinct variables for political and economic factors, one for each. These are policy instruments appropriated by households, when deciding on pro-

[1]Acemoglu et al. (2004) provides an evidence-rich narrative for economic institutions endogenous to political institutions.

duction/consumption schemes and migration policies. When building the empirical model, we think of these variables as aggregate indicators, reflecting respondents' *perceptions* on government policies. Nothing impedes to add an unobservable component to the policy instruments in the theoretical model, in order to differentiate the true policy from its perceived component, but the issue is beyond the informational asymmetry. We claim that adverse perceptions on the economic development path may affect the attitude towards existing political institutions. From the first insight, the fundamental causality from political institutions to their economic counterparts is reversed, but in the dynamic context current distribution of resources updates the future political states (Acemoglu et al. (2004)). Households had been sufficiently diverse in taking advantages from the emerging politico-economic institutions in the early phase of independence, and current material conditions and the attitude towards public policies much depend on their status in the past.

As a starting point for the empirical analysis, we want to make sure that the South Caucasian countries can be effectively ranked based on the democracy measure, we construct from the Caucasus Barometer dataset and name as a "political index". This is important, because we derive the central hypothesis from the theoretical model by Grigoryan (2014b), in which countries are ranked based on the extent of power concentration, the latter aimed to capture the level of democracy in a country. Our political index is a (perceived) democracy measure, constructed in two steps. In the first step we select *political factors* and construct an index with equal weights. Then, in the second step, we regress that measure on the indicators of economic conditions, and the unexplained part is taken as the political index[2]. The underlying argument is that economic conditions are predetermined and resulted from the past political institutions. On the other hand, *economic factors* to which emigration intentions respond are captured by perception based variables, reflecting respondents' attitude towards current economic policies. That is, we also distinguish two sets of economic variables, which are mutually exclusive: (i) variables measuring households' economic condi-

[2]In our regressions we control for economic conditions, which allows to directly use the measure constructed in the first step as a political index.

tions and (ii) variables measuring respondents' attitude towards *current* economic policies. The second set of variables are the economic factors, which constitute *the economic index*.

In the empirical part of the study, we estimate how willingness to emigrate responds to variation of the political and economic indexes, given the "stock" of democracy as a country specific factor. Formally we test the following hypotheses:

Hypothesis 1: The response of emigration intentions to the deterioration of *perceived* democracy measure (the political index) is stronger in a less democratic country;

Hypothesis 2: The response of emigration intentions to the deterioration of *perceived* economic policy measure (the economic index) is stronger in a less democratic country.

In the context of the South Caucasus, these hypotheses rank the three countries in terms of the described responses, using the commonly perceived rank of the countries with respect to the "stock" of democracy.

Our key findings are as follows. The country rank with respect to the political index is not preserved - Armenia, the second in the democracy stock, reports the largest response of emigration intentions to the political index. That is, Hypothesis 1 is essentially rejected. We motivate discussion in a separate section and explain this finding in that if a country is sufficiently close to either of political regimes, such as Azerbaijan to autocracy and Georgia to democracy, emigration intentions respond to the changes in political institutions weakly, since the chance to have a shift in the direction of convergence is very low. Armenia is centered between the two absorbing states and may experience a shift in politico-economic discourse through a relatively small change in political institutions. This explains why the response of young households in Armenia to the small perturbation of political institutions is the largest. For old households, the involvement of the government in production plays a crucial role in shaping responses of emigration intentions, and we argue that it is very large in Armenia, bringing equivalent distortions to the private business. In Azerbaijan, the government is largely involved in the oil sector, and people in the private sector (rather than oil) may not feel the burden that strongly. Contrary to Hypothesis 1, one cannot reject

Hypothesis 2.

In our model we control for migrant social capital by the variable "close friend abroad", which is significant for young households[3]. The variable serves as an indicator for migration costs, since close friend(s) outside may mitigate the process of migration and thereby amplify intentions. In the theoretical model (Grigoryan (2014b)), remittances play a crucial role in explaining migration related decisions. The head of household, if emigrated, sends remittances based on altruistic motives[4]. Nevertheless, in the empirical model remittances do not have a significant impact on emigration intentions once we control for the migrant social capital.

There are only few papers studying the pattern of migration and consequences in South Caucasus. Our study has a direct link to Gugushvili (2011), which uses the same dataset as we do, but for the period 2009 - 2010. In the empirical part of the study, we test Gugushvili's (2011) hypothesis "...that in an authoritative political system (Azerbaijan), political attitudes are more important for emigration than economic conditions, while in more troubled economic environment (Georgia) material conditions are more decisive for emigration than political attitudes". Using more robust methodology, our findings fail to support Gugushvili (2011) hypothesis, both for economic conditions and for the policy index reflecting the quality of economic institutions.

Dermendzhieva (2011) provides an empirical evidence on labor migration for the countries in South Caucasus. The author uses household level dataset for South Caucasus for the years 2004 - 2005 and finds no evidence of emigration among skilled workers. Still, individuals

[3]The concept is developed by Garip (2008), using Portes (1998) approach. Grigoryan (2014a) discusses the role of migrant social capital for Armenian emigrants. Gerber and Torosyan (2013) finds an evidence for Georgia that social capital formation can be a distinct motive for sending remittances.

[4]Migration and remittances are interconnected through a large set of channels. In the literature, two types of motives are distinguished when 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. These motives are bequest (Hoddinott (1994), Bernheim et al. (1985)), accumulation of wealth (Dustmann and Kirchkamp (2001)), covering educational costs of household members (Lucas and Stark (1985)), allocating risks (Stark and Lucas (1988), Cox et al. (1998)), exchange of various types of services with remittances (Rapoport and Docquier (2005)). As a distinct motive, remittances may encourage or discourage migration from a home country (e.g. Stark (1995), van Dalen et al. (2005), Rapoport and Docquier (1998)).

with higher education are more likely to emigrate to high income OECD countries from the capital of Armenia. Despite the lack of clear evidence on brain drain, Dermendzhieva (2011) does not exclude the possibility of brain drain from the region towards high-income OECD countries. In our study, years of education and work experience are not significant in explaining emigration intentions. Respondents' low selectivity on these skill measures suggests that emigration intentions are uniformly spread over the population, known as *mass migration*. Grigoryan (2014a) finds the same evidence for Armenia.

Our paper contributes to the relatively scarce emigration literature in several aspects. To our knowledge, previous works (Taylor (1999), van Dalen et al. (2005), van Dalen and Henkens (2008)) estimate emigration intentions having no structural relationship behind. We derive our testable hypotheses from a micro-founded model, which allows to properly interpret empirical results. Importantly, we distinguish two types of households in an economy, young and old. Young households embed future development of institutions in their decisions, and the dynamic structure of the environment makes current economic and political reforms relevant for reshaping emigration intentions for the young. We suggest a novelty for a non-linear relationship between emigration (intentions) and the stage of the politico-economic development. Political discontent need not be high in transition, but small perturbation in the development process may create high resonance in emigration intentions, as it can be perceived as a shift in the political discourse from moving towards democracy to autocracy (or vice versa).

The paper has the following structure. We construct the theoretical model in Section 1. Section 2 describes the empirical strategy and the dataset. The econometric model and the followed discussion are in Section 4 and Section 5, respectively. The main findings are summarized in Conclusion.

1 Theoretical model

We derive our hypotheses from the household block of the Grigoryan (2014b) model. In order to save space, some of the analytical results will be readily used from Grigoryan (2014b).

The economy is populated by infinitely lived dynasties, each of them represented by a distinct household in a given period. Each household, distinguished by its head, lives two periods. By the end of the second period, a household bequeathes a fraction of earnings to a successor household, to be headed by the offspring. At the first period of household's life, the head decides whether to emigrate or stay at home. At the beginning of the first period, the household's head either (i) emigrates and sends remittances within that period or (ii) continues to live in the home country. At the beginning of the second period of household's life, the head, if migrated in the first period, decides on the location of family unification, between home and host. If the head stays at home in the first period, she/he can still emigrate, but with the entire family[5].

From the description it follows that in a given period we distinguish two classes of households: (i) the ones which are at their second period of life (old households, *HH1*) and (ii) the others which are at the first period of life (young households, *HH2*). The timing and migration related options are in Figure 1, where U_{bh}, U_{tf} U_{nm} and U_m are the household involved utility payoffs from *back home* and *taking family to the host country*, *no migration* and *migration*, respectively.

Each household runs a separate business project (a cottage economy), capital and productivity involved. As described below, the government participates in the production process, providing a part of capital in form of government expenditures. In fact, the head is the only producer in the household and whether he is in the home or the host country, determines the location of production. The skill level determines individual (household specific)

[5]We assume it is too costly for the household head over 45 to emigrate temporarily. Migration in the second period of the household's life encompasses the entire family, as there is no a third period for reunification.

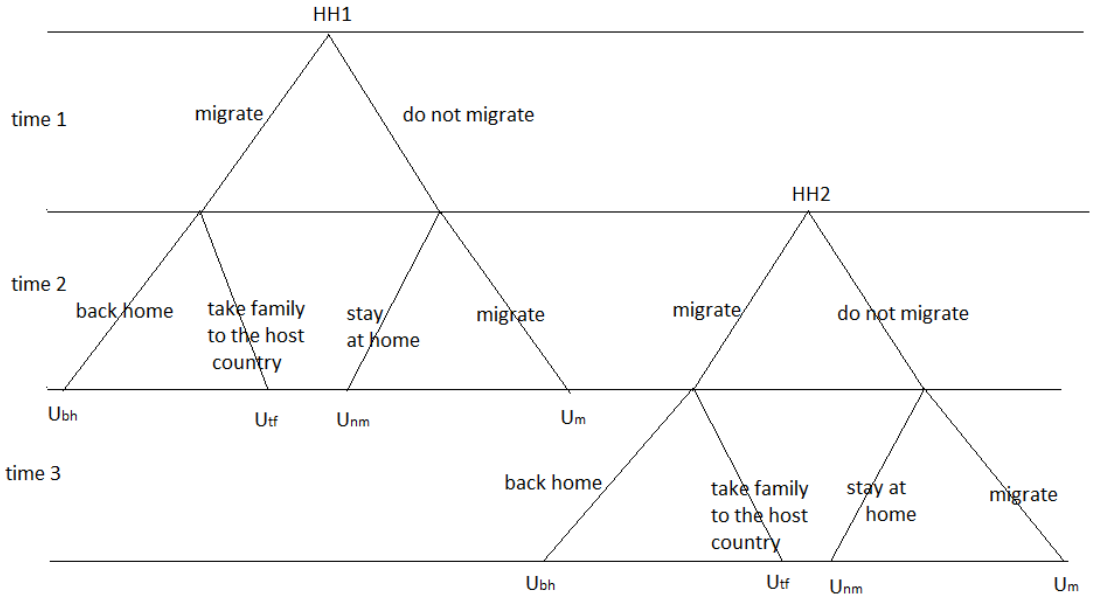

Figure 1: Household's decision tree

productivity, by which a country specific output is scaled.

For analytical convenience, we use additive separable form for the household utility function, similar to Rapoport and Docquier (2005) and Melkonyan and Grigorian (2011). In the model, labor is supplied inelastically and therefore does not enter the utility structure. For each node of decision three, we specify corresponding utility functions:

$$U_{nm} = \ln c_1 + \theta \mathbf{E}[\ln \mathbf{c_{h,2}} + \beta \ln \mathbf{k_{h,2}}], \tag{1}$$

$$U_{m} = \ln c_1 + \theta \mathbf{E}[\ln \mathbf{c_{f,2}} + \beta \ln \mathbf{k_{f,2}}], \tag{2}$$

$$U_{bh} = \alpha \ln c_{m,1} + (1-\alpha) \ln c_{n,1} + \theta \mathbf{E}[\ln \mathbf{c_{h,2}} + \beta \ln \mathbf{k_{h,2}}], \tag{3}$$

$$U_{tf} = \alpha \ln c_{m,1} + (1-\alpha) \ln c_{n,1} + \theta \mathbf{E}[\ln \mathbf{c_{f,2}} + \beta \ln \mathbf{k_{f,2}}], \tag{4}$$

where the parameter $\alpha \in (0,1)$ governs the share of the utility from consumption for the migrant member ($c_{m,1}$) and non-migrant member ($c_{n,1}$); θ is the discounting factor, β governs the share of earnings bequeathed to the offspring and $\mathbf{E}[.]$ is the expectation operator for the second period utility. Numbers in indexes indicate time periods and the variables c and k in

the square brackets are family involved consumption and bequest to the next generation. We use indexes to identify the country, h for home and and f for foreign. The bequest motive is purely altruistic, following Andreoni (1989). For the complete characterization and the solution of the household problem, see Grigoryan (2014b).

We take a more general form for the production function, which allows richer interaction between policy variables and production factors. Production function takes the form

$$y = (SA)^{\frac{1}{\gamma}}[(1-q)\mu]^{\frac{1-\gamma}{\gamma}}k^{\frac{v}{\gamma}}, \tag{5}$$

where v is the contribution of capital to the production $y = SAk^v[(1-q)g]^{1-\gamma}$, with the government expenditure g. The parameters γ and v are country specific and in particular condition the effectiveness of the individual skill S and the country specific productivity A. If government expenditures have a large contribution to the production process, given the level of power concentration, it increases the contribution of both country specific and individual productivities in the value creation process. In order to save space, we denote $\bar{A} \equiv (SA)^{\frac{1}{\gamma}}[(1-q)\mu]^{\frac{1-\gamma}{\gamma}}$, and the production function becomes $y = \bar{A}k^{\frac{v}{\gamma}}$. Under constant return to scale, which is the case in Grigoryan (2014), $v = \gamma$.

In order to derive the econometric model, we take the approach by Borjas (1987), modeling migration decision by comparing benefits at home and abroad, if migration would occur. The choice is modeled through the binary variable, which enables to make the model probabilistic. Our primary interest is to model permanent migration and for this reason we identify utilities in the corresponding nodes and compare with the alternative, which is to stay at home. We develop testable hypotheses separately for young and old households. We start from the old, since they have one period decision making and it is therefore less involved.

1.1 Old households

If the the household has no a migrant member by the end of the first period, the head of household chooses between *stay at home* and *migrate* at the beginning of the second period.

In the decision tree in Figure 1, the two choices correspond to the end nodes with the payoffs U_{nm} and U_m, respectively. Then, the choice can be modeled as[6]:

$$I^* = 1 \text{ if } I = U_m - U_{nm} > 0, \text{ otherwise } I^* = 0; \tag{6}$$

where I is a latent variable and I^* is the revealed intention to emigrate, observed from the dataset. We can write the model (6) in a standard probability form and plug consumption policies from Grigoryan (2014b) into the utilities, after correcting for minor changes due to a more general form of the production function:

$$Prob(I^* = 1) = Prob(U_m - U_{nm} > 0)$$

$$= Prob(\log[(1-\tau_2^f)^{\bar{q}_{f,2}}(1-q_{f,2})^{\eta}\bar{A}^f(k_1 - Q_2^S)^{v_f/\gamma_f}] - \log[(1-\tau_2)^{\bar{q}_2}(1-q_2)^{\eta}\bar{A}k_1^{v/\gamma}] > 0), \tag{7}$$

where $\eta = (1-\gamma)/\gamma$. Power concentration is measured by $q_2 \in [0,1]$, with perfect democracy and perfect autocracy at $q = 0$ and $q = 1$, respectively[7]. The time index represents the life period for the household under consideration. The way, private resources are diverted here, is different from that in Grigoryan (2014). There, part of resources, taxed from households but not appropriated by the government, is wasted. In the current setting there is no resource waste. The government expropriates the fraction $[1-(1-\tau)^q]$, which is less than τ unless $q = 1$, while the rest remains with the household. The intuition is that the lower the power concentration, the weaker the bargaining power of the government and the less resources are diverted from households.

Two measures of power concentration, q and $\bar{q}$, differ in that the former reflects the individual perception, while the latter is the de-facto measure of it. In the empirical model q enters as a variable and $\bar{q}$ is fixed. Households face different levels of destruction in the production process ($[1-q]^{1-\gamma}$) and extraction rents ($[1-\tau]^{\bar{q}}$), but the curvature of the

[6]We suppress the household specific index to save space.

[7]The notation is different from Grigoryan(2014b), where democracy and autocracy correspond to the values $q_2 = 1$ and $q_2 = 0$. We change the notation for the analytical convenience.

extraction rent is common for all, given by $\bar{q}$.

In our dataset, we have null information about a (potential) migrant, implying that all variables with the superscript f, determined in a host country, should be treated as unobservables. However, we keep skill and capital related productivity differentials between the host and home countries, in order to identify the impact of skill change on emigration intentions. As a result, (7) reduces to

$$\begin{aligned} Prob(I^* = 1) = Prob(\epsilon - \frac{1-\gamma}{\gamma}\log\gamma - \bar{q}_2\log(1-\tau_2) - \eta\log(1-q_2) \\ + \frac{v_f}{\gamma_f}\log(k_1 - Q_2^S) - \frac{v}{\gamma}\log k_1 + \left[\frac{1}{\gamma_f} - \frac{1}{\gamma}\right]\log S_2), \end{aligned} \tag{8}$$

where $G(.)$ is a cumulative distribution function, with the symmetric density function $G'(.)$ and the unobservable components are embedded into the error term,

$$\epsilon \equiv \bar{q}_{f,2}\log[(1-\tau_2^f) + \eta\log(1-q_{f,2}) + \frac{1}{\gamma_f}\log A^f + \frac{1-\gamma_f}{\gamma_f}\log\mu. \tag{9}$$

Assuming normality for cumulative distribution function $G(.)$, we can write the model in the probit form,

$$\begin{aligned} Prob(I^* = 1) = G(-\frac{1-\gamma}{\gamma}\log\gamma - \bar{q}_2\log(1-\tau_2) - \eta\log(1-q_2) \\ + \frac{v_f}{\gamma_f}\log(k_1 - Q_2^S) - \frac{v}{\gamma}\log k_1 - \frac{1}{\gamma}\log A + \left[\frac{1}{\gamma_f} - \frac{1}{\gamma}\right]\log S_2). \end{aligned}$$

For notational convenience we denote the argument of G by z, and evaluate it at the mean values of observables q, τ k and S. Then, in order to derive the hypotheses, we take partial derivatives with respect to the variables in the function G.

$$\frac{\partial Prob(I^* = 1)}{\partial\log q_2} = \frac{1-\gamma}{\gamma}G'(\bar{z}), \tag{10}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log \tau_2} = \bar{q}_2 G'(\bar{z}), \tag{11}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log(k_1 - Q_2^S)} = \frac{v_f}{\gamma_f} G'(\bar{z}), \ \frac{\partial Prob(I^*=1)}{\partial \log k_1} = -\frac{v}{\gamma} G'(\bar{z}) \tag{12}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log S_2} = \left[\frac{1}{\gamma_f} - \frac{1}{\gamma}\right] G'(\bar{z}). \tag{13}$$

Now, consider two economies with high and low power concentration indexes, q^h and q^l, respectively. One of the key hypotheses (Hypothesis 1), which is the response of emigration intentions to the political index is stronger in a more power concentrated country, hinges on the participation share of government in the production process. If a more power concentrated country patterns a larger involvement in the value creation process (low γ), then higher concentration brings more destruction, translating into stronger intentions to emigrate. As for the second hypothesis, according to (11), emigration intentions respond to the excessive tax rate stronger in a more concentrated country.

The role of capital in shaping intentions depends on migration cost Q_2^S: larger migration costs make potential migrants less eager to emigrate (Equation 12). On the other hand, a higher capital productivity abroad, v_f/γ_f, amplifies intentions. Finally, if government investment share is higher in a host country, it increases the individual (as well as country specific) productivity abroad and hence emigration intentions (Equation 13).

1.2 Young households

Next we develop the probabilistic model for the young household, which should decide between permanent migration and staying at home. In Figure 1, we consider two terminal nodes, U_{tf} and U_{nm} for the family unification abroad and no migration, respectively. We drop temporary migration as a second alternative to permanent migration, because our primary interest is to identify determinants of permanent migration. The choice model, similar to the one for the second period household, takes the following form:

$$I^* = 1 \text{ if } I = U_{tf} - U_{nm} > 0, \text{ otherwise } I^* = 0; \tag{14}$$

For the young household the model is more involved, because the decision making covers two periods. The probabilistic model is

$$Prob(I^* = 1) = Prob(U_{tf} - U_{nm} > 0) = Prob(\alpha \log c_{m,1} + (1-\alpha) c_{n,1}$$

$$+ \theta \mathbf{E}\{\log c_{f,2} + \beta \log k_{f,2}\} - \log c_1 - \theta \mathbf{E}\{\log c_2 + \beta \log k_2\} > 0), \tag{15}$$

where $\mathbf{E}\{\}$ the expectation operator defined over the state space S, conditioned by the information set available at the end of the first period[8].

After plugging the optimal values for the two-period consumption, capital and bequest and removing unobservables, the model in (15) takes the form

$$\begin{aligned} Prob(I^* = 1) = G((1/\gamma_f - 1/\gamma)[(1+\theta)\log S_1 + \theta \mathbf{E}\log(S_2)] \\ + (1+\theta)[v_f \log(k_0 - Q_1^M) - v \log k_0] \\ - (\alpha + \theta)\bar{q}_1 \log(1-\tau_1) - \theta \mathbf{E}\{\bar{q}_2 \log(1-\tau_2)\} \\ - (1+\theta)\eta \log(1-q_1) - \theta\eta \mathbf{E}\{\log(1-q_2)\}), \end{aligned} \tag{16}$$

where $G(.)$ is the cumulative normal distribution function, the rows, from above to below, are the corresponding terms for the skill, initial asset, power concentration and excessive tax rate. When taking the model into the data, we assume perfect foresight in order to utilize second period variables through their first period counterparts. We assume the following dynamic rule for power concentration:

$$1 - q_{t+1} = e^{\mu_j}(1-q_t)^{\lambda_{q,j}}(1-\tau_t)^{1-\lambda_{q,j}}, \tag{17}$$

where j is the country index. The rule is analytically convenient and share basic properties with that in Grigoryan (2014b)[9]. For the excessive tax rate, Grigoryan (2014b) assumes

[8] $\mathbf{E}x = \int_{s\in S} x_s f_s(x) ds$, with the (objective) probability distribution $f_s(.)$.

[9] Grigoryan (2014b) uses a linear form for the dynamic model and involves τ_{t-1}, $(1-q_{t+1}) = \lambda_q(1-q_t) - (1-\lambda_q)(\tau_t - \tau_{t-1}) + \epsilon_t^q; \epsilon_t^q \sim \mathcal{N}(0, \sigma_q^2)$.

AR(1) process, for which the deterministic version collapses to $\tau_{t+1} = \tau_t$. Also, we drop the second period migration cost, assuming that its first period counterpart Q_1^M includes the costs for family unification in the second period.

Using the dynamic rules for power concentration and the excessive tax rate, we modify (16) to

$$\begin{aligned} Prob(I^* = 1) = G((1/\gamma_f - 1/\gamma)[(1+\theta)\log S_1 + \theta \mathbf{E}\log(S_2)] \\ + (1+\theta)[(v_f/\gamma_f)\log(k_0 - Q_1^M) - (v/\gamma)\log k_0] \\ - [(\alpha+\theta)\bar{q}_1 + \theta\{1-(1-\bar{q}_1)^{\lambda_q}(1-\tau_1)^{1-\lambda_q}\} + \theta\eta(1-\lambda_q)]\log(1-\tau_1) \\ - [(1+\theta)\eta + \theta\eta\lambda_q]\log(1-q_1)), \end{aligned} \tag{18}$$

Partial impacts with respect to the variables of interest are

$$\frac{\partial Prob(I^*=1)}{\partial \log q_1} = \eta[(1+\theta) + \theta\lambda_q]G'(\bar{z}), \tag{19}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log \tau_1} = [(\alpha+\theta)\bar{q}_1 + \theta\{1-(1-\bar{q}_1)^{\lambda_q}(1-\tau_1)^{1-\lambda_q}\} + \theta\eta(1-\lambda_q)]G'(\bar{z}), \tag{20}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log(k_1 - Q_1^S)} = \frac{v_f}{\gamma_f}(1+\theta)G'(\bar{z}), \ \frac{\partial Prob(I^*=1)}{\partial \log k_1} = -\frac{v}{\gamma}(1+\theta)G'(\bar{z}), \tag{21}$$

$$\frac{\partial Prob(I^*=1)}{\partial \log S_1} = (1+2\theta)(1/\gamma_f - 1/\gamma)G'(\bar{z}). \tag{22}$$

For the young household, the partial impact of power concentration on emigration intentions depends on the share of government investments, η, but the latter is scaled upward by the factor, involving the patience rate θ and the coefficient λ_q which governs the persistence of q_t. One can draw a scenario, which may lead to the rejection of Hypothesis 1: suppose the domestic country experiences a drastic positive change in economic policies, which is effectively translated into the next period low power concentration (through small λ_q in Equation 17). Then, despite the currently high power concentration, marginal response of emigration intentions can be small enough to maintain households at home. The policy implication is

that *successful economic reforms can bring changes in emigration decisions for the young, despite their discontent from the current political discourse.*

The response of emigration intentions to the capital stock and the skill depends on their contribution to the production process, similar to the old household case. The only change is that the patience (preference) rate amplifies the response, since initial assets and skills determine the capacity of the household in raising the life time, current and next period, income. As a result, the response of emigration intentions to production factors is stronger.

2 Empirical strategy

In order to estimate for the South Caucasian countries the partial impacts on emigration intentions of (i) *power concentration*, (ii) *excessive tax rate*, (iii) *household asset holdings* and (iv) *individual skills*, we use the Caucasus Barometer Dataset for the period 2010 - 2013. We have longitudinal data on respondents' and their households' characteristics, attitudes to public policies with the large spectrum of political and economic factors, perceptions to their financial and economic situation (absolute and relative), social capital abroad in forms of household migrant member and/or a close friend abroad, intentions to emigrate (permanently and temporarily), among other variables. Summary statistics of the variables of interest separate for each country are shown in Tables 9, 10 and 11.

Power concentration and the excessive tax rate are distinct variables in the theoretical model, while in our dataset we have respondents' perceptions on the quality of public institutions. We embed the information from several variables and construct aggregate measures (indexes) as proxies for *perceived* power concentration and the excessive tax rate. In the empirical model, the political index as a perceived democracy measure is the proxy for power concentration. Respectively, the economic index measures the ineffectiveness of economic policies and proxies the excessive tax rate.

We select 4 variables to construct the political index (Pol): (i) trust towards local government, (ii) fairness of the most recent national elections, (iii) how fairly people are treated

by the government and (iv) people's right to openly say what they think. These variables enter the political index with equal weights. If a respondent gives the highest values for all variables in the index, then, according to her view, political institutions are completely in place and there is no power concentration in the sense of the theoretical model. If the index takes the value zero then the respondent perceives an absolute concentration of the power, which in particular leads to total destruction of production. Values in between correspond to imperfect concentration of the power.

For sake of robustness, we construct alternative measures for political and economic indexes, involving different set of variables, while sharing the same structure with the original indexes. The second political index, denoted Pol_2, involves the following variables: "trust towards excetive government", "fair treatment by the government", "fair elections" and "fair courts".[10]

The theoretical model in Grigoryan (2014b) ranks the countries according to the level of democracy, using the indicator, developed by Marshall et al. (2012). If we want to test the model implied hypotheses, we should make sure that the micro data preserves the ranking invoked in the theoretical model so that the estimated partial impacts can represent their theoretical counterparts. For this purpose, we plot the commutative distribution of the constructed political index (Figure 2) and discuss whether the ranking is preserved using stochastic dominance as a criterion. For a given value of the index x^*, the cumulative distribution $F(x^*)$ indicates the fraction of respondents, who evaluate the extent of democracy or the efficiency of political institutions at most x^*, while the fraction $1 - F(x^*)$ gives the value to the same variable at least x^*. Then, if a country has the lowest score of democracy in Marshall et al. (2012), which is Azerbaijan, then we expect that the corresponding index will be first order stochastically dominated by the indexes of the other two countries. Consequently, the index for Georgia should first order stochastically dominate the indexes of the

[10]The alternative political index Pol_2 involves the first and fourth variables instead of "trust towards the local government" and "open voice", appearing in then main Pol_1. The other two variables are the same in both indexes.

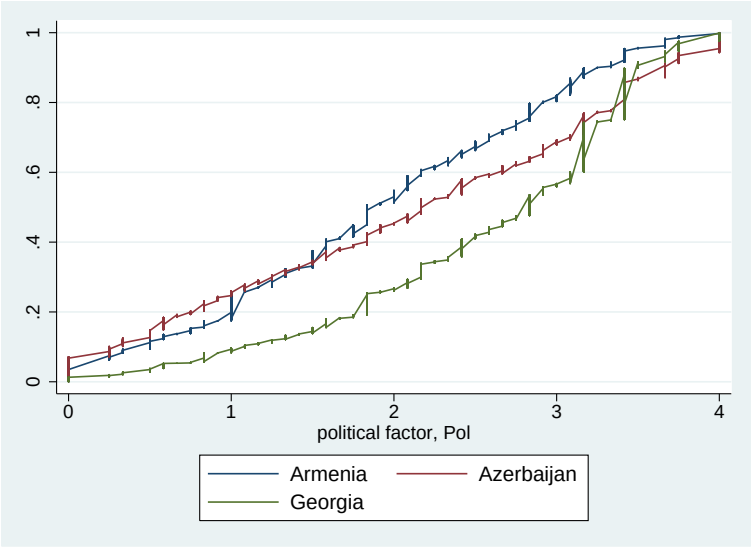

Figure 2: Cumulative distribution of the political index for the three 3 countries.

remaining countries. That is, we should have

$$F_{GEO}(x) \leq F_{ARM}(x) \leq F_{AZE}(x), \forall x \in [0, 4], \tag{23}$$

where F is the cumulative distribution function plotted in Figure 2. The expected ranking, however, is not observed, since the the cumulative distribution for Armenia remains above for the values $Pol > 1.5$. The mismatch between the democracy index by Marshall et al. (2012) and the political index based on the micro data is unexpected, because the two measures are based on the common components[11] and aggregate perceptions, though from different datasets.

We think that the discrepancy between the indexes is due to respondents (their households') economic situation, which differs from one country to another substantially. Azerbaijan patterns a strong increase in GDP per capita (Figure 4), while Georgia consistently improves the political environment. Consequently, people in Azerbaijan might be less sensi-

[11]In page 14, Marshall et al. (2012) provide information on the main components of the index: "Institutionalized Democracy: Democracy is conceived as three essential, interdependent elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation". In fact, our political index involves variables which capture respondents' perceptions in these elements.

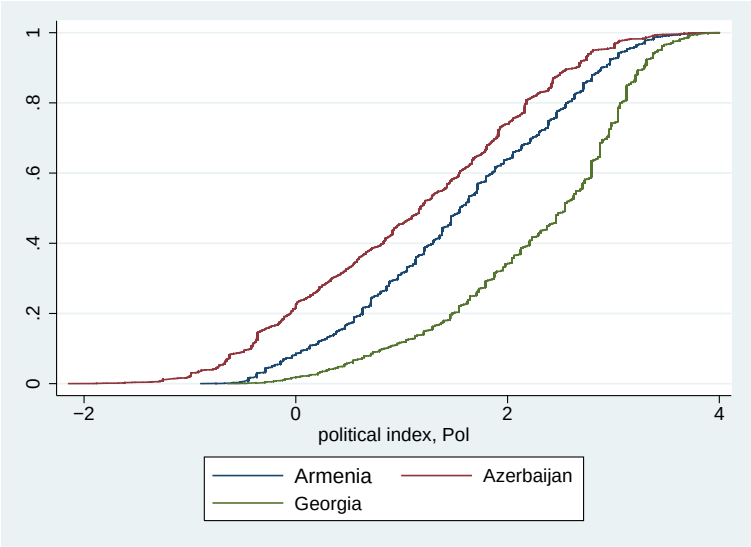

Figure 3: Cumulative distribution of the political index conditioned by economic variables for the three 3 countries.

tive to political constraints, as they are compensated by economic wellbeing, while people in Georgia directly observe achievements in democratic values and economic wellbeing does not distort political perceptions. In Armenia, on the other hand, *poor economic conditions may intensify political discontent*, and this will introduce a positive bias in our political index. (Figure 4 indicates the divergence of GDP in South Caucasus, started in 2005.) In order to control for the bias, we run the following regression for each country:

$$Pol_i = \theta_0 + \theta_1 EconSit_i + \theta_2 RelEcon_i + \epsilon_i, \tag{24}$$

where Pol_i is the political index, $EconSit_i$ and $RelEcon_i$ are the household's economic situation and relative economic conditions. The two economic variables determine the current economic conditions (absolute and relative), distinct from economic factors constituting the economic index and reflecting the attitude towards current economic policies. The regression outcome is in Table 1. As expected, all factors (the constant included) are significant. The new measure for the political index is then

$$\tilde{Pol}_i = \theta_0 + \epsilon_i, \tag{25}$$

net of the impact from the current economic situation conditions. Then, the updated cumulative distribution perfectly respects the ordering in (23), plotted in Figure 3.

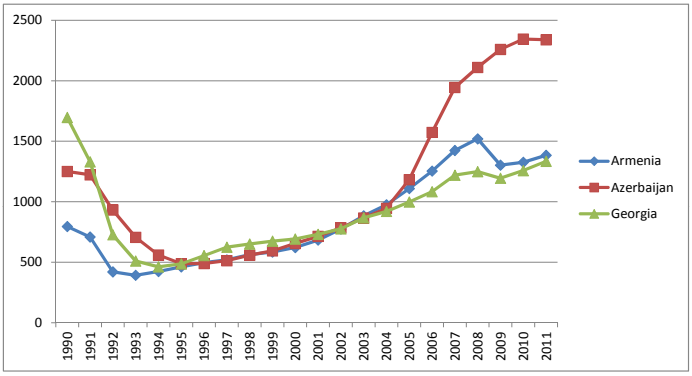

Figure 4: GDP per capita in constant 2000 US dollars. *Source:* World Bank

It is important to note that in the regression model the net impact of the political index on emigration intentions are properly identified, since we control for these economic variables.

Table 1: Regression output from Equation 24

	Armenia	Azerbaijan	Georgia
household's economic situation	.098***	.300***	.099***
	(.016)	(.022)	(.017)
household's relative economic conditions	.157***	.411***	.137***
	(.023)	(.029)	(.025)
constant term	1.482***	1.203***	2.550***
	(.041)	(.046)	(.041)
Number of observations	6793	5354	5671
R^2	.022	.143	.022

For the economic index we use respondents' perception on the importance of economic issues for their country. We identify four issues, namely, (i) corruption[12], (ii) unemployment, (iii) poverty and (iv) inflation, classified in two categories, namely, "most important issue facing the country" and the "second most important issue facing the country". If none of these issues appears in any of the two categories, the index takes value 0. If any of these issues is perceived as the second most important the country is facing, the the index takes value 1. Further, if any of these issues is perceived as the most important issue, the index

[12]We acknowledge that corruption is a direct consequence of weak institutions broadly defined, but it is rather experienced in economic relationships.

takes the value 2. Finally, if in both categories we have an economic issue, the index is equal 3, indicating that economic issues are extremely intense, according to the respondent. Similar to the political index case, we construct an alternative economic index ($Econ_2$), which uses "low wages" instead of "inflation" as a major problem in the country, otherwise the same as the main index ($Econ_1$).

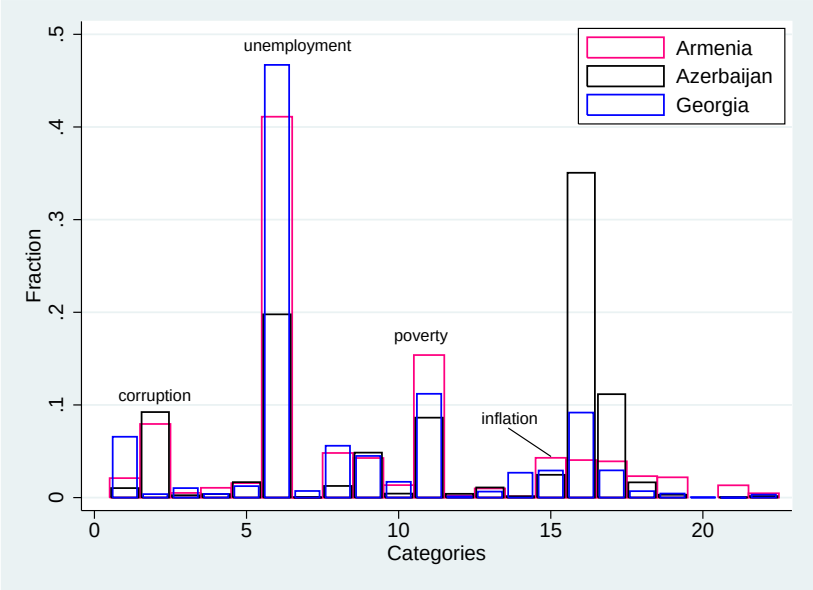

Figure 5: Most important issue the country faces: 1. Unaffordability of health care, 2. Corruption, 3. Unfairness of courts, 4. Unfairness of elections, 5. Violation of human rights, 6. Unemployment, 7. Not having NATO membership, 8. Lack of peace in the country, 9. Low pensions, 10. Political instability in the country, 11. Poverty, 12. Violation of property rights, 13. Low quality of education, 14. Relations with Russia, 15. Rising prices/Inflation, 16. Unsolved territorial conflicts, 17. Low wages, 18. Religious intolerance, 19. Other.

We observe from Figures 5 and 6 that economic factors are among the more important issues[13], while only a negligible fraction of respondents points out political factors such as unfairness of courts, unfairness of elections and violation of property rights, as the most important or second most important issue the country faces. This can be explained by the essence of economic institutions - while people acknowledge economic burden in a daily life, the burden itself is a consequence of political arrangements - a mechanism which is at the heart dynamic politico-economic models (Acemoglu et al. (2004), Grigoryan (2013, 2014b),

[13]We exclude low wages and low pensions from the economic index, since they capture households' current wellbeing, rather than reflect public policies. However, as an alternative measure for the economic index, we use low wages instead of inflation in regression models.

among others).

We also plot the histogram of the economic index (Figure 7). The crucial observation is that economic issues are generally more dominant in Armenia and less prevalent in Georgia, suggesting that the rank on political merits cannot be extended to economic merits. Importantly, we do not claim that such correspondence exists.

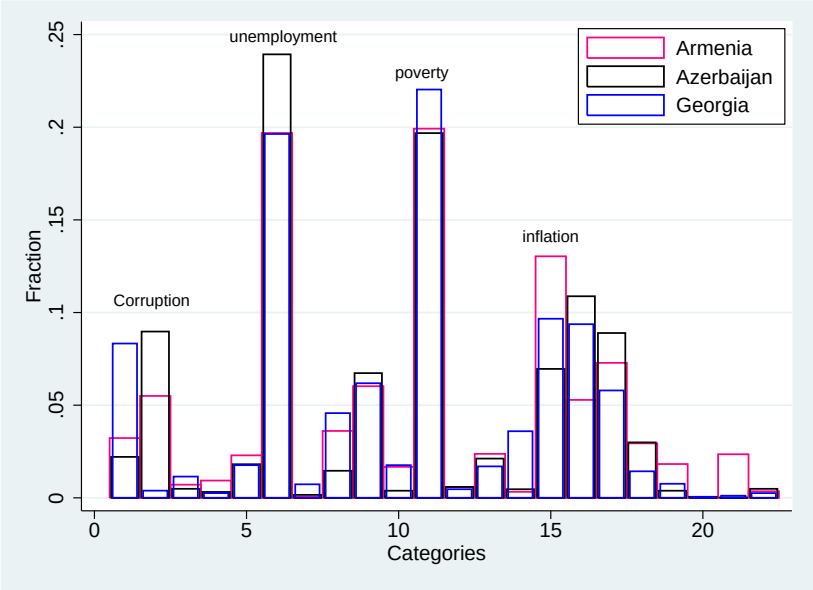

Figure 6: Second important issue the country faces: 1. Unaffordability of health care, 2. Corruption, 3. Unfairness of courts, 4. Unfairness of elections, 5. Violation of human rights, 6. Unemployment, 7. Not having NATO membership, 8. Lack of peace in the country, 9. Low pensions, 10. Political instability in the country, 11. Poverty, 12. Violation of property rights, 13. Low quality of education, 14. Relations with Russia, 15. Rising prices/Inflation, 16. Unsolved territorial conflicts, 17. Low wages, 18. Religious intolerance, 19. Other.

3 The regression model

From the partial impact analysis we conclude that the way emigration intentions respond to the variables of interest for second period households can be projected to first period households. More precisely, necessary and sufficient conditions derived for old households have been extended for the young taking expectations of second period variables. If young households do not expect structural shift in the future so that existing politico-economic institutions will be reproduced in the future, then the emigration intentions for two cohorts

will not differ. If, however, young households expect that economic institutions will significantly improve, say, in 10-15 years, then they may prefer staying at home, while second period households will depart.

We start from the model, in which we can identify both cohorts by assigning corresponding values for variables. We construct a bivariate probit model with a binary endogenous variable, which is a migrant in the household. The model goes back to Heckman (1978) and Maddala (1983), also called *a recursive probit model*. The recursive structure is conditional and does not restrict the use of the model. The selected model controls for the endogeneity of past migration and simultaneous movements in error terms due to unobserved characteristics of a migrant, which may affect both migration decision in the past for a migrant and intentions to emigrate in the present for a respondent.

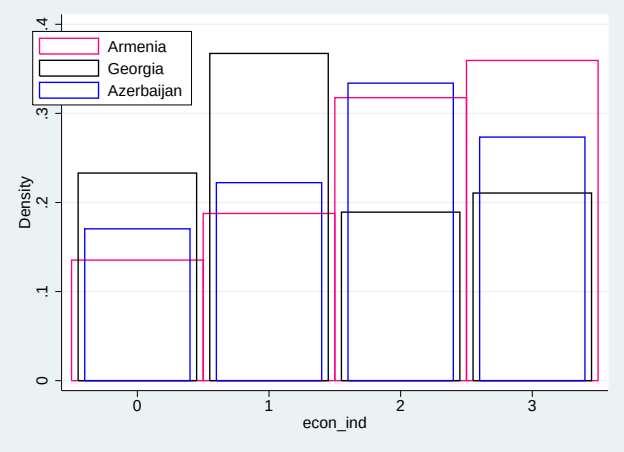

Figure 7: The histogram of the economic index: 0. No economic issue, 1. Second important issue is economic, 2. First important issue is economic, 3. Both first and second important issues are economic.

The model has the following form:

$$M = 1, \text{ if } z_1\delta_1 + z_2\delta_2 + v > 0; \text{ otherwise } M = 0, \tag{26}$$

$$I = 1, \text{ if } z_1\delta_3 + \alpha_1 M + u > 0; \text{ otherwise } I = 0, \tag{27}$$

where M and I are binary variables for *intentions to emigrate* of a respondent and *a migrant member in the household*, z_1 is the vector of control variables and z_2 is the vector of

instruments. Th vector of error terms, (u, v) is independent from $z \equiv [z_1, z_2]$, has a bivariate normal distribution with zero mean, unit variances and the correlation coefficient $\rho = Corr(u, v)$.[14] A nonzero value of ρ implies that migration in the past is endogenous and the joint distribution of (u, v) should be used to consistently estimate the coefficient vector z_1 and α_1 by the maximum likelihood estimation method.

3.1 All households

We first discuss th model with both young and old households. We estimate the model in (26) - (27). The vector of controls, z_1, involves the following variables: close friend outside, political index, economic index, relative economic conditions, household's economic situation, future economic conditions, age, child in the household, gender and employed in private sector. The vector of instruments, z_2, is rather country specific. We have the list of instruments and corresponding coefficients for all households in Table 12.

Table 2 reports the estimates of the second stage equation (27). A migrant member in the household intensifies emigration intentions in Georgia and Azerbaijan, while it has an opposite impact in Armenia. Grigoryan (2014a), using another dataset from 2011-12, estimates a 3-stage model (migration, remittances and emigration intentions), where migration in the past affects positively on emigration intentions. In our model, if we do not control for the binary variable indicating the presence of "a close friend outside the county", the coefficient for migration in the past is positive either. Social migrant capital involves close friends only for Armenia, while for the other countries the coefficient is insignificant and does not particularly divert the causal impact from the past migration to emigration intentions.

In the bivariate model for all households, we obtain the expected signs for the main variables of interest, which are the political index Pol and economic index $Econ$ and enter the model in forms of $\log(1 - Pol)$ and $\log(1 - Econ)$, respectively. These coefficients are significant for all countries at 1% level, except the economic factor for Armenia, which is significant at 5% level. In order test the two main hypotheses which rank the countries in

[14]The representation of the model is classical and can be found in e.g. Wooldridge (2010).

Table 2: Second stage output (Equation 27, $Pol_1, Econ_1$)

	Armenia	Azerbaijan	Georgia
close friend outside	.563***		
	(.169)		
household member outside		1.085***	1.036***
		(.174)	(.130)
political index	-.380***	-.544***	-.451***
	(.048)	(.070)	(.065)
economic index	-.085**	-.157***	-.127***
	(.035)	(.048)	(.045)
relative economic conditions	-.104**	-.093	-.202***
	(.047)	(.057)	(.053)
household's economic situation	-.136***	.056	-.030
	(.026)	(.039)	(.034)
future economic conditions	-.107***	-.166***	
	(.025)	(.041)	
age	-.831***	-.697***	-.473***
	(.067)	(.079)	(.065)
child	.140**	-.134*	
	(.065)	(.072)	
female		-.328***	-.125**
		(.055)	(.052)
employed in private sector	.161***		
	(.050)		
ρ	-.227**	-.714***	-.565***
	(.115)	(.169)	(.110)
Number of observations	4509	3431	5716

terms of emigration intentions' responses to the political and economic factors, we need to estimate partial impacts. Table 3 reports partial effects and average partial effects for these two variables, calculated for each country separately. In all cases, Table 3 reports that the key hypotheses, which are emigration intentions are more sensitive to both political and economic factors in a more power concentrated country, cannot be rejected:

$$|Pol_{Geo}| < |Pol_{Arm}| < |Pol_{Aze}|; \ |Econ_{Geo}| < |Econ_{Arm}| < |Econ_{Aze}|. \tag{28}$$

When taking *all* respondents into the regression model, we assume that both the young and the old has the same preferences. We may evaluate partial impacts at the specific values of determinants, such as age, marrital status etc, but the assumption of a single type of preferences does not vanish. Our primary objective is then to reveal whether the ranking in (28) can also be established when running the regression model separately for the young and for the old households.

3.2 Young households

For young households we estimate the bivariate probit model, considering that some households are at the stage of having a migrant abroad, who will either return back or take the family to the host country. The theoretical model, nevertheless, restricts the analysis to the set of young households without migrants. For this purpose we also estimate a probit model for the young.

Table 4 in reports the bivariate probit model outcomes for the respondents less than 46 years old[15]. The two models in (2) and (4) do not differ much qualitatively, but partial effects analysis shows that there are substantial differences. Partial analysis is feasible only for the economic index $Econ_1$, since its alternative $Econ_2$ yields insignificant and mixed results. We observe from Table 5 that the coefficients for the political index are the largest (in absolute values) for Armenia. In other words, the average young respondent in Armenia is more

[15]The first stage regression outcome is in Table 13.

Table 3: Partial effects analysis for all households (bivariate probit)

	Partial effects			Average partial effects		
	Georgia	Armenia	Azerbaijan	Georgia	Armenia	Azerbaijan
Pol_1	-.0301	-.1257	-.1311	-.0650	-.1170	-.1246
$Econ_1$	-.0024	-.0273	-.0379	-.0184	-.0254	-.0360
Pol_1	-.0365	-.1257	-.1347	-.0654	-.1170	-.1275
$Econ_2$	-.00371	-.0290	-.0403	-.0025	-.0270	-.0382
Pol_2	-.0294	-.1184	-.1210	-.0512	-.1101	-.1140
$Econ_1$	-.0023	-.0274	-.0429	-.0021	-.0255	-.0404
Pol_2	-.0293	-.1182	-.1246	-.0512	-.1104	-.1173
$Econ_2$	-.0023	-.0274	-.0441	-.0024	-.0280	-.0415

sensitive to political factors when deciding on permanent migration than her counterpart in Azerbaijan.

In order to properly address the hypothesis derived from the theoretical model, we restrict our attention to those households, which do not have a migrant member. For this reason we estimate a probit model, the output reported in Table 6, 2-4 columns. Economic index patterns low significance for Armenia and Georgia, between 12-20 % significance level, but it is still legitimate to test the hypothesis, since the signs remain valid. For the young, partial impact analysis shows that out four models (Table 7), the rank for the political index is preserved in two models, while in other two it is violated. To conclude, we find that there is a sufficient evidence to reject Hypothesis 1 for young households, at least in its strong form.

Migrant social capital embedded in the variable "close friend(s) abroad" is significant for young households. We can think of this variable as an indicator for migration costs - close friend(s) outside may potentially mitigate migration related costs and thus intensify emigration intentions. The impact is relevant for young households, but not for the old.

Table 4: Second stage of the bivariate model (young households) $(Pol_1, Econ_1)$

	Armenia	Azerbaijan	Georgia
close friend outside	.541**		
	(.267)		
household member outside		1.341***	1.236***
		(.216)	(.196)
political index	-.448***	-.492***	-.203*
	(.074)	(.114)	(.110)
economic index	-.098	-.150**	-.193***
	(.061)	(.065)	(.074)
relative economic conditions	-.124	-.083	-.252***
	(.085)	(.074)	(.096)
household's economic situation	-.160***	-.015	-.104*
	(.043)	(.053)	(.055)
future economic conditions	-.199***	-.145***	
	(.045)	(.056)	
age	-.446**	-.397**	-.251
	(.176)	(.173)	(.184)
child	-.028	-.040	
	(.185)	(.142)	
female		.082***	.071
	(.081)	(.088)	
employed in private sector	.121		
	(.079)		
ρ	-.252	-1.017***	-.857***
	(.185)	(.317)	(.221)
Number of observations	1495	1597	1683

Table 5: Partial effects analysis from the bivariate probit model for young households

	Partial effect			Average partial effects		
	Georgia	Armenia	Azerbaijan	Georgia	Armenia	Azerbaijan
Pol_1	.0468	-.1499	-.1401	-.0454	-.1364	-.1221
$Econ_1$	-.0172	-.0378	-.0415	-.0312	-.0340	-.0361
Pol_2	-.0444	-.1657	-.1390	-.0382	-.1494	-.1231
$Econ_1$	-.0228	-.0362	–.0423	-.0364	-.0327	-.0375

3.3 Old households

Turning to old households, we observe that political factors are more influential in Armenia too (Table 8). In all four models, $|Pol_{Arm}| > |Pol_{Aze}|$, suggesting that the second generation in Armenia is more sensitive to political issues whenever it concerns emigration. Economic factors, as for young households, respect the hypothesized rank. We do not report a bivariate probit for old households, as it provides a mixed evidence and cannot be consistently analyzed. This can be explained by the fact that old households with a migrant member are rather at the stage of temporary migration, which corresponds to a different, unexplored path in our model.

Table 6: Probit model for young and for old households

	Young households			Old households		
	Armenia	Azerbaijan	Georgia	Armenia	Azerbaijan	Georgia
close friend outside	.197***	.232***	.322***			
	(.069)	(.078)	(.082)			
political index	-.455***	-.687***	-.480***	-.416***	-.727***	-.364**
	(.065)	(.072)	(.101)	(.103)	(.162)	(.167)
economic index	-.062	-.154**	-.067	-.095	-.368***	-.164
	(.058)	(.065)	(.073)	(.085)	(.127)	(.111)
household's econ. situation	-.143***			-.193***		
	(.039)			(.060)		
future economic conditions	-.234***	-.154***			-.166**	
	(.040)	(.042)			(.082)	
age	-.443***	-.480***		-2.025***	-1.009	-.381
	(.165)	(.171)		(.343)	(.618)	(.356)
female	-.151**	-.398***		-.318***	-.305*	-.500***
	(.068)	(.075)		(.113)	(.166)	(.155)
Number of observations	1581	1851	1977	845	700	1286

Interestingly, years of education is insignificant in all regressions. The sign of theoretical partial impact with respect to the skill depends on individual productivity differential between the host and home country (Equation 13 for the old and Equation 22 for the young), and the insignificant coefficient implies that respondents do not consider to gain additional earnings abroad owing to their education based skills[16]. The same argument extends to the

[16]This evidence is consistent with Grigoryan (2014a), where the author finds low selectivity on educational

Table 7: Partial effects analysis for the probit model (young households)

	Partial effect			Average partial effects		
	Georgia	Armenia	Azerbaijan	Georgia	Armenia	Azerbaijan
Pol_1	-.0703	-.1640	-.1637	-.0732	-.1525	-.1586
$Econ_1$	-.0098	-.0251	-.0367	-.0102	-.0234	-.0356
Pol_2	-.0601	-.16735	-.16726	-.0626	-.1547	-.1630
$Econ_1$	-.0137	-.0227	-.0374	-.0143	-.0210	-.0365

Table 8: Partial effects analysis for the probit model of old households

	Partial effect			Average partial effects		
	Georgia	Armenia	Azerbaijan	Georgia	Armenia	Azerbaijan
Pol_1	-.0233	-.1067	-.0893	-.0265	-.1057	-.1044
$Econ_1$	-.0105	-.0325	-.0366	-.0119	-.0322	-.04284
Pol_2	-.0146	-.1067	-.0782	-.0166	-.1010	-.0906
$Econ_1$	-.0095	-.0325	-.0396	-.0108	-.0229	-.0459

work experience, absent in regression models.

As for the measure of capital, the economic situation may proxy for this variable. It is hard to materialize the assets of households, which can be effectively transfered to a host country and invested in production. However, current economic situation provides an insight about that potential of the household. Equations 12 and 21 indicate that the impact of capital is twofold and depends on the production share of capital at home and abroad. The argument is more explicit if migration costs are sufficiently small. Then a negative sign for the coefficient both for the young and for the old implies that the current potential of capital, measured by the variable "household's economic situation" in the model, is more efficiently used in the home country and downgrades emigration intentions. The variable and hence the argument is particularly significant for Armenia.

grounds in migration related decisions for Armenia.

4 Discussion

When summarizing the main findings from different and to some extent alternative models, we can state that Hypothesis 2 cannot be rejected, while Hypothesis 1 is rejected in most cases. If treating the entire population homogeneous in terms of migration preferences, then Hypothesis 1 is not rejected (the bivariate model in Table 2). The picture is however substantially different when running separate models for the young and for the old. In particular, political factors are more influential for both young and old households in Armenia than in Azerbaijan. We rewrite partial impacts with respect to the political index for the young,

$$\frac{\partial Prob(I^* = 1)}{\partial \log(1 - q_1)} = -\eta[(1 + \theta) + \theta\lambda_q]G'(\bar{z}). \tag{29}$$

Young households in Armenia can be more sensitive to the change in political institutions, if the latter is more path-dependent than that in Azerbaijan, $\lambda_q^{ARM} > \lambda_q^{ARM}$. Young households form expectations for the next period political institutions, and the strong persistence in the dynamics (high λ_q) translates into high responses of emigration intentions today. Current political institutions can be better in Armenia but if the deterioration of institutions are expected to be magnified more in Armenia than in Azerbaijan for the second period of life, then the young in Armenia is likely to be more vulnerable.

Grigoryan (2014b) plots a democracy index from the Policy-IV dataset, which is constant for Azerbaijan for the last 20 years and patterns limited volatility for Armenia. Little changes in political institutions may quickly vanish in Azerbaijan, while they might be amplified in Armenia, taking into account the transition the country is experiencing as "incomplete democracy" or "anocracy" (Marshall et al. (2012), Grigoryan (2013)). Grigoryan (2014a), on the other hand, finds that the push factors for emigration intentions in Armenia are rather non-economic, further suggesting that the future development of the country may well determine current emigration tendencies. We elaborate on the argument in a more detail below.

From Grigoryan (2014b) we learn that the current tax policy is a function of power

concentration. For our purpose, we can write (17) in the form

$$\log h_{t+1} = \mu + \lambda_q \log h_t + (1 - \lambda_q) \log w_t, \tag{30}$$

where $h = 1 - q$ and $w = 1 - \tau$. The policy function is $\tau_t^* = \tau(q_t; v_t, z)$, where v_t is the vector of all other variables and z is the vector of parameters, can be translated into $w_t^* = w(h_t; v_t, z)$. Then, (30) can be rewritten as

$$\log h_{t+1} = \mu + \lambda_q \log h_t + (1 - \lambda_q) \log w_t(h_t; v_t, z). \tag{31}$$

The change in current political institutions brings to a corresponding change in the next period political institutions:

$$\frac{d \log h_{t+1}}{d \log h_t} = \lambda_q + (1 - \lambda_q) \frac{\partial w_t(h_t; v_t, z)}{\partial h_t}. \tag{32}$$

The direct impact of the current political institutions (h_t) to its next period value (h_{t+1}) is captured by λ_q. The indirect impact is channeled by the economic policy, $\frac{\partial w_t(h_t; v_t, z)}{\partial h_t}$, scaled by the factor $(1-\lambda_q)$. Important to our econometric analysis, we may have a change in economic policies not triggered by political institutions, but some other factors entering in v_t. If we think that there two steady states, namely, perfect autocracy ($h = 0$) and perfect democracy ($h = 1$), a given country should gradually converge to either of two states. As plotted in Figure 8, countries closer to either of absorbing states, will have λ_q lower than countries in the middle. The economic policy component in (31) with a (potentially) nonlinear slop $(1 - \lambda_q) \frac{\partial w_t(h_t; v_t, z)}{\partial h_t}$, will perturb the graph $\log h_{t+1} = \lambda_q \log h_t$. If current economic policies bring drastic changes in future political institutions, then the resulting dynamic rule for the evolution of political institutions can be very different from its component driven by current political institutions. The dashed line is the complete dynamic rule for the evolution of political institutions, given by (31).

Current states of political institutions are specified following to the rank on the democ-

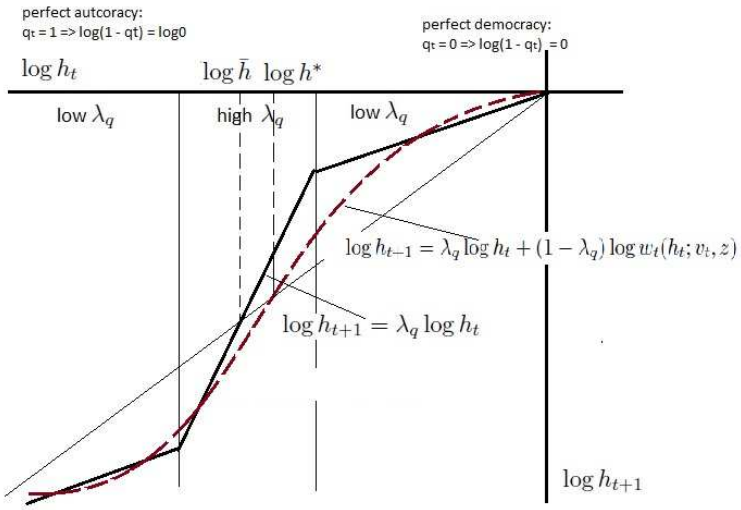

Figure 8: The dynamics of political institutions

racy index by Polity-IV in Grigoryan (2014b) (and by others such as Freedom House, Transparency International etc). Gradual convergence of political institutions is properly identified for Georgia converging to perfect democracy ($h = 1$) and for Azerbaijan converging to perfect autocracy ($h = 0$). The dynamics of political institutions in Armenia depends on the current state: if the country is at $h_0 < h^*$ ($\log h_0 < \log h^*$), it will move towards perfect autocracy, and if the country is at $h_1 > h^*$, it will reach to perfect democracy. Important to our analysis, λ_q remains high for Armenia relative to that for Azerbaijan, unless Armenia is very close to Georgia.

From (29) we see that emigration intentions for the young positively depends on λ_q. *In Armenia, according to the empirical results, the marginal response of intentions to the current political institutions are the highest which can be explained by the transition status of the country when future direction of institutional development is highly sensitive to the current politics.* The intuition behind this result is that young people in Armenia presume substantial reversibility in political institutions. While in Georgia and Azerbaijan the direction of convergence for political institutions will remain invariant to a slight change in current political institutions, in Armenia such a change may circumvent h^* in Figure 8, thus shifting the destiny of the country from democracy to autocracy or vice versa (reversal of fortune).

Young households in Armenia, therefore, are more sensitive to the movements of current political institutions, because the latter essentially determines the future politico-economic discourse of the country.

The role of economic policy is crucial in reshaping the otherwise exogenous evolution of political regimes. Grigoryan (2014b) finds that in general the more the country is autocratic, the heavier is the the excessive tax rate (except the first 2-3 periods), suggesting that economic policies amplify political rigidities rather mitigate them. The flipping point h^* is then expected to be higher for the complete dynamic rule that that for the rule without economic policy component ($\log h_{t+1} = \lambda_q \log h_t$). Suppose the country country starts from $\log h_0 \in (\log \bar{h}, \log h^*)$. Then, if economic policy had not affect next period political institutions, the country would have converged to perfect democracy. Economic policy, nevertheless, further deteriorates political institutions and the country will converge to perfect autocracy. Of course, one can draw a scenario in which $h^* < \bar{h}$, in which economic policy will rather help the country converge to perfect democracy.

For old households, the partial impact formula is

$$\frac{\partial Prob(I^* = 1)}{\partial \log(1 - q_2)} = -\frac{1-\gamma}{\gamma} G'(\bar{z}).$$

Here, the response of emigration intentions to the political index merely depends on the share of the government's contribution to the production process - a high share of government investments, 1 - γ, amplifies the response. Recalling that in the model we allow governments to be non-benevolent, larger participation of the government in business brings more distortion, and this intensifies emigration intentions. Our results suggest that old households in Armenia may reflect stronger intentions to emigrate at the margin, because the government harms the private business more severely, in terms of providing, e.g., green light to monopolists, public goods with higher costs etc, which are eventually transformed to a larger destruction in value creation. In Azerbaijan, people may not feel the burden to such a high extent, because of the very high concentration of the oil sector, distinct from the private

business. The above argument is also valid for young households.

5 Conclusion

This paper elaborates on the theoretical model by Grigoryan (2014b) and derives testable hypotheses on the causal relationship between politico-economic factors and emigration intentions for the South Caucasian countries. These hypotheses are then tested using Caucasus Barometer Dataset for the period 2010-2013.

Theoretical partial impacts of emigration intentions with respect to power concentration and the excessive tax rate convey information relevant for the interpretation of empirical findings. For young households, the dynamic rule of power concentration directly enters the partial impact formula and explains why the response of emigration intentions to power concentration is the highest in Armenia, contrary to the initial claim that partial impacts can be ordered following to the rank of democracy stock in the three countries. While Georgia is getting closer to democracy and Azerbaijan is rather perceived as an autocratic state, Armenia navigates between the two extremes, and any slight change in political institutions in either of directions creates a resonance for the young in terms of updating migration related decisions. Young households are specifically vulnerable to the arrangements of political institutions, as the quality of the second period life is essentially determined by current political institutions. Both young and old households are concerned with the government's involvement in production, which brings distortions to this process. According to the empirical results, old households in Armenia are more sensitive to these distortions in the context of migration decision making and, as in the young households' case, Azerbaijan is in the second place. Our empirical evidence therefore rejects Hypothesis 1.

The response of emigration intentions to the economic policy index is effectively ordered according to Hypothesis 2. The de-facto measure of power concentration enters the formula for the young and lonely constitutes the partial impact for the old. As a consequence, the country rank of the democracy stock, measured by power concentration, is preserved for the

economic policy index.

Our empirical framework enables to test Gugushvili (2011) hypothesis "...that in an authoritative political system (Azerbaijan), political attitudes are more important for emigration than economic conditions, while in more troubled economic environment (Georgia) material conditions are more decisive for emigration than political attitudes". Based on different and more robust methodology, our findings fail to support Gugushvili (2011) hypothesis, both for economic conditions and for the policy index reflecting the quality of economic institutions.

Our findings emphasize the role of political and/or economic reforms in shaping emigration moods for young households with forward looking nature. The marginal change in intentions particularly depends on the extent by which current policies affect the next period political institutions[17]. Current economic policies therefore can drastically change the emigration intentions for the young through the expectations for the second period outcomes. If the current government is able to launch reforms, either economic or political, it will provide an opportunity to reverse the destiny of the country and move towards democracy. The argument opens a room for the debate that *no matter how deteriorated current institutions are (causing high population outflows from the country), current politico-economic reforms can bring a "within a period" impact on emigration moods among young households.*

We also estimate the impact of migrant social capital on emigration intentions. The impact is significant for the young households, but not for the old. Somewhat surprisingly, years of education and work experience are insignificant in all regressions. Respondents' low selectivity on these skill measures suggests that emigration intentions are uniformly spread over the population, known as *mass migration* (for revealed actions) in the literature.

[17]This is embedded in λ (Equation 19) for political reforms and in $(1 - \lambda_q)$ (Equation 20) for economic reforms.

Appendix

Table 9: Summary statistics (Armenia)

Variable	Mean	Std. Dev.	Min.	Max.	N
Individual characteristics					
age	47.727	17.815	18	98	10447
female	0.569	0.495	0	1	10461
married	0.646	0.478	0	1	10478
child	0.879	0.326	0	1	10478
personal income	2.734	1.474	1	8	10057
work experience (years)	6.072	9.310	1	71	10478
years of education	11.776	3.126	0	29	10465
work in private sector	0.214	0.41	0	1	10478
intentions to emigrate (permanent)	0.255	0.436	0	1	10224
Household characteristics					
household size	3.917	1.911	1	14	8482
migrant member	0.711	0.453	0	1	10464
close friend(s) abroad	0.461	0.499	0	1	10457
remittances	0.173	0.379	0	1	10470
household's econ. situation	1.043	0.927	0	4	10393
relative economic conditions	1.867	0.684	0	4	10161
future economic rung	3.977	2.418	0	9	5636
Political factors					
trust local government	0.487	0.323	0	1	9992
trust executive government	0.383	0.314	0	1	9894
fair treatment by the government	0.271	0.278	0	1	9492
fair elections	0.492	0.5	0	1	10478
open voice	0.662	0.473	0	1	9792
fair courts	0.121	0.326	0	1	10478
political index Pol_1	2.094	1.032	0	4	8685
political index Pol_2	2.734	0.946	0	4	9084
Economic factors (most important issue)					
unemployment	0.405	0.491	0	1	10478
corruption	0.078	0.269	0	1	10478
poverty	0.152	0.359	0	1	10478
inflation	0.042	0.201	0	1	10478
low wages	0.039	0.193	0	1	10478
economic index $Econ_1$	1.901	1.039	0	3	10478
economic index $Econ_2$	1.84	1.029	0	3	10478

Source: Caucasus Barometer Dataset 2010-2013.

Table 10: Summary statistics (Azerbaijan)

Variable	Mean	Std. Dev.	Min.	Max.	N
Individual characteristics					
age	42.824	15.846	18	104	9063
female	0.518	0.5	0	1	9080
married	0.693	0.461	0	1	9094
child	0.844	0.363	0	1	9094
personal income	3.369	1.729	1	8	8810
work experience (years)	6.112	8.661	1	59	9094
years of education	11.152	2.808	0	25	8945
private sector	0.154	0.361	0	1	9094
intentions to emigrate (permanent)	0.179	0.383	0	1	8808
Household characteristics					
household size	4.226	1.786	1	14	7268
migrant member	0.439	0.496	0	1	9053
close friend(s) abroad	0.257	0.437	0	1	9063
remittances	0.055	0.227	0	1	9069
household's econ. situation	1.296	0.987	0	4	8788
relative economic conditions	1.743	0.769	0	4	8744
future economic run	4.171	2.246	0	9	5442
Political factors					
trust local government	0.516	0.317	0	1	8695
trust executive government	0.597	0.311	0	1	8569
fair treatment by the government	0.492	0.309	0	1	8296
fair elections	0.534	0.499	0	1	9094
open voice	0.518	0.5	0	1	7709
fair courts	0.19	0.393	0	1	9094
political index Pol_1	1.905	1.241	0	4	7094
political index Pol_2	2.15	1.088	0	4	7917
Economic factors (most important issue)					
unemployment	0.197	0.398	0	1	9094
corruption	0.092	0.289	0	1	9094
poverty	0.086	0.28	0	1	9094
inflation	0.025	0.155	0	1	9094
low wages	0.111	0.314	0	1	9094
economic index $Econ_1$	1.377	1.059	0	3	9094
economic index $Econ_2$	1.57	1.05	0	3	9094

Source: Caucasus Barometer Dataset 2010-2013.

Table 11: Summary statistics (Georgia)

Variable	Mean	Std. Dev.	Min.	Max.	N
Individual characteristics					
age	49.328	18.227	18	103	10954
female	0.604	0.489	0	1	10968
married	0.601	0.49	0	1	11002
child	0.863	0.344	0	1	11002
personal income	2.626	1.378	1	8	10462
work experience (years)	5.541	9.759	1	75	11002
years of education	12.522	3.306	0	27	10931
private sector	0.212	0.409	0	1	11002
intentions to emigrate (permanent)	0.069	0.254	0	1	10771
Household characteristics					
household size	3.502	1.829	1	13	9011
migrant member	0.466	0.499	0	1	10977
close friend(s) abroad	0.318	0.466	0	1	10956
remittances	0.1	0.299	0	1	10986
household's econ. situation	1.095	0.929	0	4	10705
household's econ. situation	1.694	0.687	0	4	10679
future economic run	5.12	2.255	0	9	4186
Political factors					
trust local government	0.555	0.248	0	1	9883
trust executive government	0.581	0.256	0	1	9511
fair treatment by the government	0.513	0.27	0	1	8853
fair elections	0.675	0.468	0	1	11002
open voice	0.76	0.427	0	1	9286
fair courts	0.18	0.384	0	1	11002
political index Pol_1	1.445	0.945	0	4	7460
political index Pol_2	1.987	0.924	0	4	7971
Economic factors (most important issue)					
unemployment	0.463	0.499	0	1	11002
corruption	0.004	0.061	0	1	11002
poverty	0.111	0.314	0	1	11002
inflation	0.029	0.168	0	1	11002
low wages	0.029	0.168	0	1	11002
economic index $Econ_1$	1.71	1.046	0	3	11002
economic index $Econ_2$	1.674	1.04	0	3	11002

Source: Caucasus Barometer Dataset 2010-2013.

Table 12: First stage of the bivariate probit model (all households)

	Armenia	Azerbaijan	Georgia
personal income	.125***	.042***	
	(.036)	(.015)	
year 2010	-.161***		
	(.050)		
year 2011	-.207***		
	(.049)		
years of education	.078***		-.191***
	(.007)		(.063)
married	.138***		
	(.052)		
female	-.253***		
	(.042)		
north-east rural	-.127*		
	(.069)		
north-east urban	-.186**		
	(.079)		
household size		-.045***	-.080***
		(.016)	(.014)
south-east rural		.144**	
		(.061)	
south-east rural		.360***	
		(.076)	
south-east rural		.144***	
		(.060)	
work experience			-.022
			(.014)

Table 13: First stage of the bivariate model (young households)

	Armenia	Azerbaijan	Georgia
personal income	.218***	.070***	
	(.060)	(.060)	
household size	.218***	-.020	-.077***
	(.060)	(.025)	(.028)
year 2010	-.116		
	(.089)		
year 2011	-.066		
	(.088)		
years of education	.085***		
	(.014)		
female	-.362***		
	(.078)		
north-east rural	-.084		
	(.112)		
north-east urban	-.052		
	(.129)		
south-east rural		0.149	
		(.098)	
north-west urban		.232**	
		(.089)	
English knowledge		.286**	
		(.014)	
friend outside			.862***
			(.068)
household size			-.077***
			(.028)
work experience			-.058**
			(.030)
years of education			-.396 ***
			(.133)

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